

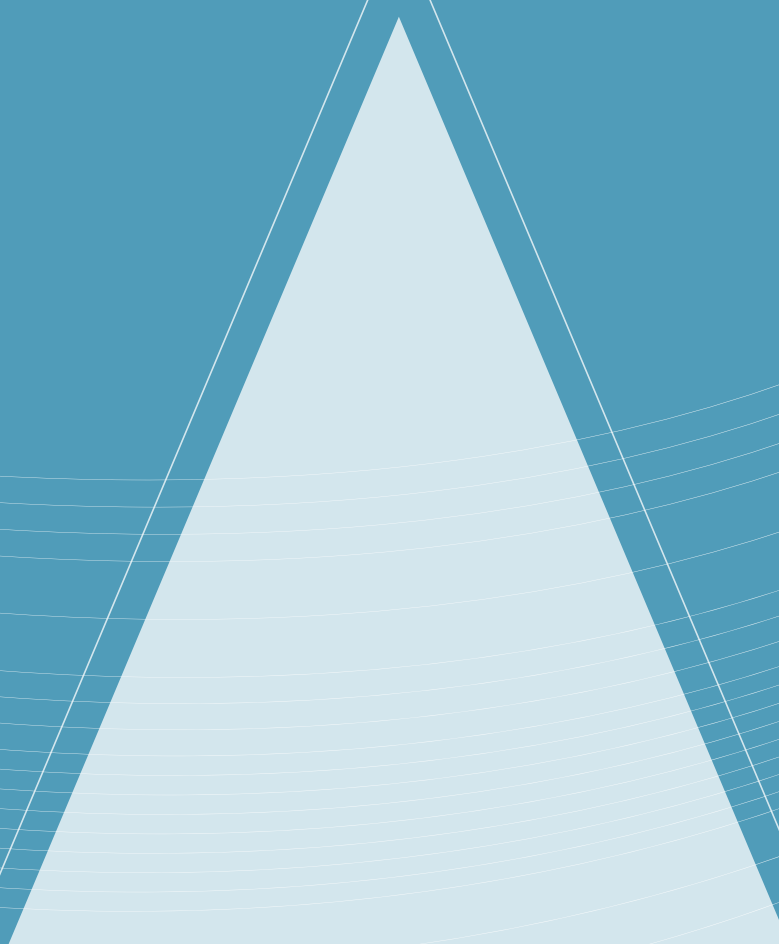
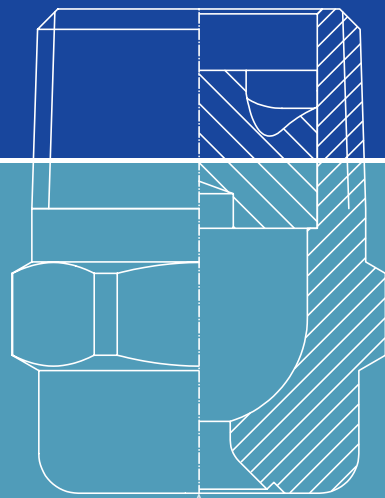
ENGINEERING  
YOUR SPRAY SOLUTION



# PRECISION SPRAY NOZZLES AND ACCESSORIES

for industrial spray solutions | Edition 221

INDUSTRY





# INDUSTRIAL NOZZLE TECHNOLOGY FROM EUROPE'S LEADING SUPPLIER

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## ➤➤ WHERE TRADITION MEETS THE FUTURE

1879

Company founded by  
Paul Lechler

1893

Patent for  
liquid atomization

1967

Relocation of production  
to Metzingen

1978

Expansion to the USA  
and then to  
other countries

1995

Production, sales  
and administration are  
concentrated in Metzingen



# 140

1879 - 2019

**2010**

Expansion of production  
with a new 13.000 m<sup>2</sup>  
Manufacturing Plant

**2016**

New Development and  
Technology Center is  
opened in Metzingen

**2019**

Celebrating  
140 years

**2021**

New factory  
in China

**2022**

New logistics center  
in Metzingen



# THERE ARE MANY REASONS TO CHOOSE NOZZLES FROM LECHLER

## The first choice for your nozzle solution

You only become a market leader and Europe's number one in nozzle technology when you can offer your customers a variety of engineered spray solutions. Lechler embodies our relationships with customers on every level.

## Measurement Technology Center

In our globally incomparable development and technology center, we analyze the spray behavior of our nozzles. Equipped with cutting-edge test rigs, highly developed nozzle measurement technology and state of the art infrastructure. Lechler's research and development center offers various opportunities that serve all of our customers needs; from practical testing, droplet analysis, measurement technology, and more.

## Unrivalled product diversity

Boasting over 45,000 different nozzles and nozzle systems, Lechler is able to solve the challenges of virtually every process in every industry. If there is not a product for you in our portfolio, Lechler will develop solutions working with our customers and their requirements.

## Highly qualified employees

Employee management at Lechler is characterized by the promotion of continuous development and team spirit in the workplace. This is the secret recipe behind our companies success and true passion and commitment of our people throughout the organization.

## Over 140 years of experience

Lechler has been atomizing liquids since 1879. Today, we understand spray technology better than anyone else. With this experience, we not only develop the perfect nozzle for each application, but also offer expert advice on optimising spraying processes.

## Creating Solutions

The needs and requirements of our customers are at the forefront of everything we do. Our goal is to always offer the ideal solution for every task, and if it is not yet available, we develop it.

## State of the Art Manufacturing

Whether you are looking for state-of-the-art metal processing, precision injection moulding, metal injection molding (MIM), ceramic sintering or 3D printing: We have the experience and knowledge to offer all manufacturing techniques.

## Long Lasting Customer Relationships

Longevity and quality is the foundation to which our business is built upon. We thrive on mutual trust and attach great importance to excelling through performance, know-how and long-term partnerships.

**XactClean** HP  
High Performance



# GERMAN ENGINEERING EUROPE'S NO. 1 GLOBAL MARKET LEADER

Chicago

Mumbai

Headquarters



Subsidiary



Sales office/  
Sales agent



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- Subsidiary
- Sales office/  
Sales agent



# DIVERSITY IN TOP FORM

Lechler's services go far beyond the development and production of nozzles. Thanks to an extensive portfolio of products and services, we are able to ensure optimum spraying results in a wide range of industries and applications.

## MEASURING TECHNOLOGY

At Lechler, high-precision spray measurements and analysis are not only used for nozzle developments, they are also offered as a service.



For detailed information about our range of services, please visit:  
**[www.lechler.com](http://www.lechler.com)**

## NOZZLES

In addition to the nozzles presented in this catalogue, our portfolio also includes numerous special nozzles – for applications in many other industries, from agriculture to steel production.

## CFD

Computational Fluid Dynamics (CFD) not only enables us to develop nozzles quickly and precisely, it also ensures customer-specific process optimization.

## ENGINEERING

Our experienced engineering team strives to provide you with a system solution tailored to your application and installation-specific conditions.



## DROPLET SEPARATORS

Our droplet separators play a key role in process optimizations. They are primarily designed to separate liquids from gas flows and are currently used in over 100 different applications worldwide.

## LANCES AND CUSTOM SOLUTIONS

With custom nozzle lances, spray headers and spray systems, we ensure the implementation of customized solutions for your specific application.

# ➤➤ FOUR BUSINESS DIVISIONS DIVERSITY AT ITS FINEST

There's more to spraying than meets the eye. Various industries have their own focus and requirements. To meet all of them, we develop and sell industry-oriented solutions in four individual business sectors.

Our diversity and experience spanning over 140 years gives us a wealth of knowledge that is shared to guarantee the best engineered spray solution across all industries.



## GENERAL INDUSTRY

Food and Beverage Industry, Pharmaceutical Industry, Chemical Industry, Automotive Industry, just to name a few. Lechler Nozzles can be found in almost every production environment. With a deep understanding of customer processes, we ensure an optimized engineered spray solution for every application.



## AGRICULTURE

From plant protection and liquid fertilization to irrigation – Lechler offers the ideal nozzles for precise application – thereby achieving the best results with minimal effort in the shortest possible time. This helps to increase yields and protect the environment.



## METALLURGY

Steel and aluminium producers face immense competitive pressure worldwide. The required product qualities can only be produced with maximum energy efficiency through optimization of your process. Lechler nozzles make a decisive contribution to producing innovative material grades and reducing CO<sub>2</sub> emissions.



## AIR QUALITY CONTROL SYSTEMS

Increasingly stringent emission requirements but also a growing number of voluntary commitments mean air quality control systems are in the spotlight more than ever. With its wide range of nozzles and efficient gas treatment systems, Lechler offers the perfect answer for every application.

# AT HOME IN MANY INDUSTRY SECTORS

We understand your processes and engineer every solution to match each nozzle to the respective environmental conditions. Our specialists will help you choose the right nozzle and aid in engineering services to meet your application needs.

## APPLICATIONS



CLEANING  
REMOVING  
COOLING  
SURFACE TREATMENT  
SURFACE SPRAYING  
ATOMIZING  
MIXING

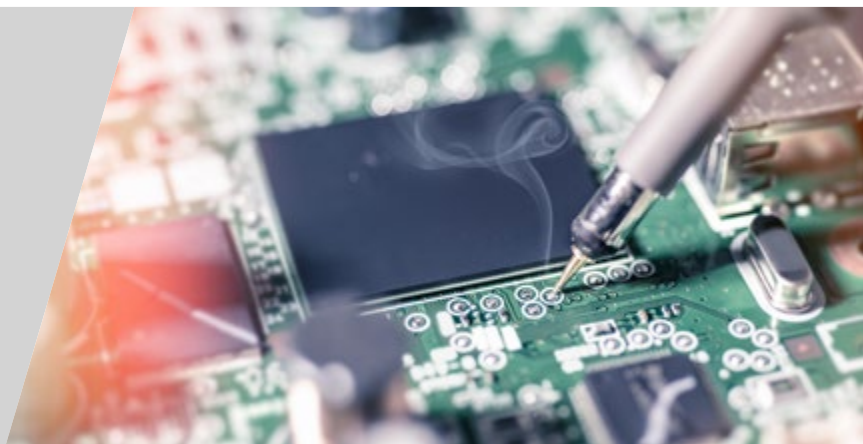
## AUTOMOTIVE INDUSTRY



## CHEMICAL INDUSTRY



## ELECTRONICS INDUSTRY





## **INDUSTRIAL CLEANING TECHNOLOGY**



## **FOOD AND BEVERAGE INDUSTRY**



## **SURFACE TREATMENT**

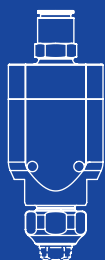
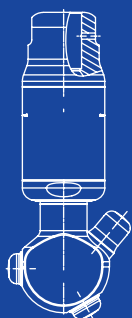
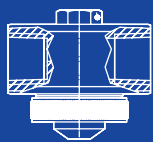


## **PHARMACEUTICAL AND COSMETICS INDUSTRY**



## **SHIPBUILDING INDUSTRY AND MANY MORE ...**

# ➤➤ A BRIEF INTRODUCTION TO MORE THAN 45,000 PRODUCTS





# QUESTION OF SHAPE: THE IDEAL SPRAY PATTERN FOR YOUR APPLICATION

Form follows function – and vice-versa. The search for the right nozzle begins with the choice of atomization type (single fluid nozzle or pneumatic atomizing nozzle) and the appropriate spray pattern. This determines the essential properties of the nozzle.

## Single fluid nozzle

By narrowing the cross section in the nozzle, the flow velocity of the fluid being atomized increases. Potential energy is converted into kinetic energy (speed). The fluid exiting the nozzle orifice discharges the liquid into droplets of various sizes and distribution.

### Solid stream nozzles



Precise, solid jet with the highest impact and limited atomization.

Main applications:

- Cleaning
- Injection
- Targeted cooling

### Flat fan nozzles



Defined spray, linear impact. A wide range of nozzles with various flow rates, spray angles and materials.

Main applications:

- Cleaning
- Coating
- Humidification

### Hollow cone nozzles



Ring-shaped impact, various flow rates and fine atomization. Available in two designs (axial and tangential).

Main applications:

- Cooling
- Humidification
- Chemical engineering

### Full cone nozzles



A wide range of nozzles with full surface impact. Available in two designs (axial and tangential).

Main applications:

- Cleaning
- Surface spraying
- Chemical engineering

### Pneumatic atomizing nozzles

With pneumatic atomization, the various flow velocities of gases and liquids in a nozzle result in the desired shearing of the liquid into extremely fine droplets.



Finest atomization even of viscous fluids. Full cone or flat fan versions are available.

Main applications:

- Cooling
- Humidification
- Chemical engineering

### Compressed air nozzles

Compressed air nozzles are used for dispersing air or saturated steam in a concentrated fan. Generally, they are flat fan, solid stream or round jet nozzles. Our multi-channel compressed air nozzles are extremely quiet and also economical in terms of air consumption.



High blowing force with maximum efficiency and reduced noise level.

Main applications:

- Blowing off and out
- Cooling
- Drying

### Tank cleaning nozzles

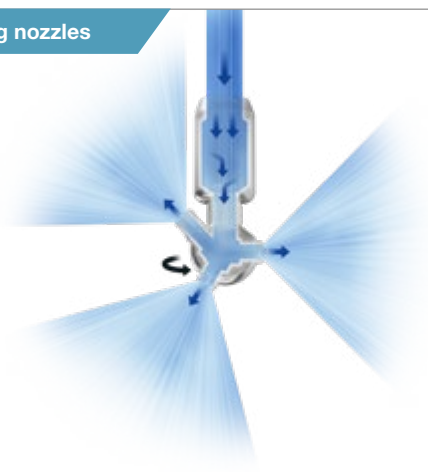
For years now, our tank cleaning nozzles have been making a name for themselves as both an economical and highly effective solution for tank and equipment cleaning. The portfolio is divided into static spray balls and rotating cleaning nozzles.

#### Static nozzles



Extremely robust version for easy rinsing even at high temperatures.

#### Rotating nozzles



High cleaning performance in the low pressure range for any amount of soiling. Enables cleaning in place and saves on expensive cleaning chemicals.



## OVERVIEW OF KEY NOZZLE PARAMETERS

FLOW RATE

TEMPERATURE

LIQUID

PRESSURE



In addition to the spray pattern, each nozzle has specific properties, which in turn depend on various – mutually influencing – operating parameters. An overview of the key factors can be found in the planning aids section starting on Page 258.

IMPACT

SPRAY ANGLE

DROPLET SIZE

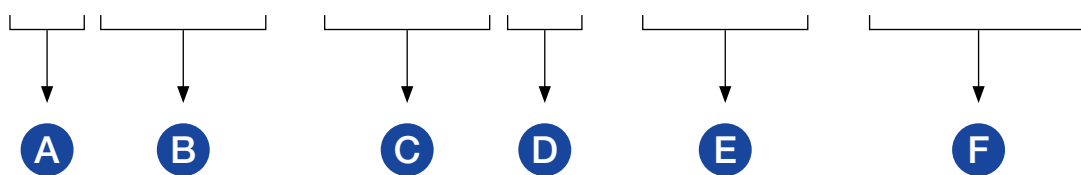
LIQUID DISTRIBUTION

# OUR PRODUCT NUMBERS: EVERYTHING YOU NEED TO KNOW IN TEN CHARACTERS

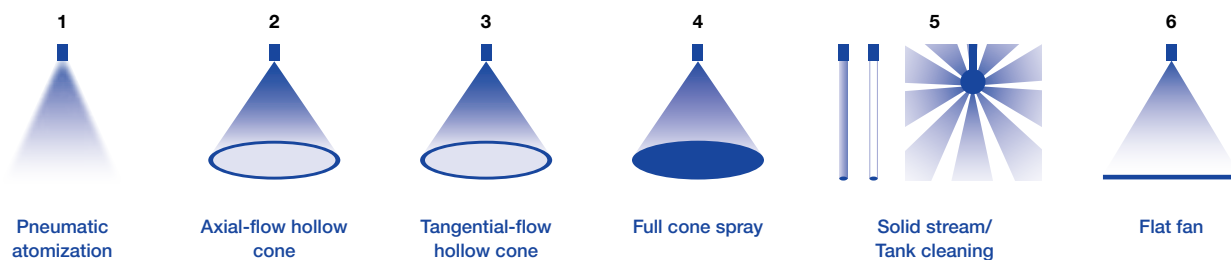
Each Lechler product number not only serves as an order number, it also describes all the essential properties of the associated nozzle.

## Product number

# 632.301.16.CA



### A SPRAY PATTERN



### B NOZZLE TYPE/SERIES

### C FLOW RATE



The flow rate depends on the respective nozzle type. The exact specifications are shown in the tables on the product pages. The values refer to the measurement with water.

### D SPRAY ANGLE



**Flat fan:** 1 = 20°, 2 = 30°, 3 = 45°, 4 = 60°, 5 = 75°, 6 = 90°, 7 = 120°  
**Hollow and full cone:** 3 = 45°, 4 = 60°, 5 = 80°, 6 = 90°, 8 = 120°/130°  
**Solid stream:** 0 = 0°

### E MATERIAL



11 = stainless steel 430F, 1Y = stainless steel 316L, 16 = stainless steel 303,  
 17 = stainless steel 316Ti, 30 = brass, 5E = PVDF, 51 = PA, 53 = PP, 55 = PTFE,  
 56 = POM, 42 = aluminum.  
 For individual series, the material may deviate from this numbering system.  
 Refer to the respective product page for details. Special material available on request.

### F CONNECTION



1/8" to 4" connections. The exact specifications are shown in the tables on the product pages.

| Spray angle | Nozzle type | Ordering no. |                         |                            |       |          |          |          |          | Bore diameter B [mm] | Narrowest free cross section Ø [mm] | Flow rate |              |              |      |      |      |      |     | Spray width |
|-------------|-------------|--------------|-------------------------|----------------------------|-------|----------|----------|----------|----------|----------------------|-------------------------------------|-----------|--------------|--------------|------|------|------|------|-----|-------------|
|             |             | Mat. no.     |                         |                            |       | Code     |          |          |          |                      |                                     | p [bar]   | H = 200 [mm] | H = 500 [mm] |      |      |      |      |     |             |
|             |             | 16           | 17                      | 30                         | 5E    | 1/8 BSPT | 1/4 BSPT | 3/8 BSPT | 1/2 BSPT |                      |                                     |           |              |              |      |      |      |      |     |             |
|             |             | Type         | Stainless steel 303/304 | Stainless steel 316Ti/316L | Brass |          |          |          |          |                      |                                     |           |              |              | PVDF |      |      |      |     |             |
|             |             | 0.5          | 1.0                     | 2.0*                       | 3.0   |          |          |          |          |                      |                                     |           |              |              | 5.0  | 7.0  | 10.0 |      |     |             |
| 20°         | 632.301     | ●            | ●                       | ●                          | ●     | CA       | CC       |          |          | 0.70                 | 0.60                                | 0.16      | 0.23         | 0.32         | 0.39 | 1.44 | 1.65 | 1.90 | 160 | 400         |
|             | 632.441     | ●            | ●                       | ●                          | ●     | CA       | CC       |          |          | 1.00                 | 1.10                                | 0.62      | 0.88         | 1.25         | 1.53 | 4.54 | 5.20 | 6.00 | 160 | 400         |
|             | 632.481     | ●            | ●                       | ●                          | ●     | CA       | CC       |          |          | 1.50                 | 1.20                                | 0.80      | 1.13         | 1.60         | 1.96 | 5.77 | 6.60 | 7.61 | 160 | 400         |
| 60°         | 632.364     | ●            | ●                       | ●                          | ●     | CA       | CC       |          |          | 1.00                 | 0.60                                | 0.31      | 0.44         | 0.63         | 0.77 | 1.00 | 1.18 | 1.40 | 230 | 460         |
|             | 632.404     | ●            | ●                       | ●                          | ●     | CA       | CC       |          |          | 1.20                 | 0.80                                | 0.50      | 0.71         | 1.00         | 1.23 | 1.58 | 1.87 | 2.24 | 245 | 485         |
|             | 632.444     | ●            | ●                       | ●                          | ●     | CA       | CC       |          |          | 1.35                 | 0.90                                | 0.62      | 0.88         | 1.25         | 1.53 | 1.98 | 2.34 | 2.80 | 255 | 495         |
|             | 632.484     | ●            | ●                       | ●                          | ●     | CA       | CC       |          |          | 1.50                 | 1.00                                | 0.80      | 1.13         | 1.60         | 1.96 | 2.53 | 2.99 | 3.58 | 260 | 510         |

\* All the nozzles are designed for a specific reference pressure. This pressure is highlighted in bold in the tables on the product pages. The flow rate specifications at the reference pressure are measured values. The flow rate specifications for a deviating pressure level are calculated values.

### Ordering examples

- You are looking for a flat fan nozzle with a 20° spray angle and an approx. 0.3 l/min flow rate at 2 bar. It should be made of stainless steel 303 and come with a 1/8" male thread.

| Type    | + | Material no. | + | Code | = | Ordering no.  |
|---------|---|--------------|---|------|---|---------------|
| 632.301 | + | 16           | + | CA   | = | 632.301.16.CA |

- You are looking for a flat fan nozzle with a 60° spray angle and an approx. 0.6 l/min flow rate at 3 bar. It should be made of brass and come with a 1/4" male threaded connection.

| Type    | + | Material no. | + | Code | = | Ordering no.  |
|---------|---|--------------|---|------|---|---------------|
| 632.364 | + | 30           | + | CC   | = | 632.364.30.CC |

### Information on dimensions

- All dimensions in technical drawings and tables are in millimetres (unless stated otherwise).
- Thread sizes BSPP and BSPT are given in inches.

### Description of variables in technical drawings

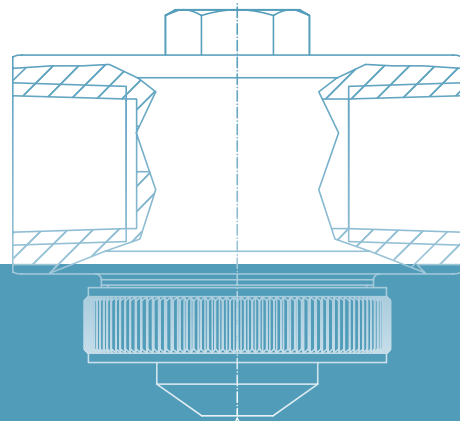
B = bore diameter  
 E = narrowest cross-section  
 G = thread  
 Hex = wrench size  
 Flats = wrench size

### Product images

The images on the product pages are provided as examples and may deviate in individual cases depending on the actual nozzle size.



# PNEUMATIC ATOMIZING NOZZLES



# PNEUMATIC ATOMIZING NOZZLES GENERAL INFORMATION



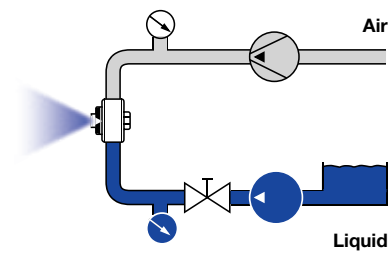
Pneumatic atomizing nozzles produce extremely fine droplets with a small droplet spectrum. They can be split into two types: Internal mixing (for low viscous fluids) and external mixing (for viscous fluids). Gas and liquid are mixed on the inside or outside of the nozzle. Depending on the actual design of the nozzle, the liquid is self-aspirated or supplied under pressure. Various spray jet shapes can be achieved through the design of the nozzle tip.

## Pneumatic atomizing nozzles

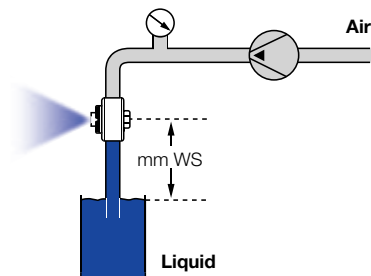


- Produces extremely fine droplets
- Wide range of liquid-supply
- Internal or external mixing
- Suitable for humidification, cooling and the atomization of viscous fluids

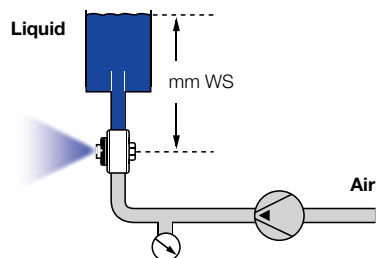
## Liquid pressure principle



## Siphon principle



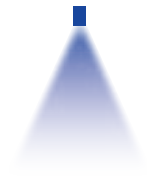
## Supply principle





# PNEUMATIC ATOMIZING NOZZLES

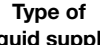
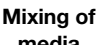
## OVERVIEW OF SERIES



|                       |                                | Pneumatic atomizing nozzles                                                       |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
|-----------------------|--------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                       |                                |  |  |  |  |  |
| Series                |                                | 140                                                                               | 176 ViscoMist                                                                     | 170                                                                                | 150                                                                                 | 77X, 78X, 79X                                                                       |
| Information on page   |                                | 53                                                                                | 54                                                                                | on request                                                                         | on request                                                                          | on request                                                                          |
| Spray character       | Full cone spray                | •                                                                                 | •                                                                                 | •                                                                                  | •                                                                                   | •                                                                                   |
|                       | Flat fan                       |                                                                                   | •                                                                                 |                                                                                    |                                                                                     |                                                                                     |
|                       | Solid stream                   |                                                                                   | •                                                                                 |                                                                                    |                                                                                     |                                                                                     |
| Type of liquid supply | Pressure principle             |                                                                                   | •                                                                                 | •                                                                                  | •                                                                                   | •                                                                                   |
|                       | Siphon and/or supply principle | •                                                                                 |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| Mixing of media       | Internal mixing                | •                                                                                 |                                                                                   | •                                                                                  |                                                                                     |                                                                                     |
|                       | External mixing                |                                                                                   | •                                                                                 |                                                                                    | •                                                                                   | •                                                                                   |
| Flow rate             | I/h                            | 4.50–12.00                                                                        | 7.80–307.00                                                                       | 8.50–290.00<br>[l/min]                                                             | 0.15–63.00<br>[l/min]                                                               | 3.00–1,164.00                                                                       |
| Spray angle           | Small<br>(15°–30°)             | •                                                                                 | •                                                                                 | •                                                                                  | •                                                                                   | •                                                                                   |
|                       | Medium<br>(45°)                |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
|                       | Large<br>(60°–80°)             |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |



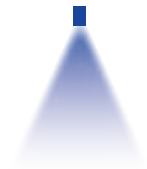


|                                                                                                              |                                |  |  |  |  |
|--------------------------------------------------------------------------------------------------------------|--------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Series                                                                                                       |                                | 136.1                                                                             | 136.2                                                                              | 136.3                                                                               | 136.4                                                                               |
| Information on page                                                                                          |                                | 30                                                                                | 32                                                                                 | 33                                                                                  | 36                                                                                  |
| <br>Spray character         | Full cone spray                | •                                                                                 | •                                                                                  | •                                                                                   |                                                                                     |
|                                                                                                              | Flat fan                       |                                                                                   |                                                                                    |                                                                                     | •                                                                                   |
|                                                                                                              | Solid stream                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| <br>Type of liquid supply | Pressure principle             | •                                                                                 | •                                                                                  |                                                                                     | •                                                                                   |
|                                                                                                              | Siphon and/or supply principle |                                                                                   |                                                                                    | •                                                                                   |                                                                                     |
| <br>Mixing of media       | Internal mixing                | •                                                                                 | •                                                                                  |                                                                                     | •                                                                                   |
|                                                                                                              | External mixing                |                                                                                   |                                                                                    | •                                                                                   |                                                                                     |
| <br>Flow rate             | I/h                            | 0.40–93.20                                                                        | 0.40–132.90                                                                        | 0.30–66.72                                                                          | 0.10–76.10                                                                          |
| <br>Spray angle           | Small<br>(15°–30°)             | •                                                                                 |                                                                                    | •                                                                                   |                                                                                     |
|                                                                                                              | Medium<br>(45°)                |                                                                                   |                                                                                    |                                                                                     | •                                                                                   |
|                                                                                                              | Large<br>(60°–80°)             |                                                                                   | •                                                                                  |                                                                                     | •                                                                                   |

## Pneumatic atomizing nozzles

|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |  |
| <b>136.5</b>                                                                     | <b>136.6</b>                                                                      | <b>166.1</b>                                                                      | <b>166.2</b>                                                                      | <b>166.4</b>                                                                        | <b>166.6</b>                                                                        |
| 38                                                                               | 40                                                                                | 44                                                                                | 46                                                                                | 47                                                                                  | 49                                                                                  |
|                                                                                  |                                                                                   | •                                                                                 | •                                                                                 |                                                                                     |                                                                                     |
| •                                                                                | •                                                                                 |                                                                                   |                                                                                   | •                                                                                   | •                                                                                   |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|                                                                                  | •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                   | •                                                                                   |
| •                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| •                                                                                |                                                                                   | •                                                                                 | •                                                                                 | •                                                                                   |                                                                                     |
|                                                                                  | •                                                                                 |                                                                                   |                                                                                   |                                                                                     | •                                                                                   |
| 0.80–3.20                                                                        | 1.68–102.10                                                                       | 0.40–93.20                                                                        | 0.40–132.90                                                                       | 0.10–76.10                                                                          | 1.68–102.10                                                                         |
|                                                                                  |                                                                                   | •                                                                                 |                                                                                   |                                                                                     |                                                                                     |
|                                                                                  | •                                                                                 |                                                                                   |                                                                                   | •                                                                                   | •                                                                                   |
| •                                                                                | •                                                                                 |                                                                                   | •                                                                                 | •                                                                                   | •                                                                                   |

# ➤ Pneumatic atomizing nozzles, full cone, pressure principle, internal mixing Series 136.1

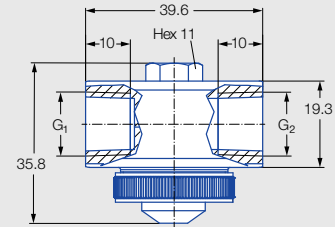


## Features:

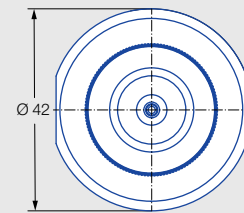
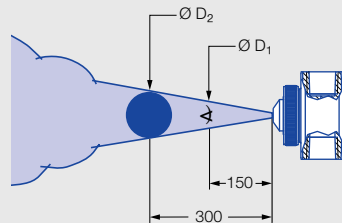
- Fine full cone atomization
- Liquid pressure principle
- Internal mixing

## Applications:

- Humidification of air
- Cooling



Series 136.1



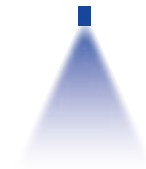
| Liquid connection G <sub>1</sub> | Air connection G <sub>2</sub> | Screw plug thread (size 11) | Weight [g]<br>(Stainless steel 303) |
|----------------------------------|-------------------------------|-----------------------------|-------------------------------------|
| 1/4 BSPP                         | 1/4 BSPP                      | 5/16-24 UNF-2A              | 220                                 |

| Spray angle   | Ordering no.  |                      |                     | Narrowest free cross section Ø [mm] | Liquid pressure p [bar] |                |                            |             |                |                            |             |                |                            |      |      |     | Spray dimensions |               |                       |                       |
|---------------|---------------|----------------------|---------------------|-------------------------------------|-------------------------|----------------|----------------------------|-------------|----------------|----------------------------|-------------|----------------|----------------------------|------|------|-----|------------------|---------------|-----------------------|-----------------------|
|               | Type          | Mat. no.             |                     |                                     | 0.7                     |                |                            |             | 1.5            |                            |             | 3.0            |                            |      | 4.0  |     | p air [bar]      | p water [bar] | Ø D <sub>1</sub> [mm] | Ø D <sub>2</sub> [mm] |
|               |               | 1Y                   | 16                  |                                     | p air [bar]             | V̇ water [l/h] | V̇ <sub>n</sub> air [m³/h] | p air [bar] | V̇ water [l/h] | V̇ <sub>n</sub> air [m³/h] | p air [bar] | V̇ water [l/h] | V̇ <sub>n</sub> air [m³/h] |      |      |     |                  |               |                       |                       |
|               |               | Stainless steel 316L | Stainless steel 303 |                                     |                         |                |                            |             |                |                            |             |                |                            |      |      |     |                  |               |                       |                       |
| 20°           | 136.115.xx.A2 | ●                    | ●                   | 0.5                                 | 0.4                     | 5.9            | 0.3                        | 1.4         | 5.8            | 0.8                        | 2.4         | 9.1            | 1.1                        | 3.0  | 11.0 | 1.2 | 0.8              | 0.7           | 60                    | 100                   |
| 0.8           |               |                      |                     |                                     | 3.8                     | 0.6            | 1.8                        | 4.1         | 1.0            | 2.8                        | 7.5         | 1.2            | 3.4                        | 9.6  | 1.4  | 1.8 | 1.5              | 60            | 95                    |                       |
| 1.2           |               |                      |                     |                                     | 1.7                     | 0.9            | 2.2                        | 2.2         | 1.4            | 3.2                        | 5.9         | 1.5            | 3.8                        | 8.2  | 1.6  | 2.6 | 2.0              | 60            | 100                   |                       |
| -             |               |                      |                     |                                     | -                       | -              | 2.6                        | 1.2         | 1.7            | 3.6                        | 4.4         | 1.8            | 4.2                        | 6.8  | 1.9  | 3.2 | 3.0              | 55            | 95                    |                       |
| -             |               |                      |                     |                                     | -                       | -              | -                          | -           | -              | 4.0                        | 2.9         | 2.1            | 4.6                        | 5.5  | 2.2  | 4.4 | 4.0              | 55            | 100                   |                       |
| -             |               |                      |                     |                                     | -                       | -              | -                          | -           | -              | 4.4                        | 2.0         | 2.5            | 5.0                        | 4.1  | 2.5  | -   | -                | -             | -                     |                       |
| -             |               |                      |                     |                                     | -                       | -              | -                          | -           | -              | 4.8                        | 1.1         | 2.8            | 5.4                        | 2.9  | 2.8  | -   | -                | -             | -                     |                       |
| -             |               |                      |                     |                                     | -                       | -              | -                          | -           | -              | 5.2                        | 0.4         | 3.0            | 5.8                        | 2.1  | 3.1  | -   | -                | -             | -                     |                       |
| 136.125.xx.A2 | ●             | ●                    | 0.5                 | 0.8                                 | 4.7                     | 1.5            | 1.2                        | 7.0         | 1.8            | 2.8                        | 9.1         | 3.3            | 3.4                        | 10.6 | 3.9  | 1.4 | 0.7              | 55            | 90                    |                       |
|               |               |                      |                     | 1.2                                 | 4.4                     | 1.9            | 1.6                        | 6.6         | 2.2            | 3.2                        | 8.7         | 3.7            | 3.8                        | 10.3 | 4.3  | 2.2 | 1.5              | 55            | 95                    |                       |
|               |               |                      |                     | 1.6                                 | 4.0                     | 2.3            | 2.0                        | 6.2         | 2.6            | 3.6                        | 8.4         | 4.1            | 4.2                        | 9.9  | 4.6  | 2.8 | 2.0              | 55            | 100                   |                       |
|               |               |                      |                     | 2.0                                 | 3.5                     | 2.6            | 2.4                        | 5.8         | 3.0            | 4.0                        | 8.0         | 4.5            | 4.6                        | 9.6  | 5.0  | 3.4 | 3.0              | 60            | 100                   |                       |
|               |               |                      |                     | 2.4                                 | 3.0                     | 3.0            | 2.8                        | 5.4         | 3.4            | 4.4                        | 7.7         | 4.8            | 5.0                        | 9.3  | 5.4  | 4.2 | 4.0              | 60            | 100                   |                       |
|               |               |                      |                     | 2.8                                 | 2.7                     | 3.2            | 3.2                        | 4.9         | 3.7            | 4.8                        | 7.3         | 5.2            | 5.4                        | 8.9  | 5.8  | -   | -                | -             | -                     |                       |
|               |               |                      |                     | 3.2                                 | 2.0                     | 3.7            | 3.6                        | 4.4         | 4.1            | 5.2                        | 7.0         | 5.6            | 5.8                        | 8.6  | 6.1  | -   | -                | -             | -                     |                       |
|               |               |                      |                     | 3.6                                 | 1.6                     | 4.1            | 4.0                        | 3.9         | 4.5            | 5.6                        | 6.6         | 5.9            | -                          | -    | -    | -   | -                | -             | -                     |                       |
|               |               |                      |                     | 4.0                                 | 1.3                     | 4.5            | 4.4                        | 3.5         | 4.8            | 6.0                        | 6.2         | 6.3            | -                          | -    | -    | -   | -                | -             | -                     |                       |
|               |               |                      |                     | 4.4                                 | 1.0                     | 4.9            | 4.8                        | 3.1         | 5.2            | -                          | -           | -              | -                          | -    | -    | -   | -                | -             | -                     |                       |
|               |               |                      |                     | 4.8                                 | 0.6                     | 5.2            | 5.2                        | 2.7         | 5.6            | -                          | -           | -              | -                          | -    | -    | -   | -                | -             | -                     |                       |
|               |               |                      |                     | -                                   | -                       | -              | 5.6                        | 2.3         | 5.9            | -                          | -           | -              | -                          | -    | -    | -   | -                | -             | -                     |                       |
|               |               |                      |                     | -                                   | -                       | -              | 6.0                        | 1.9         | 6.3            | -                          | -           | -              | -                          | -    | -    | -   | -                | -             | -                     |                       |

| Spray angle   | Ordering no.  |                      | Narrowest free cross section Ø [mm] | Liquid pressure p [bar] |             |               |                           |             |               |                           |             |               |                           |             |               | Spray dimensions |               |                       |                       |                           |
|---------------|---------------|----------------------|-------------------------------------|-------------------------|-------------|---------------|---------------------------|-------------|---------------|---------------------------|-------------|---------------|---------------------------|-------------|---------------|------------------|---------------|-----------------------|-----------------------|---------------------------|
|               | Type          | Mat. no.             |                                     | 0.7                     |             |               | 1.5                       |             |               | 3.0                       |             |               | 4.0                       |             |               | p air [bar]      | p water [bar] | Ø D <sub>1</sub> [mm] | Ø D <sub>2</sub> [mm] |                           |
|               |               | 1Y                   |                                     | 16                      | p air [bar] | ṽ water [l/h] | ṽ <sub>n</sub> air [m³/h] | p air [bar] | ṽ water [l/h] | ṽ <sub>n</sub> air [m³/h] | p air [bar] | ṽ water [l/h] | ṽ <sub>n</sub> air [m³/h] | p air [bar] | ṽ water [l/h] |                  |               |                       |                       | ṽ <sub>n</sub> air [m³/h] |
|               |               | Stainless steel 316L |                                     | Stainless steel 303     |             |               |                           |             |               |                           |             |               |                           |             |               |                  |               |                       |                       |                           |
| 20°           | 136.134.xx.A2 | ●                    | ●                                   | 0.7                     | 1.2         | 13.2          | 2.7                       | 2.0         | 19.4          | 3.9                       | 3.0         | 28.3          | 5.2                       | 3.8         | 32.6          | 6.2              | 1.8           | 0.7                   | 55                    | 95                        |
| 1.6           |               |                      |                                     |                         | 12.4        | 3.3           | 2.4                       | 18.1        | 4.4           | 3.4                       | 27.5        | 5.7           | 4.2                       | 32.0        | 6.8           | 2.8              | 1.5           | 60                    | 105                   |                           |
| 2.0           |               |                      |                                     |                         | 11.8        | 3.9           | 2.8                       | 17.3        | 4.9           | 3.8                       | 26.7        | 6.3           | 4.6                       | 31.3        | 7.3           | 3.8              | 2.0           | 60                    | 105                   |                           |
| 2.4           |               |                      |                                     |                         | 11.4        | 4.4           | 3.2                       | 16.7        | 5.5           | 4.2                       | 25.9        | 6.8           | 5.0                       | 30.6        | 7.8           | 5.2              | 3.0           | 65                    | 110                   |                           |
| 2.8           |               |                      |                                     |                         | 11.1        | 4.9           | 3.6                       | 16.1        | 6.0           | 4.6                       | 25.0        | 7.3           | 5.4                       | 29.9        | 8.4           | 6.0              | 4.0           | 65                    | 110                   |                           |
| 3.2           |               |                      |                                     |                         | 10.8        | 5.5           | 4.0                       | 15.6        | 6.5           | 5.0                       | 24.2        | 7.8           | 5.8                       | 29.3        | 8.9           | –                | –             | –                     | –                     |                           |
| 3.6           |               |                      |                                     |                         | 10.6        | 6.0           | 4.4                       | 15.2        | 7.0           | 5.4                       | 23.6        | 8.4           | –                         | –           | –             | –                | –             | –                     | –                     |                           |
| 4.0           |               |                      |                                     |                         | 10.4        | 6.5           | 4.8                       | 15.0        | 7.6           | 5.8                       | 23.1        | 8.9           | –                         | –           | –             | –                | –             | –                     | –                     |                           |
| 4.4           |               |                      |                                     |                         | 10.1        | 7.0           | 5.2                       | 14.6        | 8.1           | –                         | –           | –             | –                         | –           | –             | –                | –             | –                     | –                     |                           |
| 4.8           |               |                      |                                     |                         | 9.9         | 7.6           | 5.6                       | 14.1        | 8.6           | –                         | –           | –             | –                         | –           | –             | –                | –             | –                     | –                     |                           |
| 5.2           |               |                      |                                     |                         | 9.5         | 8.1           | 6.0                       | 13.8        | 9.1           | –                         | –           | –             | –                         | –           | –             | –                | –             | –                     | –                     |                           |
| 5.6           |               |                      |                                     |                         | 9.0         | 8.6           | –                         | –           | –             | –                         | –           | –             | –                         | –           | –             | –                | –             | –                     | –                     |                           |
| 6.0           |               |                      |                                     |                         | 8.5         | 9.2           | –                         | –           | –             | –                         | –           | –             | –                         | –           | –             | –                | –             | –                     | –                     |                           |
| 136.142.xx.A2 | ●             | ●                    | 2.5                                 | 1.4                     | 24.2        | 5.1           | 1.6                       | 53.4        | 4.7           | 3.2                       | 70.8        | 8.0           | 3.8                       | 93.2        | 9.2           | 0.8              | 0.7           | 60                    | 100                   |                           |
|               |               |                      |                                     | 1.8                     | 20.4        | 6.3           | 2.0                       | 42.6        | 5.9           | 3.6                       | 62.5        | 9.2           | 4.2                       | 83.1        | 10.1          | 1.6              | 1.5           | 65                    | 105                   |                           |
|               |               |                      |                                     | 2.2                     | 20.0        | 7.2           | 2.4                       | 35.3        | 7.2           | 4.0                       | 55.7        | 10.6          | 4.6                       | 75.3        | 11.3          | 3.0              | 2.0           | 60                    | 105                   |                           |
|               |               |                      |                                     | 2.6                     | 19.3        | 8.2           | 2.8                       | 30.4        | 8.4           | 4.4                       | 49.3        | 11.7          | 5.0                       | 69.0        | 12.5          | 4.0              | 3.0           | 65                    | 110                   |                           |
|               |               |                      |                                     | 3.0                     | 17.6        | 9.3           | 3.2                       | 28.6        | 9.5           | 4.8                       | 44.6        | 12.9          | 5.4                       | 63.4        | 13.7          | 6.0              | 4.0           | 65                    | 110                   |                           |
|               |               |                      |                                     | 3.4                     | 16.5        | 10.4          | 3.6                       | 28.2        | 10.5          | 5.2                       | 41.9        | 14.1          | 5.8                       | 57.5        | 14.9          | –                | –             | –                     | –                     |                           |
|               |               |                      |                                     | 3.8                     | 17.0        | 11.4          | 4.0                       | 27.3        | 11.5          | 5.6                       | 40.4        | 15.1          | –                         | –           | –             | –                | –             | –                     | –                     |                           |
|               |               |                      |                                     | 4.2                     | 16.3        | 12.4          | 4.4                       | 25.9        | 12.5          | 6.0                       | 39.7        | 16.1          | –                         | –           | –             | –                | –             | –                     | –                     |                           |
|               |               |                      |                                     | 4.6                     | 15.1        | 13.3          | 4.8                       | 24.3        | 13.5          | –                         | –           | –             | –                         | –           | –             | –                | –             | –                     | –                     |                           |
|               |               |                      |                                     | 5.0                     | 14.0        | 14.3          | 5.2                       | 22.3        | 14.6          | –                         | –           | –             | –                         | –           | –             | –                | –             | –                     | –                     |                           |
|               |               |                      |                                     | 5.4                     | 13.1        | 15.3          | 5.6                       | 21.8        | 15.7          | –                         | –           | –             | –                         | –           | –             | –                | –             | –                     | –                     |                           |
|               |               |                      |                                     | 5.8                     | 12.4        | 16.2          | 6.0                       | 21.4        | 16.7          | –                         | –           | –             | –                         | –           | –             | –                | –             | –                     | –                     |                           |

Ordering Type + Material no. = Ordering no.  
example: 136.134.xx.A2 + 1Y = 136.134.1Y.A2

# ➤ Pneumatic atomizing nozzles, full cone, pressure principle, internal mixing Series 136.2

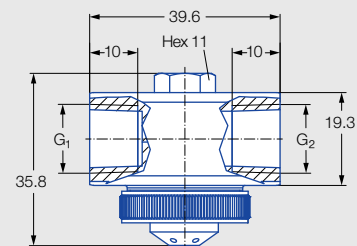


## Features:

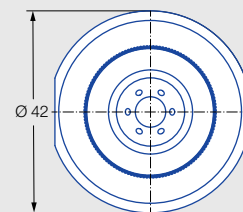
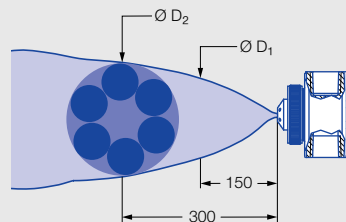
- Fine full cone atomization
- Liquid pressure principle
- Internal mixing
- Especially wide spray angle of 60°

## Applications:

- Humidification of air
- Cooling



Series 136.2



| Liquid connection G <sub>1</sub> | Air connection G <sub>2</sub> | Screw plug thread (size 11) | Weight [g] (Stainless steel 303) |
|----------------------------------|-------------------------------|-----------------------------|----------------------------------|
| 1/4 BSPP                         | 1/4 BSPP                      | 5/16-24 UNF-2A              | 220                              |

| Spray angle | Ordering no.  |                      |                     | Narrowest free cross section<br>Ø<br>[mm] | Liquid pressure p [bar] |                |                            |             |                |                            |             |                |                            |     |       |      | Spray dimensions |               |                       |                       |
|-------------|---------------|----------------------|---------------------|-------------------------------------------|-------------------------|----------------|----------------------------|-------------|----------------|----------------------------|-------------|----------------|----------------------------|-----|-------|------|------------------|---------------|-----------------------|-----------------------|
|             | Type          | Mat. no.             |                     |                                           | 0.7                     |                |                            |             | 1.5            |                            |             | 3.0            |                            |     | 4.0   |      | p air [bar]      | p water [bar] | Ø D <sub>1</sub> [mm] | Ø D <sub>2</sub> [mm] |
|             |               | 1Y                   | 16                  |                                           | p air [bar]             | V̇ water [l/h] | V̇ <sub>n</sub> air [m³/h] | p air [bar] | V̇ water [l/h] | V̇ <sub>n</sub> air [m³/h] | p air [bar] | V̇ water [l/h] | V̇ <sub>n</sub> air [m³/h] |     |       |      |                  |               |                       |                       |
|             |               | Stainless steel 316L | Stainless steel 303 |                                           |                         |                |                            |             |                |                            |             |                |                            |     |       |      |                  |               |                       |                       |
| 60°         | 136.215.xx.A2 | ●                    | ●                   | 0.5                                       | 1.0                     | 3.0            | 1.3                        | 1.6         | 5.8            | 1.7                        | 2.8         | 8.5            | 2.4                        | 3.8 | 9.4   | 3.1  | 1.0              | 0.7           | 200                   | 330                   |
|             |               |                      |                     |                                           | 1.2                     | 1.8            | 1.5                        | 1.8         | 4.9            | 1.9                        | 3.2         | 7.2            | 2.8                        | 4.2 | 8.2   | 3.5  | 1.6              | 1.5           | 230                   | 380                   |
|             |               |                      |                     |                                           | 1.4                     | 0.7            | 1.8                        | 2.0         | 3.8            | 2.1                        | 3.6         | 5.7            | 3.2                        | 4.6 | 6.9   | 3.9  | 2.4              | 2.0           | 230                   | 385                   |
|             |               |                      |                     |                                           | –                       | –              | –                          | 2.2         | 2.8            | 2.3                        | 4.0         | 4.0            | 3.6                        | 5.0 | 5.4   | 4.2  | 3.2              | 3.0           | 245                   | 390                   |
|             |               |                      |                     |                                           | –                       | –              | –                          | 2.4         | 1.7            | 2.5                        | 4.4         | 2.2            | 4.1                        | 5.4 | 3.8   | 4.7  | 4.2              | 4.0           | 250                   | 410                   |
|             |               |                      |                     |                                           | –                       | –              | –                          | 2.6         | 0.8            | 2.8                        | 4.8         | 0.8            | 4.5                        | 5.8 | 2.3   | 5.2  | –                | –             | –                     | –                     |
|             |               |                      |                     |                                           | –                       | –              | –                          | –           | –              | –                          | 5.0         | 0.4            | 4.6                        | 6.0 | 1.4   | 5.6  | –                | –             | –                     | –                     |
|             |               |                      |                     |                                           | –                       | –              | –                          | –           | –              | –                          | –           | –              | –                          | –   | –     | –    | –                | –             | –                     | –                     |
|             | 136.222.xx.A2 | ●                    | ●                   | 1.0                                       | 0.8                     | 17.5           | 2.8                        | 1.6         | 25.9           | 4.0                        | 3.0         | 40.4           | 5.8                        | 3.8 | 54.9  | 6.4  | 0.8              | 0.7           | 250                   | 450                   |
|             |               |                      |                     |                                           | 1.0                     | 6.0            | 4.3                        | 1.8         | 14.7           | 5.3                        | 3.2         | 31.5           | 6.9                        | 4.0 | 45.6  | 7.3  | 1.6              | 1.5           | 245                   | 465                   |
|             |               |                      |                     |                                           | –                       | –              | –                          | 2.0         | 6.7            | 6.7                        | 3.4         | 22.2           | 8.2                        | 4.2 | 37.6  | 8.5  | 2.3              | 2.0           | 245                   | 465                   |
|             |               |                      |                     |                                           | –                       | –              | –                          | 2.2         | 1.9            | 8.1                        | 3.6         | 14.6           | 9.5                        | 4.4 | 29.6  | 9.7  | 3.2              | 3.0           | 250                   | 465                   |
|             |               |                      |                     |                                           | –                       | –              | –                          | –           | –              | –                          | 3.8         | 8.5            | 11.0                       | 4.6 | 21.6  | 11.2 | 4.2              | 4.0           | 245                   | 465                   |
|             |               |                      |                     |                                           | –                       | –              | –                          | –           | –              | –                          | 4.0         | 4.5            | 12.3                       | 4.8 | 15.3  | 12.4 | –                | –             | –                     | –                     |
|             |               |                      |                     |                                           | –                       | –              | –                          | –           | –              | –                          | –           | –              | –                          | 5.0 | 9.7   | 13.8 | –                | –             | –                     | –                     |
|             |               |                      |                     |                                           | –                       | –              | –                          | –           | –              | –                          | –           | –              | –                          | 5.2 | 6.0   | 15.2 | –                | –             | –                     | –                     |
|             | –             | –                    | –                   | –                                         | –                       | –              | –                          | –           | –              | 5.4                        | 2.9         | 16.5           | –                          | –   | –     | –    |                  |               |                       |                       |
|             | 136.231.xx.A2 | ●                    | ●                   | 1.4                                       | 1.6                     | 25.6           | 5.1                        | 2.6         | 44.2           | 7.0                        | 3.6         | 93.7           | 7.9                        | 4.2 | 132.9 | 7.3  | 2.0              | 0.7           | 235                   | 380                   |
|             |               |                      |                     |                                           | 2.0                     | 17.8           | 6.2                        | 3.0         | 33.0           | 8.2                        | 4.0         | 78.3           | 9.3                        | 4.6 | 117.2 | 9.0  | 2.6              | 1.5           | 245                   | 415                   |
|             |               |                      |                     |                                           | 2.4                     | 11.3           | 7.2                        | 3.4         | 24.7           | 9.2                        | 4.4         | 65.8           | 10.6                       | 5.0 | 101.1 | 10.4 | 2.4              | 2.0           | 255                   | 420                   |
|             |               |                      |                     |                                           | 2.8                     | 6.9            | 8.1                        | 3.8         | 18.1           | 10.2                       | 4.8         | 54.9           | 11.9                       | 5.4 | 87.9  | 11.8 | 3.6              | 3.0           | 255                   | 425                   |
|             |               |                      |                     |                                           | –                       | –              | –                          | 4.2         | 13.2           | 11.2                       | 5.2         | 45.6           | 13.0                       | 5.8 | 76.6  | 13.2 | 4.2              | 4.0           | 265                   | 430                   |
|             |               |                      |                     |                                           | –                       | –              | –                          | 4.6         | 9.3            | 12.0                       | 5.6         | 38.0           | 14.1                       | 6.0 | 71.2  | 13.8 | –                | –             | –                     | –                     |
|             |               |                      |                     |                                           | –                       | –              | –                          | –           | –              | –                          | 6.0         | 36.1           | 14.4                       | –   | –     | –    | –                | –             | –                     | –                     |
| –           |               |                      |                     |                                           | –                       | –              | –                          | –           | –              | –                          | –           | –              | –                          | –   | –     | –    | –                | –             | –                     |                       |

Ordering Type + Material no. = Ordering no.  
example: 136.215.xx.A2 + 1Y = 136.215.1Y.A2

# Pneumatic atomizing nozzles, full cone, siphon principle, external mixing Series 136.3

## Features:

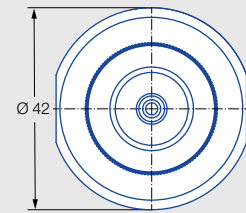
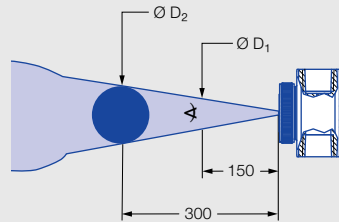
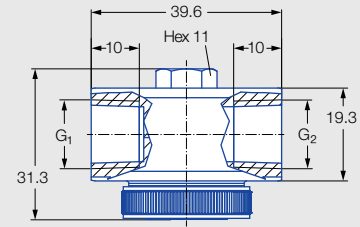
- Particularly fine full cone atomization
- Siphon principle
- External mixing

## Applications:

- Cooling
- Atomization of viscous liquids
- Chemical industry



Series 136.3



| Liquid connection G <sub>1</sub> | Air connection G <sub>2</sub> | Screw plug thread (size 11) | Weight [g] (Stainless steel 303) |
|----------------------------------|-------------------------------|-----------------------------|----------------------------------|
| 1/4 BSPP                         | 1/4 BSPP                      | 5/16-24 UNF-2A              | 220                              |

| Spray angle | Ordering no.  |          | Narrowest free cross section Ø [mm] | Air     |                        | V̇ water [l/h]       |      |      |                           |      |      |      |      | Spray dimensions |                           |                       |                       |
|-------------|---------------|----------|-------------------------------------|---------|------------------------|----------------------|------|------|---------------------------|------|------|------|------|------------------|---------------------------|-----------------------|-----------------------|
|             | Type          | Mat. no. |                                     | p [bar] | V̇ <sub>n</sub> [m³/h] | Water column [mm WS] |      |      | Aspiration height [mm WS] |      |      |      |      | p air [bar]      | Aspiration height [mm WS] | Ø D <sub>1</sub> [mm] | Ø D <sub>2</sub> [mm] |
|             |               | 1Y       | 16                                  |         |                        | 150                  | 300  | 450  | 100                       | 200  | 300  | 600  | 900  |                  |                           |                       |                       |
| 20°         | 136.316.xx.A2 | ●        | ●                                   | 0.40    | 0.60                   | 0.70                 | –    | 1.38 | 1.32                      | –    | –    | –    | –    | 1.40             | 300                       | 60                    | 110                   |
|             |               |          |                                     |         | 0.80                   | 0.90                 | 1.29 | 1.44 | 1.38                      | –    | –    | –    | –    | 3.20             | 300                       | 60                    | 120                   |
|             |               |          |                                     |         | 1.20                   | 1.10                 | 1.47 | 1.62 | 1.53                      | 1.02 | 0.84 | –    | –    | 4.80             | 300                       | 80                    | 135                   |
|             |               |          |                                     |         | 1.40                   | 1.20                 | 1.50 | 1.68 | 1.62                      | 1.14 | 0.96 | 0.66 | –    | 6.00             | 300                       | 70                    | 120                   |
|             |               |          |                                     |         | 1.80                   | 1.40                 | 1.62 | 1.80 | 1.71                      | 1.26 | 1.11 | 0.90 | –    | –                | –                         | –                     | –                     |
|             |               |          |                                     |         | 2.00                   | 1.60                 | 1.68 | 1.86 | 1.77                      | 1.32 | 1.17 | 0.96 | –    | –                | –                         | –                     | –                     |
|             |               |          |                                     |         | 2.40                   | 1.80                 | 1.74 | 1.92 | 1.86                      | 1.44 | 1.32 | 1.14 | 0.51 | –                | –                         | –                     | –                     |
|             |               |          |                                     |         | 2.60                   | 1.90                 | 1.80 | 1.98 | 1.89                      | 1.50 | 1.32 | 1.20 | 0.63 | –                | –                         | –                     | –                     |
|             |               |          |                                     |         | 3.00                   | 2.10                 | 1.92 | 2.07 | 1.95                      | 1.59 | 1.44 | 1.29 | 0.84 | 0.39             | –                         | –                     | –                     |
|             |               |          |                                     |         | 3.20                   | 2.20                 | 1.95 | 2.10 | 1.98                      | 1.65 | 1.50 | 1.35 | 0.96 | 0.48             | –                         | –                     | –                     |
|             |               |          |                                     |         | 3.60                   | 2.40                 | 2.07 | 2.19 | 2.10                      | 1.80 | 1.65 | 1.50 | 1.14 | 0.72             | –                         | –                     | –                     |
|             |               |          |                                     |         | 3.80                   | 2.60                 | 2.13 | 2.25 | 2.16                      | 1.83 | 1.71 | 1.59 | 1.23 | 0.81             | –                         | –                     | –                     |
|             |               |          |                                     |         | 4.20                   | 2.80                 | 2.22 | 2.37 | 2.28                      | 1.95 | 1.80 | 1.68 | 1.38 | 1.08             | –                         | –                     | –                     |
|             |               |          |                                     |         | 4.40                   | 2.90                 | 2.25 | 2.40 | 2.34                      | 1.98 | 1.89 | 1.77 | 1.44 | 1.14             | –                         | –                     | –                     |
|             |               |          |                                     |         | 4.80                   | 3.10                 | 2.25 | 2.34 | 2.28                      | 1.92 | 1.86 | 1.77 | 1.50 | 1.14             | –                         | –                     | –                     |
|             |               |          |                                     |         | 5.00                   | 3.20                 | 2.25 | 2.31 | 2.22                      | 1.89 | 1.83 | 1.71 | 1.41 | 0.84             | –                         | –                     | –                     |
|             |               |          |                                     |         | 5.40                   | 3.40                 | 2.13 | 2.25 | 2.16                      | 1.80 | 1.68 | 1.56 | 1.05 | 0.30             | –                         | –                     | –                     |
|             |               |          |                                     |         | 5.60                   | 3.60                 | 2.07 | 2.19 | 2.10                      | 1.74 | 1.65 | 1.44 | 0.72 | –                | –                         | –                     | –                     |
|             |               |          |                                     |         | 6.00                   | 3.80                 | 1.98 | 2.10 | 1.95                      | 1.56 | 1.50 | 1.26 | –    | –                | –                         | –                     | –                     |

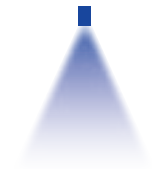


| Spray angle   | Ordering no.  |                      |                     | Narrowest free cross section Ø [mm] | Air  |      | V̇ water [l/h]       |      |      |                           |      |      |      |      | Spray dimensions |                           |                       |                       |
|---------------|---------------|----------------------|---------------------|-------------------------------------|------|------|----------------------|------|------|---------------------------|------|------|------|------|------------------|---------------------------|-----------------------|-----------------------|
|               | Type          | Mat. no.             |                     |                                     |      |      | Water column [mm WS] |      |      | Aspiration height [mm WS] |      |      |      |      | p air [bar]      | Aspiration height [mm WS] | Ø D <sub>1</sub> [mm] | Ø D <sub>2</sub> [mm] |
|               |               | 1Y                   | 16                  |                                     | 150  | 300  | 450                  | 100  | 200  | 300                       | 600  | 900  |      |      |                  |                           |                       |                       |
|               |               | Stainless steel 316L | Stainless steel 303 |                                     |      |      |                      |      |      |                           |      |      |      |      |                  |                           |                       |                       |
| 20°           | 136.324.xx.A2 | ●                    | ●                   | 0.70                                | 0.80 | 0.90 | –                    | –    | –    | 2.49                      | 1.71 | –    | –    | –    | 1.20             | 300                       | 60                    | 115                   |
| 1.20          |               |                      |                     |                                     | 1.10 | –    | –                    | –    | 3.12 | 2.53                      | 1.86 | –    | –    | 3.20 | 300              | 65                        | 125                   |                       |
| 1.40          |               |                      |                     |                                     | 1.20 | –    | –                    | –    | 3.36 | 2.78                      | 2.22 | –    | –    | 4.80 | 300              | 70                        | 135                   |                       |
| 1.80          |               |                      |                     |                                     | 1.50 | –    | –                    | –    | 3.75 | 3.22                      | 2.67 | –    | –    | 6.00 | 300              | 80                        | 135                   |                       |
| 2.00          |               |                      |                     |                                     | 1.60 | –    | –                    | –    | 3.96 | 3.39                      | 2.85 | 0.66 | –    | –    | –                | –                         | –                     |                       |
| 2.40          |               |                      |                     |                                     | 1.80 | –    | –                    | –    | 4.29 | 3.73                      | 3.21 | 1.41 | –    | –    | –                | –                         | –                     |                       |
| 2.60          |               |                      |                     |                                     | 1.90 | –    | –                    | –    | 4.41 | 3.91                      | 3.39 | 1.68 | –    | –    | –                | –                         | –                     |                       |
| 3.00          |               |                      |                     |                                     | 2.10 | 5.43 | –                    | –    | 4.71 | 4.18                      | 3.75 | 2.07 | –    | –    | –                | –                         | –                     |                       |
| 3.20          |               |                      |                     |                                     | 2.20 | 5.55 | –                    | –    | 4.80 | 4.31                      | 3.90 | 2.25 | –    | –    | –                | –                         | –                     |                       |
| 3.60          |               |                      |                     |                                     | 2.40 | 5.82 | –                    | –    | 5.07 | 4.56                      | 4.20 | 2.61 | –    | –    | –                | –                         | –                     |                       |
| 3.80          |               |                      |                     |                                     | 2.60 | 6.03 | –                    | –    | 5.22 | 4.72                      | 4.38 | 2.88 | 2.10 | –    | –                | –                         | –                     |                       |
| 4.20          |               |                      |                     |                                     | 2.80 | 6.30 | 6.66                 | –    | 5.64 | 5.15                      | 4.71 | 3.21 | 2.85 | –    | –                | –                         | –                     |                       |
| 4.40          |               |                      |                     |                                     | 2.90 | 6.36 | 6.72                 | 7.05 | 5.88 | 5.38                      | 4.92 | 3.60 | 2.97 | –    | –                | –                         | –                     |                       |
| 4.80          |               |                      |                     |                                     | 3.10 | 6.27 | 6.57                 | 6.84 | 5.97 | 5.47                      | 5.22 | 3.93 | 1.93 | –    | –                | –                         | –                     |                       |
| 5.00          |               |                      |                     |                                     | 3.20 | 6.12 | 6.42                 | 6.75 | 5.88 | 5.36                      | 5.10 | 4.05 | –    | –    | –                | –                         | –                     |                       |
| 5.40          |               |                      |                     |                                     | 3.40 | 5.82 | 6.12                 | 6.48 | 5.49 | 5.03                      | 4.71 | 3.81 | –    | –    | –                | –                         | –                     |                       |
| 5.60          |               |                      |                     |                                     | 3.50 | 5.67 | 5.97                 | 6.30 | 5.22 | 4.84                      | 4.53 | 3.63 | –    | –    | –                | –                         | –                     |                       |
| 6.00          |               |                      |                     |                                     | 3.80 | 5.31 | 5.58                 | 6.00 | 4.80 | 4.48                      | 4.08 | 1.92 | –    | –    | –                | –                         | –                     |                       |
| 136.334.xx.A2 | ●             | ●                    | 0.70                | 0.60                                | 1.20 | –    | –                    | –    | 2.19 | –                         | –    | –    | –    | 0.80 | 300              | 65                        | 120                   |                       |
|               |               |                      |                     | 0.80                                | 1.40 | –    | –                    | –    | 2.64 | 2.28                      | 1.44 | –    | –    | 3.20 | 300              | 65                        | 115                   |                       |
|               |               |                      |                     | 1.20                                | 1.80 | –    | –                    | –    | 3.39 | 3.00                      | 2.73 | 0.78 | –    | 4.80 | 300              | 70                        | 115                   |                       |
|               |               |                      |                     | 1.40                                | 2.00 | –    | –                    | –    | 3.69 | 3.33                      | 3.06 | 1.11 | –    | 6.00 | 300              | 75                        | 120                   |                       |
|               |               |                      |                     | 1.80                                | 2.30 | 5.19 | –                    | –    | 4.20 | 3.87                      | 3.51 | 2.16 | –    | –    | –                | –                         | –                     |                       |
|               |               |                      |                     | 2.00                                | 2.50 | 5.43 | 5.97                 | 6.42 | 4.47 | 4.08                      | 3.78 | 2.58 | 0.84 | –    | –                | –                         | –                     |                       |
|               |               |                      |                     | 2.40                                | 2.80 | 5.79 | 6.27                 | 6.72 | 4.86 | 4.53                      | 4.20 | 3.30 | 1.44 | –    | –                | –                         | –                     |                       |
|               |               |                      |                     | 2.60                                | 3.00 | 6.00 | 6.48                 | 6.90 | 4.98 | 4.68                      | 4.41 | 3.57 | 1.77 | –    | –                | –                         | –                     |                       |
|               |               |                      |                     | 3.00                                | 3.40 | 6.30 | 6.75                 | 7.14 | 5.37 | 5.07                      | 4.71 | 3.87 | 2.31 | –    | –                | –                         | –                     |                       |
|               |               |                      |                     | 3.20                                | 3.50 | 6.42 | 6.90                 | 7.29 | 5.52 | 5.19                      | 4.89 | 4.02 | 2.52 | –    | –                | –                         | –                     |                       |
|               |               |                      |                     | 3.60                                | 3.90 | 6.75 | 7.17                 | 7.59 | 5.82 | 5.55                      | 5.19 | 4.29 | 3.42 | –    | –                | –                         | –                     |                       |
|               |               |                      |                     | 3.80                                | 4.00 | 6.87 | 7.32                 | 7.80 | 6.03 | 5.73                      | 5.37 | 4.47 | 3.81 | –    | –                | –                         | –                     |                       |
|               |               |                      |                     | 4.20                                | 4.40 | 7.29 | 7.80                 | 8.34 | 6.39 | 6.09                      | 5.79 | 4.83 | 4.17 | –    | –                | –                         | –                     |                       |
|               |               |                      |                     | 4.40                                | 4.60 | 7.62 | 8.16                 | 8.73 | 6.69 | 6.39                      | 6.09 | 5.13 | 4.38 | –    | –                | –                         | –                     |                       |
|               |               |                      |                     | 4.80                                | 4.90 | 8.37 | 8.85                 | 9.21 | 7.32 | 6.99                      | 6.69 | 5.76 | 4.86 | –    | –                | –                         | –                     |                       |
|               |               |                      |                     | 5.00                                | 5.10 | 8.52 | 8.85                 | 9.15 | 7.71 | 7.32                      | 7.05 | 6.06 | 5.19 | –    | –                | –                         | –                     |                       |
|               |               |                      |                     | 5.40                                | 5.40 | 8.34 | 8.64                 | 8.88 | 7.71 | 7.53                      | 7.29 | 6.48 | 5.67 | –    | –                | –                         | –                     |                       |
|               |               |                      |                     | 5.60                                | 5.60 | 8.19 | 8.49                 | 8.76 | 7.59 | 7.41                      | 7.20 | 6.45 | 5.73 | –    | –                | –                         | –                     |                       |
| 6.00          | 5.90          | 7.86                 | 8.16                | 8.43                                | 7.26 | 7.05 | 6.84                 | 6.15 | 5.64 | –                         | –    | –    | –    |      |                  |                           |                       |                       |

| Spray angle   | Ordering no.  |                      |                     | Narrowest free cross section<br>Ø [mm] | Air   |       | V̇ water [l/h]       |       |       |                           |       |       |       |      | Spray dimensions |         |                        |     |
|---------------|---------------|----------------------|---------------------|----------------------------------------|-------|-------|----------------------|-------|-------|---------------------------|-------|-------|-------|------|------------------|---------|------------------------|-----|
|               | Type          | Mat. no.             |                     |                                        |       |       | Water column [mm WS] |       |       | Aspiration height [mm WS] |       |       |       |      |                  |         |                        |     |
|               |               | 1Y                   | 16                  |                                        |       |       |                      |       |       |                           |       |       |       |      |                  |         |                        |     |
|               |               | Stainless steel 316L | Stainless steel 303 |                                        |       |       |                      |       |       |                           |       |       |       |      |                  | p [bar] | V̇ <sub>n</sub> [m³/h] | 150 |
| 20°           | 136.342.xx.A2 | ●                    | ●                   | 1.50                                   | 1.40  | 3.60  | –                    | –     | –     | 8.82                      | –     | –     | 3.93  | –    | 1.80             | 300     | 70                     | 120 |
| 1.80          |               |                      |                     |                                        | 4.20  | –     | –                    | –     | 9.45  | 8.49                      | 7.50  | 5.22  | 3.39  | 3.00 | 300              | 70      | 120                    |     |
| 2.00          |               |                      |                     |                                        | 4.50  | 11.97 | –                    | –     | 9.75  | 8.91                      | 7.95  | 5.76  | 4.05  | 4.20 | 300              | 70      | 120                    |     |
| 2.40          |               |                      |                     |                                        | 5.20  | 12.18 | –                    | –     | 10.26 | 9.51                      | 8.73  | 6.75  | 5.19  | 6.00 | 300              | 70      | 120                    |     |
| 2.60          |               |                      |                     |                                        | 5.50  | 12.27 | 13.32                | –     | 10.47 | 9.75                      | 9.03  | 7.14  | 5.58  | –    | –                | –       | –                      |     |
| 3.00          |               |                      |                     |                                        | 6.10  | 12.27 | 13.23                | 14.16 | 10.65 | 10.05                     | 9.42  | 7.74  | 6.39  | –    | –                | –       | –                      |     |
| 3.20          |               |                      |                     |                                        | 6.40  | 12.30 | 13.17                | 14.07 | 10.74 | 10.23                     | 9.63  | 8.13  | 6.81  | –    | –                | –       | –                      |     |
| 3.60          |               |                      |                     |                                        | 7.00  | 12.42 | 13.20                | 14.07 | 11.01 | 10.53                     | 10.05 | 8.85  | 7.86  | –    | –                | –       | –                      |     |
| 3.80          |               |                      |                     |                                        | 7.30  | 12.54 | 13.26                | 14.10 | 11.28 | 10.86                     | 10.44 | 9.30  | 8.46  | –    | –                | –       | –                      |     |
| 4.20          |               |                      |                     |                                        | 8.00  | 13.17 | 13.83                | 14.49 | 12.12 | 11.76                     | 11.40 | 10.41 | 9.69  | –    | –                | –       | –                      |     |
| 4.40          |               |                      |                     |                                        | 8.30  | 13.53 | 14.13                | 14.73 | 12.48 | 12.15                     | 11.76 | 10.80 | 10.08 | –    | –                | –       | –                      |     |
| 4.80          |               |                      |                     |                                        | 8.90  | 13.98 | 14.52                | 15.15 | 12.99 | 12.63                     | 12.18 | 11.19 | 10.29 | –    | –                | –       | –                      |     |
| 5.00          |               |                      |                     |                                        | 9.20  | 14.04 | 14.52                | 15.15 | 13.05 | 12.66                     | 12.30 | 11.16 | 10.11 | –    | –                | –       | –                      |     |
| 5.40          |               |                      |                     |                                        | 9.80  | 13.74 | 14.31                | 14.94 | 12.66 | 12.24                     | 11.79 | 10.62 | 9.21  | –    | –                | –       | –                      |     |
| 5.60          |               |                      |                     |                                        | 10.10 | 13.35 | 14.04                | 14.64 | 12.27 | 11.82                     | 11.37 | 10.08 | 8.52  | –    | –                | –       | –                      |     |
| 6.00          |               |                      |                     |                                        | 10.80 | 12.21 | 12.90                | –     | 10.98 | 10.50                     | 10.17 | 8.70  | 7.05  | –    | –                | –       | –                      |     |
| 136.351.xx.A2 | ●             | ●                    | 2.50                | 3.20                                   | 11.50 | –     | –                    | –     | –     | 38.92                     | –     | –     | –     | 3.80 | 300              | 95      | 135                    |     |
|               |               |                      |                     | 3.60                                   | 12.50 | –     | –                    | –     | 45.73 | 41.94                     | –     | 33.17 | –     | 4.60 | 300              | 95      | 145                    |     |
|               |               |                      |                     | 3.80                                   | 13.10 | –     | –                    | –     | 47.81 | 45.14                     | 42.29 | 35.36 | –     | 5.40 | 300              | 100     | 150                    |     |
|               |               |                      |                     | 4.20                                   | 14.20 | –     | –                    | –     | 51.61 | 49.07                     | 46.46 | 39.58 | 29.94 | 6.00 | 300              | 95      | 150                    |     |
|               |               |                      |                     | 4.40                                   | 14.80 | –     | –                    | –     | 53.10 | 50.87                     | 48.30 | 41.59 | 31.59 | –    | –                | –       | –                      |     |
|               |               |                      |                     | 4.80                                   | 15.90 | –     | 63.39                | –     | 55.30 | 53.40                     | 51.26 | 45.06 | 34.68 | –    | –                | –       | –                      |     |
|               |               |                      |                     | 5.00                                   | 16.50 | –     | 63.75                | 66.69 | 56.05 | 54.15                     | 52.18 | 46.29 | 35.88 | –    | –                | –       | –                      |     |
|               |               |                      |                     | 5.40                                   | 17.60 | 61.12 | 64.17                | 66.72 | 56.71 | 55.04                     | 53.17 | 47.62 | 37.83 | –    | –                | –       | –                      |     |
|               |               |                      |                     | 5.60                                   | 18.10 | 60.93 | 63.87                | 66.48 | 56.66 | 55.04                     | 53.22 | 47.68 | 38.43 | –    | –                | –       | –                      |     |
|               |               |                      |                     | 6.00                                   | 19.20 | 59.89 | 62.88                | 65.43 | 55.69 | 53.98                     | 52.11 | 45.78 | 37.05 | –    | –                | –       | –                      |     |

Ordering Type + Material no. = Ordering no.  
example: 136.342.xx.A2 + 1Y = 136.342.1Y.A2

# Pneumatic atomizing nozzles, flat fan, pressure principle, internal mixing Series 136.4



## Features:

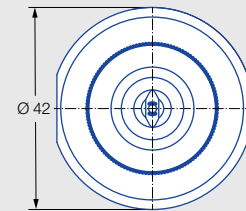
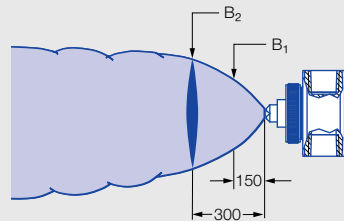
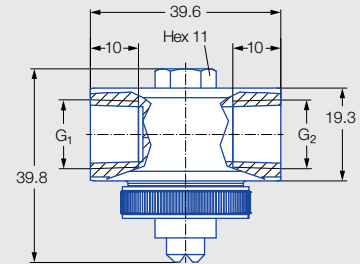
- Fine flat fan atomization
- Pressure principle
- Internal mixing

## Applications:

- Humidification of goods
- Cooling
- Belt humidification



Series 136.4



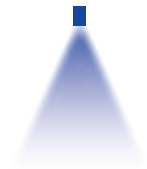
| Liquid connection G <sub>1</sub> | Air connection G <sub>2</sub> | Screw plug thread (size 11) | Weight [g]<br>(Stainless steel 303) |
|----------------------------------|-------------------------------|-----------------------------|-------------------------------------|
| 1/4 BSPP                         | 1/4 BSPP                      | 5/16-24 UNF-2A              | 220                                 |

| Spray angle | Ordering no.  |                      |                     | Narrowest free cross section<br>Ø<br>[mm] | Liquid pressure p [bar] |               |                           |             |               |                           |             |               |                           |             |               |                           | Spray dimensions |     |     |     |  |
|-------------|---------------|----------------------|---------------------|-------------------------------------------|-------------------------|---------------|---------------------------|-------------|---------------|---------------------------|-------------|---------------|---------------------------|-------------|---------------|---------------------------|------------------|-----|-----|-----|--|
|             | Type          | Mat. no.             |                     |                                           | 0.7                     |               |                           |             | 1.5           |                           |             | 3.0           |                           |             | 4.0           |                           |                  |     |     |     |  |
|             |               | 1Y                   | 16                  |                                           | p air [bar]             | ṽ water [l/h] | ṽ <sub>n</sub> air [m³/h] | p air [bar] | ṽ water [l/h] | ṽ <sub>n</sub> air [m³/h] | p air [bar] | ṽ water [l/h] | ṽ <sub>n</sub> air [m³/h] | p air [bar] | ṽ water [l/h] | ṽ <sub>n</sub> air [m³/h] |                  |     |     |     |  |
|             |               | Stainless steel 316L | Stainless steel 303 |                                           |                         |               |                           |             |               |                           |             |               |                           |             |               |                           |                  |     |     |     |  |
| 45°         | 136.414.xx.A2 | ●                    | ●                   | 0.7                                       | 1.0                     | 7.7           | 1.3                       | 1.4         | 14.3          | 1.5                       | 2.2         | 22.4          | 2.0                       | 3.0         | 25.1          | 2.5                       | 1.4              | 0.7 | 85  | 125 |  |
|             |               |                      |                     |                                           | 1.2                     | 6.0           | 1.5                       | 1.6         | 13.0          | 1.6                       | 2.6         | 20.0          | 2.3                       | 3.4         | 23.0          | 2.8                       | 2.4              | 1.5 | 100 | 145 |  |
|             |               |                      |                     |                                           | 1.4                     | 4.2           | 1.7                       | 1.8         | 11.6          | 1.8                       | 3.0         | 17.7          | 2.6                       | 3.8         | 20.9          | 3.1                       | 3.2              | 2.0 | 105 | 155 |  |
|             |               |                      |                     |                                           | 1.6                     | 2.7           | 1.9                       | 2.0         | 10.2          | 2.0                       | 3.4         | 15.5          | 3.0                       | 4.2         | 18.9          | 3.5                       | 3.8              | 3.0 | 120 | 170 |  |
|             |               |                      |                     |                                           | 1.8                     | 1.3           | 2.1                       | 2.2         | 8.9           | 2.2                       | 3.8         | 13.3          | 3.4                       | 4.6         | 16.9          | 3.8                       | 4.6              | 4.0 | 130 | 210 |  |
|             |               |                      |                     |                                           | –                       | –             | –                         | 2.4         | 7.4           | 2.4                       | 4.2         | 11.0          | 3.7                       | 5.0         | 14.9          | 4.2                       | –                | –   | –   | –   |  |
|             |               |                      |                     |                                           | –                       | –             | –                         | 2.6         | 5.9           | 2.6                       | 4.6         | 8.8           | 4.1                       | 5.4         | 12.8          | 4.6                       | –                | –   | –   | –   |  |
|             |               |                      |                     |                                           | –                       | –             | –                         | 2.8         | 4.6           | 2.8                       | 5.0         | 6.6           | 4.5                       | 5.8         | 10.8          | 5.0                       | –                | –   | –   | –   |  |
|             |               |                      |                     |                                           | –                       | –             | –                         | 3.0         | 3.2           | 3.0                       | 5.4         | 4.3           | 4.9                       | 6.0         | 9.8           | 5.2                       | –                | –   | –   | –   |  |
|             |               |                      |                     |                                           | –                       | –             | –                         | 3.2         | 2.1           | 3.2                       | 5.8         | 2.5           | 5.3                       | –           | –             | –                         | –                | –   | –   | –   |  |
|             |               |                      |                     |                                           | –                       | –             | –                         | 3.4         | 1.1           | 3.4                       | 6.0         | 1.6           | 5.5                       | –           | –             | –                         | –                | –   | –   | –   |  |
|             | 136.443.xx.A2 | ●                    | ●                   | 1.0                                       | 1.2                     | 13.9          | 1.5                       | 1.6         | 26.6          | 1.6                       | 3.0         | 37.1          | 2.6                       | 3.6         | 45.6          | 2.9                       | 1.2              | 0.7 | 110 | 165 |  |
|             |               |                      |                     |                                           | 1.4                     | 11.9          | 1.7                       | 1.8         | 24.3          | 1.8                       | 3.4         | 33.1          | 3.0                       | 4.0         | 41.9          | 3.3                       | 2.0              | 1.5 | 115 | 190 |  |
|             |               |                      |                     |                                           | 1.6                     | 9.5           | 1.9                       | 2.0         | 22.0          | 2.0                       | 3.8         | 29.5          | 3.4                       | 4.4         | 38.3          | 3.7                       | 2.8              | 2.0 | 145 | 190 |  |
|             |               |                      |                     |                                           | 1.8                     | 7.8           | 2.1                       | 2.2         | 19.9          | 2.2                       | 4.2         | 26.2          | 3.8                       | 4.8         | 35.0          | 4.0                       | 3.8              | 3.0 | 150 | 210 |  |
|             |               |                      |                     |                                           | –                       | –             | –                         | 2.4         | 18.0          | 2.4                       | 4.6         | 23.0          | 4.2                       | 5.2         | 31.8          | 4.5                       | 4.8              | 4.0 | 160 | 230 |  |
|             |               |                      |                     |                                           | –                       | –             | –                         | 2.6         | 16.2          | 2.6                       | 5.0         | 20.2          | 4.6                       | 5.6         | 29.0          | 4.9                       | –                | –   | –   | –   |  |
|             |               |                      |                     |                                           | –                       | –             | –                         | 2.8         | 14.4          | 2.8                       | 5.4         | 17.6          | 4.9                       | 6.0         | 26.2          | 5.2                       | –                | –   | –   | –   |  |
|             |               |                      |                     |                                           | –                       | –             | –                         | 3.0         | 12.8          | 3.0                       | 5.8         | 14.9          | 5.3                       | –           | –             | –                         | –                | –   | –   | –   |  |
|             |               |                      |                     |                                           | –                       | –             | –                         | 3.2         | 11.3          | 3.2                       | 6.0         | 14.1          | 5.5                       | –           | –             | –                         | –                | –   | –   | –   |  |
|             |               |                      |                     |                                           | –                       | –             | –                         | 3.4         | 9.9           | 3.4                       | –           | –             | –                         | –           | –             | –                         | –                | –   | –   | –   |  |
|             |               |                      |                     |                                           | –                       | –             | –                         | 3.6         | 8.8           | 3.6                       | –           | –             | –                         | –           | –             | –                         | –                | –   | –   | –   |  |

| Spray angle | Ordering no.  |                      |                     | Narrowest free cross section Ø [mm] | Liquid pressure p [bar] |                |                            |             |                |                            |             |                |                            |             |                |                            | Spray dimensions |               |                     |                     |
|-------------|---------------|----------------------|---------------------|-------------------------------------|-------------------------|----------------|----------------------------|-------------|----------------|----------------------------|-------------|----------------|----------------------------|-------------|----------------|----------------------------|------------------|---------------|---------------------|---------------------|
|             | Type          | Mat. no.             |                     |                                     | 0.7                     |                |                            | 1.5         |                |                            | 3.0         |                |                            | 4.0         |                |                            |                  |               |                     |                     |
|             |               | 1Y                   | 16                  |                                     | p air [bar]             | V̇ water [l/h] | V̇ <sub>n</sub> air [m³/h] | p air [bar] | V̇ water [l/h] | V̇ <sub>n</sub> air [m³/h] | p air [bar] | V̇ water [l/h] | V̇ <sub>n</sub> air [m³/h] | p air [bar] | V̇ water [l/h] | V̇ <sub>n</sub> air [m³/h] | p air [bar]      | p water [bar] | B <sub>1</sub> [mm] | B <sub>2</sub> [mm] |
|             |               | Stainless steel 316L | Stainless steel 303 |                                     |                         |                |                            |             |                |                            |             |                |                            |             |                |                            |                  |               |                     |                     |
| 45°         | 136.462.xx.A2 | ●                    | ●                   | 1.5                                 | 1.2                     | 19.0           | 2.6                        | 2.0         | 22.0           | 2.0                        | 3.0         | 61.8           | 4.0                        | 3.8         | 76.1           | 4.6                        | 1.2              | 0.7           | 120                 | 140                 |
| 1.6         |               |                      |                     |                                     | 12.2                    | 3.4            | 2.4                        | 18.0        | 2.4            | 3.4                        | 51.9        | 4.8            | 4.0                        | 70.4        | 5.1            | 2.4                        | 1.5              | 120           | 170                 |                     |
| 2.0         |               |                      |                     |                                     | 9.4                     | 4.1            | 2.8                        | 14.4        | 2.8            | 3.8                        | 44.6        | 5.8            | 4.2                        | 65.6        | 5.5            | 3.2                        | 2.0              | 120           | 175                 |                     |
| 2.4         |               |                      |                     |                                     | 7.1                     | 4.8            | 3.2                        | 11.3        | 3.2            | 4.2                        | 39.0        | 6.6            | 4.4                        | 61.3        | 5.9            | 3.8                        | 3.0              | 140           | 205                 |                     |
| 2.8         |               |                      |                     |                                     | 5.7                     | 5.4            | 3.6                        | 8.8         | 3.6            | 4.6                        | 33.4        | 7.4            | 4.6                        | 57.3        | 6.4            | 6.0                        | 4.0              | 145           | 205                 |                     |
| 3.2         |               |                      |                     |                                     | 5.0                     | 6.0            | 4.0                        | 8.1         | 3.9            | 5.0                        | 29.4        | 8.1            | 4.8                        | 54.1        | 6.7            | –                          | –                | –             | –                   |                     |
| 3.6         |               |                      |                     |                                     | 3.6                     | 6.6            | 4.4                        | 6.2         | 4.3            | 5.4                        | 25.5        | 8.9            | 5.0                        | 51.3        | 7.2            | –                          | –                | –             | –                   |                     |
| 4.0         |               |                      |                     |                                     | 3.2                     | 7.2            | 4.8                        | 4.6         | 4.6            | 5.8                        | 22.0        | 9.6            | 5.2                        | 49.3        | 7.7            | –                          | –                | –             | –                   |                     |
| 4.4         |               |                      |                     |                                     | 2.2                     | 7.8            | 5.2                        | 3.2         | 4.9            | 6.0                        | 20.6        | 9.9            | 5.4                        | 46.5        | 8.2            | –                          | –                | –             | –                   |                     |
| –           |               |                      |                     |                                     | –                       | –              | 5.6                        | 1.6         | 5.3            | –                          | –           | –              | 5.6                        | 43.7        | 8.6            | –                          | –                | –             | –                   |                     |
| –           |               |                      |                     |                                     | –                       | –              | 5.8                        | 0.8         | 5.4            | –                          | –           | –              | 5.8                        | 41.3        | 8.9            | –                          | –                | –             | –                   |                     |
| –           |               |                      |                     |                                     | –                       | –              | –                          | –           | –              | –                          | –           | –              | 6.0                        | 39.0        | 9.3            | –                          | –                | –             | –                   |                     |
| 60°         | 136.425.xx.A2 | ●                    | ●                   | 0.5                                 | 0.8                     | 6.5            | 1.2                        | 1.4         | 9.4            | 1.7                        | 2.4         | 13.2           | 2.5                        | 2.4         | 16.1           | 2.5                        | 1.2              | 0.7           | 155                 | 195                 |
|             |               |                      |                     |                                     | 1.2                     | 5.5            | 1.6                        | 1.8         | 8.7            | 2.1                        | 2.6         | 12.9           | 2.7                        | 2.8         | 15.5           | 2.9                        | 2.2              | 1.5           | 165                 | 255                 |
|             |               |                      |                     |                                     | 1.6                     | 4.7            | 1.9                        | 2.2         | 7.9            | 2.4                        | 3.0         | 12.3           | 3.0                        | 3.2         | 15.0           | 3.2                        | 3.0              | 2.0           | 170                 | 265                 |
|             |               |                      |                     |                                     | 2.0                     | 4.0            | 2.3                        | 2.6         | 7.2            | 2.7                        | 3.4         | 11.8           | 3.4                        | 3.6         | 14.5           | 3.5                        | 3.4              | 3.0           | 200                 | 330                 |
|             |               |                      |                     |                                     | 2.4                     | 3.2            | 2.6                        | 3.0         | 6.4            | 3.1                        | 3.8         | 11.1           | 3.7                        | 4.0         | 13.9           | 3.8                        | 5.6              | 4.0           | 200                 | 330                 |
|             |               |                      |                     |                                     | 2.8                     | 2.6            | 2.9                        | 3.4         | 5.7            | 3.4                        | 4.2         | 10.4           | 4.0                        | 4.4         | 13.4           | 4.1                        | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 3.0                     | 2.2            | 3.1                        | 3.8         | 5.1            | 3.7                        | 4.6         | 9.8            | 4.3                        | 4.8         | 12.8           | 4.5                        | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | –                       | –              | –                          | 4.0         | 4.8            | 3.9                        | 5.0         | 9.2            | 4.6                        | 5.2         | 12.2           | 4.8                        | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | –                       | –              | –                          | 4.4         | 4.2            | 4.2                        | 5.4         | 8.6            | 5.0                        | 5.6         | 11.7           | 5.1                        | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | –                       | –              | –                          | 4.8         | 3.6            | 4.5                        | 5.8         | 8.1            | 5.3                        | 6.0         | 11.2           | 5.4                        | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | –                       | –              | –                          | 5.2         | 2.8            | 4.8                        | 6.0         | 7.8            | 5.4                        | –           | –              | –                          | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | –                       | –              | –                          | 5.6         | 2.2            | 5.1                        | –           | –              | –                          | –           | –              | –                          | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | –                       | –              | –                          | 6.0         | 1.6            | 5.5                        | –           | –              | –                          | –           | –              | –                          | –                | –             | –                   | –                   |
|             | 136.452.xx.A2 | ●                    | ●                   | 1.5                                 | 1.0                     | 18.8           | 3.9                        | 1.8         | 31.0           | 5.3                        | 3.2         | 50.1           | 7.7                        | 3.8         | 70.7           | 8.2                        | 1.0              | 0.7           | 130                 | 185                 |
|             |               |                      |                     |                                     | 1.4                     | 8.6            | 5.7                        | 2.0         | 25.4           | 6.3                        | 3.6         | 39.5           | 9.4                        | 4.2         | 58.6           | 9.6                        | 1.8              | 1.5           | 150                 | 240                 |
|             |               |                      |                     |                                     | 1.8                     | 7.4            | 7.0                        | 2.2         | 20.1           | 7.2                        | 4.0         | 31.3           | 11.2                       | 4.6         | 48.6           | 11.2                       | 2.6              | 2.0           | 155                 | 245                 |
|             |               |                      |                     |                                     | 2.2                     | 4.1            | 8.4                        | 2.4         | 15.5           | 8.0                        | 4.4         | 24.0           | 12.9                       | 5.0         | 41.2           | 13.1                       | 3.6              | 3.0           | 175                 | 280                 |
|             |               |                      |                     |                                     | 2.6                     | 1.0            | 9.8                        | 2.6         | 12.4           | 8.9                        | 4.8         | 17.7           | 14.5                       | 5.4         | 33.6           | 14.8                       | 5.0              | 4.0           | 180                 | 285                 |
|             |               |                      |                     |                                     | 2.8                     | 0.1            | 10.3                       | 2.8         | 10.4           | 9.6                        | 5.2         | 13.4           | 16.0                       | 5.8         | 27.5           | 16.4                       | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | –                       | –              | –                          | –           | –              | –                          | 5.6         | 10.6           | 17.5                       | 6.0         | 24.4           | 17.2                       | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | –                       | –              | –                          | –           | –              | –                          | 6.0         | 8.6            | 18.8                       | –           | –              | –                          | –                | –             | –                   | –                   |
| 80°         | 136.433.xx.A2 | ●                    | ●                   | 0.4                                 | 1.0                     | 11.6           | 2.0                        | 1.8         | 18.3           | 2.8                        | 3.0         | 31.0           | 3.7                        | 3.8         | 37.5           | 4.4                        | 1.4              | 0.7           | 150                 | 210                 |
|             |               |                      |                     |                                     | 1.2                     | 8.1            | 2.4                        | 2.0         | 15.3           | 3.2                        | 3.4         | 25.4           | 4.4                        | 4.2         | 32.4           | 5.0                        | 2.2              | 1.5           | 185                 | 255                 |
|             |               |                      |                     |                                     | 1.4                     | 5.3            | 2.8                        | 2.2         | 12.2           | 3.6                        | 3.8         | 20.6           | 5.1                        | 4.6         | 27.7           | 5.7                        | 3.0              | 2.0           | 205                 | 300                 |
|             |               |                      |                     |                                     | 1.6                     | 3.7            | 3.2                        | 2.4         | 9.8            | 4.0                        | 4.2         | 16.3           | 5.9                        | 5.0         | 23.4           | 6.5                        | 3.8              | 4.0           | 300                 | 485                 |
|             |               |                      |                     |                                     | –                       | –              | –                          | 2.6         | 7.6            | 4.3                        | 4.6         | 12.5           | 6.6                        | 5.4         | 19.4           | 7.2                        | 5.2              | 4.0           | 260                 | 395                 |
|             |               |                      |                     |                                     | –                       | –              | –                          | 2.8         | 5.9            | 4.7                        | 5.0         | 9.3            | 7.3                        | 5.8         | 15.9           | 7.9                        | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | –                       | –              | –                          | 3.0         | 4.4            | 5.0                        | 5.4         | 6.5            | 8.0                        | 6.0         | 14.2           | 8.3                        | –                | –             | –                   | –                   |

Ordering Type + Material no. = Ordering no.  
example: 136.462.xx.A2 + 1Y = 136.462.1Y.A2

# Pneumatic atomizing nozzles, flat fan, siphon principle, internal mixing Series 136.5



## Features:

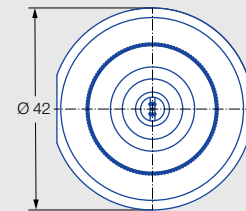
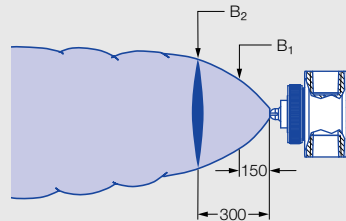
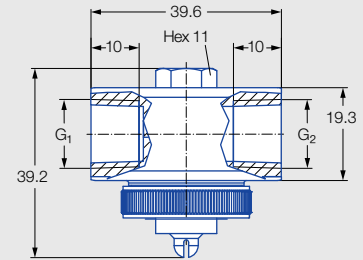
- Particularly fine flat fan atomization
- Siphon principle
- Internal mixing

## Applications:

- Humidification of goods
- Cooling
- Belt humidification



Series 136.5



| Liquid connection G <sub>1</sub> | Air connection G <sub>2</sub> | Screw plug thread (size 11) | Weight [g] (Stainless steel 303 SS) |
|----------------------------------|-------------------------------|-----------------------------|-------------------------------------|
| 1/4 BSPP                         | 1/4 BSPP                      | 5/16-24 UNF-2A              | 220                                 |

| Spray angle | Ordering no.  |                                                                                     |                                                                                     | Narrowest free cross section Ø [mm] | Air     |                        | V̇ water [l/h]       |      |      |      |                           |      |      |      | Spray dimensions |                           |                     |                     |
|-------------|---------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------|---------|------------------------|----------------------|------|------|------|---------------------------|------|------|------|------------------|---------------------------|---------------------|---------------------|
|             | Type          | Mat. no.                                                                            |                                                                                     |                                     |         |                        | Water column [mm WS] |      |      |      | Aspiration height [mm WS] |      |      |      | p air [bar]      | Aspiration height [mm WS] | B <sub>1</sub> [mm] | B <sub>2</sub> [mm] |
|             |               | 1Y                                                                                  | 16                                                                                  |                                     |         |                        |                      |      |      |      |                           |      |      |      |                  |                           |                     |                     |
|             |               | Stainless steel 316L                                                                | Stainless steel 303                                                                 |                                     | p [bar] | V̇ <sub>n</sub> [m³/h] | 150                  | 300  | 450  | 100  | 200                       | 300  | 600  | 900  |                  |                           |                     |                     |
| 60°         | 136.516.xx.A2 |  |  | 0.40                                | 0.80    | 1.80                   | –                    | –    | –    | 1.62 | 1.53                      | –    | 1.17 | 0.88 | 1.00             | 300                       | 130                 | 165                 |
| 1.20        |               |                                                                                     |                                                                                     |                                     | 2.20    | 1.89                   | 2.13                 | 2.19 | 1.80 | 1.77 | 1.68                      | 1.41 | 1.16 | 3.00 | 300              | 150                       | 200                 |                     |
| 1.40        |               |                                                                                     |                                                                                     |                                     | 2.50    | 1.95                   | 2.16                 | 2.25 | 1.86 | 1.80 | 1.68                      | 1.47 | 1.21 | 4.60 | 300              | 170                       | 225                 |                     |
| 1.80        |               |                                                                                     |                                                                                     |                                     | 2.90    | 1.98                   | 2.22                 | 2.34 | 1.89 | 1.86 | 1.77                      | 1.53 | 1.26 | 6.00 | 300              | 180                       | 240                 |                     |
| 2.00        |               |                                                                                     |                                                                                     |                                     | 3.10    | 1.95                   | 2.19                 | 2.31 | 1.89 | 1.80 | 1.68                      | 1.50 | 1.26 | –    | –                | –                         | –                   |                     |
| 2.40        |               |                                                                                     |                                                                                     |                                     | 3.50    | 1.89                   | 2.25                 | 2.25 | 1.83 | 1.71 | 1.68                      | 1.47 | 1.22 | –    | –                | –                         | –                   |                     |
| 2.60        |               |                                                                                     |                                                                                     |                                     | 3.70    | 1.83                   | 2.25                 | 2.25 | 1.74 | 1.71 | 1.59                      | 1.44 | 1.18 | –    | –                | –                         | –                   |                     |
| 3.00        |               |                                                                                     |                                                                                     |                                     | 4.20    | 1.74                   | 2.01                 | 2.22 | 1.71 | 1.62 | 1.56                      | 1.44 | 1.28 | –    | –                | –                         | –                   |                     |
| 3.20        |               |                                                                                     |                                                                                     |                                     | 4.40    | 1.71                   | 1.92                 | 2.16 | 1.65 | 1.62 | 1.59                      | 1.59 | 1.38 | –    | –                | –                         | –                   |                     |
| 3.60        |               |                                                                                     |                                                                                     |                                     | 4.80    | 1.74                   | 1.83                 | 2.10 | 1.80 | 1.77 | 1.74                      | 1.68 | 1.47 | –    | –                | –                         | –                   |                     |
| 3.80        |               |                                                                                     |                                                                                     |                                     | 5.00    | 1.92                   | 1.80                 | 2.10 | 1.86 | 1.86 | 1.80                      | 1.71 | 1.49 | –    | –                | –                         | –                   |                     |
| 4.20        |               |                                                                                     |                                                                                     |                                     | 5.50    | 1.98                   | 2.04                 | 2.19 | 1.92 | 1.83 | 1.83                      | 1.68 | 1.70 | –    | –                | –                         | –                   |                     |
| 4.40        |               |                                                                                     |                                                                                     |                                     | 5.70    | 1.95                   | 2.04                 | 2.19 | 1.89 | 1.86 | 1.80                      | 1.74 | 1.77 | –    | –                | –                         | –                   |                     |
| 4.80        |               |                                                                                     |                                                                                     |                                     | 6.10    | 2.01                   | 2.04                 | 2.16 | 2.01 | 2.01 | 2.04                      | 2.04 | 1.98 | –    | –                | –                         | –                   |                     |
| 5.00        |               |                                                                                     |                                                                                     |                                     | 6.30    | 2.10                   | 2.13                 | 2.22 | 2.19 | 2.19 | 2.16                      | 2.10 | 1.93 | –    | –                | –                         | –                   |                     |
| 5.40        |               |                                                                                     |                                                                                     |                                     | 6.80    | 2.31                   | 2.34                 | 2.28 | 2.25 | 2.22 | 2.16                      | 2.04 | 1.86 | –    | –                | –                         | –                   |                     |
| 5.60        |               |                                                                                     |                                                                                     |                                     | 7.00    | 2.31                   | 2.28                 | 2.25 | 2.19 | 2.16 | 2.10                      | 2.01 | 1.80 | –    | –                | –                         | –                   |                     |
| 6.00        |               |                                                                                     |                                                                                     |                                     | 7.40    | 2.22                   | 2.22                 | 2.22 | 2.10 | 2.10 | 2.04                      | 1.92 | 1.79 | –    | –                | –                         | –                   |                     |

| Spray angle | Ordering no.  |                      |                     | Narrowest free cross section Ø [mm] | Air  |      | V̇ water [l/h]       |      |      |                           |      |      |             |                           | Spray dimensions    |                     |     |     |
|-------------|---------------|----------------------|---------------------|-------------------------------------|------|------|----------------------|------|------|---------------------------|------|------|-------------|---------------------------|---------------------|---------------------|-----|-----|
|             | Type          | Mat. no.             |                     |                                     |      |      | Water column [mm WS] |      |      | Aspiration height [mm WS] |      |      |             |                           |                     |                     |     |     |
|             |               | 1Y                   | 16                  |                                     | 150  | 300  | 450                  | 100  | 200  | 300                       | 600  | 900  | p air [bar] | Aspiration height [mm WS] | B <sub>1</sub> [mm] | B <sub>2</sub> [mm] |     |     |
|             |               | Stainless steel 316L | Stainless steel 303 |                                     |      |      |                      |      |      |                           |      |      |             |                           |                     |                     |     |     |
| 60°         | 136.525.xx.A2 | ●                    | ●                   | 0.50                                | 0.60 | 1.60 | –                    | –    | –    | 2.00                      | –    | –    | –           | –                         | 1.00                | 300                 | 155 | 240 |
| 0.80        |               |                      |                     |                                     | 1.90 | –    | –                    | –    | 2.21 | 2.10                      | 1.98 | –    | –           | 3.00                      | 300                 | 200                 | 295 |     |
| 1.20        |               |                      |                     |                                     | 2.30 | 2.75 | 2.84                 | –    | 2.53 | 2.39                      | 2.33 | 2.04 | 1.69        | 4.60                      | 300                 | 215                 | 325 |     |
| 1.40        |               |                      |                     |                                     | 2.60 | 2.84 | 2.90                 | 3.05 | 2.63 | 2.51                      | 2.42 | 2.14 | 1.82        | 6.00                      | 300                 | 250                 | 400 |     |
| 1.80        |               |                      |                     |                                     | 3.00 | 2.96 | 3.01                 | 3.16 | 2.78 | 2.64                      | 2.56 | 2.20 | 1.88        | –                         | –                   | –                   | –   |     |
| 2.00        |               |                      |                     |                                     | 3.30 | 2.94 | 3.02                 | 3.16 | 2.73 | 2.69                      | 2.58 | 2.18 | 1.82        | –                         | –                   | –                   | –   |     |
| 2.40        |               |                      |                     |                                     | 3.70 | 2.87 | 2.97                 | 3.10 | 2.59 | 2.50                      | 2.38 | 2.01 | 1.68        | –                         | –                   | –                   | –   |     |
| 2.60        |               |                      |                     |                                     | 3.90 | 2.82 | 2.86                 | 3.04 | 2.49 | 2.46                      | 2.29 | 1.91 | 1.62        | –                         | –                   | –                   | –   |     |
| 3.00        |               |                      |                     |                                     | 4.40 | 2.59 | 2.71                 | 2.85 | 2.23 | 2.11                      | 2.04 | 1.73 | 1.72        | –                         | –                   | –                   | –   |     |
| 3.20        |               |                      |                     |                                     | 4.60 | 2.48 | 2.51                 | 2.71 | 2.09 | 1.96                      | 1.91 | 1.74 | 1.87        | –                         | –                   | –                   | –   |     |
| 3.60        |               |                      |                     |                                     | 5.10 | 2.37 | 2.31                 | 2.51 | 2.25 | 2.18                      | 2.19 | 1.98 | 1.90        | –                         | –                   | –                   | –   |     |
| 3.80        |               |                      |                     |                                     | 5.30 | 2.34 | 2.37                 | 2.52 | 2.22 | 2.23                      | 2.15 | 1.99 | 1.85        | –                         | –                   | –                   | –   |     |
| 4.20        |               |                      |                     |                                     | 5.70 | 2.35 | 2.35                 | 2.43 | 2.20 | 2.13                      | 2.11 | 1.94 | 1.82        | –                         | –                   | –                   | –   |     |
| 4.40        |               |                      |                     |                                     | 6.00 | 2.30 | 2.32                 | 2.44 | 2.20 | 2.07                      | 2.05 | 1.96 | 1.83        | –                         | –                   | –                   | –   |     |
| 4.80        |               |                      |                     |                                     | 6.40 | 2.25 | 2.24                 | 2.41 | 2.12 | 2.03                      | 2.08 | 1.90 | 2.12        | –                         | –                   | –                   | –   |     |
| 5.00        |               |                      |                     |                                     | 6.60 | 2.20 | 2.21                 | 2.37 | 2.09 | 2.03                      | 1.98 | 2.25 | 2.27        | –                         | –                   | –                   | –   |     |
| 5.40        |               |                      |                     |                                     | 7.10 | 2.52 | 2.23                 | 2.36 | 2.60 | 2.55                      | 2.49 | 2.26 | 2.08        | –                         | –                   | –                   | –   |     |
| 5.60        |               |                      |                     |                                     | 7.30 | 2.50 | 2.45                 | 2.58 | 2.57 | 2.54                      | 2.39 | 2.16 | 2.02        | –                         | –                   | –                   | –   |     |
| 6.00        |               |                      |                     |                                     | 7.80 | 2.57 | 2.61                 | 2.76 | 2.37 | 2.40                      | 2.18 | 1.94 | 1.80        | –                         | –                   | –                   | –   |     |

Ordering Type + Material no. = Ordering no.  
example: 136.525.xx.A2 + 1Y = 136.525.1Y.A2

# Pneumatic atomizing nozzles, flat fan, pressure principle, external mixing Series 136.6



## Features:

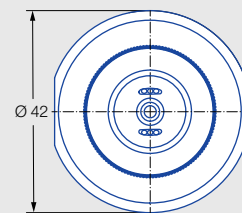
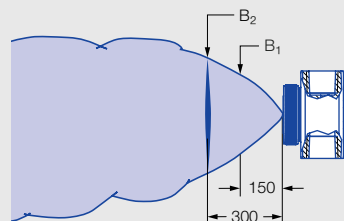
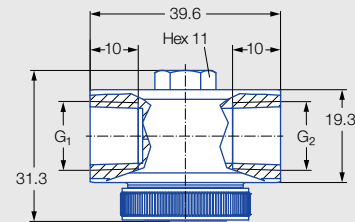
- Fine flat fan atomization
- Liquid pressure principle
- External mixing

## Applications:

- Humidification of goods
- Cooling
- Belt humidification
- Atomization of viscous liquids



Series 136.6



| Liquid connection G <sub>1</sub> | Air connection G <sub>2</sub> | Screw plug thread (size 11) | Weight [g] (Stainless steel 303) |
|----------------------------------|-------------------------------|-----------------------------|----------------------------------|
| 1/4 BSPP                         | 1/4 BSPP                      | 5/16-24 UNF-2A              | 220                              |

| Spray angle | Ordering no.  |                      |                     | Narrowest free cross section Ø [mm] | Liquid pressure p [bar] |                |                            |             |                |                            |             |                |                            |      |      |       | Spray dimensions |               |                     |                     |
|-------------|---------------|----------------------|---------------------|-------------------------------------|-------------------------|----------------|----------------------------|-------------|----------------|----------------------------|-------------|----------------|----------------------------|------|------|-------|------------------|---------------|---------------------|---------------------|
|             | Type          | Mat. no.             |                     |                                     | 0.07                    |                |                            |             | 0.15           |                            |             | 0.30           |                            |      | 0.35 |       | p air [bar]      | p water [bar] | B <sub>1</sub> [mm] | B <sub>2</sub> [mm] |
|             |               | 1Y                   | 16                  |                                     | p air [bar]             | V̇ water [l/h] | V̇ <sub>n</sub> air [m³/h] | p air [bar] | V̇ water [l/h] | V̇ <sub>n</sub> air [m³/h] | p air [bar] | V̇ water [l/h] | V̇ <sub>n</sub> air [m³/h] |      |      |       |                  |               |                     |                     |
|             |               | Stainless steel 316L | Stainless steel 303 |                                     |                         |                |                            |             |                |                            |             |                |                            |      |      |       |                  |               |                     |                     |
| 45°         | 136.616.xx.A2 | ●                    | ●                   | 0.40                                | 0.80                    | 1.68           | 2.50                       | 0.80        | 2.43           | 2.40                       | 0.80        | 3.42           | 2.50                       | 1.00 | 3.69 | 2.80  | 1.40             | 0.07          | 80                  | 115                 |
|             |               |                      |                     |                                     | 1.20                    | 1.80           | 3.10                       | 1.00        | 2.46           | 2.90                       | 1.20        | 3.48           | 3.10                       | 1.40 | 3.81 | 3.40  | 2.20             | 0.15          | 90                  | 130                 |
|             |               |                      |                     |                                     | 1.60                    | 1.92           | 3.70                       | 1.40        | 2.58           | 3.60                       | 1.60        | 3.51           | 3.70                       | 1.80 | 3.87 | 4.00  | 3.20             | 0.20          | 90                  | 135                 |
|             |               |                      |                     |                                     | 2.00                    | 2.10           | 4.30                       | 1.80        | 2.61           | 4.20                       | 2.00        | 3.63           | 4.30                       | 2.20 | 3.84 | 4.60  | 4.00             | 0.30          | 95                  | 145                 |
|             |               |                      |                     |                                     | 2.40                    | 2.07           | 4.90                       | 2.20        | 2.76           | 4.80                       | 2.40        | 3.63           | 4.90                       | 2.60 | 3.90 | 5.20  | 5.00             | 0.35          | 100                 | 145                 |
|             |               |                      |                     |                                     | 2.80                    | 2.19           | 5.50                       | 2.60        | 2.73           | 5.40                       | 2.80        | 3.63           | 5.50                       | 3.00 | 3.93 | 5.80  | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 3.20                    | 2.19           | 6.10                       | 3.00        | 2.73           | 6.00                       | 3.20        | 3.63           | 6.10                       | 3.40 | 3.90 | 6.40  | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 3.60                    | 2.22           | 6.70                       | 3.60        | 2.76           | 6.70                       | 3.60        | 3.66           | 6.70                       | 3.80 | 3.93 | 7.00  | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 4.00                    | 2.22           | 7.30                       | 4.00        | 2.76           | 7.30                       | 4.00        | 3.69           | 7.30                       | 4.20 | 3.96 | 7.60  | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 4.40                    | 2.22           | 7.90                       | 4.40        | 2.76           | 7.90                       | 4.40        | 3.69           | 7.90                       | 4.60 | 3.93 | 8.20  | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 4.80                    | 2.22           | 8.50                       | 4.80        | 2.76           | 8.50                       | 4.80        | 3.69           | 8.40                       | 5.00 | 3.93 | 8.80  | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 5.20                    | 2.22           | 9.10                       | 5.20        | 2.76           | 9.10                       | 5.20        | 3.66           | 9.10                       | 5.40 | 3.93 | 9.40  | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 5.60                    | 2.22           | 9.60                       | 5.60        | 2.76           | 9.70                       | 5.60        | 3.66           | 9.60                       | 5.80 | 3.87 | 10.00 | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 6.00                    | 2.22           | 10.20                      | 6.00        | 2.73           | 10.20                      | 6.00        | 3.66           | 10.20                      | 6.00 | 3.87 | 10.20 | –                | –             | –                   | –                   |

| Spray angle | Ordering no.  |                      |                     | Narrowest free cross section Ø [mm] | Liquid pressure p [bar] |                |                            |             |                |                            |             |                |                            |             |                |                            | Spray dimensions |               |                     |                     |
|-------------|---------------|----------------------|---------------------|-------------------------------------|-------------------------|----------------|----------------------------|-------------|----------------|----------------------------|-------------|----------------|----------------------------|-------------|----------------|----------------------------|------------------|---------------|---------------------|---------------------|
|             | Type          | Mat. no.             |                     |                                     |                         |                |                            |             |                |                            |             |                |                            |             |                |                            |                  |               |                     |                     |
|             |               | 1Y                   | 16                  |                                     | 0.07                    |                |                            | 0.15        |                |                            | 0.30        |                |                            | 0.35        |                |                            | p air [bar]      | p water [bar] | B <sub>1</sub> [mm] | B <sub>2</sub> [mm] |
|             |               | Stainless steel 316L | Stainless steel 303 |                                     | p air [bar]             | V̇ water [l/h] | V̇ <sub>n</sub> air [m³/h] | p air [bar] | V̇ water [l/h] | V̇ <sub>n</sub> air [m³/h] | p air [bar] | V̇ water [l/h] | V̇ <sub>n</sub> air [m³/h] | p air [bar] | V̇ water [l/h] | V̇ <sub>n</sub> air [m³/h] |                  |               |                     |                     |
| 45°         | 136.635.xx.A2 | ●                    | ●                   | 0.50                                | 0.80                    | 2.37           | 2.50                       | 0.80        | 3.45           | 2.40                       | 0.80        | 4.80           | 2.40                       | 1.00        | 5.34           | 2.80                       | 1.40             | 0.07          | 85                  | 120                 |
|             |               |                      |                     |                                     | 1.20                    | 2.61           | 3.10                       | 1.20        | 3.54           | 3.10                       | 1.20        | 5.10           | 3.10                       | 1.40        | 5.37           | 3.40                       | 2.20             | 0.15          | 95                  | 130                 |
|             |               |                      |                     |                                     | 1.60                    | 2.85           | 3.70                       | 1.60        | 3.66           | 3.70                       | 1.60        | 5.01           | 3.70                       | 1.80        | 5.46           | 4.00                       | 3.20             | 0.20          | 95                  | 135                 |
|             |               |                      |                     |                                     | 2.00                    | 3.03           | 4.30                       | 2.00        | 3.72           | 4.30                       | 2.10        | 5.10           | 4.30                       | 2.20        | 5.46           | 4.60                       | 4.00             | 0.30          | 100                 | 140                 |
|             |               |                      |                     |                                     | 2.40                    | 3.12           | 4.90                       | 2.40        | 3.90           | 4.90                       | 2.40        | 5.13           | 4.90                       | 2.60        | 5.58           | 5.20                       | 5.00             | 0.35          | 100                 | 145                 |
|             |               |                      |                     |                                     | 2.80                    | 3.15           | 5.50                       | 2.80        | 3.87           | 5.50                       | 2.80        | 5.16           | 5.50                       | 3.00        | 5.58           | 5.80                       | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 3.20                    | 3.21           | 6.10                       | 3.20        | 3.96           | 6.10                       | 3.20        | 5.22           | 6.10                       | 3.40        | 5.58           | 6.40                       | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 3.60                    | 3.18           | 6.70                       | 3.60        | 3.96           | 6.70                       | 3.60        | 5.25           | 6.70                       | 3.80        | 5.58           | 7.00                       | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 4.00                    | 3.21           | 7.30                       | 4.00        | 3.96           | 7.20                       | 4.00        | 5.22           | 7.30                       | 4.20        | 5.58           | 7.60                       | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 4.40                    | 3.21           | 7.90                       | 4.40        | 3.96           | 7.90                       | 4.40        | 5.22           | 7.90                       | 4.60        | 5.58           | 8.10                       | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 4.80                    | 3.21           | 8.40                       | 4.80        | 3.96           | 8.40                       | 4.80        | 5.22           | 8.40                       | 5.00        | 5.58           | 8.70                       | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 5.20                    | 3.21           | 9.00                       | 5.20        | 3.96           | 9.00                       | 5.20        | 5.22           | 9.00                       | 5.40        | 5.58           | 9.30                       | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 5.60                    | 3.12           | 9.60                       | 5.60        | 3.90           | 9.60                       | 5.60        | 5.22           | 9.60                       | 5.80        | 5.58           | 9.90                       | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 6.00                    | 3.18           | 10.20                      | 6.00        | 3.84           | 10.20                      | 6.00        | 5.16           | 10.20                      | 6.00        | 5.58           | 10.20                      | –                | –             | –                   | –                   |
|             | 136.654.xx.A2 | ●                    | ●                   | 0.70                                | 0.80                    | 5.25           | 2.40                       | 0.80        | 7.29           | 2.40                       | 1.20        | 10.11          | 3.10                       | 1.60        | 11.07          | 3.70                       | 1.40             | 0.07          | 95                  | 135                 |
|             |               |                      |                     |                                     | 1.20                    | 5.64           | 3.10                       | 1.20        | 7.44           | 3.10                       | 1.60        | 10.23          | 3.70                       | 2.00        | 11.22          | 4.30                       | 2.20             | 0.15          | 100                 | 150                 |
|             |               |                      |                     |                                     | 1.60                    | 5.79           | 3.70                       | 1.60        | 7.62           | 3.70                       | 2.00        | 10.38          | 4.30                       | 2.40        | 11.28          | 4.90                       | 3.20             | 0.20          | 105                 | 160                 |
|             |               |                      |                     |                                     | 2.00                    | 6.18           | 4.30                       | 2.00        | 7.86           | 4.30                       | 2.40        | 10.47          | 4.90                       | 2.80        | 11.31          | 5.50                       | 4.00             | 0.30          | 105                 | 160                 |
|             |               |                      |                     |                                     | 2.40                    | 6.24           | 4.90                       | 2.40        | 7.92           | 4.90                       | 2.80        | 10.59          | 5.50                       | 3.20        | 11.43          | 6.10                       | 5.00             | 0.35          | 105                 | 160                 |
|             |               |                      |                     |                                     | 2.80                    | 6.27           | 5.50                       | 2.80        | 8.04           | 5.50                       | 3.20        | 10.59          | 6.10                       | 3.60        | 11.46          | 6.60                       | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 3.20                    | 6.39           | 6.10                       | 3.20        | 8.13           | 6.10                       | 3.60        | 10.62          | 6.70                       | 4.00        | 11.43          | 7.20                       | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 3.60                    | 6.42           | 6.60                       | 3.60        | 8.13           | 6.70                       | 4.00        | 10.62          | 7.20                       | 4.40        | 11.37          | 7.80                       | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 4.00                    | 6.45           | 7.20                       | 4.00        | 8.13           | 7.20                       | 4.40        | 10.62          | 7.80                       | 4.80        | 11.37          | 8.40                       | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 4.40                    | 6.42           | 7.80                       | 4.40        | 8.07           | 7.80                       | 4.80        | 10.59          | 8.40                       | 5.20        | 11.34          | 9.00                       | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 4.80                    | 6.30           | 8.40                       | 4.80        | 8.04           | 8.40                       | 5.20        | 10.56          | 9.00                       | 5.60        | 11.22          | 9.60                       | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 5.20                    | 6.24           | 9.00                       | 5.20        | 7.86           | 9.00                       | 5.60        | 10.50          | 9.60                       | 6.00        | 11.16          | 10.10                      | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 5.60                    | 6.09           | 9.60                       | 5.60        | 7.83           | 9.60                       | 6.00        | 10.35          | 10.20                      | –           | –              | –                          | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 6.00                    | 5.85           | 10.20                      | 6.00        | 7.59           | 10.20                      | –           | –              | –                          | –           | –              | –                          | –                | –             | –                   | –                   |
| 60°         | 136.626.xx.A2 | ●                    | ●                   | 0.40                                | 0.80                    | 1.83           | 2.80                       | 0.80        | 2.49           | 2.80                       | 0.80        | 3.48           | 2.80                       | 0.80        | 3.78           | 2.80                       | 1.60             | 0.07          | 85                  | 135                 |
|             |               |                      |                     |                                     | 1.20                    | 1.98           | 3.60                       | 1.20        | 2.58           | 3.50                       | 1.20        | 3.60           | 3.50                       | 1.20        | 3.87           | 3.60                       | 2.40             | 0.15          | 90                  | 140                 |
|             |               |                      |                     |                                     | 1.60                    | 2.10           | 4.30                       | 1.60        | 2.70           | 4.20                       | 1.60        | 3.66           | 4.30                       | 1.60        | 3.90           | 4.20                       | 3.20             | 0.20          | 90                  | 140                 |
|             |               |                      |                     |                                     | 2.00                    | 2.16           | 4.90                       | 2.00        | 2.82           | 4.90                       | 2.00        | 3.69           | 4.90                       | 2.00        | 3.96           | 4.90                       | 4.00             | 0.30          | 100                 | 145                 |
|             |               |                      |                     |                                     | 2.40                    | 2.25           | 5.60                       | 2.40        | 2.85           | 5.60                       | 2.40        | 3.69           | 5.60                       | 2.40        | 3.96           | 5.60                       | 5.20             | 0.35          | 105                 | 150                 |
|             |               |                      |                     |                                     | 2.80                    | 2.34           | 6.30                       | 2.80        | 2.88           | 6.30                       | 2.80        | 3.72           | 6.30                       | 2.80        | 4.02           | 6.30                       | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 3.20                    | 2.31           | 7.00                       | 3.20        | 2.88           | 7.00                       | 3.20        | 3.78           | 7.00                       | 3.20        | 3.99           | 7.00                       | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 3.60                    | 2.34           | 7.60                       | 3.60        | 2.88           | 7.70                       | 3.60        | 3.78           | 7.60                       | 3.60        | 4.02           | 7.70                       | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 4.00                    | 2.40           | 8.40                       | 4.00        | 2.94           | 8.40                       | 4.00        | 3.81           | 8.30                       | 4.00        | 4.05           | 8.30                       | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 4.40                    | 2.40           | 9.00                       | 4.40        | 2.91           | 9.00                       | 4.40        | 3.81           | 9.00                       | 4.40        | 4.02           | 9.00                       | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 4.80                    | 2.40           | 9.70                       | 4.80        | 2.97           | 9.70                       | 4.80        | 3.81           | 9.70                       | 4.80        | 4.08           | 9.70                       | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 5.20                    | 2.43           | 10.40                      | 5.20        | 2.97           | 10.40                      | 5.20        | 3.81           | 10.40                      | 5.20        | 4.05           | 10.40                      | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 5.60                    | 2.43           | 11.20                      | 5.60        | 2.97           | 11.10                      | 5.60        | 3.81           | 11.10                      | 5.60        | 4.05           | 11.00                      | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 6.00                    | 2.43           | 11.80                      | 6.00        | 2.97           | 11.80                      | 6.00        | 3.81           | 11.80                      | 6.00        | 4.05           | 11.80                      | –                | –             | –                   | –                   |





| Spray angle   | Ordering no.  |                      |                     | Narrowest free cross section Ø [mm] | Liquid pressure p [bar] |                |                            |             |                |                            |             |                |                            |             |                |                            | Spray dimensions |               |                     |                     |
|---------------|---------------|----------------------|---------------------|-------------------------------------|-------------------------|----------------|----------------------------|-------------|----------------|----------------------------|-------------|----------------|----------------------------|-------------|----------------|----------------------------|------------------|---------------|---------------------|---------------------|
|               | Type          | Mat. no.             |                     |                                     |                         |                |                            |             |                |                            |             |                |                            |             |                |                            |                  |               |                     |                     |
|               |               | 1Y                   | 16                  |                                     | 0.07                    |                |                            | 0.15        |                |                            | 0.30        |                |                            | 0.35        |                |                            | p air [bar]      | p water [bar] | B <sub>1</sub> [mm] | B <sub>2</sub> [mm] |
|               |               | Stainless steel 316L | Stainless steel 303 |                                     | p air [bar]             | v̇ water [l/h] | v̇ <sub>n</sub> air [m³/h] | p air [bar] | v̇ water [l/h] | v̇ <sub>n</sub> air [m³/h] | p air [bar] | v̇ water [l/h] | v̇ <sub>n</sub> air [m³/h] | p air [bar] | v̇ water [l/h] | v̇ <sub>n</sub> air [m³/h] |                  |               |                     |                     |
| 60°           | 136.645.xx.A2 | ●                    | ●                   | 0.50                                | 0.80                    | 2.73           | 2.80                       | 0.80        | 3.69           | 2.80                       | 1.00        | 5.16           | 3.20                       | 1.00        | 5.55           | 3.10                       | 1.60             | 0.07          | 100                 | 140                 |
| 1.20          |               |                      |                     |                                     | 2.82                    | 3.50           | 1.20                       | 3.87        | 3.50           | 1.40                       | 5.31        | 3.90           | 1.40                       | 5.64        | 3.90           | 2.40                       | 0.15             | 110           | 150                 |                     |
| 1.60          |               |                      |                     |                                     | 3.09                    | 4.20           | 1.60                       | 3.99        | 4.20           | 1.80                       | 5.37        | 4.60           | 1.80                       | 5.67        | 4.60           | 3.20                       | 0.20             | 115           | 155                 |                     |
| 2.00          |               |                      |                     |                                     | 3.27                    | 4.90           | 2.00                       | 4.11        | 4.90           | 2.20                       | 5.37        | 5.20           | 2.20                       | 5.76        | 5.20           | 4.00                       | 0.30             | 125           | 160                 |                     |
| 2.40          |               |                      |                     |                                     | 3.36                    | 5.60           | 2.40                       | 4.17        | 5.60           | 2.60                       | 5.43        | 5.90           | 2.60                       | 5.82        | 5.90           | 5.20                       | 0.35             | 130           | 165                 |                     |
| 2.80          |               |                      |                     |                                     | 3.39                    | 6.20           | 2.80                       | 4.20        | 6.30           | 3.00                       | 5.49        | 6.60           | 3.00                       | 5.82        | 6.60           | –                          | –                | –             | –                   |                     |
| 3.20          |               |                      |                     |                                     | 3.45                    | 7.00           | 3.20                       | 4.26        | 7.00           | 3.40                       | 5.49        | 7.20           | 3.40                       | 5.88        | 7.30           | –                          | –                | –             | –                   |                     |
| 3.60          |               |                      |                     |                                     | 3.48                    | 7.60           | 3.60                       | 4.29        | 7.60           | 3.80                       | 5.55        | 8.00           | 3.80                       | 5.88        | 8.00           | –                          | –                | –             | –                   |                     |
| 4.00          |               |                      |                     |                                     | 3.51                    | 8.30           | 4.00                       | 4.32        | 8.30           | 4.20                       | 5.55        | 8.60           | 4.20                       | 5.88        | 8.70           | –                          | –                | –             | –                   |                     |
| 4.40          |               |                      |                     |                                     | 3.54                    | 9.00           | 4.40                       | 4.35        | 9.00           | 4.60                       | 5.58        | 9.30           | 4.60                       | 5.94        | 9.30           | –                          | –                | –             | –                   |                     |
| 4.80          |               |                      |                     |                                     | 3.57                    | 9.70           | 4.80                       | 4.38        | 9.70           | 5.00                       | 5.55        | 10.00          | 5.00                       | 5.94        | 10.10          | –                          | –                | –             | –                   |                     |
| 5.20          |               |                      |                     |                                     | 3.57                    | 10.40          | 5.20                       | 4.35        | 10.40          | 5.40                       | 5.61        | 10.70          | 5.40                       | 5.94        | 10.70          | –                          | –                | –             | –                   |                     |
| 5.60          |               |                      |                     |                                     | 3.60                    | 11.00          | 5.60                       | 4.35        | 11.10          | 5.80                       | 5.61        | 11.40          | 5.80                       | 5.94        | 11.40          | –                          | –                | –             | –                   |                     |
| 6.00          |               |                      |                     |                                     | 3.60                    | 11.70          | 6.00                       | 4.38        | 11.70          | 6.00                       | 5.61        | 11.80          | 6.00                       | 5.97        | 11.80          | –                          | –                | –             | –                   |                     |
| 136.664.xx.A2 | ●             | ●                    | 0.70                | 0.80                                | 5.46                    | 2.80           | 1.00                       | 7.68        | 3.20           | 1.00                       | 10.50       | 3.20           | 1.00                       | 11.28       | 3.20           | 1.60                       | 0.07             | 110           | 140                 |                     |
|               |               |                      |                     | 1.20                                | 5.91                    | 3.50           | 1.40                       | 7.95        | 3.90           | 1.40                       | 10.71       | 3.90           | 1.40                       | 11.52       | 3.90           | 2.40                       | 0.15             | 130           | 160                 |                     |
|               |               |                      |                     | 1.60                                | 6.15                    | 4.20           | 1.80                       | 8.13        | 4.60           | 1.80                       | 10.83       | 4.60           | 1.80                       | 11.58       | 4.50           | 3.20                       | 0.20             | 140           | 170                 |                     |
|               |               |                      |                     | 2.00                                | 6.42                    | 4.90           | 2.20                       | 8.34        | 5.30           | 2.20                       | 11.01       | 5.30           | 2.20                       | 11.70       | 5.20           | 4.00                       | 0.30             | 150           | 180                 |                     |
|               |               |                      |                     | 2.40                                | 6.63                    | 5.60           | 2.60                       | 8.46        | 5.90           | 2.60                       | 11.07       | 5.90           | 2.60                       | 11.79       | 5.90           | 5.20                       | 0.35             | 155           | 200                 |                     |
|               |               |                      |                     | 2.80                                | 6.75                    | 6.30           | 3.00                       | 8.58        | 6.60           | 3.00                       | 11.16       | 6.60           | 3.00                       | 11.88       | 6.60           | –                          | –                | –             | –                   |                     |
|               |               |                      |                     | 3.20                                | 6.93                    | 6.90           | 3.40                       | 8.67        | 7.30           | 3.40                       | 11.19       | 7.30           | 3.40                       | 11.94       | 7.30           | –                          | –                | –             | –                   |                     |
|               |               |                      |                     | 3.60                                | 6.99                    | 7.60           | 3.80                       | 8.73        | 8.00           | 3.80                       | 11.25       | 8.00           | 3.80                       | 12.00       | 8.00           | –                          | –                | –             | –                   |                     |
|               |               |                      |                     | 4.00                                | 7.05                    | 8.30           | 4.20                       | 8.76        | 8.70           | 4.20                       | 11.28       | 8.60           | 4.20                       | 12.03       | 8.70           | –                          | –                | –             | –                   |                     |
|               |               |                      |                     | 4.40                                | 7.11                    | 9.00           | 4.60                       | 8.82        | 9.30           | 4.60                       | 11.34       | 9.40           | 4.60                       | 12.06       | 9.40           | –                          | –                | –             | –                   |                     |
|               |               |                      |                     | 4.80                                | 7.11                    | 9.70           | 5.00                       | 8.82        | 10.10          | 5.00                       | 11.37       | 10.00          | 5.00                       | 12.06       | 10.10          | –                          | –                | –             | –                   |                     |
|               |               |                      |                     | 5.20                                | 7.17                    | 10.40          | 5.40                       | 8.82        | 10.70          | 5.40                       | 11.37       | 10.70          | 5.40                       | 12.09       | 10.70          | –                          | –                | –             | –                   |                     |
|               |               |                      |                     | 5.60                                | 7.11                    | 11.10          | 5.80                       | 8.85        | 11.40          | 5.80                       | 11.40       | 11.40          | 5.80                       | 12.12       | 11.40          | –                          | –                | –             | –                   |                     |
|               |               |                      |                     | 6.00                                | 7.20                    | 11.80          | 6.00                       | 8.85        | 11.80          | 6.00                       | 11.40       | 11.70          | 6.00                       | 12.15       | 11.80          | –                          | –                | –             | –                   |                     |
| 136.673.xx.A2 | ●             | ●                    | 1.00                | 0.60                                | 13.89                   | 5.60           | 1.00                       | 18.51       | 7.60           | 1.60                       | 24.81       | 10.20          | 2.00                       | 26.61       | 11.80          | 1.60                       | 0.07             | 115           | 160                 |                     |
|               |               |                      |                     | 1.00                                | 14.28                   | 7.60           | 1.40                       | 18.51       | 9.30           | 2.00                       | 24.66       | 11.70          | 2.40                       | 26.31       | 13.50          | 2.40                       | 0.15             | 120           | 160                 |                     |
|               |               |                      |                     | 1.40                                | 14.28                   | 9.40           | 1.80                       | 18.33       | 11.00          | 2.40                       | 24.42       | 13.30          | 2.80                       | 25.65       | 15.10          | 3.20                       | 0.20             | 120           | 160                 |                     |
|               |               |                      |                     | 1.80                                | 14.10                   | 11.00          | 2.20                       | 17.91       | 12.70          | 2.80                       | 23.52       | 15.10          | 3.20                       | 24.57       | 16.60          | 4.00                       | 0.30             | 120           | 165                 |                     |
|               |               |                      |                     | 2.20                                | 13.68                   | 12.60          | 2.60                       | 17.37       | 14.20          | 3.20                       | 22.47       | 16.60          | 3.60                       | 23.28       | 18.30          | 5.20                       | 0.35             | 120           | 170                 |                     |
|               |               |                      |                     | 2.60                                | 13.62                   | 14.20          | 3.00                       | 16.65       | 15.90          | 3.60                       | 21.30       | 18.40          | 4.00                       | 21.93       | 19.90          | –                          | –                | –             | –                   |                     |
|               |               |                      |                     | 3.00                                | 13.29                   | 18.90          | 3.40                       | 15.93       | 17.30          | 4.00                       | 20.10       | 19.80          | 4.40                       | 20.34       | 21.50          | –                          | –                | –             | –                   |                     |
|               |               |                      |                     | 3.40                                | 12.87                   | 17.40          | 3.80                       | 15.06       | 19.00          | 4.40                       | 18.78       | 21.50          | 4.80                       | 19.20       | 23.10          | –                          | –                | –             | –                   |                     |
|               |               |                      |                     | 3.80                                | 12.57                   | 19.10          | 4.20                       | 14.58       | 20.80          | 4.80                       | 17.52       | 23.20          | 5.20                       | 18.06       | 24.70          | –                          | –                | –             | –                   |                     |
|               |               |                      |                     | 4.20                                | 12.18                   | 20.80          | 4.60                       | 13.83       | 22.30          | 5.20                       | 16.71       | 24.80          | 5.60                       | 17.01       | 26.30          | –                          | –                | –             | –                   |                     |
|               |               |                      |                     | 4.60                                | 11.79                   | 22.40          | 5.00                       | 13.08       | 24.00          | 5.60                       | 15.63       | 26.40          | 6.00                       | 15.87       | 28.00          | –                          | –                | –             | –                   |                     |
|               |               |                      |                     | 5.00                                | 10.95                   | 24.00          | 5.40                       | 12.30       | 25.60          | 5.80                       | 15.12       | 27.30          | –                          | –           | –              | –                          | –                | –             | –                   |                     |
|               |               |                      |                     | 5.40                                | 10.44                   | 25.60          | 5.80                       | 11.52       | 27.20          | 6.00                       | 14.76       | 28.00          | –                          | –           | –              | –                          | –                | –             | –                   |                     |
|               |               |                      |                     | 5.80                                | 9.57                    | 27.20          | 6.00                       | 11.04       | 28.10          | –                          | –           | –              | –                          | –           | –              | –                          | –                | –             | –                   |                     |
|               |               |                      |                     | 6.00                                | 8.97                    | 28.10          | –                          | –           | –              | –                          | –           | –              | –                          | –           | –              | –                          | –                | –             | –                   |                     |

| Spray angle | Ordering no.  |                      |                     | Narrowest free cross section Ø [mm] | Liquid pressure p [bar] |                |                            |             |                |                            |             |                |                            |             |                |                            | Spray dimensions |               |                     |                     |
|-------------|---------------|----------------------|---------------------|-------------------------------------|-------------------------|----------------|----------------------------|-------------|----------------|----------------------------|-------------|----------------|----------------------------|-------------|----------------|----------------------------|------------------|---------------|---------------------|---------------------|
|             | Type          | Mat. no.             |                     |                                     |                         |                |                            |             |                |                            |             |                |                            |             |                |                            |                  |               |                     |                     |
|             |               | 1Y                   | 16                  |                                     | 0.07                    |                |                            | 0.15        |                |                            | 0.30        |                |                            | 0.35        |                |                            |                  |               |                     |                     |
|             |               | Stainless steel 316L | Stainless steel 303 |                                     | p air [bar]             | V̇ water [l/h] | V̇ <sub>n</sub> air [m³/h] | p air [bar] | V̇ water [l/h] | V̇ <sub>n</sub> air [m³/h] | p air [bar] | V̇ water [l/h] | V̇ <sub>n</sub> air [m³/h] | p air [bar] | V̇ water [l/h] | V̇ <sub>n</sub> air [m³/h] | p air [bar]      | p water [bar] | B <sub>1</sub> [mm] | B <sub>2</sub> [mm] |
| 60°         | 136.682.xx.A2 | ●                    | ●                   | 1.50                                | 1.00                    | 22.41          | 7.50                       | 1.40        | 28.95          | 9.30                       | 1.80        | 41.22          | 11.10                      | 2.00        | 44.04          | 11.80                      | 1.60             | 0.07          | 110                 | 155                 |
|             |               |                      |                     |                                     | 1.40                    | 20.19          | 9.30                       | 1.80        | 26.07          | 10.90                      | 2.20        | 34.92          | 12.60                      | 2.40        | 39.09          | 13.40                      | 2.40             | 0.15          | 120                 | 155                 |
|             |               |                      |                     |                                     | 1.80                    | 18.75          | 11.00                      | 2.20        | 23.94          | 12.50                      | 2.60        | 33.18          | 14.20                      | 2.80        | 35.16          | 15.10                      | 3.20             | 0.20          | 120                 | 160                 |
|             |               |                      |                     |                                     | 2.20                    | 17.88          | 12.50                      | 2.60        | 22.23          | 14.30                      | 3.00        | 30.45          | 15.90                      | 3.20        | 32.22          | 16.70                      | 4.00             | 0.30          | 120                 | 165                 |
|             |               |                      |                     |                                     | 2.60                    | 17.10          | 14.20                      | 3.00        | 21.12          | 15.90                      | 3.40        | 28.29          | 17.50                      | 3.60        | 30.18          | 18.30                      | 5.20             | 0.35          | 120                 | 175                 |
|             |               |                      |                     |                                     | 3.00                    | 16.47          | 15.90                      | 3.40        | 20.10          | 17.50                      | 3.80        | 26.64          | 19.10                      | 4.00        | 28.32          | 19.90                      | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 3.40                    | 16.08          | 17.50                      | 3.80        | 19.44          | 19.10                      | 4.20        | 25.35          | 20.70                      | 4.40        | 26.94          | 21.50                      | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 3.80                    | 15.90          | 19.10                      | 4.20        | 18.99          | 20.70                      | 4.60        | 24.24          | 22.30                      | 4.80        | 25.59          | 23.10                      | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 4.20                    | 15.90          | 20.70                      | 4.60        | 18.45          | 22.30                      | 5.00        | 23.13          | 24.00                      | 5.20        | 24.36          | 24.80                      | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 4.60                    | 15.81          | 22.30                      | 5.00        | 18.18          | 24.00                      | 5.40        | 22.14          | 25.50                      | 5.60        | 23.28          | 26.40                      | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 5.00                    | 15.21          | 23.90                      | 5.40        | 17.25          | 25.40                      | 5.80        | 21.12          | 27.20                      | 6.00        | 22.17          | 28.00                      | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 5.40                    | 13.92          | 25.50                      | 5.80        | 15.72          | 27.20                      | 6.00        | 20.67          | 28.00                      | –           | –              | –                          | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 5.80                    | 12.09          | 27.20                      | 6.00        | 14.91          | 28.00                      | –           | –              | –                          | –           | –              | –                          | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 6.00                    | 11.07          | 28.00                      | –           | –              | –                          | –           | –              | –                          | –           | –              | –                          | –                | –             | –                   | –                   |
|             | 136.691.xx.A2 | ●                    | ●                   | 2.50                                | 1.40                    | 52.00          | 13.80                      | 2.00        | 67.30          | 17.50                      | 2.60        | 92.30          | 21.20                      | 2.60        | 102.10         | 21.20                      | 1.60             | 0.07          | 150                 | 200                 |
|             |               |                      |                     |                                     | 1.80                    | 50.00          | 16.30                      | 2.40        | 64.60          | 20.10                      | 3.00        | 87.70          | 23.60                      | 3.00        | 97.20          | 23.70                      | 2.40             | 0.15          | 160                 | 205                 |
|             |               |                      |                     |                                     | 2.20                    | 48.60          | 18.80                      | 2.80        | 62.00          | 22.50                      | 3.40        | 84.30          | 26.00                      | 3.40        | 92.50          | 26.10                      | 3.20             | 0.20          | 160                 | 205                 |
|             |               |                      |                     |                                     | 2.60                    | 47.50          | 21.30                      | 3.20        | 60.40          | 24.90                      | 3.80        | 80.70          | 28.50                      | 3.80        | 88.40          | 28.50                      | 4.00             | 0.30          | 160                 | 210                 |
|             |               |                      |                     |                                     | 3.00                    | 46.50          | 23.70                      | 3.60        | 58.00          | 27.30                      | 4.20        | 77.00          | 30.90                      | 4.20        | 85.20          | 31.00                      | 5.20             | 0.35          | 150                 | 210                 |
|             |               |                      |                     |                                     | 3.40                    | 45.40          | 26.10                      | 4.00        | 56.20          | 29.80                      | 4.60        | 74.40          | 33.40                      | 4.60        | 81.30          | 33.40                      | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 3.80                    | 44.40          | 28.60                      | 4.40        | 54.20          | 32.10                      | 5.00        | 71.10          | 35.90                      | 5.00        | 78.20          | 35.80                      | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 4.20                    | 42.90          | 31.00                      | 4.80        | 52.40          | 34.70                      | 5.40        | 68.10          | 38.30                      | 5.40        | 74.30          | 38.20                      | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 4.60                    | 41.50          | 33.40                      | 5.20        | 49.90          | 37.10                      | 5.80        | 64.30          | 40.80                      | 5.80        | 71.10          | 40.70                      | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 5.00                    | 39.90          | 35.80                      | 5.60        | 48.10          | 39.50                      | 6.00        | 63.20          | 42.00                      | 6.00        | 68.90          | 41.90                      | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 5.40                    | 38.90          | 38.30                      | 6.00        | 46.40          | 42.00                      | –           | –              | –                          | –           | –              | –                          | –                | –             | –                   | –                   |
|             |               |                      |                     |                                     | 5.60                    | 38.50          | 39.40                      | –           | –              | –                          | –           | –              | –                          | –           | –              | –                          | –                | –             | –                   | –                   |

Ordering Type + Material no. = Ordering no.  
 example: 136.682.xx.A2 + 1Y = 136.682.1Y.A2

# ➤ Pneumatic atomizing nozzles, full cone, pressure principle, internal mixing Series 166.1



## Features:

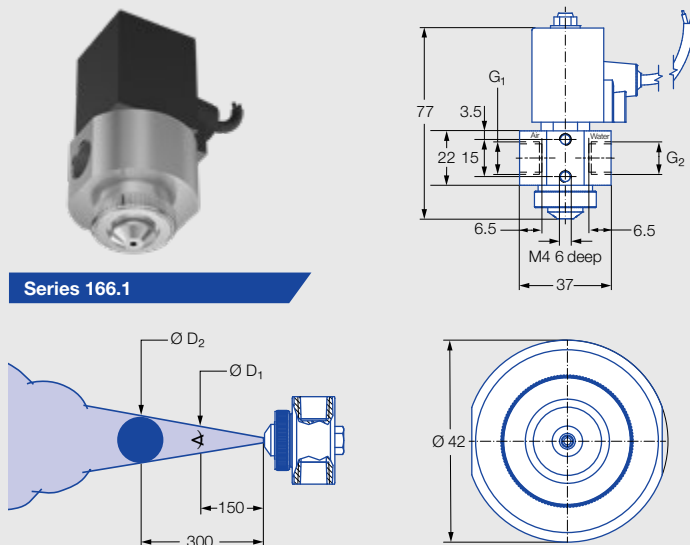
- Version with magnetic valve
- Fine full cone atomization
- Liquid pressure principle
- Internal mixing

## Applications:

- Humidification of air
- Cooling

## Technical data:

- Operating pressure: 0–6 bar
- Voltage: 24 V DC
- Power: 8 W
- Switching frequency: Approx. 500/min
- Protective system: IP 67
- Ambient temperature: +10 °C/+50 °C
- Cable length: 1,000 mm
- Material of gasket: EPDM



Series 166.1

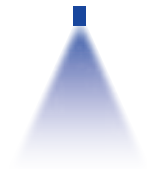
| Air connection G <sub>1</sub> | Water connection G <sub>2</sub> | Weight [g] |
|-------------------------------|---------------------------------|------------|
| 1/4 BSPP                      | 1/4 BSPP                        | 410        |

| Spray angle | Ordering no.  |          | Narrow-<br>est free<br>cross<br>section<br>Ø<br>[mm] | Liquid pressure p [bar]   |                |                   |                               |                |                   |                               |                |                   |                               |                | Spray dimensions  |                               |                |                  |                       |                       |
|-------------|---------------|----------|------------------------------------------------------|---------------------------|----------------|-------------------|-------------------------------|----------------|-------------------|-------------------------------|----------------|-------------------|-------------------------------|----------------|-------------------|-------------------------------|----------------|------------------|-----------------------|-----------------------|
|             | Type          | Mat. no. |                                                      | 0.7                       |                |                   | 1.5                           |                |                   | 3.0                           |                |                   | 4.0                           |                |                   |                               |                |                  |                       |                       |
|             |               | 16       |                                                      | Stainless<br>steel<br>303 | p<br>air [bar] | V̇<br>water [l/h] | V̇ <sub>n</sub><br>air [m³/h] | p<br>air [bar] | V̇<br>water [l/h] | V̇ <sub>n</sub><br>air [m³/h] | p<br>air [bar] | V̇<br>water [l/h] | V̇ <sub>n</sub><br>air [m³/h] | p<br>air [bar] | V̇<br>water [l/h] | V̇ <sub>n</sub><br>air [m³/h] | p<br>air [bar] | p<br>water [bar] | Ø D <sub>1</sub> [mm] | Ø D <sub>2</sub> [mm] |
|             |               |          |                                                      |                           |                |                   |                               |                |                   |                               |                |                   |                               |                |                   |                               |                |                  |                       |                       |
| 20°         | 166.115.xx.A2 | ●        | 0.5                                                  | 0.4                       | 5.9            | 0.3               | 1.4                           | 5.8            | 0.8               | 2.4                           | 9.1            | 1.1               | 3.0                           | 11.0           | 1.2               | 0.8                           | 0.7            | 60               | 100                   |                       |
|             |               |          |                                                      | 0.8                       | 3.8            | 0.6               | 1.8                           | 4.1            | 1.0               | 2.8                           | 7.5            | 1.2               | 3.4                           | 9.6            | 1.4               | 1.8                           | 1.5            | 60               | 95                    |                       |
|             |               |          |                                                      | 1.2                       | 1.7            | 0.9               | 2.2                           | 2.2            | 1.4               | 3.2                           | 5.9            | 1.5               | 3.8                           | 8.2            | 1.6               | 2.6                           | 2.0            | 60               | 100                   |                       |
|             |               |          |                                                      | -                         | -              | -                 | 2.6                           | 1.2            | 1.7               | 3.6                           | 4.4            | 1.8               | 4.2                           | 6.8            | 1.9               | 3.2                           | 3.0            | 55               | 95                    |                       |
|             |               |          |                                                      | -                         | -              | -                 | -                             | -              | -                 | 4.0                           | 2.9            | 2.1               | 4.6                           | 5.5            | 2.2               | 4.4                           | 4.0            | 55               | 100                   |                       |
|             |               |          |                                                      | -                         | -              | -                 | -                             | -              | -                 | 4.4                           | 2.0            | 2.5               | 5.0                           | 4.1            | 2.5               | -                             | -              | -                | -                     |                       |
|             |               |          |                                                      | -                         | -              | -                 | -                             | -              | -                 | 4.8                           | 1.1            | 2.8               | 5.4                           | 2.9            | 2.8               | -                             | -              | -                | -                     |                       |
|             |               |          |                                                      | -                         | -              | -                 | -                             | -              | -                 | 5.2                           | 0.4            | 3.0               | 5.8                           | 2.1            | 3.1               | -                             | -              | -                | -                     |                       |
|             | 166.125.xx.A2 | ●        | 0.5                                                  | 0.8                       | 4.7            | 1.5               | 1.2                           | 7.0            | 1.8               | 2.8                           | 9.1            | 3.3               | 3.4                           | 10.6           | 3.9               | 1.4                           | 0.7            | 55               | 90                    |                       |
|             |               |          |                                                      | 1.2                       | 4.4            | 1.9               | 1.6                           | 6.6            | 2.2               | 3.2                           | 8.7            | 3.7               | 3.8                           | 10.3           | 4.3               | 2.2                           | 1.5            | 55               | 95                    |                       |
|             |               |          |                                                      | 1.6                       | 4.0            | 2.3               | 2.0                           | 6.2            | 2.6               | 3.6                           | 8.4            | 4.1               | 4.2                           | 9.9            | 4.6               | 2.8                           | 2.0            | 55               | 100                   |                       |
|             |               |          |                                                      | 2.0                       | 3.5            | 2.6               | 2.4                           | 5.8            | 3.0               | 4.0                           | 8.0            | 4.5               | 4.6                           | 9.6            | 5.0               | 3.4                           | 3.0            | 60               | 100                   |                       |
|             |               |          |                                                      | 2.4                       | 3.0            | 3.0               | 2.8                           | 5.4            | 3.4               | 4.4                           | 7.7            | 4.8               | 5.0                           | 9.3            | 5.4               | 4.2                           | 4.0            | 60               | 100                   |                       |
|             |               |          |                                                      | 2.8                       | 2.7            | 3.2               | 3.2                           | 4.9            | 3.7               | 4.8                           | 7.3            | 5.2               | 5.4                           | 8.9            | 5.8               | -                             | -              | -                | -                     |                       |
|             |               |          |                                                      | 3.2                       | 2.0            | 3.7               | 3.6                           | 4.4            | 4.1               | 5.2                           | 7.0            | 5.6               | 5.8                           | 8.6            | 6.1               | -                             | -              | -                | -                     |                       |
|             |               |          |                                                      | 3.6                       | 1.6            | 4.1               | 4.0                           | 3.9            | 4.5               | 5.6                           | 6.6            | 5.9               | -                             | -              | -                 | -                             | -              | -                | -                     |                       |
|             |               |          |                                                      | 4.0                       | 1.3            | 4.5               | 4.4                           | 3.5            | 4.8               | 6.0                           | 6.2            | 6.3               | -                             | -              | -                 | -                             | -              | -                | -                     |                       |
|             |               |          |                                                      | 4.4                       | 1.0            | 4.9               | 4.8                           | 3.1            | 5.2               | -                             | -              | -                 | -                             | -              | -                 | -                             | -              | -                | -                     |                       |
|             |               |          |                                                      | 4.8                       | 0.6            | 5.2               | 5.2                           | 2.7            | 5.6               | -                             | -              | -                 | -                             | -              | -                 | -                             | -              | -                | -                     |                       |
|             |               |          |                                                      | -                         | -              | -                 | 5.6                           | 2.3            | 5.9               | -                             | -              | -                 | -                             | -              | -                 | -                             | -              | -                | -                     |                       |
|             |               |          |                                                      | -                         | -              | -                 | 6.0                           | 1.9            | 6.3               | -                             | -              | -                 | -                             | -              | -                 | -                             | -              | -                | -                     |                       |

| Spray angle | Ordering no.  |          | Narrowest free cross section Ø [mm] | Liquid pressure p [bar] |               |              |             |               |              |             |               |              |             |               |              | Spray dimensions |               |                       |                       |
|-------------|---------------|----------|-------------------------------------|-------------------------|---------------|--------------|-------------|---------------|--------------|-------------|---------------|--------------|-------------|---------------|--------------|------------------|---------------|-----------------------|-----------------------|
|             | Type          | Mat. no. |                                     | 0.7                     |               |              | 1.5         |               |              | 3.0         |               |              | 4.0         |               |              | p air [bar]      | p water [bar] | Ø D <sub>1</sub> [mm] | Ø D <sub>2</sub> [mm] |
|             |               | 16       |                                     | p air [bar]             | ṽ water [l/h] | ṽ air [m³/h] | p air [bar] | ṽ water [l/h] | ṽ air [m³/h] | p air [bar] | ṽ water [l/h] | ṽ air [m³/h] | p air [bar] | ṽ water [l/h] | ṽ air [m³/h] |                  |               |                       |                       |
| 20°         | 166.134.xx.A2 | ●        | 0.7                                 | 1.2                     | 13.2          | 2.7          | 2.0         | 19.4          | 3.9          | 3.0         | 28.3          | 5.2          | 3.8         | 32.6          | 6.2          | 1.8              | 0.7           | 55                    | 95                    |
|             |               |          |                                     | 1.6                     | 12.4          | 3.3          | 2.4         | 18.1          | 4.4          | 3.4         | 27.5          | 5.7          | 4.2         | 32.0          | 6.8          | 2.8              | 1.5           | 60                    | 105                   |
|             |               |          |                                     | 2.0                     | 11.8          | 3.9          | 2.8         | 17.3          | 4.9          | 3.8         | 26.7          | 6.3          | 4.6         | 31.3          | 7.3          | 3.8              | 2.0           | 60                    | 105                   |
|             |               |          |                                     | 2.4                     | 11.4          | 4.4          | 3.2         | 16.7          | 5.5          | 4.2         | 25.9          | 6.8          | 5.0         | 30.6          | 7.8          | 5.2              | 3.0           | 65                    | 110                   |
|             |               |          |                                     | 2.8                     | 11.1          | 4.9          | 3.6         | 16.1          | 6.0          | 4.6         | 25.0          | 7.3          | 5.4         | 29.9          | 8.4          | 6.0              | 4.0           | 65                    | 110                   |
|             |               |          |                                     | 3.2                     | 10.8          | 5.5          | 4.0         | 15.6          | 6.5          | 5.0         | 24.2          | 7.8          | 5.8         | 29.3          | 8.9          | —                | —             | —                     | —                     |
|             |               |          |                                     | 3.6                     | 10.6          | 6.0          | 4.4         | 15.2          | 7.0          | 5.4         | 23.6          | 8.4          | —           | —             | —            | —                | —             | —                     | —                     |
|             |               |          |                                     | 4.0                     | 10.4          | 6.5          | 4.8         | 15.0          | 7.6          | 5.8         | 23.1          | 8.9          | —           | —             | —            | —                | —             | —                     | —                     |
|             |               |          |                                     | 4.4                     | 10.1          | 7.0          | 5.2         | 14.6          | 8.1          | —           | —             | —            | —           | —             | —            | —                | —             | —                     | —                     |
|             |               |          |                                     | 4.8                     | 9.9           | 7.6          | 5.6         | 14.1          | 8.6          | —           | —             | —            | —           | —             | —            | —                | —             | —                     | —                     |
|             |               |          |                                     | 5.2                     | 9.5           | 8.1          | 6.0         | 13.8          | 9.1          | —           | —             | —            | —           | —             | —            | —                | —             | —                     | —                     |
|             |               |          |                                     | 5.6                     | 9.0           | 8.6          | —           | —             | —            | —           | —             | —            | —           | —             | —            | —                | —             | —                     | —                     |
|             |               |          |                                     | 6.0                     | 8.5           | 9.2          | —           | —             | —            | —           | —             | —            | —           | —             | —            | —                | —             | —                     | —                     |
|             | 166.142.xx.A2 | ●        | 2.5                                 | 1.4                     | 24.2          | 5.1          | 1.6         | 53.4          | 4.7          | 3.2         | 70.8          | 8.0          | 3.8         | 93.2          | 9.2          | 0.8              | 0.7           | 60                    | 100                   |
|             |               |          |                                     | 1.8                     | 20.4          | 6.3          | 2.0         | 42.6          | 5.9          | 3.6         | 62.5          | 9.2          | 4.2         | 83.1          | 10.1         | 1.6              | 1.5           | 65                    | 105                   |
|             |               |          |                                     | 2.2                     | 20.0          | 7.2          | 2.4         | 35.3          | 7.2          | 4.0         | 55.7          | 10.6         | 4.6         | 75.3          | 11.3         | 3.0              | 2.0           | 60                    | 105                   |
|             |               |          |                                     | 2.6                     | 19.3          | 8.2          | 2.8         | 30.4          | 8.4          | 4.4         | 49.3          | 11.7         | 5.0         | 69.0          | 12.5         | 4.0              | 3.0           | 65                    | 110                   |
|             |               |          |                                     | 3.0                     | 17.6          | 9.3          | 3.2         | 28.6          | 9.5          | 4.8         | 44.6          | 12.9         | 5.4         | 63.4          | 13.7         | 6.0              | 4.0           | 65                    | 110                   |
|             |               |          |                                     | 3.4                     | 16.5          | 10.4         | 3.6         | 28.2          | 10.5         | 5.2         | 41.9          | 14.1         | 5.8         | 57.5          | 14.9         | —                | —             | —                     | —                     |
|             |               |          |                                     | 3.8                     | 17.0          | 11.4         | 4.0         | 27.3          | 11.5         | 5.6         | 40.4          | 15.1         | —           | —             | —            | —                | —             | —                     | —                     |
|             |               |          |                                     | 4.2                     | 16.3          | 12.4         | 4.4         | 25.9          | 12.5         | 6.0         | 39.7          | 16.1         | —           | —             | —            | —                | —             | —                     | —                     |
|             |               |          |                                     | 4.6                     | 15.1          | 13.3         | 4.8         | 24.3          | 13.5         | —           | —             | —            | —           | —             | —            | —                | —             | —                     | —                     |
|             |               |          |                                     | 5.0                     | 14.0          | 14.3         | 5.2         | 22.3          | 14.6         | —           | —             | —            | —           | —             | —            | —                | —             | —                     | —                     |
|             |               |          |                                     | 5.4                     | 13.1          | 15.3         | 5.6         | 21.8          | 15.7         | —           | —             | —            | —           | —             | —            | —                | —             | —                     | —                     |
|             |               |          |                                     | 5.8                     | 12.4          | 16.2         | 6.0         | 21.4          | 16.7         | —           | —             | —            | —           | —             | —            | —                | —             | —                     | —                     |

Ordering Type + Material no. = Ordering no.  
example: 166.134.xx.A2 + 16 = 166.134.16.A2

# Pneumatic atomizing nozzles, full cone, pressure principle, internal mixing Series 166.2



## Features:

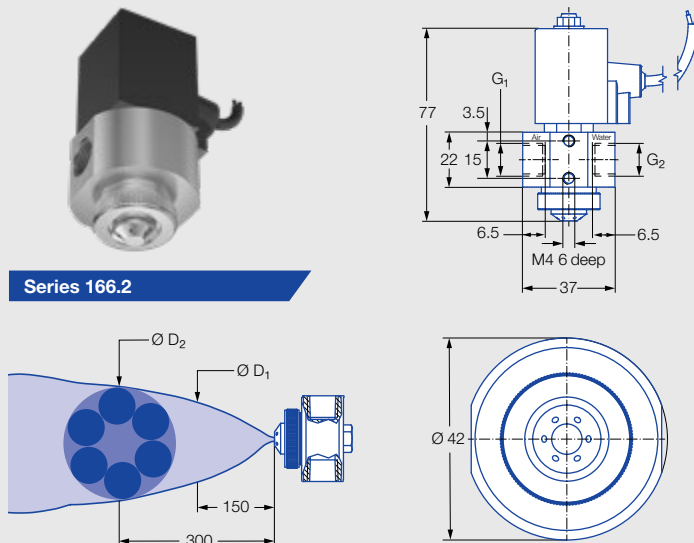
- Version with magnetic valve
- Fine full cone atomization
- Pressure principle
- Internal mixing
- Especially wide spray angle of 60°

## Applications:

- Humidification of air
- Cooling

## Technical data:

- Operating pressure: 0–6 bar
- Voltage: 24 V DC
- Power: 8 W
- Switching frequency: Approx. 500/min
- Protective system: IP 67
- Ambient temperature: +10 °C / +50 °C
- Cable length: 1,000 mm
- Material of gasket: EPDM



Series 166.2

| Air connection G <sub>1</sub> | Water connection G <sub>2</sub> | Weight [g] |
|-------------------------------|---------------------------------|------------|
| 1/4 BSPP                      | 1/4 BSPP                        | 410        |

| Spray angle | Ordering no.  |                           | Narrowest free cross section Ø [mm] | Liquid pressure p [bar] |               |              |             |               |              |             |               |              |             |               |              | Spray dimensions |               |                       |                       |
|-------------|---------------|---------------------------|-------------------------------------|-------------------------|---------------|--------------|-------------|---------------|--------------|-------------|---------------|--------------|-------------|---------------|--------------|------------------|---------------|-----------------------|-----------------------|
|             | Type          | Mat. no.                  |                                     | 0.7                     |               |              | 1.5         |               |              | 3.0         |               |              | 4.0         |               |              | p air [bar]      | p water [bar] | Ø D <sub>1</sub> [mm] | Ø D <sub>2</sub> [mm] |
|             |               | 16<br>Stainless steel 303 |                                     | p air [bar]             | v water [l/h] | v air [m³/h] | p air [bar] | v water [l/h] | v air [m³/h] | p air [bar] | v water [l/h] | v air [m³/h] | p air [bar] | v water [l/h] | v air [m³/h] |                  |               |                       |                       |
| 60°         | 166.215.xx.A2 | ●                         | 0.5                                 | 1.0                     | 3.0           | 1.3          | 1.6         | 5.8           | 1.7          | 2.8         | 8.5           | 2.4          | 3.8         | 9.4           | 3.1          | 1.0              | 0.7           | 200                   | 330                   |
|             |               |                           |                                     | 1.2                     | 1.8           | 1.5          | 1.8         | 4.9           | 1.9          | 3.2         | 7.2           | 2.8          | 4.2         | 8.2           | 3.5          | 1.6              | 1.5           | 230                   | 380                   |
|             |               |                           |                                     | 1.4                     | 0.7           | 1.8          | 2.0         | 3.8           | 2.1          | 3.6         | 5.7           | 3.2          | 4.6         | 6.9           | 3.9          | 2.4              | 2.0           | 230                   | 385                   |
|             |               |                           |                                     | –                       | –             | –            | 2.2         | 2.8           | 2.3          | 4.0         | 4.0           | 3.6          | 5.0         | 5.4           | 4.2          | 3.2              | 3.0           | 245                   | 390                   |
|             |               |                           |                                     | –                       | –             | –            | 2.4         | 1.7           | 2.5          | 4.4         | 2.2           | 4.1          | 5.4         | 3.8           | 4.7          | 4.2              | 4.0           | 250                   | 410                   |
|             |               |                           |                                     | –                       | –             | –            | 2.6         | 0.8           | 2.8          | 4.8         | 0.8           | 4.5          | 5.8         | 2.3           | 5.2          | –                | –             | –                     | –                     |
|             |               |                           |                                     | –                       | –             | –            | –           | –             | –            | 5.0         | 0.4           | 4.6          | 6.0         | 1.4           | 5.6          | –                | –             | –                     | –                     |
|             |               |                           |                                     | 0.8                     | 17.5          | 2.8          | 1.6         | 25.9          | 4.0          | 3.0         | 40.4          | 5.8          | 3.8         | 54.9          | 6.4          | 0.8              | 0.7           | 250                   | 450                   |
|             | 166.222.xx.A2 | ●                         | 1.0                                 | 1.0                     | 6.0           | 4.3          | 1.8         | 14.7          | 5.3          | 3.2         | 31.5          | 6.9          | 4.0         | 45.6          | 7.3          | 1.6              | 1.5           | 245                   | 465                   |
|             |               |                           |                                     | –                       | –             | –            | 2.0         | 6.7           | 6.7          | 3.4         | 22.2          | 8.2          | 4.2         | 37.6          | 8.5          | 2.3              | 2.0           | 245                   | 465                   |
|             |               |                           |                                     | –                       | –             | –            | 2.2         | 1.9           | 8.1          | 3.6         | 14.6          | 9.5          | 4.4         | 29.6          | 9.7          | 3.2              | 3.0           | 250                   | 465                   |
|             |               |                           |                                     | –                       | –             | –            | –           | –             | –            | 3.8         | 8.5           | 11.0         | 4.6         | 21.6          | 11.2         | 4.2              | 4.0           | 245                   | 465                   |
|             |               |                           |                                     | –                       | –             | –            | –           | –             | –            | 4.0         | 4.5           | 12.3         | 4.8         | 15.3          | 12.4         | –                | –             | –                     | –                     |
|             |               |                           |                                     | –                       | –             | –            | –           | –             | –            | –           | –             | –            | 5.0         | 9.7           | 13.8         | –                | –             | –                     | –                     |
|             |               |                           |                                     | –                       | –             | –            | –           | –             | –            | –           | –             | –            | 5.2         | 6.0           | 15.2         | –                | –             | –                     | –                     |
|             |               |                           |                                     | –                       | –             | –            | –           | –             | –            | –           | –             | –            | 5.4         | 2.9           | 16.5         | –                | –             | –                     | –                     |
|             | 166.231.xx.A2 | ●                         | 1.4                                 | 1.6                     | 25.6          | 5.1          | 2.6         | 44.2          | 7.0          | 3.6         | 93.7          | 7.9          | 4.2         | 132.9         | 7.3          | 2.0              | 0.7           | 235                   | 380                   |
|             |               |                           |                                     | 2.0                     | 17.8          | 6.2          | 3.0         | 33.0          | 8.2          | 4.0         | 78.3          | 9.3          | 4.6         | 117.2         | 9.0          | 2.6              | 1.5           | 245                   | 415                   |
|             |               |                           |                                     | 2.4                     | 11.3          | 7.2          | 3.4         | 24.7          | 9.2          | 4.4         | 65.8          | 10.6         | 5.0         | 101.1         | 10.4         | 2.4              | 2.0           | 255                   | 420                   |
|             |               |                           |                                     | 2.8                     | 6.9           | 8.1          | 3.8         | 18.1          | 10.2         | 4.8         | 54.9          | 11.9         | 5.4         | 87.9          | 11.8         | 3.6              | 3.0           | 255                   | 425                   |
|             |               |                           |                                     | –                       | –             | –            | 4.2         | 13.2          | 11.2         | 5.2         | 45.6          | 13.0         | 5.8         | 76.6          | 13.2         | 4.2              | 4.0           | 265                   | 430                   |
|             |               |                           |                                     | –                       | –             | –            | 4.6         | 9.3           | 12.0         | 5.6         | 38.0          | 14.1         | 6.0         | 71.2          | 13.8         | –                | –             | –                     | –                     |
|             |               |                           |                                     | –                       | –             | –            | –           | –             | –            | 6.0         | 36.1          | 14.4         | –           | –             | –            | –                | –             | –                     | –                     |
|             |               |                           |                                     | –                       | –             | –            | –           | –             | –            | –           | –             | –            | –           | –             | –            | –                | –             | –                     | –                     |

Ordering Type + Material no. = Ordering no.  
 example: 166.215.xx.A2 + 16 = 166.215.16.A2



# Pneumatic atomizing nozzles, flat fan, pressure principle, internal mixing

## Series 166.4



### Features:

- Version with magnetic valve
- Fine flat fan atomization
- Liquid pressure principle
- Internal mixing

### Applications:

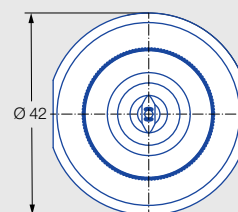
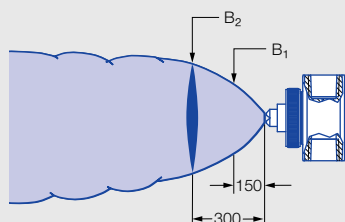
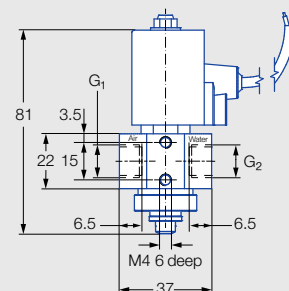
- Belt humidification
- Cooling
- Humidification of goods

### Technical data:

- Operating pressure: 0–6 bar
- Voltage: 24 V DC
- Power: 8 W
- Switching frequency: Approx. 500/min
- Protective system: IP 67
- Ambient temperature: +10 °C / +50 °C
- Cable length: 1,000 mm
- Material of gasket: EPDM



Series 166.4



| Air connection G <sub>1</sub> | Water connection G <sub>2</sub> | Weight [g] |
|-------------------------------|---------------------------------|------------|
| 1/4 BSPP                      | 1/4 BSPP                        | 410        |

| Spray angle | Ordering no.  |                           | Narrowest free cross section Ø [mm] | Liquid pressure p [bar] |                |                            |             |                |                            |             |                |                            |             |                |                            | Spray dimensions |               |                     |                     |
|-------------|---------------|---------------------------|-------------------------------------|-------------------------|----------------|----------------------------|-------------|----------------|----------------------------|-------------|----------------|----------------------------|-------------|----------------|----------------------------|------------------|---------------|---------------------|---------------------|
|             | Type          | Mat. no.                  |                                     | 0.7                     |                |                            | 1.5         |                |                            | 3.0         |                |                            | 4.0         |                |                            | p air [bar]      | p water [bar] | B <sub>1</sub> [mm] | B <sub>2</sub> [mm] |
|             |               | 16<br>Stainless steel 303 |                                     | p air [bar]             | v̇ water [l/h] | v̇ <sub>n</sub> air [m³/h] | p air [bar] | v̇ water [l/h] | v̇ <sub>n</sub> air [m³/h] | p air [bar] | v̇ water [l/h] | v̇ <sub>n</sub> air [m³/h] | p air [bar] | v̇ water [l/h] | v̇ <sub>n</sub> air [m³/h] |                  |               |                     |                     |
| 45°         | 166.414.xx.A2 | ●                         | 0.7                                 | 1.0                     | 7.7            | 1.3                        | 1.4         | 14.3           | 1.5                        | 2.2         | 22.4           | 2.0                        | 3.0         | 25.1           | 2.5                        | 1.4              | 0.7           | 85                  | 125                 |
|             |               |                           |                                     | 1.2                     | 6.0            | 1.5                        | 1.6         | 13.0           | 1.6                        | 2.6         | 20.0           | 2.3                        | 3.4         | 23.0           | 2.8                        | 2.4              | 1.5           | 100                 | 145                 |
|             |               |                           |                                     | 1.4                     | 4.2            | 1.7                        | 1.8         | 11.6           | 1.8                        | 3.0         | 17.7           | 2.6                        | 3.8         | 20.9           | 3.1                        | 3.2              | 2.0           | 105                 | 155                 |
|             |               |                           |                                     | 1.6                     | 2.7            | 1.9                        | 2.0         | 10.2           | 2.0                        | 3.4         | 15.5           | 3.0                        | 4.2         | 18.9           | 3.5                        | 3.8              | 3.0           | 120                 | 170                 |
|             |               |                           |                                     | 1.8                     | 1.3            | 2.1                        | 2.2         | 8.9            | 2.2                        | 3.8         | 13.3           | 3.4                        | 4.6         | 16.9           | 3.8                        | 4.6              | 4.0           | 130                 | 210                 |
|             |               |                           |                                     | –                       | –              | –                          | 2.4         | 7.4            | 2.4                        | 4.2         | 11.0           | 3.7                        | 5.0         | 14.9           | 4.2                        | –                | –             | –                   | –                   |
|             |               |                           |                                     | –                       | –              | –                          | 2.6         | 5.9            | 2.6                        | 4.6         | 8.8            | 4.1                        | 5.4         | 12.8           | 4.6                        | –                | –             | –                   | –                   |
|             |               |                           |                                     | –                       | –              | –                          | 2.8         | 4.6            | 2.8                        | 5.0         | 6.6            | 4.5                        | 5.8         | 10.8           | 5.0                        | –                | –             | –                   | –                   |
|             |               |                           |                                     | –                       | –              | –                          | 3.0         | 3.2            | 3.0                        | 5.4         | 4.3            | 4.9                        | 6.0         | 9.8            | 5.2                        | –                | –             | –                   | –                   |
|             |               |                           |                                     | –                       | –              | –                          | 3.2         | 2.1            | 3.2                        | 5.8         | 2.5            | 5.3                        | –           | –              | –                          | –                | –             | –                   | –                   |
|             |               |                           |                                     | –                       | –              | –                          | 3.4         | 1.1            | 3.4                        | 6.0         | 1.6            | 5.5                        | –           | –              | –                          | –                | –             | –                   | –                   |
|             | 166.462.xx.A2 | ●                         | 1.5                                 | 1.2                     | 19.0           | 2.6                        | 2.0         | 22.0           | 2.0                        | 3.0         | 61.8           | 4.0                        | 3.8         | 76.1           | 4.6                        | 1.2              | 0.7           | 120                 | 140                 |
|             |               |                           |                                     | 1.6                     | 12.2           | 3.4                        | 2.4         | 18.0           | 2.4                        | 3.4         | 51.9           | 4.8                        | 4.0         | 70.4           | 5.1                        | 2.4              | 1.5           | 120                 | 170                 |
|             |               |                           |                                     | 2.0                     | 9.4            | 4.1                        | 2.8         | 14.4           | 2.8                        | 3.8         | 44.6           | 5.8                        | 4.2         | 65.6           | 5.5                        | 3.2              | 2.0           | 120                 | 175                 |
|             |               |                           |                                     | 2.4                     | 7.1            | 4.8                        | 3.2         | 11.3           | 3.2                        | 4.2         | 39.0           | 6.6                        | 4.4         | 61.3           | 5.9                        | 3.8              | 3.0           | 140                 | 205                 |
|             |               |                           |                                     | 2.8                     | 5.7            | 5.4                        | 3.6         | 8.8            | 3.6                        | 4.6         | 33.4           | 7.4                        | 4.6         | 57.3           | 6.4                        | 6.0              | 4.0           | 145                 | 205                 |
|             |               |                           |                                     | 3.2                     | 5.0            | 6.0                        | 4.0         | 8.1            | 3.9                        | 5.0         | 29.4           | 8.1                        | 4.8         | 54.1           | 6.7                        | –                | –             | –                   | –                   |
|             |               |                           |                                     | 3.6                     | 3.6            | 6.6                        | 4.4         | 6.2            | 4.3                        | 5.4         | 25.5           | 8.9                        | 5.0         | 51.3           | 7.2                        | –                | –             | –                   | –                   |
|             |               |                           |                                     | 4.0                     | 3.2            | 7.2                        | 4.8         | 4.6            | 4.6                        | 5.8         | 22.0           | 9.6                        | 5.2         | 49.3           | 7.7                        | –                | –             | –                   | –                   |
|             |               |                           |                                     | 4.4                     | 2.2            | 7.8                        | 5.2         | 3.2            | 4.9                        | 6.0         | 20.6           | 9.9                        | 5.4         | 46.5           | 8.2                        | –                | –             | –                   | –                   |
|             |               |                           |                                     | –                       | –              | –                          | 5.6         | 1.6            | 5.3                        | –           | –              | –                          | 5.6         | 43.7           | 8.6                        | –                | –             | –                   | –                   |
|             |               |                           |                                     | –                       | –              | –                          | 5.8         | 0.8            | 5.4                        | –           | –              | –                          | 5.8         | 41.3           | 8.9                        | –                | –             | –                   | –                   |
|             |               |                           |                                     | –                       | –              | –                          | –           | –              | –                          | –           | –              | –                          | 6.0         | 39.0           | 9.3                        | –                | –             | –                   | –                   |





| Spray angle | Ordering no.  |                     | Narrowest free cross section Ø [mm] | Liquid pressure p [bar] |                |                |             |                |                |             |                |                |             |                |                | Spray dimensions |               |         |         |
|-------------|---------------|---------------------|-------------------------------------|-------------------------|----------------|----------------|-------------|----------------|----------------|-------------|----------------|----------------|-------------|----------------|----------------|------------------|---------------|---------|---------|
|             | Type          | Mat. no.            |                                     |                         |                |                |             |                |                |             |                |                |             |                |                |                  |               |         |         |
|             |               | 16                  |                                     |                         |                |                |             |                |                |             |                |                |             |                |                |                  |               |         |         |
|             |               | Stainless steel 303 |                                     | p air [bar]             | V̇ water [l/h] | V̇a air [m³/h] | p air [bar] | V̇ water [l/h] | V̇a air [m³/h] | p air [bar] | V̇ water [l/h] | V̇a air [m³/h] | p air [bar] | V̇ water [l/h] | V̇a air [m³/h] | p air [bar]      | p water [bar] | B₁ [mm] | B₂ [mm] |
| 60°         | 166.425.xx.A2 | ●                   | 0.5                                 | 0.8                     | 6.5            | 1.2            | 1.4         | 9.4            | 1.7            | 2.4         | 13.2           | 2.5            | 2.4         | 16.1           | 2.5            | 1.2              | 0.7           | 155     | 195     |
|             |               |                     |                                     | 1.2                     | 5.5            | 1.6            | 1.8         | 8.7            | 2.1            | 2.6         | 12.9           | 2.7            | 2.8         | 15.5           | 2.9            | 2.2              | 1.5           | 165     | 255     |
|             |               |                     |                                     | 1.6                     | 4.7            | 1.9            | 2.2         | 7.9            | 2.4            | 3.0         | 12.3           | 3.0            | 3.2         | 15.0           | 3.2            | 3.0              | 2.0           | 170     | 265     |
|             |               |                     |                                     | 2.0                     | 4.0            | 2.3            | 2.6         | 7.2            | 2.7            | 3.4         | 11.8           | 3.4            | 3.6         | 14.5           | 3.5            | 3.4              | 3.0           | 200     | 330     |
|             |               |                     |                                     | 2.4                     | 3.2            | 2.6            | 3.0         | 6.4            | 3.1            | 3.8         | 11.1           | 3.7            | 4.0         | 13.9           | 3.8            | 5.6              | 4.0           | 200     | 330     |
|             |               |                     |                                     | 2.8                     | 2.6            | 2.9            | 3.4         | 5.7            | 3.4            | 4.2         | 10.4           | 4.0            | 4.4         | 13.4           | 4.1            | –                | –             | –       | –       |
|             |               |                     |                                     | 3.0                     | 2.2            | 3.1            | 3.8         | 5.1            | 3.7            | 4.6         | 9.8            | 4.3            | 4.8         | 12.8           | 4.5            | –                | –             | –       | –       |
|             |               |                     |                                     | –                       | –              | –              | 4.0         | 4.8            | 3.9            | 5.0         | 9.2            | 4.6            | 5.2         | 12.2           | 4.8            | –                | –             | –       | –       |
|             |               |                     |                                     | –                       | –              | –              | 4.4         | 4.2            | 4.2            | 5.4         | 8.6            | 5.0            | 5.6         | 11.7           | 5.1            | –                | –             | –       | –       |
|             |               |                     |                                     | –                       | –              | –              | 4.8         | 3.6            | 4.5            | 5.8         | 8.1            | 5.3            | 6.0         | 11.2           | 5.4            | –                | –             | –       | –       |
|             |               |                     |                                     | –                       | –              | –              | 5.2         | 2.8            | 4.8            | 6.0         | 7.8            | 5.4            | –           | –              | –              | –                | –             | –       | –       |
|             |               |                     |                                     | –                       | –              | –              | 5.6         | 2.2            | 5.1            | –           | –              | –              | –           | –              | –              | –                | –             | –       | –       |
|             |               |                     |                                     | –                       | –              | –              | 6.0         | 1.6            | 5.5            | –           | –              | –              | –           | –              | –              | –                | –             | –       | –       |
|             | 166.452.xx.A2 | ●                   | 1.5                                 | 1.0                     | 18.8           | 3.9            | 1.8         | 31.0           | 5.3            | 3.2         | 50.1           | 7.7            | 3.8         | 70.7           | 8.2            | 1.0              | 0.7           | 130     | 185     |
|             |               |                     |                                     | 1.4                     | 8.6            | 5.7            | 2.0         | 25.4           | 6.3            | 3.6         | 39.5           | 9.4            | 4.2         | 58.6           | 9.6            | 1.8              | 1.5           | 150     | 240     |
|             |               |                     |                                     | 1.8                     | 7.4            | 7.0            | 2.2         | 20.1           | 7.2            | 4.0         | 31.3           | 11.2           | 4.6         | 48.6           | 11.2           | 2.6              | 2.0           | 155     | 245     |
|             |               |                     |                                     | 2.2                     | 4.1            | 8.4            | 2.4         | 15.5           | 8.0            | 4.4         | 24.0           | 12.9           | 5.0         | 41.2           | 13.1           | 3.6              | 3.0           | 175     | 280     |
|             |               |                     |                                     | 2.6                     | 1.0            | 9.8            | 2.6         | 12.4           | 8.9            | 4.8         | 17.7           | 14.5           | 5.4         | 33.6           | 14.8           | 5.0              | 4.0           | 180     | 285     |
|             |               |                     |                                     | 2.8                     | 0.1            | 10.3           | 2.8         | 10.4           | 9.6            | 5.2         | 13.4           | 16.0           | 5.8         | 27.5           | 16.4           | –                | –             | –       | –       |
|             |               |                     |                                     | –                       | –              | –              | –           | –              | –              | 5.6         | 10.6           | 17.5           | 6.0         | 24.4           | 17.2           | –                | –             | –       | –       |
|             |               |                     |                                     | –                       | –              | –              | –           | –              | –              | 6.0         | 8.6            | 18.8           | –           | –              | –              | –                | –             | –       | –       |
| 80°         | 166.433.xx.A2 | ●                   | 0.4                                 | 1.0                     | 11.6           | 2.0            | 1.8         | 18.3           | 2.8            | 3.0         | 31.0           | 3.7            | 3.8         | 37.5           | 4.4            | 1.4              | 0.7           | 150     | 210     |
|             |               |                     |                                     | 1.2                     | 8.1            | 2.4            | 2.0         | 15.3           | 3.2            | 3.4         | 25.4           | 4.4            | 4.2         | 32.4           | 5.0            | 2.2              | 1.5           | 185     | 255     |
|             |               |                     |                                     | 1.4                     | 5.3            | 2.8            | 2.2         | 12.2           | 3.6            | 3.8         | 20.6           | 5.1            | 4.6         | 27.7           | 5.7            | 3.0              | 2.0           | 205     | 300     |
|             |               |                     |                                     | 1.6                     | 3.7            | 3.2            | 2.4         | 9.8            | 4.0            | 4.2         | 16.3           | 5.9            | 5.0         | 23.4           | 6.5            | 3.8              | 4.0           | 300     | 485     |
|             |               |                     |                                     | –                       | –              | –              | 2.6         | 7.6            | 4.3            | 4.6         | 12.5           | 6.6            | 5.4         | 19.4           | 7.2            | 5.2              | 4.0           | 260     | 395     |
|             |               |                     |                                     | –                       | –              | –              | 2.8         | 5.9            | 4.7            | 5.0         | 9.3            | 7.3            | 5.8         | 15.9           | 7.9            | –                | –             | –       | –       |
|             |               |                     |                                     | –                       | –              | –              | 3.0         | 4.4            | 5.0            | 5.4         | 6.5            | 8.0            | 6.0         | 14.2           | 8.3            | –                | –             | –       | –       |
|             |               |                     |                                     | –                       | –              | –              | –           | –              | –              | –           | –              | –              | –           | –              | –              | –                | –             | –       | –       |

Ordering Type + Material no. = Ordering no.  
 example: 166.425.xx.A2 + 16 = 166.425.16.A2

# Pneumatic atomizing nozzles, flat fan, pressure principle, external mixing Series 166.6

## Features:

- Version with magnetic valve
- Fine flat fan atomization
- Liquid pressure principle
- External mixing

## Applications:

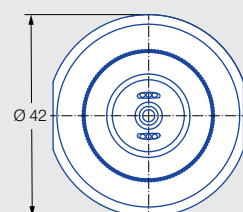
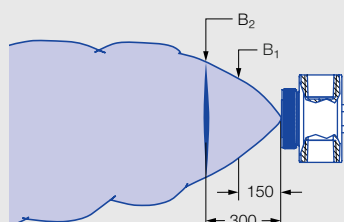
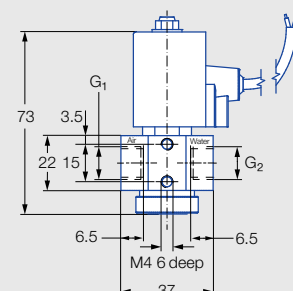
- Belt humidification
- Cooling
- Humidification of goods
- Atomization of viscous liquids

## Technical data:

- Operating pressure: 0–6 bar
- Voltage: 24 V DC
- Power: 8 W
- Switching frequency: Approx. 500/min
- Protective system: IP 67
- Ambient temperature: +10 °C /+50 °C
- Cable length: 1,000 mm
- Material of gasket: EPDM



Series 166.6



| Air connection G <sub>1</sub> | Water connection G <sub>2</sub> | Weight [g] |
|-------------------------------|---------------------------------|------------|
| 1/4 BSPP                      | 1/4 BSPP                        | 410        |

| Spray angle | Ordering no.  |                           | Narrowest free cross section Ø [mm] | Liquid pressure p [bar] |               |              |      |             |               |              |       |             |               |              |       | Spray dimensions |               |              |     |
|-------------|---------------|---------------------------|-------------------------------------|-------------------------|---------------|--------------|------|-------------|---------------|--------------|-------|-------------|---------------|--------------|-------|------------------|---------------|--------------|-----|
|             | Type          | Mat. no.                  |                                     | 0.07                    |               |              |      | 0.15        |               |              |       | 0.30        |               |              |       | 0.35             |               |              |     |
|             |               | 16<br>Stainless steel 303 |                                     | p air [bar]             | ṽ water [l/h] | ṽ air [m³/h] |      | p air [bar] | ṽ water [l/h] | ṽ air [m³/h] |       | p air [bar] | ṽ water [l/h] | ṽ air [m³/h] |       | p air [bar]      | ṽ water [l/h] | ṽ air [m³/h] |     |
| 45°         | 166.616.xx.A2 | ●                         | 0.40                                | 0.80                    | 1.68          | 2.50         | 0.80 | 2.43        | 2.40          | 0.80         | 3.42  | 2.50        | 1.00          | 3.69         | 2.80  | 1.40             | 0.07          | 80           | 115 |
|             | 166.654.xx.A2 | ●                         | 0.70                                | 1.20                    | 1.80          | 3.10         | 1.00 | 2.46        | 2.90          | 1.20         | 3.48  | 3.10        | 1.40          | 3.81         | 3.40  | 2.20             | 0.15          | 90           | 130 |
|             |               |                           |                                     | 1.60                    | 1.92          | 3.70         | 1.40 | 2.58        | 3.60          | 1.60         | 3.51  | 3.70        | 1.80          | 3.87         | 4.00  | 3.20             | 0.20          | 90           | 135 |
|             |               |                           |                                     | 2.00                    | 2.10          | 4.30         | 1.80 | 2.61        | 4.20          | 2.00         | 3.63  | 4.30        | 2.20          | 3.84         | 4.60  | 4.00             | 0.30          | 95           | 145 |
|             |               |                           |                                     | 2.40                    | 2.07          | 4.90         | 2.20 | 2.76        | 4.80          | 2.40         | 3.63  | 4.90        | 2.60          | 3.90         | 5.20  | 5.00             | 0.35          | 100          | 145 |
|             |               |                           |                                     | 2.80                    | 2.19          | 5.50         | 2.60 | 2.73        | 5.40          | 2.80         | 3.63  | 5.50        | 3.00          | 3.93         | 5.80  | –                | –             | –            | –   |
|             |               |                           |                                     | 3.20                    | 2.19          | 6.10         | 3.00 | 2.73        | 6.00          | 3.20         | 3.63  | 6.10        | 3.40          | 3.90         | 6.40  | –                | –             | –            | –   |
|             |               |                           |                                     | 3.60                    | 2.22          | 6.70         | 3.60 | 2.76        | 6.70          | 3.60         | 3.66  | 6.70        | 3.80          | 3.93         | 7.00  | –                | –             | –            | –   |
|             |               |                           |                                     | 4.00                    | 2.22          | 7.30         | 4.00 | 2.76        | 7.30          | 4.00         | 3.69  | 7.30        | 4.20          | 3.96         | 7.60  | –                | –             | –            | –   |
|             |               |                           |                                     | 4.40                    | 2.22          | 7.90         | 4.40 | 2.76        | 7.90          | 4.40         | 3.69  | 7.90        | 4.60          | 3.93         | 8.20  | –                | –             | –            | –   |
|             |               |                           |                                     | 4.80                    | 2.22          | 8.50         | 4.80 | 2.76        | 8.50          | 4.80         | 3.69  | 8.40        | 5.00          | 3.93         | 8.80  | –                | –             | –            | –   |
|             |               |                           |                                     | 5.20                    | 2.22          | 9.10         | 5.20 | 2.76        | 9.10          | 5.20         | 3.66  | 9.10        | 5.40          | 3.93         | 9.40  | –                | –             | –            | –   |
|             |               |                           |                                     | 5.60                    | 2.22          | 9.60         | 5.60 | 2.76        | 9.70          | 5.60         | 3.66  | 9.60        | 5.80          | 3.87         | 10.00 | –                | –             | –            | –   |
|             |               |                           |                                     | 6.00                    | 2.22          | 10.20        | 6.00 | 2.73        | 10.20         | 6.00         | 3.66  | 10.20       | 6.00          | 3.87         | 10.20 | –                | –             | –            | –   |
|             |               |                           |                                     | 0.80                    | 5.25          | 2.40         | 0.80 | 7.29        | 2.40          | 1.20         | 10.11 | 3.10        | 1.60          | 11.07        | 3.70  | 1.40             | 0.07          | 95           | 135 |
|             |               |                           |                                     | 1.20                    | 5.64          | 3.10         | 1.20 | 7.44        | 3.10          | 1.60         | 10.23 | 3.70        | 2.00          | 11.22        | 4.30  | 2.20             | 0.15          | 100          | 150 |
|             |               |                           |                                     | 1.60                    | 5.79          | 3.70         | 1.60 | 7.62        | 3.70          | 2.00         | 10.38 | 4.30        | 2.40          | 11.28        | 4.90  | 3.20             | 0.20          | 105          | 160 |
|             |               |                           |                                     | 2.00                    | 6.18          | 4.30         | 2.00 | 7.86        | 4.30          | 2.40         | 10.47 | 4.90        | 2.80          | 11.31        | 5.50  | 4.00             | 0.30          | 105          | 160 |
|             |               |                           |                                     | 2.40                    | 6.24          | 4.90         | 2.40 | 7.92        | 4.90          | 2.80         | 10.59 | 5.50        | 3.20          | 11.43        | 6.10  | 5.00             | 0.35          | 105          | 160 |
|             |               |                           |                                     | 2.80                    | 6.27          | 5.50         | 2.80 | 8.04        | 5.50          | 3.20         | 10.59 | 6.10        | 3.60          | 11.46        | 6.60  | –                | –             | –            | –   |
|             |               |                           |                                     | 3.20                    | 6.39          | 6.10         | 3.20 | 8.13        | 6.10          | 3.60         | 10.62 | 6.70        | 4.00          | 11.43        | 7.20  | –                | –             | –            | –   |
|             |               |                           |                                     | 3.60                    | 6.42          | 6.60         | 3.60 | 8.13        | 6.70          | 4.00         | 10.62 | 7.20        | 4.40          | 11.37        | 7.80  | –                | –             | –            | –   |
|             |               |                           |                                     | 4.00                    | 6.45          | 7.20         | 4.00 | 8.13        | 7.20          | 4.40         | 10.62 | 7.80        | 4.80          | 11.37        | 8.40  | –                | –             | –            | –   |
|             |               |                           |                                     | 4.40                    | 6.42          | 7.80         | 4.40 | 8.07        | 7.80          | 4.80         | 10.59 | 8.40        | 5.20          | 11.34        | 9.00  | –                | –             | –            | –   |
|             |               |                           |                                     | 4.80                    | 6.30          | 8.40         | 4.80 | 8.04        | 8.40          | 5.20         | 10.56 | 9.00        | 5.60          | 11.22        | 9.60  | –                | –             | –            | –   |
|             |               |                           |                                     | 5.20                    | 6.24          | 9.00         | 5.20 | 7.86        | 9.00          | 5.60         | 10.50 | 9.60        | 6.00          | 11.16        | 10.10 | –                | –             | –            | –   |
|             |               |                           |                                     | 5.60                    | 6.09          | 9.60         | 5.60 | 7.83        | 9.60          | 6.00         | 10.35 | 10.20       | –             | –            | –     | –                | –             | –            | –   |
|             |               |                           |                                     | 6.00                    | 5.85          | 10.20        | 6.00 | 7.59        | 10.20         | –            | –     | –           | –             | –            | –     | –                | –             | –            | –   |



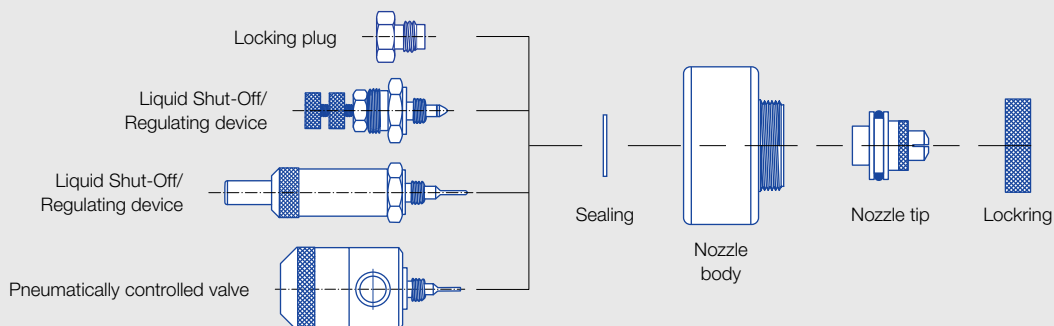
| Spray angle | Ordering no.  |                           | Narrowest free cross section Ø [mm] | Liquid pressure p [bar] |               |                           |             |               |                           |             |               |                           |             |               |                           | Spray dimensions |               |                     |                     |
|-------------|---------------|---------------------------|-------------------------------------|-------------------------|---------------|---------------------------|-------------|---------------|---------------------------|-------------|---------------|---------------------------|-------------|---------------|---------------------------|------------------|---------------|---------------------|---------------------|
|             | Type          | Mat. no.                  |                                     | 0.07                    |               |                           | 0.15        |               |                           | 0.30        |               |                           | 0.35        |               |                           | p air [bar]      | p water [bar] | B <sub>1</sub> [mm] | B <sub>2</sub> [mm] |
|             |               | 16<br>Stainless steel 303 |                                     | p air [bar]             | V water [l/h] | V <sub>n</sub> air [m³/h] | p air [bar] | V water [l/h] | V <sub>n</sub> air [m³/h] | p air [bar] | V water [l/h] | V <sub>n</sub> air [m³/h] | p air [bar] | V water [l/h] | V <sub>n</sub> air [m³/h] |                  |               |                     |                     |
| 60°         | 166.626.xx.A2 | ●                         | 0.40                                | 0.80                    | 1.83          | 2.80                      | 0.80        | 2.49          | 2.80                      | 0.80        | 3.48          | 2.80                      | 0.80        | 3.78          | 2.80                      | 1.60             | 0.07          | 85                  | 135                 |
|             |               |                           |                                     | 1.20                    | 1.98          | 3.60                      | 1.20        | 2.58          | 3.50                      | 1.20        | 3.60          | 3.50                      | 1.20        | 3.87          | 3.60                      | 2.40             | 0.15          | 90                  | 140                 |
|             |               |                           |                                     | 1.60                    | 2.10          | 4.30                      | 1.60        | 2.70          | 4.20                      | 1.60        | 3.66          | 4.30                      | 1.60        | 3.90          | 4.20                      | 3.20             | 0.20          | 90                  | 140                 |
|             |               |                           |                                     | 2.00                    | 2.16          | 4.90                      | 2.00        | 2.82          | 4.90                      | 2.00        | 3.69          | 4.90                      | 2.00        | 3.96          | 4.90                      | 4.00             | 0.30          | 100                 | 145                 |
|             |               |                           |                                     | 2.40                    | 2.25          | 5.60                      | 2.40        | 2.85          | 5.60                      | 2.40        | 3.69          | 5.60                      | 2.40        | 3.96          | 5.60                      | 5.20             | 0.35          | 105                 | 150                 |
|             |               |                           |                                     | 2.80                    | 2.34          | 6.30                      | 2.80        | 2.88          | 6.30                      | 2.80        | 3.72          | 6.30                      | 2.80        | 4.02          | 6.30                      | –                | –             | –                   | –                   |
|             |               |                           |                                     | 3.20                    | 2.31          | 7.00                      | 3.20        | 2.88          | 7.00                      | 3.20        | 3.78          | 7.00                      | 3.20        | 3.99          | 7.00                      | –                | –             | –                   | –                   |
|             |               |                           |                                     | 3.60                    | 2.34          | 7.60                      | 3.60        | 2.88          | 7.70                      | 3.60        | 3.78          | 7.60                      | 3.60        | 4.02          | 7.70                      | –                | –             | –                   | –                   |
|             |               |                           |                                     | 4.00                    | 2.40          | 8.40                      | 4.00        | 2.94          | 8.40                      | 4.00        | 3.81          | 8.30                      | 4.00        | 4.05          | 8.30                      | –                | –             | –                   | –                   |
|             |               |                           |                                     | 4.40                    | 2.40          | 9.00                      | 4.40        | 2.91          | 9.00                      | 4.40        | 3.81          | 9.00                      | 4.40        | 4.02          | 9.00                      | –                | –             | –                   | –                   |
|             |               |                           |                                     | 4.80                    | 2.40          | 9.70                      | 4.80        | 2.97          | 9.70                      | 4.80        | 3.81          | 9.70                      | 4.80        | 4.08          | 9.70                      | –                | –             | –                   | –                   |
|             |               |                           |                                     | 5.20                    | 2.43          | 10.40                     | 5.20        | 2.97          | 10.40                     | 5.20        | 3.81          | 10.40                     | 5.20        | 4.05          | 10.40                     | –                | –             | –                   | –                   |
|             | 166.682.xx.A2 | ●                         | 1.50                                | 5.60                    | 2.43          | 11.20                     | 5.60        | 2.97          | 11.10                     | 5.60        | 3.81          | 11.10                     | 5.60        | 4.05          | 11.00                     | –                | –             | –                   | –                   |
|             |               |                           |                                     | 6.00                    | 2.43          | 11.80                     | 6.00        | 2.97          | 11.80                     | 6.00        | 3.81          | 11.80                     | 6.00        | 4.05          | 11.80                     | –                | –             | –                   | –                   |
|             |               |                           |                                     | 1.00                    | 22.41         | 7.50                      | 1.40        | 28.95         | 9.30                      | 1.80        | 41.22         | 11.10                     | 2.00        | 44.04         | 11.80                     | 1.60             | 0.07          | 110                 | 155                 |
|             |               |                           |                                     | 1.40                    | 20.19         | 9.30                      | 1.80        | 26.07         | 10.90                     | 2.20        | 34.92         | 12.60                     | 2.40        | 39.09         | 13.40                     | 2.40             | 0.15          | 120                 | 155                 |
|             |               |                           |                                     | 1.80                    | 18.75         | 11.00                     | 2.20        | 23.94         | 12.50                     | 2.60        | 33.18         | 14.20                     | 2.80        | 35.16         | 15.10                     | 3.20             | 0.20          | 120                 | 160                 |
|             |               |                           |                                     | 2.20                    | 17.88         | 12.50                     | 2.60        | 22.23         | 14.30                     | 3.00        | 30.45         | 15.90                     | 3.20        | 32.22         | 16.70                     | 4.00             | 0.30          | 120                 | 165                 |
|             |               |                           |                                     | 2.60                    | 17.10         | 14.20                     | 3.00        | 21.12         | 15.90                     | 3.40        | 28.29         | 17.50                     | 3.60        | 30.18         | 18.30                     | 5.20             | 0.35          | 120                 | 175                 |
|             |               |                           |                                     | 3.00                    | 16.47         | 15.90                     | 3.40        | 20.10         | 17.50                     | 3.80        | 26.64         | 19.10                     | 4.00        | 28.32         | 19.90                     | –                | –             | –                   | –                   |
|             |               |                           |                                     | 3.40                    | 16.08         | 17.50                     | 3.80        | 19.44         | 19.10                     | 4.20        | 25.35         | 20.70                     | 4.40        | 26.94         | 21.50                     | –                | –             | –                   | –                   |
|             |               |                           |                                     | 3.80                    | 15.90         | 19.10                     | 4.20        | 18.99         | 20.70                     | 4.60        | 24.24         | 22.30                     | 4.80        | 25.59         | 23.10                     | –                | –             | –                   | –                   |
|             |               |                           |                                     | 4.20                    | 15.90         | 20.70                     | 4.60        | 18.45         | 22.30                     | 5.00        | 23.13         | 24.00                     | 5.20        | 24.36         | 24.80                     | –                | –             | –                   | –                   |
|             |               |                           |                                     | 4.60                    | 15.81         | 22.30                     | 5.00        | 18.18         | 24.00                     | 5.40        | 22.14         | 25.50                     | 5.60        | 23.28         | 26.40                     | –                | –             | –                   | –                   |
|             | 166.691.xx.A2 | ●                         | 2.50                                | 5.00                    | 15.21         | 23.90                     | 5.40        | 17.25         | 25.40                     | 5.80        | 21.12         | 27.20                     | 6.00        | 22.17         | 28.00                     | –                | –             | –                   | –                   |
|             |               |                           |                                     | 5.40                    | 13.92         | 25.50                     | 5.80        | 15.72         | 27.20                     | 6.00        | 20.67         | 28.00                     | –           | –             | –                         | –                | –             | –                   | –                   |
|             |               |                           |                                     | 5.80                    | 12.09         | 27.20                     | 6.00        | 14.91         | 28.00                     | –           | –             | –                         | –           | –             | –                         | –                | –             | –                   | –                   |
|             |               |                           |                                     | 6.00                    | 11.07         | 28.00                     | –           | –             | –                         | –           | –             | –                         | –           | –             | –                         | –                | –             | –                   | –                   |
|             |               |                           |                                     | 1.40                    | 52.00         | 13.80                     | 2.00        | 67.30         | 17.50                     | 2.60        | 92.30         | 21.20                     | 2.60        | 102.10        | 21.20                     | 1.60             | 0.07          | 150                 | 200                 |
|             |               |                           |                                     | 1.80                    | 50.00         | 16.30                     | 2.40        | 64.60         | 20.10                     | 3.00        | 87.70         | 23.60                     | 3.00        | 97.20         | 23.70                     | 2.40             | 0.15          | 160                 | 205                 |
|             |               |                           |                                     | 2.20                    | 48.60         | 18.80                     | 2.80        | 62.00         | 22.50                     | 3.40        | 84.30         | 26.00                     | 3.40        | 92.50         | 26.10                     | 3.20             | 0.20          | 160                 | 205                 |
|             |               |                           |                                     | 2.60                    | 47.50         | 21.30                     | 3.20        | 60.40         | 24.90                     | 3.80        | 80.70         | 28.50                     | 3.80        | 88.40         | 28.50                     | 4.00             | 0.30          | 160                 | 210                 |
|             |               |                           |                                     | 3.00                    | 46.50         | 23.70                     | 3.60        | 58.00         | 27.30                     | 4.20        | 77.00         | 30.90                     | 4.20        | 85.20         | 31.00                     | 5.20             | 0.35          | 150                 | 210                 |
|             |               |                           |                                     | 3.40                    | 45.40         | 26.10                     | 4.00        | 56.20         | 29.80                     | 4.60        | 74.40         | 33.40                     | 4.60        | 81.30         | 33.40                     | –                | –             | –                   | –                   |
|             |               |                           |                                     | 3.80                    | 44.40         | 28.60                     | 4.40        | 54.20         | 32.10                     | 5.00        | 71.10         | 35.90                     | 5.00        | 78.20         | 35.80                     | –                | –             | –                   | –                   |
|             |               |                           |                                     | 4.20                    | 42.90         | 31.00                     | 4.80        | 52.40         | 34.70                     | 5.40        | 68.10         | 38.30                     | 5.40        | 74.30         | 38.20                     | –                | –             | –                   | –                   |
|             |               |                           |                                     | 4.60                    | 41.50         | 33.40                     | 5.20        | 49.90         | 37.10                     | 5.80        | 64.30         | 40.80                     | 5.80        | 71.10         | 40.70                     | –                | –             | –                   | –                   |
|             |               |                           |                                     | 5.00                    | 39.90         | 35.80                     | 5.60        | 48.10         | 39.50                     | 6.00        | 63.20         | 42.00                     | 6.00        | 68.90         | 41.90                     | –                | –             | –                   | –                   |
|             |               |                           |                                     | 5.40                    | 38.90         | 38.30                     | 6.00        | 46.40         | 42.00                     | –           | –             | –                         | –           | –             | –                         | –                | –             | –                   | –                   |
|             |               |                           |                                     | 5.60                    | 38.50         | 39.40                     | –           | –             | –                         | –           | –             | –                         | –           | –             | –                         | –                | –             | –                   | –                   |

Ordering Type + Material no. = Ordering no.  
example: 166.626.xx.A2 + 16 = 166.626.16.A2

# Accessories for pneumatic atomizing nozzles

## Series 136.1 to 136.6

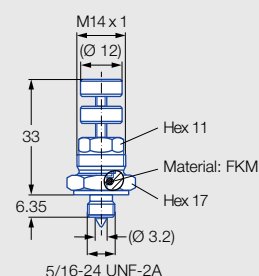
### Overview of accessories



### Regulating device and shut-off needle

Enables manual regulation of the flow rate and closing of the nozzle.

Material: Stainless steel 303  
Weight: 33 g



### Ordering no.

Type

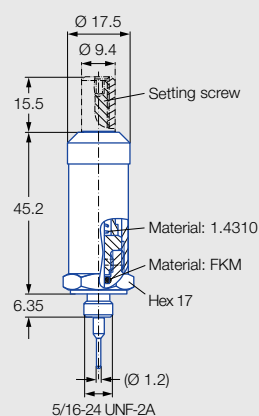
**015.600.16**

Suitable for  
all nozzles of  
series 136

### Regulating device with quick-cleaning needle

Enables manual regulation of the flow rate and cleaning of the nozzle orifice.

Material: Stainless steel 303  
Weight: 75 g



### Ordering no.

Type

**013.601.16.30**

**013.602.16.30**

**013.603.16.30**

**013.604.16.30**

**013.605.16.30**

**013.606.16.30**

For nozzles

136.xx1

136.xx2

136.xx3

136.xx4

136.xx5

136.xx6

Needle diameter  
D  
[mm]

2.1

1.2

0.8

0.6

0.4

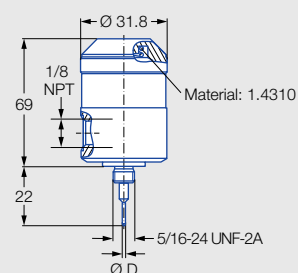
0.3



**Pneumatically controlled valve. Opening pressure 2.1 bar, max. 180 cycles/min.**

External control system via separate compressed air connection for switching the nozzle on and off.

Material: Stainless steel 303  
Weight: 230 g



| Ordering no.         |             |                        |
|----------------------|-------------|------------------------|
| Type                 | For nozzles | Needle diameter D [mm] |
| <b>013.601.16.10</b> | 136.xx1     | 2.1                    |
| <b>013.602.16.10</b> | 136.xx2     | 1.2                    |
| <b>013.603.16.10</b> | 136.xx3     | 0.8                    |
| <b>013.604.16.10</b> | 136.xx4     | 0.6                    |
| <b>013.605.16.10</b> | 136.xx5     | 0.4                    |
| <b>013.606.16.10</b> | 136.xx6     | 0.3                    |

# Pneumatic atomizing nozzles, full cone, siphon principle, internal mixing Series 140

## Features:

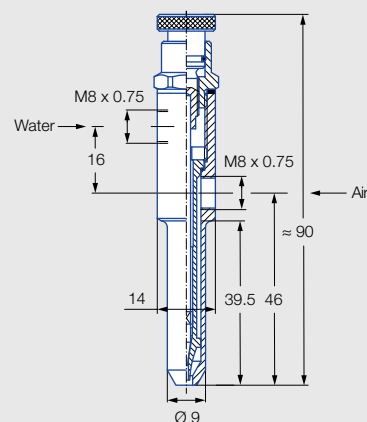
- Particularly fine full cone atomization
- Siphon principle
- Internal mixing
- Integrated regulating device
- Material: Brass

## Applications:

- Lubrication
- Cooling
- Humidification of air



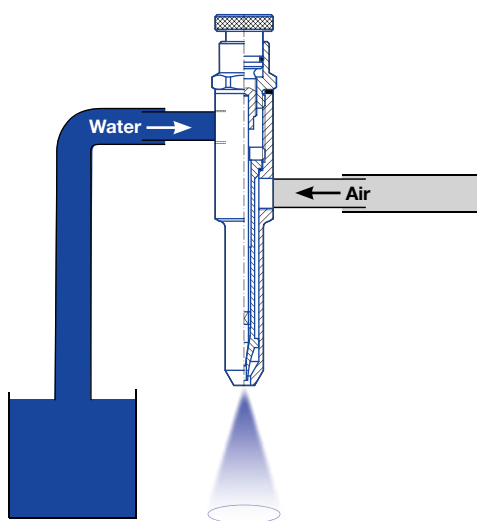
Series 140



| Mat. no. | Weight [g] |
|----------|------------|
| 30       | 70         |

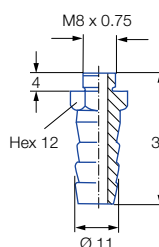
| Spray angle | Ordering no.<br><br>Type | Narrowest free cross section Ø [mm] |      | Hs<br>Aspiration height [mm WS] | Flow rate<br>$\dot{V}_W$ = water $\dot{V}_n$ L = air<br>$p$ [bar] air pressure |                      |                   |                      |                   |                      |                   |                      |
|-------------|--------------------------|-------------------------------------|------|---------------------------------|--------------------------------------------------------------------------------|----------------------|-------------------|----------------------|-------------------|----------------------|-------------------|----------------------|
|             |                          |                                     |      |                                 | 0.5                                                                            |                      | 1.0               |                      | 2.0               |                      | 3.0               |                      |
|             |                          |                                     |      |                                 | $\dot{V}_W$ [l/h]                                                              | $\dot{V}_n$ L [m³/h] | $\dot{V}_W$ [l/h] | $\dot{V}_n$ L [m³/h] | $\dot{V}_W$ [l/h] | $\dot{V}_n$ L [m³/h] | $\dot{V}_W$ [l/h] | $\dot{V}_n$ L [m³/h] |
| 20°–30°     | 140.252.30.01            | 0.50                                | 0.75 | 500                             | –                                                                              | –                    | 4.50              | 4.00                 | 8.00              | 6.00                 | 10.50             | 8.00                 |
|             |                          | 0.50                                | 0.75 | 200                             | 4.50                                                                           | 2.50                 | 7.00              | 4.00                 | 10.00             | 6.00                 | 12.00             | 8.00                 |

## Assembly scheme/Accessories



## Accessories:

- Gasket  
**014.040.72**  
 7.8 x 12 x 1 (EWP 210)
- Nipple  
**014.010.30.04**  
 (Material: Brass)  
 Weight: 17 g



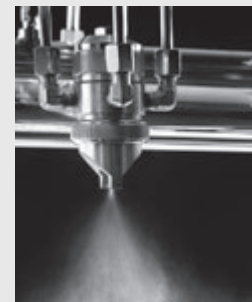
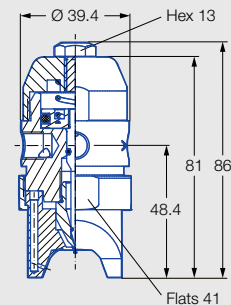
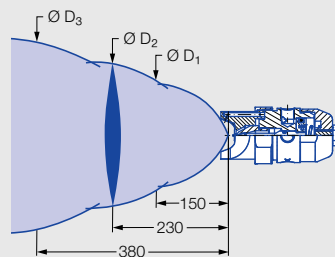
# Pneumatic atomizing nozzles for atomizing viscous media Series 176 ViscoMist

**The ViscoMist series enables the independent regulation of both atomizing air and fan air. Spray angle and droplet size can thus be individually adjusted.**

The integrated, pneumatically controlled shut-off/clean-out needle opens and closes the liquid orifice and also cleans it during each closing procedure. This is of particular advantage when spraying viscous liquids. Thanks to their modular design, the nozzles of the ViscoMist series can be optimally adapted to the respective spraying process. To do this, it is simply enough to replace the nozzle components relevant for the flow rate and spray pattern. The housing stays the same.



Series 176 ViscoMist



## External mixing nozzle for viscous liquids, e.g. for:

- Coating processes
- Moisturising
- Lubrication
- Glazing
- Disinfection

## One nozzle – several spray characters:

- Spray characters
  - Solid stream
  - Full cone
  - Flat fan
- Independent regulation of liquid, atomizing air and fan air
- Fluid circulation possible (nozzle body with five connections)

## Nozzle sizes:

- Ø 0.38 mm to 2.54 mm

## Valve position:

- Normally closed, fail-safe with loss of air

## Signal air pressure:

- Min. 2 bar, max. 3 bar

## Cycles per minute:

- 180 cycles/min (short term)

## Connection thread:

- 1/8 BSPP
- NPT thread available on request

## Weight:

- 550 g

## Material:

- 1Y (stainless steel 316L)

## Flow rate range:

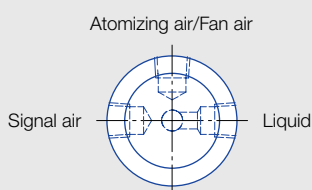
- Water: 7.8 to 307.0 l/h, at 2 bar
- Air 7.5 to 28.4 m³/h in normal condition, at 2 bar

## Atomizing air/Signal air/Fan air:

- The atomizing air causes the liquid to atomize at the nozzle orifice. The fan air allows the spray characteristics to be adapted to the application. The nozzle is activated by the signal air.

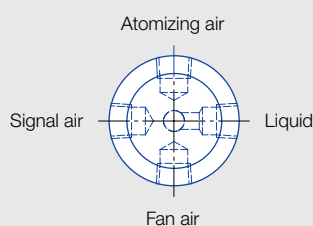
## Nozzle body configurations

### Nozzle body configuration 2



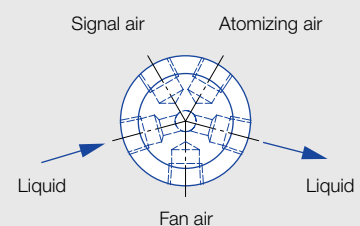
Version with three connections

### Nozzle body configuration 4



Version with four connections

### Nozzle body configuration 5



Version with five connections

| Ordering no.                                             | Narrowest<br>free cross<br>section<br>Ø<br>[mm] | Liquid                            |                  | Air                                |                         |                   | Spray dimensions [mm] at distance D <sub>1</sub> , D <sub>2</sub> and D <sub>3</sub> |                                |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |
|----------------------------------------------------------|-------------------------------------------------|-----------------------------------|------------------|------------------------------------|-------------------------|-------------------|--------------------------------------------------------------------------------------|--------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Type                                                     |                                                 | Liquid pressure<br><b>p</b> [bar] | V water<br>[l/h] | Air pressure<br><b>p</b> air [bar] | Atomizing air<br>[m³/h] | Fan air<br>[m³/h] | Atomizing air [bar]                                                                  | Liquid pressure <b>p</b> [bar] | Fan air [bar]             |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |
|                                                          |                                                 |                                   |                  |                                    |                         |                   |                                                                                      |                                | 0.00*                     |                           |                           | 0.35                      |                           |                           | 0.70                      |                           |                           | 1.00                      |                           |                           | 1.50                      |                           |                           |
|                                                          |                                                 |                                   |                  |                                    |                         |                   |                                                                                      |                                | Ø D <sub>1</sub> = 150 mm | Ø D <sub>2</sub> = 230 mm | Ø D <sub>3</sub> = 380 mm | Ø D <sub>1</sub> = 150 mm | Ø D <sub>2</sub> = 230 mm | Ø D <sub>3</sub> = 380 mm | Ø D <sub>1</sub> = 150 mm | Ø D <sub>2</sub> = 230 mm | Ø D <sub>3</sub> = 380 mm | Ø D <sub>1</sub> = 150 mm | Ø D <sub>2</sub> = 230 mm | Ø D <sub>3</sub> = 380 mm | Ø D <sub>1</sub> = 150 mm | Ø D <sub>2</sub> = 230 mm | Ø D <sub>3</sub> = 380 mm |
| 176.201.1Y.11.00<br>176.401.1Y.11.00<br>176.501.1Y.11.00 | 0.38                                            | 0.15                              | 1.89             | 0.15                               | 0.75                    | 1.00              | 0.30                                                                                 | 0.35                           | 40                        | 60                        | 100                       | 150                       | 180                       | 200                       | 180                       | 230                       | 290                       | 180                       | 230                       | 250                       | 180                       | 230                       | 280                       |
|                                                          |                                                 | 0.30                              | 2.80             | 0.30                               | 1.09                    | 1.44              |                                                                                      | 0.70                           | 40                        | 50                        | 80                        | 150                       | 200                       | 280                       | 200                       | 270                       | 330                       | 230                       | 280                       | 330                       | 230                       | 280                       | 330                       |
|                                                          |                                                 | 0.70                              | 4.39             | 0.70                               | 1.63                    | 2.28              |                                                                                      | 1.00                           | -                         | -                         | -                         | 170                       | 200                       | 280                       | 200                       | 300                       | 380                       | 230                       | 300                       | 360                       | 250                       | 300                       | 380                       |
|                                                          |                                                 | 1.50                              | -                | -                                  | -                       | -                 |                                                                                      | 1.50                           | -                         | -                         | -                         | 170                       | 200                       | 360                       | 200                       | 250                       | 340                       | 250                       | 300                       | 360                       | 280                       | 320                       | 380                       |
|                                                          |                                                 | 1.00                              | 5.49             | 1.00                               | 2.02                    | 2.89              | 1.00                                                                                 | 0.35                           | 40                        | 60                        | 100                       | 100                       | 130                       | 170                       | 130                       | 180                       | 230                       | 150                       | 230                       | 280                       | 170                       | 220                       | 300                       |
|                                                          |                                                 | 1.35                              | 6.40             | 1.35                               | 2.38                    | 3.45              |                                                                                      | 0.70                           | 40                        | 60                        | 100                       | 80                        | 110                       | 180                       | 130                       | 180                       | 230                       | 150                       | 200                       | 230                       | 180                       | 230                       | 280                       |
|                                                          |                                                 | 1.70                              | 7.19             | 1.70                               | 2.77                    | 3.99              |                                                                                      | 1.00                           | 30                        | 40                        | 80                        | 80                        | 130                       | 180                       | 130                       | 180                       | 250                       | 150                       | 230                       | 280                       | 180                       | 230                       | 330                       |
|                                                          |                                                 | 2.00                              | 7.91             | 2.00                               | 3.11                    | 4.55              |                                                                                      | 1.50                           | -                         | -                         | -                         | 100                       | 150                       | 200                       | 150                       | 190                       | 250                       | 180                       | 250                       | 360                       | 190                       | 270                       | 360                       |
|                                                          |                                                 | 2.40                              | 8.63             | 2.40                               | 3.48                    | 5.11              | 2.00                                                                                 | 0.35                           | 40                        | 60                        | 100                       | 50                        | 80                        | 110                       | 90                        | 130                       | 150                       | 100                       | 150                       | 190                       | 150                       | 200                       | 240                       |
|                                                          |                                                 | 2.75                              | 9.24             | 2.75                               | 3.87                    | 5.67              |                                                                                      | 0.70                           | 40                        | 60                        | 90                        | 60                        | 90                        | 140                       | 80                        | 100                       | 140                       | 110                       | 180                       | 230                       | 150                       | 200                       | 250                       |
|                                                          |                                                 | 3.15                              | 9.80             | 3.15                               | 4.23                    | 6.24              |                                                                                      | 1.00                           | 40                        | 60                        | 90                        | 70                        | 90                        | 140                       | 100                       | 130                       | 190                       | 130                       | 200                       | 250                       | 150                       | 200                       | 250                       |
|                                                          |                                                 | 3.50                              | 10.33            | 3.50                               | 4.60                    | 6.78              |                                                                                      | 1.50                           | -                         | -                         | -                         | 60                        | 80                        | 130                       | 110                       | 140                       | 180                       | 140                       | 190                       | 230                       | 180                       | 230                       | 300                       |
| 4.00                                                     | 11.17                                           | 4.00                              | 5.22             | 7.70                               | 2.75                    | 0.35              | 40                                                                                   | 60                             | 90                        | 50                        | 60                        | 90                        | 50                        | 90                        | 110                       | 80                        | 130                       | 180                       | 170                       | 150                       | 180                       |                           |                           |
| 0.70                                                     | 40                                              | 70                                | 110              | 40                                 |                         | 70                | 110                                                                                  | 70                             | 100                       | 130                       | 90                        | 130                       | 170                       | 130                       | 170                       | 190                       |                           |                           |                           |                           |                           |                           |                           |
| 1.00                                                     | 40                                              | 60                                | 100              | 50                                 |                         | 80                | 100                                                                                  | 80                             | 100                       | 130                       | 100                       | 140                       | 170                       | 130                       | 150                       | 200                       |                           |                           |                           |                           |                           |                           |                           |
| 1.50                                                     | 30                                              | 40                                | 80               | 50                                 |                         | 70                | 110                                                                                  | 70                             | 100                       | 150                       | 100                       | 140                       | 180                       | 110                       | 170                       | 230                       |                           |                           |                           |                           |                           |                           |                           |
| 176.202.1Y.11.00<br>176.402.1Y.11.00<br>176.502.1Y.11.00 | 0.58                                            | 0.15                              | 4.05             | 0.15                               | 0.78                    | 1.00              | 0.30                                                                                 | 0.35                           | 40                        | 60                        | 100                       | 140                       | 190                       | 270                       | 220                       | 250                       | 300                       | 190                       | 240                       | 280                       | 200                       | 230                       | 300                       |
|                                                          |                                                 | 0.30                              | 5.90             | 0.30                               | 1.10                    | 1.44              |                                                                                      | 0.70                           | -                         | -                         | -                         | 180                       | 240                       | 250                       | 230                       | 300                       | 360                       | 280                       | 330                       | 410                       | 300                       | 340                       | 410                       |
|                                                          |                                                 | 0.70                              | 9.27             | 0.70                               | 1.67                    | 2.28              |                                                                                      | 1.00                           | -                         | -                         | -                         | 150                       | 200                       | 230                       | 250                       | 290                       | 430                       | 300                       | 340                       | 460                       | 300                       | 370                       | 560                       |
|                                                          |                                                 | 1.50                              | -                | -                                  | -                       | -                 |                                                                                      | 1.50                           | -                         | -                         | -                         | -                         | -                         | -                         | 250                       | 290                       | 360                       | 280                       | 340                       | 430                       | 360                       | 410                       | 480                       |
|                                                          |                                                 | 1.00                              | 11.47            | 1.00                               | 2.06                    | 2.89              | 1.00                                                                                 | 0.35                           | 40                        | 50                        | 90                        | 110                       | 140                       | 150                       | 130                       | 170                       | 230                       | 150                       | 180                       | 230                       | 180                       | 220                       | 250                       |
|                                                          |                                                 | 1.35                              | 13.32            | 1.35                               | 2.43                    | 3.45              |                                                                                      | 0.70                           | 40                        | 60                        | 90                        | 110                       | 130                       | 190                       | 140                       | 180                       | 240                       | 170                       | 220                       | 250                       | 200                       | 230                       | 280                       |
|                                                          |                                                 | 1.70                              | 14.99            | 1.70                               | 2.79                    | 3.99              |                                                                                      | 1.00                           | -                         | -                         | -                         | 100                       | 140                       | 200                       | 170                       | 200                       | 280                       | 190                       | 230                       | 330                       | 200                       | 250                       | 330                       |
|                                                          |                                                 | 2.00                              | 16.43            | 2.00                               | 3.14                    | 4.55              |                                                                                      | 1.50                           | -                         | -                         | -                         | -                         | -                         | -                         | 170                       | 200                       | 300                       | 200                       | 250                       | 360                       | 250                       | 300                       | 380                       |
|                                                          |                                                 | 2.40                              | 17.90            | 2.40                               | 3.52                    | 5.11              | 2.00                                                                                 | 0.35                           | 40                        | 50                        | 80                        | 60                        | 80                        | 110                       | 90                        | 130                       | 170                       | 110                       | 150                       | 180                       | 130                       | 200                       | 230                       |
|                                                          |                                                 | 2.75                              | 19.23            | 2.75                               | 3.91                    | 5.67              |                                                                                      | 0.70                           | 40                        | 40                        | 80                        | 70                        | 100                       | 130                       | 110                       | 140                       | 170                       | 140                       | 180                       | 190                       | 150                       | 200                       | 250                       |
|                                                          |                                                 | 3.15                              | 20.44            | 3.15                               | 4.28                    | 6.24              |                                                                                      | 1.00                           | 30                        | 50                        | 90                        | 70                        | 100                       | 130                       | 100                       | 150                       | 180                       | 130                       | 180                       | 230                       | 150                       | 200                       | 250                       |
|                                                          |                                                 | 3.50                              | 21.57            | 3.50                               | 4.66                    | 6.78              |                                                                                      | 1.50                           | -                         | -                         | -                         | 70                        | 100                       | 150                       | 110                       | 150                       | 230                       | 130                       | 180                       | 240                       | 170                       | 230                       | 300                       |
| 4.00                                                     | 23.32                                           | 4.00                              | 5.22             | 7.70                               | 2.75                    | 0.35              | 40                                                                                   | 40                             | 80                        | 60                        | 80                        | 100                       | 80                        | 100                       | 120                       | 100                       | 140                       | 180                       | 130                       | 150                       | 180                       |                           |                           |
| 0.70                                                     | 30                                              | 60                                | 90               | 60                                 |                         | 80                | 100                                                                                  | 100                            | 100                       | 130                       | 100                       | 140                       | 180                       | 130                       | 150                       | 200                       |                           |                           |                           |                           |                           |                           |                           |
| 1.00                                                     | 40                                              | 50                                | 70               | 60                                 |                         | 90                | 110                                                                                  | 100                            | 130                       | 150                       | 120                       | 140                       | 190                       | 150                       | 200                       | 240                       |                           |                           |                           |                           |                           |                           |                           |
| 1.50                                                     | 40                                              | 60                                | 90               | 60                                 |                         | 90                | 140                                                                                  | 100                            | 120                       | 180                       | 120                       | 170                       | 230                       | 150                       | 190                       | 290                       |                           |                           |                           |                           |                           |                           |                           |
| 176.203.1Y.11.00<br>176.403.1Y.11.00<br>176.503.1Y.11.00 | 0.79                                            | 0.15                              | 8.36             | 0.15                               | 0.48                    | 1.00              | 0.30                                                                                 | 0.35                           | -                         | -                         | -                         | 230                       | 300                       | 410                       | 330                       | 410                       | 480                       | 330                       | 410                       | 510                       | 300                       | 380                       | 460                       |
|                                                          |                                                 | 0.30                              | 12.38            | 0.30                               | 0.71                    | 1.44              |                                                                                      | 0.70                           | -                         | -                         | -                         | 230                       | 280                       | 330                       | 300                       | 360                       | 510                       | 410                       | 480                       | 610                       | 430                       | 580                       | 740                       |
|                                                          |                                                 | 0.70                              | 19.19            | 0.70                               | 1.16                    | 2.28              |                                                                                      | 1.00                           | -                         | -                         | -                         | -                         | -                         | -                         | 330                       | 410                       | 530                       | 410                       | 460                       | 640                       | 460                       | 530                       | 710                       |
|                                                          |                                                 | 1.50                              | -                | -                                  | -                       | -                 |                                                                                      | 1.50                           | -                         | -                         | -                         | -                         | -                         | -                         | 280                       | 360                       | 460                       | 380                       | 460                       | 610                       | 410                       | 510                       | 580                       |
|                                                          |                                                 | 1.00                              | 23.77            | 1.00                               | 1.46                    | 2.89              | 1.00                                                                                 | 0.35                           | 40                        | 60                        | 100                       | 150                       | 200                       | 270                       | 170                       | 230                       | 280                       | 230                       | 300                       | 380                       | 280                       | 360                       | 410                       |
|                                                          |                                                 | 1.35                              | 27.59            | 1.35                               | 1.65                    | 3.45              |                                                                                      | 0.70                           | -                         | -                         | -                         | 150                       | 200                       | 250                       | 230                       | 300                       | 380                       | 300                       | 360                       | 460                       | 330                       | 380                       | 430                       |
|                                                          |                                                 | 1.70                              | 31.04            | 1.70                               | 1.89                    | 3.99              |                                                                                      | 1.00                           | -                         | -                         | -                         | -                         | -                         | -                         | 230                       | 280                       | 380                       | 280                       | 380                       | 510                       | 330                       | 430                       | 530                       |

\* A cone-shaped spray pattern is produced without fan air.





| Ordering no. | Narrowest free cross section Ø [mm] | Liquid                  |               | Air                      |                      |                | Spray dimensions [mm] at distance D <sub>1</sub> , D <sub>2</sub> and D <sub>3</sub> |                         |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|              |                                     |                         |               |                          |                      |                | Atomizing air [bar]                                                                  | Liquid pressure p [bar] | Fan air [bar]             |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|              |                                     | Liquid pressure p [bar] | V water [l/h] | Air pressure p air [bar] | Atomizing air [m³/h] | Fan air [m³/h] |                                                                                      |                         | 0.00*                     |                           |                           | 0.35                      |                           |                           | 0.70                      |                           |                           | 1.00                      |                           |                           | 1.50                      |                           |                           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|              |                                     |                         |               |                          |                      |                |                                                                                      |                         | Ø D <sub>1</sub> = 150 mm | Ø D <sub>2</sub> = 230 mm | Ø D <sub>3</sub> = 380 mm | Ø D <sub>1</sub> = 150 mm | Ø D <sub>2</sub> = 230 mm | Ø D <sub>3</sub> = 380 mm | Ø D <sub>1</sub> = 150 mm | Ø D <sub>2</sub> = 230 mm | Ø D <sub>3</sub> = 380 mm | Ø D <sub>1</sub> = 150 mm | Ø D <sub>2</sub> = 230 mm | Ø D <sub>3</sub> = 380 mm | Ø D <sub>1</sub> = 150 mm | Ø D <sub>2</sub> = 230 mm | Ø D <sub>3</sub> = 380 mm |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Type         |                                     |                         |               |                          |                      |                |                                                                                      |                         |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

\* A cone-shaped spray pattern is produced without fan air.

| Ordering no.                                             | Narrow-<br>est free<br>cross<br>section<br>Ø<br>[mm] | Liquid                            |                  | Air                                |                      |                | Spray dimensions [mm] at distance D <sub>1</sub> , D <sub>2</sub> and D <sub>3</sub> |                                |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |  |
|----------------------------------------------------------|------------------------------------------------------|-----------------------------------|------------------|------------------------------------|----------------------|----------------|--------------------------------------------------------------------------------------|--------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|--|
| Type                                                     |                                                      | Liquid pressure<br><b>p</b> [bar] | V<br>water [l/h] | Air pressure<br><b>p</b> air [bar] | Atomizing air [m³/h] | Fan air [m³/h] | Atomizing air [bar]                                                                  | Liquid pressure <b>p</b> [bar] | Fan air [bar]             |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |  |
|                                                          |                                                      |                                   |                  |                                    |                      |                |                                                                                      |                                | 0.70                      |                           |                           | 1.00                      |                           |                           | 1.40                      |                           |                           | 1.75                      |                           |                           | 2.00                      |                           |                           |  |
|                                                          |                                                      |                                   |                  |                                    |                      |                |                                                                                      |                                | Ø D <sub>1</sub> = 150 mm | Ø D <sub>2</sub> = 230 mm | Ø D <sub>3</sub> = 380 mm | Ø D <sub>1</sub> = 150 mm | Ø D <sub>2</sub> = 230 mm | Ø D <sub>3</sub> = 380 mm | Ø D <sub>1</sub> = 150 mm | Ø D <sub>2</sub> = 230 mm | Ø D <sub>3</sub> = 380 mm | Ø D <sub>1</sub> = 150 mm | Ø D <sub>2</sub> = 230 mm | Ø D <sub>3</sub> = 380 mm | Ø D <sub>1</sub> = 150 mm | Ø D <sub>2</sub> = 230 mm | Ø D <sub>3</sub> = 380 mm |  |
| 176.206.1Y.11.00<br>176.406.1Y.11.00<br>176.506.1Y.11.00 | 1,70                                                 | 0.15                              | 41.71            | 0.15                               | 1.53                 | 2.04           | 1.00                                                                                 | 0.35                           | 220                       | 330                       | 510                       | 280                       | 410                       | 610                       | 360                       | 460                       | 660                       | -                         | -                         | -                         | -                         | -                         | -                         |  |
|                                                          |                                                      | 0.30                              | 59.54            | 0.30                               | 2.24                 | 2.94           |                                                                                      | 0.70                           | 240                       | 360                       | 530                       | 330                       | 430                       | 660                       | 360                       | 510                       | 760                       | -                         | -                         | -                         | -                         | -                         | -                         |  |
|                                                          |                                                      | 0.70                              | 90.88            | 0.70                               | 3.47                 | 4.60           |                                                                                      | 1.00                           | 250                       | 360                       | 510                       | 300                       | 430                       | 610                       | 360                       | 510                       | 690                       | -                         | -                         | -                         | -                         | -                         | -                         |  |
|                                                          |                                                      | 1.00                              | 111.73           | 1.00                               | 4.35                 | 5.81           |                                                                                      | 1.50                           | -                         | -                         | -                         | 300                       | 380                       | 560                       | 330                       | 460                       | 610                       | -                         | -                         | -                         | -                         | -                         | -                         |  |
|                                                          |                                                      | 1.35                              | 128.99           | 1.35                               | 5.15                 | 6.90           | 2.00                                                                                 | 0.35                           | 150                       | 230                       | 330                       | 200                       | 280                       | 410                       | 230                       | 300                       | 460                       | 230                       | 330                       | 460                       | 250                       | 330                       | 430                       |  |
|                                                          |                                                      | 1.70                              | 144.21           | 1.70                               | 5.95                 | 7.99           |                                                                                      | 0.70                           | 180                       | 230                       | 300                       | 200                       | 250                       | 380                       | 230                       | 300                       | 460                       | 250                       | 360                       | 480                       | 280                       | 360                       | 510                       |  |
|                                                          |                                                      | 2.00                              | 157.91           | 2.00                               | 6.71                 | 9.06           |                                                                                      | 1.00                           | 150                       | 230                       | 330                       | 180                       | 250                       | 380                       | 230                       | 300                       | 430                       | 250                       | 330                       | 480                       | 280                       | 360                       | 530                       |  |
|                                                          |                                                      | 2.40                              | 170.48           | 2.40                               | 7.53                 | 10.13          |                                                                                      | 1.50                           | -                         | -                         | -                         | 180                       | 250                       | 360                       | 230                       | 280                       | 430                       | 250                       | 330                       | 510                       | 280                       | 360                       | 510                       |  |
|                                                          |                                                      | 2.75                              | 182.25           | 2.75                               | 8.27                 | 11.21          | 2.75                                                                                 | 0.35                           | 140                       | 180                       | 280                       | 180                       | 230                       | 300                       | 180                       | 250                       | 360                       | 200                       | 280                       | 410                       | 200                       | 280                       | 430                       |  |
|                                                          |                                                      | 3.15                              | 193.26           | 3.15                               | 9.07                 | 12.27          |                                                                                      | 0.70                           | 150                       | 200                       | 300                       | 180                       | 230                       | 330                       | 180                       | 250                       | 380                       | 200                       | 280                       | 410                       | 230                       | 300                       | 410                       |  |
|                                                          |                                                      | 3.50                              | 203.52           | 3.50                               | 9.91                 | 13.32          |                                                                                      | 1.00                           | 140                       | 180                       | 280                       | 180                       | 230                       | 330                       | 190                       | 230                       | 380                       | 200                       | 280                       | 410                       | 230                       | 300                       | 430                       |  |
|                                                          |                                                      | 4.00                              | 218.85           | 4.00                               | 11.13                | 15.12          |                                                                                      | 1.50                           | 130                       | 180                       | 250                       | 150                       | 200                       | 330                       | 180                       | 250                       | 380                       | 200                       | 280                       | 430                       | 230                       | 330                       | 480                       |  |
| 176.207.1Y.11.00<br>176.407.1Y.11.00<br>176.507.1Y.11.00 | 2,05                                                 | 0.15                              | 59.20            | 0.15                               | 3.64                 | 3.36           | 1.00                                                                                 | 0.35                           | 200                       | 280                       | 410                       | 280                       | 360                       | 480                       | 330                       | 430                       | 530                       | 330                       | 480                       | 690                       | 410                       | 480                       | 660                       |  |
|                                                          |                                                      | 0.30                              | 84.97            | 0.30                               | 5.37                 | 4.91           |                                                                                      | 0.70                           | 200                       | 280                       | 410                       | 280                       | 360                       | 480                       | 300                       | 410                       | 580                       | 360                       | 460                       | 710                       | 410                       | 530                       | 760                       |  |
|                                                          |                                                      | 0.70                              | 129.79           | 0.70                               | 8.53                 | 7.87           |                                                                                      | 1.00                           | 150                       | 230                       | 360                       | 230                       | 300                       | 460                       | 280                       | 360                       | 530                       | 300                       | 430                       | 610                       | 360                       | 510                       | 740                       |  |
|                                                          |                                                      | 1.00                              | 159.42           | 1.00                               | 10.84                | 10.08          |                                                                                      | 1.50                           | -                         | -                         | -                         | -                         | -                         | -                         | -                         | -                         | -                         | -                         | -                         | -                         | -                         | -                         | -                         |  |
|                                                          |                                                      | 1.35                              | 184.59           | 1.35                               | 12.98                | 12.16          | 2.00                                                                                 | 0.35                           | 100                       | 140                       | 220                       | 140                       | 190                       | 280                       | 180                       | 230                       | 360                       | 230                       | 280                       | 380                       | 250                       | 330                       | 480                       |  |
|                                                          |                                                      | 1.70                              | 206.70           | 1.70                               | 14.92                | 14.07          |                                                                                      | 0.70                           | 100                       | 150                       | 230                       | 140                       | 190                       | 280                       | 180                       | 250                       | 380                       | 200                       | 280                       | 410                       | 250                       | 330                       | 480                       |  |
|                                                          |                                                      | 2.00                              | 226.76           | 2.00                               | 16.91                | 15.97          |                                                                                      | 1.00                           | 100                       | 150                       | 250                       | 130                       | 180                       | 280                       | 170                       | 220                       | 330                       | 200                       | 280                       | 410                       | 240                       | 300                       | 480                       |  |
|                                                          |                                                      | 2.40                              | 245.27           | 2.40                               | 18.94                | 17.69          |                                                                                      | 1.50                           | -                         | -                         | -                         | -                         | -                         | -                         | 150                       | 230                       | 330                       | 190                       | 250                       | 380                       | 230                       | 300                       | 430                       |  |
|                                                          |                                                      | 2.75                              | 262.64           | 2.75                               | 20.86                | 19.64          | 2.75                                                                                 | 0.35                           | 90                        | 130                       | 180                       | 110                       | 170                       | 250                       | 150                       | 200                       | 300                       | 180                       | 230                       | 330                       | 200                       | 280                       | 380                       |  |
|                                                          |                                                      | 3.15                              | 279.03           | 3.15                               | 22.82                | 21.53          |                                                                                      | 0.70                           | 90                        | 130                       | 200                       | 130                       | 170                       | 250                       | 150                       | 200                       | 300                       | 180                       | 230                       | 360                       | 200                       | 280                       | 410                       |  |
|                                                          |                                                      | 3.50                              | 293.98           | 3.50                               | 24.72                | 23.33          |                                                                                      | 1.00                           | 90                        | 110                       | 180                       | 120                       | 150                       | 250                       | 140                       | 190                       | 300                       | 170                       | 230                       | 330                       | 200                       | 280                       | 380                       |  |
|                                                          |                                                      | 4.00                              | 317.15           | 4.00                               | 27.80                | 26.33          |                                                                                      | 1.50                           | 90                        | 130                       | 200                       | 110                       | 150                       | 250                       | 140                       | 200                       | 300                       | 150                       | 230                       | 360                       | 200                       | 280                       | 380                       |  |





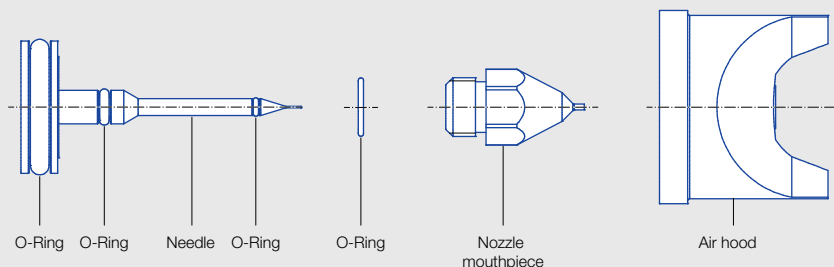
| Ordering no.                                             | Narrow-<br>est free<br>cross<br>section<br>Ø<br>[mm] | Liquid                        |                | Air                            |                      |                | Spray dimensions [mm] at distance D <sub>1</sub> , D <sub>2</sub> and D <sub>3</sub> |                               |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |  |
|----------------------------------------------------------|------------------------------------------------------|-------------------------------|----------------|--------------------------------|----------------------|----------------|--------------------------------------------------------------------------------------|-------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|--|
| Type                                                     |                                                      | Liquid<br>pressure<br>p [bar] | V̇ water [l/h] | Air<br>pressure<br>p air [bar] | Atomizing air [m³/h] | Fan air [m³/h] | Atomizing air [bar]                                                                  | Liquid<br>pressure<br>p [bar] | Fan air [bar]             |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |                           |  |
|                                                          |                                                      |                               |                |                                |                      |                |                                                                                      |                               | 0.70                      |                           |                           |                           |                           |                           | 1.00                      |                           |                           | 1.40                      |                           |                           | 1.75                      |                           |                           |  |
|                                                          |                                                      |                               |                |                                |                      |                |                                                                                      |                               | Ø D <sub>1</sub> = 150 mm | Ø D <sub>2</sub> = 230 mm | Ø D <sub>3</sub> = 380 mm | Ø D <sub>1</sub> = 150 mm | Ø D <sub>2</sub> = 230 mm | Ø D <sub>3</sub> = 380 mm | Ø D <sub>1</sub> = 150 mm | Ø D <sub>2</sub> = 230 mm | Ø D <sub>3</sub> = 380 mm | Ø D <sub>1</sub> = 150 mm | Ø D <sub>2</sub> = 230 mm | Ø D <sub>3</sub> = 380 mm | Ø D <sub>1</sub> = 150 mm | Ø D <sub>2</sub> = 230 mm | Ø D <sub>3</sub> = 380 mm |  |
| 176.208.1Y.11.00<br>176.408.1Y.11.00<br>176.508.1Y.11.00 | 2.36                                                 | 0.15                          | 97.20          | 0.15                           | 3.84                 | 4.40           | 1.00                                                                                 | 0.35                          | 190                       | 280                       | 430                       | 280                       | 360                       | 610                       | 300                       | 460                       | 710                       | -                         | -                         | -                         | -                         | -                         | -                         |  |
|                                                          |                                                      | 0.30                          | 114.76         | 0.30                           | 4.64                 | 5.28           |                                                                                      | 0.70                          | 190                       | 280                       | 430                       | 250                       | 360                       | 610                       | 330                       | 480                       | 760                       | -                         | -                         | -                         | -                         | -                         | -                         |  |
|                                                          |                                                      | 0.70                          | 162.98         | 0.70                           | 6.80                 | 7.87           |                                                                                      | 1.00                          | -                         | -                         | -                         | 230                       | 330                       | 560                       | 300                       | 430                       | 690                       | -                         | -                         | -                         | -                         | -                         | -                         |  |
|                                                          |                                                      | 1.00                          | 199.13         | 1.00                           | 8.63                 | 10.08          |                                                                                      | 1.50                          | -                         | -                         | -                         | 250                       | 360                       | 530                       | 300                       | 380                       | 580                       | -                         | -                         | -                         | -                         | -                         | -                         |  |
|                                                          |                                                      | 1.35                          | 229.60         | 1.35                           | 10.21                | 12.16          | 2.00                                                                                 | 0.35                          | 110                       | 190                       | 300                       | 170                       | 250                       | 360                       | 200                       | 280                       | 410                       | 230                       | 330                       | 460                       | 280                       | 460                       | 560                       |  |
|                                                          |                                                      | 1.70                          | 256.24         | 1.70                           | 11.86                | 14.07          |                                                                                      | 0.70                          | 110                       | 180                       | 250                       | 170                       | 230                       | 360                       | 220                       | 280                       | 410                       | 230                       | 360                       | 510                       | 270                       | 380                       | 530                       |  |
|                                                          |                                                      | 2.00                          | 280.70         | 2.00                           | 13.37                | 15.97          |                                                                                      | 1.00                          | 110                       | 170                       | 230                       | 140                       | 200                       | 330                       | 190                       | 250                       | 410                       | 230                       | 300                       | 480                       | 280                       | 380                       | 610                       |  |
|                                                          |                                                      | 2.40                          | 302.99         | 2.40                           | 14.99                | 17.69          |                                                                                      | 1.50                          | -                         | -                         | -                         | 150                       | 200                       | 330                       | 200                       | 280                       | 380                       | 220                       | 300                       | 460                       | 270                       | 380                       | 560                       |  |
|                                                          |                                                      | 2.75                          | 324.03         | 2.75                           | 16.33                | 19.64          | 2.75                                                                                 | 0.35                          | 110                       | 170                       | 230                       | 140                       | 190                       | 280                       | 170                       | 250                       | 360                       | 200                       | 280                       | 380                       | 250                       | 360                       | 460                       |  |
|                                                          |                                                      | 3.15                          | 343.22         | 3.15                           | 17.99                | 21.53          |                                                                                      | 0.70                          | 100                       | 150                       | 230                       | 140                       | 200                       | 300                       | 170                       | 240                       | 360                       | 200                       | 280                       | 430                       | 230                       | 330                       | 480                       |  |
|                                                          |                                                      | 3.50                          | 361.32         | 3.50                           | 19.27                | 23.33          |                                                                                      | 1.00                          | 100                       | 140                       | 200                       | 130                       | 180                       | 280                       | 170                       | 230                       | 380                       | 200                       | 280                       | 410                       | 230                       | 330                       | 480                       |  |
|                                                          |                                                      | 4.00                          | 388.72         | 4.00                           | 21.73                | 26.33          |                                                                                      | 1.50                          | 90                        | 130                       | 200                       | 130                       | 180                       | 280                       | 150                       | 220                       | 360                       | 190                       | 280                       | 460                       | 230                       | 320                       | 460                       |  |
|                                                          |                                                      | 4.00                          | 388.72         | 4.00                           | 21.73                | 26.33          | 4.00                                                                                 | 0.35                          | 90                        | 110                       | 180                       | 110                       | 150                       | 220                       | 140                       | 190                       | 300                       | 150                       | 220                       | 300                       | 190                       | 300                       | 410                       |  |
|                                                          |                                                      | 4.00                          | 388.72         | 4.00                           | 21.73                | 26.33          |                                                                                      | 0.70                          | 90                        | 110                       | 190                       | 130                       | 170                       | 230                       | 140                       | 200                       | 300                       | 170                       | 230                       | 330                       | 200                       | 270                       | 430                       |  |
|                                                          |                                                      | 4.00                          | 388.72         | 4.00                           | 21.73                | 26.33          |                                                                                      | 1.00                          | 90                        | 110                       | 170                       | 110                       | 150                       | 220                       | 130                       | 200                       | 300                       | 150                       | 230                       | 360                       | 180                       | 280                       | 430                       |  |
|                                                          |                                                      | 4.00                          | 388.72         | 4.00                           | 21.73                | 26.33          |                                                                                      | 1.50                          | -                         | -                         | -                         | 110                       | 150                       | 220                       | 140                       | 200                       | 300                       | 150                       | 220                       | 360                       | 190                       | 250                       | 410                       |  |
| 176.209.1Y.11.00<br>176.409.1Y.11.00<br>176.509.1Y.11.00 | 2.54                                                 | 0.15                          | 82.06          | 0.15                           | 1.87                 | 3.36           | 1.00                                                                                 | 0.35                          | 200                       | 300                       | 460                       | 280                       | 380                       | 610                       | 330                       | 460                       | 710                       | 410                       | 530                       | 760                       | 460                       | 660                       | 810                       |  |
|                                                          |                                                      | 0.30                          | 119.53         | 0.30                           | 3.77                 | 4.91           |                                                                                      | 0.70                          | 200                       | 280                       | 430                       | 280                       | 410                       | 610                       | 330                       | 480                       | 690                       | 410                       | 560                       | 740                       | 460                       | 640                       | 810                       |  |
|                                                          |                                                      | 0.69                          | 180.05         | 0.69                           | 6.58                 | 7.87           |                                                                                      | 1.00                          | -                         | -                         | -                         | -                         | -                         | -                         | 300                       | 460                       | 690                       | 410                       | 510                       | 690                       | 430                       | 580                       | 810                       |  |
|                                                          |                                                      | 1.03                          | 221.23         | 1.03                           | 8.50                 | 10.08          |                                                                                      | 1.50                          | -                         | -                         | -                         | -                         | -                         | -                         | 300                       | 460                       | 690                       | 380                       | 530                       | 760                       | 430                       | 580                       | 810                       |  |
|                                                          |                                                      | 1.38                          | 255.60         | 1.38                           | 10.13                | 12.16          | 2.00                                                                                 | 0.35                          | 130                       | 200                       | 300                       | 180                       | 250                       | 380                       | 200                       | 280                       | 460                       | 250                       | 330                       | 510                       | 280                       | 360                       | 560                       |  |
|                                                          |                                                      | 1.72                          | 285.50         | 1.72                           | 11.57                | 14.07          |                                                                                      | 0.70                          | 130                       | 180                       | 280                       | 170                       | 230                       | 360                       | 200                       | 280                       | 460                       | 230                       | 330                       | 560                       | 280                       | 380                       | 610                       |  |
|                                                          |                                                      | 2.07                          | 312.94         | 2.07                           | 13.13                | 15.97          |                                                                                      | 1.00                          | 100                       | 170                       | 280                       | 170                       | 230                       | 360                       | 200                       | 280                       | 430                       | 230                       | 330                       | 510                       | 280                       | 380                       | 560                       |  |
|                                                          |                                                      | 2.41                          | 338.83         | 2.41                           | 14.71                | 17.69          |                                                                                      | 1.50                          | -                         | -                         | -                         | -                         | -                         | -                         | 200                       | 250                       | 430                       | 230                       | 300                       | 460                       | 250                       | 380                       | 560                       |  |
|                                                          |                                                      | 2.76                          | 362.49         | 2.76                           | 16.26                | 19.64          | 2.75                                                                                 | 0.35                          | 100                       | 150                       | 230                       | 150                       | 200                       | 330                       | 170                       | 230                       | 410                       | 200                       | 280                       | 460                       | 240                       | 360                       | 510                       |  |
|                                                          |                                                      | 3.10                          | 384.75         | 3.10                           | 17.75                | 21.53          |                                                                                      | 0.70                          | 100                       | 150                       | 230                       | 140                       | 190                       | 300                       | 180                       | 240                       | 410                       | 200                       | 280                       | 460                       | 230                       | 360                       | 560                       |  |
|                                                          |                                                      | 3.45                          | 405.71         | 3.45                           | 19.33                | 23.33          |                                                                                      | 1.00                          | 90                        | 140                       | 230                       | 140                       | 190                       | 300                       | 180                       | 250                       | 410                       | 200                       | 280                       | 460                       | 250                       | 360                       | 560                       |  |
|                                                          |                                                      | 4.00                          | 436.86         | 4.00                           | 21.83                | 26.33          |                                                                                      | 1.50                          | 100                       | 140                       | 200                       | 140                       | 190                       | 300                       | 180                       | 250                       | 410                       | 200                       | 280                       | 460                       | 230                       | 330                       | 510                       |  |
|                                                          |                                                      | 4.00                          | 436.86         | 4.00                           | 21.83                | 26.33          | 4.00                                                                                 | 0.35                          | 100                       | 140                       | 200                       | 130                       | 180                       | 250                       | 140                       | 190                       | 280                       | 180                       | 250                       | 360                       | 190                       | 250                       | 410                       |  |
|                                                          |                                                      | 4.00                          | 436.86         | 4.00                           | 21.83                | 26.33          |                                                                                      | 0.70                          | 90                        | 130                       | 200                       | 130                       | 180                       | 280                       | 150                       | 200                       | 300                       | 170                       | 230                       | 360                       | 200                       | 280                       | 410                       |  |
|                                                          |                                                      | 4.00                          | 436.86         | 4.00                           | 21.83                | 26.33          |                                                                                      | 1.00                          | 90                        | 130                       | 180                       | 110                       | 150                       | 250                       | 140                       | 200                       | 300                       | 180                       | 230                       | 410                       | 200                       | 280                       | 460                       |  |
|                                                          |                                                      | 4.00                          | 436.86         | 4.00                           | 21.83                | 26.33          |                                                                                      | 1.50                          | -                         | -                         | -                         | 110                       | 150                       | 250                       | 140                       | 180                       | 300                       | 170                       | 230                       | 410                       | 190                       | 280                       | 460                       |  |

**Notice:**

The fourth digit in the order number (2, 4 or 5) stands for the housing variant (for details see Page 54).

# Spare parts set for pneumatic atomizing nozzles Series 176 ViscoMist

## Overview of the spare parts set and the power set



### Spare parts set

Spare parts set for replacing the main wear parts of the nozzle, consisting of:

- Needle (stainless steel 316L)
- O-rings (Viton)
- Nozzle tip (stainless steel 316L)

| Ordering no.         | Narrowest free cross section<br>Ø<br>[mm] | For nozzles      |
|----------------------|-------------------------------------------|------------------|
| Type                 |                                           |                  |
| <b>017.601.1Y.01</b> | 0.38                                      | 176.xx1.1Y.11.00 |
| <b>017.602.1Y.01</b> | 0.58                                      | 176.xx2.1Y.11.00 |
| <b>017.603.1Y.01</b> | 0.79                                      | 176.xx3.1Y.11.00 |
| <b>017.604.1Y.01</b> | 1.07                                      | 176.xx4.1Y.11.00 |
| <b>017.605.1Y.01</b> | 1.32                                      | 176.xx5.1Y.11.00 |
| <b>017.606.1Y.01</b> | 1.32                                      | 176.xx6.1Y.11.00 |
| <b>017.607.1Y.01</b> | 2.05                                      | 176.xx7.1Y.11.00 |
| <b>017.608.1Y.01</b> | 2.36                                      | 176.xx8.1Y.11.00 |
| <b>017.609.1Y.01</b> | 2.54                                      | 176.xx9.1Y.11.00 |

### Power set

Power set for replacing the main wear parts of the nozzle and the air hood, consisting of:

- Needle (stainless steel 316L)
- O-rings (Viton)
- Nozzle tip (stainless steel 316L)
- Air hood (stainless steel 316L)

| Ordering no.         | Narrowest free cross section<br>Ø<br>[mm] | For nozzles      |
|----------------------|-------------------------------------------|------------------|
| Type                 |                                           |                  |
| <b>017.601.1Y.00</b> | 0.38                                      | 176.xx1.1Y.11.00 |
| <b>017.602.1Y.00</b> | 0.58                                      | 176.xx2.1Y.11.00 |
| <b>017.603.1Y.00</b> | 0.79                                      | 176.xx3.1Y.11.00 |
| <b>017.604.1Y.00</b> | 1.07                                      | 176.xx4.1Y.11.00 |
| <b>017.605.1Y.00</b> | 1.32                                      | 176.xx5.1Y.11.00 |
| <b>017.606.1Y.00</b> | 1.32                                      | 176.xx6.1Y.11.00 |
| <b>017.607.1Y.00</b> | 2.05                                      | 176.xx7.1Y.11.00 |
| <b>017.608.1Y.00</b> | 2.36                                      | 176.xx8.1Y.11.00 |
| <b>017.609.1Y.00</b> | 2.54                                      | 176.xx9.1Y.11.00 |

#### Notice:

Instructions for replacing individual or all components of the nozzles are included in the scope of delivery of the spare parts sets and the power sets.

### O-ring set

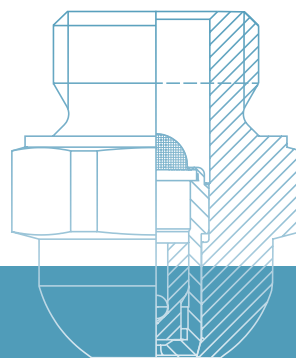
| Ordering no.     |          |      | Consisting of<br>4 O-rings, suitable<br>for all nozzles of<br>series 176 |
|------------------|----------|------|--------------------------------------------------------------------------|
| Type             | Mat. no. |      |                                                                          |
|                  | 7A       | 6C   |                                                                          |
|                  | Viton    | EPDM |                                                                          |
| 017.600.xx.01.03 | ●        | ●    |                                                                          |

Viton (7A) is the standard O-ring material.  
EPDM (6C) is optionally available.

Ordering Type + Material no. = Ordering no.  
example: 017.600.xx.01.03 + 7A = 017.600.7A.01.03

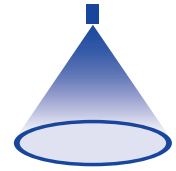


# HOLLOW CONE NOZZLES



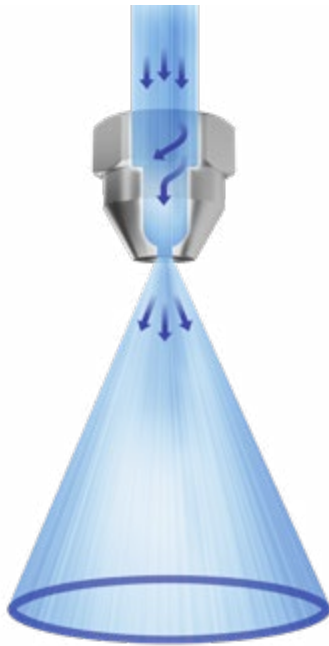
# HOLLOW CONE NOZZLES

## OVERVIEW OF TYPES



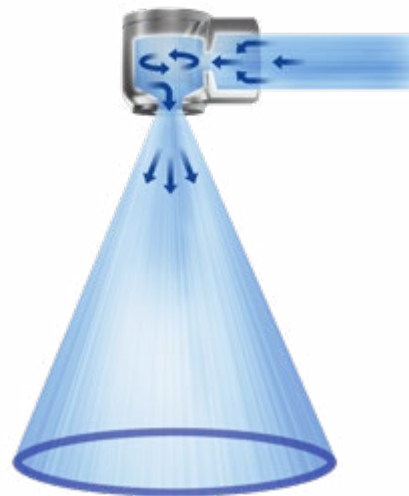
Hollow cone nozzles are used wherever fine droplets are required. A distinction is made between axial-flow hollow cone nozzles and tangential-flow hollow cone nozzles. Axial-flow hollow cone nozzles are mainly used for cooling, humidification and disinfecting, whilst tangential-flow hollow cone nozzles are traditionally used for humidification of air, dust control, sprinkling and foaming.

### Axial-flow hollow cone nozzles



- High and controlled degree of atomization due to integrated swirl insert
- Narrow droplet spectrum
- Uniform atomization
- Large droplet surface area for mass transfer processes

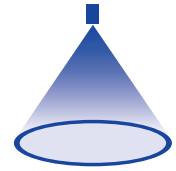
### Tangential-flow hollow cone nozzles



- Liquid rotation without swirl insert
- Maximum free passage making less susceptible to clogging
- Large free cross sections
- Operational reliability
- Coarse droplets that are larger than axial-flow hollow cone nozzles



# HOLLOW CONE NOZZLES OVERVIEW OF SERIES

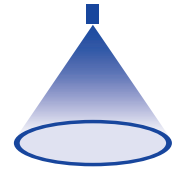


|                                                                                                                    |                                       | Axial-flow hollow cone nozzles                                                                      |                                                                                                     |                                                                                                         |                                                                                                       |
|--------------------------------------------------------------------------------------------------------------------|---------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
|                                                                                                                    |                                       |                    |                    |                      |                    |
| Series                                                                                                             |                                       | 220                                                                                                 | 226                                                                                                 | 214/216                                                                                                 | 2TR                                                                                                   |
| Information on page                                                                                                |                                       | 66                                                                                                  | 67                                                                                                  | 68                                                                                                      | 69                                                                                                    |
| <br><b>Flow rate at p = 2 bar</b> | <b>Very low</b><br>< 0.5 l/min        | <br>(at p = 5 bar) | <br>(at p = 5 bar) | <br>(at p = 5 bar)   | <br>(at p = 5 bar) |
|                                                                                                                    | <b>Low</b><br>0.5 l/min–2.0 l/min     |                                                                                                     |                                                                                                     | <br>(at p = 5 bar)   | <br>(at p = 5 bar) |
|                                                                                                                    | <b>Medium</b><br>2.0 l/min–10.0 l/min |                                                                                                     |                                                                                                     | <br>(at p = 5 bar)   |                                                                                                       |
|                                                                                                                    | <b>High</b><br>10.0 l/min–50.0 l/min  |                                                                                                     |                                                                                                     | <br>(at p = 5 bar) |                                                                                                       |
|                                                                                                                    | <b>Very high</b><br>> 50.0 l/min      |                                                                                                     |                                                                                                     |                                                                                                         |                                                                                                       |
| <br><b>Spray angle</b>          | <b>Small</b><br>45°                   |                                                                                                     |                                                                                                     |                                                                                                         |                                                                                                       |
|                                                                                                                    | <b>Medium</b><br>55°–95°              |                  |                  |                    |                  |
|                                                                                                                    | <b>Large</b><br>130°                  |                                                                                                     |                                                                                                     |                                                                                                         |                                                                                                       |
| <br><b>Nozzle material</b>      | <b>Stainless steel</b>                |                  |                  |                    |                                                                                                       |
|                                                                                                                    | <b>Brass</b>                          |                                                                                                     |                                                                                                     |                    |                                                                                                       |
|                                                                                                                    | <b>Plastic</b>                        |                                                                                                     |                                                                                                     |                                                                                                         |                  |
| <br><b>Nozzle connection</b>    |                                       | 1/4 BSPP                                                                                            | Assembly with retaining nut<br>3/8 BSPP                                                             | 1/8 BSPP<br>3/8 BSPP                                                                                    | Assembly with retaining nut<br>3/8 BSPP                                                               |

## Tangential-flow hollow cone nozzles

|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |  |
| 302                                                                              | 302 with bayonet quick-release system                                             | 308                                                                               | 304/306/307                                                                       | 350                                                                                 | 373 Ramp Bottom                                                                     |
| 70/71                                                                            | 66                                                                                | 74                                                                                | 75                                                                                | 76                                                                                  | 77                                                                                  |
| •                                                                                | •                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| •                                                                                | •                                                                                 | •                                                                                 |                                                                                   | •                                                                                   |                                                                                     |
| •                                                                                |                                                                                   | •                                                                                 | •                                                                                 | •                                                                                   |                                                                                     |
| •                                                                                |                                                                                   |                                                                                   | •                                                                                 |                                                                                     |                                                                                     |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                     | •                                                                                   |
|                                                                                  | •                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| •                                                                                | •                                                                                 | •                                                                                 | •                                                                                 |                                                                                     | •                                                                                   |
| •                                                                                | •                                                                                 |                                                                                   | •                                                                                 | •                                                                                   |                                                                                     |
| •                                                                                |                                                                                   |                                                                                   | •                                                                                 |                                                                                     | •                                                                                   |
| •                                                                                |                                                                                   | •                                                                                 | •                                                                                 |                                                                                     |                                                                                     |
| •                                                                                | •                                                                                 |                                                                                   |                                                                                   | •                                                                                   |                                                                                     |
| 3/8 BSPP                                                                         | Assembly with bayonet quick-release system                                        | 3/8 BSPP                                                                          | 1/2 BSPP<br>3/4 BSPP                                                              | 3/8 BSPP quick-release system                                                       | 1 BSPP<br>1 1/4 BSPP<br>1 1/2 BSPP                                                  |

# Axial-flow hollow cone nozzles Series 220



## Features:

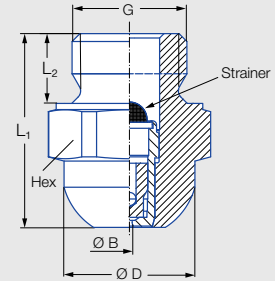
- Extremely fine, fog-like atomization

## Applications:

- Humidification
- Cooling
- Disinfection
- Chemical engineering
- Adiabatic cooling



Series 220



| Code | G        | Dimensions [mm] |                |      |     | Weight [g] |
|------|----------|-----------------|----------------|------|-----|------------|
|      |          | L <sub>1</sub>  | L <sub>2</sub> | Ø D  | Hex |            |
| AC   | 1/4 BSPP | 22.0            | 8.0            | 15.0 | 17  | 27.0       |

| Spray angle | Ordering no. |                      |                      |      | Bore diameter B [mm] | Narrowest free cross section Ø [mm] | Strainer insert mesh size [mm] | V̇ water [l/min] |       |       |       |       |       |       |       | Spray diameter D [mm]<br>(at p = 5 bar)<br> |
|-------------|--------------|----------------------|----------------------|------|----------------------|-------------------------------------|--------------------------------|------------------|-------|-------|-------|-------|-------|-------|-------|----------------------------------------------------------------------------------------------------------------------------------|
|             | Type         | Mat. no.             |                      | Code |                      |                                     |                                | p [bar]          |       |       |       |       |       |       |       |                                                                                                                                  |
|             |              | 1Y                   | 11                   |      |                      |                                     |                                |                  |       |       |       |       |       |       |       |                                                                                                                                  |
|             |              | Stainless steel 316L | Stainless steel 430F |      |                      |                                     |                                | 1/4 BSPP         | 2.0   | 3.0   | 5.0   | 7.0   | 10.0  | 20.0  | 50.0  | 100.0                                                                                                                            |
| 60°         | 220.004      | ●                    | ●                    | AC   | 0.10                 | 0.10                                | 0.04                           | –                | –     | 0.013 | 0.015 | 0.018 | 0.026 | 0.041 | 0.058 | 120                                                                                                                              |
|             | 220.014      | ●                    | ●                    | AC   | 0.15                 | 0.15                                | 0.04                           | –                | 0.015 | 0.019 | 0.022 | 0.027 | 0.038 | 0.060 | 0.085 | 140                                                                                                                              |
|             | 220.054      | ●                    | ●                    | AC   | 0.20                 | 0.15                                | 0.04                           | 0.017            | 0.021 | 0.027 | 0.032 | 0.038 | 0.054 | 0.085 | 0.121 | 160                                                                                                                              |
| 80°         | 220.085      | ●                    | ●                    | AC   | 0.25                 | 0.25                                | 0.10                           | 0.025            | 0.031 | 0.040 | 0.047 | 0.057 | 0.080 | 0.126 | 0.179 | 190                                                                                                                              |
|             | 220.125      | ●                    | ●                    | AC   | 0.35                 | 0.35                                | 0.10                           | 0.039            | 0.048 | 0.062 | 0.073 | 0.088 | 0.124 | 0.196 | 0.277 | 230                                                                                                                              |
|             | 220.145      | ●                    | ●                    | AC   | 0.40                 | 0.40                                | 0.10                           | 0.052            | 0.064 | 0.082 | 0.097 | 0.116 | 0.164 | 0.259 | 0.367 | 250                                                                                                                              |
|             | 220.165      | ●                    | ●                    | AC   | 0.45                 | 0.45                                | 0.10                           | 0.065            | 0.080 | 0.103 | 0.122 | 0.146 | 0.206 | 0.326 | 0.461 | 260                                                                                                                              |
|             | 220.185      | ●                    | ●                    | AC   | 0.55                 | 0.35                                | 0.20                           | 0.082            | 0.101 | 0.130 | 0.154 | 0.184 | 0.260 | 0.411 | 0.581 | 270                                                                                                                              |
|             | 220.205      | ●                    | ●                    | AC   | 0.60                 | 0.35                                | 0.20                           | 0.106            | 0.130 | 0.168 | 0.199 | 0.238 | 0.336 | 0.531 | 0.751 | 280                                                                                                                              |
|             | 220.245      | ●                    | ●                    | AC   | 0.70                 | 0.50                                | 0.20                           | 0.165            | 0.202 | 0.261 | 0.309 | 0.369 | 0.522 | 0.825 | 1.167 | 290                                                                                                                              |
|             | 220.285      | ●                    | ●                    | AC   | 0.90                 | 0.55                                | 0.20                           | 0.247            | 0.302 | 0.390 | 0.461 | 0.552 | 0.780 | 1.233 | 1.744 | 300                                                                                                                              |

| Mat. no. | Housing              | Nozzle insert        | Strainer             |
|----------|----------------------|----------------------|----------------------|
| 1Y       | Stainless steel 316L | Stainless steel 316L | Stainless steel 316L |
| 11       | Stainless steel 430F | Stainless steel 430F | Stainless steel 316L |

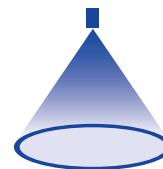
The supplied and integrated strainer insert prevents clogging of the nozzle, thereby ensuring a long service life.

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. + Code = Ordering no.  
example: 220.004 + 1Y + AC = 220.004.1Y.AC

 Assembly accessories can be found in Chapter 9 "Accessories".

# Axial-flow hollow cone nozzles Series 226

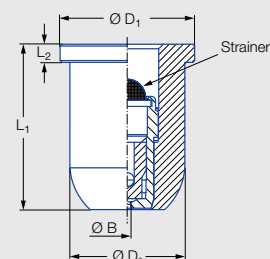


## Features:

- Extremely fine, fog-like atomization
- Assembly with retaining nut

## Applications:

- Humidification
- Cooling
- Disinfection
- Chemical engineering
- Adiabatic cooling



Series 226

| Code                                 | Dimensions [mm] |                |                  |                  | Weight [g] |
|--------------------------------------|-----------------|----------------|------------------|------------------|------------|
|                                      | L <sub>1</sub>  | L <sub>2</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> |            |
| Assembly with retaining nut 3/8 BSPP | 18.00           | 2.00           | 14.80            | 12.65            | 20.00      |

| Spray angle | Ordering no. |                     | Bore diameter B [mm] | Narrowest free cross section Ø [mm] | Strainer insert mesh size [mm] | V̇ water [l/min] |       |       |       |       |       |       |       | Spray diameter D [mm]<br>(at p = 5 bar)                                               |
|-------------|--------------|---------------------|----------------------|-------------------------------------|--------------------------------|------------------|-------|-------|-------|-------|-------|-------|-------|---------------------------------------------------------------------------------------|
|             | Type         | Mat. no.            |                      |                                     |                                | p [bar]          |       |       |       |       |       |       |       |  |
|             |              | 16                  |                      |                                     |                                |                  |       |       |       |       |       |       |       |                                                                                       |
|             |              | Stainless steel 303 |                      |                                     |                                | 2.0              | 3.0   | 5.0   | 7.0   | 10.0  | 20.0  | 50.0  | 100.0 |                                                                                       |
| 60°         | 226.004      | ●                   | 0.10                 | 0.10                                | 0.04                           | –                | –     | 0.013 | 0.015 | 0.018 | 0.026 | 0.041 | 0.058 | 120                                                                                   |
|             | 226.014      | ●                   | 0.15                 | 0.15                                | 0.04                           | –                | 0.015 | 0.019 | 0.022 | 0.027 | 0.038 | 0.060 | 0.085 | 140                                                                                   |
|             | 226.054      | ●                   | 0.20                 | 0.15                                | 0.04                           | 0.017            | 0.021 | 0.027 | 0.032 | 0.038 | 0.054 | 0.085 | 0.121 | 160                                                                                   |
| 80°         | 226.085      | ●                   | 0.25                 | 0.25                                | 0.10                           | 0.025            | 0.031 | 0.040 | 0.047 | 0.057 | 0.080 | 0.126 | 0.179 | 190                                                                                   |
|             | 226.125      | ●                   | 0.35                 | 0.35                                | 0.10                           | 0.039            | 0.048 | 0.062 | 0.073 | 0.088 | 0.124 | 0.196 | 0.277 | 230                                                                                   |
|             | 226.145      | ●                   | 0.40                 | 0.40                                | 0.10                           | 0.052            | 0.064 | 0.082 | 0.097 | 0.116 | 0.164 | 0.259 | 0.367 | 250                                                                                   |
|             | 226.165      | ●                   | 0.45                 | 0.45                                | 0.10                           | 0.065            | 0.080 | 0.103 | 0.122 | 0.146 | 0.206 | 0.326 | 0.461 | 260                                                                                   |
|             | 226.185      | ●                   | 0.55                 | 0.35                                | 0.20                           | 0.082            | 0.101 | 0.130 | 0.154 | 0.184 | 0.260 | 0.411 | 0.581 | 270                                                                                   |
|             | 226.205      | ●                   | 0.60                 | 0.35                                | 0.20                           | 0.106            | 0.130 | 0.168 | 0.199 | 0.238 | 0.336 | 0.531 | 0.751 | 280                                                                                   |
|             | 226.245      | ●                   | 0.70                 | 0.50                                | 0.20                           | 0.165            | 0.202 | 0.261 | 0.309 | 0.369 | 0.522 | 0.825 | 1.167 | 290                                                                                   |
|             | 226.285      | ●                   | 0.90                 | 0.55                                | 0.20                           | 0.247            | 0.302 | 0.390 | 0.461 | 0.552 | 0.780 | 1.233 | 1.744 | 300                                                                                   |

| Mat. no. | Housing             | Nozzle insert        | Strainer             |
|----------|---------------------|----------------------|----------------------|
| 16       | Stainless steel 303 | Stainless steel 430F | Stainless steel 316L |

The supplied and integrated strainer insert prevents clogging of the nozzle, thereby ensuring a long service life.

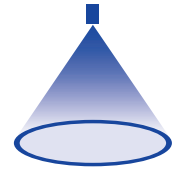
Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. = Ordering no.  
example: 226.004 + 16 = 226.004.16



Assembly accessories can be found in Chapter 9 "Accessories".

# Axial-flow hollow cone nozzles Series 214/216

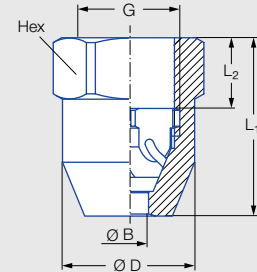


## Features:

- Fine, uniform atomization

## Applications:

- Cooling
- Gas washing
- Dust control
- Sprinkling
- Adiabatic cooling



Series 214/216

| Series | G        | Dimensions [mm] |                |      |     | Weight [g] (Brass) |
|--------|----------|-----------------|----------------|------|-----|--------------------|
|        |          | L <sub>1</sub>  | L <sub>2</sub> | Ø D  | Hex |                    |
| 214    | 1/8 BSPP | 18.0            | 6.0            | 16.0 | 17  | 27.0               |
| 216    | 3/8 BSPP | 29.0            | 12.0           | 21.3 | 22  | 60.0               |

| Spray angle | Ordering no. |                       |       | Bore diameter B [mm] | Narrowest free cross section Ø [mm] | V̇ water [l/min] |      |      |       |       |       |       | Spray diameter D [mm]<br>(at p = 5 bar)<br> |
|-------------|--------------|-----------------------|-------|----------------------|-------------------------------------|------------------|------|------|-------|-------|-------|-------|----------------------------------------------------------------------------------------------------------------------------------|
|             | Type         | Mat. no.              |       |                      |                                     | p [bar]          |      |      |       |       |       |       |                                                                                                                                  |
|             |              | 17                    | 30    |                      |                                     |                  |      |      |       |       |       |       |                                                                                                                                  |
|             |              | Stainless steel 316Ti | Brass |                      |                                     | 0.5              | 1.0  | 2.0  | 3.0   | 5.0   | 10.0  | 20.0  | H =250 [mm]                                                                                                                      |
| 60°         | 214.184      | ●                     | ●     | 0.50                 | 0.50                                | –                | –    | 0.08 | 0.10  | 0.13  | 0.18  | 0.25  | 120                                                                                                                              |
|             | 216.324      | ●                     | ●     | 1.00                 | 1.00                                | –                | 0.28 | 0.40 | 0.49  | 0.63  | 0.89  | 1.26  | 190                                                                                                                              |
|             | 216.364      | ●                     | ●     | 1.40                 | 1.40                                | –                | 0.45 | 0.63 | 0.77  | 1.00  | 1.41  | 1.99  | 220                                                                                                                              |
|             | 216.404      | ●                     | ●     | 2.00                 | 2.00                                | –                | 0.71 | 1.00 | 1.22  | 1.58  | 2.24  | 3.16  | 240                                                                                                                              |
| 80°         | 214.245      | ●                     | ●     | 1.00                 | 0.50                                | –                | –    | 0.16 | 0.20  | 0.25  | 0.36  | 0.51  | 240                                                                                                                              |
|             | 214.305      | ●                     | ●     | 1.80                 | 0.50                                | –                | 0.23 | 0.32 | 0.39  | 0.51  | 0.72  | 1.01  | 320                                                                                                                              |
| 90°         | 216.496      | ●                     | ●     | 3.00                 | 2.00                                | –                | 1.20 | 1.70 | 2.08  | 2.69  | 3.80  | 5.38  | 430                                                                                                                              |
|             | 216.566      | ●                     | ●     | 4.00                 | 2.00                                | –                | 1.77 | 2.50 | 3.06  | 3.95  | 5.59  | 7.91  | 430                                                                                                                              |
|             | 216.646      | ●                     | ●     | 3.50                 | 2.00                                | 2.00             | 2.83 | 4.00 | 4.90  | 6.32  | 8.94  | 12.65 | 440                                                                                                                              |
|             | 216.686      | ●                     | ●     | 4.00                 | 2.00                                | 2.50             | 3.54 | 5.00 | 6.12  | 7.91  | 11.18 | 15.81 | 450                                                                                                                              |
|             | 216.726      | ●                     | ●     | 5.00                 | 2.00                                | 3.15             | 4.45 | 6.30 | 7.72  | 9.96  | 14.09 | 19.92 | 460                                                                                                                              |
|             | 216.776      | ●                     | ●     | 6.00                 | 2.00                                | 4.30             | 6.00 | 8.50 | 10.40 | 13.40 | 19.00 | 26.90 | 470                                                                                                                              |

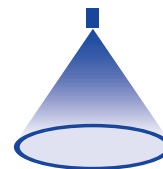
Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. = Ordering no.  
example: 214.184 + 17 = 214.184.17



Assembly accessories can be found in Chapter 9 "Accessories".

# ➤ Axial-flow hollow cone nozzles Series 2TR

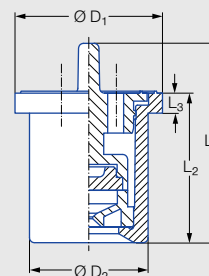


## Features:

- Fine, uniform atomization
- Assembly with retaining nut

## Applications:

- Sprinkling
- Adiabatic cooling
- Cooling
- Humidification of air

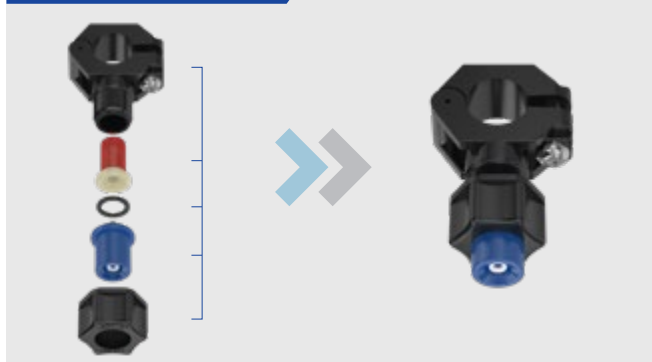


Series 2TR

| Code                                 | Dimensions [mm] |                |                |                  |                  | Weight [g] |
|--------------------------------------|-----------------|----------------|----------------|------------------|------------------|------------|
|                                      | L <sub>1</sub>  | L <sub>2</sub> | L <sub>3</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> |            |
| Assembly with retaining nut 3/8 BSPP | 20.0            | 15.0           | 2.0            | 14.8             | 11.9             | 3.0        |

| Spray angle | Ordering no. |                                 | Color  | Bore diameter B [mm] | Narrowest free cross section Ø [mm] | V̇ water [l/min] |      |      |      |      |      | Spray diameter D [mm]<br>(at p = 5 bar)<br> |
|-------------|--------------|---------------------------------|--------|----------------------|-------------------------------------|------------------|------|------|------|------|------|----------------------------------------------------------------------------------------------------------------------------------|
|             | Type         | Mat. no.                        |        |                      |                                     | p [bar]          |      |      |      |      |      |                                                                                                                                  |
|             |              | C8                              |        |                      |                                     |                  |      |      |      |      |      |                                                                                                                                  |
|             |              | Housing: POM<br>Insert: Ceramic |        |                      |                                     | 1.0              | 2.0  | 3.0  | 5.0  | 7.0  | 10.0 | H = 250 [mm]                                                                                                                     |
| 80°         | 2TR.245      | ●                               | Purple | 0.65                 | 0.55                                | –                | 0.16 | 0.20 | 0.25 | 0.30 | 0.36 | 220                                                                                                                              |
|             | 2TR.275      | ●                               | Black  | 0.80                 | 0.70                                | 0.16             | 0.22 | 0.27 | 0.35 | 0.41 | 0.49 | 260                                                                                                                              |
|             | 2TR.305      | ●                               | Orange | 0.90                 | 0.80                                | 0.23             | 0.32 | 0.39 | 0.51 | 0.60 | 0.72 | 320                                                                                                                              |
|             | 2TR.345      | ●                               | Green  | 1.10                 | 0.90                                | 0.34             | 0.48 | 0.59 | 0.76 | 0.90 | 1.07 | 420                                                                                                                              |
|             | 2TR.365      | ●                               | Yellow | 1.40                 | 0.95                                | 0.46             | 0.65 | 0.80 | 1.03 | 1.22 | 1.45 | 490                                                                                                                              |
|             | 2TR.405      | ●                               | Blue   | 1.70                 | 1.10                                | 0.69             | 0.97 | 1.19 | 1.53 | 1.81 | 2.17 | 530                                                                                                                              |
|             | 2TR.445      | ●                               | Red    | 2.00                 | 1.20                                | 0.89             | 1.26 | 1.55 | 2.02 | 2.37 | 2.83 | 550                                                                                                                              |
|             | 2TR.485      | ●                               | Brown  | 2.20                 | 1.30                                | 1.11             | 1.57 | 1.94 | 2.50 | 2.96 | 3.54 | 560                                                                                                                              |

## Assembly example



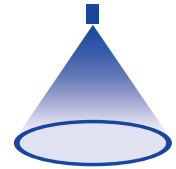
Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. = Ordering no.  
example: 2TR.245 + C8 = 2TR.245.C8



Assembly accessories can be found in Chapter 9 "Accessories".

# >> Tangential-flow hollow cone nozzles, stainless steel/brass version Series 302



## Features:

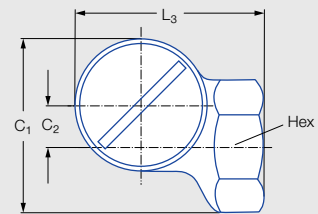
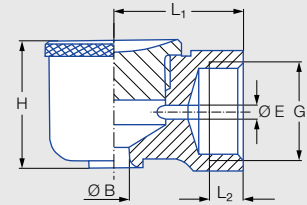
- Uniform atomization
- Non-clogging nozzle without swirl insert

## Applications:

- Humidification of air
- Dust control
- Sprinkling
- Foam control
- Adiabatic cooling



Series 302



| G        | Dimensions [mm] |                |      |                |                |                |     | Weight<br>[g]<br>(Brass) |
|----------|-----------------|----------------|------|----------------|----------------|----------------|-----|--------------------------|
|          | C <sub>1</sub>  | C <sub>2</sub> | H    | L <sub>1</sub> | L <sub>2</sub> | L <sub>3</sub> | Hex |                          |
| 3/8 BSPP | 34.0            | 8.0            | 23.0 | 23.0           | 6.5            | 36.0           | 22  | 90.0                     |

| Spray<br>angle | Ordering no. |                         |       | Bore<br>diameter<br>B<br>[mm] | Narrowest<br>free cross<br>section<br>Ø<br>[mm] | V̇ water [l/min] |      |      |      |       |       |       | Spray diameter<br>D [mm]<br>(at p = 2 bar) |                 |
|----------------|--------------|-------------------------|-------|-------------------------------|-------------------------------------------------|------------------|------|------|------|-------|-------|-------|--------------------------------------------|-----------------|
|                | Type         | Mat. no.                |       |                               |                                                 | p [bar]          |      |      |      |       |       |       | H = 250<br>[mm]                            | H = 500<br>[mm] |
|                |              | 1Y                      | 30    |                               |                                                 |                  |      |      |      |       |       |       |                                            |                 |
|                |              | Stainless steel<br>316L | Brass |                               |                                                 |                  |      |      |      |       |       |       |                                            |                 |
|                |              |                         |       |                               |                                                 | 0.5              | 1.0  | 2.0  | 3.0  | 5.0   | 7.0   | 10.0  |                                            |                 |
| 60°            | 302.364      |                         | ●     | 1.50                          | 1.50                                            | 0.32             | 0.45 | 0.63 | 0.77 | 1.00  | 1.18  | 1.41  | 280                                        | 420             |
|                | 302.464      | ●                       | ●     | 2.00                          | 2.00                                            | 0.70             | 0.99 | 1.40 | 1.71 | 2.21  | 2.62  | 3.13  | 280                                        | 460             |
| 80°            | 302.545      | ●                       | ●     | 4.90                          | 2.30                                            | 1.12             | 1.58 | 2.24 | 2.74 | 3.54  | 4.19  | 5.01  | 360                                        | 660             |
| 90°            | 302.606      | ●                       | ●     | 4.60                          | 4.00                                            | 1.58             | 2.23 | 3.15 | 3.86 | 4.98  | 5.89  | 7.04  | 470                                        | 810             |
| 130°           | 302.368      | ●                       | ●     | 3.00                          | 1.00                                            | 0.32             | 0.45 | 0.63 | 0.77 | 1.00  | 1.18  | 1.41  | 660                                        | 1,080           |
|                | 302.468      | ●                       | ●     | 5.00                          | 1.70                                            | 0.70             | 0.99 | 1.40 | 1.71 | 2.21  | 2.62  | 3.13  | 810                                        | 1,370           |
|                | 302.548      |                         | ●     | 5.00                          | 2.50                                            | 1.12             | 1.58 | 2.24 | 2.74 | 3.54  | 4.19  | 5.01  | 960                                        | 1,640           |
|                | 302.608      | ●                       | ●     | 5.00                          | 3.50                                            | 1.58             | 2.23 | 3.15 | 3.86 | 4.98  | 5.89  | 7.04  | 1,060                                      | 1,800           |
|                | 302.668      |                         | ●     | 7.50                          | 3.60                                            | 2.25             | 3.18 | 4.50 | 5.51 | 7.12  | 8.42  | 10.06 | 1,120                                      | 1,950           |
|                | 302.748      | ●                       | ●     | 7.50                          | 4.80                                            | 3.55             | 5.02 | 7.10 | 8.70 | 11.23 | 13.28 | 15.88 | 1,160                                      | 2,150           |

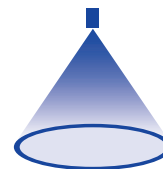
Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. = Ordering no.  
 example: 302.364 + 30 = 302.364.30



Assembly accessories can be found in Chapter 9  
 "Accessories".

# Tangential-flow hollow cone nozzles, plastic version Series 302

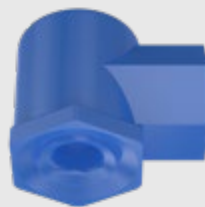


## Features:

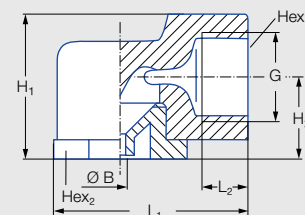
- Uniform atomization
- Non-clogging nozzle without swirl insert

## Applications:

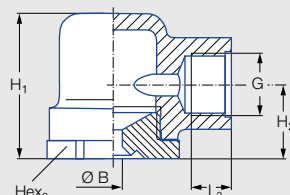
- Humidification of air
- Dust control
- Sprinkling
- Foam control
- Adiabatic cooling



Series 302



Type 302.32x-302.48x



Type 302.52x-302.96x

| Type            | G        | Dimensions [mm] |                |                |                |                  |                  | Weight [g] | p <sub>max</sub> [bar] |
|-----------------|----------|-----------------|----------------|----------------|----------------|------------------|------------------|------------|------------------------|
|                 |          | H <sub>1</sub>  | H <sub>2</sub> | L <sub>1</sub> | L <sub>2</sub> | Hex <sub>1</sub> | Hex <sub>2</sub> |            |                        |
| 302.32x-302.48x | 3/8 BSPP | 27.5            | 16.5           | 43.5           | 10.0           | 22               | 22               | 13.0       | 5.0                    |
| 302.52x-302.96x | 3/8 BSPP | 34.0            | 18.5           | 37.0           | 10.0           | 22               | 22               | 18.0       | 5.0                    |

| Spray angle | Ordering no. |          |      |    | Bore diameter B [mm] | Narrowest free cross section Ø [mm] | V̇ water [l/min] |       |       |       |       | Spray diameter D [mm]<br>(at p = 2 bar) |              |
|-------------|--------------|----------|------|----|----------------------|-------------------------------------|------------------|-------|-------|-------|-------|-----------------------------------------|--------------|
|             | Type         | Mat. no. |      |    |                      |                                     | p [bar]          |       |       |       |       | H = 250 [mm]                            | H = 500 [mm] |
|             |              | 51       | 5E   | 53 |                      |                                     |                  |       |       |       |       |                                         |              |
|             |              | PA       | PVDF | PP |                      |                                     | 0.5              | 1.0   | 2.0   | 3.0   | 5.0   |                                         |              |
| 60°         | 302.364      | ●        |      | ●  | 1.30                 | 1.30                                | 0.32             | 0.45  | 0.63  | 0.77  | 1.00  | 320                                     | 600          |
|             | 302.464      | ●        |      | ●  | 1.95                 | 1.95                                | 0.70             | 0.99  | 1.40  | 1.71  | 2.21  | 330                                     | 620          |
| 90°         | 302.326      | ●        | ●    |    | 1.05                 | 1.05                                | 0.20             | 0.28  | 0.40  | 0.49  | 0.63  | 470                                     | 770          |
|             | 302.366      | ●        | ●    |    | 1.30                 | 1.30                                | 0.32             | 0.45  | 0.63  | 0.77  | 1.00  | 480                                     | 790          |
|             | 302.406      | ●        | ●    | ●  | 1.55                 | 1.55                                | 0.50             | 0.71  | 1.00  | 1.22  | 1.58  | 490                                     | 810          |
|             | 302.486      | ●        |      | ●  | 2.10                 | 2.10                                | 0.80             | 1.13  | 1.60  | 1.96  | 2.53  | 510                                     | 850          |
|             | 302.526      | ●        |      | ●  | 5.00                 | 2.00                                | 1.00             | 1.41  | 2.00  | 2.45  | 3.16  | 520                                     | 870          |
|             | 302.566      | ●        |      | ●  | 5.00                 | 2.40                                | 1.25             | 1.77  | 2.50  | 3.06  | 3.95  | 520                                     | 900          |
|             | 302.606      | ●        |      | ●  | 5.00                 | 3.20                                | 1.58             | 2.23  | 3.15  | 3.86  | 4.98  | 530                                     | 940          |
|             | 302.686      | ●        |      |    | 7.50                 | 3.40                                | 2.50             | 3.54  | 5.00  | 6.12  | 7.91  | 540                                     | 1,010        |
|             | 302.766      | ●        |      |    | 9.00                 | 4.30                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 540                                     | 1,040        |
|             | 302.846      | ●        |      | ●  | 11.00                | 5.20                                | 6.25             | 8.84  | 12.50 | 15.31 | 19.67 | 540                                     | 1,050        |
|             | 302.886      | ●        | ●    | ●  | 11.00                | 6.40                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 540                                     | 1,050        |
|             | 302.966      | ●        |      |    | 11.00                | 8.60                                | 12.50            | 17.68 | 25.00 | 30.62 | 39.53 | 540                                     | 1,050        |





| Spray angle | Ordering no. |          |      |    | Bore diameter B [mm] | Narrowest free cross section Ø [mm] | V̇ water [l/min] |       |       |       |       | Spray diameter D [mm]<br>(at p = 2 bar)                                             |       |
|-------------|--------------|----------|------|----|----------------------|-------------------------------------|------------------|-------|-------|-------|-------|-------------------------------------------------------------------------------------|-------|
|             | Type         | Mat. no. |      |    |                      |                                     | p [bar]          |       |       |       |       |  |       |
|             |              | 51       | 5E   | 53 |                      |                                     |                  |       |       |       |       |                                                                                     |       |
|             |              | PA       | PVDF | PP |                      |                                     | 0.5              | 1.0   | 2.0   | 3.0   | 5.0   |                                                                                     |       |
| 130°        | 302.328      |          | ●    |    | 1.35                 | 0.80                                | 0.20             | 0.28  | 0.40  | 0.49  | 0.63  | 640                                                                                 | 930   |
|             | 302.368      | ●        | ●    |    | 1.85                 | 1.10                                | 0.32             | 0.45  | 0.63  | 0.77  | 1.00  | 660                                                                                 | 1,010 |
|             | 302.408      | ●        | ●    |    | 3.65                 | 1.30                                | 0.50             | 0.71  | 1.00  | 1.22  | 1.58  | 680                                                                                 | 1,110 |
|             | 302.488      | ●        |      | ●  | 5.20                 | 1.60                                | 0.80             | 1.13  | 1.60  | 1.96  | 2.53  | 720                                                                                 | 1,250 |
|             | 302.528      | ●        |      |    | 5.00                 | 2.00                                | 1.00             | 1.41  | 2.00  | 2.45  | 3.16  | 750                                                                                 | 1,330 |
|             | 302.568      | ●        |      |    | 5.00                 | 2.40                                | 1.25             | 1.77  | 2.50  | 3.06  | 3.95  | 780                                                                                 | 1,410 |
|             | 302.608      | ●        | ●    | ●  | 5.00                 | 3.20                                | 1.58             | 2.23  | 3.15  | 3.86  | 4.98  | 820                                                                                 | 1,500 |
|             | 302.648      | ●        |      |    | 7.50                 | 3.00                                | 2.00             | 2.83  | 4.00  | 4.90  | 6.32  | 860                                                                                 | 1,590 |
|             | 302.688      | ●        |      |    | 7.50                 | 3.40                                | 2.50             | 3.54  | 5.00  | 6.12  | 7.91  | 900                                                                                 | 1,650 |
|             | 302.728      | ●        |      |    | 7.50                 | 4.10                                | 3.15             | 4.45  | 6.30  | 7.72  | 9.96  | 920                                                                                 | 1,700 |
|             | 302.768      | ●        |      |    | 9.00                 | 4.30                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 940                                                                                 | 1,730 |
|             | 302.848      | ●        |      |    | 11.00                | 5.20                                | 6.25             | 8.84  | 12.50 | 15.31 | 19.76 | 960                                                                                 | 1,760 |
|             | 302.888      | ●        |      | ●  | 11.00                | 6.40                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 970                                                                                 | 1,780 |
|             | 302.968      | ●        | ●    |    | 11.00                | 8.60                                | 12.50            | 17.68 | 25.00 | 30.62 | 39.53 | 1,000                                                                               | 1,800 |

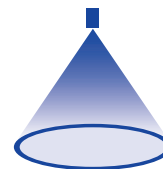
Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. = Ordering no.  
example: 302.328 + 5E = 302.328.5E



Assembly accessories can be found in Chapter 9 "Accessories".

# Tangential-flow hollow cone nozzles, plastic version with bayonet quick-release system Series 302



## Features:

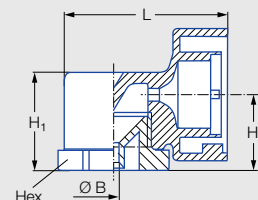
- Uniform atomization
- Non-clogging nozzle without swirl insert
- Quick and secure assembly thanks to bayonet quick-release system
- Setting of spray direction

## Applications:

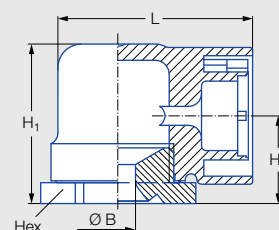
- Humidification of air
- Dust control
- Sprinkling
- Foam control
- Adiabatic cooling



Series 302



Type 302.32x-302.54x



Type 302.6xx.51.KB

| Type            | Code | Dimensions [mm] |                |      |     | Weight [g] | P <sub>max</sub> [bar] |
|-----------------|------|-----------------|----------------|------|-----|------------|------------------------|
|                 |      | H <sub>1</sub>  | H <sub>2</sub> | L    | Hex |            |                        |
| 302.32x-302.54x | KB   | 21.8            | 16.8           | 36.0 | 22  | 12.0       | 5.0                    |
| 302.6xx.51.KB   | KB   | 34.0            | 19.0           | 42.0 | 30  | 19.0       | 5.0                    |

| Spray angle | Ordering no. |          |     |      | Bore diameter B [mm] | Narrowest free cross section Ø [mm] | V̇ water [l/min] |      |      |      |      | Spray diameter D [mm]<br>(at p = 2 bar) |              |
|-------------|--------------|----------|-----|------|----------------------|-------------------------------------|------------------|------|------|------|------|-----------------------------------------|--------------|
|             | Type         | Mat. no. |     | Code |                      |                                     | p [bar]          |      |      |      |      | H = 250 [mm]                            | H = 500 [mm] |
|             |              | 51       | 56  |      |                      |                                     |                  |      |      |      |      |                                         |              |
|             |              | PA       | POM |      |                      |                                     |                  |      |      |      |      |                                         |              |
| 45°         | 302.503      | ●        |     | KB   | 2.05                 | 2.05                                | 0.90             | 1.27 | 1.80 | 2.20 | 2.85 | 210                                     | 430          |
| 60°         | 302.464      |          | ●   | KB   | 1.95                 | 1.95                                | 0.70             | 0.99 | 1.40 | 1.71 | 2.21 | 290                                     | 540          |
| 80°         | 302.545      |          | ●   | KB   | 2.30                 | 2.30                                | 1.12             | 1.58 | 2.24 | 2.74 | 3.54 | 450                                     | 810          |
| 90°         | 302.326      | ●        | ●   | KB   | 1.05                 | 1.05                                | 0.20             | 0.28 | 0.40 | 0.49 | 0.63 | 400                                     | 720          |
|             | 302.406      | ●        | ●   | KB   | 1.55                 | 1.55                                | 0.50             | 0.71 | 1.00 | 1.22 | 1.58 | 400                                     | 740          |
|             | 302.486      | ●        |     | KB   | 2.10                 | 2.10                                | 0.80             | 1.13 | 1.60 | 1.96 | 2.53 | 450                                     | 800          |
|             | 302.606      | ●        |     | KB   | 5.00                 | 3.20                                | 1.58             | 2.23 | 3.15 | 3.86 | 4.98 | 530                                     | 1,000        |
|             | 302.686      |          | ●   | KB   | 7.50                 | 3.40                                | 2.50             | 3.54 | 5.00 | 6.13 | 7.91 | 540                                     | 1,010        |
| 130°        | 302.368      |          | ●   | KB   | 1.30                 | 1.30                                | 0.32             | 0.45 | 0.63 | 0.77 | 1.00 | 660                                     | 1,100        |
|             | 302.408      | ●        | ●   | KB   | 2.00                 | 2.00                                | 0.50             | 0.71 | 1.00 | 1.22 | 1.58 | 680                                     | 1,200        |
|             | 302.468      | ●        |     | KB   | 2.40                 | 2.40                                | 0.70             | 0.99 | 1.40 | 1.71 | 2.21 | 680                                     | 1,250        |
|             | 302.488      | ●        |     | KB   | 2.75                 | 2.75                                | 0.80             | 1.13 | 1.60 | 1.96 | 2.53 | 720                                     | 1,300        |

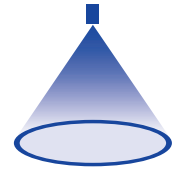
Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{P_2}{P_1}}$

Ordering Type + Material no. + Code = Ordering no.  
 example: 302.503 + 51 + KB = 302.503.51.KB



Assembly accessories can be found in Chapter 9 "Accessories".

# Tangential-flow hollow cone nozzles Series 308



## Features:

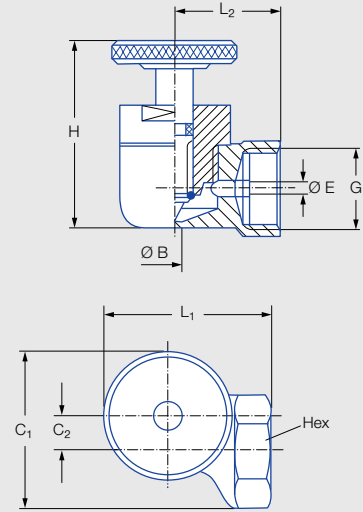
- Uniform atomization
- Non-clogging nozzle without swirl insert
- Adjustable flow rate

## Applications:

- Humidification of air in air washers
- Dust control
- Spraying onto filters
- Foam control
- Cooling



Series 308



| G        | Dimensions [mm] |                |      |                |                |     | Weight [g] |
|----------|-----------------|----------------|------|----------------|----------------|-----|------------|
|          | C <sub>1</sub>  | C <sub>2</sub> | H    | L <sub>1</sub> | L <sub>2</sub> | Hex |            |
| 3/8 BSPP | 34.0            | 8.0            | 40.0 | 36.0           | 23.0           | 22  | 150.0      |

| Spray angle | Ordering no. |          | Bore diameter B [mm] | Narrowest free cross section Ø [mm] | V <sub>max</sub> water [l/min] |      |      |      |      |      | Spray diameter D [mm]<br>(at p = 2 bar)                                               |              |
|-------------|--------------|----------|----------------------|-------------------------------------|--------------------------------|------|------|------|------|------|---------------------------------------------------------------------------------------|--------------|
|             | Type         | Mat. no. |                      |                                     | p [bar]                        |      |      |      |      |      |  |              |
|             |              | 30       |                      |                                     |                                |      |      |      |      |      |                                                                                       |              |
|             |              | Brass    |                      |                                     |                                |      |      |      |      |      |                                                                                       |              |
|             |              |          |                      |                                     | 0.3                            | 0.5  | 1.0  | 2.0  | 5.0  | 10.0 | H = 250 [mm]                                                                          | H = 500 [mm] |
| 90°         | 308.466      | ●        | 2.00                 | 2.00                                | 0.54                           | 0.70 | 1.00 | 1.40 | 2.21 | 3.13 | 440                                                                                   | 830          |
|             | 308.606      | ●        | 4.00                 | 4.00                                | 1.22                           | 1.58 | 2.23 | 3.15 | 4.98 | 7.04 | 460                                                                                   | 850          |

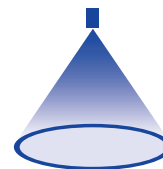
Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. = Ordering no.  
example: 308.466 + 30 = 308.466.30



Assembly accessories can be found in Chapter 9 "Accessories".

# Tangential-flow hollow cone nozzles Series 304/306/307



## Features:

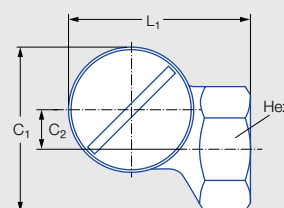
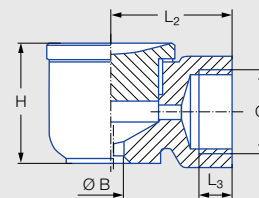
- Uniform atomization
- Non-clogging nozzle without swirl insert

## Applications:

- Storage tank cooling
- Foam control
- Dust control
- Surface spraying
- Absorption



Series 304/306/307



| Series  | G        | Dimensions [mm] |                |      |                |                |                |     | Weight [g] (Brass) |
|---------|----------|-----------------|----------------|------|----------------|----------------|----------------|-----|--------------------|
|         |          | C <sub>1</sub>  | C <sub>2</sub> | H    | L <sub>1</sub> | L <sub>2</sub> | L <sub>3</sub> | Hex |                    |
| 304     | 1/2 BSPP | 43.0            | 11.0           | 33.0 | 46.0           | 30.0           | 11.0           | 27  | 205.0              |
| 306/307 | 3/4 BSPP | 54.0            | 13.0           | 43.0 | 60.0           | 40.0           | 13.0           | 36  | 410.0              |

| Spray angle | Ordering no. |                      |       | Bore diameter B [mm] | Narrowest free cross section Ø [mm] | G ISO 228 | V̇ water [l/min] |       |       |       |       |       |       | Spray diameter D [mm]<br>(at p = 2 bar) |              |
|-------------|--------------|----------------------|-------|----------------------|-------------------------------------|-----------|------------------|-------|-------|-------|-------|-------|-------|-----------------------------------------|--------------|
|             | Type         | Mat. no.             |       |                      |                                     |           | p [bar]          |       |       |       |       |       |       | H = 250 [mm]                            | H = 500 [mm] |
|             |              | 1Y                   | 30    |                      |                                     |           |                  |       |       |       |       |       |       |                                         |              |
|             |              | Stainless steel 316L | Brass |                      |                                     |           |                  |       |       |       |       |       |       |                                         |              |
|             |              |                      |       |                      |                                     |           | 0.5              | 1.0   | 2.0   | 3.0   | 5.0   | 7.0   | 10.0  |                                         |              |
| 90°         | 304.706      | ●                    | ●     | 5.10                 | 5.10                                | 1/2       | 2.80             | 3.96  | 5.60  | 6.86  | 8.85  | 10.48 | 12.52 | 500                                     | 1,000        |
|             | 304.796      | ●                    | ●     | 8.90                 | 6.00                                | 1/2       | 4.75             | 6.72  | 9.50  | 11.64 | 15.02 | 17.77 | 21.24 | 500                                     | 1,000        |
|             | 306.906      | ●                    | ●     | 9.00                 | 9.00                                | 3/4       | 9.00             | 12.73 | 18.00 | 22.05 | 28.46 | 33.67 | 40.25 | 550                                     | 1,050        |
|             | 306.976      | ●                    | ●     | 13.50                | 10.00                               | 3/4       | 13.25            | 18.74 | 26.50 | 32.46 | 41.90 | 49.58 | 59.26 | 550                                     | 1,050        |
| 130°        | 304.818      |                      | ●     | 12.00                | 5.00                                | 1/2       | 5.30             | 7.50  | 10.60 | 12.98 | 16.76 | 19.83 | 23.70 | 1,200                                   | 2,100        |
|             | 304.898      | ●                    | ●     | 12.00                | 7.00                                | 1/2       | 8.50             | 12.02 | 17.00 | 20.82 | 26.88 | 31.80 | 38.01 | 1,250                                   | 2,200        |
|             | 306.978      |                      | ●     | 19.00                | 7.30                                | 3/4       | 13.25            | 18.74 | 26.50 | 32.46 | 41.90 | 49.58 | 59.26 | 1,300                                   | 2,350        |
|             | 307.018      | ●                    | ●     | 19.00                | 8.60                                | 3/4       | 16.75            | 23.69 | 33.50 | 41.03 | 52.97 | 62.67 | 74.91 | 1,300                                   | 2,350        |

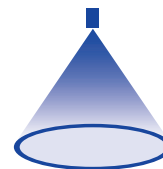
Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. = Ordering no.  
example: 304.706 + 1Y = 307.706.1Y



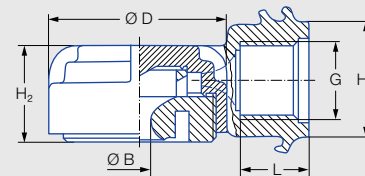
Assembly accessories can be found in Chapter 9 "Accessories".

# Tangential-flow hollow cone nozzles Series 350



## Features:

- High performance nozzle for humidification of air
- Very narrow droplet spectrum
- Extremely uniform liquid distribution over the entire spray pattern
- Quick-release clamp unit available for pipe mounting



## Applications:

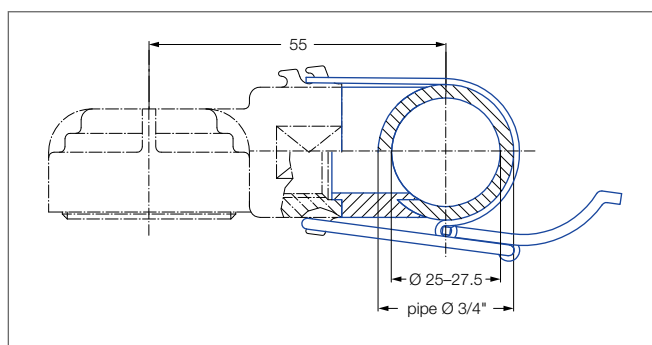
- Foam control
- Dust control
- Surface spraying
- Absorption

Series 350

| G        | Dimensions [mm] |                |      |      | Weight [g] | P <sub>max</sub> [bar] |
|----------|-----------------|----------------|------|------|------------|------------------------|
|          | H <sub>1</sub>  | H <sub>2</sub> | L    | Ø D  |            |                        |
| 3/8 BSPP | 24.0            | 20.0           | 14.0 | 37.0 | 37.0       | 20.0                   |

| Spray angle | Ordering no. |          | Bore diameter B [mm] | Narrowest free cross section Ø [mm] | V̇ water [l/min] |      |      |      |      |      |      | Spray diameter D [mm]<br>(at p = 2 bar)                                               |              |
|-------------|--------------|----------|----------------------|-------------------------------------|------------------|------|------|------|------|------|------|---------------------------------------------------------------------------------------|--------------|
|             | Type         | Mat. no. |                      |                                     | p [bar]          |      |      |      |      |      |      |  |              |
|             |              | 56       |                      |                                     |                  |      |      |      |      |      |      |                                                                                       |              |
|             |              | POM      |                      |                                     | 0.5              | 1.0  | 2.0  | 3.0  | 5.0  | 7.0  | 10.0 |                                                                                       | H = 250 [mm] |
| 130°        | 350.368      | ●        | 1.55                 | 0.70                                | 0.32             | 0.45 | 0.63 | 0.77 | 1.00 | 1.18 | 1.41 | 950                                                                                   | 1,250        |
|             | 350.608      | ●        | 5.00                 | 1.40                                | 1.58             | 2.23 | 3.15 | 3.86 | 4.98 | 5.89 | 7.04 | 990                                                                                   | 1,950        |

## Accessories:



Recommended bore diameter 18 mm.

Quick-release clamp unit: Ordering no. 035.030.15.05.00.0.

Consisting of: Stainless steel clamp, polyurethane gasket.

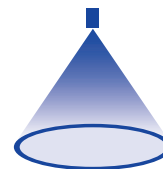
Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. = Ordering no.  
 example: 350.368 + 56 = 350.368.56



Assembly accessories can be found in Chapter 9 "Accessories".

# Eccentric hollow cone nozzles Series 373 Ramp Bottom



## Features:

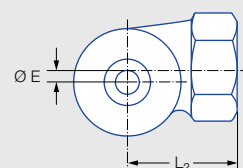
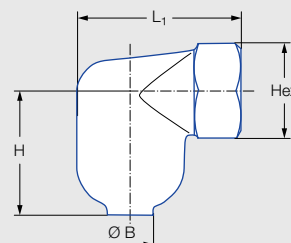
- Fine, uniform atomization even at low pressure
- Patented swirl chamber with built-in ramp extends service life

## Applications:

- Gas cooling
- Water recooling
- Dust control



Series 373



| Code      | G          | Dimensions [mm] |                |                |     |     | Weight [g] |
|-----------|------------|-----------------|----------------|----------------|-----|-----|------------|
|           |            | H               | L <sub>1</sub> | L <sub>2</sub> | E   | Hex |            |
| <b>AN</b> | 1 BSPP     | 52.0            | 67.0           | 45.0           | 6.3 | 41  | 285.0      |
| <b>AQ</b> | 1 1/4 BSPP | 65.0            | 77.0           | 51.0           | 7.9 | 48  | 570.0      |
| <b>AS</b> | 1 1/2 BSPP | 81.0            | 97.0           | 65.0           | 7.9 | 58  | 900.0      |

| Spray angle | Ordering no. |                     |        |            |            | Bore diameter B [mm] | V̇ water [l/min] |        |        |        |        |        | Spray diameter D [mm]<br>(at p = 2 bar)<br> |                |
|-------------|--------------|---------------------|--------|------------|------------|----------------------|------------------|--------|--------|--------|--------|--------|----------------------------------------------------------------------------------------------------------------------------------|----------------|
|             | Type         | Mat. no.            | Code   |            |            |                      |                  |        |        |        |        |        |                                                                                                                                  |                |
|             |              | 17                  | 1 BSPP | 1 1/4 BSPP | 1 1/2 BSPP |                      |                  |        |        |        |        |        |                                                                                                                                  |                |
|             |              | Stainless steel 316 |        |            |            |                      |                  |        |        |        |        |        |                                                                                                                                  |                |
|             |              |                     |        |            |            |                      | p [bar]          |        |        |        |        |        | H = 500 [mm]                                                                                                                     | H = 1,000 [mm] |
|             |              |                     |        |            |            |                      | 0.3              | 0.5    | 1.0    | 2.0    | 5.0    | 10.0   |                                                                                                                                  |                |
| 80°         | 373.115      | ●                   | AN     |            |            | 11.40                | 24.40            | 31.50  | 44.55  | 63.00  | 99.61  | 140.87 | 670                                                                                                                              | 1,200          |
|             | 373.175      | ●                   | AN     |            |            | 12.90                | 30.98            | 40.00  | 56.57  | 80.00  | 126.49 | 178.89 | 800                                                                                                                              | 1,450          |
|             | 373.235      | ●                   |        | AQ         |            | 16.20                | 45.70            | 59.00  | 83.44  | 118.00 | 186.57 | 263.86 | 750                                                                                                                              | 1,300          |
|             | 373.285      | ●                   |        | AQ         |            | 20.50                | 61.97            | 80.00  | 113.14 | 160.00 | 252.98 | 357.77 | 800                                                                                                                              | 1,350          |
|             | 373.325      | ●                   |        |            | AS         | 22.20                | 77.46            | 100.00 | 141.42 | 200.00 | 316.23 | 447.21 | 900                                                                                                                              | 1,500          |
|             | 373.365      | ●                   |        |            | AS         | 23.60                | 87.92            | 113.50 | 160.51 | 227.00 | 358.92 | 507.59 | 830                                                                                                                              | 1,400          |

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

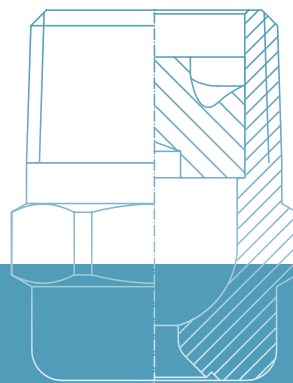
Ordering Type + Material no. + Code = Ordering no.  
 example: 373.115 + 17 + AN = 373.115.17.AN



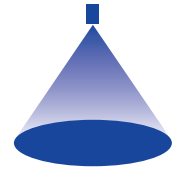
Assembly accessories can be found in Chapter 9 "Accessories".



## FULL CONE NOZZLES



# FULL CONE NOZZLES OVERVIEW OF TYPES



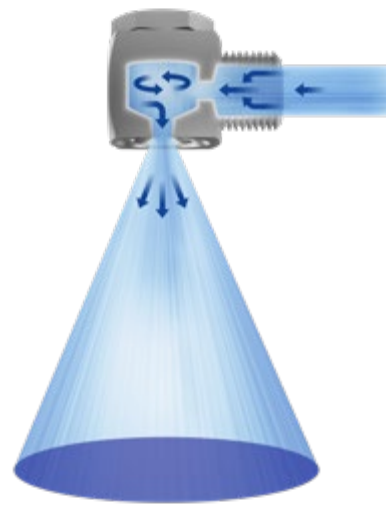
Lechler full cone nozzles are characterised by uniform liquid distribution over the entire circular impact area and are used, among other things, for surface spraying, in cleaning and washing processes and also in chemical process engineering. Full cone nozzles come in a variety of sizes and are made available as an axial full cone or a tangential full cone design. For special applications, unique types are made available, e.g. cluster head nozzles and deflector-plate nozzles.

## Axial-flow full cone nozzles



- Axial flow
- Uniform liquid distribution
- Full surface impact
- Extensive flow rate range
- Extensive range of spray angles
- Standard materials:  
Stainless steel 316Ti/316L, Brass, PVDF (special material available on request)

## Tangential-flow full cone nozzles



- Tangential flow
- Uniform liquid distribution
- Full surface impact
- Maximum free passage making less susceptible to clogging
- Stable spray angle
- Standard materials:  
Stainless steel 316L, Brass, PVDF (special material available on request)

### Cluster head nozzles



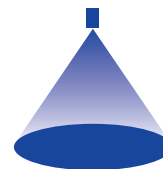
- Axial flow
- Multi-nozzle spray head
- Full surface impact
- Atomized spray – very fine droplets
- Small droplet sizes
- Enlarged droplet surface area
- Standard materials:  
Stainless steel 316Ti/316L, Brass  
(special material available on request)

### Deflector-plate nozzles



- Axial flow
- Large impact area
- Large free cross sections
- Standard materials:  
Stainless steel 316Ti/316L, Brass  
(special material available on request)

# FULL CONE NOZZLES OVERVIEW OF SERIES

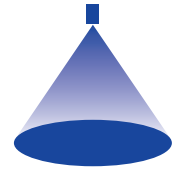


|                                                                                                                     |                                    | Axial-flow full cone nozzles                                                      |                                                                                   |                                                                                     |                                                                                     |
|---------------------------------------------------------------------------------------------------------------------|------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                                                                                                     |                                    |  |  |  |  |
| Series                                                                                                              |                                    | 490/491                                                                           | 460/461                                                                           | 405                                                                                 | 403                                                                                 |
| Information on page                                                                                                 |                                    | 84                                                                                | 87                                                                                | 89                                                                                  | 90                                                                                  |
| <br><b>Flow rate at p = 2 bar</b> | <b>Very low</b><br>< 5 l/min       | •                                                                                 | •                                                                                 |                                                                                     |                                                                                     |
|                                                                                                                     | <b>Low</b><br>5 l/min–25 l/min     | •                                                                                 | •                                                                                 |                                                                                     |                                                                                     |
|                                                                                                                     | <b>Medium</b><br>25 l/min–80 l/min | •                                                                                 | •                                                                                 |                                                                                     |                                                                                     |
|                                                                                                                     | <b>High</b><br>80 l/min–400 l/min  |                                                                                   |                                                                                   | •                                                                                   |                                                                                     |
|                                                                                                                     | <b>Very high</b><br>> 400 l/min    |                                                                                   |                                                                                   |                                                                                     | •                                                                                   |
| <br><b>Spray angle</b>           | <b>Small</b><br>45°                | •                                                                                 |                                                                                   |                                                                                     |                                                                                     |
|                                                                                                                     | <b>Medium</b><br>60°–90°           | •                                                                                 | •                                                                                 | •                                                                                   | •                                                                                   |
|                                                                                                                     | <b>Large</b><br>≥ 120°             | •                                                                                 | •                                                                                 | •                                                                                   | •                                                                                   |
| <br><b>Nozzle material</b>       | <b>Stainless steel</b>             | •                                                                                 |                                                                                   | •                                                                                   | •                                                                                   |
|                                                                                                                     | <b>Brass</b>                       | •                                                                                 |                                                                                   | •                                                                                   |                                                                                     |
|                                                                                                                     | <b>Plastic</b>                     |                                                                                   | •                                                                                 |                                                                                     |                                                                                     |
| <br><b>Nozzle connection</b>     |                                    | 1/8 BSPT<br>1/4 BSPT<br>3/8 BSPT<br>1/2 BSPT<br>3/4 BSPP<br>1 BSPP                | 1/8 BSPT<br>1/4 BSPT<br>3/8 BSPT<br>1/2 BSPT<br>3/4 BSPT<br>3/4 BSPP<br>1 BSPP    | 1 1/4 BSPP<br>1 1/2 BSPP<br>2 BSPP                                                  | 2 1/2 BSPP<br>3 BSPP<br>3 1/2 BSPP<br>4 BSPP                                        |

|                                                                                   |                                                                                   | Tangential-flow full cone nozzles                                                 |                                                                                   | Cluster head nozzles                                                                | Deflector-plate nozzles                                                             |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |  |
| 419                                                                               | 468                                                                               | 422/423                                                                           | 422 with bayonet quick-release system                                             | 502/503                                                                             | 524/525                                                                             |
| 91                                                                                | 92                                                                                | 93/95                                                                             | 97                                                                                | 98                                                                                  | 99                                                                                  |
|                                                                                   | •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                   |                                                                                     |
|                                                                                   | •                                                                                 | •                                                                                 |                                                                                   | •                                                                                   | •                                                                                   |
|                                                                                   |                                                                                   | •                                                                                 |                                                                                   | •                                                                                   | •                                                                                   |
| •<br>(at p = 1 bar)                                                               |                                                                                   | •                                                                                 |                                                                                   |                                                                                     | •                                                                                   |
| •<br>(at p = 1 bar)                                                               |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                   |                                                                                     |
| •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                   | •                                                                                   |
| •                                                                                 | •                                                                                 | •                                                                                 |                                                                                   | •                                                                                   | •                                                                                   |
|                                                                                   | •                                                                                 | •                                                                                 |                                                                                   | •                                                                                   | •                                                                                   |
|                                                                                   | •                                                                                 | •                                                                                 | •                                                                                 |                                                                                     |                                                                                     |
| 2 BSPP<br>2 1/2 BSPP<br>3 BSPP                                                    | Assembly with retaining nut<br>3/8 BSPP                                           | 1/4 BSPT<br>3/8 BSPT<br>1/2 BSPT<br>3/4 BSPT<br>1 BSPT                            | Assembly with bayonet quick-release system                                        | 1/2 BSPP<br>3/4 BSPP                                                                | 1/2 BSPP                                                                            |

# ➤ Axial-flow full cone nozzles

## Series 490/491



### Features:

- Extremely uniform liquid distribution
- Very stable spray angle
- Non clogging due to large free cross sections

### Applications:

- Cleaning and washing processes
- Surface spraying
- Chemical process engineering
- Foam control



Series 490/491

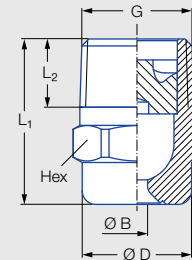


Figure 1

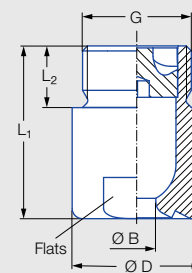


Figure 2

| Code      | Figure | G        | Dimensions [mm] |                |      |           | Weight [g] (brass) |
|-----------|--------|----------|-----------------|----------------|------|-----------|--------------------|
|           |        |          | L <sub>1</sub>  | L <sub>2</sub> | Ø D  | Hex/Flats |                    |
| <b>CA</b> | 1      | 1/8 BSPT | 18.0            | 6.5            | 10.0 | 11        | 13.0               |
| <b>CC</b> | 1      | 1/4 BSPT | 22.0            | 10.0           | 13.0 | 14        | 16.0               |
| <b>CE</b> | 1      | 3/8 BSPT | 24.5            | 10.0           | 16.0 | 17        | 30.0               |
| CE        | 1      | 3/8 BSPT | 30.0            | 10.0           | 16.0 | 17        | 50.0               |
| <b>CG</b> | 1      | 1/2 BSPT | 32.5            | 13.0           | 21.0 | 22        | 60.0               |
| CG        | 1      | 1/2 BSPT | 43.5            | 13.0           | 21.0 | 22        | 85.0               |
| <b>AK</b> | 2      | 3/4 BSPP | 42.0            | 15.0           | 32.0 | 27        | 190.0              |
| <b>AM</b> | 2      | 1 BSPP   | 56.0            | 17.0           | 40.0 | 36        | 350.0              |

| Spray angle | Ordering no. |                      |       |          |          |                 |          |          |        | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min] |       |       |       |       |       |       | Spray diameter D [mm] (at p = 2 bar) |              |
|-------------|--------------|----------------------|-------|----------|----------|-----------------|----------|----------|--------|----------------------|--------------------------------------|------------------|-------|-------|-------|-------|-------|-------|--------------------------------------|--------------|
|             | Type         | Mat. no.             |       | Code     |          |                 |          |          |        |                      |                                      | p [bar]          |       |       |       |       |       |       | H = 250 [mm]                         | H = 500 [mm] |
|             |              | 1Y                   | 30    | 1/8 BSPT | 1/4 BSPT | 3/8 BSPT        | 1/2 BSPT | 3/4 BSPP | 1 BSPP |                      |                                      |                  |       |       |       |       |       |       |                                      |              |
|             |              | Stainless steel 316L | Brass |          |          |                 |          |          |        |                      |                                      |                  |       |       |       |       |       |       |                                      |              |
|             |              |                      |       |          |          |                 |          |          |        |                      |                                      | 0.5              | 1.0   | 2.0   | 3.0   | 5.0   | 7.0   | 10.0  |                                      |              |
| 45°         | 490.403      | ●                    | ●     | CA       |          |                 |          |          |        | 1.25                 | 1.25                                 | 0.57             | 0.76  | 1.00  | 1.18  | 1.44  | 1.65  | 1.90  | 200                                  | 400          |
|             | 490.523      | ●                    | ●     | CA       |          |                 |          |          |        | 1.70                 | 1.70                                 | 1.15             | 1.52  | 2.00  | 2.35  | 2.89  | 3.30  | 3.81  | 200                                  | 410          |
|             | 490.603      | ●                    | ●     |          | CC       | CE <sup>1</sup> |          |          |        | 2.00                 | 2.00                                 | 1.81             | 2.39  | 3.15  | 3.70  | 4.54  | 5.20  | 6.00  | 200                                  | 410          |
|             | 490.643      | ●                    | ●     |          | CC       | CE <sup>1</sup> |          |          |        | 2.45                 | 2.45                                 | 2.30             | 3.03  | 4.00  | 4.70  | 5.77  | 6.60  | 7.61  | 200                                  | 410          |
|             | 490.683      |                      | ●     |          |          | CE              |          |          |        | 2.55                 | 2.55                                 | 2.87             | 3.79  | 5.00  | 5.88  | 7.21  | 8.25  | 9.52  | 210                                  | 410          |
|             | 490.703      |                      | ●     |          |          | CE              |          |          |        | 2.65                 | 2.65                                 | 3.22             | 4.24  | 5.60  | 6.59  | 8.08  | 9.24  | 10.66 | 210                                  | 420          |
|             | 490.723      | ●                    | ●     |          |          | CE              |          |          |        | 2.85                 | 2.85                                 | 3.62             | 4.77  | 6.30  | 7.41  | 9.09  | 10.40 | 11.99 | 210                                  | 420          |
|             | 490.783      |                      | ●     |          |          |                 | CG       |          |        | 3.45                 | 3.45                                 | 5.17             | 6.82  | 9.00  | 10.58 | 12.98 | 14.85 | 17.13 | 210                                  | 430          |
| 490.843     |              | ●                    |       |          |          | CG              |          |          | 3.80   | 3.80                 | 7.18                                 | 9.47             | 12.50 | 14.70 | 18.03 | 20.63 | 23.80 | 220   | 430                                  |              |

<sup>1</sup> Only available in material 30.

| Spray<br>angle | Ordering no. |                      |       |          |          |          |          |          |        | Bore<br>diameter<br>B<br>[mm] | Narrowest<br>free cross<br>sections<br>Ø<br>[mm] | V̇ water [l/min] |       |       |        |        |        |        | Spray<br>diameter D<br>[mm]<br>(at p = 2 bar)<br> |                    |
|----------------|--------------|----------------------|-------|----------|----------|----------|----------|----------|--------|-------------------------------|--------------------------------------------------|------------------|-------|-------|--------|--------|--------|--------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------|
|                | Type         | Mat. no.             |       | Code     |          |          |          |          |        |                               |                                                  | p [bar]          |       |       |        |        |        |        |                                                                                                                                      |                    |
|                |              | 1Y                   | 30    | 1/8 BSPT | 1/4 BSPT | 3/8 BSPT | 1/2 BSPT | 3/4 BSPP | 1 BSPP |                               |                                                  | 0.5              | 1.0   | 2.0   | 3.0    | 5.0    | 7.0    | 10.0   | H =<br>250<br>[mm]                                                                                                                   | H =<br>500<br>[mm] |
|                |              | Stainless steel 316L | Brass |          |          |          |          |          |        |                               |                                                  |                  |       |       |        |        |        |        |                                                                                                                                      |                    |
| 60°            | 490.404      | ●                    | ●     | CA       |          |          |          |          |        | 1.15                          | 1.15                                             | 0.57             | 0.76  | 1.00  | 1.18   | 1.44   | 1.65   | 1.90   | 260                                                                                                                                  | 520                |
|                | 490.444      | ●                    |       | CA       |          |          |          |          |        | 1.25                          | 1.25                                             | 0.72             | 0.95  | 1.25  | 1.47   | 1.80   | 2.06   | 2.38   | 260                                                                                                                                  | 520                |
|                | 490.484      | ●                    | ●     | CA       |          |          |          |          |        | 1.45                          | 1.45                                             | 0.92             | 1.21  | 1.60  | 1.88   | 2.31   | 2.64   | 3.05   | 260                                                                                                                                  | 520                |
|                | 490.524      | ●                    | ●     | CA       |          |          |          |          |        | 1.60                          | 1.60                                             | 1.15             | 1.52  | 2.00  | 2.35   | 2.89   | 3.30   | 3.81   | 270                                                                                                                                  | 530                |
|                | 490.564      | ●                    | ●     | CA       |          |          |          |          |        | 1.80                          | 1.80                                             | 1.44             | 1.89  | 2.50  | 2.94   | 3.61   | 4.13   | 4.76   | 270                                                                                                                                  | 530                |
|                | 490.604      | ●                    | ●     | CA       | CC       | CE       |          |          |        | 2.05                          | 2.05                                             | 1.81             | 2.39  | 3.15  | 3.70   | 4.54   | 5.20   | 6.00   | 270                                                                                                                                  | 540                |
|                | 490.644      | ●                    | ●     |          | CC       | CE       |          |          |        | 2.30                          | 2.30                                             | 2.30             | 3.03  | 4.00  | 4.70   | 5.77   | 6.60   | 7.61   | 270                                                                                                                                  | 540                |
|                | 490.684      | ●                    | ●     |          | CC       | CE       |          |          |        | 2.60                          | 2.60                                             | 2.87             | 3.79  | 5.00  | 5.88   | 7.21   | 8.25   | 9.52   | 280                                                                                                                                  | 550                |
|                | 490.724      | ●                    | ●     |          | CC       | CE       |          |          |        | 2.95                          | 2.80                                             | 3.62             | 4.77  | 6.30  | 7.41   | 9.09   | 10.40  | 11.99  | 280                                                                                                                                  | 560                |
|                | 490.764      | ●                    | ●     |          |          | CE       |          |          |        | 3.25                          | 3.25                                             | 4.59             | 6.06  | 8.00  | 9.41   | 11.54  | 13.20  | 15.23  | 290                                                                                                                                  | 560                |
|                | 490.804      | ●                    | ●     |          |          | CE       |          |          |        | 3.70                          | 3.70                                             | 5.74             | 7.58  | 10.00 | 11.76  | 14.43  | 16.51  | 19.04  | 290                                                                                                                                  | 570                |
|                | 490.844      | ●                    | ●     |          |          |          | CG       |          |        | 4.05                          | 4.05                                             | 7.18             | 9.47  | 12.50 | 14.70  | 18.03  | 20.63  | 23.80  | 290                                                                                                                                  | 570                |
|                | 490.884      | ●                    | ●     |          |          |          | CG       |          |        | 4.65                          | 4.65                                             | 9.19             | 12.13 | 16.00 | 18.82  | 23.08  | 26.41  | 30.46  | 300                                                                                                                                  | 580                |
|                | 490.924      | ●                    | ●     |          |          |          |          | AK       |        | 5.20                          | 5.20                                             | 11.49            | 15.16 | 20.00 | 23.52  | 28.85  | 33.01  | 38.07  | 300                                                                                                                                  | 590                |
|                | 490.964      | ●                    | ●     |          |          |          |          | AK       |        | 5.80                          | 5.80                                             | 14.36            | 18.95 | 25.00 | 29.40  | 36.07  | 41.26  | 47.59  | 300                                                                                                                                  | 590                |
|                | 491.044      | ●                    | ●     |          |          |          |          |          | AM     | 7.25                          | 7.25                                             | 22.97            | 30.31 | 40.00 | 47.04  | 57.71  | 66.02  | 76.15  | 300                                                                                                                                  | 600                |
|                | 491.084      | ●                    | ●     |          |          |          |          |          | AM     | 8.15                          | 8.15                                             | 28.72            | 37.89 | 50.00 | 58.80  | 72.13  | 82.53  | 95.18  | 300                                                                                                                                  | 600                |
| 90°            | 490.406      | ●                    | ●     | CA       |          |          |          |          |        | 1.20                          | 1.20                                             | 0.57             | 0.76  | 1.00  | 1.18   | 1.44   | 1.65   | 1.90   | 490                                                                                                                                  | 880                |
|                | 490.446      |                      | ●     | CA       |          |          |          |          |        | 1.30                          | 1.30                                             | 0.72             | 0.95  | 1.25  | 1.47   | 1.80   | 2.06   | 2.38   | 490                                                                                                                                  | 900                |
|                | 490.486      | ●                    | ●     | CA       |          |          |          |          |        | 1.45                          | 1.45                                             | 0.92             | 1.21  | 1.60  | 1.88   | 2.31   | 2.64   | 3.05   | 500                                                                                                                                  | 900                |
|                | 490.526      | ●                    | ●     | CA       |          |          |          |          |        | 1.70                          | 1.55                                             | 1.15             | 1.52  | 2.00  | 2.35   | 2.89   | 3.30   | 3.81   | 500                                                                                                                                  | 910                |
|                | 490.566      | ●                    | ●     | CA       |          |          |          |          |        | 1.90                          | 1.90                                             | 1.44             | 1.89  | 2.50  | 2.94   | 3.61   | 4.13   | 4.76   | 510                                                                                                                                  | 920                |
|                | 490.606      | ●                    | ●     | CA       |          |          | CE       |          |        | 2.10                          | 2.05                                             | 1.81             | 2.39  | 3.15  | 3.70   | 4.54   | 5.20   | 6.00   | 510                                                                                                                                  | 930                |
|                | 490.646      | ●                    | ●     |          | CC       | CE       |          |          |        | 2.40                          | 2.40                                             | 2.30             | 3.03  | 4.00  | 4.70   | 5.77   | 6.60   | 7.61   | 520                                                                                                                                  | 950                |
|                | 490.686      | ●                    | ●     |          | CC       | CE       |          |          |        | 2.70                          | 2.70                                             | 2.87             | 3.79  | 5.00  | 5.88   | 7.21   | 8.25   | 9.52   | 520                                                                                                                                  | 960                |
|                | 490.726      | ●                    | ●     |          | CC       | CE       |          |          |        | 3.20                          | 2.80                                             | 3.62             | 4.77  | 6.30  | 7.41   | 9.09   | 10.40  | 11.99  | 530                                                                                                                                  | 970                |
|                | 490.746      | ●                    | ●     |          |          | CE       |          |          |        | 3.15                          | 3.15                                             | 4.08             | 5.38  | 7.10  | 8.35   | 10.24  | 11.72  | 13.52  | 530                                                                                                                                  | 980                |
|                | 490.766      | ●                    | ●     |          |          | CE       |          |          |        | 3.40                          | 3.40                                             | 4.59             | 6.06  | 8.00  | 9.41   | 11.54  | 13.20  | 15.23  | 540                                                                                                                                  | 980                |
|                | 490.806      | ●                    | ●     |          |          | CE       |          |          |        | 3.90                          | 3.90                                             | 5.74             | 7.58  | 10.00 | 11.76  | 14.43  | 16.51  | 19.04  | 550                                                                                                                                  | 990                |
|                | 490.846      | ●                    | ●     |          |          | CE       |          |          |        | 4.65                          | 4.00                                             | 7.18             | 9.47  | 12.50 | 14.70  | 18.03  | 20.63  | 23.80  | 550                                                                                                                                  | 1,000              |
|                | 490.886      | ●                    | ●     |          |          |          | CG       |          |        | 5.45                          | 4.50                                             | 9.19             | 12.13 | 16.00 | 18.82  | 23.08  | 26.41  | 30.46  | 550                                                                                                                                  | 1,010              |
|                | 490.926      | ●                    | ●     |          |          |          | CG       |          |        | 5.90                          | 4.50                                             | 11.49            | 15.16 | 20.00 | 23.52  | 28.85  | 33.01  | 38.07  | 560                                                                                                                                  | 1,010              |
|                | 490.966      | ●                    | ●     |          |          |          | CG       | AK       |        | 6.55                          | 4.85                                             | 14.36            | 18.95 | 25.00 | 29.40  | 36.07  | 41.26  | 47.59  | 560                                                                                                                                  | 1,020              |
|                | 491.006      | ●                    | ●     |          |          |          |          | AK       |        | 7.55                          | 5.50                                             | 18.09            | 23.87 | 31.50 | 37.05  | 45.45  | 51.99  | 59.97  | 560                                                                                                                                  | 1,030              |
|                | 491.046      | ●                    | ●     |          |          |          |          | AK       |        | 8.60                          | 6.60                                             | 22.97            | 30.31 | 40.00 | 47.04  | 57.71  | 66.02  | 76.15  | 560                                                                                                                                  | 1,040              |
|                | 491.086      | ●                    | ●     |          |          |          |          |          | AM     | 9.45                          | 7.25                                             | 28.72            | 37.89 | 50.00 | 58.80  | 72.13  | 82.53  | 95.18  | 560                                                                                                                                  | 1,040              |
|                | 491.126      | ●                    | ●     |          |          |          |          |          | AM     | 10.40                         | 8.00                                             | 36.18            | 47.75 | 63.00 | 74.09  | 90.89  | 103.98 | 119.93 | 560                                                                                                                                  | 1,040              |
| 491.146        | ●            |                      |       |          |          |          |          | AM       | 11.00  | 7.50                          | 40.78                                            | 53.81            | 71.00 | 83.50 | 102.43 | 117.19 | 135.16 | 560    | 1,040                                                                                                                                |                    |
| 120°           | 490.368      | ●                    | ●     | CA       |          |          |          |          |        | 0.85                          | 0.65                                             | 0.36             | 0.48  | 0.63  | 0.74   | 0.91   | 1.04   | 1.20   | 700                                                                                                                                  | 1,240              |
|                | 490.408      | ●                    | ●     | CA       |          |          |          |          |        | 1.20                          | 1.20                                             | 0.57             | 0.76  | 1.00  | 1.18   | 1.44   | 1.65   | 1.90   | 720                                                                                                                                  | 1,260              |
|                | 490.448      | ●                    | ●     | CA       |          |          |          |          |        | 1.30                          | 1.30                                             | 0.72             | 0.95  | 1.25  | 1.47   | 1.80   | 2.06   | 2.38   | 740                                                                                                                                  | 1,280              |
|                | 490.488      | ●                    | ●     | CA       |          |          |          |          |        | 1.45                          | 1.45                                             | 0.92             | 1.21  | 1.60  | 1.88   | 2.31   | 2.64   | 3.05   | 760                                                                                                                                  | 1,300              |
|                | 490.528      | ●                    | ●     | CA       |          |          |          |          |        | 1.70                          | 1.70                                             | 1.15             | 1.52  | 2.00  | 2.35   | 2.89   | 3.30   | 3.81   | 780                                                                                                                                  | 1,320              |
|                | 490.568      | ●                    | ●     | CA       |          |          |          |          |        | 1.90                          | 1.90                                             | 1.44             | 1.89  | 2.50  | 2.94   | 3.61   | 4.13   | 4.76   | 800                                                                                                                                  | 1,340              |





| Spray angle | Ordering no. |                      |       |          |          |          |          |          |        | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min] |       |       |       |        |        |        | Spray diameter D [mm]<br>(at p = 2 bar) |              |
|-------------|--------------|----------------------|-------|----------|----------|----------|----------|----------|--------|----------------------|--------------------------------------|------------------|-------|-------|-------|--------|--------|--------|-----------------------------------------|--------------|
|             | Type         | Mat. no.             |       | Code     |          |          |          |          |        |                      |                                      | p [bar]          |       |       |       |        |        |        | H = 250 [mm]                            | H = 500 [mm] |
|             |              | 1Y                   | 30    | 1/8 BSPT | 1/4 BSPT | 3/8 BSPT | 1/2 BSPT | 3/4 BSPP | 1 BSPP |                      |                                      |                  |       |       |       |        |        |        |                                         |              |
|             |              | Stainless steel 316L | Brass |          |          |          |          |          |        |                      |                                      |                  |       |       |       |        |        |        |                                         |              |
| 120°        | 490.608      | ●                    | ●     | CA       |          |          |          |          |        | 2.10                 | 2.05                                 | 1.81             | 2.39  | 3.15  | 3.70  | 4.54   | 5.20   | 6.00   | 820                                     | 1,370        |
|             | 490.648      | ●                    | ●     |          | CC       | CE       |          |          |        | 2.40                 | 2.40                                 | 2.30             | 3.03  | 4.00  | 4.70  | 5.77   | 6.60   | 7.61   | 840                                     | 1,400        |
|             | 490.688      | ●                    | ●     |          | CC       | CE       |          |          |        | 2.75                 | 2.75                                 | 2.87             | 3.79  | 5.00  | 5.88  | 7.21   | 8.25   | 9.52   | 850                                     | 1,430        |
|             | 490.728      | ●                    | ●     |          | CC       | CE       |          |          |        | 3.20                 | 2.80                                 | 3.62             | 4.77  | 6.30  | 7.41  | 9.09   | 10.40  | 11.99  | 860                                     | 1,470        |
|             | 490.748      | ●                    | ●     |          |          | CE       |          |          |        | 3.20                 | 3.20                                 | 4.08             | 5.38  | 7.10  | 8.35  | 10.24  | 11.72  | 13.52  | 870                                     | 1,500        |
|             | 490.768      | ●                    | ●     |          |          | CE       |          |          |        | 3.45                 | 3.45                                 | 4.59             | 6.06  | 8.00  | 9.41  | 11.54  | 13.20  | 15.23  | 880                                     | 1,530        |
|             | 490.808      | ●                    | ●     |          |          | CE       |          |          |        | 3.90                 | 3.90                                 | 5.74             | 7.58  | 10.00 | 11.76 | 14.43  | 16.51  | 19.04  | 900                                     | 1,580        |
|             | 490.848      | ●                    | ●     |          |          | CE       |          |          |        | 4.70                 | 4.00                                 | 7.18             | 9.47  | 12.50 | 14.70 | 18.03  | 20.63  | 23.80  | 910                                     | 1,630        |
|             | 490.888      | ●                    | ●     |          |          |          | CG       |          |        | 5.10                 | 4.50                                 | 9.19             | 12.13 | 16.00 | 18.82 | 23.08  | 26.41  | 30.46  | 920                                     | 1,680        |
|             | 490.928      | ●                    | ●     |          |          |          | CG       |          |        | 5.80                 | 4.75                                 | 11.49            | 15.16 | 20.00 | 23.52 | 28.85  | 33.01  | 38.07  | 930                                     | 1,700        |
|             | 490.968      | ●                    | ●     |          |          |          | CG       | AK       |        | 6.65                 | 4.85                                 | 14.36            | 18.95 | 25.00 | 29.40 | 36.07  | 41.26  | 47.59  | 930                                     | 1,710        |
|             | 491.048      | ●                    | ●     |          |          |          |          | AK       |        | 9.10                 | 5.85                                 | 22.97            | 30.31 | 40.00 | 47.04 | 57.71  | 66.02  | 76.15  | 930                                     | 1,730        |
|             | 491.128      | ●                    | ●     |          |          |          |          |          | AM     | 10.80                | 7.75                                 | 36.18            | 47.75 | 63.00 | 74.09 | 90.89  | 103.98 | 119.93 | 930                                     | 1,740        |
|             | 491.148      | ●                    |       |          |          |          |          |          | AM     | 11.40                | 7.65                                 | 40.78            | 53.81 | 71.00 | 83.50 | 102.43 | 117.19 | 135.16 | 930                                     | 1,750        |

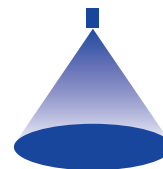
Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \left(\frac{p_2}{p_1}\right)^{0.4}$   
(≤ 10 bar)

Ordering Type + Material no. + Code = Ordering no.  
example: 490.608 + 1Y + CA = 490.608.1Y.CA



Assembly accessories can be found in Chapter 9 "Accessories".

# Axial-flow full cone nozzles Series 460/461



## Features:

- Extremely uniform liquid distribution

## Applications:

- Cleaning and washing processes
- Cooling
- Surface spraying
- Chemical process engineering



Series 460/461

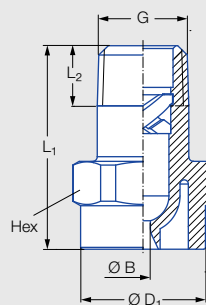


Figure 1

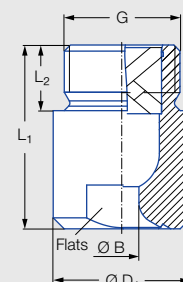


Figure 2

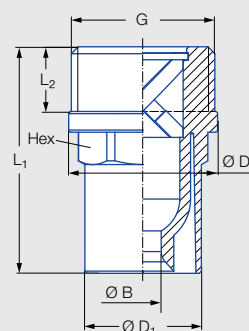


Figure 3

| Code | Figure | G        | Dimensions [mm] |                |                  |                  |           | Weight [g] |
|------|--------|----------|-----------------|----------------|------------------|------------------|-----------|------------|
|      |        |          | L <sub>1</sub>  | L <sub>2</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> | Hex/Flats |            |
| CA   | 1      | 1/8 BSPT | 22.0            | 6.5            | 13.0             | –                | 14        | 2.7        |
| CC   | 1      | 1/4 BSPT | 22.0            | 9.7            | 13.0             | –                | 14        | 3.3        |
| CE   | 1      | 3/8 BSPT | 30.0            | 10.0           | 17.0             | –                | 17        | 6.4        |
| CG   | 1      | 1/2 BSPT | 43.5            | 13.2           | 22.0             | –                | 22        | 14.5       |
| CK   | 2      | 3/4 BSPT | 42.0            | 15.0           | 31.5             | –                | 27        | 19.9       |
| AK   | 2      | 3/4 BSPP | 42.0            | 15.0           | 31.5             | –                | 27        | 24.3       |
| AM   | 3      | 1 BSPP   | 52.5            | 15.0           | 27.0             | 34.5             | 27        | 34.4       |

| Spray angle | Ordering no. |          |          |          |          |          |          |          | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min] |       |       |       |       |       |       | Spray diameter D [mm]<br>(at p = 2 bar)                                               |              |              |      |
|-------------|--------------|----------|----------|----------|----------|----------|----------|----------|----------------------|--------------------------------------|------------------|-------|-------|-------|-------|-------|-------|---------------------------------------------------------------------------------------|--------------|--------------|------|
|             | Type         | Mat. no. | Code     |          |          |          |          |          |                      |                                      | p [bar]          |       |       |       |       |       |       |  | H = 250 [mm] | H = 500 [mm] |      |
|             |              | 5E       | 1/8 BSPT | 1/4 BSPT | 3/8 BSPT | 1/2 BSPT | 3/4 BSPT | 3/4 BSPP |                      |                                      | 1 BSPP           | 0.5   | 1.0   | 2.0   | 3.0   | 5.0   | 7.0   |                                                                                       |              |              | 10.0 |
|             |              | PVDF     |          |          |          |          |          |          |                      |                                      |                  |       |       |       |       |       |       |                                                                                       |              |              |      |
| 60°         | 460.524      | ●        | CA       |          |          |          |          |          |                      | 1.60                                 | 1.60             | 1.15  | 1.52  | 2.00  | 2.35  | 2.89  | 3.30  | 3.81                                                                                  | 210          | 380          |      |
|             | 460.644      | ●        |          | CC       |          |          |          |          |                      | 2.40                                 | 1.90             | 2.30  | 3.03  | 4.00  | 4.70  | 5.77  | 6.60  | 7.61                                                                                  | 240          | 420          |      |
|             | 460.724      | ●        |          | CC       |          |          |          |          |                      | 2.80                                 | 2.10             | 3.15  | 4.45  | 6.30  | 7.72  | 8.91  | 9.96  | 14.09                                                                                 | 260          | 450          |      |
|             | 460.964      | ●        |          |          |          |          |          |          | AK                   | 5.80                                 | 4.90             | 14.36 | 18.95 | 25.00 | 29.40 | 36.07 | 41.26 | 47.59                                                                                 | 310          | 560          |      |





| Spray angle | Ordering no. |                |          |          |          |          |          |          |        | Bore diameter B [mm] | Narrow-est free cross sections Ø [mm] | V̇ water [l/min] |       |       |       |       |       |        | Spray diameter D [mm]<br>(at p = 2 bar)                                             |       |
|-------------|--------------|----------------|----------|----------|----------|----------|----------|----------|--------|----------------------|---------------------------------------|------------------|-------|-------|-------|-------|-------|--------|-------------------------------------------------------------------------------------|-------|
|             | Type         | Mat. no.       | Code     |          |          |          |          |          |        |                      |                                       | p [bar]          |       |       |       |       |       |        |  |       |
|             |              | 5E             | 1/8 BSPT | 1/4 BSPT | 3/8 BSPT | 1/2 BSPT | 3/4 BSPT | 3/4 BSPP | 1 BSPP |                      |                                       | 0.5              | 1.0   | 2.0   | 3.0   | 5.0   | 7.0   | 10.0   |                                                                                     |       |
|             |              | PVDF           |          |          |          |          |          |          |        |                      |                                       |                  |       |       |       |       |       |        |                                                                                     |       |
| 90°         | 460.326      | ●              | CA       |          |          |          |          |          |        | 0.80                 | 0.55                                  | 0.23             | 0.30  | 0.40  | 0.47  | 0.58  | 0.66  | 0.76   | 430                                                                                 | 750   |
|             | 460.406      | ●              | CA       |          |          |          |          |          |        | 1.20                 | 0.85                                  | 0.57             | 0.76  | 1.00  | 1.18  | 1.44  | 1.65  | 1.90   | 440                                                                                 | 780   |
|             | 460.486      | ●              | CA       |          |          |          |          |          |        | 1.45                 | 1.20                                  | 0.92             | 1.21  | 1.60  | 1.88  | 2.31  | 2.64  | 3.05   | 450                                                                                 | 800   |
|             | 460.526      | ●              | CA       |          |          |          |          |          |        | 1.65                 | 1.30                                  | 1.15             | 1.52  | 2.00  | 2.35  | 2.89  | 3.30  | 3.81   | 450                                                                                 | 820   |
|             | 460.606      | ●              | CA       |          | CE       |          |          |          |        | 2.05                 | 1.45                                  | 1.81             | 2.39  | 3.15  | 3.70  | 4.54  | 5.20  | 6.00   | 470                                                                                 | 850   |
|             | 460.646      | ●              |          | CC       |          |          |          |          |        | 2.30                 | 1.80                                  | 2.30             | 3.03  | 4.00  | 4.70  | 5.77  | 6.60  | 7.61   | 480                                                                                 | 870   |
|             | 460.726      | ●              |          |          | CE       |          |          |          |        | 2.95                 | 2.00                                  | 3.62             | 4.77  | 6.30  | 7.41  | 9.09  | 10.40 | 11.99  | 500                                                                                 | 900   |
|             | 460.746      | ●              |          |          | CE       |          |          |          |        | 3.30                 | 1.90                                  | 4.08             | 5.38  | 7.10  | 8.35  | 10.24 | 11.72 | 13.52  | 510                                                                                 | 910   |
|             | 460.766      | ●              |          |          | CE       |          |          |          |        | 3.30                 | 2.40                                  | 4.59             | 6.06  | 8.00  | 9.41  | 11.54 | 13.20 | 15.23  | 510                                                                                 | 910   |
|             | 460.806      | ●              |          |          | CE       |          |          |          |        | 3.70                 | 2.70                                  | 5.74             | 7.58  | 10.00 | 11.76 | 14.43 | 16.51 | 19.04  | 520                                                                                 | 920   |
|             | 460.846      | ●              |          |          | CE       |          |          |          |        | 4.05                 | 3.20                                  | 7.18             | 9.47  | 12.50 | 14.70 | 18.03 | 20.63 | 23.80  | 520                                                                                 | 930   |
|             | 460.886      | ●              |          |          | CE       | CG       |          |          |        | 4.70                 | 3.10                                  | 9.19             | 12.13 | 16.00 | 18.82 | 23.08 | 26.41 | 30.46  | 520                                                                                 | 930   |
|             | 460.926      | ●              |          |          |          | CG       |          |          |        | 5.10                 | 2.80                                  | 11.49            | 15.16 | 20.00 | 23.52 | 28.85 | 33.01 | 38.07  | 520                                                                                 | 940   |
|             | 460.966      | ●              |          |          |          | CG       |          |          |        | 5.80                 | 3.80                                  | 14.36            | 18.95 | 25.00 | 29.40 | 36.07 | 41.26 | 47.59  | 520                                                                                 | 940   |
|             | 461.006      | ●              |          |          |          | CG       |          |          |        | 6.40                 | 3.80                                  | 18.09            | 23.87 | 31.50 | 37.05 | 45.45 | 51.99 | 59.97  | 520                                                                                 | 940   |
|             | 461.046      | ●              |          |          |          |          | CK       |          |        | 7.20                 | 5.30                                  | 22.97            | 30.31 | 40.00 | 47.04 | 57.71 | 66.02 | 76.15  | 520                                                                                 | 950   |
|             | 461.086      | ●              |          |          |          |          |          | AM       |        | 8.40                 | 5.00                                  | 25.00            | 35.36 | 50.00 | 61.24 | 70.71 | 79.06 | 111.80 | 530                                                                                 | 950   |
| 120°        | 460.368      | ●              | CA       |          |          |          |          |          |        | 0.95                 | 0.65                                  | 0.32             | 0.45  | 0.63  | 0.77  | 0.89  | 1.00  | 1.41   | 650                                                                                 | 1,030 |
|             | 460.408      | ●              | CA       |          |          |          |          |          |        | 1.20                 | 0.85                                  | 0.57             | 0.76  | 1.00  | 1.18  | 1.44  | 1.65  | 1.90   | 680                                                                                 | 1,100 |
|             | 460.488      | ●              | CA       |          |          |          |          |          |        | 1.50                 | 1.00                                  | 0.92             | 1.21  | 1.60  | 1.88  | 2.31  | 2.64  | 3.05   | 700                                                                                 | 1,160 |
|             | 460.528      | ●              | CA       |          |          |          |          |          |        | 1.65                 | 1.20                                  | 1.15             | 1.52  | 2.00  | 2.35  | 2.89  | 3.30  | 3.81   | 710                                                                                 | 1,200 |
|             | 460.608      | ●              | CA       |          |          |          |          |          |        | 2.10                 | 1.40                                  | 1.81             | 2.39  | 3.15  | 3.70  | 4.54  | 5.20  | 6.00   | 730                                                                                 | 1,270 |
|             | 460.648      | ●              |          | CC       |          |          |          |          |        | 2.45                 | 1.60                                  | 2.30             | 3.03  | 4.00  | 4.70  | 5.77  | 6.60  | 7.61   | 750                                                                                 | 1,310 |
|             | 460.728      | ●              |          |          | CE       |          |          |          |        | 3.10                 | 1.90                                  | 3.62             | 4.77  | 6.30  | 7.41  | 9.09  | 10.40 | 11.99  | 780                                                                                 | 1,380 |
|             | 460.748      | ●              |          |          | CE       |          |          |          |        | 3.30                 | 1.90                                  | 4.08             | 5.38  | 7.10  | 8.35  | 10.24 | 11.72 | 13.52  | 790                                                                                 | 1,400 |
|             | 460.768      | ●              |          |          | CE       |          |          |          |        | 3.50                 | 1.90                                  | 4.59             | 6.06  | 8.00  | 9.41  | 11.54 | 13.20 | 15.23  | 790                                                                                 | 1,410 |
|             | 460.808      | ●              |          |          | CE       |          |          |          |        | 3.80                 | 2.40                                  | 5.74             | 7.58  | 10.00 | 11.76 | 14.43 | 16.51 | 19.04  | 810                                                                                 | 1,430 |
|             | 460.848      | ●              |          |          | CE       |          |          |          |        | 4.20                 | 2.70                                  | 7.18             | 9.47  | 12.50 | 14.70 | 18.03 | 20.63 | 23.80  | 820                                                                                 | 1,450 |
|             | 460.888      | ●              |          |          |          | CG       |          |          |        | 4.60                 | 3.10                                  | 9.19             | 12.13 | 16.00 | 18.82 | 23.08 | 26.41 | 30.46  | 830                                                                                 | 1,470 |
|             | 460.968      | ●              |          |          |          | CG       |          |          |        | 5.90                 | 4.10                                  | 14.36            | 18.95 | 25.00 | 29.40 | 36.07 | 41.26 | 47.59  | 850                                                                                 | 1,500 |
|             | 461.048      | ● <sup>1</sup> |          |          |          |          | CK       |          |        | 7.60                 | 4.90                                  | 22.97            | 30.31 | 40.00 | 47.04 | 57.71 | 66.02 | 76.15  | 870                                                                                 | 1,530 |

<sup>1</sup> Material PP (mat. no. 53).

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \left(\frac{p_2}{p_1}\right)^{0.4}$   
(≤ 10 bar)

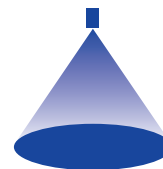
Ordering Type + Material no. + Code = Ordering no.  
example: 460.326 + 5E + CA = 460.326.5E.CA



Assembly accessories can be found in Chapter 9 "Accessories".

# Axial-flow full cone nozzles

## Series 405



### Features:

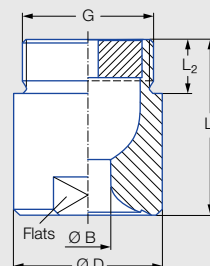
- Extremely uniform liquid distribution

### Applications:

- Surface spraying
- Chemical process engineering
- Cleaning and washing processes
- Water treatment



Series 405



| Code | G          | Dimensions [mm] |                |      |       | Weight [kg] (brass) |
|------|------------|-----------------|----------------|------|-------|---------------------|
|      |            | L <sub>1</sub>  | L <sub>2</sub> | Ø D  | Flats |                     |
| AP   | 1 1/4 BSPP | 50.0            | 19.0           | 49.0 | 41    | 0.5                 |
| AR   | 1 1/2 BSPP | 60.0            | 19.0           | 59.0 | 50    | 0.9                 |
| AV   | 2 BSPP     | 78.0            | 24.0           | 68.0 | 60    | 1.6                 |

| Spray angle | Ordering no. |                      |       |            |            |        | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min] |     |     |     |     |     | Spray diameter D [mm] (at p = 2 bar)<br> |       |
|-------------|--------------|----------------------|-------|------------|------------|--------|----------------------|--------------------------------------|------------------|-----|-----|-----|-----|-----|-------------------------------------------------------------------------------------------------------------------------------|-------|
|             | Type         | Mat. no.             |       | Code       |            |        |                      |                                      | p [bar]          |     |     |     |     |     |                                                                                                                               |       |
|             |              | 1Y                   | 30    | 1 1/4 BSPP | 1 1/2 BSPP | 2 BSPP |                      |                                      | 0.3              | 0.5 | 1.0 | 2.0 | 3.0 | 5.0 |                                                                                                                               |       |
|             |              | Stainless steel 316L | Brass |            |            |        |                      |                                      |                  |     |     |     |     |     |                                                                                                                               |       |
| 60°         | 405.204      | ●                    | ●     | AP         |            |        | 11.2                 | 5.8                                  | 47               | 57  | 76  | 100 | 118 | 144 | 600                                                                                                                           | 1,140 |
|             | 405.284      | ●                    | ●     |            | AR         |        | 14.3                 | 7.0                                  | 75               | 92  | 121 | 160 | 188 | 231 | 630                                                                                                                           | 1,210 |
|             | 405.324      | ●                    | ●     |            |            | AV     | 16.4                 | 7.5                                  | 94               | 115 | 152 | 200 | 235 | 289 | 650                                                                                                                           | 1,250 |
|             | 405.364      | ●                    | ●     |            |            | AV     | 18.4                 | 8.5                                  | 117              | 144 | 189 | 250 | 294 | 361 | 650                                                                                                                           | 1,250 |
|             | 405.404      | ●                    |       |            |            | AV     | 20.0                 | 7.0                                  | 147              | 181 | 239 | 315 | 370 | 454 | 650                                                                                                                           | 1,250 |
| 90°         | 405.206      | ●                    | ●     | AP         |            |        | 12.0                 | 5.0                                  | 47               | 57  | 76  | 100 | 118 | 144 | 1,120                                                                                                                         | 2,100 |
|             | 405.286      | ●                    | ●     |            | AR         |        | 15.2                 | 6.2                                  | 75               | 92  | 121 | 160 | 188 | 231 | 1,120                                                                                                                         | 2,100 |
|             | 405.326      | ●                    |       |            |            | AV     | 17.2                 | 7.7                                  | 94               | 115 | 152 | 200 | 235 | 289 | 1,120                                                                                                                         | 2,100 |
|             | 405.366      | ●                    |       |            |            | AV     | 19.5                 | 8.7                                  | 117              | 144 | 189 | 250 | 294 | 361 | 1,120                                                                                                                         | 2,100 |
|             | 405.406      | ●                    | ●     |            |            | AV     | 22.0                 | 9.5                                  | 147              | 181 | 239 | 315 | 370 | 454 | 1,120                                                                                                                         | 2,100 |
| 120°        | 405.208      | ●                    | ●     | AP         |            |        | 12.7                 | 5.0                                  | 47               | 57  | 76  | 100 | 118 | 144 | 1,850                                                                                                                         | 3,050 |
|             | 405.288      | ●                    | ●     |            | AR         |        | 16.0                 | 6.6                                  | 75               | 92  | 121 | 160 | 188 | 231 | 1,900                                                                                                                         | 3,150 |
|             | 405.328      | ●                    |       |            |            | AV     | 17.8                 | 7.9                                  | 94               | 115 | 152 | 200 | 235 | 289 | 1,900                                                                                                                         | 3,200 |
|             | 405.368      | ●                    | ●     |            |            | AV     | 20.1                 | 8.8                                  | 117              | 144 | 189 | 250 | 294 | 361 | 1,900                                                                                                                         | 3,200 |
|             | 405.408      | ●                    | ●     |            |            | AV     | 22.4                 | 9.1                                  | 147              | 181 | 239 | 315 | 370 | 454 | 1,900                                                                                                                         | 3,200 |

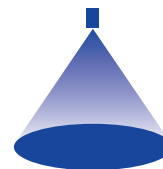
Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \left(\frac{p_2}{p_1}\right)^{0.4}$   
(≤ 10 bar)

Ordering Type + Material no. + Code = Ordering no.  
example: 405.204 + 1Y + AP = 405.204.1Y.AP



Assembly accessories can be found in Chapter 9 "Accessories".

# Axial-flow full cone nozzles Series 403



## Features:

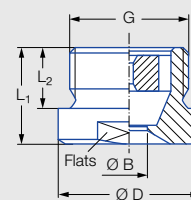
- Extremely uniform liquid distribution

## Applications:

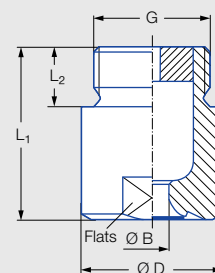
- Surface spraying
- Spraying over packings
- Chemical process engineering
- Cleaning and washing processes
- Cooling



Series 403



90° version



120° version

## 90° version

| Type            | G          | Dimensions [mm] |                |       |       | Weight [kg] |
|-----------------|------------|-----------------|----------------|-------|-------|-------------|
|                 |            | L <sub>1</sub>  | L <sub>2</sub> | Ø D   | Flats |             |
| 403.446/403.486 | 2 1/2 BSPP | 52.0            | 27.0           | 83.0  | 75    | 1.3         |
| 403.526         | 3 BSPP     | 60.0            | 30.0           | 98.0  | 85    | 2.0         |
| 403.606         | 3 1/2 BSPP | 70.0            | 32.0           | 118.0 | 105   | 3.6         |

## 120° version

| Type            | G          | Dimensions [mm] |                |       |       | Weight [kg] |
|-----------------|------------|-----------------|----------------|-------|-------|-------------|
|                 |            | L <sub>1</sub>  | L <sub>2</sub> | Ø D   | Flats |             |
| 403.448/403.488 | 2 1/2 BSPP | 124.0           | 27.0           | 83.0  | 75    | 3.2         |
| 403.528         | 3 BSPP     | 153.0           | 30.0           | 98.0  | 85    | 5.4         |
| 403.608         | 3 1/2 BSPP | 156.0           | 32.0           | 118.0 | 105   | 8.3         |
| 403.628         | 4 BSPP     | 165.0           | 36.0           | 128.0 | 110   | 9.6         |

| Spray angle | Ordering no. |                      | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min] |     |     |       |       |       |       | Spray diameter D [mm]<br>(at p = 2 bar)                                               |                |
|-------------|--------------|----------------------|----------------------|--------------------------------------|------------------|-----|-----|-------|-------|-------|-------|---------------------------------------------------------------------------------------|----------------|
|             | Type         | Mat. no.             |                      |                                      | p [bar]          |     |     |       |       |       |       |  |                |
|             |              | 1Y                   |                      |                                      |                  |     |     |       |       |       |       |                                                                                       |                |
|             |              | Stainless steel 316L |                      |                                      |                  |     |     |       |       |       |       |                                                                                       |                |
|             |              |                      |                      |                                      | 0.3              | 0.5 | 1.0 | 2.0   | 3.0   | 5.0   | 7.0   | H = 500 [mm]                                                                          | H = 1,000 [mm] |
| 90°         | 403.446      | ●                    | 25.0                 | 12.0                                 | 187              | 230 | 303 | 400   | 470   | 577   | 660   | 1,000                                                                                 | 1,780          |
|             | 403.486      | ●                    | 29.5                 | 12.0                                 | 234              | 287 | 379 | 500   | 588   | 721   | 825   | 1,000                                                                                 | 1,780          |
|             | 403.526      | ●                    | 32.0                 | 13.8                                 | 295              | 362 | 477 | 630   | 741   | 909   | 1,040 | 1,000                                                                                 | 1,780          |
|             | 403.606      | ●                    | 40.0                 | 15.0                                 | 468              | 574 | 758 | 1,000 | 1,176 | 1,443 | 1,651 | 1,000                                                                                 | 1,780          |
| 120°        | 403.448      | ●                    | 25.5                 | 10.0                                 | 187              | 230 | 303 | 400   | 470   | 577   | 660   | 1,700                                                                                 | 2,930          |
|             | 403.488      | ●                    | 29.5                 | 11.0                                 | 234              | 287 | 379 | 500   | 588   | 721   | 825   | 1,700                                                                                 | 2,930          |
|             | 403.528      | ●                    | 32.0                 | 15.0                                 | 295              | 362 | 477 | 630   | 741   | 909   | 1,040 | 1,700                                                                                 | 2,930          |
|             | 403.608      | ●                    | 42.0                 | 12.0                                 | 468              | 574 | 758 | 1,000 | 1,176 | 1,443 | 1,651 | 1,700                                                                                 | 2,930          |
|             | 403.628      | ●                    | 45.0                 | 15.0                                 | 585              | 718 | 947 | 1,250 | 1,470 | 1,803 | 2,063 | 1,700                                                                                 | 2,930          |

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \left(\frac{p_2}{p_1}\right)^{0.4}$   
(≤ 10 bar)

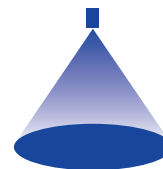
Ordering Type + Material no. = Ordering no.  
example: 403.446 + 1Y = 403.446.1Y



Assembly accessories can be found in Chapter 9 "Accessories".

# Axial-flow full cone nozzles

## Series 419 FreeFlow



### Features:

- Non clogging due to very large free cross sections
- Very stable spray angle
- Uniform liquid distribution

### Applications:

- Cleaning and washing processes
- Dust control
- Absorption
- Distillation

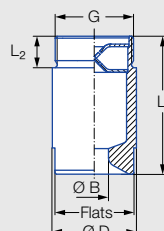


Figure 1

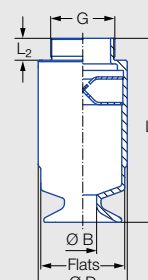


Figure 2

Series 419

| Type    | Code | Figure | G          | Dimensions [mm] |                |       |       | Weight [kg] |
|---------|------|--------|------------|-----------------|----------------|-------|-------|-------------|
|         |      |        |            | L <sub>1</sub>  | L <sub>2</sub> | Ø D   | Flats |             |
| 419.3xx | AV   | 1      | 2 BSPP     | 114.0           | 24.0           | 64.0  | 60    | 1.2         |
| 419.4xx | AV   | 2      | 2 BSPP     | 163.0           | 24.0           | 80.0  | 75    | 2.0         |
| 419.51x | AV   | 2      | 2 BSPP     | 199.0           | 24.0           | 102.0 | 95    | 3.7         |
| 419.51x | AY   | 2      | 2 1/2 BSPP | 202.0           | 27.0           | 102.0 | 95    | 3.8         |
| 419.54x | AY   | 2      | 2 1/2 BSPP | 202.0           | 27.0           | 102.0 | 95    | 3.8         |
| 419.57x | AY   | 2      | 2 1/2 BSPP | 231.0           | 27.0           | 115.0 | 105   | 5.2         |
| 419.57x | LA   | 2      | 3 BSPP     | 233.0           | 30.0           | 115.0 | 105   | 5.2         |
| 419.6xx | LA   | 2      | 3 BSPP     | 252.0           | 30.0           | 122.0 | 115   | 5.4         |

| Spray angle <sup>1</sup> | Ordering no. |                      |      |    |      | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min] |            |        |       |       | Spray diameter D [mm]<br>(at p = 1 bar)                                               |       |
|--------------------------|--------------|----------------------|------|----|------|----------------------|--------------------------------------|------------------|------------|--------|-------|-------|---------------------------------------------------------------------------------------|-------|
|                          | Type         | Mat. no.             | Code |    |      |                      |                                      | p [bar]          |            |        |       |       |  |       |
|                          |              | 1Y                   |      |    |      |                      |                                      |                  |            |        |       |       |                                                                                       |       |
|                          |              | Stainless steel 316L |      |    |      |                      |                                      | 2 BSPP           | 2 1/2 BSPP | 3 BSPP | 0.3   | 0.5   |                                                                                       | 1.0   |
| 90°                      | 419.366      | ●                    | AV   |    |      | 18.0                 | 17.5                                 | 117              | 143        | 189    | 249   | 360   | 1,200                                                                                 | 2,200 |
|                          | 419.396      | ●                    | AV   |    |      | 20.5                 | 17.5                                 | 140              | 172        | 227    | 300   | 432   | 1,200                                                                                 | 2,200 |
|                          | 419.446      | ●                    | AV   |    |      | 23.0                 | 20.5                                 | 187              | 230        | 303    | 400   | 577   | 1,200                                                                                 | 2,200 |
|                          | 419.486      | ●                    | AV   |    |      | 28.0                 | 20.5                                 | 234              | 287        | 379    | 500   | 721   | 1,200                                                                                 | 2,200 |
|                          | 419.516      | ●                    | AV   | AY |      | 27.2                 | 24.1                                 | 281              | 345        | 455    | 600   | 866   | 1,200                                                                                 | 2,200 |
|                          | 419.546      | ●                    |      | AY |      | 33.0                 | 24.1                                 | 332              | 408        | 538    | 710   | 1,024 | 1,200                                                                                 | 2,200 |
|                          | 419.576      | ●                    |      | AY | LA   | 34.0                 | 27.2                                 | 398              | 488        | 644    | 850   | 1,226 | 1,200                                                                                 | 2,200 |
|                          | 419.606      | ●                    |      |    | LA   | 37.5                 | 30.1                                 | 468              | 574        | 758    | 1,000 | 1,443 | 1,200                                                                                 | 2,200 |
| 419.626                  | ●            |                      |      | LA | 43.0 | 30.1                 | 585                                  | 718              | 947        | 1,250  | 1,803 | 1,200 | 2,200                                                                                 |       |
| 120°                     | 419.368      | ●                    | AV   |    |      | 20.5                 | 17.4                                 | 117              | 143        | 189    | 249   | 360   | 1,660                                                                                 | 2,900 |
|                          | 419.398      | ●                    | AV   |    |      | 23.5                 | 17.4                                 | 140              | 172        | 227    | 300   | 432   | 1,660                                                                                 | 2,900 |
|                          | 419.448      | ●                    | AV   |    |      | 24.5                 | 20.5                                 | 187              | 230        | 303    | 400   | 577   | 1,660                                                                                 | 2,900 |
|                          | 419.488      | ●                    | AV   |    |      | 29.5                 | 20.5                                 | 234              | 287        | 379    | 500   | 721   | 1,660                                                                                 | 2,900 |
|                          | 419.518      | ●                    | AV   | AY |      | 27.2                 | 24.1                                 | 281              | 345        | 455    | 600   | 866   | 1,660                                                                                 | 2,900 |
|                          | 419.548      | ●                    |      | AY |      | 34.0                 | 24.1                                 | 332              | 408        | 538    | 710   | 1,024 | 1,660                                                                                 | 2,900 |
|                          | 419.578      | ●                    |      | AY | LA   | 34.0                 | 28.6                                 | 398              | 488        | 644    | 850   | 1,226 | 1,660                                                                                 | 2,900 |
|                          | 419.608      | ●                    |      |    | LA   | 38.0                 | 32.2                                 | 468              | 574        | 758    | 1,000 | 1,443 | 1,660                                                                                 | 2,900 |
|                          | 419.628      | ●                    |      |    | LA   | 43.5                 | 32.2                                 | 585              | 718        | 947    | 1,250 | 1,803 | 1,660                                                                                 | 2,900 |

<sup>1</sup> Spray angle at 1 bar.

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \left(\frac{p_2}{p_1}\right)^{0.4}$   
(≤ 10 bar)

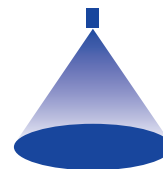
Ordering Type + Material no. + Code = Ordering no.  
example: 419.366 + 1Y + AV = 419.366.1Y.AV



Assembly accessories can be found in Chapter 9 "Accessories".

# ➤ Axial-flow full cone nozzles

## Series 468



### Features:

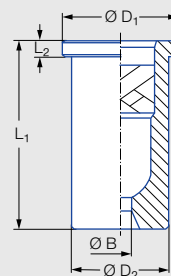
- Extremely uniform liquid distribution
- Assembly with retaining nut

### Applications:

- Surface spraying
- Chemical process engineering
- Cleaning and washing processes
- Water treatment



Series 468



| Code                                 | Dimensions [mm] |                  |                  | Weight [g] (brass) |
|--------------------------------------|-----------------|------------------|------------------|--------------------|
|                                      | L <sub>2</sub>  | Ø D <sub>1</sub> | Ø D <sub>2</sub> |                    |
| Assembly with retaining nut 3/8 BSPP | 2.00            | 14.80            | 12.65            | 18.00              |

| Spray angle | Ordering no. |                                                |       |      | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | L <sub>1</sub> [mm] | V̇ water [l/min] |      |       |       |       |       | Spray diameter D [mm]<br>(at p = 2 bar) |              |
|-------------|--------------|------------------------------------------------|-------|------|----------------------|--------------------------------------|---------------------|------------------|------|-------|-------|-------|-------|-----------------------------------------|--------------|
|             | Type         | Mat. no.                                       |       |      |                      |                                      |                     | p [bar]          |      |       |       |       |       | H = 250 [mm]                            | H = 500 [mm] |
|             |              | 17 <sup>1</sup>                                | 30    | 5E   |                      |                                      |                     |                  |      |       |       |       |       |                                         |              |
|             |              | Stainless steel 316Ti/<br>Stainless steel 316L | Brass | PVDF |                      |                                      |                     | 0.5              | 1.0  | 2.0   | 3.0   | 5.0   | 10.0  |                                         |              |
| 60°         | 468.604      | ●                                              | ●     |      | 2.05                 | 1.40                                 | 18.00               | 1.81             | 2.39 | 3.15  | 3.70  | 4.54  | 6.00  | 280                                     | 560          |
|             | 468.644      |                                                | ●     | ●    | 2.40                 | 1.90                                 | 24.50               | 2.30             | 3.03 | 4.00  | 4.70  | 5.77  | 7.61  | 290                                     | 570          |
|             | 468.684      |                                                | ●     |      | 2.60                 | 2.00                                 | 24.50               | 2.87             | 3.79 | 5.00  | 5.88  | 7.21  | 9.52  | 300                                     | 580          |
|             | 468.724      | ●                                              | ●     |      | 2.90                 | 2.00                                 | 24.50               | 3.62             | 4.77 | 6.30  | 7.41  | 9.09  | 11.99 | 310                                     | 590          |
| 90°         | 468.526      | ●                                              | ●     | ●    | 1.65                 | 1.30                                 | 18.00               | 1.15             | 1.52 | 2.00  | 2.35  | 2.89  | 3.81  | 460                                     | 780          |
|             | 468.846      | ●                                              | ●     |      | 4.05                 | 3.20                                 | 24.50               | 7.18             | 9.47 | 12.50 | 14.70 | 18.03 | 23.80 | 500                                     | 920          |
| 120°        | 468.368      |                                                | ●     |      | 0.95                 | 0.70                                 | 18.00               | 0.36             | 0.48 | 0.63  | 0.74  | 0.91  | 1.20  | 740                                     | 1,750        |
|             | 468.408      | ●                                              | ●     |      | 1.20                 | 0.85                                 | 18.00               | 0.57             | 0.76 | 1.00  | 1.18  | 1.44  | 1.90  | 740                                     | 1,750        |
|             | 468.488      | ●                                              | ●     |      | 1.50                 | 1.00                                 | 18.00               | 0.92             | 1.21 | 1.60  | 1.88  | 2.31  | 3.05  | 740                                     | 1,750        |
|             | 468.528      | ●                                              | ●     |      | 1.65                 | 1.20                                 | 18.00               | 1.15             | 1.52 | 2.00  | 2.35  | 2.89  | 3.81  | 740                                     | 1,750        |

<sup>1</sup> We reserve the right to supply material 316Ti or 316L under material no. 17.

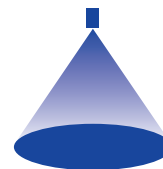
Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \left(\frac{p_2}{p_1}\right)^{0.4}$   
(≤ 10 bar)

Ordering Type + Material no. = Ordering no.  
example: 468.604 + 17 = 468.604.17



Assembly accessories can be found in Chapter 9 "Accessories".

# Tangential-flow full cone nozzles stainless steel/brass version Series 422/423



## Features:

- Tangentially arranged supply of liquid
- Without swirl inserts
- Non-clogging
- Stable spray angle
- Uniform liquid distribution

## Applications:

- Surface spraying
- Cooling
- Cleaning and washing processes
- Foam control



Series 422/423

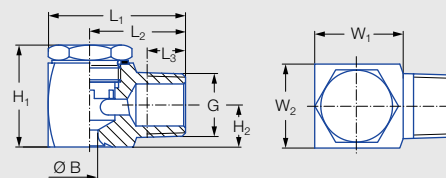


Figure 1

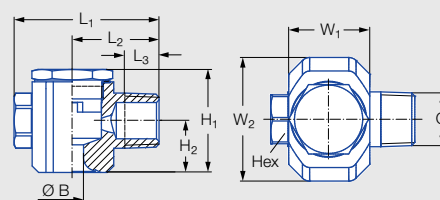


Figure 2

| Code      | Figure | G        | Dimensions [mm] |                |                |                |                |                |                |     | Weight [g]<br>(stainless steel<br>316L) |
|-----------|--------|----------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----|-----------------------------------------|
|           |        |          | H <sub>1</sub>  | H <sub>2</sub> | L <sub>1</sub> | L <sub>2</sub> | L <sub>3</sub> | W <sub>1</sub> | W <sub>2</sub> | Hex |                                         |
| <b>CC</b> | 1      | 1/4 BSPT | 21.0            | 8.0            | 28.0           | 20.0           | 9.7            | 15.6           | 16.0           | –   | 44.0                                    |
| <b>CE</b> | 1      | 3/8 BSPT | 26.7            | 11.0           | 36.0           | 25.0           | 10.1           | 23.2           | 22.0           | –   | 101.0                                   |
| <b>CG</b> | 2      | 1/2 BSPT | 40.0            | 20.0           | 56.0           | 33.5           | 13.2           | 32.0           | 48.0           | 19  | 370.0                                   |
| <b>CK</b> | 2      | 3/4 BSPT | 57.0            | 23.5           | 65.5           | 38.5           | 14.5           | 40.0           | 63.0           | 27  | 830.0                                   |
| <b>CM</b> | 2      | 1 BSPT   | 66.0            | 27.3           | 85.0           | 48.5           | 16.8           | 55.0           | 78.0           | 36  | 1.581.0                                 |

| Spray<br>angle | Ordering no. |                         |       |          |          |          |          |        | Bore<br>diameter<br>B<br>[mm] | Narrowest<br>free cross<br>sections<br>Ø<br>[mm] | V̇ water [l/min] |       |       |       |       |       | Spray<br>diameter D<br>[mm]<br>(at p = 2 bar) |                 |
|----------------|--------------|-------------------------|-------|----------|----------|----------|----------|--------|-------------------------------|--------------------------------------------------|------------------|-------|-------|-------|-------|-------|-----------------------------------------------|-----------------|
|                | Type         | Mat. no.                |       | Code     |          |          |          |        |                               |                                                  | p [bar]          |       |       |       |       |       | H = 250<br>[mm]                               | H = 500<br>[mm] |
|                |              | 1Y                      | 30    |          |          |          |          |        |                               |                                                  |                  |       |       |       |       |       |                                               |                 |
|                |              | Stainless steel<br>316L | Brass |          |          |          |          |        |                               |                                                  |                  |       |       |       |       |       |                                               |                 |
|                |              |                         |       | 1/4 BSPT | 3/8 BSPT | 1/2 BSPT | 3/4 BSPT | 1 BSPT |                               |                                                  | 0.5              | 1.0   | 2.0   | 3.0   | 5.0   | 10.0  |                                               |                 |
| 60°            | 422.644      | ●                       | ●     |          | CE       |          |          |        | 3.00                          | 3.00                                             | 2.00             | 2.83  | 4.00  | 4.90  | 6.32  | 8.94  | 300                                           | 580             |
| 90°            | 422.406      | ●                       | ●     | CC       |          |          |          |        | 1.40                          | 1.40                                             | 0.50             | 0.71  | 1.00  | 1.22  | 1.58  | 2.24  | 430                                           | 800             |
|                | 422.486      | ●                       |       | CC       |          |          |          |        | 1.85                          | 1.85                                             | 0.80             | 1.13  | 1.60  | 1.96  | 2.53  | 3.58  | 450                                           | 820             |
|                | 422.566      | ●                       | ●     | CC       |          |          |          |        | 2.25                          | 2.25                                             | 1.25             | 1.77  | 2.50  | 3.06  | 3.95  | 5.59  | 470                                           | 840             |
|                | 422.606      | ●                       | ●     |          | CE       |          |          |        | 2.55                          | 2.55                                             | 1.57             | 2.23  | 3.15  | 3.86  | 4.98  | 7.04  | 480                                           | 860             |
|                | 422.646      | ●                       | ●     |          | CE       |          |          |        | 2.90                          | 2.90                                             | 2.00             | 2.83  | 4.00  | 4.90  | 6.32  | 8.94  | 500                                           | 880             |
|                | 422.726      |                         | ●     |          | CE       |          |          |        | 3.70                          | 3.70                                             | 3.15             | 4.45  | 6.30  | 7.72  | 9.96  | 14.09 | 520                                           | 910             |
|                | 422.766      | ●                       |       |          | CE       |          |          |        | 4.15                          | 4.15                                             | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 17.89 | 520                                           | 910             |
|                | 422.806      |                         | ●     |          | CE       |          |          |        | 4.65                          | 4.65                                             | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 22.36 | 520                                           | 910             |
|                | 422.846      | ●                       | ●     |          | CE       |          |          |        | 5.30                          | 5.30                                             | 6.25             | 8.84  | 12.50 | 15.31 | 19.76 | 27.95 | 520                                           | 910             |
|                | 422.886      | ●                       | ●     |          | CE       |          |          |        | 5.85                          | 5.85                                             | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 35.78 | 520                                           | 910             |
|                | 422.966      | ●                       |       |          |          | CG       |          |        | 8.00                          | 8.00                                             | 12.50            | 17.68 | 25.00 | 30.62 | 39.53 | 55.90 | 520                                           | 910             |





| Spray angle | Ordering no. |                      |       |      |    |    |    |    | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min] |       |        |        |        |              | Spray diameter D [mm]<br>(at p = 2 bar)                                             |          |
|-------------|--------------|----------------------|-------|------|----|----|----|----|----------------------|--------------------------------------|------------------|-------|--------|--------|--------|--------------|-------------------------------------------------------------------------------------|----------|
|             | Type         | Mat. no.             |       | Code |    |    |    |    |                      |                                      | p [bar]          |       |        |        |        |              |  |          |
|             |              | 1Y                   | 30    |      |    |    |    |    |                      |                                      |                  |       |        |        |        |              |                                                                                     |          |
|             |              | Stainless steel 316L | Brass |      |    |    |    |    |                      |                                      |                  |       |        |        |        | 1/4 BSPT     |                                                                                     | 3/8 BSPT |
|             |              |                      |       |      |    |    |    |    |                      | 0.5                                  | 1.0              | 2.0   | 3.0    | 5.0    | 10.0   | H = 250 [mm] | H = 500 [mm]                                                                        |          |
| 120°        | 422.488      |                      | ●     | CC   |    |    |    |    | 1.90                 | 1.90                                 | 0.80             | 1.13  | 1.60   | 1.96   | 2.53   | 3.58         | 670                                                                                 | 1,200    |
|             | 422.568      | ●                    | ●     | CC   |    |    |    |    | 2.45                 | 2.40                                 | 1.25             | 1.77  | 2.50   | 3.06   | 3.95   | 5.59         | 700                                                                                 | 1,230    |
|             | 422.608      |                      | ●     |      | CE |    |    |    | 2.70                 | 2.70                                 | 1.57             | 2.23  | 3.15   | 3.86   | 4.98   | 7.04         | 710                                                                                 | 1,250    |
|             | 422.728      | ●                    | ●     |      | CE |    |    |    | 4.00                 | 3.90                                 | 3.15             | 4.45  | 6.30   | 7.72   | 9.96   | 14.09        | 770                                                                                 | 1,360    |
|             | 422.808      | ●                    |       |      | CE |    |    |    | 4.90                 | 4.90                                 | 5.00             | 7.07  | 10.00  | 12.25  | 15.81  | 22.36        | 830                                                                                 | 1,490    |
|             | 422.848      | ●                    | ●     |      | CE |    |    |    | 5.30                 | 5.30                                 | 6.25             | 8.84  | 12.50  | 15.31  | 19.76  | 27.95        | 860                                                                                 | 1,550    |
|             | 422.888      | ●                    | ●     |      | CE |    |    |    | 6.60                 | 6.00                                 | 8.00             | 11.31 | 16.00  | 19.60  | 25.30  | 35.78        | 880                                                                                 | 1,570    |
|             | 422.928      | ●                    |       |      |    | CG |    |    | 7.30                 | 7.30                                 | 10.00            | 14.14 | 20.00  | 24.49  | 31.62  | 44.72        | 890                                                                                 | 1,580    |
|             | 422.968      | ●                    | ●     |      |    | CG |    |    | 8.00                 | 8.00                                 | 12.50            | 17.68 | 25.00  | 30.62  | 39.53  | 55.90        | 890                                                                                 | 1,590    |
|             | 423.008      | ●                    |       |      |    | CG |    |    | 8.70                 | 8.70                                 | 15.75            | 22.27 | 31.50  | 38.58  | 49.81  | 70.44        | 890                                                                                 | 1,590    |
|             | 423.128      | ●                    |       |      |    |    | CK |    | 12.70                | 12.30                                | 31.50            | 44.55 | 63.00  | 77.16  | 99.61  | 140.87       | 890                                                                                 | 1,590    |
|             | 423.208      | ●                    |       |      |    |    |    | CM | 17.00                | 16.00                                | 50.00            | 70.71 | 100.00 | 122.47 | 158.11 | 223.61       | 890                                                                                 | 1,590    |

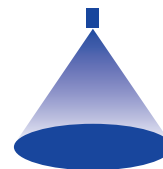
Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. + Code = Ordering no.  
example: 422.488 + 30 + CC = 422.488.30.CC



Assembly accessories can be found in Chapter 9 "Accessories".

# Tangential-flow full cone nozzles, plastic version Series 422/423



## Features:

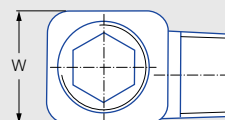
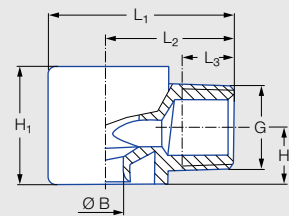
- Tangentially arranged supply of liquid
- Without swirl inserts
- Non-clogging
- Stable spray angle
- Uniform liquid distribution
- High chemical resistance



## Applications:

- Surface spraying
- Cooling
- Cleaning and washing processes
- Foam control

Series 422/423



| Code      | G        | Dimensions [mm] |                |                |                |                |       | Weight [g] |
|-----------|----------|-----------------|----------------|----------------|----------------|----------------|-------|------------|
|           |          | H <sub>1</sub>  | H <sub>2</sub> | L <sub>1</sub> | L <sub>2</sub> | L <sub>3</sub> | Flats |            |
| <b>CC</b> | 1/4 BSPT | 16.0            | 8.0            | 28.0           | 20.0           | 9.8            | 16.0  | 7.0        |
| <b>CE</b> | 3/8 BSPT | 23.0            | 11.2           | 36.0           | 25.0           | 10.1           | 22.0  | 16.0       |
| <b>CG</b> | 1/2 BSPT | 38.0            | 19.2           | 49.5           | 33.5           | 13.2           | 32.0  | 40.0       |
| <b>CK</b> | 3/4 BSPT | 50.0            | 24.5           | 58.5           | 38.5           | 18.5           | 41.0  | 50.0       |

| Spray<br>angle | Ordering no. |          |          |          |          |          | Bore<br>diameter B<br>[mm] | Narrowest<br>free cross<br>sections<br>Ø<br>[mm] | V̇ water [l/min] |       |       |       |       |        | Spray<br>diameter D<br>[mm]<br>(at p = 2 bar)<br> |                 |
|----------------|--------------|----------|----------|----------|----------|----------|----------------------------|--------------------------------------------------|------------------|-------|-------|-------|-------|--------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------|
|                | Type         | Mat. no. | Code     |          |          |          |                            |                                                  | p [bar]          |       |       |       |       |        |                                                                                                                                        |                 |
|                |              | 5E       | 1/4 BSPT | 3/8 BSPT | 1/2 BSPT | 3/4 BSPT |                            |                                                  | 0.5              | 1.0   | 2.0   | 3.0   | 5.0   | 10.0   | H = 250<br>[mm]                                                                                                                        | H = 500<br>[mm] |
|                |              | PVDF     |          |          |          |          |                            |                                                  |                  |       |       |       |       |        |                                                                                                                                        |                 |
| 60°            | 422.724      | ●        |          | CE       |          |          | 3.60                       | 3.60                                             |                  |       |       |       |       |        |                                                                                                                                        |                 |
| 90°            | 422.406      | ●        | CC       |          |          |          | 1.50                       | 1.45                                             | 0.50             | 0.71  | 1.00  | 1.22  | 1.58  | 2.24   | 530                                                                                                                                    | 900             |
|                | 422.566      | ●        | CC       |          |          |          | 2.30                       | 2.20                                             | 1.25             | 1.77  | 2.50  | 3.06  | 3.95  | 5.59   | 530                                                                                                                                    | 920             |
|                | 422.606      | ●        |          | CE       |          |          | 2.60                       | 2.50                                             | 1.58             | 2.23  | 3.15  | 3.86  | 4.98  | 7.04   | 540                                                                                                                                    | 920             |
|                | 422.646      | ●        |          | CE       |          |          | 3.00                       | 2.90                                             | 2.00             | 2.83  | 4.00  | 4.90  | 6.32  | 8.94   | 540                                                                                                                                    | 930             |
|                | 422.726      | ●        |          | CE       |          |          | 3.70                       | 3.60                                             | 3.15             | 4.45  | 6.30  | 7.72  | 9.96  | 14.09  | 550                                                                                                                                    | 950             |
|                | 422.806      | ●        |          | CE       |          |          | 4.65                       | 4.60                                             | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 22.36  | 560                                                                                                                                    | 980             |
|                | 422.846      | ●        |          | CE       |          |          | 5.30                       | 5.30                                             | 6.25             | 8.84  | 12.50 | 15.31 | 19.76 | 27.95  | 560                                                                                                                                    | 990             |
|                | 422.886      | ●        |          | CE       |          |          | 5.80                       | 5.80                                             | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 35.78  | 570                                                                                                                                    | 1,010           |
|                | 422.926      | ●        |          |          | CG       |          | 7.30                       | 7.30                                             | 10.00            | 14.14 | 20.00 | 24.49 | 31.62 | 44.72  | 570                                                                                                                                    | 1,030           |
|                | 422.966      | ●        |          |          | CG       |          | 8.00                       | 8.00                                             | 12.50            | 17.68 | 25.00 | 30.62 | 39.53 | 55.90  | 580                                                                                                                                    | 1,040           |
|                | 423.006      | ●        |          |          | CG       |          | 8.70                       | 8.70                                             | 15.75            | 22.27 | 31.50 | 38.58 | 49.81 | 70.44  | 580                                                                                                                                    | 1,040           |
|                | 423.126      | ●        |          |          |          | CK       | 12.00                      | 12.00                                            | 31.50            | 44.55 | 63.00 | 77.16 | 99.61 | 140.87 | 580                                                                                                                                    | 1,050           |





| Spray angle | Ordering no. |          |      |    |    |       | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min] |          |          |          |        |       | Spray diameter D [mm]<br>(at p = 2 bar)<br> |       |
|-------------|--------------|----------|------|----|----|-------|----------------------|--------------------------------------|------------------|----------|----------|----------|--------|-------|--------------------------------------------------------------------------------------------------------------------------------|-------|
|             | Type         | Mat. no. | Code |    |    |       |                      |                                      | p [bar]          |          |          |          |        |       |                                                                                                                                |       |
|             |              | 5E       |      |    |    |       |                      |                                      |                  |          |          |          |        |       |                                                                                                                                |       |
|             |              | PVDF     |      |    |    |       |                      |                                      | 1/4 BSPT         | 3/8 BSPT | 1/2 BSPT | 3/4 BSPT | 0.5    | 1.0   | 2.0                                                                                                                            | 3.0   |
| 120°        | 422.408      | ●        | CC   |    |    |       | 1.50                 | 1.45                                 | 0.50             | 0.71     | 1.00     | 1.22     | 1.58   | 2.24  | 670                                                                                                                            | 1,200 |
|             | 422.448      | ●        | CC   |    |    |       | 1.65                 | 1.60                                 | 0.63             | 0.88     | 1.25     | 1.53     | 1.98   | 2.80  | 680                                                                                                                            | 1,210 |
|             | 422.488      | ●        | CC   |    |    |       | 1.90                 | 1.90                                 | 0.80             | 1.13     | 1.60     | 1.96     | 2.53   | 3.58  | 680                                                                                                                            | 1,230 |
|             | 422.568      | ●        | CC   |    |    |       | 2.40                 | 2.40                                 | 1.25             | 1.77     | 2.50     | 3.06     | 3.95   | 5.59  | 700                                                                                                                            | 1,260 |
|             | 422.728      | ●        |      | CE |    |       | 4.00                 | 3.90                                 | 3.15             | 4.45     | 6.30     | 7.72     | 9.96   | 14.09 | 770                                                                                                                            | 1,400 |
|             | 422.888      | ●        |      | CE |    |       | 6.60                 | 6.00                                 | 8.00             | 11.31    | 16.00    | 19.60    | 25.30  | 35.78 | 850                                                                                                                            | 1,560 |
|             | 422.968      | ●        |      |    | CG |       | 8.00                 | 8.00                                 | 12.50            | 17.68    | 25.00    | 30.62    | 39.53  | 55.90 | 960                                                                                                                            | 1,620 |
|             | 423.008      | ●        |      |    | CG |       | 8.70                 | 8.70                                 | 15.75            | 22.27    | 31.50    | 38.58    | 49.81  | 70.44 | 970                                                                                                                            | 1,630 |
| 423.128     | ●            |          |      |    | CK | 12.70 | 12.30                | 31.50                                | 44.55            | 63.00    | 77.16    | 99.61    | 140.87 | 990   | 1,660                                                                                                                          |       |

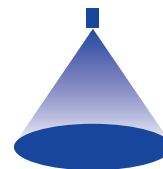
Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. + Code = Ordering no.  
example: 422.408 + 5E + CC = 422.408.5E.CC



Assembly accessories can be found in Chapter 9 "Accessories".

# Tangential-flow full cone nozzles, plastic version with bayonet quick-release system Series 422



## Features:

- Without swirl inserts
- Non-clogging
- Stable spray angle
- Simple and quick assembly
- Uniform liquid distribution
- High chemical resistance

## Applications:

- Surface spraying
- Cooling
- Cleaning and washing processes
- Foam control



Series 422

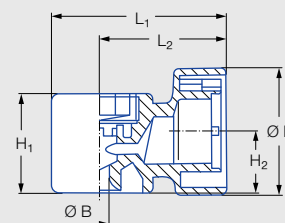


Figure 1

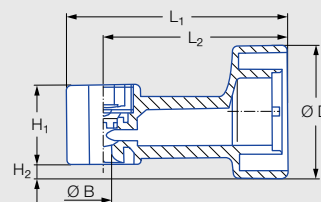


Figure 2

| Type                    | Code | Figure | Dimensions [mm] |                |                |                |      | Weight [g] (PVDF) |
|-------------------------|------|--------|-----------------|----------------|----------------|----------------|------|-------------------|
|                         |      |        | H <sub>1</sub>  | H <sub>2</sub> | L <sub>1</sub> | L <sub>2</sub> | Ø D  |                   |
| 422,644/422,606/422,608 | KB   | 1      | 23.0            | 14.0           | 40.0           | 29.0           | 29.5 | 20.0              |
| 422,406/422,408/422,528 | KB   | 2      | 17.5            | 3.5            | 48.0           | 40.0           | 29.5 | 14.0              |

| Spray angle | Ordering no. |          |    |      | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min]             |      |      |      |      |      | Spray diameter D [mm]<br>(at p = 2 bar) |              |
|-------------|--------------|----------|----|------|----------------------|--------------------------------------|------------------------------|------|------|------|------|------|-----------------------------------------|--------------|
|             | Type         | Mat. no. |    | Code |                      |                                      | p [bar]                      |      |      |      |      |      | H = 250 [mm]                            | H = 500 [mm] |
|             |              | 5E       | 53 |      |                      |                                      |                              |      |      |      |      |      |                                         |              |
|             |              | PVDF     | PP |      |                      |                                      | Bayonet quick-release system |      |      |      |      |      |                                         |              |
| 60°         | 422.644      |          | ●  | KB   | 2.90                 | 2.90                                 | 2.00                         | 2.83 | 4.00 | 4.90 | 6.32 | 8.94 | 250                                     | 490          |
| 90°         | 422.406      | ●        |    | KB   | 1.50                 | 1.45                                 | 0.50                         | 0.71 | 1.00 | 1.22 | 1.58 | 2.24 | 530                                     | 900          |
|             | 422.606      | ●        |    | KB   | 2.60                 | 2.50                                 | 1.58                         | 2.23 | 3.15 | 3.86 | 4.98 | 7.04 | 540                                     | 920          |
| 120°        | 422.408      | ●        |    | KB   | 1.50                 | 1.45                                 | 0.50                         | 0.71 | 1.00 | 1.22 | 1.58 | 2.24 | 670                                     | 1,140        |
|             | 422.528      | ●        |    | KB   | 2.10                 | 2.00                                 | 1.00                         | 1.41 | 2.00 | 2.45 | 3.16 | 4.47 | 690                                     | 1,220        |
|             | 422.608      | ●        |    | KB   | 2.60                 | 2.50                                 | 1.58                         | 2.23 | 3.15 | 3.86 | 4.98 | 7.04 | 710                                     | 1,260        |

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. + Code = Ordering no.  
 example: 422.644 + 53 + KB = 422.644.53.KB



Assembly accessories can be found in Chapter 9 "Accessories".

# Cluster head nozzles

## Series 502/503



### Features:

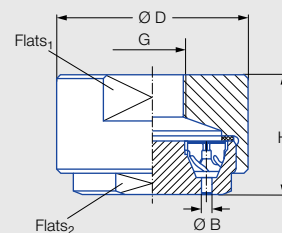
- Fine, uniform atomization
- Stable spray angle
- Space-saving installation
- Maintenance-friendly design
- High temperature and chemical resistance

### Applications:

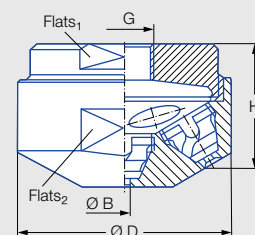
- Chlorine precipitation
- Absorption
- Dust suppression
- Degassing of liquids
- Desuperheating



Series 502/503



70° version



130° version

### 70° version

| G        | Dimensions [mm] |      |                    |                    | Weight [g] (brass) |
|----------|-----------------|------|--------------------|--------------------|--------------------|
|          | H               | Ø D  | Flats <sub>1</sub> | Flats <sub>2</sub> |                    |
| 1/2 BSPP | 25.0            | 50.0 | 46                 | 38                 | 250.0              |
| 3/4 BSPP | 46.0            | 75.0 | 65                 | 55                 | 870.0              |

### 130° version

| G        | Dimensions [mm] |      |                    |                    | Weight [g] (brass) |
|----------|-----------------|------|--------------------|--------------------|--------------------|
|          | H               | Ø D  | Flats <sub>1</sub> | Flats <sub>2</sub> |                    |
| 1/2 BSPP | 28.0            | 40.0 | 27                 | 36                 | 150.0              |
| 3/4 BSPP | 53.0            | 60.0 | 50                 | 55                 | 410.0              |

| Spray angle | Ordering no. |                                                |       | BSPP | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min] |       |       |       |        | Spray diameter D [mm]<br>(at p = 2 bar) |                |
|-------------|--------------|------------------------------------------------|-------|------|----------------------|--------------------------------------|------------------|-------|-------|-------|--------|-----------------------------------------|----------------|
|             | Type         | Mat. no.                                       |       |      |                      |                                      | p [bar]          |       |       |       |        | H = 500 [mm]                            | H = 1,000 [mm] |
|             |              | 17 <sup>1</sup>                                | 30    |      |                      |                                      |                  |       |       |       |        |                                         |                |
|             |              | Stainless steel 316Ti/<br>Stainless steel 316L | Brass |      |                      |                                      |                  |       |       |       |        |                                         |                |
|             |              |                                                |       |      |                      |                                      | 0.5              | 1.0   | 2.0   | 5.0   | 10.0   |                                         |                |
| 70°         | 502.445      |                                                | ●     | 1/2  | 0.90                 | 0.50                                 | –                | –     | 1.25  | 1.98  | 2.80   | 270                                     | 360            |
|             | 502.985      | ●                                              |       | 3/4  | 3.30                 | 2.00                                 | 14.00            | 19.80 | 28.00 | 44.27 | 62.61  | 610                                     | 1,000          |
|             | 503.065      | ●                                              |       | 3/4  | 4.90                 | 2.00                                 | 22.50            | 31.82 | 45.00 | 71.15 | 100.62 | 920                                     | 1,520          |
| 130°        | 502.448      | ●                                              | ●     | 1/2  | 0.90                 | 0.50                                 | –                | –     | 1.25  | 1.98  | 2.80   | 310                                     | 370            |
|             | 502.548      | ●                                              | ●     | 1/2  | 1.80                 | 0.50                                 | –                | 1.58  | 2.24  | 3.54  | 5.01   | 450                                     | 570            |
|             | 502.748      | ●                                              | ●     | 3/4  | 1.90                 | 1.90                                 | 3.55             | 5.02  | 7.10  | 11.23 | 15.88  | 1,110                                   | 1,400          |
|             | 502.838      | ●                                              | ●     | 3/4  | 2.90                 | 2.00                                 | 5.90             | 8.34  | 11.80 | 18.66 | 26.39  | 1,500                                   | 2,060          |
|             | 502.908      | ●                                              | ●     | 3/4  | 4.00                 | 2.00                                 | 9.00             | 12.73 | 18.00 | 28.46 | 40.25  | 1,770                                   | 2,650          |
|             | 503.028      | ●                                              | ●     | 3/4  | 4.20                 | 2.00                                 | 17.75            | 25.10 | 35.50 | 56.13 | 79.38  | 2,050                                   | 3,150          |
|             | 503.118      | ●                                              | ●     | 3/4  | 6.50                 | 2.00                                 | 30.00            | 42.43 | 60.00 | 94.87 | 134.16 | 2,300                                   | 3,550          |

<sup>1</sup> We reserve the right to supply material 316Ti or 316L under material no. 17.

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

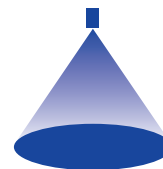
Ordering Type + Material no. = Ordering no.  
example: 502.445 + 30 = 502.445.30



Assembly accessories can be found in Chapter 9 "Accessories".

# Deflector-plate nozzles

## Series 524/525

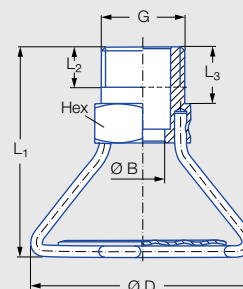


### Features:

- Full cone atomization
- Large impact area
- Non-clogging

### Applications:

- Fire fighting
- Sprinkling
- Dust suppression



Series 524/525

| G        | Dimensions [mm] |                |                |      |     | Weight [g] (brass) |
|----------|-----------------|----------------|----------------|------|-----|--------------------|
|          | L <sub>1</sub>  | L <sub>2</sub> | L <sub>3</sub> | Ø D  | Hex |                    |
| 1/2 BSPP | 53.5            | 11.0           | 14.5           | 56.0 | 24  | 68.0               |

| Spray angle | Ordering no. |                                                |       | Bore diameter B<br>[mm] | V̇ water [l/min] |       |        |        |        |        | Spray diameter D<br>[mm]<br>(at p = 2 bar)                                            |        |
|-------------|--------------|------------------------------------------------|-------|-------------------------|------------------|-------|--------|--------|--------|--------|---------------------------------------------------------------------------------------|--------|
|             | Type         | Mat. no.                                       |       |                         | p [bar]          |       |        |        |        |        |  |        |
|             |              | 17¹                                            | 30    |                         |                  |       |        |        |        |        |                                                                                       |        |
|             |              | Stainless steel 316Ti/<br>Stainless steel 316L | Brass |                         | 0.5              | 1.0   | 2.0    | 3.0    | 5.0    | 10.0   |                                                                                       |        |
| 180°        | 524.809      | ●                                              | ●     | 4.00                    | 5.00             | 7.07  | 10.00  | 12.25  | 15.81  | 22.36  | 3,800                                                                                 | 4,300  |
|             | 525.049      | ●                                              | ●     | 8.00                    | 20.00            | 28.28 | 40.00  | 48.99  | 63.25  | 89.44  | 10,000                                                                                | 11,500 |
|             | 525.109      |                                                | ●     | 9.30                    | 28.00            | 39.60 | 56.00  | 89.59  | 88.54  | 125.22 | 10,500                                                                                | 12,750 |
|             | 525.169      |                                                | ●     | 10.90                   | 40.00            | 56.57 | 80.00  | 97.98  | 126.49 | 178.89 | 10,500                                                                                | 14,500 |
|             | 525.229      |                                                | ●     | 12.20                   | 56.00            | 79.20 | 112.00 | 137.17 | 177.09 | 250.44 | 7,500                                                                                 | 11,500 |
|             | 525.269      | ●                                              | ●     | 12.30                   | 70.00            | 98.99 | 140.00 | 171.46 | 221.36 | 313.05 | 7,000                                                                                 | 12,000 |

<sup>1</sup> We reserve the right to supply material 316Ti or 316L under material no. 17.

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

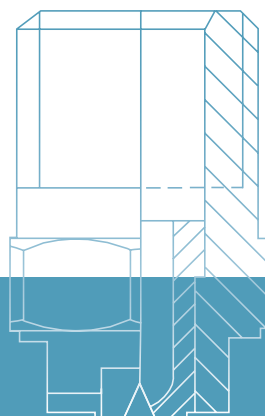
Ordering Type + Material no. = Ordering no.  
example: 524.809 + 17 = 524.809.17



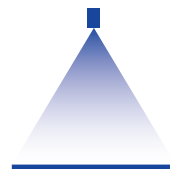
Assembly accessories can be found in Chapter 9 "Accessories".



## FLAT FAN NOZZLES



# FLAT FAN NOZZLES OVERVIEW OF TYPES



Lechler flat fan nozzles produce intensive, uniform water jet. Flat fan nozzles are generally used in cleaning processes and throughout many areas of surface treatment. Numerous designs – including tongue-type nozzles for special applications – and extensive assembly accessories enable easy installation as well as quick nozzle changeovers.

## Standard flat fan nozzles



- Particularly high-energy spray with spray angles of up to 60°
- Parabolic liquid distribution
- Unaffected by transient pressures
- Simple and cost-saving assembling options

## Tongue-type nozzles



- Special design in which a solid stream is diverted by a deflector plate
- Powerful, sharply delimited spray
- Shape of the deflector plate determines the spray angle
- Clog resistant due to large free cross-sections

## International nozzle code

Flat fan nozzles designations are governed by international standards. The first two digits specify the spray angle in degrees, the others the flow rate in US gallons per minute at 40 psi. Our high pressure flat fan nozzles (series 602/608/652/6FH) are specified with this international nozzle code.

Spray angle  
in degrees



Flow rate in US gal/min at 40 psi

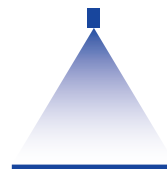
Conversion: Value · 3.22 = flow rate in l/min at 2 bar

example: 0.2 gal/min at 40 psi = 0.644 l/min at 2 bar

## Good to know

Information on the arrangement of several flat fan nozzles can be found in Chapter “Planning Aids” on Page 255.

# FLAT FAN NOZZLES OVERVIEW OF SERIES



|                                                                                                              |                            | Standard flat fan nozzles                                                         |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
|--------------------------------------------------------------------------------------------------------------|----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                                                                                              |                            |  |  |  |  |  |
| Series                                                                                                       |                            | 632/633                                                                           | 610                                                                               | 612                                                                                | 616/617                                                                             | 652                                                                                 |
| Information on page                                                                                          |                            | 108                                                                               | 111                                                                               | 113                                                                                | 116                                                                                 | 118                                                                                 |
| Pressure range                                                                                               | Low pressure               | •                                                                                 | •                                                                                 | •                                                                                  | •                                                                                   | •                                                                                   |
|                                                                                                              | High pressure              |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| <br>Flow rate at p = 5 bar | Low<br>< 4 l/min           | •                                                                                 | •                                                                                 | •                                                                                  |                                                                                     | •                                                                                   |
|                                                                                                              | Medium<br>4 l/min–16 l/min | •                                                                                 | •                                                                                 | •                                                                                  | •                                                                                   | •                                                                                   |
|                                                                                                              | High<br>16 l/min–50 l/min  | •                                                                                 |                                                                                   | •                                                                                  | •                                                                                   | •                                                                                   |
|                                                                                                              | Very high<br>> 50 l/min    |                                                                                   |                                                                                   |                                                                                    | •                                                                                   |                                                                                     |
| <br>Spray angle           | Small<br>20°–45°           | •                                                                                 | •                                                                                 | •                                                                                  | •                                                                                   | •                                                                                   |
|                                                                                                              | Medium<br>60°–90°          | •                                                                                 | •                                                                                 | •                                                                                  | •                                                                                   | •                                                                                   |
|                                                                                                              | Large<br>120°–140°         | •                                                                                 | •                                                                                 | •                                                                                  | •                                                                                   | •                                                                                   |
| <br>Nozzle material       | Stainless steel            | •                                                                                 | •                                                                                 | •                                                                                  | •                                                                                   | •                                                                                   |
|                                                                                                              | Brass                      | •                                                                                 | •                                                                                 | •                                                                                  | •                                                                                   | •                                                                                   |
|                                                                                                              | Plastic                    | •                                                                                 |                                                                                   |                                                                                    |                                                                                     | •                                                                                   |
| <br>Nozzle connection     |                            | 1/8 BSPT<br>1/4 BSPT<br>3/8 BSPT<br>1/2 BSPT                                      | 1/8 BSPP                                                                          | 1/4 BSPP                                                                           | 3/4 BSPP                                                                            | Assembly with retaining nut<br>3/8 BSPP                                             |



|                                                                                                                  |                            | Standard flat fan nozzles                                                         |                                                                                    |                                                                                     |                                                                                     |
|------------------------------------------------------------------------------------------------------------------|----------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                                                                                                  |                            |  |  |  |  |
| Series                                                                                                           |                            | 652<br>Belt lubrication<br>nozzle                                                 | 612.xxx.5E.03<br>Press-in nozzle                                                   | 656/657                                                                             | 660                                                                                 |
| Information on page                                                                                              |                            | 121                                                                               | 122                                                                                | 123                                                                                 | 125                                                                                 |
| Pressure range                                                                                                   | Low pressure               | •                                                                                 | •                                                                                  | •                                                                                   | •                                                                                   |
|                                                                                                                  | High pressure              |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
| <br>Flow rate at<br>p = 5 bar | Low<br>< 4 l/min           | •<br>(at p = 3 bar)                                                               | •<br>(at p = 2 bar)                                                                |                                                                                     | •                                                                                   |
|                                                                                                                  | Medium<br>4 l/min–16 l/min |                                                                                   |                                                                                    | •                                                                                   | •                                                                                   |
|                                                                                                                  | High<br>16 l/min–50 l/min  |                                                                                   |                                                                                    | •                                                                                   |                                                                                     |
|                                                                                                                  | Very high<br>> 50 l/min    |                                                                                   |                                                                                    | •                                                                                   |                                                                                     |
| <br>Spray angle               | Small<br>20°–45°           |                                                                                   |                                                                                    | •                                                                                   | •                                                                                   |
|                                                                                                                  | Medium<br>60°–90°          | •                                                                                 | •                                                                                  | •                                                                                   | •                                                                                   |
|                                                                                                                  | Large<br>120°–140°         | •                                                                                 | •                                                                                  | •                                                                                   | •                                                                                   |
| <br>Nozzle material           | Stainless steel            | •                                                                                 |                                                                                    | •                                                                                   | •                                                                                   |
|                                                                                                                  | Brass                      |                                                                                   |                                                                                    | •                                                                                   | •                                                                                   |
|                                                                                                                  | Plastic                    | •                                                                                 | •                                                                                  |                                                                                     |                                                                                     |
| <br>Nozzle connection         |                            | Assembly with<br>retaining nut<br>3/8 BSPP                                        | For pressing into<br>pipes                                                         | Assembly with<br>retaining nut<br>3/4 BSPP                                          | Assembly with<br>retaining nut<br>3/8 BSPP<br>and dovetail guide                    |

|                                                                                   |                                                                                   | Tongue-type nozzles                                                               |                                                                                    |                                                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |
| 664/665                                                                           | 646                                                                               | 688/689                                                                           | 686                                                                                | 684                                                                                 |
| 127                                                                               | 129                                                                               | 131                                                                               | 132                                                                                | 134                                                                                 |
| •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                  | •                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |
|                                                                                   | •                                                                                 |                                                                                   | •<br>(at p = 2 bar)                                                                | •<br>(at p = 2 bar)                                                                 |
| •                                                                                 | •                                                                                 | •<br>(at p = 2 bar)                                                               | •<br>(at p = 2 bar)                                                                | •<br>(at p = 2 bar)                                                                 |
| •                                                                                 |                                                                                   | •<br>(at p = 2 bar)                                                               | •<br>(at p = 2 bar)                                                                |                                                                                     |
| •                                                                                 |                                                                                   |                                                                                   |                                                                                    |                                                                                     |
| •                                                                                 | •                                                                                 | •                                                                                 |                                                                                    |                                                                                     |
| •                                                                                 | •                                                                                 |                                                                                   | •                                                                                  |                                                                                     |
| •                                                                                 | •                                                                                 |                                                                                   | •                                                                                  | •                                                                                   |
| •                                                                                 |                                                                                   | •                                                                                 | •                                                                                  |                                                                                     |
| •                                                                                 |                                                                                   |                                                                                   | •                                                                                  |                                                                                     |
|                                                                                   | •                                                                                 | •                                                                                 | •                                                                                  | •                                                                                   |
| Assembly with<br>retaining nut<br>3/4 BSPP<br>and dovetail guide                  | Assembly with<br>bayonet quick-release system                                     | 3/8 BSPT<br>3/4 BSPP                                                              | 1/8 BSPT<br>1/4 BSPT<br>3/8 BSPT<br>1/2 BSPT                                       | Assembly with<br>retaining nut<br>3/8 BSPP                                          |



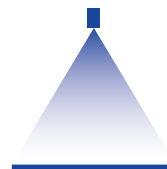


|                                                                                                                 |                            | Standard flat fan nozzles                                                         |                                                                                   |                                                                                     |                                                                                          |
|-----------------------------------------------------------------------------------------------------------------|----------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
|                                                                                                                 |                            |  |  |  |       |
| Series                                                                                                          |                            | 602                                                                               | 608                                                                               | 652                                                                                 | 6FH<br>with spray stabiliser                                                             |
| Information on page                                                                                             |                            | 135                                                                               | 136                                                                               | 137                                                                                 | 138                                                                                      |
| Pressure range                                                                                                  | Low pressure               |                                                                                   |                                                                                   |                                                                                     |                                                                                          |
|                                                                                                                 | High pressure              | •                                                                                 | •                                                                                 | •                                                                                   | •                                                                                        |
| <br>Flow rate at<br>p = 5 bar | Low<br>< 4 l/min           |                                                                                   |                                                                                   |                                                                                     |                                                                                          |
|                                                                                                                 | Medium<br>4 l/min–16 l/min | •<br>(at p = 80 bar)                                                              | •<br>(at p = 80 bar)                                                              | •<br>(at p = 80 bar)                                                                | •<br>(at p = 80 bar)                                                                     |
|                                                                                                                 | High<br>16 l/min–50 l/min  | •<br>(at p = 80 bar)                                                              | •<br>(at p = 80 bar)                                                              | •<br>(at p = 80 bar)                                                                | •<br>(at p = 80 bar)                                                                     |
|                                                                                                                 | Very high<br>> 50 l/min    | •<br>(at p = 80 bar)                                                              |                                                                                   | •<br>(at p = 80 bar)                                                                | •<br>(at p = 80 bar)                                                                     |
| <br>Spray angle              | Small<br>20°–45°           | •                                                                                 | •                                                                                 | •                                                                                   | •                                                                                        |
|                                                                                                                 | Medium<br>60°–90°          | •                                                                                 | •                                                                                 | •                                                                                   | •                                                                                        |
|                                                                                                                 | Large<br>120°–140°         |                                                                                   |                                                                                   |                                                                                     |                                                                                          |
| <br>Nozzle material          | Stainless steel            | •                                                                                 | •                                                                                 | •                                                                                   | •                                                                                        |
|                                                                                                                 | Brass                      |                                                                                   |                                                                                   |                                                                                     |                                                                                          |
|                                                                                                                 | Plastic                    |                                                                                   |                                                                                   |                                                                                     |                                                                                          |
| <br>Nozzle connection        |                            | 1/4 BSPT<br>1/4 NPT                                                               | 1/8 BSPT<br>1/8 NPT                                                               | Assembly with<br>retaining nut<br>3/8 BSPP                                          | 1/8 BSPT<br>1/8 NPT<br>1/4 BSPT<br>1/4 NPT<br>Assembly with<br>retaining nut<br>3/8 BSPP |

| Swivelling nozzles                                                                 | Nozzle systems for surface treatment                                              |                                                                                    | Descaling nozzles                                                                   |
|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|   |  |  |  |
| <b>676</b>                                                                         | <b>676/677<br/>MEMOSPRAY</b>                                                      | <b>676<br/>Easy-Clip</b>                                                           | <b>SCALEMASTER</b>                                                                  |
| 140                                                                                | 142                                                                               | 146                                                                                | Upon request                                                                        |
| •                                                                                  | •                                                                                 | •                                                                                  |                                                                                     |
|                                                                                    |                                                                                   |                                                                                    |                                                                                     |
| •                                                                                  |                                                                                   |                                                                                    |                                                                                     |
| •                                                                                  | •<br>(at p = 2 bar)                                                               | •<br>(at p = 2 bar)                                                                |                                                                                     |
|                                                                                    | •<br>(at p = 2 bar)                                                               | •<br>(at p = 2 bar)                                                                |                                                                                     |
|                                                                                    |                                                                                   |                                                                                    |                                                                                     |
| •                                                                                  | •                                                                                 |                                                                                    |                                                                                     |
| •                                                                                  | •                                                                                 | •                                                                                  |                                                                                     |
| •                                                                                  | •                                                                                 |                                                                                    |                                                                                     |
| •                                                                                  | •                                                                                 |                                                                                    |                                                                                     |
| •                                                                                  |                                                                                   |                                                                                    |                                                                                     |
|                                                                                    | •                                                                                 | •                                                                                  |                                                                                     |
|                                                                                    |                                                                                   |                                                                                    |                                                                                     |
| Assembly with retaining nut<br>Welded nipple<br>Threaded nipple<br>Threaded socket | Eyelet clamps for<br>following pipe sizes:<br>1"<br>1 1/4"<br>1 1/2"<br>2"        | Eyelet clamps for<br>following pipe sizes:<br>1"<br>1 1/4"<br>1 1/2"<br>2"         |                                                                                     |

# Low pressure flat fan nozzles

## Series 632/633



### Features:

- Uniform, parabolic liquid distribution
- Stable spray angle
- Tapered, self-sealing thread

### Applications:

- Spray cleaning
- Surface cleaning
- Strainer insert cleaning
- Coating processes
- Belt cleaning
- Lubrication processes



Series 632/633

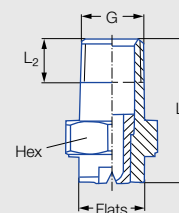


Figure 1

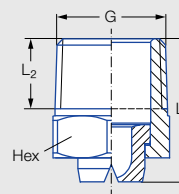


Figure 2

| Code      | Figure | G        | Dimensions [mm] |                |     |       | Weight [g] (Brass) |
|-----------|--------|----------|-----------------|----------------|-----|-------|--------------------|
|           |        |          | L <sub>1</sub>  | L <sub>2</sub> | Hex | Flats |                    |
| <b>CA</b> | 1      | 1/8 BSPT | 22.0            | 6.5            | 14  | 10    | 17.0               |
| <b>CC</b> | 1      | 1/4 BSPT | 22.0            | 9.7            | 14  | 10    | 20.0               |
| <b>CE</b> | 2      | 3/8 BSPT | 22.0            | 10.1           | 17  | –     | 30.0               |
| <b>CG</b> | 2      | 1/2 BSPT | 27.0            | 13.2           | 22  | –     | 40.0               |

| Spray angle | Ordering no. |                                             |                                                |       |      |          |          |          |          | Equivalent bore diameter A [mm] | Narrowest free cross section Ø [mm] | V̇ water [l/min] |       |       |       |       |       |       | Spray width B [mm]<br>(at p = 5 bar) |              |
|-------------|--------------|---------------------------------------------|------------------------------------------------|-------|------|----------|----------|----------|----------|---------------------------------|-------------------------------------|------------------|-------|-------|-------|-------|-------|-------|--------------------------------------|--------------|
|             | Type         | Mat. no.                                    |                                                |       |      | Code     |          |          |          |                                 |                                     | p [bar]          |       |       |       |       |       |       | H = 250 [mm]                         | H = 500 [mm] |
|             |              | 16 <sup>1</sup>                             | 17 <sup>2</sup>                                | 30    | 5E   | 1/8 BSPT | 1/4 BSPT | 3/8 BSPT | 1/2 BSPT |                                 |                                     | 0.5              | 1.0   | 2.0   | 3.0   | 5.0   | 7.0   | 10.0  |                                      |              |
|             |              | Stainless steel 303/<br>Stainless steel 304 | Stainless steel 316Ti/<br>Stainless steel 316L | Brass | PVDF |          |          |          |          |                                 |                                     |                  |       |       |       |       |       |       |                                      |              |
| 20°         | 632.301      | ●                                           | ●                                              | ●     | ●    | CA       | CC       |          |          | 0.70                            | 0.60                                | 0.16*            | 0.23* | 0.32  | 0.39  | 0.51  | 0.60  | 0.72  | 85                                   | 160          |
|             | 632.361      | ●                                           | ●                                              | ●     | ●    | CA       | CC       |          |          | 1.00                            | 0.80                                | 0.31*            | 0.44* | 0.63  | 0.77  | 1.00  | 1.18  | 1.40  | 85                                   | 160          |
|             | 632.441      | ●                                           | ●                                              | ●     | ●    | CA       | CC       |          |          | 1.35                            | 1.10                                | 0.62*            | 0.88  | 1.25  | 1.53  | 1.98  | 2.34  | 2.80  | 85                                   | 160          |
|             | 632.481      | ●                                           | ●                                              | ●     | ●    | CA       | CC       |          |          | 1.50                            | 1.20                                | 0.80*            | 1.13  | 1.60  | 1.96  | 2.53  | 2.99  | 3.58  | 85                                   | 160          |
| 30°         | 632.302      | ●                                           | ●                                              | ●     | ●    | CA       | CC       |          |          | 0.60                            | 0.50                                | 0.16*            | 0.23* | 0.32  | 0.39  | 0.51  | 0.60  | 0.72  | 120                                  | 220          |
|             | 632.362      | ●                                           | ●                                              | ●     | ●    | CA       | CC       |          |          | 1.00                            | 0.70                                | 0.31*            | 0.44* | 0.63  | 0.77  | 1.00  | 1.18  | 1.40  | 120                                  | 220          |
|             | 632.402      | ●                                           | ●                                              | ●     | ●    | CA       | CC       |          |          | 1.20                            | 0.90                                | 0.50*            | 0.71  | 1.00  | 1.23  | 1.58  | 1.87  | 2.24  | 120                                  | 230          |
|             | 632.482      | ●                                           | ●                                              | ●     | ●    | CA       | CC       |          |          | 1.50                            | 1.10                                | 0.80*            | 1.13  | 1.60  | 1.96  | 2.53  | 2.99  | 3.58  | 130                                  | 230          |
|             | 632.562      | ●                                           | ●                                              | ●     | ●    | CA       | CC       |          |          | 2.00                            | 1.50                                | 1.25             | 1.77  | 2.50  | 3.06  | 3.95  | 4.68  | 5.59  | 130                                  | 240          |
|             | 632.642      | ●                                           | ●                                              | ●     |      |          | CC       |          |          | 2.50                            | 1.80                                | 2.00             | 2.83  | 4.00  | 4.90  | 6.33  | 7.48  | 8.94  | 140                                  | 250          |
|             | 632.722      | ●                                           | ●                                              | ●     |      |          | CC       |          |          | 3.00                            | 2.40                                | 3.15             | 4.46  | 6.30  | 7.72  | 9.96  | 11.79 | 14.09 | 140                                  | 260          |
|             | 632.762      | ●                                           | ●                                              | ●     |      |          | CC       |          |          | 3.50                            | 2.70                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 14.97 | 17.89 | 140                                  | 260          |
| 632.802     | ●            | ●                                           | ●                                              |       |      | CC       |          |          | 4.00     | 3.10                            | 5.00                                | 7.07             | 10.00 | 12.25 | 15.81 | 18.71 | 22.36 | 140   | 260                                  |              |

| Spray angle | Ordering no. |                                             |                                                |       |                |          |          |          |          | Equivalent bore diameter A [mm] | Narrowest free cross section Ø [mm] | V̇ water [l/min] |       |       |       |       |        |       | Spray width B [mm] (at p = 5 bar) |              |
|-------------|--------------|---------------------------------------------|------------------------------------------------|-------|----------------|----------|----------|----------|----------|---------------------------------|-------------------------------------|------------------|-------|-------|-------|-------|--------|-------|-----------------------------------|--------------|
|             | Type         | Mat. no.                                    |                                                |       |                | Code     |          |          |          |                                 |                                     | p [bar]          |       |       |       |       |        |       | H = 250 [mm]                      | H = 500 [mm] |
|             |              | 16 <sup>1</sup>                             | 17 <sup>2</sup>                                | 30    | 5E             |          |          |          |          |                                 |                                     |                  |       |       |       |       |        |       |                                   |              |
|             |              |                                             |                                                |       |                |          |          |          |          |                                 |                                     |                  |       |       |       |       |        |       |                                   |              |
|             |              | Stainless steel 303/<br>Stainless steel 304 | Stainless steel 316Ti/<br>Stainless steel 316L | Brass | PVDF           | 1/8 BSPT | 1/4 BSPT | 3/8 BSPT | 1/2 BSPT |                                 |                                     | 0.5              | 1.0   | 2.0   | 3.0   | 5.0   | 7.0    | 10.0  |                                   |              |
| 45°         | 632.303      | ●                                           | ●                                              | ●     |                | CA       | CC       |          |          | 0.70                            | 0.50                                | 0.16*            | 0.23* | 0.32  | 0.39  | 0.51  | 0.60   | 0.72  | 170                               | 330          |
|             | 632.363      | ●                                           | ●                                              | ●     | ●              | CA       | CC       |          |          | 1.00                            | 0.60                                | 0.31*            | 0.44* | 0.63  | 0.77  | 1.00  | 1.18   | 1.40  | 190                               | 350          |
|             | 632.403      | ●                                           | ●                                              | ●     | ●              | CA       | CC       |          |          | 1.20                            | 0.90                                | 0.50*            | 0.71  | 1.00  | 1.23  | 1.58  | 1.87   | 2.24  | 200                               | 370          |
|             | 632.483      | ●                                           | ●                                              | ●     | ●              | CA       | CC       |          |          | 1.50                            | 1.10                                | 0.80*            | 1.13  | 1.60  | 1.96  | 2.53  | 2.99   | 3.58  | 200                               | 390          |
|             | 632.563      | ●                                           | ●                                              | ●     | ●              | CA       | CC       |          |          | 2.00                            | 1.40                                | 1.25             | 1.77  | 2.50  | 3.06  | 3.95  | 4.68   | 5.59  | 210                               | 410          |
|             | 632.643      | ●                                           | ●                                              | ●     | ●              | CA       | CC       |          |          | 2.50                            | 1.80                                | 2.00             | 2.83  | 4.00  | 4.90  | 6.33  | 7.48   | 8.94  | 220                               | 410          |
|             | 632.673      | ●                                           | ●                                              | ●     |                |          | CC       | CE       |          | 2.70                            | 2.00                                | 2.37             | 3.36  | 4.75  | 5.82  | 7.51  | 8.89   | 10.62 | 220                               | 420          |
|             | 632.723      | ●                                           | ●                                              | ●     |                |          | CC       | CE       |          | 3.00                            | 2.40                                | 3.15             | 4.46  | 6.30  | 7.72  | 9.96  | 11.79  | 14.09 | 220                               | 420          |
|             | 632.763      | ●                                           | ●                                              | ●     |                |          | CC       | CE       |          | 3.50                            | 2.60                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 14.97  | 17.89 | 220                               | 420          |
|             | 632.803      | ●                                           | ●                                              | ●     |                |          | CC       | CE       | CG       | 4.00                            | 3.00                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 18.71  | 22.36 | 220                               | 420          |
|             | 632.843      | ●                                           | ● <sup>3</sup>                                 | ●     |                |          | CC       |          | CG       | 4.50                            | 3.40                                | 6.25             | 8.84  | 12.50 | 15.31 | 19.76 | 23.38  | 27.94 | 220                               | 420          |
|             | 632.883      | ●                                           | ●                                              | ●     |                |          |          |          | CG       | 5.00                            | 3.80                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 29.94  | 35.78 | 220                               | 420          |
|             | 632.923      | ●                                           | ●                                              | ●     |                |          |          |          | CG       | 5.50                            | 4.20                                | 10.00            | 14.14 | 20.00 | 24.49 | 31.62 | 37.41  | 44.72 | 220                               | 430          |
| 632.963     | ●            | ●                                           | ●                                              |       |                |          |          | CG       | 6.00     | 4.40                            | 12.50                               | 17.68            | 25.00 | 30.62 | 39.53 | 46.77 | 55.90  | 220   | 430                               |              |
| 60°         | 632.304      | ●                                           | ●                                              | ●     | ●              | CA       | CC       |          |          | 0.70                            | 0.40                                | 0.16*            | 0.23* | 0.32  | 0.39  | 0.51  | 0.60   | 0.72  | 260                               | 480          |
|             | 632.334      | ●                                           | ●                                              | ●     | ●              | CA       | CC       |          |          | 0.90                            | 0.50                                | 0.22*            | 0.32* | 0.45  | 0.55  | 0.71  | 0.84   | 1.00  | 260                               | 490          |
|             | 632.364      | ●                                           | ●                                              | ●     | ●              | CA       | CC       |          |          | 1.00                            | 0.60                                | 0.31*            | 0.44* | 0.63  | 0.77  | 1.00  | 1.18   | 1.40  | 260                               | 500          |
|             | 632.404      | ●                                           | ●                                              | ●     | ●              | CA       | CC       |          |          | 1.20                            | 0.80                                | 0.50*            | 0.71  | 1.00  | 1.23  | 1.58  | 1.87   | 2.24  | 260                               | 510          |
|             | 632.444      | ●                                           | ●                                              | ●     | ●              | CA       | CC       |          |          | 1.35                            | 0.90                                | 0.62*            | 0.88  | 1.25  | 1.53  | 1.98  | 2.34   | 2.80  | 260                               | 510          |
|             | 632.484      | ●                                           | ●                                              | ●     | ●              | CA       | CC       |          |          | 1.50                            | 1.00                                | 0.80*            | 1.13  | 1.60  | 1.96  | 2.53  | 2.99   | 3.58  | 260                               | 520          |
|             | 632.514      | ●                                           | ●                                              | ●     | ●              | CA       | CC       |          |          | 1.65                            | 1.10                                | 0.95*            | 1.34  | 1.90  | 2.32  | 3.00  | 3.55   | 4.24  | 270                               | 520          |
|             | 632.564      | ●                                           | ●                                              | ●     | ●              | CA       | CC       |          |          | 2.00                            | 1.30                                | 1.25             | 1.77  | 2.50  | 3.06  | 3.95  | 4.68   | 5.59  | 270                               | 530          |
|             | 632.604      | ●                                           | ●                                              | ●     | ●              | CA       | CC       |          |          | 2.20                            | 1.50                                | 1.57             | 2.23  | 3.15  | 3.86  | 4.98  | 5.89   | 7.04  | 270                               | 540          |
|             | 632.644      | ●                                           | ●                                              | ●     | ● <sup>4</sup> |          | CC       | CE       |          | 2.50                            | 1.60                                | 2.00             | 2.83  | 4.00  | 4.90  | 6.33  | 7.48   | 8.94  | 270                               | 540          |
|             | 632.674      | ●                                           | ●                                              | ●     | ● <sup>4</sup> |          | CC       | CE       |          | 2.70                            | 1.80                                | 2.37             | 3.36  | 4.75  | 5.82  | 7.51  | 8.89   | 10.62 | 270                               | 550          |
|             | 632.724      | ●                                           | ●                                              | ●     | ● <sup>4</sup> |          | CC       | CE       |          | 3.00                            | 2.10                                | 3.15             | 4.46  | 6.30  | 7.72  | 9.96  | 11.79  | 14.09 | 280                               | 560          |
|             | 632.764      | ●                                           | ●                                              | ●     |                |          | CC       | CE       |          | 3.50                            | 2.30                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 14.97  | 17.89 | 280                               | 570          |
|             | 632.804      | ●                                           | ● <sup>3</sup>                                 | ●     | ● <sup>4</sup> |          | CC       |          | CG       | 4.00                            | 2.60                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 18.71  | 22.36 | 290                               | 580          |
|             | 632.844      | ●                                           | ● <sup>3</sup>                                 | ●     | ● <sup>4</sup> |          | CC       |          | CG       | 4.50                            | 3.00                                | 6.25             | 8.84  | 12.50 | 15.31 | 19.76 | 23.38  | 27.94 | 290                               | 580          |
|             | 632.884      | ●                                           | ● <sup>3</sup>                                 | ●     | ● <sup>4</sup> |          | CC       |          | CG       | 5.00                            | 3.40                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 29.94  | 35.78 | 290                               | 580          |
|             | 632.924      | ●                                           | ●                                              | ●     |                |          |          |          | CG       | 5.50                            | 4.10                                | 10.00            | 14.14 | 20.00 | 24.49 | 31.62 | 37.41  | 44.72 | 290                               | 580          |
|             | 632.964      | ●                                           | ●                                              | ●     |                |          |          |          | CG       | 6.00                            | 4.20                                | 12.50            | 17.68 | 25.00 | 30.62 | 39.53 | 46.77  | 55.90 | 290                               | 580          |
|             | 633.004      | ●                                           | ●                                              |       |                |          |          |          | CG       | 7.00                            | 4.80                                | 15.75            | 22.27 | 31.50 | 38.57 | 49.80 | 58.92  | 70.43 | 290                               | 580          |
|             | 633.044      | ●                                           | ●                                              | ●     |                |          |          |          | CG       | 8.00                            | 5.50                                | 20.00            | 28.29 | 40.00 | 48.99 | 63.25 | 74.84  | 89.45 | 290                               | 580          |
| 633.084     | ●            | ●                                           | ●                                              |       |                |          |          | CG       | 9.00     | 6.80                            | 25.00                               | 35.36            | 50.00 | 61.24 | 79.06 | 93.55 | 111.81 | 290   | 580                               |              |
| 75°         | 632.145      | ●                                           |                                                | ●     |                | CA       | CC       |          |          | 0.20                            | 0.12                                | –                | 0.04* | 0.05  | 0.06  | 0.08  | 0.09   | 0.11  | 380                               | 690          |
|             | 632.165      | ●                                           |                                                | ●     |                | CA       | CC       |          |          | 0.20                            | 0.14                                | –                | 0.04* | 0.06  | 0.08  | 0.10  | 0.12   | 0.14  | 380                               | 690          |
|             | 632.185      | ●                                           |                                                | ●     |                | CA       | CC       |          |          | 0.20                            | 0.16                                | –                | 0.06* | 0.08  | 0.10  | 0.13  | 0.15   | 0.18  | 380                               | 690          |
|             | 632.215      | ●                                           |                                                | ●     |                | CA       | CC       |          |          | 0.40                            | 0.20                                | –                | 0.08* | 0.11  | 0.14  | 0.18  | 0.21   | 0.25  | 380                               | 690          |
|             | 632.245      | ●                                           |                                                | ●     |                | CA       | CC       |          |          | 0.50                            | 0.30                                | –                | 0.12* | 0.16  | 0.20  | 0.26  | 0.31   | 0.37  | 380                               | 690          |
|             | 632.275      | ●                                           |                                                | ●     |                | CA       | CC       |          |          | 0.60                            | 0.30                                | 0.11*            | 0.16* | 0.22  | 0.27  | 0.35  | 0.41   | 0.49  | 380                               | 690          |





| Spray angle | Ordering no.   |                                             |                                                |                |                |          |          |          | Equivalent bore diameter A [mm] | Narrowest free cross section Ø [mm] | V̇ water [l/min] |       |       |       |       |       |       |       | Spray width B [mm] (at p = 5 bar) |              |
|-------------|----------------|---------------------------------------------|------------------------------------------------|----------------|----------------|----------|----------|----------|---------------------------------|-------------------------------------|------------------|-------|-------|-------|-------|-------|-------|-------|-----------------------------------|--------------|
|             | Type           | Mat. no.                                    |                                                |                |                | Code     |          |          |                                 |                                     | p [bar]          |       |       |       |       |       |       |       |                                   |              |
|             |                | 16 <sup>1</sup>                             | 17 <sup>2</sup>                                | 30             | 5E             |          |          |          |                                 |                                     |                  |       |       |       |       |       |       |       |                                   |              |
|             |                | Stainless steel 303/<br>Stainless steel 304 | Stainless steel 316Ti/<br>Stainless steel 316L | Brass          | PVDF           | 1/8 BSPT | 1/4 BSPT | 3/8 BSPT |                                 |                                     | 1/2 BSPT         | 0.5   | 1.0   | 2.0   | 3.0   | 5.0   | 7.0   | 10.0  | H = 250 [mm]                      | H = 500 [mm] |
| 90°         | 632.216        | ●                                           |                                                | ●              |                | CA       | CC       |          |                                 | 0.40                                | 0.20             | –     | 0.08* | 0.11  | 0.14  | 0.18  | 0.21  | 0.25  | 420                               | 780          |
|             | 632.276        | ●                                           |                                                | ●              |                | CA       | CC       |          |                                 | 0.60                                | 0.30             | 0.11* | 0.16* | 0.22  | 0.27  | 0.35  | 0.41  | 0.49  | 430                               | 790          |
|             | 632.306        |                                             | ●                                              | ●              | ●              | CA       | CC       |          |                                 | 0.70                                | 0.40             | 0.16* | 0.23* | 0.32  | 0.39  | 0.51  | 0.60  | 0.72  | 440                               | 800          |
|             | 632.336        | ●                                           | ●                                              | ●              | ●              | CA       | CC       |          |                                 | 0.90                                | 0.50             | 0.22* | 0.32* | 0.45  | 0.55  | 0.71  | 0.84  | 1.00  | 440                               | 820          |
|             | 632.366        | ●                                           | ●                                              | ●              | ●              | CA       | CC       |          |                                 | 1.00                                | 0.50             | 0.31* | 0.44* | 0.63  | 0.77  | 1.00  | 1.18  | 1.40  | 450                               | 830          |
|             | 632.406        | ●                                           | ●                                              | ●              | ●              | CA       | CC       |          |                                 | 1.20                                | 0.70             | 0.50* | 0.71  | 1.00  | 1.23  | 1.58  | 1.87  | 2.24  | 450                               | 840          |
|             | 632.446        | ●                                           | ●                                              | ●              | ●              | CA       | CC       |          |                                 | 1.35                                | 0.80             | 0.62* | 0.88  | 1.25  | 1.53  | 1.98  | 2.34  | 2.80  | 460                               | 860          |
|             | 632.486        | ●                                           | ●                                              | ●              | ●              | CA       | CC       |          |                                 | 1.50                                | 0.80             | 0.80* | 1.13  | 1.60  | 1.96  | 2.53  | 2.99  | 3.58  | 470                               | 870          |
|             | 632.516        | ●                                           | ●                                              | ●              | ●              | CA       | CC       |          |                                 | 1.65                                | 0.90             | 0.95* | 1.34  | 1.90  | 2.32  | 3.00  | 3.55  | 4.24  | 480                               | 880          |
|             | 632.566        | ●                                           | ●                                              | ●              | ●              | CA       | CC       |          |                                 | 2.00                                | 1.10             | 1.25  | 1.77  | 2.50  | 3.06  | 3.95  | 4.68  | 5.59  | 490                               | 900          |
|             | 632.606        | ●                                           | ●                                              | ●              | ●              | CA       | CC       |          |                                 | 2.20                                | 1.20             | 1.57  | 2.23  | 3.15  | 3.86  | 4.98  | 5.89  | 7.04  | 500                               | 910          |
|             | 632.646        | ●                                           | ●                                              | ●              | ● <sup>4</sup> |          | CC       | CE       |                                 | 2.50                                | 1.30             | 2.00  | 2.83  | 4.00  | 4.90  | 6.33  | 7.48  | 8.94  | 510                               | 930          |
|             | 632.676        | ●                                           | ●                                              | ●              | ● <sup>4</sup> |          | CC       | CE       |                                 | 2.70                                | 1.40             | 2.37  | 3.36  | 4.75  | 5.82  | 7.51  | 8.89  | 10.62 | 510                               | 950          |
|             | 632.726        | ●                                           | ●                                              | ●              | ● <sup>4</sup> |          | CC       | CE       |                                 | 3.00                                | 1.70             | 3.15  | 4.46  | 6.30  | 7.72  | 9.96  | 11.79 | 14.09 | 520                               | 980          |
|             | 632.766        | ●                                           | ●                                              | ●              | ● <sup>4</sup> |          | CC       | CE       |                                 | 3.50                                | 1.90             | 4.00  | 5.66  | 8.00  | 9.80  | 12.65 | 14.97 | 17.89 | 530                               | 1,000        |
|             | 632.806        | ●                                           | ● <sup>3</sup>                                 | ●              | ● <sup>4</sup> |          | CC       |          | CG                              | 4.00                                | 2.40             | 5.00  | 7.07  | 10.00 | 12.25 | 15.81 | 18.71 | 22.36 | 530                               | 1,030        |
|             | 632.846        | ●                                           | ● <sup>3</sup>                                 | ●              | ● <sup>4</sup> |          | CC       |          | CG                              | 4.50                                | 2.40             | 6.25  | 8.84  | 12.50 | 15.31 | 19.76 | 23.38 | 27.94 | 540                               | 1,050        |
|             | 632.886        | ●                                           | ● <sup>3</sup>                                 | ●              | ● <sup>4</sup> |          | CC       |          | CG                              | 5.00                                | 3.10             | 8.00  | 11.31 | 16.00 | 19.60 | 25.30 | 29.94 | 35.78 | 540                               | 1,060        |
| 632.926     | ●              | ●                                           | ●                                              |                |                |          |          | CG       | 5.50                            | 3.60                                | 10.00            | 14.14 | 20.00 | 24.49 | 31.62 | 37.41 | 44.72 | 540   | 1,070                             |              |
| 632.966     | ●              | ●                                           | ●                                              |                |                |          |          | CG       | 6.00                            | 3.90                                | 12.50            | 17.68 | 25.00 | 30.62 | 39.53 | 46.77 | 55.90 | 540   | 1,070                             |              |
| 120°        | 632.187        | ●                                           |                                                | ●              |                | CA       | CC       |          |                                 | 0.35                                | 0.20             | –     | 0.06* | 0.08  | 0.10  | 0.13  | 0.15  | 0.18  | 630                               | 1,060        |
|             | 632.217        | ●                                           |                                                | ●              |                | CA       | CC       |          |                                 | 0.40                                | 0.20             | –     | 0.08* | 0.11  | 0.14  | 0.18  | 0.21  | 0.25  | 650                               | 1,080        |
|             | 632.247        | ●                                           |                                                | ●              |                | CA       | CC       |          |                                 | 0.50                                | 0.20             | –     | 0.12* | 0.16  | 0.20  | 0.26  | 0.31  | 0.37  | 660                               | 1,100        |
|             | 632.277        | ●                                           |                                                | ●              |                | CA       | CC       |          |                                 | 0.60                                | 0.30             | –     | 0.16* | 0.22  | 0.27  | 0.35  | 0.41  | 0.49  | 670                               | 1,150        |
|             | 632.307        | ●                                           | ●                                              | ●              | ●              | CA       | CC       |          |                                 | 0.70                                | 0.30             | 0.16* | 0.23* | 0.32  | 0.39  | 0.51  | 0.60  | 0.72  | 710                               | 1,240        |
|             | 632.337        | ●                                           | ●                                              | ●              | ●              | CA       | CC       |          |                                 | 0.90                                | 0.40             | 0.22* | 0.32* | 0.45  | 0.55  | 0.71  | 0.84  | 1.00  | 740                               | 1,350        |
|             | 632.367        | ●                                           | ●                                              | ●              | ●              | CA       | CC       |          |                                 | 1.00                                | 0.50             | 0.31* | 0.44* | 0.63  | 0.77  | 1.00  | 1.18  | 1.40  | 800                               | 1,430        |
|             | 632.407        | ●                                           | ●                                              | ●              | ●              | CA       | CC       |          |                                 | 1.20                                | 0.60             | 0.50* | 0.71  | 1.00  | 1.23  | 1.58  | 1.87  | 2.24  | 830                               | 1,480        |
|             | 632.447        | ●                                           | ●                                              | ●              | ●              | CA       | CC       |          |                                 | 1.35                                | 0.60             | 0.62* | 0.88  | 1.25  | 1.53  | 1.98  | 2.34  | 2.80  | 840                               | 1,520        |
|             | 632.487        | ●                                           | ●                                              | ●              | ●              | CA       | CC       |          |                                 | 1.50                                | 0.60             | 0.80* | 1.13  | 1.60  | 1.96  | 2.53  | 2.99  | 3.58  | 850                               | 1,540        |
|             | 632.517        | ●                                           | ●                                              | ●              | ●              | CA       | CC       |          |                                 | 1.65                                | 0.90             | 0.95* | 1.34  | 1.90  | 2.32  | 3.00  | 3.55  | 4.24  | 850                               | 1,560        |
|             | 632.567        | ●                                           | ●                                              | ●              | ●              | CA       | CC       |          |                                 | 2.00                                | 0.90             | 1.25  | 1.77  | 2.50  | 3.06  | 3.95  | 4.68  | 5.59  | 870                               | 1,590        |
|             | 632.607        | ●                                           | ●                                              | ●              | ●              | CA       | CC       |          |                                 | 2.20                                | 1.10             | 1.57  | 2.23  | 3.15  | 3.86  | 4.98  | 5.89  | 7.04  | 870                               | 1,620        |
|             | 632.647        | ●                                           | ●                                              | ●              |                |          | CC       | CE       |                                 | 2.50                                | 1.30             | 2.00  | 2.83  | 4.00  | 4.90  | 6.33  | 7.48  | 8.94  | 880                               | 1,640        |
|             | 632.677        | ●                                           | ●                                              | ●              | ● <sup>4</sup> |          | CC       | CE       |                                 | 2.70                                | 1.40             | 2.37  | 3.36  | 4.75  | 5.82  | 7.51  | 8.89  | 10.62 | 890                               | 1,660        |
|             | 632.727        | ●                                           | ●                                              | ●              | ● <sup>4</sup> |          | CC       | CE       |                                 | 3.00                                | 1.60             | 3.15  | 4.46  | 6.30  | 7.72  | 9.96  | 11.79 | 14.09 | 890                               | 1,680        |
|             | 632.767        | ●                                           | ●                                              | ●              | ● <sup>4</sup> |          | CC       | CE       |                                 | 3.50                                | 1.70             | 4.00  | 5.66  | 8.00  | 9.80  | 12.65 | 14.97 | 17.89 | 900                               | 1,700        |
|             | 632.807        | ●                                           | ● <sup>3</sup>                                 | ●              |                |          | CC       |          | CG                              | 4.00                                | 2.00             | 5.00  | 7.07  | 10.00 | 12.25 | 15.81 | 18.71 | 22.36 | 900                               | 1,710        |
| 632.847     | ● <sup>3</sup> | ● <sup>3</sup>                              | ● <sup>3</sup>                                 | ● <sup>4</sup> |                | CC       |          | CG       | 4.50                            | 2.30                                | 6.25             | 8.84  | 12.50 | 15.31 | 19.76 | 23.38 | 27.94 | 900   | 1,710                             |              |
| 632.887     | ●              | ●                                           | ●                                              |                |                |          |          | CG       | 5.00                            | 2.60                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 29.94 | 35.78 | 910   | 1,710                             |              |
| 632.927     | ●              | ●                                           | ●                                              |                |                |          |          | CG       | 5.50                            | 2.90                                | 10.00            | 14.14 | 20.00 | 24.49 | 31.62 | 37.41 | 44.72 | 910   | 1,710                             |              |

\* Differing spray pattern.

<sup>1</sup> We reserve the right to supply material 303 or 304 under material no. 16.

<sup>2</sup> We reserve the right to supply material 316Ti or 316L under material no. 17.

<sup>3</sup> Only available with Code CG.

<sup>4</sup> Only available with Code CC.

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

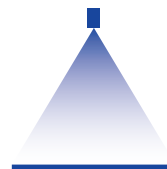
Ordering Type + Material no. + Code = Ordering no.  
example: 632.216 + 16 + CA = 632.216.16.CA



Assembly accessories can be found in Chapter 9 "Accessories".

# Low pressure flat fan nozzles

## Series 610

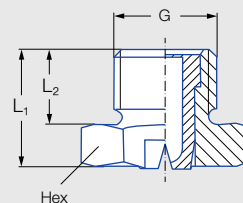


### Features:

- Uniform, parabolic liquid distribution
- Stable spray angle
- Compact design for narrow installation conditions

### Applications:

- Spray cleaning
- Surface cleaning
- Strainer insert cleaning
- Coating processes
- Belt cleaning
- Lubrication processes



Series 610

| G        | Dimensions [mm] |                |     | Weight [g]<br>Brass |
|----------|-----------------|----------------|-----|---------------------|
|          | L <sub>1</sub>  | L <sub>2</sub> | Hex |                     |
| 1/8 BSPP | 11.0            | 7.0            | 14  | 10.0                |

| Spray angle | Ordering no. |                     |       | Equivalent bore diameter<br>A [mm] | Narrowest free cross section<br>Ø [mm] | V̇ water [l/min] |       |      |      |      |      |      | Spray width B [mm]<br>(at p = 5 bar) |              |
|-------------|--------------|---------------------|-------|------------------------------------|----------------------------------------|------------------|-------|------|------|------|------|------|--------------------------------------|--------------|
|             | Type         | Mat. no.            |       |                                    |                                        | p [bar]          |       |      |      |      |      |      | H = 250 [mm]                         | H = 500 [mm] |
|             |              | 16                  | 30    |                                    |                                        |                  |       |      |      |      |      |      |                                      |              |
|             |              | Stainless steel 303 | Brass |                                    |                                        |                  |       |      |      |      |      |      |                                      |              |
| 20°         | 610.301      | ●                   | ●     | 0.70                               | 0.60                                   | 0.16*            | 0.23* | 0.32 | 0.40 | 0.51 | 0.60 | 0.72 | 85                                   | 160          |
|             | 610.361      | ●                   | ●     | 1.00                               | 0.80                                   | 0.32*            | 0.45* | 0.63 | 0.77 | 1.00 | 1.18 | 1.41 | 85                                   | 160          |
|             | 610.441      | ●                   | ●     | 1.35                               | 1.10                                   | 0.63*            | 0.89  | 1.25 | 1.53 | 1.98 | 2.34 | 2.80 | 85                                   | 160          |
|             | 610.481      | ●                   | ●     | 1.50                               | 1.20                                   | 0.80*            | 1.13  | 1.60 | 1.96 | 2.53 | 2.99 | 3.58 | 85                                   | 160          |
| 30°         | 610.302      | ●                   | ●     | 0.70                               | 0.50                                   | 0.16*            | 0.23* | 0.32 | 0.40 | 0.51 | 0.60 | 0.72 | 120                                  | 220          |
|             | 610.362      | ●                   | ●     | 1.00                               | 0.70                                   | 0.32*            | 0.45* | 0.63 | 0.77 | 1.00 | 1.18 | 1.41 | 120                                  | 220          |
|             | 610.402      | ●                   | ●     | 1.20                               | 0.90                                   | 0.50*            | 0.71  | 1.00 | 1.22 | 1.58 | 1.87 | 2.23 | 120                                  | 230          |
|             | 610.482      | ●                   | ●     | 1.50                               | 1.10                                   | 0.80*            | 1.13  | 1.60 | 1.96 | 2.53 | 2.99 | 3.58 | 130                                  | 230          |
|             | 610.562      | ●                   | ●     | 2.00                               | 1.50                                   | 1.25             | 1.77  | 2.50 | 3.06 | 3.95 | 4.67 | 5.59 | 130                                  | 240          |
| 45°         | 610.303      | ●                   | ●     | 0.70                               | 0.50                                   | 0.16*            | 0.23* | 0.32 | 0.40 | 0.51 | 0.60 | 0.72 | 170                                  | 330          |
|             | 610.363      | ●                   | ●     | 1.00                               | 0.60                                   | 0.32*            | 0.45* | 0.63 | 0.77 | 1.00 | 1.18 | 1.41 | 190                                  | 350          |
|             | 610.403      | ●                   | ●     | 1.20                               | 0.90                                   | 0.50*            | 0.71  | 1.00 | 1.22 | 1.58 | 1.87 | 2.23 | 200                                  | 370          |
|             | 610.483      | ●                   | ●     | 1.50                               | 1.10                                   | 0.80*            | 1.13  | 1.60 | 1.96 | 2.53 | 2.99 | 3.58 | 200                                  | 390          |
|             | 610.563      | ●                   | ●     | 2.00                               | 1.40                                   | 1.25             | 1.77  | 2.50 | 3.06 | 3.95 | 4.67 | 5.59 | 210                                  | 410          |
|             | 610.643      | ●                   | ●     | 2.20                               | 1.80                                   | 2.00             | 2.83  | 4.00 | 4.90 | 6.33 | 7.49 | 8.95 | 220                                  | 410          |





| Spray angle | Ordering no. |                     |       | Equivalent bore diameter<br>A<br>[mm] | Narrowest free cross section<br>Ø<br>[mm] | V̇ water [l/min] |       |      |      |      |      |      | Spray width B<br>[mm]<br>(at p = 5 bar)                                             |                 |
|-------------|--------------|---------------------|-------|---------------------------------------|-------------------------------------------|------------------|-------|------|------|------|------|------|-------------------------------------------------------------------------------------|-----------------|
|             | Type         | Mat. no.            |       |                                       |                                           | p [bar]          |       |      |      |      |      |      |  |                 |
|             |              | 16                  | 30    |                                       |                                           |                  |       |      |      |      |      |      |                                                                                     |                 |
|             |              | Stainless steel 303 | Brass |                                       |                                           | 0.5              | 1.0   | 2.0  | 3.0  | 5.0  | 7.0  | 10.0 |                                                                                     | H = 250<br>[mm] |
| 60°         | 610.304      | ●                   | ●     | 0.70                                  | 0.40                                      | 0.16*            | 0.23* | 0.32 | 0.40 | 0.51 | 0.60 | 0.72 | 260                                                                                 | 480             |
|             | 610.334      | ●                   | ●     | 0.90                                  | 0.50                                      | 0.22*            | 0.32* | 0.45 | 0.55 | 0.71 | 0.84 | 1.00 | 260                                                                                 | 490             |
|             | 610.364      | ●                   | ●     | 1.00                                  | 0.60                                      | 0.32*            | 0.45* | 0.63 | 0.77 | 1.00 | 1.18 | 1.41 | 260                                                                                 | 500             |
|             | 610.404      | ●                   | ●     | 1.20                                  | 0.80                                      | 0.50*            | 0.71  | 1.00 | 1.22 | 1.58 | 1.87 | 2.23 | 260                                                                                 | 510             |
|             | 610.444      | ●                   | ●     | 1.35                                  | 0.90                                      | 0.63*            | 0.89  | 1.25 | 1.53 | 1.98 | 2.34 | 2.80 | 260                                                                                 | 510             |
|             | 610.484      | ●                   | ●     | 1.50                                  | 1.00                                      | 0.80*            | 1.13  | 1.60 | 1.96 | 2.53 | 2.99 | 3.58 | 260                                                                                 | 520             |
|             | 610.514      | ●                   | ●     | 1.65                                  | 1.10                                      | 0.95*            | 1.34  | 1.90 | 2.32 | 3.00 | 3.55 | 4.24 | 270                                                                                 | 520             |
|             | 610.564      | ●                   | ●     | 2.00                                  | 1.30                                      | 1.25             | 1.77  | 2.50 | 3.06 | 3.95 | 4.67 | 5.59 | 270                                                                                 | 530             |
| 610.604     | ●            | ●                   | 2.20  | 1.50                                  | 1.57                                      | 2.23             | 3.15  | 3.86 | 4.98 | 5.89 | 7.04 | 270  | 540                                                                                 |                 |
| 75°         | 610.145      | ●                   | ●     | 0.20                                  | 0.12                                      | –                | 0.04* | 0.05 | 0.06 | 0.08 | 0.09 | 0.11 | 380                                                                                 | 690             |
|             | 610.165      | ●                   | ●     | 0.20                                  | 0.14                                      | –                | 0.05* | 0.06 | 0.08 | 0.10 | 0.12 | 0.14 | 380                                                                                 | 690             |
|             | 610.185      | ●                   | ●     | 0.20                                  | 0.16                                      | –                | 0.06* | 0.08 | 0.10 | 0.13 | 0.15 | 0.18 | 380                                                                                 | 690             |
|             | 610.215      | ●                   | ●     | 0.40                                  | 0.20                                      | –                | 0.08* | 0.11 | 0.14 | 0.18 | 0.21 | 0.25 | 380                                                                                 | 690             |
|             | 610.245      | ●                   | ●     | 0.50                                  | 0.30                                      | –                | 0.12* | 0.16 | 0.20 | 0.26 | 0.31 | 0.37 | 380                                                                                 | 690             |
|             | 610.275      | ●                   | ●     | 0.60                                  | 0.30                                      | 0.11*            | 0.16* | 0.22 | 0.27 | 0.35 | 0.41 | 0.49 | 380                                                                                 | 690             |
| 90°         | 610.216      | ●                   | ●     | 0.40                                  | 0.20                                      | –                | 0.08* | 0.11 | 0.14 | 0.18 | 0.21 | 0.25 | 420                                                                                 | 780             |
|             | 610.276      | ●                   | ●     | 0.60                                  | 0.30                                      | 0.11*            | 0.16* | 0.22 | 0.27 | 0.35 | 0.41 | 0.49 | 430                                                                                 | 790             |
|             | 610.306      | ●                   | ●     | 0.70                                  | 0.40                                      | 0.16*            | 0.23* | 0.32 | 0.40 | 0.51 | 0.60 | 0.72 | 440                                                                                 | 800             |
|             | 610.336      | ●                   | ●     | 0.90                                  | 0.50                                      | 0.22*            | 0.32* | 0.45 | 0.55 | 0.71 | 0.84 | 1.00 | 440                                                                                 | 820             |
|             | 610.366      | ●                   | ●     | 1.00                                  | 0.50                                      | 0.32*            | 0.45* | 0.63 | 0.77 | 1.00 | 1.18 | 1.41 | 450                                                                                 | 830             |
|             | 610.406      | ●                   | ●     | 1.20                                  | 0.70                                      | 0.50*            | 0.71  | 1.00 | 1.22 | 1.58 | 1.87 | 2.23 | 450                                                                                 | 840             |
|             | 610.446      | ●                   | ●     | 1.35                                  | 0.80                                      | 0.63*            | 0.89  | 1.25 | 1.53 | 1.98 | 2.34 | 2.80 | 460                                                                                 | 860             |
|             | 610.486      | ●                   | ●     | 1.50                                  | 0.80                                      | 0.80*            | 1.13  | 1.60 | 1.96 | 2.53 | 2.99 | 3.58 | 470                                                                                 | 870             |
|             | 610.516      | ●                   | ●     | 1.65                                  | 0.90                                      | 0.95*            | 1.34  | 1.90 | 2.32 | 3.00 | 3.55 | 4.24 | 480                                                                                 | 880             |
|             | 610.566      | ●                   | ●     | 2.00                                  | 1.10                                      | 1.25             | 1.77  | 2.50 | 3.06 | 3.95 | 4.67 | 5.59 | 490                                                                                 | 900             |
|             | 610.606      | ●                   | ●     | 2.20                                  | 1.20                                      | 1.57             | 2.23  | 3.15 | 3.86 | 4.98 | 5.89 | 7.04 | 500                                                                                 | 910             |
| 120°        | 610.187      | ●                   | ●     | 0.35                                  | 0.20                                      | –                | 0.06* | 0.08 | 0.10 | 0.13 | 0.15 | 0.18 | 630                                                                                 | 1,060           |
|             | 610.217      | ●                   | ●     | 0.40                                  | 0.20                                      | –                | 0.08* | 0.11 | 0.14 | 0.18 | 0.21 | 0.25 | 650                                                                                 | 1,080           |
|             | 610.247      | ●                   | ●     | 0.50                                  | 0.20                                      | –                | 0.12* | 0.16 | 0.20 | 0.26 | 0.31 | 0.37 | 660                                                                                 | 1,100           |
|             | 610.277      | ●                   | ●     | 0.60                                  | 0.30                                      | –                | 0.16* | 0.22 | 0.27 | 0.35 | 0.41 | 0.49 | 670                                                                                 | 1,150           |
|             | 610.307      | ●                   | ●     | 0.70                                  | 0.30                                      | 0.16*            | 0.23* | 0.32 | 0.40 | 0.51 | 0.60 | 0.72 | 710                                                                                 | 1,240           |
|             | 610.337      | ●                   | ●     | 0.90                                  | 0.40                                      | 0.22*            | 0.32* | 0.45 | 0.55 | 0.71 | 0.84 | 1.00 | 740                                                                                 | 1,350           |
|             | 610.367      | ●                   | ●     | 1.00                                  | 0.50                                      | 0.32*            | 0.45* | 0.63 | 0.77 | 1.00 | 1.18 | 1.41 | 800                                                                                 | 1,430           |
|             | 610.407      | ●                   | ●     | 1.20                                  | 0.60                                      | 0.50*            | 0.71  | 1.00 | 1.22 | 1.58 | 1.87 | 2.23 | 830                                                                                 | 1,480           |
|             | 610.447      | ●                   | ●     | 1.35                                  | 0.60                                      | 0.63*            | 0.89  | 1.25 | 1.53 | 1.98 | 2.34 | 2.80 | 840                                                                                 | 1,520           |
|             | 610.487      | ●                   | ●     | 1.50                                  | 0.60                                      | 0.80*            | 1.13  | 1.60 | 1.96 | 2.53 | 2.99 | 3.58 | 850                                                                                 | 1,540           |
|             | 610.517      | ●                   | ●     | 1.65                                  | 0.90                                      | 0.95*            | 1.34  | 1.90 | 2.32 | 3.00 | 3.55 | 4.24 | 850                                                                                 | 1,560           |
|             | 610.567      | ●                   | ●     | 2.00                                  | 0.90                                      | 1.25             | 1.77  | 2.50 | 3.06 | 3.95 | 4.67 | 5.59 | 870                                                                                 | 1,590           |
|             | 610.607      | ●                   | ●     | 2.20                                  | 1.10                                      | 1.57             | 2.23  | 3.15 | 3.86 | 4.98 | 5.89 | 7.04 | 870                                                                                 | 1,620           |

\* Differing spray pattern.

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

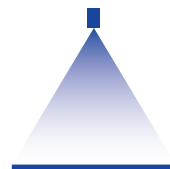
Ordering Type + Material no. = Ordering no.  
example: 610.304 + 16 = 610.304.16



Assembly accessories can be found in Chapter 9 "Accessories".

# Low pressure flat fan nozzles

## Series 612

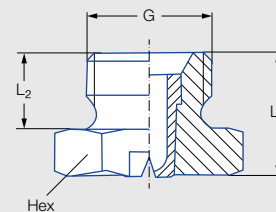


### Features:

- Uniform, parabolic liquid distribution
- Stable spray angle
- Compact design for narrow installation conditions

### Applications:

- Spray cleaning
- Surface cleaning
- Strainer insert cleaning
- Coating processes
- Belt cleaning
- Lubrication processes



Series 612

| G        | Dimensions [mm] |                |     | Weight [g]<br>Brass |
|----------|-----------------|----------------|-----|---------------------|
|          | L <sub>1</sub>  | L <sub>2</sub> | Hex |                     |
| 1/4 BSPP | 13.0            | 8.0            | 17  | 14.0                |

| Spray angle | Ordering no. |                     |                                                |       | Equivalent bore diameter A [mm] | Narrowest free cross section Ø [mm] | V̇ water [l/min] |       |       |       |       |       |       | Spray width B [mm]<br>(at p = 5 bar)                                                  |              |
|-------------|--------------|---------------------|------------------------------------------------|-------|---------------------------------|-------------------------------------|------------------|-------|-------|-------|-------|-------|-------|---------------------------------------------------------------------------------------|--------------|
|             | Type         | Mat. no.            |                                                |       |                                 |                                     | p [bar]          |       |       |       |       |       |       |  |              |
|             |              | 16                  | 17 <sup>1</sup>                                | 30    |                                 |                                     |                  |       |       |       |       |       |       |                                                                                       |              |
|             |              | Stainless steel 303 | Stainless steel 316Ti/<br>Stainless steel 316L | Brass |                                 |                                     |                  |       |       |       |       |       |       |                                                                                       |              |
|             |              |                     |                                                |       |                                 |                                     | 0.5              | 1.0   | 2.0   | 3.0   | 5.0   | 7.0   | 10.0  | H = 250 [mm]                                                                          | H = 500 [mm] |
| 20°         | 612.301      | ●                   | ●                                              | ●     | 0.70                            | 0.60                                | 0.16*            | 0.23* | 0.32  | 0.40  | 0.51  | 0.60  | 0.72  | 85                                                                                    | 160          |
|             | 612.361      | ●                   | ●                                              | ●     | 1.00                            | 0.80                                | 0.32*            | 0.45* | 0.63  | 0.77  | 1.00  | 1.18  | 1.41  | 85                                                                                    | 160          |
|             | 612.441      | ●                   | ●                                              | ●     | 1.30                            | 1.10                                | 0.63*            | 0.89  | 1.25  | 1.53  | 1.98  | 2.34  | 2.80  | 85                                                                                    | 160          |
|             | 612.481      | ●                   | ●                                              | ●     | 1.50                            | 1.20                                | 0.80*            | 1.13  | 1.60  | 1.96  | 2.53  | 2.99  | 3.58  | 85                                                                                    | 160          |
| 30°         | 612.302      | ●                   | ●                                              | ●     | 0.60                            | 0.50                                | 0.16*            | 0.23* | 0.32  | 0.40  | 0.51  | 0.60  | 0.72  | 120                                                                                   | 220          |
|             | 612.362      | ●                   | ●                                              | ●     | 1.00                            | 0.70                                | 0.32*            | 0.45* | 0.63  | 0.77  | 1.00  | 1.18  | 1.41  | 120                                                                                   | 220          |
|             | 612.402      | ●                   | ●                                              | ●     | 1.20                            | 0.90                                | 0.50*            | 0.71  | 1.00  | 1.22  | 1.58  | 1.87  | 2.23  | 120                                                                                   | 230          |
|             | 612.482      | ●                   | ●                                              | ●     | 1.50                            | 1.10                                | 0.80*            | 1.13  | 1.60  | 1.96  | 2.53  | 2.99  | 3.58  | 130                                                                                   | 230          |
|             | 612.562      | ●                   | ●                                              | ●     | 2.00                            | 1.50                                | 1.25             | 1.77  | 2.50  | 3.06  | 3.95  | 4.67  | 5.59  | 130                                                                                   | 240          |
|             | 612.642      | ●                   | ●                                              | ●     | 2.50                            | 1.80                                | 2.00             | 2.83  | 4.00  | 4.90  | 6.33  | 7.49  | 8.95  | 140                                                                                   | 250          |
|             | 612.722      | ●                   | ●                                              | ●     | 3.00                            | 2.40                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 11.78 | 14.09 | 140                                                                                   | 260          |
|             | 612.762      | ●                   | ●                                              | ●     | 3.50                            | 2.70                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 14.97 | 17.89 | 140                                                                                   | 260          |
| 612.802     | ●            | ●                   | ●                                              | 4.00  | 3.10                            | 5.00                                | 7.07             | 10.00 | 12.25 | 15.81 | 18.71 | 22.36 | 140   | 260                                                                                   |              |
| 45°         | 612.303      | ●                   | ●                                              | ●     | 0.70                            | 0.50                                | 0.16*            | 0.23* | 0.32  | 0.40  | 0.51  | 0.60  | 0.72  | 170                                                                                   | 330          |
|             | 612.363      | ●                   | ●                                              | ●     | 1.00                            | 0.60                                | 0.32*            | 0.45* | 0.63  | 0.77  | 1.00  | 1.18  | 1.41  | 190                                                                                   | 350          |
|             | 612.403      | ●                   | ●                                              | ●     | 1.20                            | 0.90                                | 0.50*            | 0.71  | 1.00  | 1.22  | 1.58  | 1.87  | 2.23  | 200                                                                                   | 370          |
|             | 612.483      | ●                   | ●                                              | ●     | 1.50                            | 1.10                                | 0.80*            | 1.13  | 1.60  | 1.96  | 2.53  | 2.99  | 3.58  | 200                                                                                   | 390          |
|             | 612.563      | ●                   | ●                                              | ●     | 2.00                            | 1.40                                | 1.25             | 1.77  | 2.50  | 3.06  | 3.95  | 4.67  | 5.59  | 210                                                                                   | 410          |
|             | 612.643      | ●                   | ●                                              | ●     | 2.50                            | 1.80                                | 2.00             | 2.83  | 4.00  | 4.90  | 6.33  | 7.49  | 8.95  | 220                                                                                   | 410          |
|             | 612.723      | ●                   | ●                                              | ●     | 3.00                            | 2.40                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 11.78 | 14.09 | 220                                                                                   | 420          |
|             | 612.763      | ●                   | ●                                              | ●     | 3.50                            | 2.60                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 14.97 | 17.89 | 220                                                                                   | 420          |
| 612.803     | ●            | ●                   | ●                                              | 4.00  | 3.00                            | 5.00                                | 7.07             | 10.00 | 12.25 | 15.81 | 18.71 | 22.36 | 220   | 420                                                                                   |              |



| Spray angle | Ordering no. |                     |                                               |       | Equivalent bore diameter A [mm] | Narrowest free cross section Ø [mm] | V̇ water [l/min] |       |       |       |       |       |       | Spray width B [mm]<br>(at p = 5 bar)                                                |              |
|-------------|--------------|---------------------|-----------------------------------------------|-------|---------------------------------|-------------------------------------|------------------|-------|-------|-------|-------|-------|-------|-------------------------------------------------------------------------------------|--------------|
|             | Type         | Mat. no.            |                                               |       |                                 |                                     | p [bar]          |       |       |       |       |       |       |  |              |
|             |              | 16                  | 17¹                                           | 30    |                                 |                                     |                  |       |       |       |       |       |       |                                                                                     |              |
|             |              | Stainless steel 303 | Stainless steel 316Ti<br>Stainless steel 316L | Brass |                                 |                                     | 0.5              | 1.0   | 2.0   | 3.0   | 5.0   | 7.0   | 10.0  |                                                                                     | H = 250 [mm] |
| 60°         | 612.304      | ●                   | ●                                             | ●     | 0.70                            | 0.40                                | 0.16*            | 0.23* | 0.32  | 0.40  | 0.51  | 0.60  | 0.72  | 260                                                                                 | 480          |
|             | 612.334      | ●                   | ●                                             | ●     | 0.90                            | 0.50                                | 0.22*            | 0.32* | 0.45  | 0.55  | 0.71  | 0.84  | 1.00  | 260                                                                                 | 490          |
|             | 612.364      | ●                   | ●                                             | ●     | 1.00                            | 0.60                                | 0.32*            | 0.45* | 0.63  | 0.77  | 1.00  | 1.18  | 1.41  | 260                                                                                 | 500          |
|             | 612.404      | ●                   | ●                                             | ●     | 1.20                            | 0.80                                | 0.50*            | 0.71  | 1.00  | 1.22  | 1.58  | 1.87  | 2.23  | 260                                                                                 | 510          |
|             | 612.444      | ●                   | ●                                             | ●     | 1.35                            | 0.90                                | 0.63*            | 0.89  | 1.25  | 1.53  | 1.98  | 2.34  | 2.80  | 260                                                                                 | 510          |
|             | 612.484      | ●                   | ●                                             | ●     | 1.50                            | 1.00                                | 0.80*            | 1.13  | 1.60  | 1.96  | 2.53  | 2.99  | 3.58  | 260                                                                                 | 520          |
|             | 612.514      | ●                   | ●                                             | ●     | 1.65                            | 1.10                                | 0.95*            | 1.34  | 1.90  | 2.32  | 3.00  | 3.55  | 4.24  | 270                                                                                 | 520          |
|             | 612.564      | ●                   | ●                                             | ●     | 2.00                            | 1.30                                | 1.25             | 1.77  | 2.50  | 3.06  | 3.95  | 4.67  | 5.59  | 270                                                                                 | 530          |
|             | 612.604      | ●                   | ●                                             | ●     | 2.20                            | 1.50                                | 1.57             | 2.23  | 3.15  | 3.86  | 4.98  | 5.89  | 7.04  | 270                                                                                 | 540          |
|             | 612.644      | ●                   | ●                                             | ●     | 2.50                            | 1.60                                | 2.00             | 2.83  | 4.00  | 4.90  | 6.33  | 7.49  | 8.95  | 270                                                                                 | 540          |
|             | 612.674      | ●                   | ●                                             | ●     | 2.70                            | 1.80                                | 2.37             | 3.36  | 4.75  | 5.82  | 7.51  | 8.89  | 10.62 | 270                                                                                 | 550          |
|             | 612.724      | ●                   | ●                                             | ●     | 3.00                            | 2.10                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 11.78 | 14.09 | 280                                                                                 | 560          |
|             | 612.764      | ●                   | ●                                             | ●     | 3.50                            | 2.30                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 14.97 | 17.89 | 280                                                                                 | 570          |
|             | 612.804      | ●                   | ●                                             | ●     | 4.00                            | 2.60                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 18.71 | 22.36 | 290                                                                                 | 580          |
| 612.884     | ●            |                     | ●                                             | 5.00  | 3.40                            | 8.00                                | 11.31            | 16.00 | 19.60 | 25.30 | 29.94 | 35.78 | 290   | 580                                                                                 |              |
| 75°         | 612.145      | ●                   |                                               | ●     | 0.20                            | 0.12                                | –                | 0.04* | 0.05  | 0.06  | 0.08  | 0.09  | 0.11  | 380                                                                                 | 690          |
|             | 612.165      | ●                   |                                               | ●     | 0.20                            | 0.14                                | –                | 0.05* | 0.07  | 0.08  | 0.10  | 0.12  | 0.15  | 380                                                                                 | 690          |
|             | 612.185      | ●                   |                                               | ●     | 0.20                            | 0.16                                | –                | 0.06* | 0.08  | 0.10  | 0.13  | 0.15  | 0.18  | 380                                                                                 | 690          |
|             | 612.215      | ●                   |                                               | ●     | 0.40                            | 0.20                                | –                | 0.08* | 0.11  | 0.14  | 0.18  | 0.21  | 0.25  | 380                                                                                 | 690          |
|             | 612.245      | ●                   |                                               | ●     | 0.50                            | 0.30                                | –                | 0.12* | 0.16  | 0.20  | 0.26  | 0.31  | 0.37  | 380                                                                                 | 690          |
|             | 612.275      | ●                   |                                               | ●     | 0.60                            | 0.30                                | 0.11*            | 0.16  | 0.22  | 0.27  | 0.35  | 0.41  | 0.49  | 380                                                                                 | 690          |
| 90°         | 612.216      | ●                   |                                               | ●     | 0.40                            | 0.20                                | –                | 0.08* | 0.11  | 0.14  | 0.18  | 0.21  | 0.25  | 420                                                                                 | 780          |
|             | 612.276      | ●                   |                                               | ●     | 0.60                            | 0.30                                | 0.11*            | 0.16* | 0.22  | 0.27  | 0.35  | 0.41  | 0.49  | 430                                                                                 | 790          |
|             | 612.306      | ●                   | ●                                             | ●     | 0.70                            | 0.40                                | 0.16*            | 0.23* | 0.32  | 0.40  | 0.51  | 0.60  | 0.72  | 440                                                                                 | 800          |
|             | 612.336      | ●                   | ●                                             | ●     | 0.90                            | 0.50                                | 0.22*            | 0.32* | 0.45  | 0.55  | 0.71  | 0.84  | 1.00  | 440                                                                                 | 820          |
|             | 612.366      | ●                   | ●                                             | ●     | 1.00                            | 0.50                                | 0.32*            | 0.45* | 0.63  | 0.77  | 1.00  | 1.18  | 1.41  | 450                                                                                 | 830          |
|             | 612.406      | ●                   |                                               | ●     | 1.20                            | 0.70                                | 0.50*            | 0.71  | 1.00  | 1.22  | 1.58  | 1.87  | 2.23  | 450                                                                                 | 840          |
|             | 612.446      | ●                   | ●                                             | ●     | 1.35                            | 0.80                                | 0.63*            | 0.89  | 1.25  | 1.53  | 1.98  | 2.34  | 2.80  | 460                                                                                 | 860          |
|             | 612.486      | ●                   | ●                                             | ●     | 1.50                            | 0.80                                | 0.80*            | 1.13  | 1.60  | 1.96  | 2.53  | 2.99  | 3.58  | 470                                                                                 | 870          |
|             | 612.516      | ●                   | ●                                             | ●     | 1.65                            | 0.90                                | 0.95*            | 1.34  | 1.90  | 2.32  | 3.00  | 3.55  | 4.24  | 480                                                                                 | 880          |
|             | 612.566      | ●                   | ●                                             | ●     | 2.00                            | 1.10                                | 1.25             | 1.77  | 2.50  | 3.06  | 3.95  | 4.67  | 5.59  | 490                                                                                 | 900          |
|             | 612.606      | ●                   | ●                                             | ●     | 2.20                            | 1.20                                | 1.57             | 2.23  | 3.15  | 3.86  | 4.98  | 5.89  | 7.04  | 500                                                                                 | 910          |
|             | 612.646      | ●                   | ●                                             | ●     | 2.50                            | 1.30                                | 2.00             | 2.83  | 4.00  | 4.90  | 6.33  | 7.49  | 8.95  | 510                                                                                 | 930          |
|             | 612.676      | ●                   | ●                                             | ●     | 2.70                            | 1.40                                | 2.37             | 3.36  | 4.75  | 5.82  | 7.51  | 8.89  | 10.62 | 510                                                                                 | 950          |
|             | 612.726      | ●                   | ●                                             | ●     | 3.00                            | 1.70                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 11.78 | 14.09 | 520                                                                                 | 980          |
|             | 612.766      | ●                   | ●                                             | ●     | 3.50                            | 1.90                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 14.97 | 17.89 | 530                                                                                 | 1,000        |
|             | 612.806      | ●                   |                                               | ●     | 4.00                            | 2.40                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 18.71 | 22.36 | 530                                                                                 | 1,030        |

| Spray angle | Ordering no. |                     |                                               |       | Equivalent bore diameter A [mm] | Narrowest free cross section Ø [mm] | V̇ water [l/min] |       |       |       |       |       |       | Spray width B [mm]<br>(at p = 5 bar)                                                |       |
|-------------|--------------|---------------------|-----------------------------------------------|-------|---------------------------------|-------------------------------------|------------------|-------|-------|-------|-------|-------|-------|-------------------------------------------------------------------------------------|-------|
|             | Type         | Mat. no.            |                                               |       |                                 |                                     | p [bar]          |       |       |       |       |       |       |  |       |
|             |              | 16                  | 17 <sup>1</sup>                               | 30    |                                 |                                     |                  |       |       |       |       |       |       |                                                                                     |       |
|             |              | Stainless steel 303 | Stainless steel 316Ti<br>Stainless steel 316L | Brass |                                 |                                     | 0.5              | 1.0   | 2.0   | 3.0   | 5.0   | 7.0   | 10.0  |                                                                                     |       |
| 120°        | 612.187      | ●                   |                                               | ●     | 0.35                            | 0.20                                | –                | 0.06* | 0.08  | 0.10  | 0.13  | 0.15  | 0.18  | 630                                                                                 | 1,060 |
|             | 612.217      | ●                   |                                               | ●     | 0.40                            | 0.20                                | –                | 0.08* | 0.11  | 0.14  | 0.18  | 0.21  | 0.25  | 650                                                                                 | 1,080 |
|             | 612.247      | ●                   |                                               | ●     | 0.50                            | 0.20                                | –                | 0.12* | 0.16  | 0.20  | 0.26  | 0.31  | 0.37  | 660                                                                                 | 1,100 |
|             | 612.277      | ●                   |                                               | ●     | 0.60                            | 0.30                                | 0.11*            | 0.16* | 0.22  | 0.27  | 0.35  | 0.41  | 0.49  | 670                                                                                 | 1,150 |
|             | 612.307      | ●                   |                                               | ●     | 0.70                            | 0.30                                | 0.16*            | 0.23* | 0.32  | 0.40  | 0.51  | 0.60  | 0.72  | 710                                                                                 | 1,240 |
|             | 612.337      | ●                   | ●                                             | ●     | 0.90                            | 0.40                                | 0.22*            | 0.32* | 0.45  | 0.55  | 0.71  | 0.84  | 1.00  | 740                                                                                 | 1,350 |
|             | 612.367      | ●                   | ●                                             | ●     | 1.00                            | 0.40                                | 0.32*            | 0.45* | 0.63  | 0.77  | 1.00  | 1.18  | 1.41  | 800                                                                                 | 1,430 |
|             | 612.407      | ●                   | ●                                             | ●     | 1.20                            | 0.60                                | 0.50*            | 0.71  | 1.00  | 1.22  | 1.58  | 1.87  | 2.23  | 830                                                                                 | 1,480 |
|             | 612.447      | ●                   | ●                                             | ●     | 1.35                            | 0.60                                | 0.63*            | 0.89  | 1.25  | 1.53  | 1.98  | 2.34  | 2.80  | 840                                                                                 | 1,520 |
|             | 612.487      | ●                   | ●                                             | ●     | 1.50                            | 0.60                                | 0.80*            | 1.13  | 1.60  | 1.96  | 2.53  | 2.99  | 3.58  | 850                                                                                 | 1,540 |
|             | 612.517      | ●                   | ●                                             | ●     | 1.65                            | 0.90                                | 0.95*            | 1.34  | 1.90  | 2.32  | 3.00  | 3.55  | 4.24  | 850                                                                                 | 1,560 |
|             | 612.567      | ●                   | ●                                             | ●     | 2.00                            | 0.90                                | 1.25             | 1.77  | 2.50  | 3.06  | 3.95  | 4.67  | 5.59  | 870                                                                                 | 1,590 |
|             | 612.607      | ●                   | ●                                             | ●     | 2.20                            | 1.10                                | 1.57             | 2.23  | 3.15  | 3.86  | 4.98  | 5.89  | 7.04  | 870                                                                                 | 1,620 |
|             | 612.647      | ●                   | ●                                             | ●     | 2.50                            | 1.30                                | 2.00             | 2.83  | 4.00  | 4.90  | 6.33  | 7.49  | 8.95  | 880                                                                                 | 1,640 |
|             | 612.677      | ●                   | ●                                             | ●     | 2.70                            | 1.40                                | 2.37             | 3.36  | 4.75  | 5.82  | 7.51  | 8.89  | 10.62 | 890                                                                                 | 1,660 |
|             | 612.727      | ●                   | ●                                             | ●     | 3.00                            | 1.60                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 11.78 | 14.09 | 890                                                                                 | 1,680 |
|             | 612.767      | ●                   | ●                                             | ●     | 3.50                            | 1.70                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 14.97 | 17.89 | 900                                                                                 | 1,700 |
|             | 612.807      | ●                   |                                               | ●     | 4.00                            | 2.00                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 18.71 | 22.36 | 900                                                                                 | 1,710 |

\* Differing spray pattern.

<sup>1</sup> We reserve the right to supply material 316Ti or 316L under material no. 17.

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. = Ordering no.  
example: 612.187 + 16 = 612.187.16



Assembly accessories can be found in Chapter 9 "Accessories".

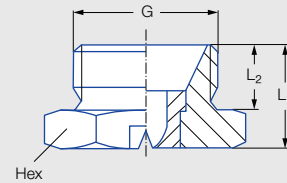
# Low pressure flat fan nozzles

## Series 616/617



### Features:

- Uniform, parabolic liquid distribution
- Stable spray angle
- Compact design for narrow installation conditions



### Applications:

- Spray cleaning
- Surface cleaning
- Filter cleaning
- Coating processes
- Belt cleaning
- Lubrication processes

Series 616/617

| G        | Dimensions [mm] |                |     | Weight [g]<br>Brass |
|----------|-----------------|----------------|-----|---------------------|
|          | L <sub>1</sub>  | L <sub>2</sub> | Hex |                     |
| 3/4 BSPP | 19.0            | 12.0           | 32  | 75.0                |

| Spray angle | Ordering no. |                     |                                                |       | Equivalent bore diameter A [mm] | Narrowest free cross section Ø [mm] | V̇ water [l/min] |       |       |       |       |       |       |     | Spray width B [mm]<br>(at p = 5 bar) |              |
|-------------|--------------|---------------------|------------------------------------------------|-------|---------------------------------|-------------------------------------|------------------|-------|-------|-------|-------|-------|-------|-----|--------------------------------------|--------------|
|             | Type         | Mat. no.            |                                                |       |                                 |                                     | p [bar]          |       |       |       |       |       |       |     | H = 250 [mm]                         | H = 500 [mm] |
|             |              | 16                  | 17 <sup>1</sup>                                | 30    |                                 |                                     |                  |       |       |       |       |       |       |     |                                      |              |
|             |              | Stainless steel 303 | Stainless steel 316Ti/<br>Stainless steel 316L | Brass |                                 |                                     |                  |       |       |       |       |       |       |     |                                      |              |
|             |              |                     |                                                |       |                                 |                                     | 0.5              | 1.0   | 2.0   | 3.0   | 5.0   | 7.0   | 10.0  |     |                                      |              |
| 20°         | 616.721      | ●                   | ●                                              | ●     | 3.00                            | 2.50                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 11.78 | 14.09 | 100 | 180                                  |              |
|             | 616.801      | ●                   | ●                                              | ●     | 4.00                            | 3.20                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 18.71 | 22.36 | 100 | 180                                  |              |
|             | 616.881      | ●                   | ●                                              | ●     | 5.00                            | 4.00                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 29.94 | 35.78 | 100 | 180                                  |              |
|             | 616.921      | ●                   | ●                                              | ●     | 5.50                            | 4.40                                | 10.00            | 14.14 | 20.00 | 24.49 | 31.62 | 37.41 | 44.72 | 100 | 180                                  |              |
|             | 616.961      | ●                   | ●                                              | ●     | 6.00                            | 5.10                                | 12.50            | 17.68 | 25.00 | 30.62 | 39.53 | 46.77 | 55.90 | 100 | 180                                  |              |
| 30°         | 616.722      | ●                   | ●                                              | ●     | 3.00                            | 2.50                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 11.78 | 14.09 | 140 | 260                                  |              |
|             | 616.762      | ●                   | ●                                              | ●     | 3.50                            | 2.80                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 14.97 | 17.89 | 140 | 260                                  |              |
|             | 616.802      | ●                   | ●                                              | ●     | 4.00                            | 3.10                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 18.71 | 22.36 | 140 | 260                                  |              |
|             | 616.882      | ●                   | ●                                              | ●     | 5.00                            | 4.00                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 29.94 | 35.78 | 140 | 270                                  |              |
|             | 616.922      | ●                   | ●                                              | ●     | 5.50                            | 4.40                                | 10.00            | 14.14 | 20.00 | 24.49 | 31.62 | 37.41 | 44.72 | 140 | 270                                  |              |
|             | 616.962      | ●                   | ●                                              | ●     | 6.00                            | 5.00                                | 12.50            | 17.68 | 25.00 | 30.62 | 39.53 | 46.77 | 55.90 | 140 | 270                                  |              |
| 45°         | 616.723      | ●                   | ●                                              | ●     | 3.00                            | 2.40                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 11.78 | 14.09 | 220 | 420                                  |              |
|             | 616.763      | ●                   | ●                                              | ●     | 3.50                            | 2.60                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 14.97 | 17.89 | 220 | 420                                  |              |
|             | 616.803      | ●                   | ●                                              | ●     | 4.00                            | 3.00                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 18.71 | 22.36 | 220 | 420                                  |              |
|             | 616.843      | ●                   | ●                                              | ●     | 4.50                            | 3.40                                | 6.25             | 8.84  | 12.50 | 15.31 | 19.76 | 23.38 | 27.94 | 220 | 420                                  |              |
|             | 616.883      | ●                   | ●                                              | ●     | 5.00                            | 3.80                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 29.94 | 35.78 | 220 | 420                                  |              |
|             | 616.923      | ●                   | ●                                              | ●     | 5.50                            | 4.20                                | 10.00            | 14.14 | 20.00 | 24.49 | 31.62 | 37.41 | 44.72 | 220 | 430                                  |              |
|             | 616.963      | ●                   | ●                                              | ●     | 6.00                            | 4.40                                | 12.50            | 17.68 | 25.00 | 30.62 | 39.53 | 46.77 | 55.90 | 220 | 430                                  |              |

| Spray angle | Ordering no. |                     |                                                |       | Equivalent bore diameter A [mm] | Narrowest free cross section Ø [mm] | V̇ water [l/min] |       |       |       |        |        |       | Spray width B [mm]<br>(at p = 5 bar)                                                |              |              |
|-------------|--------------|---------------------|------------------------------------------------|-------|---------------------------------|-------------------------------------|------------------|-------|-------|-------|--------|--------|-------|-------------------------------------------------------------------------------------|--------------|--------------|
|             | Type         | Mat. no.            |                                                |       |                                 |                                     | p [bar]          |       |       |       |        |        |       |  | H = 250 [mm] | H = 500 [mm] |
|             |              | 16                  | 17¹                                            | 30    |                                 |                                     |                  |       |       |       |        |        |       |                                                                                     |              |              |
|             |              | Stainless steel 303 | Stainless steel 316Ti/<br>Stainless steel 316L | Brass |                                 |                                     |                  |       |       |       |        |        |       |                                                                                     |              |              |
| 60°         | 616.724      | ●                   | ●                                              | ●     | 3.00                            | 2.10                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96   | 11.78  | 14.09 | 280                                                                                 | 560          |              |
|             | 616.764      | ●                   | ●                                              | ●     | 3.50                            | 2.30                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65  | 14.97  | 17.89 | 280                                                                                 | 570          |              |
|             | 616.804      | ●                   | ●                                              | ●     | 4.00                            | 2.60                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81  | 18.71  | 22.36 | 290                                                                                 | 580          |              |
|             | 616.844      | ●                   | ●                                              | ●     | 4.50                            | 3.00                                | 6.25             | 8.84  | 12.50 | 15.31 | 19.76  | 23.38  | 27.94 | 290                                                                                 | 580          |              |
|             | 616.884      | ●                   | ●                                              | ●     | 5.00                            | 3.40                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30  | 29.94  | 35.78 | 290                                                                                 | 580          |              |
|             | 616.924      | ●                   | ●                                              | ●     | 5.50                            | 4.10                                | 10.00            | 14.14 | 20.00 | 24.49 | 31.62  | 37.41  | 44.72 | 290                                                                                 | 580          |              |
|             | 616.964      | ●                   | ●                                              | ●     | 6.00                            | 4.20                                | 12.50            | 17.68 | 25.00 | 30.62 | 39.53  | 46.77  | 55.90 | 290                                                                                 | 580          |              |
|             | 617.044      | ●                   |                                                | ●     | 8.00                            | 5.50                                | 20.00            | 28.26 | 39.97 | 48.95 | 63.20  | 74.78  | 89.38 | 290                                                                                 | 580          |              |
|             |              |                     | ●                                              | 10.00 | 7.40                            | 31.50                               | 44.54            | 62.99 | 77.15 | 99.60 | 117.85 | 140.86 | 290   | 580                                                                                 |              |              |
| 90°         | 616.726      | ●                   | ●                                              | ●     | 3.00                            | 1.80                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96   | 11.78  | 14.09 | 520                                                                                 | 980          |              |
|             | 616.766      | ●                   | ●                                              | ●     | 3.50                            | 1.90                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65  | 14.97  | 17.89 | 530                                                                                 | 1,000        |              |
|             | 616.806      | ●                   | ●                                              | ●     | 4.00                            | 2.40                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81  | 18.71  | 22.36 | 530                                                                                 | 1,030        |              |
|             | 616.846      | ●                   | ●                                              | ●     | 4.50                            | 2.40                                | 6.25             | 8.84  | 12.50 | 15.31 | 19.76  | 23.38  | 27.94 | 540                                                                                 | 1,050        |              |
|             | 616.886      | ●                   | ●                                              | ●     | 5.00                            | 3.10                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30  | 29.94  | 35.78 | 540                                                                                 | 1,060        |              |
|             | 616.926      | ●                   | ●                                              | ●     | 5.50                            | 3.60                                | 10.00            | 14.14 | 20.00 | 24.49 | 31.62  | 37.41  | 44.72 | 540                                                                                 | 1,070        |              |
|             | 616.966      | ●                   | ●                                              | ●     | 6.00                            | 3.90                                | 12.50            | 17.68 | 25.00 | 30.62 | 39.53  | 46.77  | 55.90 | 540                                                                                 | 1,070        |              |
| 120°        | 616.727      | ●                   | ●                                              | ●     | 3.00                            | 1.60                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96   | 11.78  | 14.09 | 890                                                                                 | 1,680        |              |
|             | 616.767      | ●                   | ●                                              | ●     | 3.50                            | 1.70                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65  | 14.97  | 17.89 | 900                                                                                 | 1,700        |              |
|             | 616.807      | ●                   | ●                                              | ●     | 4.00                            | 2.00                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81  | 18.71  | 22.36 | 900                                                                                 | 1,710        |              |
|             | 616.887      | ●                   | ●                                              | ●     | 5.00                            | 2.60                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30  | 29.94  | 35.78 | 910                                                                                 | 1,710        |              |
|             | 616.927      | ●                   | ●                                              | ●     | 5.50                            | 2.90                                | 10.00            | 14.14 | 20.00 | 24.49 | 31.62  | 37.41  | 44.72 | 910                                                                                 | 1,710        |              |
|             | 616.967      |                     |                                                | ●     | 6.00                            | 3.20                                | 12.50            | 17.68 | 25.00 | 30.62 | 39.53  | 46.77  | 55.90 | 910                                                                                 | 1,710        |              |
|             | 617.047      |                     |                                                | ●     | 8.00                            | 4.40                                | 20.00            | 28.26 | 39.97 | 48.95 | 63.20  | 74.78  | 89.38 | 910                                                                                 | 1,710        |              |

<sup>1</sup> We reserve the right to supply material 316Ti or 316L under material no. 17.

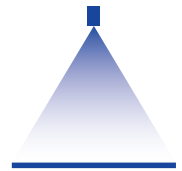
Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. = Ordering no.  
example: 616.724 + 16 = 616.724.16



Assembly accessories can be found in Chapter 9 "Accessories".

# Low pressure flat fan nozzles for retaining nut Series 652



## Features:

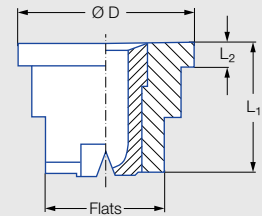
- Uniform, parabolic liquid distribution
- Stable spray angle
- Assembly with retaining nut

## Applications:

- Spray cleaning
- Surface cleaning
- Filter cleaning
- Coating processes
- Belt cleaning
- Lubrication processes



Series 652



| Code                                 | Dimensions [mm] |                |      |       | Weight [g]<br>Brass |
|--------------------------------------|-----------------|----------------|------|-------|---------------------|
|                                      | L <sub>1</sub>  | L <sub>2</sub> | Ø D  | Flats |                     |
| Assembly with retaining nut 3/8 BSPP | 11.0            | 2.0            | 14.8 | 10    | 9.0                 |

| Spray angle | Ordering no. |                     |                                                |       |      | Equivalent bore diameter A [mm] | Narrowest free cross section Ø [mm] | V̇ water [l/min] |       |       |       |       |       | Spray width B [mm]<br>(at p = 5 bar) |              |
|-------------|--------------|---------------------|------------------------------------------------|-------|------|---------------------------------|-------------------------------------|------------------|-------|-------|-------|-------|-------|--------------------------------------|--------------|
|             | Type         | Mat. no.            |                                                |       |      |                                 |                                     | p [bar]          |       |       |       |       |       | H = 250 [mm]                         | H = 500 [mm] |
|             |              | 16                  | 17 <sup>1</sup>                                | 30    | 5E   |                                 |                                     |                  |       |       |       |       |       |                                      |              |
|             |              | Stainless steel 303 | Stainless steel 316Ti/<br>Stainless steel 316L | Brass | PVDF |                                 |                                     | 0.5              | 1.0   | 2.0   | 3.0   | 5.0   | 10.0  |                                      |              |
|             |              |                     |                                                |       |      |                                 |                                     |                  |       |       |       |       |       |                                      |              |
| 20°         | 652.301      | ●                   | ●                                              | ●     | ●    | 0.70                            | 0.60                                | 0.16*            | 0.23* | 0.32  | 0.40  | 0.51  | 0.72  | 85                                   | 160          |
|             | 652.361      | ●                   | ●                                              | ●     | ●    | 1.00                            | 0.80                                | 0.32*            | 0.45* | 0.63  | 0.77  | 1.00  | 1.41  | 85                                   | 160          |
|             | 652.441      | ●                   | ●                                              | ●     | ●    | 1.35                            | 1.10                                | 0.63*            | 0.89  | 1.25  | 1.53  | 1.98  | 2.80  | 85                                   | 160          |
|             | 652.481      | ●                   | ●                                              | ●     | ●    | 1.50                            | 1.20                                | 0.80*            | 1.13  | 1.60  | 1.96  | 2.53  | 3.58  | 85                                   | 160          |
| 30°         | 652.302      | ●                   | ●                                              | ●     | ●    | 0.60                            | 0.50                                | 0.16*            | 0.23* | 0.32  | 0.40  | 0.51  | 0.72  | 120                                  | 220          |
|             | 652.362      | ●                   | ●                                              | ●     | ●    | 1.00                            | 0.70                                | 0.32*            | 0.45* | 0.63  | 0.77  | 1.00  | 1.41  | 120                                  | 220          |
|             | 652.402      | ●                   | ●                                              | ●     | ●    | 1.20                            | 0.90                                | 0.50*            | 0.71  | 1.00  | 1.22  | 1.58  | 2.23  | 120                                  | 230          |
|             | 652.482      | ●                   | ●                                              | ●     | ●    | 1.50                            | 1.10                                | 0.80*            | 1.13  | 1.60  | 1.96  | 2.53  | 3.58  | 130                                  | 230          |
|             | 652.562      | ●                   | ●                                              | ●     | ●    | 2.00                            | 1.50                                | 1.25             | 1.77  | 2.50  | 3.06  | 3.95  | 5.59  | 130                                  | 240          |
|             | 652.642      | ●                   | ●                                              | ●     |      | 2.50                            | 1.80                                | 2.00             | 2.83  | 4.00  | 4.90  | 6.33  | 8.95  | 140                                  | 250          |
|             | 652.722      | ●                   | ●                                              | ●     |      | 3.00                            | 2.40                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 14.09 | 140                                  | 260          |
|             | 652.762      | ●                   | ●                                              | ●     |      | 3.50                            | 2.70                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 17.89 | 140                                  | 260          |
| 652.802     | ●            | ●                   | ●                                              |       | 4.00 | 3.10                            | 5.00                                | 7.07             | 10.00 | 12.25 | 15.81 | 22.36 | 140   | 260                                  |              |
| 45°         | 652.303      | ●                   | ●                                              | ●     |      | 0.70                            | 0.50                                | 0.16*            | 0.23* | 0.32  | 0.40  | 0.51  | 0.72  | 170                                  | 330          |
|             | 652.363      | ●                   | ●                                              | ●     | ●    | 1.00                            | 0.60                                | 0.32*            | 0.45* | 0.63  | 0.77  | 1.00  | 1.41  | 190                                  | 350          |
|             | 652.403      | ●                   | ●                                              | ●     | ●    | 1.20                            | 0.90                                | 0.50*            | 0.71  | 1.00  | 1.22  | 1.58  | 2.23  | 200                                  | 370          |
|             | 652.483      | ●                   | ●                                              | ●     | ●    | 1.50                            | 1.10                                | 0.80*            | 1.13  | 1.60  | 1.96  | 2.53  | 3.58  | 200                                  | 390          |
|             | 652.563      | ●                   | ●                                              | ●     | ●    | 2.00                            | 1.40                                | 1.25             | 1.77  | 2.50  | 3.06  | 3.95  | 5.59  | 210                                  | 410          |
|             | 652.643      | ●                   | ●                                              | ●     | ●    | 2.50                            | 1.80                                | 2.00             | 2.83  | 4.00  | 4.90  | 6.33  | 8.95  | 220                                  | 410          |
|             | 652.723      | ●                   | ●                                              | ●     |      | 3.00                            | 2.40                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 14.09 | 220                                  | 420          |
|             | 652.763      | ●                   | ●                                              | ●     |      | 3.50                            | 2.60                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 17.89 | 220                                  | 420          |
| 652.803     | ●            | ●                   | ●                                              |       | 4.00 | 3.00                            | 5.00                                | 7.07             | 10.00 | 12.25 | 15.81 | 22.36 | 220   | 420                                  |              |

| Spray angle | Ordering no. |                     |                                               |       |      | Equivalent bore diameter A [mm] | Narrowest free cross section Ø [mm] | V̇ water [l/min] |       |       |       |       |       | Spray width B [mm]<br>(at p = 5 bar) |              |
|-------------|--------------|---------------------|-----------------------------------------------|-------|------|---------------------------------|-------------------------------------|------------------|-------|-------|-------|-------|-------|--------------------------------------|--------------|
|             | Type         | Mat. no.            |                                               |       |      |                                 |                                     | p [bar]          |       |       |       |       |       | H = 250 [mm]                         | H = 500 [mm] |
|             |              | 16                  | 17 <sup>1</sup>                               | 30    | 5E   |                                 |                                     |                  |       |       |       |       |       |                                      |              |
|             |              | Stainless steel 303 | Stainless steel 316Ti<br>Stainless steel 316L | Brass | PVDF |                                 |                                     | 0.5              | 1.0   | 2.0   | 3.0   | 5.0   | 10.0  |                                      |              |
| 60°         | 652.304      | ●                   | ●                                             | ●     | ●    | 0.70                            | 0.40                                | 0.16*            | 0.23* | 0.32  | 0.40  | 0.51  | 0.72  | 260                                  | 480          |
|             | 652.334      | ●                   | ●                                             | ●     | ●    | 0.90                            | 0.50                                | 0.22*            | 0.32* | 0.45  | 0.55  | 0.71  | 1.00  | 260                                  | 490          |
|             | 652.364      | ●                   | ●                                             | ●     | ●    | 1.00                            | 0.60                                | 0.32*            | 0.45* | 0.63  | 0.77  | 1.00  | 1.41  | 260                                  | 500          |
|             | 652.404      | ●                   | ●                                             | ●     | ●    | 1.20                            | 0.80                                | 0.50*            | 0.71  | 1.00  | 1.22  | 1.58  | 2.23  | 260                                  | 510          |
|             | 652.444      | ●                   | ●                                             | ●     | ●    | 1.35                            | 0.90                                | 0.63*            | 0.89  | 1.25  | 1.53  | 1.98  | 2.80  | 260                                  | 510          |
|             | 652.484      | ●                   | ●                                             | ●     | ●    | 1.50                            | 1.00                                | 0.80*            | 1.13  | 1.60  | 1.96  | 2.53  | 3.58  | 260                                  | 520          |
|             | 652.514      | ●                   | ●                                             | ●     | ●    | 1.65                            | 1.10                                | 0.95*            | 1.34  | 1.90  | 2.32  | 3.00  | 4.24  | 270                                  | 520          |
|             | 652.564      | ●                   | ●                                             | ●     | ●    | 2.00                            | 1.30                                | 1.25             | 1.77  | 2.50  | 3.06  | 3.95  | 5.59  | 270                                  | 530          |
|             | 652.604      | ●                   | ●                                             | ●     | ●    | 2.20                            | 1.50                                | 1.57             | 2.23  | 3.15  | 3.86  | 4.98  | 7.04  | 270                                  | 540          |
|             | 652.644      | ●                   | ●                                             | ●     | ●    | 2.50                            | 1.60                                | 2.00             | 2.83  | 4.00  | 4.90  | 6.33  | 8.95  | 270                                  | 540          |
|             | 652.674      | ●                   | ●                                             | ●     | ●    | 2.70                            | 1.80                                | 2.37             | 3.36  | 4.75  | 5.82  | 7.51  | 10.62 | 270                                  | 550          |
|             | 652.724      | ●                   | ●                                             | ●     | ●    | 3.00                            | 2.10                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 14.09 | 280                                  | 560          |
|             | 652.764      | ●                   | ●                                             | ●     |      | 3.50                            | 2.30                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 17.89 | 280                                  | 570          |
|             | 652.804      | ●                   | ●                                             | ●     | ●    | 4.00                            | 2.60                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 22.36 | 290                                  | 580          |
|             | 652.844      | ●                   |                                               |       | ●    | 4.50                            | 3.00                                | 6.25             | 8.84  | 12.50 | 15.31 | 19.76 | 27.94 | 290                                  | 580          |
|             | 652.884      | ●                   |                                               | ●     |      | 5.00                            | 3.40                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 35.78 | 290                                  | 580          |
| 75°         | 652.145      | ●                   |                                               | ●     |      | 0.20                            | 0.12                                | –                | 0.04* | 0.05  | 0.06  | 0.08  | 0.11  | 380                                  | 690          |
|             | 652.165      | ●                   |                                               | ●     |      | 0.20                            | 0.14                                | –                | 0.05* | 0.07  | 0.08  | 0.10  | 0.14  | 380                                  | 690          |
|             | 652.185      | ●                   |                                               | ●     |      | 0.20                            | 0.16                                | –                | 0.06* | 0.08  | 0.10  | 0.13  | 0.18  | 380                                  | 690          |
|             | 652.215      | ●                   |                                               | ●     |      | 0.40                            | 0.20                                | –                | 0.08* | 0.11  | 0.14  | 0.18  | 0.25  | 380                                  | 690          |
|             | 652.245      | ●                   |                                               | ●     |      | 0.50                            | 0.30                                | –                | 0.12* | 0.16  | 0.20  | 0.26  | 0.37  | 380                                  | 690          |
|             | 652.275      | ●                   |                                               | ●     |      | 0.60                            | 0.30                                | 0.11*            | 0.16* | 0.22  | 0.27  | 0.35  | 0.49  | 380                                  | 690          |
| 90°         | 652.216      | ●                   |                                               | ●     |      | 0.40                            | 0.20                                | 0.06*            | 0.08* | 0.11  | 0.14  | 0.18  | 0.25  | 420                                  | 780          |
|             | 652.246      | ●                   |                                               | ●     |      | 0.50                            | 0.30                                | 0.08*            | 0.12* | 0.16  | 0.20  | 0.26  | 0.37  | 420                                  | 780          |
|             | 652.276      | ●                   |                                               | ●     |      | 0.60                            | 0.30                                | 0.11*            | 0.16* | 0.22  | 0.27  | 0.35  | 0.49  | 430                                  | 790          |
|             | 652.306      | ●                   | ●                                             | ●     | ●    | 0.70                            | 0.40                                | 0.16*            | 0.23* | 0.32  | 0.40  | 0.51  | 0.72  | 440                                  | 800          |
|             | 652.336      | ●                   | ●                                             | ●     | ●    | 0.90                            | 0.50                                | 0.22*            | 0.32* | 0.45  | 0.55  | 0.71  | 1.00  | 440                                  | 820          |
|             | 652.366      | ●                   | ●                                             | ●     | ●    | 1.00                            | 0.50                                | 0.32*            | 0.45* | 0.63  | 0.77  | 1.00  | 1.41  | 450                                  | 830          |
|             | 652.406      | ●                   | ●                                             | ●     | ●    | 1.20                            | 0.70                                | 0.50*            | 0.71  | 1.00  | 1.22  | 1.58  | 2.23  | 450                                  | 840          |
|             | 652.446      | ●                   | ●                                             | ●     | ●    | 1.35                            | 0.80                                | 0.63*            | 0.89  | 1.25  | 1.53  | 1.98  | 2.80  | 460                                  | 860          |
|             | 652.486      | ●                   | ●                                             | ●     | ●    | 1.50                            | 0.80                                | 0.80*            | 1.13  | 1.60  | 1.96  | 2.53  | 3.58  | 470                                  | 870          |
|             | 652.516      | ●                   | ●                                             | ●     | ●    | 1.65                            | 0.90                                | 0.95*            | 1.34  | 1.90  | 2.32  | 3.00  | 4.24  | 480                                  | 880          |
|             | 652.566      | ●                   | ●                                             | ●     | ●    | 2.00                            | 1.10                                | 1.25             | 1.77  | 2.50  | 3.06  | 3.95  | 5.59  | 490                                  | 900          |
|             | 652.606      | ●                   | ●                                             | ●     | ●    | 2.20                            | 1.20                                | 1.57             | 2.23  | 3.15  | 3.86  | 4.98  | 7.04  | 500                                  | 910          |
|             | 652.646      | ●                   | ●                                             | ●     | ●    | 2.50                            | 1.30                                | 2.00             | 2.83  | 4.00  | 4.90  | 6.33  | 8.95  | 510                                  | 930          |
|             | 652.676      | ●                   | ●                                             | ●     | ●    | 2.70                            | 1.40                                | 2.37             | 3.36  | 4.75  | 5.82  | 7.51  | 10.62 | 510                                  | 950          |
|             | 652.726      | ●                   | ●                                             | ●     | ●    | 3.00                            | 1.70                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 14.09 | 520                                  | 980          |
|             | 652.766      | ●                   | ●                                             | ●     |      | 3.50                            | 1.90                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 17.89 | 530                                  | 1,000        |
|             | 652.806      | ●                   | ●                                             | ●     | ●    | 4.00                            | 2.40                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 22.36 | 530                                  | 1,030        |
|             | 652.846      |                     |                                               | ●     | ●    | 4.50                            | 2.40                                | 6.25             | 8.84  | 12.50 | 15.31 | 19.76 | 27.94 | 540                                  | 1,050        |
|             | 652.886      | ●                   |                                               | ●     | ●    | 5.00                            | 3.10                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 35.78 | 540                                  | 1,060        |

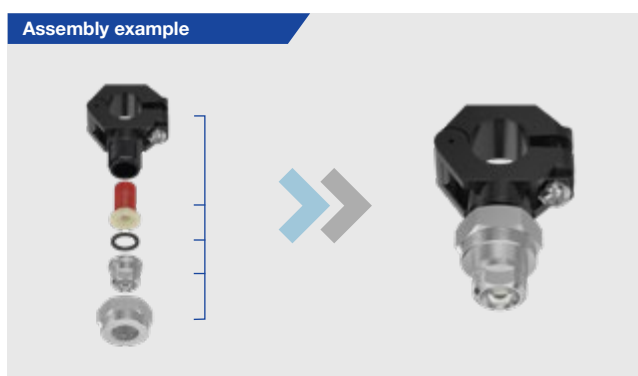




| Spray angle | Ordering no. |                     |                                                |       |      | Equivalent bore diameter A [mm] | Narrowest free cross section Ø [mm] | V̇ water [l/min] |       |       |       |       |       | Spray width B [mm]<br>(at p = 5 bar)<br> |       |
|-------------|--------------|---------------------|------------------------------------------------|-------|------|---------------------------------|-------------------------------------|------------------|-------|-------|-------|-------|-------|-----------------------------------------------------------------------------------------------------------------------------|-------|
|             | Mat. no.     |                     |                                                |       |      |                                 |                                     |                  |       |       |       |       |       |                                                                                                                             |       |
|             | Type         | 16                  | 17 <sup>1</sup>                                | 30    | 5E   |                                 |                                     | p [bar]          |       |       |       |       |       |                                                                                                                             |       |
|             |              | Stainless steel 303 | Stainless steel 316Ti/<br>Stainless steel 316L | Brass | PVDF |                                 |                                     | 0.5              | 1.0   | 2.0   | 3.0   | 5.0   | 10.0  |                                                                                                                             |       |
| 120°        | 652.187      | ●                   |                                                | ●     |      | 0.35                            | 0.20                                | –                | 0.06* | 0.08  | 0.10  | 0.13  | 0.18  | 630                                                                                                                         | 1,060 |
|             | 652.217      | ●                   |                                                | ●     |      | 0.40                            | 0.20                                | –                | 0.08* | 0.11  | 0.14  | 0.18  | 0.25  | 650                                                                                                                         | 1,080 |
|             | 652.247      | ●                   |                                                | ●     |      | 0.50                            | 0.20                                | –                | 0.12* | 0.16  | 0.20  | 0.26  | 0.37  | 660                                                                                                                         | 1,100 |
|             | 652.277      | ●                   |                                                | ●     |      | 0.60                            | 0.30                                | –                | 0.16* | 0.22  | 0.27  | 0.35  | 0.49  | 670                                                                                                                         | 1,150 |
|             | 652.307      | ●                   |                                                | ●     | ●    | 0.70                            | 0.30                                | 0.16*            | 0.23* | 0.32  | 0.40  | 0.51  | 0.72  | 710                                                                                                                         | 1,240 |
|             | 652.337      | ●                   | ●                                              | ●     | ●    | 0.90                            | 0.40                                | 0.22*            | 0.32* | 0.45  | 0.55  | 0.71  | 1.00  | 740                                                                                                                         | 1,350 |
|             | 652.367      | ●                   | ●                                              | ●     | ●    | 1.00                            | 0.50                                | 0.32*            | 0.45* | 0.63  | 0.77  | 1.00  | 1.41  | 800                                                                                                                         | 1,430 |
|             | 652.407      | ●                   | ●                                              | ●     | ●    | 1.20                            | 0.60                                | 0.50*            | 0.71  | 1.00  | 1.22  | 1.58  | 2.23  | 830                                                                                                                         | 1,480 |
|             | 652.447      | ●                   | ●                                              | ●     | ●    | 1.35                            | 0.60                                | 0.63*            | 0.89  | 1.25  | 1.53  | 1.98  | 2.80  | 840                                                                                                                         | 1,520 |
|             | 652.487      | ●                   | ●                                              | ●     | ●    | 1.50                            | 0.60                                | 0.80*            | 1.13  | 1.60  | 1.96  | 2.53  | 3.58  | 850                                                                                                                         | 1,540 |
|             | 652.517      | ●                   | ●                                              | ●     | ●    | 1.65                            | 0.90                                | 0.95*            | 1.34  | 1.90  | 2.32  | 3.00  | 4.24  | 850                                                                                                                         | 1,560 |
|             | 652.567      | ●                   | ●                                              | ●     | ●    | 2.00                            | 0.90                                | 1.25             | 1.77  | 2.50  | 3.06  | 3.95  | 5.59  | 870                                                                                                                         | 1,590 |
|             | 652.607      | ●                   | ●                                              | ●     | ●    | 2.20                            | 1.10                                | 1.57             | 2.23  | 3.15  | 3.86  | 4.98  | 7.04  | 870                                                                                                                         | 1,620 |
|             | 652.647      | ●                   | ●                                              | ●     |      | 2.50                            | 1.30                                | 2.00             | 2.83  | 4.00  | 4.90  | 6.33  | 8.95  | 880                                                                                                                         | 1,640 |
|             | 652.677      | ●                   | ●                                              | ●     |      | 2.70                            | 1.40                                | 2.37             | 3.36  | 4.75  | 5.82  | 7.51  | 10.62 | 890                                                                                                                         | 1,660 |
|             | 652.727      | ●                   | ●                                              | ●     | ●    | 3.00                            | 1.60                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 14.09 | 890                                                                                                                         | 1,680 |
|             | 652.767      | ●                   | ●                                              | ●     |      | 3.50                            | 1.70                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 17.89 | 900                                                                                                                         | 1,700 |
|             | 652.807      | ●                   |                                                | ●     |      | 4.00                            | 2.00                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 22.36 | 900                                                                                                                         | 1,710 |
|             | 652.847      |                     |                                                |       | ●    | 4.50                            | 2.30                                | 6.25             | 8.84  | 12.50 | 15.31 | 19.76 | 27.94 | 900                                                                                                                         | 1,710 |
|             | 652.887      |                     |                                                |       | ●    | 5.00                            | 2.60                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 35.78 | 910                                                                                                                         | 1,710 |

\* Differing spray pattern.

<sup>1</sup> We reserve the right to supply material 316Ti or 316L under material no. 17.



Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. = Ordering no.  
example: 652.187 + 16 = 652.187.16

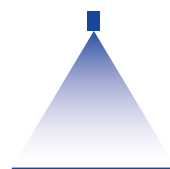


Assembly accessories can be found in Chapter 9 "Accessories".

# Low pressure flat fan nozzles

## Belt lubrication

### Series 652



#### Features:

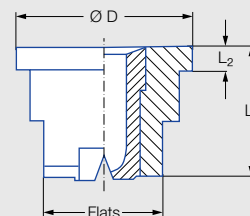
- Particularly low flow rate
- Parabolic liquid distribution
- Assembly with retaining nut

#### Applications:

- Belt lubrication
- Spraying on food products
- Moistening of rollers
- Oiling of metal sheets



Series 652.xxx.56.03



| Code                                    | Material            | Dimensions [mm] |                |      |       | Weight [g] |
|-----------------------------------------|---------------------|-----------------|----------------|------|-------|------------|
|                                         |                     | L <sub>1</sub>  | L <sub>2</sub> | Ø D  | Flats |            |
| Assembly with retaining nut<br>3/8 BSPP | Stainless steel 303 | 11.0            | 2.0            | 14.8 | 10    | 10.0       |
|                                         | POM/Stainless steel | 12.0            | 2.0            | 14.8 | 8     | 3.0        |
|                                         | POM                 | 11.0            | 2.0            | 15.0 | 8     | 2.0        |

| Spray angle | Ordering no. |                     |                                |       | Color  | Narrowest free cross section<br>Ø<br>[mm] | V̇ water [l/min] |      |      |      |
|-------------|--------------|---------------------|--------------------------------|-------|--------|-------------------------------------------|------------------|------|------|------|
|             | Type         | Mat. no.            |                                |       |        |                                           | p [bar]          |      |      |      |
|             |              | 16                  | 8H.03                          | 56.03 |        |                                           |                  |      |      |      |
|             |              | Stainless steel 303 | Housing: POM<br>Insert: 303 SS | POM   |        |                                           | 1.0              | 2.0  | 3.0  | 5.0  |
| 75°         | 652.145      | ●                   | ●                              | ●     | Green  | 0.12                                      | 0.04*            | 0.05 | 0.06 | 0.08 |
|             | 652.165      | ●                   | ●                              |       | Black  | 0.14                                      | 0.05*            | 0.07 | 0.08 | 0.10 |
|             | 652.185      | ●                   | ●                              | ●     | Red    | 0.16                                      | 0.06*            | 0.08 | 0.10 | 0.13 |
|             | 652.215      | ●                   | ●                              | ●     | Blue   | 0.20                                      | 0.08*            | 0.11 | 0.14 | 0.18 |
|             | 652.245      | ●                   | ●                              | ●     | Orange | 0.30                                      | 0.12*            | 0.16 | 0.20 | 0.26 |
|             | 652.275      | ●                   | ●                              |       | Brown  | 0.30                                      | 0.16*            | 0.22 | 0.27 | 0.35 |
| 120°        | 652.187      | ●                   | ●                              |       | Grey   | 0.20                                      | 0.06*            | 0.08 | 0.10 | 0.13 |
|             | 652.247      | ●                   | ●                              |       | Black  | 0.20                                      | 0.12*            | 0.16 | 0.20 | 0.26 |
|             | 652.277      | ●                   | ●                              |       | Black  | 0.30                                      | 0.16*            | 0.22 | 0.27 | 0.35 |

\* Differing spray pattern.

#### Accessories:

|  | Designation                  | Ordering no.     | Material            | Color | Pressure [bar] |         | G BSPP | Dimensions [mm] |                |       |                  |                  |     | Mesh size [mm] |
|--|------------------------------|------------------|---------------------|-------|----------------|---------|--------|-----------------|----------------|-------|------------------|------------------|-----|----------------|
|  |                              |                  |                     |       | Opening        | Closing |        | H <sub>1</sub>  | H <sub>2</sub> | Ø D   | Ø D <sub>1</sub> | Ø D <sub>2</sub> | Hex |                |
|  | Filter with non-return valve | 095.016.53.11.00 | PP                  | Blue  | 0.50           | 0.30    | –      | 21.00           | 1.60           | –     | 15.00            | 11.00            | –   | 0.08           |
|  |                              | 095.016.53.14.63 | PP                  | Green | 2.80           | 1.60    | –      | 21.00           | 1.50           | –     | 15.00            | 11.00            | –   | 0.08           |
|  | Flat gas-ket                 | 065.240.55       | PTFE                | –     | –              | –       | –      | –               | –              | –     | –                | –                | –   | –              |
|  |                              | 065.240.72       | EWP 210             | –     | –              | –       | –      | –               | –              | –     | –                | –                | –   | –              |
|  | Retaining nut                | 065.200.16       | Stainless steel 303 | –     | –              | –       | 3/8    | 13.00           | 10.00          | 12.80 | –                | –                | 22  | –              |
|  |                              | 065.200.56       | POM                 | Black | –              | –       | 3/8    | 14.50           | 11.50          | 13.00 | –                | –                | 22  | –              |

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. = Ordering no.  
example: 652.145 + 16 = 652.145.16

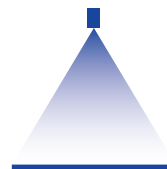


Assembly accessories can be found in Chapter 9 "Accessories".

# Low pressure flat fan nozzles

## Press-in nozzle

### Series 612.xxx.5E.03

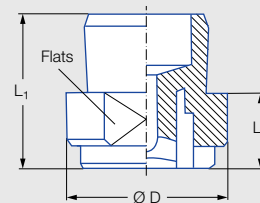


#### Features:

- Uniform, parabolic liquid distribution
- For pressing into pipes

#### Applications:

- Cleaning and rinsing procedures
- Industrial dish washers

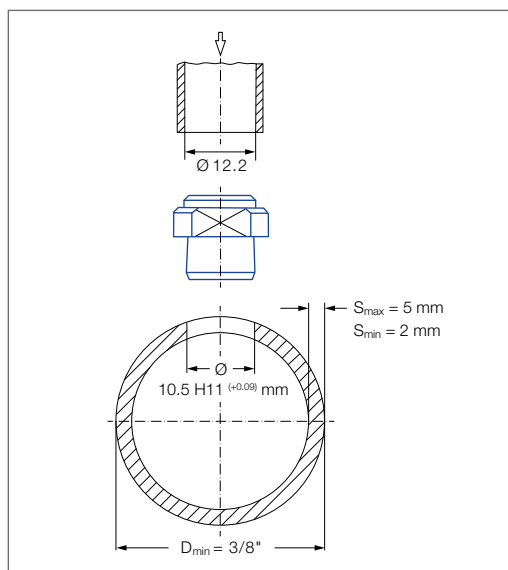


Series 612.xxx.5E.03

| Dimensions [mm] |                |      |       | Weight [g] |
|-----------------|----------------|------|-------|------------|
| L <sub>1</sub>  | L <sub>2</sub> | Ø D  | Flats |            |
| 12.5            | 5.5            | 14.0 | 12    | 2.0        |

| Spray angle | Ordering no. |          | Equivalent bore diameter<br>A<br>[mm] | Narrowest free cross section<br>Ø<br>[mm] | V̇ water [l/min] |      |      |      |      |      | Spray width B<br>[mm]<br>(at p = 2 bar)                                              |                 |
|-------------|--------------|----------|---------------------------------------|-------------------------------------------|------------------|------|------|------|------|------|--------------------------------------------------------------------------------------|-----------------|
|             | Type         | Mat. no. |                                       |                                           | p [bar]          |      |      |      |      |      |  |                 |
|             |              | 5E.03    |                                       |                                           |                  |      |      |      |      |      |                                                                                      |                 |
|             |              | PVDF     |                                       |                                           | 0.3              | 0.5  | 0.7  | 1.0  | 1.5  | 2.0  |                                                                                      | H = 250<br>[mm] |
| 90°         | 612.366      | ●        | 1.00                                  | 0.50                                      | 0.24             | 0.31 | 0.37 | 0.44 | 0.55 | 0.63 | 360                                                                                  | 730             |
|             | 612.486      | ●        | 1.50                                  | 0.60                                      | 0.62             | 0.80 | 0.95 | 1.13 | 1.39 | 1.60 | 360                                                                                  | 730             |
| 120°        | 612.487      | ●        | 1.50                                  | 0.60                                      | 0.62             | 0.80 | 0.95 | 1.13 | 1.39 | 1.60 | 720                                                                                  | 1,280           |
|             | 612.647      | ●        | 2.50                                  | 1.20                                      | 1.55             | 2.00 | 2.37 | 2.83 | 3.46 | 4.00 | 720                                                                                  | 1,280           |

#### Assembly :



Drill pipe (Ø 10 mm), ream to Ø 10.5 H11 (+0.09) mm, adjust nozzle, place press-in pipe (inner diameter 12.2 mm) on nozzle and tap in using a rubber mallet. Max. flow velocity in the pipe 2–3 m/s.

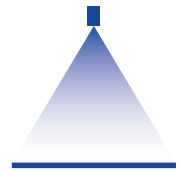
Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. = Ordering no.  
example: 612.366 + 5E.03 = 612.366.5E.03



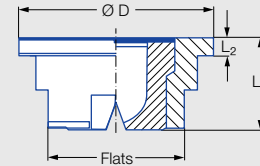
Assembly accessories can be found in Chapter 9 "Accessories".

# Low pressure flat fan nozzles for retaining nut Series 656/657



## Features:

- Uniform, parabolic liquid distribution
- Stable spray angle
- High spray energy
- Assembly with retaining nut
- Non-clogging



## Applications:

- Cleaning installations
- Gravel washing
- Roll cooling
- Cooling of rolled stock
- Cooling pipes

Series 656/657

| Code                                 | Dimensions [mm] |                |      |       | Weight<br>[g]<br>Brass |
|--------------------------------------|-----------------|----------------|------|-------|------------------------|
|                                      | L <sub>1</sub>  | L <sub>2</sub> | Ø D  | Flats |                        |
| Assembly with retaining nut 3/4 BSPP | 11.0            | 2.0            | 24.0 | 17    | 23.0                   |

| Spray angle | Ordering no. |                     |                                                |       | Equivalent bore diameter A [mm] | Narrowest free cross section Ø [mm] | V̇ water [l/min] |       |       |       |       |       |       | Spray width B [mm]<br>(at p = 5 bar) |              |
|-------------|--------------|---------------------|------------------------------------------------|-------|---------------------------------|-------------------------------------|------------------|-------|-------|-------|-------|-------|-------|--------------------------------------|--------------|
|             | Type         | Mat. no.            |                                                |       |                                 |                                     | p [bar]          |       |       |       |       |       |       | H = 250 [mm]                         | H = 500 [mm] |
|             |              | 16                  | 17 <sup>1</sup>                                | 30    |                                 |                                     |                  |       |       |       |       |       |       |                                      |              |
|             |              | Stainless steel 303 | Stainless steel 316Ti/<br>Stainless steel 316L | Brass |                                 |                                     |                  |       |       |       |       |       |       |                                      |              |
|             |              |                     |                                                |       |                                 |                                     | 0.5              | 1.0   | 2.0   | 3.0   | 5.0   | 7.0   | 10.0  |                                      |              |
| 20°         | 656.721      | ●                   | ●                                              | ●     | 3.00                            | 2.50                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 11.78 | 14.09 | 100                                  | 180          |
|             | 656.801      | ●                   | ●                                              | ●     | 4.00                            | 3.20                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 18.71 | 22.36 | 100                                  | 180          |
|             | 656.881      | ●                   | ●                                              | ●     | 5.00                            | 4.00                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 29.94 | 35.78 | 100                                  | 180          |
|             | 656.921      | ●                   | ●                                              | ●     | 5.50                            | 4.40                                | 10.00            | 14.14 | 20.00 | 24.49 | 31.62 | 37.41 | 44.72 | 100                                  | 180          |
|             | 656.961      | ●                   | ●                                              | ●     | 6.00                            | 5.30                                | 12.50            | 17.68 | 25.00 | 30.62 | 39.53 | 46.77 | 55.90 | 100                                  | 180          |
| 30°         | 656.722      | ●                   | ●                                              | ●     | 3.00                            | 2.40                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 11.78 | 14.09 | 140                                  | 260          |
|             | 656.762      | ●                   | ●                                              | ●     | 3.50                            | 2.70                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 14.97 | 17.89 | 140                                  | 260          |
|             | 656.802      | ●                   | ●                                              | ●     | 4.00                            | 3.10                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 18.71 | 22.36 | 140                                  | 260          |
|             | 656.882      | ●                   | ●                                              | ●     | 5.00                            | 4.00                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 29.94 | 35.78 | 140                                  | 270          |
|             | 656.922      | ●                   | ●                                              | ●     | 5.50                            | 4.40                                | 10.00            | 14.14 | 20.00 | 24.49 | 31.62 | 37.41 | 44.72 | 140                                  | 270          |
|             | 656.962      | ●                   | ●                                              | ●     | 6.00                            | 5.00                                | 12.50            | 17.68 | 25.00 | 30.62 | 39.53 | 46.77 | 55.90 | 140                                  | 270          |
| 45°         | 656.723      | ●                   | ●                                              | ●     | 3.00                            | 2.40                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 11.78 | 14.09 | 220                                  | 420          |
|             | 656.763      | ●                   | ●                                              | ●     | 3.50                            | 2.60                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 14.97 | 17.89 | 220                                  | 420          |
|             | 656.803      | ●                   | ●                                              | ●     | 4.00                            | 3.00                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 18.71 | 22.36 | 220                                  | 420          |
|             | 656.843      | ●                   | ●                                              | ●     | 4.50                            | 3.40                                | 6.25             | 8.84  | 12.50 | 15.31 | 19.76 | 23.38 | 27.94 | 220                                  | 420          |
|             | 656.883      | ●                   | ●                                              | ●     | 5.00                            | 3.80                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 29.94 | 35.78 | 220                                  | 420          |
|             | 656.923      | ●                   | ●                                              | ●     | 5.50                            | 4.20                                | 10.00            | 14.14 | 20.00 | 24.49 | 31.62 | 37.41 | 44.72 | 220                                  | 430          |
|             | 656.963      | ●                   | ●                                              | ●     | 6.00                            | 4.40                                | 12.50            | 17.68 | 25.00 | 30.62 | 39.53 | 46.77 | 55.90 | 220                                  | 430          |





| Spray angle | Ordering no. |                     |                                                |       | Equivalent bore diameter A [mm] | Narrowest free cross section Ø [mm] | V̇ water [l/min] |       |       |       |       |       |       | Spray width B [mm]<br>(at p = 5 bar)                                                |              |
|-------------|--------------|---------------------|------------------------------------------------|-------|---------------------------------|-------------------------------------|------------------|-------|-------|-------|-------|-------|-------|-------------------------------------------------------------------------------------|--------------|
|             | Type         | Mat. no.            |                                                |       |                                 |                                     | p [bar]          |       |       |       |       |       |       |  |              |
|             |              | 16                  | 17¹                                            | 30    |                                 |                                     |                  |       |       |       |       |       |       |                                                                                     |              |
|             |              | Stainless steel 303 | Stainless steel 316Ti/<br>Stainless steel 316L | Brass |                                 |                                     | 0.5              | 1.0   | 2.0   | 3.0   | 5.0   | 7.0   | 10.0  |                                                                                     | H = 250 [mm] |
| 60°         | 656.724      | ●                   | ●                                              | ●     | 3.00                            | 2.10                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 11.78 | 14.09 | 280                                                                                 | 560          |
|             | 656.764      | ●                   | ●                                              | ●     | 3.50                            | 2.30                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 14.97 | 17.89 | 280                                                                                 | 570          |
|             | 656.804      | ●                   | ●                                              | ●     | 4.00                            | 2.60                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 18.71 | 22.36 | 290                                                                                 | 580          |
|             | 656.844      | ●                   | ●                                              | ●     | 4.50                            | 3.00                                | 6.25             | 8.84  | 12.50 | 15.31 | 19.76 | 23.38 | 27.94 | 290                                                                                 | 580          |
|             | 656.884      | ●                   | ●                                              | ●     | 5.00                            | 3.40                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 29.94 | 35.78 | 290                                                                                 | 580          |
|             | 656.924      | ●                   | ●                                              | ●     | 5.50                            | 4.10                                | 10.00            | 14.14 | 20.00 | 24.49 | 31.62 | 37.41 | 44.72 | 290                                                                                 | 580          |
|             | 656.964      | ●                   | ●                                              | ●     | 6.00                            | 4.20                                | 12.50            | 17.68 | 25.00 | 30.62 | 39.53 | 46.77 | 55.90 | 290                                                                                 | 580          |
|             |              | ●                   | ●                                              | 8.00  | 5.50                            | 20.00                               | 28.29            | 40.00 | 48.99 | 63.25 | 74.84 | 89.45 | 290   | 580                                                                                 |              |
| 90°         | 656.726      | ●                   | ●                                              | ●     | 3.00                            | 1.70                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 11.78 | 14.09 | 520                                                                                 | 980          |
|             | 656.766      | ●                   | ●                                              | ●     | 3.50                            | 1.90                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 14.97 | 17.89 | 530                                                                                 | 1,000        |
|             | 656.806      | ●                   | ●                                              | ●     | 4.00                            | 2.40                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 18.71 | 22.36 | 530                                                                                 | 1,030        |
|             | 656.846      | ●                   | ●                                              | ●     | 4.50                            | 2.40                                | 6.25             | 8.84  | 12.50 | 15.31 | 19.76 | 23.38 | 27.94 | 540                                                                                 | 1,050        |
|             | 656.886      | ●                   | ●                                              | ●     | 5.00                            | 3.10                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 29.94 | 35.78 | 540                                                                                 | 1,060        |
|             | 656.926      | ●                   | ●                                              | ●     | 5.50                            | 3.60                                | 10.00            | 14.14 | 20.00 | 24.49 | 31.62 | 37.41 | 44.72 | 540                                                                                 | 1,070        |
|             | 656.966      | ●                   | ●                                              | ●     | 6.00                            | 3.90                                | 12.50            | 17.68 | 25.00 | 30.62 | 39.53 | 46.77 | 55.90 | 540                                                                                 | 1,070        |
|             | 657.046      |                     |                                                | ●     | 8.00                            | 4.90                                | 20.00            | 28.29 | 40.00 | 48.99 | 63.25 | 74.84 | 89.45 | 540                                                                                 | 1,070        |
| 120°        | 656.727      | ●                   | ●                                              | ●     | 3.00                            | 1.60                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 11.78 | 14.09 | 890                                                                                 | 1,680        |
|             | 656.767      | ●                   | ●                                              | ●     | 3.50                            | 1.70                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 14.97 | 17.89 | 900                                                                                 | 1,700        |
|             | 656.807      | ●                   | ●                                              | ●     | 4.00                            | 2.00                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 18.71 | 22.36 | 900                                                                                 | 1,710        |
|             | 656.887      | ●                   | ●                                              | ●     | 5.00                            | 2.60                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 29.94 | 35.78 | 910                                                                                 | 1,710        |
|             | 656.927      | ●                   | ●                                              | ●     | 5.50                            | 2.90                                | 10.00            | 14.14 | 20.00 | 24.49 | 31.62 | 37.41 | 44.72 | 910                                                                                 | 1,710        |

<sup>1</sup> We reserve the right to supply material 316Ti or 316L under material no. 17.

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

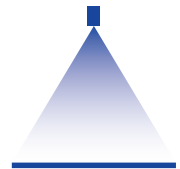
Ordering Type + Material no. = Ordering no.  
example: 656.724 + 16 = 656.724.16



Assembly accessories can be found in Chapter 9 "Accessories".

# Low pressure flat fan nozzles with dovetail guide

## Series 660

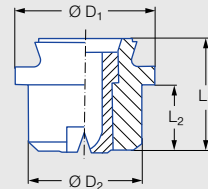


### Features:

- Uniform, parabolic liquid distribution
- Stable spray angle
- Spray automatically aligned approx. 5° to the longitudinal axis of the pipe due to dovetail guide
- Assembly with retaining nut
- Non-clogging
- High spray energy



Series 660



### Applications:

- Cleaning installations
- Spray pipes
- Cooling pipes

| Code                                                    | Dimensions [mm] |                |                  |                  | Weight [g]<br>Brass |
|---------------------------------------------------------|-----------------|----------------|------------------|------------------|---------------------|
|                                                         | L <sub>1</sub>  | L <sub>2</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> |                     |
| Assembly with retaining nut 3/8 BSPP and dovetail guide | 12.0            | 7.0            | 14.8             | 12.0             | 10.0                |

| Spray angle | Ordering no. |                     |                                                |       | Equivalent bore diameter<br>A<br>[mm] | Narrowest free cross section<br>Ø<br>[mm] | V̇ water [l/min] |       |      |      |      |      | Spray width B<br>[mm]<br>(at p = 5 bar) |                 |
|-------------|--------------|---------------------|------------------------------------------------|-------|---------------------------------------|-------------------------------------------|------------------|-------|------|------|------|------|-----------------------------------------|-----------------|
|             | Type         | Mat. no.            |                                                |       |                                       |                                           | p [bar]          |       |      |      |      |      | H = 250<br>[mm]                         | H = 500<br>[mm] |
|             |              | 16                  | 17 <sup>1</sup>                                | 30    |                                       |                                           |                  |       |      |      |      |      |                                         |                 |
|             |              | Stainless steel 303 | Stainless steel 316Ti/<br>Stainless steel 316L | Brass |                                       |                                           | 0.5              | 1.0   | 2.0  | 3.0  | 5.0  | 10.0 |                                         |                 |
| 20°         | 660.301      | ●                   | ●                                              | ●     | 0.70                                  | 0.60                                      | 0.16*            | 0.23* | 0.32 | 0.40 | 0.51 | 0.72 | 85                                      | 160             |
|             | 660.361      | ●                   | ●                                              | ●     | 1.00                                  | 0.80                                      | 0.32*            | 0.45* | 0.63 | 0.77 | 1.00 | 1.41 | 85                                      | 160             |
|             | 660.441      | ●                   | ●                                              | ●     | 1.35                                  | 1.10                                      | 0.63*            | 0.89  | 1.25 | 1.53 | 1.98 | 2.80 | 85                                      | 160             |
|             | 660.481      | ●                   | ●                                              | ●     | 1.50                                  | 1.20                                      | 0.80*            | 1.13  | 1.60 | 1.96 | 2.53 | 3.58 | 85                                      | 160             |
| 30°         | 660.302      | ●                   | ●                                              | ●     | 0.60                                  | 0.50                                      | 0.16*            | 0.23* | 0.32 | 0.40 | 0.51 | 0.72 | 120                                     | 220             |
|             | 660.362      | ●                   | ●                                              | ●     | 1.00                                  | 0.70                                      | 0.32*            | 0.45* | 0.63 | 0.77 | 1.00 | 1.41 | 120                                     | 220             |
|             | 660.402      | ●                   | ●                                              | ●     | 1.20                                  | 0.90                                      | 0.50*            | 0.71  | 1.00 | 1.22 | 1.58 | 2.23 | 120                                     | 230             |
|             | 660.482      | ●                   | ●                                              | ●     | 1.50                                  | 1.10                                      | 0.80*            | 1.13  | 1.60 | 1.96 | 2.53 | 3.58 | 130                                     | 230             |
|             | 660.562      | ●                   | ●                                              | ●     | 2.00                                  | 1.50                                      | 1.25             | 1.77  | 2.50 | 3.06 | 3.95 | 5.59 | 130                                     | 240             |
| 45°         | 660.303      | ●                   | ●                                              | ●     | 0.70                                  | 0.50                                      | 0.16*            | 0.23* | 0.32 | 0.40 | 0.51 | 0.72 | 170                                     | 330             |
|             | 660.363      | ●                   | ●                                              | ●     | 1.00                                  | 0.60                                      | 0.32*            | 0.45* | 0.63 | 0.77 | 1.00 | 1.41 | 190                                     | 350             |
|             | 660.403      | ●                   | ●                                              | ●     | 1.20                                  | 0.90                                      | 0.50*            | 0.71  | 1.00 | 1.22 | 1.58 | 2.23 | 200                                     | 370             |
|             | 660.483      | ●                   | ●                                              | ●     | 1.50                                  | 1.10                                      | 0.80*            | 1.13  | 1.60 | 1.96 | 2.53 | 3.58 | 200                                     | 390             |
|             | 660.563      | ●                   | ●                                              | ●     | 2.00                                  | 1.40                                      | 1.25             | 1.77  | 2.50 | 3.06 | 3.95 | 5.59 | 210                                     | 410             |
|             | 660.643      | ●                   | ●                                              | ●     | 2.50                                  | 1.80                                      | 2.00             | 2.83  | 4.00 | 4.90 | 6.33 | 8.95 | 220                                     | 410             |
| 60°         | 660.304      | ●                   | ●                                              | ●     | 0.70                                  | 0.40                                      | 0.16*            | 0.23* | 0.32 | 0.40 | 0.51 | 0.72 | 260                                     | 480             |
|             | 660.334      | ●                   | ●                                              | ●     | 0.90                                  | 0.50                                      | 0.22*            | 0.32* | 0.45 | 0.55 | 0.71 | 1.00 | 260                                     | 490             |
|             | 660.364      | ●                   | ●                                              | ●     | 1.00                                  | 0.60                                      | 0.32*            | 0.45* | 0.63 | 0.77 | 1.00 | 1.41 | 260                                     | 500             |
|             | 660.404      | ●                   | ●                                              | ●     | 1.20                                  | 0.80                                      | 0.50*            | 0.71  | 1.00 | 1.22 | 1.58 | 2.23 | 260                                     | 510             |
|             | 660.444      | ●                   | ●                                              | ●     | 1.35                                  | 0.90                                      | 0.63*            | 0.89  | 1.25 | 1.53 | 1.98 | 2.80 | 260                                     | 510             |





| Spray angle | Ordering no. |                     |                                                |       | Equivalent bore diameter<br>A<br>[mm] | Narrowest free cross section<br>Ø<br>[mm] | V̇ water [l/min] |       |       |       |       |       | Spray width B<br>[mm]<br>(at p = 5 bar) |                 |
|-------------|--------------|---------------------|------------------------------------------------|-------|---------------------------------------|-------------------------------------------|------------------|-------|-------|-------|-------|-------|-----------------------------------------|-----------------|
|             | Type         | Mat. no.            |                                                |       |                                       |                                           | p [bar]          |       |       |       |       |       | H = 250<br>[mm]                         | H = 500<br>[mm] |
|             |              | 16                  | 17 <sup>1</sup>                                | 30    |                                       |                                           |                  |       |       |       |       |       |                                         |                 |
|             |              | Stainless steel 303 | Stainless steel 316Ti/<br>Stainless steel 316L | Brass |                                       |                                           |                  |       |       |       |       |       |                                         |                 |
|             |              |                     |                                                |       |                                       | 0.5                                       | 1.0              | 2.0   | 3.0   | 5.0   | 10.0  |       |                                         |                 |
| 60°         | 660.484      | ●                   | ●                                              | ●     | 1.50                                  | 1.00                                      | 0.80*            | 1.13  | 1.60  | 1.96  | 2.53  | 3.58  | 260                                     | 520             |
|             | 660.514      | ●                   | ●                                              | ●     | 1.65                                  | 1.10                                      | 0.95*            | 1.34  | 1.90  | 2.32  | 3.00  | 4.24  | 270                                     | 520             |
|             | 660.564      | ●                   | ●                                              | ●     | 2.00                                  | 1.30                                      | 1.25             | 1.77  | 2.50  | 3.06  | 3.95  | 5.59  | 270                                     | 530             |
|             | 660.604      | ●                   | ●                                              | ●     | 2.20                                  | 1.50                                      | 1.57             | 2.23  | 3.15  | 3.86  | 4.98  | 7.04  | 270                                     | 540             |
|             | 660.644      | ●                   | ●                                              | ●     | 2.50                                  | 1.60                                      | 2.00             | 2.83  | 4.00  | 4.90  | 6.33  | 8.95  | 270                                     | 540             |
|             | 660.724      | ●                   | ●                                              | ●     | 3.00                                  | 2.10                                      | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 14.09 | 280                                     | 560             |
|             | 660.804      | ●                   |                                                | ●     | 4.00                                  | 2.60                                      | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 22.36 | 290                                     | 580             |
| 75°         | 660.145      | ●                   |                                                | ●     | 0.20                                  | 0.14                                      | –                | 0.04* | 0.05  | 0.06  | 0.08  | 0.11  | 380                                     | 690             |
|             | 660.165      | ●                   |                                                | ●     | 0.20                                  | 0.14                                      | –                | 0.05* | 0.07  | 0.08  | 0.10  | 0.15  | 380                                     | 690             |
|             | 660.185      | ●                   |                                                | ●     | 0.20                                  | 0.16                                      | –                | 0.06* | 0.08  | 0.10  | 0.13  | 0.18  | 380                                     | 690             |
|             | 660.215      | ●                   |                                                | ●     | 0.50                                  | 0.20                                      | –                | 0.08* | 0.11  | 0.14  | 0.18  | 0.25  | 380                                     | 690             |
|             | 660.245      | ●                   |                                                | ●     | 0.50                                  | 0.30                                      | –                | 0.12* | 0.16  | 0.20  | 0.26  | 0.37  | 380                                     | 690             |
|             | 660.275      | ●                   |                                                | ●     | 0.60                                  | 0.30                                      | 0.11*            | 0.16* | 0.22  | 0.27  | 0.35  | 0.49  | 380                                     | 690             |
| 90°         | 660.216      | ●                   |                                                | ●     | 0.40                                  | 0.20                                      | –                | 0.08* | 0.11  | 0.14  | 0.18  | 0.25  | 420                                     | 780             |
|             | 660.276      | ●                   |                                                | ●     | 0.60                                  | 0.30                                      | 0.11*            | 0.16* | 0.22  | 0.27  | 0.35  | 0.49  | 430                                     | 790             |
|             | 660.306      | ●                   | ●                                              | ●     | 0.70                                  | 0.40                                      | 0.16*            | 0.23* | 0.32  | 0.40  | 0.51  | 0.72  | 440                                     | 800             |
|             | 660.336      | ●                   | ●                                              | ●     | 0.90                                  | 0.50                                      | 0.22*            | 0.32* | 0.45  | 0.55  | 0.71  | 1.00  | 440                                     | 820             |
|             | 660.366      | ●                   | ●                                              | ●     | 1.00                                  | 0.50                                      | 0.32*            | 0.45* | 0.63  | 0.77  | 1.00  | 1.41  | 450                                     | 830             |
|             | 660.406      | ●                   | ●                                              | ●     | 1.20                                  | 0.70                                      | 0.50*            | 0.71  | 1.00  | 1.22  | 1.58  | 2.23  | 450                                     | 840             |
|             | 660.446      | ●                   | ●                                              | ●     | 1.35                                  | 0.80                                      | 0.63*            | 0.89  | 1.25  | 1.53  | 1.98  | 2.80  | 460                                     | 860             |
|             | 660.486      | ●                   | ●                                              | ●     | 1.50                                  | 0.80                                      | 0.80*            | 1.13  | 1.60  | 1.96  | 2.53  | 3.58  | 470                                     | 870             |
|             | 660.516      | ●                   | ●                                              | ●     | 1.65                                  | 0.90                                      | 0.95*            | 1.34  | 1.90  | 2.32  | 3.00  | 4.24  | 480                                     | 880             |
|             | 660.566      | ●                   | ●                                              | ●     | 2.00                                  | 1.10                                      | 1.25             | 1.77  | 2.50  | 3.06  | 3.95  | 5.59  | 490                                     | 900             |
|             | 660.606      | ●                   | ●                                              | ●     | 2.20                                  | 1.20                                      | 1.57             | 2.23  | 3.15  | 3.86  | 4.98  | 7.04  | 500                                     | 910             |
|             | 660.646      | ●                   | ●                                              | ●     | 2.50                                  | 1.30                                      | 2.00             | 2.83  | 4.00  | 4.90  | 6.33  | 8.95  | 510                                     | 930             |
|             | 660.676      | ●                   | ●                                              | ●     | 2.70                                  | 1.40                                      | 2.37             | 3.36  | 4.75  | 5.82  | 7.51  | 10.62 | 510                                     | 950             |
|             | 660.726      | ●                   | ●                                              | ●     | 3.00                                  | 1.70                                      | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 14.09 | 520                                     | 980             |
| 660.806     |              | ●                   | ●                                              | 4.00  | 2.40                                  | 5.00                                      | 7.07             | 10.00 | 12.25 | 15.81 | 22.36 | 530   | 1,030                                   |                 |
| 120°        | 660.187      | ●                   |                                                | ●     | 0.35                                  | 0.20                                      | –                | 0.06* | 0.08  | 0.10  | 0.13  | 0.18  | 630                                     | 1,060           |
|             | 660.217      | ●                   |                                                | ●     | 0.40                                  | 0.20                                      | –                | 0.08* | 0.11  | 0.14  | 0.18  | 0.25  | 650                                     | 1,080           |
|             | 660.247      | ●                   |                                                | ●     | 0.50                                  | 0.30                                      | –                | 0.12* | 0.16  | 0.20  | 0.26  | 0.37  | 660                                     | 1,100           |
|             | 660.277      | ●                   |                                                | ●     | 0.60                                  | 0.30                                      | –                | 0.16* | 0.22  | 0.27  | 0.35  | 0.49  | 670                                     | 1,150           |
|             | 660.307      | ●                   |                                                | ●     | 0.70                                  | 0.30                                      | 0.16*            | 0.23* | 0.32  | 0.40  | 0.51  | 0.72  | 710                                     | 1,240           |
|             | 660.337      | ●                   | ●                                              | ●     | 0.90                                  | 0.40                                      | 0.22*            | 0.32* | 0.45  | 0.55  | 0.71  | 1.00  | 740                                     | 1,350           |
|             | 660.367      | ●                   | ●                                              | ●     | 1.00                                  | 0.40                                      | 0.32*            | 0.45* | 0.63  | 0.77  | 1.00  | 1.41  | 800                                     | 1,430           |
|             | 660.407      | ●                   | ●                                              | ●     | 1.20                                  | 0.60                                      | 0.50*            | 0.71  | 1.00  | 1.22  | 1.58  | 2.23  | 830                                     | 1,480           |
|             | 660.447      | ●                   | ●                                              | ●     | 1.35                                  | 0.60                                      | 0.63*            | 0.88  | 1.25  | 1.53  | 1.98  | 2.80  | 840                                     | 1,520           |
|             | 660.487      | ●                   | ●                                              | ●     | 1.50                                  | 0.60                                      | 0.80*            | 1.13  | 1.60  | 1.96  | 2.53  | 3.58  | 850                                     | 1,540           |
|             | 660.517      | ●                   | ●                                              | ●     | 1.65                                  | 0.90                                      | 0.95*            | 1.34  | 1.90  | 2.32  | 3.00  | 4.24  | 850                                     | 1,560           |
|             | 660.567      | ●                   | ●                                              | ●     | 2.00                                  | 0.90                                      | 1.25             | 1.77  | 2.50  | 3.06  | 3.95  | 5.59  | 870                                     | 1,590           |
|             | 660.607      | ●                   | ●                                              | ●     | 2.20                                  | 1.10                                      | 1.57             | 2.23  | 3.15  | 3.86  | 4.98  | 7.04  | 870                                     | 1,620           |
|             | 660.647      | ●                   | ●                                              | ●     | 2.50                                  | 1.30                                      | 2.00             | 2.83  | 4.00  | 4.90  | 6.33  | 8.95  | 880                                     | 1,640           |
|             | 660.727      | ●                   | ●                                              | ●     | 3.00                                  | 1.60                                      | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 14.09 | 890                                     | 1,680           |
|             | 660.807      | ●                   |                                                | ●     | 4.00                                  | 2.00                                      | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 22.36 | 900                                     | 1,710           |

\* Differing spray pattern.

<sup>1</sup> We reserve the right to supply material 316Ti or 316L under material no. 17.

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

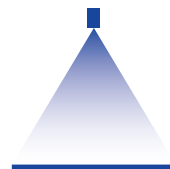
Ordering Type + Material no. = Ordering no.  
example: 660.484 + 16 = 660.484.16



Assembly accessories can be found in Chapter 9 "Accessories".

# Low pressure flat fan nozzles with dovetail guide

## Series 664/665

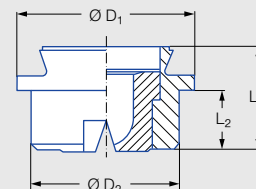


### Features:

- Uniform, parabolic liquid distribution
- Stable spray angle
- Spray automatically aligned approx. 15° to the longitudinal axis of the pipe via dovetail guide
- Assembly with retaining nut
- Non-clogging
- High spray energy



Series 664/665



### Applications:

- Cleaning installations
- Spray pipes
- Roll cooling
- Cooling pipes
- Cooling of rolled stock

| Code                                                    | Dimensions [mm] |                |                  |                  | Weight [g] |
|---------------------------------------------------------|-----------------|----------------|------------------|------------------|------------|
|                                                         | L <sub>1</sub>  | L <sub>2</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> |            |
| Assembly with retaining nut 3/4 BSPP and dovetail guide | 14.0            | 8.0            | 24.0             | 20.0             | 35.0       |

| Spray angle | Ordering no. |                     |                                                |       | Equivalent bore diameter A [mm] | Narrowest free cross section Ø [mm] | V̇ water [l/min] |       |       |       |       |        | Spray width B [mm]<br>(at p = 5 bar)                                                  |     |
|-------------|--------------|---------------------|------------------------------------------------|-------|---------------------------------|-------------------------------------|------------------|-------|-------|-------|-------|--------|---------------------------------------------------------------------------------------|-----|
|             | Type         | Mat. no.            |                                                |       |                                 |                                     | p [bar]          |       |       |       |       |        |  |     |
|             |              | 16                  | 17 <sup>1</sup>                                | 30    |                                 |                                     |                  |       |       |       |       |        |                                                                                       |     |
|             |              | Stainless steel 303 | Stainless steel 316Ti/<br>Stainless steel 316L | Brass |                                 |                                     | 0.5              | 1.0   | 2.0   | 3.0   | 5.0   | 10.0   |                                                                                       |     |
| 20°         | 664.721      | ●                   | ●                                              | ●     | 3.00                            | 2.50                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 14.09  | 100                                                                                   | 180 |
|             | 664.801      | ●                   | ●                                              | ●     | 4.00                            | 3.20                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 22.36  | 100                                                                                   | 180 |
|             | 664.881      | ●                   | ●                                              | ●     | 5.00                            | 4.00                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 35.78  | 100                                                                                   | 180 |
|             | 664.921      | ●                   | ●                                              | ●     | 5.50                            | 4.40                                | 10.00            | 14.14 | 20.00 | 24.49 | 31.62 | 44.72  | 100                                                                                   | 180 |
|             | 664.961      | ●                   | ●                                              | ●     | 6.00                            | 5.10                                | 12.50            | 17.68 | 25.00 | 30.62 | 39.53 | 55.90  | 100                                                                                   | 180 |
| 30°         | 664.722      | ●                   | ●                                              | ●     | 3.00                            | 2.40                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 14.09  | 140                                                                                   | 260 |
|             | 664.762      | ●                   | ●                                              | ●     | 3.50                            | 2.70                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 17.89  | 140                                                                                   | 260 |
|             | 664.802      | ●                   | ●                                              | ●     | 4.00                            | 3.10                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 22.36  | 140                                                                                   | 260 |
|             | 664.882      | ●                   | ●                                              | ●     | 5.00                            | 4.00                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 35.78  | 140                                                                                   | 270 |
|             | 664.922      | ●                   | ●                                              | ●     | 5.50                            | 4.40                                | 10.00            | 14.14 | 20.00 | 24.49 | 31.62 | 44.72  | 140                                                                                   | 270 |
|             | 664.962      | ●                   | ●                                              | ●     | 6.00                            | 5.00                                | 12.50            | 17.68 | 25.00 | 30.62 | 39.53 | 55.90  | 140                                                                                   | 270 |
|             | 665.042      | ●                   |                                                | ●     | 8.00                            | 6.40                                | 20.00            | 28.29 | 40.00 | 48.99 | 63.25 | 89.45  | 140                                                                                   | 270 |
|             | 665.122      |                     |                                                | ●     | 10.00                           | 8.20                                | 31.50            | 44.55 | 63.00 | 77.16 | 99.61 | 140.87 | 140                                                                                   | 270 |





| Spray angle | Ordering no. |                     |                                                |       | Equivalent bore diameter A [mm] | Narrowest free cross section Ø [mm] | V̇ water [l/min] |       |       |       |       |        | Spray width B [mm]<br>(at p = 5 bar) |              |
|-------------|--------------|---------------------|------------------------------------------------|-------|---------------------------------|-------------------------------------|------------------|-------|-------|-------|-------|--------|--------------------------------------|--------------|
|             | Type         | Mat. no.            |                                                |       |                                 |                                     | p [bar]          |       |       |       |       |        | H = 250 [mm]                         | H = 500 [mm] |
|             |              | 16                  | 17 <sup>1</sup>                                | 30    |                                 |                                     |                  |       |       |       |       |        |                                      |              |
|             |              | Stainless steel 303 | Stainless steel 316Ti/<br>Stainless steel 316L | Brass |                                 |                                     | 0.5              | 1.0   | 2.0   | 3.0   | 5.0   | 10.0   |                                      |              |
| 45°         | 664.723      | ●                   | ●                                              | ●     | 3.00                            | 2.40                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 14.09  | 220                                  | 420          |
|             | 664.763      | ●                   | ●                                              | ●     | 3.50                            | 2.60                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 17.89  | 220                                  | 420          |
|             | 664.803      | ●                   | ●                                              | ●     | 4.00                            | 3.00                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 22.36  | 220                                  | 420          |
|             | 664.843      | ●                   | ●                                              | ●     | 4.50                            | 3.40                                | 6.25             | 8.84  | 12.50 | 15.31 | 19.76 | 27.94  | 220                                  | 420          |
|             | 664.883      | ●                   | ●                                              | ●     | 5.00                            | 3.80                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 35.78  | 220                                  | 420          |
|             | 664.923      | ●                   | ●                                              | ●     | 5.50                            | 4.20                                | 10.00            | 14.14 | 20.00 | 24.49 | 31.62 | 44.72  | 220                                  | 430          |
|             | 664.963      | ●                   | ●                                              | ●     | 6.00                            | 4.40                                | 12.50            | 17.68 | 25.00 | 30.62 | 39.53 | 55.90  | 220                                  | 430          |
|             | 665.043      |                     |                                                | ●     | 8.00                            | 5.90                                | 20.00            | 28.29 | 40.00 | 48.99 | 63.25 | 89.45  | 220                                  | 430          |
| 60°         | 664.724      | ●                   | ●                                              | ●     | 3.00                            | 2.10                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 14.09  | 280                                  | 560          |
|             | 664.764      | ●                   | ●                                              | ●     | 3.50                            | 2.30                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 17.89  | 280                                  | 570          |
|             | 664.804      | ●                   | ●                                              | ●     | 4.00                            | 2.60                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 22.36  | 290                                  | 580          |
|             | 664.844      | ●                   | ●                                              | ●     | 4.50                            | 3.00                                | 6.25             | 8.84  | 12.50 | 15.31 | 19.76 | 27.94  | 290                                  | 580          |
|             | 664.884      | ●                   | ●                                              | ●     | 5.00                            | 3.40                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 35.78  | 290                                  | 580          |
|             | 664.924      | ●                   | ●                                              | ●     | 5.50                            | 4.10                                | 10.00            | 14.14 | 20.00 | 24.49 | 31.62 | 44.72  | 290                                  | 580          |
|             | 664.964      | ●                   | ●                                              | ●     | 6.00                            | 4.20                                | 12.50            | 17.68 | 25.00 | 30.62 | 39.53 | 55.90  | 290                                  | 580          |
|             | 665.044      | ●                   | ●                                              | ●     | 8.00                            | 5.50                                | 20.00            | 28.29 | 40.00 | 48.99 | 63.25 | 89.45  | 290                                  | 580          |
|             | 665.084      |                     | ●                                              | ●     | 9.00                            | 6.20                                | 25.00            | 35.36 | 50.00 | 61.24 | 79.06 | 111.81 | 290                                  | 580          |
|             | 665.124      |                     |                                                | ●     | 10.00                           | 7.40                                | 31.50            | 44.55 | 63.00 | 77.16 | 99.61 | 140.87 | 290                                  | 580          |
| 90°         | 664.726      | ●                   | ●                                              | ●     | 3.00                            | 1.70                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 14.09  | 520                                  | 980          |
|             | 664.766      | ●                   | ●                                              | ●     | 3.50                            | 1.90                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 17.89  | 530                                  | 1,000        |
|             | 664.806      | ●                   | ●                                              | ●     | 4.00                            | 2.40                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 22.36  | 530                                  | 1,030        |
|             | 664.846      | ●                   | ●                                              | ●     | 4.50                            | 2.40                                | 6.25             | 8.84  | 12.50 | 15.31 | 19.76 | 27.94  | 540                                  | 1,050        |
|             | 664.886      | ●                   | ●                                              | ●     | 5.00                            | 3.10                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 35.78  | 540                                  | 1,060        |
|             | 664.926      | ●                   | ●                                              | ●     | 5.50                            | 3.60                                | 10.00            | 14.14 | 20.00 | 24.49 | 31.62 | 44.72  | 540                                  | 1,070        |
|             | 664.966      | ●                   | ●                                              | ●     | 6.00                            | 3.90                                | 12.50            | 17.68 | 25.00 | 30.62 | 39.53 | 55.90  | 540                                  | 1,070        |
|             | 665.046      |                     |                                                | ●     | 8.00                            | 4.90                                | 20.00            | 28.29 | 40.00 | 48.99 | 63.25 | 89.45  | 540                                  | 1,070        |
|             | 665.126      |                     |                                                | ●     | 10.00                           | 6.40                                | 31.50            | 44.55 | 63.00 | 77.16 | 99.61 | 140.87 | 540                                  | 1,070        |
| 120°        | 664.727      | ●                   | ●                                              | ●     | 3.00                            | 1.60                                | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 14.09  | 890                                  | 1,680        |
|             | 664.767      | ●                   | ●                                              | ●     | 3.50                            | 1.70                                | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 17.89  | 900                                  | 1,700        |
|             | 664.807      | ●                   | ●                                              | ●     | 4.00                            | 2.00                                | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 22.36  | 900                                  | 1,710        |
|             | 664.887      | ●                   | ●                                              | ●     | 5.00                            | 2.60                                | 8.00             | 11.31 | 16.00 | 19.60 | 25.30 | 35.78  | 910                                  | 1,710        |
|             | 664.927      | ●                   | ●                                              | ●     | 5.50                            | 2.90                                | 10.00            | 14.14 | 20.00 | 24.49 | 31.62 | 44.72  | 910                                  | 1,710        |
|             | 664.967      |                     |                                                | ●     | 6.00                            | 3.20                                | 12.50            | 17.68 | 25.00 | 30.62 | 39.53 | 55.90  | 910                                  | 1,710        |
|             | 665.047      |                     |                                                | ●     | 8.00                            | 4.40                                | 20.00            | 28.29 | 40.00 | 48.99 | 63.25 | 89.45  | 910                                  | 1,710        |

<sup>1</sup> We reserve the right to supply material 316Ti or 316L under material no. 17.

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

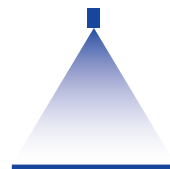
Ordering Type + Material no. = Ordering no.  
example: 664.723 + 16 = 664.723.16



Assembly accessories can be found in Chapter 9 "Accessories".

# Low pressure flat fan nozzles

## Series 646

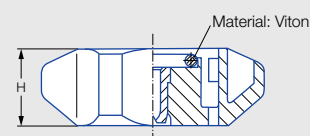
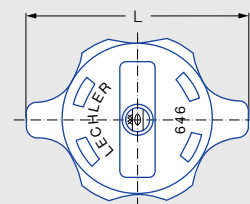


### Features:

- Uniform, parabolic liquid distribution
- Adjusted spray direction
- Simple, fast manual assembly due to bayonet quick-release system

### Applications:

- Belt cleaning
- Surface treatment
- Spray cleaning
- Coating processes



Series 646

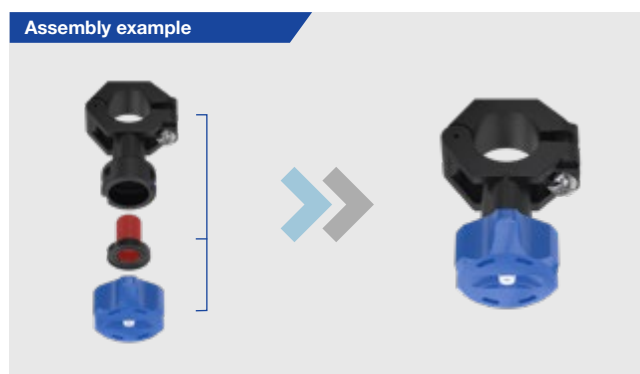
| Dimensions [mm] |      | Weight [g] |
|-----------------|------|------------|
| H               | L    |            |
| 15.0            | 44.0 | 12.0       |

| Spray angle | Ordering no. |          | Equivalent bore diameter A [mm] | Narrowest free cross section Ø [mm] | V̇ water [l/min] |       |      |      |      |      | Spray width B [mm]<br>(at p = 5 bar) |              |
|-------------|--------------|----------|---------------------------------|-------------------------------------|------------------|-------|------|------|------|------|--------------------------------------|--------------|
|             | Type         | Mat. no. |                                 |                                     | p [bar]          |       |      |      |      |      | H = 250 [mm]                         | H = 500 [mm] |
|             |              | 5E       |                                 |                                     |                  |       |      |      |      |      |                                      |              |
|             |              | PVDF     |                                 |                                     | 0.5              | 1.0   | 2.0  | 3.0  | 5.0  | 10.0 |                                      |              |
| 20°         | 646.301      | ●        | 0.70                            | 0.60                                | 0.16*            | 0.23* | 0.32 | 0.39 | 0.51 | 0.72 | 85                                   | 160          |
|             | 646.361      | ●        | 1.00                            | 0.80                                | 0.31*            | 0.44* | 0.63 | 0.77 | 1.00 | 1.41 | 85                                   | 160          |
|             | 646.441      | ●        | 1.35                            | 1.10                                | 0.63*            | 0.88  | 1.25 | 1.53 | 1.98 | 2.80 | 85                                   | 160          |
|             | 646.481      | ●        | 1.50                            | 1.20                                | 0.80*            | 1.13  | 1.60 | 1.96 | 2.53 | 3.58 | 85                                   | 160          |
| 30°         | 646.302      | ●        | 0.70                            | 0.50                                | 0.16*            | 0.23* | 0.32 | 0.39 | 0.51 | 0.72 | 120                                  | 220          |
|             | 646.362      | ●        | 1.00                            | 0.70                                | 0.31*            | 0.44* | 0.63 | 0.77 | 1.00 | 1.40 | 120                                  | 220          |
|             | 646.402      | ●        | 1.20                            | 0.90                                | 0.50*            | 0.71  | 1.00 | 1.22 | 1.58 | 2.24 | 120                                  | 230          |
|             | 646.482      | ●        | 1.50                            | 1.10                                | 0.80*            | 1.13  | 1.60 | 1.96 | 2.53 | 3.58 | 130                                  | 230          |
|             | 646.562      | ●        | 2.00                            | 1.50                                | 1.25             | 1.77  | 2.50 | 3.06 | 3.95 | 5.59 | 130                                  | 240          |
| 45°         | 646.363      | ●        | 1.00                            | 0.60                                | 0.31*            | 0.44* | 0.63 | 0.77 | 1.00 | 1.40 | 190                                  | 350          |
|             | 646.403      | ●        | 1.20                            | 0.90                                | 0.50*            | 0.71  | 1.00 | 1.23 | 1.58 | 2.24 | 200                                  | 370          |
|             | 646.483      | ●        | 1.50                            | 1.10                                | 0.80*            | 1.13  | 1.60 | 1.96 | 2.53 | 3.58 | 200                                  | 390          |
|             | 646.563      | ●        | 2.00                            | 1.40                                | 1.20             | 1.77  | 2.50 | 3.06 | 3.95 | 5.59 | 210                                  | 410          |
|             | 646.643      | ●        | 2.50                            | 1.80                                | 2.00             | 2.83  | 4.00 | 4.90 | 6.32 | 8.94 | 210                                  | 410          |
| 60°         | 646.304      | ●        | 0.70                            | 0.40                                | 0.16*            | 0.23* | 0.32 | 0.39 | 0.51 | 0.72 | 260                                  | 480          |
|             | 646.334      | ●        | 0.90                            | 0.50                                | 0.23*            | 0.32* | 0.45 | 0.55 | 0.71 | 1.01 | 260                                  | 490          |
|             | 646.364      | ●        | 1.00                            | 0.60                                | 0.32*            | 0.45* | 0.63 | 0.77 | 1.00 | 1.41 | 260                                  | 500          |
|             | 646.404      | ●        | 1.20                            | 0.80                                | 0.50*            | 0.71  | 1.00 | 1.22 | 1.58 | 2.24 | 260                                  | 510          |
|             | 646.444      | ●        | 1.35                            | 0.90                                | 0.63*            | 0.88  | 1.25 | 1.53 | 1.98 | 2.80 | 260                                  | 510          |
|             | 646.484      | ●        | 1.50                            | 1.00                                | 0.80*            | 1.13  | 1.60 | 1.96 | 2.53 | 3.58 | 260                                  | 520          |
|             | 646.514      | ●        | 1.65                            | 1.10                                | 0.95*            | 1.34  | 1.90 | 2.33 | 3.00 | 4.25 | 270                                  | 520          |
|             | 646.564      | ●        | 2.00                            | 1.30                                | 1.25             | 1.77  | 2.50 | 3.06 | 3.95 | 5.59 | 270                                  | 530          |
|             | 646.604      | ●        | 2.20                            | 1.50                                | 1.58             | 2.23  | 3.15 | 3.86 | 4.98 | 7.04 | 270                                  | 540          |



| Spray angle | Ordering no. |          | Equivalent bore diameter<br>A<br>[mm] | Narrowest free cross section<br>Ø<br>[mm] | V̇ water [l/min] |       |      |      |      |      | Spray width B<br>[mm]<br>(at p = 5 bar) |                 |
|-------------|--------------|----------|---------------------------------------|-------------------------------------------|------------------|-------|------|------|------|------|-----------------------------------------|-----------------|
|             | Type         | Mat. no. |                                       |                                           | p [bar]          |       |      |      |      |      | H = 250<br>[mm]                         | H = 500<br>[mm] |
|             |              | 5E       |                                       |                                           |                  |       |      |      |      |      |                                         |                 |
|             |              | PVDF     |                                       |                                           |                  |       |      |      |      |      |                                         |                 |
| 90°         | 646.306      | ●        | 0.70                                  | 0.40                                      | 0.16*            | 0.23* | 0.32 | 0.39 | 0.51 | 0.72 | 440                                     | 800             |
|             | 646.336      | ●        | 0.90                                  | 0.50                                      | 0.23*            | 0.32* | 0.45 | 0.55 | 0.71 | 1.01 | 440                                     | 820             |
|             | 646.366      | ●        | 1.00                                  | 0.50                                      | 0.32*            | 0.45* | 0.63 | 0.77 | 1.00 | 1.41 | 450                                     | 830             |
|             | 646.406      | ●        | 1.20                                  | 0.70                                      | 0.50*            | 0.71  | 1.00 | 1.22 | 1.58 | 2.24 | 450                                     | 840             |
|             | 646.446      | ●        | 1.35                                  | 0.80                                      | 0.63*            | 0.88  | 1.25 | 1.53 | 1.98 | 2.80 | 460                                     | 860             |
|             | 646.486      | ●        | 1.50                                  | 0.80                                      | 0.80*            | 1.13  | 1.60 | 1.96 | 2.53 | 3.58 | 470                                     | 870             |
|             | 646.516      | ●        | 1.65                                  | 0.90                                      | 0.95*            | 1.34  | 1.90 | 2.33 | 3.00 | 4.25 | 480                                     | 880             |
|             | 646.566      | ●        | 2.00                                  | 1.10                                      | 1.25             | 1.77  | 2.50 | 3.06 | 3.95 | 5.59 | 490                                     | 900             |
|             | 646.606      | ●        | 2.20                                  | 1.20                                      | 1.58             | 2.23  | 3.15 | 3.86 | 4.98 | 7.04 | 500                                     | 910             |
| 120°        | 646.307      | ●        | 0.70                                  | 0.30                                      | 0.16*            | 0.23* | 0.32 | 0.39 | 0.51 | 0.72 | 710                                     | 1,240           |
|             | 646.337      | ●        | 0.90                                  | 0.40                                      | 0.23*            | 0.32* | 0.45 | 0.55 | 0.71 | 1.01 | 740                                     | 1,310           |
|             | 646.367      | ●        | 1.00                                  | 0.50                                      | 0.32*            | 0.45* | 0.63 | 0.77 | 1.00 | 1.41 | 800                                     | 1,350           |
|             | 646.407      | ●        | 1.20                                  | 0.60                                      | 0.50*            | 0.71  | 1.00 | 1.22 | 1.58 | 2.24 | 830                                     | 1,390           |
|             | 646.447      | ●        | 1.35                                  | 0.60                                      | 0.63*            | 0.88  | 1.25 | 1.53 | 1.98 | 2.80 | 840                                     | 1,410           |
|             | 646.487      | ●        | 1.50                                  | 0.60                                      | 0.80*            | 1.13  | 1.60 | 1.96 | 2.53 | 3.58 | 850                                     | 1,420           |
|             | 646.517      | ●        | 1.65                                  | 0.90                                      | 0.95*            | 1.34  | 1.90 | 2.33 | 3.00 | 4.25 | 850                                     | 1,430           |
|             | 646.567      | ●        | 2.00                                  | 0.90                                      | 1.25             | 1.77  | 2.50 | 3.06 | 3.95 | 5.59 | 870                                     | 1,440           |
|             | 646.607      | ●        | 2.20                                  | 1.10                                      | 1.58             | 2.23  | 3.15 | 3.86 | 4.98 | 7.04 | 870                                     | 1,450           |

\* Differing spray pattern.



Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

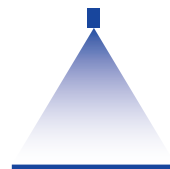
Ordering Type + Material no. = Ordering no.  
example: 646.306 + 5E = 646.306\*



Assembly accessories can be found in Chapter 9 "Accessories".

# Low pressure tongue-type nozzles

## Series 688/689



### Features:

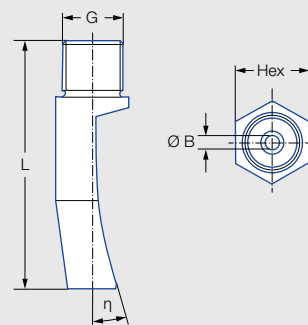
- Narrowly delimited, powerful flat fan spray
- Non-clogging

### Applications:

- Cleaning processes
- Washing processes
- Degreasing installations
- Phosphating installations
- Preparation techniques



Series 688/689



| Type           | Code      | G        | Dimensions [mm] |       | Weight [g]                               |
|----------------|-----------|----------|-----------------|-------|------------------------------------------|
|                |           |          | L               | Hex   |                                          |
| <b>688.763</b> | <b>CE</b> | 3/8 BSPT | 43.0            | 19    | 53.0<br>(Stainless steel 303)            |
| <b>688.843</b> | <b>CE</b> | 3/8 BSPT | 50.0            | 19    | 133.0<br>(Stainless steel 303)           |
| <b>688.923</b> | <b>CE</b> | 3/8 BSPT | 59.0            | 22    | 247.0<br>(Stainless steel 303)           |
| <b>689.003</b> | <b>90</b> | 3/4 BSPP | 80.0            | 32/24 | 306.0/33.0<br>(Stainless steel 303/PVDF) |

| Spray angle | η   | Ordering no. |                     |      |          | Bore diameter B [mm] | V̇ water [l/min] |       |       |       | Spray width B [mm]<br>(at p = 2 bar) |              |          |
|-------------|-----|--------------|---------------------|------|----------|----------------------|------------------|-------|-------|-------|--------------------------------------|--------------|----------|
|             |     | Type         | Mat. no.            |      | Code     |                      | p [bar]          |       |       |       | H = 250 [mm]                         | H = 500 [mm] |          |
|             |     |              | 16                  | 5E   | 3/8 BSPT |                      |                  |       |       |       |                                      |              | 3/4 BSPP |
|             |     |              | Stainless steel 303 | PVDF |          |                      |                  |       |       |       |                                      |              |          |
| 45°         | 35° | 688.763      | ●                   |      | CE       |                      | 3.00             | 4.00  | 5.66  | 8.00  | 12.65                                | 220          | 420      |
|             | 30° | 688.843      | ●                   |      | CE       |                      | 3.80             | 6.25  | 8.84  | 12.50 | 19.76                                | 220          | 420      |
|             | 29° | 688.923      | ●                   |      | CE       |                      | 4.80             | 10.00 | 14.14 | 20.00 | 31.62                                | 220          | 430      |
|             | 35° | 689.003      | ●                   | ●    |          | 90                   | 6.00             | 15.75 | 22.27 | 31.50 | 49.81                                | 220          | 430      |

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. + Code = Ordering no.  
example: 688.763 + 16 + CE = 688.763.16.CE



Assembly accessories can be found in Chapter 9 "Accessories".

# Low pressure tongue-type nozzles

## Series 686



### Features:

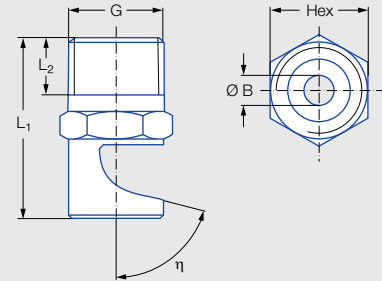
- Sharply delimited, powerful flat fan spray
- Large spray angle
- Non-clogging

### Applications:

- Foam control
- Cleaning processes
- Washing processes



Series 686



| Type    | BSPP<br>BSPT | Code | Dimensions [mm] |                |     | Weight<br>[g]<br>Brass |
|---------|--------------|------|-----------------|----------------|-----|------------------------|
|         |              |      | L <sub>1</sub>  | L <sub>2</sub> | Hex |                        |
| 686.366 | 1/8          | CA   | 23.0            | 6.5            | 11  | 13.0                   |
| 686.406 | 1/8          | CA   | 23.0            | 6.5            | 11  | 13.0                   |
| 686.686 | 1/4          | CC   | 29.5            | 9.7            | 14  | 23.0                   |
| 686.726 | 1/8          | CA   | 25.0            | 6.5            | 11  | 13.0                   |
| 686.806 | 1/4          | CC   | 33.0            | 9.7            | 14  | 24.0                   |
| 686.886 | 1/4          | CC   | 35.0            | 9.7            | 17  | 30.0                   |
| 686.926 | 3/8          | CE   | 38.5            | 10.1           | 17  | 32.0                   |
| 686.368 | 1/8          | CA   | 20.0            | 6.5            | 11  | 13.0                   |
| 686.408 | 1/8          | CA   | 23.0            | 6.5            | 11  | 13.0                   |
| 686.448 | 1/4          | CC   | 24.0            | 9.7            | 14  | 21.0                   |
| 686.488 | 1/8          | CA   | 23.0            | 6.5            | 11  | 13.0                   |
| 686.488 | 1/4          | CC   | 24.0            | 9.7            | 14  | 21.0                   |
| 686.528 | 1/8          | CA   | 23.0            | 6.5            | 11  | 13.0                   |
| 686.528 | 1/4          | CC   | 24.0            | 9.7            | 14  | 21.0                   |
| 686.568 | 1/8          | CA   | 23.0            | 6.5            | 11  | 13.0                   |
| 686.568 | 1/4          | CC   | 24.0            | 9.7            | 14  | 21.0                   |
| 686.608 | 1/8          | CA   | 23.0            | 6.5            | 11  | 13.0                   |
| 686.608 | 1/4          | CC   | 24.0            | 9.7            | 14  | 21.0                   |
| 686.648 | 1/4          | CC   | 24.0            | 9.7            | 14  | 21.0                   |
| 686.688 | 1/8          | CA   | 23.0            | 6.5            | 11  | 13.0                   |
| 686.688 | 1/4          | CC   | 27.0            | 9.7            | 14  | 22.0                   |
| 686.728 | 1/8          | CA   | 23.0            | 6.5            | 11  | 13.0                   |
| 686.728 | 1/4          | CC   | 27.0            | 9.7            | 14  | 22.0                   |
| 686.768 | 1/4          | CC   | 27.0            | 9.7            | 14  | 22.0                   |
| 686.808 | 1/8          | CA   | 23.0            | 6.5            | 11  | 13.0                   |
| 686.808 | 1/4          | CC   | 27.0            | 9.7            | 14  | 22.0                   |
| 686.828 | 1/4          | CC   | 27.0            | 9.7            | 14  | 22.0                   |
| 686.848 | 1/4          | CC   | 27.0            | 9.7            | 14  | 22.0                   |
| 686.868 | 1/4          | CC   | 28.0            | 9.7            | 14  | 23.0                   |
| 686.888 | 1/4          | CC   | 28.0            | 9.7            | 14  | 23.0                   |
| 686.908 | 1/4          | CC   | 28.0            | 9.7            | 14  | 23.0                   |
| 686.928 | 3/8          | CE   | 30.0            | 10.1           | 17  | 32.0                   |
| 686.968 | 1/2          | CG   | 37.0            | 13.2           | 22  | 60.0                   |
| 686.988 | 3/8          | CE   | 32.0            | 10.1           | 17  | 32.0                   |
| 686.988 | 1/2          | CG   | 37.0            | 13.2           | 22  | 60.0                   |

Also suitable for air or saturated steam  
(see Page 172).

| Spray angle | η   | Ordering no. |          |    |                |          |          |          | Bore diameter B [mm] | V̇ water [l/min]    |       |              | Spray width B [mm]<br>(at p = 2 bar)                                                |          |
|-------------|-----|--------------|----------|----|----------------|----------|----------|----------|----------------------|---------------------|-------|--------------|-------------------------------------------------------------------------------------|----------|
|             |     | Type         | Mat. no. |    |                | Code     |          |          |                      | p [bar]             |       |              |  |          |
|             |     |              | 16       | 30 | 5E             | 1/8 BSPT | 1/4 BSPT | 3/8 BSPT |                      |                     |       |              |                                                                                     | 1/2 BSPT |
|             |     |              |          |    |                |          |          |          |                      | Stainless steel 303 | Brass | PVDF         |                                                                                     |          |
|             |     |              |          |    |                |          |          |          | 1.0                  | 2.0                 | 5.0   | H = 250 [mm] |                                                                                     |          |
| 90°         | 75° | 686.366      |          | ●  |                | CA       |          |          | 0.80                 | 0.45                | 0.63  | 1.00         | 450                                                                                 |          |
|             |     | 686.406      | ●        | ●  |                | CA       |          |          | 1.00                 | 0.71                | 1.00  | 1.58         | 450                                                                                 |          |
|             | 40° | 686.686      | ●        | ●  |                |          | CC       |          |                      | 2.40                | 3.54  | 5.00         | 7.91                                                                                | 510      |
|             |     | 686.726      |          | ●  |                | CA       |          |          |                      | 2.70                | 4.45  | 6.30         | 9.96                                                                                | 530      |
|             |     | 686.806      | ●        | ●  |                |          | CC       |          |                      | 3.40                | 7.07  | 10.00        | 15.81                                                                               | 540      |
|             |     | 686.886      | ●        |    |                |          | CC       |          |                      | 4.20                | 11.31 | 16.00        | 25.30                                                                               | 540      |
| 686.926     | ●   |              |          |    |                | CE       |          | 4.70     | 14.14                | 20.00               | 31.62 | 540          |                                                                                     |          |
| 140°        | 75° | 686.368      | ●        | ●  |                | CA       |          |          |                      | 0.80                | 0.45  | 0.63         | 1.00                                                                                | 1,250    |
|             |     | 686.408      | ●        | ●  |                | CA       |          |          |                      | 1.00                | 0.71  | 1.00         | 1.58                                                                                | 1,260    |
|             |     | 686.448      | ●        | ●  |                |          | CC       |          |                      | 1.20                | 0.88  | 1.25         | 1.98                                                                                | 1,260    |
|             |     | 686.488      | ●        | ●  |                | CA       | CC       |          |                      | 1.30                | 1.13  | 1.60         | 2.53                                                                                | 1,270    |
|             |     | 686.528      | ●        | ●  |                | CA       | CC       |          |                      | 1.50                | 1.41  | 2.00         | 3.16                                                                                | 1,280    |
|             |     | 686.568      | ●        | ●  | ● <sup>1</sup> | CA       | CC       |          |                      | 1.70                | 1.77  | 2.50         | 3.95                                                                                | 1,290    |
|             |     | 686.608      | ●        | ●  |                | CA       | CC       |          |                      | 1.90                | 2.23  | 3.15         | 4.98                                                                                | 1,300    |
|             |     | 686.648      | ●        | ●  |                |          | CC       |          |                      | 2.20                | 2.83  | 4.00         | 6.32                                                                                | 1,320    |
|             |     | 686.688      | ●        | ●  |                | CA       | CC       |          |                      | 2.40                | 3.54  | 5.00         | 7.91                                                                                | 1,330    |
|             |     | 686.728      | ●        | ●  |                | CA       | CC       |          |                      | 2.70                | 4.45  | 6.30         | 9.96                                                                                | 1,340    |
|             |     | 686.768      | ●        | ●  |                |          | CC       |          |                      | 3.00                | 5.66  | 8.00         | 12.65                                                                               | 1,350    |
|             |     | 686.808      | ●        | ●  |                | CA       | CC       |          |                      | 3.40                | 7.07  | 10.00        | 15.81                                                                               | 1,360    |
|             |     | 686.828      | ●        | ●  |                |          | CC       |          |                      | 3.60                | 7.92  | 11.20        | 17.71                                                                               | 1,360    |
|             |     | 686.848      | ●        | ●  |                |          | CC       |          |                      | 3.80                | 8.84  | 12.50        | 19.76                                                                               | 1,360    |
|             |     | 686.868      | ●        | ●  |                |          | CC       |          |                      | 4.00                | 9.90  | 14.00        | 22.14                                                                               | 1,360    |
|             |     | 686.888      | ●        | ●  |                |          | CC       |          |                      | 4.20                | 11.31 | 16.00        | 25.30                                                                               | 1,360    |
|             |     | 686.908      | ●        | ●  |                |          | CC       |          |                      | 4.50                | 12.73 | 18.00        | 28.46                                                                               | 1,360    |
|             |     | 686.928      | ●        |    |                |          |          | CE       |                      | 4.70                | 14.14 | 20.00        | 31.62                                                                               | 1,360    |
|             |     | 686.968      |          | ●  |                |          |          |          | CG                   | 5.30                | 17.68 | 25.00        | 39.53                                                                               | 1,360    |
|             |     | 686.988      | ●        |    |                |          |          | CE       | CG                   | 5.60                | 19.80 | 28.00        | 44.27                                                                               | 1,360    |

<sup>1</sup> Only available with code CA.

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

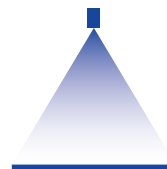
Ordering Type + Material no. + Code = Ordering no.  
example: 686.366 + 30 + CA = 686.366.30.CA



Assembly accessories can be found in Chapter 9 "Accessories".

# Low pressure tongue-type nozzles

## Series 684



### Features:

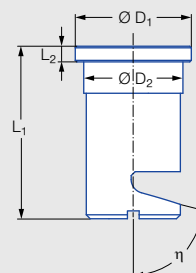
- Sharply delimited, powerful flat fan spray
- Large spray angle
- Assembly with retaining nut
- Non-clogging

### Applications:

- Foam control
- Cleaning processes
- Washing processes



Series 684



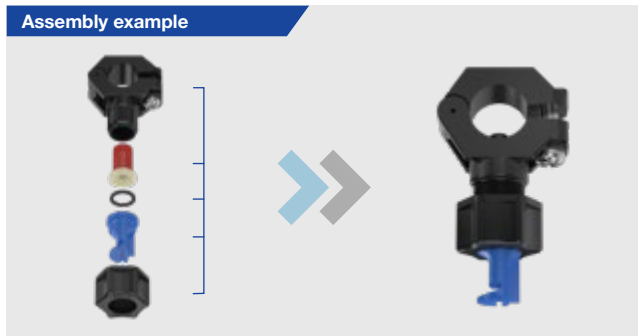
| G                                    | Dimensions [mm] |                  |                  | Weight [g] |
|--------------------------------------|-----------------|------------------|------------------|------------|
|                                      | L <sub>2</sub>  | Ø D <sub>1</sub> | Ø D <sub>2</sub> |            |
| Assembly with retaining nut 3/8 BSPP | 2.00            | 14.80            | 12.65            | 3.00       |

| Spray angle | η   | Ordering no. |          |      | Color <sup>1</sup> | Bore diameter B [mm] | L <sub>1</sub> [mm] | V̇ water [l/min] |       |       | Spray width B [mm]<br>(at p = 2 bar)                                                 |
|-------------|-----|--------------|----------|------|--------------------|----------------------|---------------------|------------------|-------|-------|--------------------------------------------------------------------------------------|
|             |     | Type         | Mat. no. |      |                    |                      |                     | p [bar]          |       |       |  |
|             |     |              | 56       | 5E   |                    |                      |                     |                  |       |       |                                                                                      |
|             |     |              | POM      | PVDF |                    |                      |                     | 1.0              | 2.0   | 5.0   |                                                                                      |
| 140°        | 75° | 684.348      | ●        |      | Green              | 0.70                 | 20.00               | 0.35*            | 0.50  | 0.79  | 1,240                                                                                |
|             |     | 684.368      | ●        | ●    | Yellow             | 0.80                 | 20.00               | 0.45*            | 0.63  | 1.00  | 1,250                                                                                |
|             |     | 684.408      | ●        |      | Blue               | 1.00                 | 20.00               | 0.71             | 1.00  | 1.58  | 1,260                                                                                |
|             |     | 684.448      | ●        |      | Red                | 1.20                 | 20.00               | 0.88             | 1.25  | 1.98  | 1,260                                                                                |
|             |     | 684.488      | ●        | ●    | Brown              | 1.30                 | 20.00               | 1.13             | 1.60  | 2.53  | 1,270                                                                                |
|             |     | 684.528      | ●        |      | Grey               | 1.50                 | 20.00               | 1.41             | 2.00  | 3.16  | 1,280                                                                                |
|             |     | 684.568      | ●        | ●    | White              | 1.70                 | 19.00               | 1.77             | 2.50  | 3.95  | 1,290                                                                                |
|             |     | 684.608      | ●        |      | Light blue         | 1.90                 | 19.00               | 2.23             | 3.15  | 4.98  | 1,300                                                                                |
|             |     | 684.688      | ●        |      | Green              | 2.40                 | 17.00               | 3.54             | 5.00  | 7.91  | 1,330                                                                                |
|             |     | 684.728      | ●        | ●    | Black              | 2.70                 | 17.00               | 4.45             | 6.30  | 9.96  | 1,340                                                                                |
|             |     | 684.808      | ●        |      | Beige              | 3.40                 | 16.00               | 7.07             | 10.00 | 15.81 | 1,340                                                                                |

\* Differing spray pattern.

<sup>1</sup> PVDF material is always blue.

### Assembly example



Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

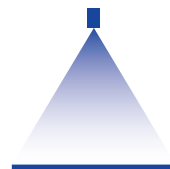
Ordering Type + Material no. = Ordering no.  
example: 684.348 + 56 = 684.348.56



Assembly accessories can be found in Chapter 9 "Accessories".

# High pressure flat fan nozzles

## Series 602



### Features:

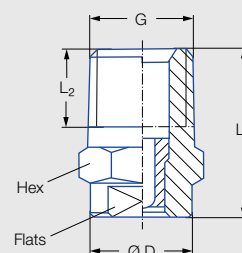
- Sharp, uniform flat fan spray
- Extremely narrow spray depth
- Housing: Stainless steel 303,  
Insert: Hardened stainless steel 420F

### Applications:

- High pressure cleaning



Series 602



| G        | Dimensions [mm] |                |      |     |       | Weight [g] | p <sub>max</sub> <sup>1</sup> [bar] |
|----------|-----------------|----------------|------|-----|-------|------------|-------------------------------------|
|          | L <sub>1</sub>  | L <sub>2</sub> | Ø D  | Hex | Flats |            |                                     |
| 1/4 BSPT | 22.0            | 10.0           | 13.0 | 14  | 10    | 18.0       | approx. 700                         |
| 1/4 NPT  | 22.0            | 10.2           | 13.0 | 14  | 10    | 18.0       | approx. 700                         |

<sup>1</sup> Applies only to operation at constant pressure.

| US<br>gal/min<br>at<br>40 psi | Ordering no. |                |     |     |     |                             |          |         | Equivalent<br>bore diameter<br>A<br>[mm] | V̇ water [l/min] |       |       |       |       |       |       |
|-------------------------------|--------------|----------------|-----|-----|-----|-----------------------------|----------|---------|------------------------------------------|------------------|-------|-------|-------|-------|-------|-------|
|                               | Series       | Flow rate code |     |     |     | Mat. no.                    | Code     |         |                                          | p [bar]          |       |       |       |       |       |       |
|                               |              | Spray angle    |     |     |     | A3                          | 1/4 BSPT | 1/4 NPT |                                          |                  |       |       |       |       |       |       |
|                               |              | 20°            | 30° | 45° | 60° | Stainless steel<br>303/420F |          |         |                                          |                  |       |       |       |       |       |       |
| 02                            | 602          | 361            | 362 | 363 | 364 | ●                           | 00       | 07      | 1.00                                     | 2.88             | 3.53  | 4.08  | 4.56  | 5.00  | 5.58  | 6.45  |
| 021                           | 602          | 371            | 372 | 373 | 374 | ●                           | 00       | 07      | 1.02                                     | 3.03             | 3.71  | 4.28  | 4.79  | 5.25  | 5.87  | 6.77  |
| 025                           | 602          | 381            | 382 | 383 | 384 | ●                           | 00       | 07      | 1.10                                     | 3.60             | 4.42  | 5.10  | 5.70  | 6.24  | 6.98  | 8.06  |
| 028                           | 602          | 391            | 392 | 393 | 394 | ●                           | 00       | 07      | 1.16                                     | 4.04             | 4.94  | 5.71  | 6.38  | 6.99  | 7.81  | 9.02  |
| 03                            | 602          | 401            | 402 | 403 | 404 | ●                           | 00       | 07      | 1.18                                     | 4.32             | 5.29  | 6.11  | 6.83  | 7.48  | 8.37  | 9.66  |
| 034                           | 602          | 411            | 412 | 413 | 414 | ●                           | 00       | 07      | 1.30                                     | 4.90             | 6.00  | 6.93  | 7.75  | 8.49  | 9.49  | 10.96 |
| 038                           | 602          | 441            | 442 | 443 |     | ●                           | 00       | 07      | 1.33                                     | 5.48             | 6.72  | 7.75  | 8.67  | 9.50  | 10.62 | 12.26 |
| 04                            | 602          | 451            | 452 | 453 | 454 | ●                           | 00       | 07      | 1.35                                     | 5.77             | 7.06  | 8.16  | 9.12  | 9.99  | 11.17 | 12.90 |
| 043                           | 602          | 461            | 462 |     |     | ●                           | 00       | 07      | 1.38                                     | 6.20             | 7.59  | 8.77  | 9.80  | 10.74 | 12.00 | 13.86 |
| 045                           | 602          | 471            | 472 | 473 | 474 | ●                           | 00       | 07      | 1.40                                     | 6.49             | 7.95  | 9.18  | 10.26 | 11.24 | 12.57 | 14.51 |
| 05                            | 602          | 481            | 482 | 483 | 484 | ●                           | 00       | 07      | 1.55                                     | 7.21             | 8.83  | 10.20 | 11.40 | 12.49 | 13.96 | 16.12 |
| 055                           | 602          | 501            | 502 | 503 | 504 | ●                           | 00       | 07      | 1.60                                     | 7.93             | 9.71  | 11.22 | 12.54 | 13.74 | 15.36 | 17.73 |
| 06                            | 602          | 521            | 522 | 523 | 524 | ●                           | 00       | 07      | 1.72                                     | 8.65             | 10.60 | 12.24 | 13.68 | 14.99 | 16.75 | 19.35 |
| 065                           | 602          | 531            | 532 | 533 | 534 | ●                           | 00       | 07      | 1.75                                     | 9.37             | 11.48 | 13.26 | 14.82 | 16.23 | 18.15 | 20.96 |
| 07                            | 602          | 541            | 542 | 543 | 544 | ●                           | 00       | 07      | 1.80                                     | 10.09            | 12.36 | 14.28 | 15.96 | 17.48 | 19.55 | 22.57 |
| 075                           | 602          | 551            | 552 | 553 | 554 | ●                           | 00       | 07      | 1.90                                     | 10.81            | 13.25 | 15.29 | 17.10 | 18.73 | 20.94 | 24.18 |
| 08                            | 602          | 571            | 572 | 573 | 574 | ●                           | 00       | 07      | 2.05                                     | 11.54            | 14.13 | 16.31 | 18.24 | 19.98 | 22.34 | 25.80 |
| 087                           | 602          | 581            | 582 | 583 | 584 | ●                           | 00       | 07      | 2.06                                     | 12.54            | 15.36 | 17.74 | 19.83 | 21.72 | 24.29 | 28.04 |
| 09                            | 602          | 591            | 592 | 593 | 594 | ●                           | 00       | 07      | 2.10                                     | 12.98            | 15.89 | 18.35 | 20.52 | 22.48 | 25.13 | 29.02 |
| 10                            | 602          | 601            | 602 | 603 | 604 | ●                           | 00       | 07      | 2.30                                     | 14.41            | 17.65 | 20.38 | 22.79 | 24.97 | 27.91 | 32.23 |
| 11                            | 602          | 621            | 622 | 623 | 624 | ●                           | 00       | 07      | 2.40                                     | 15.86            | 19.42 | 22.42 | 25.07 | 27.46 | 30.70 | 35.45 |
| 125                           | 602          | 641            | 642 | 643 | 644 | ●                           | 00       | 07      | 2.50                                     | 18.02            | 22.07 | 25.48 | 28.49 | 31.21 | 34.89 | 40.29 |
| 131                           | 602          | 651            | 652 | 653 | 654 | ●                           | 00       | 07      | 2.55                                     | 18.89            | 23.13 | 26.71 | 29.86 | 32.71 | 36.57 | 42.23 |
| 139                           | 602          | 661            | 662 | 663 | 664 | ●                           | 00       | 07      | 2.65                                     | 20.04            | 24.54 | 28.34 | 31.68 | 34.70 | 38.80 | 44.80 |
| 15                            | 602          | 671            | 672 | 673 | 674 | ●                           | 00       | 07      | 2.70                                     | 21.62            | 26.48 | 30.58 | 34.19 | 37.45 | 41.87 | 48.35 |
| 175                           | 602          | 701            | 702 | 703 | 704 | ●                           | 00       | 07      | 3.00                                     | 25.23            | 30.90 | 35.68 | 39.89 | 43.70 | 48.86 | 56.41 |
| 20                            | 602          |                |     | 723 | 724 | ●                           | 00       | 07      | 3.05                                     | 28.83            | 35.31 | 40.78 | 45.59 | 49.94 | 55.84 | 64.47 |
| 25                            | 602          |                |     | 763 | 764 | ●                           | 00       | 07      | 3.50                                     | 36.04            | 44.14 | 50.97 | 56.99 | 62.43 | 69.80 | 80.60 |
| 30                            | 602          |                |     | 793 |     | ●                           | 00       | 07      | 3.90                                     | 43.25            | 52.97 | 61.16 | 68.38 | 74.91 | 83.75 | 96.70 |

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{P_2}{P_1}}$



Assembly accessories can be found in Chapter 9 "Accessories".

Ordering Series + Flow rate code + Material no. + Code = Ordering no.  
example: 602 + 361 + A3 + 00 = 602.361.A3.00

# High pressure flat fan nozzles

## Series 608



### Features:

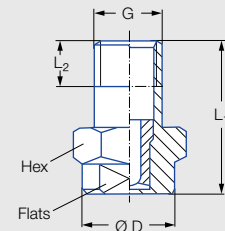
- Sharp, uniform flat fan spray
- Extremely narrow spray depth
- Housing: Stainless steel 303,  
Insert: Hardened stainless steel 420F

### Applications:

- High pressure cleaning



Series 608



| G        | Dimensions [mm] |                |      |     |       | Weight [g] | p <sub>max</sub> <sup>1</sup> [bar] |
|----------|-----------------|----------------|------|-----|-------|------------|-------------------------------------|
|          | L <sub>1</sub>  | L <sub>2</sub> | Ø D  | Hex | Flats |            |                                     |
| 1/8 BSPT | 22.0            | 6.5            | 13.0 | 14  | 10    | 13.0       | approx. 700                         |
| 1/8 NPT  | 22.0            | 6.7            | 13.0 | 14  | 10    | 13.0       | approx. 700                         |

<sup>1</sup> Applies only to operation at constant pressure.

| US<br>gal/min<br>at<br>40 psi | Ordering no. |                |     |     |     |                             |          |         | Equivalent<br>bore diameter<br>A<br>[mm] | V̇ water [l/min] |       |       |       |       |       |       |
|-------------------------------|--------------|----------------|-----|-----|-----|-----------------------------|----------|---------|------------------------------------------|------------------|-------|-------|-------|-------|-------|-------|
|                               | Series       | Flow rate code |     |     |     | Mat. no.                    | Code     |         |                                          | p [bar]          |       |       |       |       |       |       |
|                               |              | Spray angle    |     |     |     | A3                          | 1/8 BSPT | 1/8 NPT |                                          |                  |       |       |       |       |       |       |
|                               |              | 20°            | 30° | 45° | 60° | Stainless steel<br>303/420F |          |         |                                          |                  |       |       |       |       |       |       |
| 02                            | 608          | 361            | 362 | 363 | 364 | ●                           | 00       | 07      | 1.00                                     | 2.88             | 3.53  | 4.08  | 4.56  | 5.00  | 5.58  | 6.45  |
| 021                           | 608          | 371            | 372 | 373 | 374 | ●                           | 00       | 07      | 1.02                                     | 3.03             | 3.71  | 4.28  | 4.79  | 5.25  | 5.87  | 6.77  |
| 025                           | 608          | 381            | 382 | 383 | 384 | ●                           | 00       | 07      | 1.10                                     | 3.60             | 4.42  | 5.10  | 5.70  | 6.24  | 6.98  | 8.06  |
| 028                           | 608          | 391            | 392 | 393 | 394 | ●                           | 00       | 07      | 1.16                                     | 4.04             | 4.94  | 5.71  | 6.38  | 6.99  | 7.81  | 9.02  |
| 03                            | 608          | 401            | 402 | 403 | 404 | ●                           | 00       | 07      | 1.18                                     | 4.32             | 5.29  | 6.11  | 6.83  | 7.48  | 8.37  | 9.66  |
| 034                           | 608          | 411            | 412 | 413 | 414 | ●                           | 00       | 07      | 1.30                                     | 4.90             | 6.00  | 6.93  | 7.75  | 8.49  | 9.49  | 10.96 |
| 038                           | 608          | 441            | 442 | 443 |     | ●                           | 00       | 07      | 1.33                                     | 5.48             | 6.72  | 7.75  | 8.67  | 9.50  | 10.62 | 12.26 |
| 04                            | 608          | 451            | 452 | 453 | 454 | ●                           | 00       | 07      | 1.35                                     | 5.77             | 7.06  | 8.16  | 9.12  | 9.99  | 11.17 | 12.90 |
| 043                           | 608          | 461            | 462 |     |     | ●                           | 00       | 07      | 1.38                                     | 6.20             | 7.59  | 8.77  | 9.80  | 10.74 | 12.00 | 13.86 |
| 045                           | 608          | 471            | 472 | 473 | 474 | ●                           | 00       | 07      | 1.40                                     | 6.49             | 7.95  | 9.18  | 10.26 | 11.24 | 12.57 | 14.51 |
| 05                            | 608          | 481            | 482 | 483 | 484 | ●                           | 00       | 07      | 1.55                                     | 7.21             | 8.83  | 10.20 | 11.40 | 12.49 | 13.96 | 16.12 |
| 055                           | 608          | 501            | 502 | 503 | 504 | ●                           | 00       | 07      | 1.60                                     | 7.93             | 9.71  | 11.22 | 12.54 | 13.74 | 15.36 | 17.73 |
| 06                            | 608          | 521            | 522 | 523 | 524 | ●                           | 00       | 07      | 1.72                                     | 8.65             | 10.60 | 12.24 | 13.68 | 14.99 | 16.75 | 19.35 |
| 065                           | 608          | 531            | 532 | 533 | 534 | ●                           | 00       | 07      | 1.75                                     | 9.37             | 11.48 | 13.26 | 14.82 | 16.23 | 18.15 | 20.96 |
| 07                            | 608          | 541            | 542 | 543 | 544 | ●                           | 00       | 07      | 1.80                                     | 10.09            | 12.36 | 14.28 | 15.96 | 17.48 | 19.55 | 22.57 |
| 075                           | 608          | 551            | 552 | 553 | 554 | ●                           | 00       | 07      | 1.90                                     | 10.81            | 13.25 | 15.29 | 17.10 | 18.73 | 20.94 | 24.18 |
| 08                            | 608          | 571            | 572 | 573 | 574 | ●                           | 00       | 07      | 2.05                                     | 11.54            | 14.13 | 16.31 | 18.24 | 19.98 | 22.34 | 25.80 |
| 087                           | 608          | 581            | 582 | 583 | 584 | ●                           | 00       | 07      | 2.06                                     | 12.54            | 15.36 | 17.74 | 19.83 | 21.72 | 24.29 | 28.04 |
| 09                            | 608          | 591            | 592 | 593 | 594 | ●                           | 00       | 07      | 2.10                                     | 12.98            | 15.89 | 18.35 | 20.52 | 22.48 | 25.13 | 29.02 |
| 10                            | 608          | 601            | 602 | 603 | 604 | ●                           | 00       | 07      | 2.30                                     | 14.41            | 17.65 | 20.38 | 22.79 | 24.97 | 27.91 | 32.23 |

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

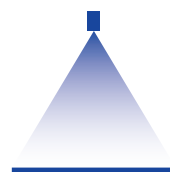


Assembly accessories can be found in Chapter 9 "Accessories".

Ordering Series + Flow rate code + Material no. + Code = Ordering no.  
example: 608 + 361 + A3 + 00 = 608.361.A3.00

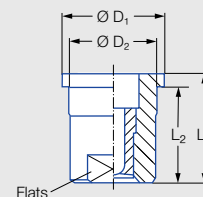
# High pressure flat fan nozzles

## Series 652



### Features:

- Sharp, uniform flat fan spray
- Extremely narrow spray depth
- Assembly with retaining nut
- Housing: Stainless steel 303,  
Insert: Hardened stainless steel 420F



### Applications:

- High pressure cleaning

Series 652

| G                                    | Dimensions [mm] |                |                  |                  |       | Weight [g] | p <sub>max</sub> <sup>1</sup> [bar] |
|--------------------------------------|-----------------|----------------|------------------|------------------|-------|------------|-------------------------------------|
|                                      | L <sub>1</sub>  | L <sub>2</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> | Flats |            |                                     |
| Assembly with retaining nut 3/8 BSPP | 16.00           | 14.00          | 14.80            | 12.65            | 10    | 13.00      | approx. 300                         |

<sup>1</sup> Applies only to operation at constant pressure.

| US<br>gal/min<br>at<br>40 psi | Ordering no. |                |     |     |     |                             |                      | Equivalent<br>bore diameter<br>A<br>[mm] | V̇ water [l/min] |       |       |       |       |       |       |
|-------------------------------|--------------|----------------|-----|-----|-----|-----------------------------|----------------------|------------------------------------------|------------------|-------|-------|-------|-------|-------|-------|
|                               | Series       | Flow rate code |     |     |     | Mat. no.                    | Code                 |                                          | p [bar]          |       |       |       |       |       |       |
|                               |              | Spray angle    |     |     |     | A3                          | For<br>retaining nut |                                          |                  |       |       |       |       |       |       |
|                               |              | 20°            | 30° | 45° | 60° | Stainless steel<br>303/420F |                      |                                          |                  |       |       |       |       |       |       |
| 02                            | 652          | 361            | 362 | 363 | 364 | ●                           | 29                   | 1.00                                     | 2.88             | 3.53  | 4.08  | 4.56  | 5.00  | 5.58  | 6.45  |
| 021                           | 652          | 371            | 372 | 373 | 374 | ●                           | 29                   | 1.02                                     | 3.03             | 3.71  | 4.28  | 4.79  | 5.25  | 5.87  | 6.77  |
| 025                           | 652          | 381            | 382 | 383 | 384 | ●                           | 29                   | 1.10                                     | 3.60             | 4.42  | 5.10  | 5.70  | 6.24  | 6.98  | 8.06  |
| 028                           | 652          | 391            | 392 | 393 | 394 | ●                           | 29                   | 1.16                                     | 4.04             | 4.94  | 5.71  | 6.38  | 6.99  | 7.81  | 9.02  |
| 03                            | 652          | 401            | 402 | 403 | 404 | ●                           | 29                   | 1.18                                     | 4.32             | 5.29  | 6.11  | 6.83  | 7.48  | 8.37  | 9.66  |
| 034                           | 652          | 411            | 412 | 413 | 414 | ●                           | 29                   | 1.30                                     | 4.90             | 6.00  | 6.93  | 7.75  | 8.49  | 9.49  | 10.96 |
| 038                           | 652          | 441            | 442 | 443 |     | ●                           | 29                   | 1.33                                     | 5.48             | 6.72  | 7.75  | 8.67  | 9.50  | 10.62 | 12.26 |
| 04                            | 652          | 451            | 452 | 453 | 454 | ●                           | 29                   | 1.35                                     | 5.77             | 7.06  | 8.16  | 9.12  | 9.99  | 11.17 | 12.90 |
| 043                           | 652          | 461            | 462 |     |     | ●                           | 29                   | 1.38                                     | 6.20             | 7.59  | 8.77  | 9.80  | 10.74 | 12.00 | 13.86 |
| 045                           | 652          | 471            | 472 | 473 | 474 | ●                           | 29                   | 1.40                                     | 6.49             | 7.95  | 9.18  | 10.26 | 11.24 | 12.57 | 14.51 |
| 05                            | 652          | 481            | 482 | 483 | 484 | ●                           | 29                   | 1.55                                     | 7.21             | 8.83  | 10.20 | 11.40 | 12.49 | 13.96 | 16.12 |
| 055                           | 652          | 501            | 502 | 503 | 504 | ●                           | 29                   | 1.60                                     | 7.93             | 9.71  | 11.22 | 12.54 | 13.74 | 15.36 | 17.73 |
| 06                            | 652          | 521            | 522 | 523 | 524 | ●                           | 29                   | 1.72                                     | 8.65             | 10.60 | 12.24 | 13.68 | 14.99 | 16.75 | 19.35 |
| 065                           | 652          | 531            | 532 | 533 | 534 | ●                           | 29                   | 1.75                                     | 9.37             | 11.48 | 13.26 | 14.82 | 16.23 | 18.15 | 20.96 |
| 07                            | 652          | 541            | 542 | 543 | 544 | ●                           | 29                   | 1.80                                     | 10.09            | 12.36 | 14.28 | 15.96 | 17.48 | 19.55 | 22.57 |
| 075                           | 652          | 551            | 552 | 553 | 554 | ●                           | 29                   | 1.90                                     | 10.81            | 13.25 | 15.29 | 17.10 | 18.73 | 20.94 | 24.18 |
| 08                            | 652          | 571            | 572 | 573 | 574 | ●                           | 29                   | 2.05                                     | 11.54            | 14.13 | 16.31 | 18.24 | 19.98 | 22.34 | 25.80 |
| 087                           | 652          | 581            | 582 | 583 | 584 | ●                           | 29                   | 2.06                                     | 12.54            | 15.36 | 17.74 | 19.83 | 21.72 | 24.29 | 28.04 |
| 09                            | 652          | 591            | 592 | 593 | 594 | ●                           | 29                   | 2.10                                     | 12.98            | 15.89 | 18.35 | 20.52 | 22.48 | 25.13 | 29.02 |
| 10                            | 652          | 601            | 602 | 603 | 604 | ●                           | 29                   | 2.30                                     | 14.41            | 17.65 | 20.38 | 22.79 | 24.97 | 27.91 | 32.23 |
| 11                            | 652          | 621            | 622 | 623 | 624 | ●                           | 29                   | 2.40                                     | 15.86            | 19.42 | 22.42 | 25.07 | 27.46 | 30.70 | 35.45 |
| 125                           | 652          | 641            | 642 | 643 | 644 | ●                           | 29                   | 2.50                                     | 18.02            | 22.07 | 25.48 | 28.49 | 31.21 | 34.89 | 40.29 |
| 131                           | 652          | 651            | 652 | 653 | 654 | ●                           | 29                   | 2.55                                     | 18.89            | 23.13 | 26.71 | 29.86 | 32.71 | 36.57 | 42.23 |
| 139                           | 652          | 661            | 662 | 663 | 664 | ●                           | 29                   | 2.65                                     | 20.04            | 24.54 | 28.34 | 31.68 | 34.70 | 38.80 | 44.80 |
| 15                            | 652          | 671            | 672 | 673 | 674 | ●                           | 29                   | 2.70                                     | 21.62            | 26.48 | 30.58 | 34.19 | 37.45 | 41.87 | 48.35 |
| 175                           | 652          | 701            | 702 | 703 | 704 | ●                           | 29                   | 3.00                                     | 25.23            | 30.90 | 35.68 | 39.89 | 43.70 | 48.86 | 56.41 |
| 20                            | 652          |                |     | 723 | 724 | ●                           | 29                   | 3.05                                     | 28.83            | 35.31 | 40.78 | 45.59 | 49.94 | 55.84 | 64.47 |
| 25                            | 652          |                |     | 763 | 764 | ●                           | 29                   | 3.50                                     | 36.04            | 44.14 | 50.97 | 56.99 | 62.43 | 69.80 | 80.60 |
| 30                            | 652          |                |     | 793 |     | ●                           | 29                   | 3.90                                     | 43.25            | 52.97 | 61.16 | 68.38 | 74.91 | 83.75 | 96.70 |

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

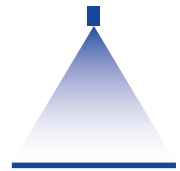


Assembly accessories can be found in Chapter 9 "Accessories".

Ordering Series + Flow rate code + Material no. + Code = Ordering no.  
example: 652 + 361 + A3 + 29 = 652.361.A3.29

# High pressure flat fan nozzles

## Series 6FH with spray stabiliser



### Features:

- Sharp, uniform flat fan spray
- Extremely narrow spray depth
- Nozzle with spray stabilizer
- Housing: Stainless steel 303,  
Insert: Hardened stainless steel 420F,  
spray stabiliser: Stainless steel 301

### Applications:

- High pressure cleaning



Series 6FH

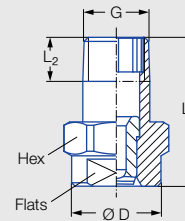


Figure 1

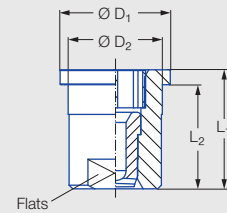


Figure 2

| Code                                 | Figure | G        | Dimensions [mm] |                |       |                  |                  |     |       | Weight [g] | p <sub>max</sub> <sup>1</sup> [bar] |
|--------------------------------------|--------|----------|-----------------|----------------|-------|------------------|------------------|-----|-------|------------|-------------------------------------|
|                                      |        |          | L <sub>1</sub>  | L <sub>2</sub> | Ø D   | Ø D <sub>1</sub> | Ø D <sub>2</sub> | Hex | Flats |            |                                     |
| <b>CA</b>                            | 1      | 1/8 BSPT | 22.00           | 6.50           | 13.00 | –                | –                | 14  | 10    | 13.00      | approx. 700                         |
| <b>BA</b>                            | 1      | 1/8 NPT  | 22.00           | 6.70           | 13.00 | –                | –                | 14  | 10    | 13.00      | approx. 700                         |
| <b>CC</b>                            | 1      | 1/4 BSPT | 22.00           | 10.00          | 13.00 | –                | –                | 14  | 10    | 18.00      | approx. 700                         |
| <b>BC</b>                            | 1      | 1/4 NPT  | 22.00           | 10.20          | 13.00 | –                | –                | 14  | 10    | 18.00      | approx. 700                         |
| Assembly with retaining nut 3/8 BSPP | 2      | –        | 16.00           | 14.00          | –     | 14.80            | 12.65            | –   | 10    | 13.00      | approx. 300                         |

<sup>1</sup> Applies only to operation at constant pressure.

| US<br>gal/min<br>at<br>40 psi | Ordering no. |                |     |     |     |                                 | Equivalent<br>bore diameter<br>A<br>[mm] | V̇ water [l/min] |       |       |       |       |       |       |
|-------------------------------|--------------|----------------|-----|-----|-----|---------------------------------|------------------------------------------|------------------|-------|-------|-------|-------|-------|-------|
|                               | Series       | Flow rate code |     |     |     | Mat. no.                        |                                          |                  |       |       |       |       |       |       |
|                               |              | Spray angle    |     |     |     | A3                              |                                          |                  |       |       |       |       |       |       |
|                               |              | 20°            | 30° | 45° | 60° | Stainless steel<br>303/420F/301 |                                          |                  |       |       |       |       |       |       |
|                               |              |                |     |     |     |                                 |                                          | 40               | 60    | 80    | 100   | 120   | 150   | 200   |
| 02                            | 6FH          | 361            | 362 | 363 | 364 | ●                               | 1.00                                     | 2.88             | 3.53  | 4.08  | 4.56  | 5.00  | 5.58  | 6.45  |
| 021                           | 6FH          | 371            | 372 | 373 | 374 | ●                               | 1.02                                     | 3.03             | 3.71  | 4.28  | 4.79  | 5.25  | 5.87  | 6.77  |
| 025                           | 6FH          | 381            | 382 | 383 | 384 | ●                               | 1.10                                     | 3.60             | 4.42  | 5.10  | 5.70  | 6.24  | 6.98  | 8.06  |
| 028                           | 6FH          | 391            | 392 | 393 | 394 | ●                               | 1.16                                     | 4.04             | 4.94  | 5.71  | 6.38  | 6.99  | 7.81  | 9.02  |
| 03                            | 6FH          | 401            | 402 | 403 | 404 | ●                               | 1.18                                     | 4.32             | 5.29  | 6.11  | 6.83  | 7.48  | 8.37  | 9.66  |
| 034                           | 6FH          | 411            | 412 | 413 | 414 | ●                               | 1.30                                     | 4.90             | 6.00  | 6.93  | 7.75  | 8.49  | 9.49  | 10.96 |
| 038                           | 6FH          | 441            | 442 | 443 |     | ●                               | 1.33                                     | 5.48             | 6.72  | 7.75  | 8.67  | 9.50  | 10.62 | 12.26 |
| 04                            | 6FH          | 451            | 452 | 453 | 454 | ●                               | 1.35                                     | 5.77             | 7.06  | 8.16  | 9.12  | 9.99  | 11.17 | 12.90 |
| 043                           | 6FH          | 461            | 462 |     |     | ●                               | 1.38                                     | 6.20             | 7.59  | 8.77  | 9.80  | 10.74 | 12.00 | 13.86 |
| 045                           | 6FH          | 471            | 472 | 473 | 474 | ●                               | 1.40                                     | 6.49             | 7.95  | 9.18  | 10.26 | 11.24 | 12.57 | 14.51 |
| 05                            | 6FH          | 481            | 482 | 483 | 484 | ●                               | 1.55                                     | 7.21             | 8.83  | 10.20 | 11.40 | 12.49 | 13.96 | 16.12 |
| 055                           | 6FH          | 501            | 502 | 503 | 504 | ●                               | 1.60                                     | 7.93             | 9.71  | 11.22 | 12.54 | 13.74 | 15.36 | 17.73 |
| 06                            | 6FH          | 521            | 522 | 523 | 524 | ●                               | 1.72                                     | 8.65             | 10.60 | 12.24 | 13.68 | 14.99 | 16.75 | 19.35 |
| 065                           | 6FH          | 531            | 532 | 533 | 534 | ●                               | 1.75                                     | 9.37             | 11.48 | 13.26 | 14.82 | 16.23 | 18.15 | 20.96 |

| US<br>gal/min<br>at<br>40 psi | Ordering no. |                |      |      |      |                                 | Equivalent<br>bore diameter<br>A<br>[mm] | V̇ water [l/min] |       |       |       |       |       |       |
|-------------------------------|--------------|----------------|------|------|------|---------------------------------|------------------------------------------|------------------|-------|-------|-------|-------|-------|-------|
|                               | Series       | Flow rate code |      |      |      | Mat. no.                        |                                          |                  |       |       |       |       |       |       |
|                               |              | Spray angle    |      |      |      | A3                              |                                          |                  |       |       |       |       |       |       |
|                               |              | 20°            | 30°  | 45°  | 60°  | Stainless steel<br>303/420F/301 |                                          | p [bar]          |       |       |       |       |       |       |
|                               |              |                |      |      |      |                                 |                                          | 40               | 60    | 80    | 100   | 120   | 150   | 200   |
| 07                            | 6FH          | 541            | 542  | 543  | 544  | ●                               | 1.80                                     | 10.09            | 12.36 | 14.28 | 15.96 | 17.48 | 19.55 | 22.57 |
| 075                           | 6FH          | 551            | 552  | 553  | 554  | ●                               | 1.90                                     | 10.81            | 13.25 | 15.29 | 17.10 | 18.73 | 20.94 | 24.18 |
| 008                           | 6FH          | 571            | 572  | 573  | 574  | ●                               | 2.05                                     | 11.54            | 14.13 | 16.31 | 18.24 | 19.98 | 22.34 | 25.80 |
| 087                           | 6FH          | 581            | 582  | 583  | 584  | ●                               | 2.06                                     | 12.54            | 15.36 | 17.74 | 19.83 | 21.72 | 24.29 | 28.04 |
| 09                            | 6FH          | 591            | 592  | 593  | 594  | ●                               | 2.10                                     | 12.98            | 15.89 | 18.35 | 20.52 | 22.48 | 25.13 | 29.02 |
| 10                            | 6FH          | 601            | 602  | 603  | 604  | ●                               | 2.30                                     | 14.41            | 17.65 | 20.38 | 22.79 | 24.97 | 27.91 | 32.23 |
| 11                            | 6FH          | 621*           | 622* | 623* | 624* | ●                               | 2.40                                     | 15.86            | 19.42 | 22.42 | 25.07 | 27.46 | 30.70 | 35.45 |
| 125                           | 6FH          | 641*           | 642* | 643* | 644* | ●                               | 2.50                                     | 18.02            | 22.07 | 25.48 | 28.49 | 31.21 | 34.89 | 40.29 |
| 131                           | 6FH          | 651*           | 652* | 653* | 654* | ●                               | 2.55                                     | 18.89            | 23.13 | 26.71 | 29.86 | 32.71 | 36.57 | 42.23 |
| 139                           | 6FH          | 661*           | 662* | 663* | 664* | ●                               | 2.65                                     | 20.04            | 24.54 | 28.34 | 31.68 | 34.70 | 38.80 | 44.80 |
| 15                            | 6FH          | 671*           | 672* | 673* | 674* | ●                               | 2.70                                     | 21.62            | 26.48 | 30.58 | 34.19 | 37.45 | 41.87 | 48.35 |
| 175                           | 6FH          | 701*           | 702* | 703* | 704* | ●                               | 3.00                                     | 25.23            | 30.9  | 35.68 | 39.89 | 43.70 | 48.86 | 56.41 |
| 20                            | 6FH          |                |      | 723* | 724* | ●                               | 3.05                                     | 28.83            | 35.31 | 40.78 | 45.59 | 49.94 | 55.84 | 64.47 |
| 25                            | 6FH          |                |      | 763* | 764* | ●                               | 3.50                                     | 36.04            | 44.14 | 50.97 | 56.99 | 62.43 | 69.80 | 80.60 |
| 30                            | 6FH          |                |      | 793* |      | ●                               | 3.90                                     | 43.25            | 52.97 | 61.16 | 68.38 | 74.91 | 83.75 | 96.70 |

\* Only available with code CC, BC or 29.

| Code | Type of connection                         |
|------|--------------------------------------------|
| CA   | 1/8 BSPT                                   |
| BA   | 1/8 NPT                                    |
| CC   | 1/4 BSPT                                   |
| BC   | 1/4 NPT                                    |
| 29   | Assembly with<br>retaining nut<br>3/8 BSPP |

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

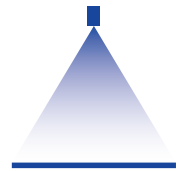


Assembly accessories can be found in Chapter 9 "Accessories".

Ordering Series + Flow rate code + Material no. + Code = Ordering no.  
example: 6FH + 541 + A3 + CA = 6FH.541.A3.CA

# Low pressure flat fan nozzles with ball joint

## Series 676



### Features:

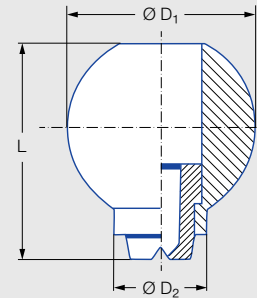
- Swivelling nozzle
- Precise spray alignment according to requirements
- Assembly with retaining nut, threaded socket, threaded nipple, welded nipple

### Applications:

- Cleaning
- Cooling
- Lubrication



Series 676



| Dimensions [mm] |                  |                  | Weight [g]<br>Brass | P <sub>max</sub> [bar] |
|-----------------|------------------|------------------|---------------------|------------------------|
| L               | Ø D <sub>1</sub> | Ø D <sub>2</sub> |                     |                        |
| 25.0            | 22.0             | 11.0             | 45.0                | 30.0                   |

| Spray angle | Ordering no. |                        |       | Equivalent bore diameter<br>A<br>[mm] | Narrowest free cross section<br>Ø<br>[mm] | V̇ water [l/min] |       |       |       |       |       | Spray width B<br>[mm]<br>(at p = 5 bar) |                 |
|-------------|--------------|------------------------|-------|---------------------------------------|-------------------------------------------|------------------|-------|-------|-------|-------|-------|-----------------------------------------|-----------------|
|             | Type         | Mat. no.               |       |                                       |                                           | p [bar]          |       |       |       |       |       | H = 250<br>[mm]                         | H = 500<br>[mm] |
|             |              | 16                     | 30    |                                       |                                           |                  |       |       |       |       |       |                                         |                 |
|             |              | Stainless steel<br>303 | Brass |                                       |                                           |                  |       |       |       |       |       |                                         |                 |
|             |              |                        |       |                                       |                                           | 0.5              | 1.0   | 2.0   | 3.0   | 5.0   | 10.0  |                                         |                 |
| 20°         | 676.301      | ●                      | ●     | 0.70                                  | 0.60                                      | 0.16*            | 0.23* | 0.32  | 0.40  | 0.51  | 0.72  | 85                                      | 160             |
|             | 676.361      | ●                      | ●     | 1.00                                  | 0.80                                      | 0.32*            | 0.45* | 0.63  | 0.77  | 1.00  | 1.41  | 85                                      | 160             |
|             | 676.441      | ●                      | ●     | 1.35                                  | 1.10                                      | 0.63*            | 0.89  | 1.25  | 1.53  | 1.98  | 2.80  | 85                                      | 160             |
|             | 676.481      | ●                      | ●     | 1.50                                  | 1.30                                      | 0.80*            | 1.13  | 1.60  | 1.96  | 2.53  | 3.58  | 85                                      | 160             |
| 30°         | 676.302      | ●                      | ●     | 0.70                                  | 0.50                                      | 0.16*            | 0.23* | 0.32  | 0.40  | 0.51  | 0.72  | 120                                     | 220             |
|             | 676.362      | ●                      | ●     | 1.00                                  | 0.80                                      | 0.32*            | 0.45* | 0.63  | 0.77  | 1.00  | 1.41  | 120                                     | 220             |
|             | 676.402      | ●                      | ●     | 1.20                                  | 1.00                                      | 0.50*            | 0.71  | 1.00  | 1.22  | 1.58  | 2.23  | 120                                     | 230             |
|             | 676.482      | ●                      | ●     | 1.50                                  | 1.10                                      | 0.80*            | 1.13  | 1.60  | 1.96  | 2.53  | 3.58  | 130                                     | 230             |
|             | 676.562      | ●                      | ●     | 2.00                                  | 1.50                                      | 1.25             | 1.77  | 2.50  | 3.06  | 3.95  | 5.59  | 130                                     | 240             |
|             | 676.642      | ●                      | ●     | 2.50                                  | 1.80                                      | 2.00             | 2.83  | 4.00  | 4.90  | 6.33  | 8.95  | 140                                     | 250             |
|             | 676.722      | ●                      | ●     | 3.00                                  | 2.40                                      | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 14.09 | 140                                     | 260             |
|             | 676.762      | ●                      | ●     | 3.50                                  | 2.70                                      | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 17.89 | 140                                     | 260             |
|             | 676.802      | ●                      | ●     | 4.00                                  | 3.10                                      | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 22.36 | 140                                     | 260             |
| 45°         | 676.303      | ●                      | ●     | 0.70                                  | 0.50                                      | 0.16*            | 0.23* | 0.32  | 0.40  | 0.51  | 0.72  | 170                                     | 330             |
|             | 676.363      | ●                      | ●     | 1.00                                  | 0.70                                      | 0.32*            | 0.45* | 0.63  | 0.77  | 1.00  | 1.41  | 190                                     | 350             |
|             | 676.403      | ●                      | ●     | 1.20                                  | 0.90                                      | 0.50*            | 0.71  | 1.00  | 1.22  | 1.58  | 2.23  | 200                                     | 370             |
|             | 676.483      | ●                      | ●     | 1.50                                  | 1.10                                      | 0.80*            | 1.13  | 1.60  | 1.96  | 2.53  | 3.58  | 200                                     | 390             |
|             | 676.563      | ●                      | ●     | 2.00                                  | 1.40                                      | 1.25             | 1.77  | 2.50  | 3.06  | 3.95  | 5.59  | 210                                     | 410             |
|             | 676.643      | ●                      | ●     | 2.50                                  | 1.80                                      | 2.00             | 2.83  | 4.00  | 4.90  | 6.33  | 8.95  | 220                                     | 410             |
|             | 676.723      | ●                      | ●     | 3.00                                  | 2.40                                      | 3.15             | 4.45  | 6.30  | 7.71  | 9.96  | 14.09 | 220                                     | 420             |
|             | 676.763      | ●                      | ●     | 3.50                                  | 2.70                                      | 4.00             | 5.66  | 8.00  | 9.80  | 12.65 | 17.89 | 220                                     | 420             |
|             | 676.803      | ●                      | ●     | 4.00                                  | 3.00                                      | 5.00             | 7.07  | 10.00 | 12.25 | 15.81 | 22.36 | 220                                     | 420             |
| 60°         | 676.304      | ●                      | ●     | 0.70                                  | 0.40                                      | 0.16*            | 0.23* | 0.32  | 0.40  | 0.51  | 0.72  | 260                                     | 480             |
|             | 676.334      | ●                      | ●     | 0.90                                  | 0.50                                      | 0.22*            | 0.32* | 0.45  | 0.55  | 0.71  | 1.00  | 260                                     | 490             |
|             | 676.364      | ●                      | ●     | 1.00                                  | 0.60                                      | 0.32*            | 0.45* | 0.63  | 0.77  | 1.00  | 1.41  | 260                                     | 500             |
|             | 676.404      | ●                      | ●     | 1.20                                  | 0.80                                      | 0.50*            | 0.71  | 1.00  | 1.22  | 1.58  | 2.23  | 260                                     | 510             |
|             | 676.444      | ●                      | ●     | 1.35                                  | 1.00                                      | 0.63*            | 0.89  | 1.25  | 1.53  | 1.98  | 2.80  | 260                                     | 510             |
|             | 676.484      | ●                      | ●     | 1.50                                  | 1.00                                      | 0.80*            | 1.13  | 1.60  | 1.96  | 2.53  | 3.58  | 260                                     | 520             |

| Spray angle | Ordering no. |                     |       | Equivalent bore diameter<br>A [mm] | Narrowest free cross section<br>Ø [mm] | V̇ water [l/min] |       |      |      |       |       | Spray width B [mm]<br>(at p = 5 bar)                                                |              |              |
|-------------|--------------|---------------------|-------|------------------------------------|----------------------------------------|------------------|-------|------|------|-------|-------|-------------------------------------------------------------------------------------|--------------|--------------|
|             | Type         | Mat. no.            |       |                                    |                                        | p [bar]          |       |      |      |       |       |  | H = 250 [mm] | H = 500 [mm] |
|             |              | 16                  | 30    |                                    |                                        |                  |       |      |      |       |       |                                                                                     |              |              |
|             |              | Stainless steel 303 | Brass |                                    |                                        |                  |       |      |      |       |       |                                                                                     |              |              |
|             |              |                     |       |                                    |                                        | 0.5              | 1.0   | 2.0  | 3.0  | 5.0   | 10.0  |                                                                                     |              |              |
| 60°         | 676.514      | ●                   | ●     | 1.65                               | 1.10                                   | 0.95*            | 1.34  | 1.90 | 2.32 | 3.00  | 4.24  | 270                                                                                 | 520          |              |
|             | 676.564      | ●                   | ●     | 2.00                               | 1.30                                   | 1.25             | 1.77  | 2.50 | 3.06 | 3.95  | 5.59  | 270                                                                                 | 530          |              |
|             | 676.604      | ●                   | ●     | 2.20                               | 1.50                                   | 1.57             | 2.23  | 3.15 | 3.86 | 4.98  | 7.04  | 270                                                                                 | 540          |              |
|             | 676.644      | ●                   | ●     | 2.50                               | 1.60                                   | 2.00             | 2.83  | 4.00 | 4.90 | 6.33  | 8.95  | 270                                                                                 | 540          |              |
|             | 676.674      | ●                   | ●     | 2.70                               | 1.80                                   | 2.37             | 3.36  | 4.75 | 5.82 | 7.51  | 10.62 | 270                                                                                 | 550          |              |
|             | 676.724      | ●                   | ●     | 3.00                               | 2.10                                   | 3.15             | 4.45  | 6.30 | 7.71 | 9.96  | 14.09 | 280                                                                                 | 560          |              |
|             | 676.764      | ●                   | ●     | 3.50                               | 2.30                                   | 4.00             | 5.66  | 8.00 | 9.80 | 12.65 | 17.89 | 280                                                                                 | 570          |              |
| 75°         | 676.145      | ●                   | ●     | 0.20                               | 0.12                                   | –                | 0.04* | 0.05 | 0.06 | 0.08  | 0.11  | 380                                                                                 | 690          |              |
|             | 676.165      | ●                   | ●     | 0.20                               | 0.08                                   | –                | 0.05* | 0.06 | 0.08 | 0.10  | 0.14  | 380                                                                                 | 690          |              |
|             | 676.185      | ●                   | ●     | 0.20                               | 0.15                                   | –                | 0.06* | 0.08 | 0.09 | 0.12  | 0.17  | 380                                                                                 | 690          |              |
|             | 676.215      | ●                   | ●     | 0.40                               | 0.20                                   | –                | 0.08* | 0.11 | 0.14 | 0.18  | 0.25  | 380                                                                                 | 690          |              |
|             | 676.245      | ●                   | ●     | 0.50                               | 0.30                                   | –                | 0.12* | 0.16 | 0.20 | 0.26  | 0.37  | 380                                                                                 | 690          |              |
|             | 676.275      | ●                   | ●     | 0.60                               | 0.30                                   | 0.11*            | 0.16* | 0.22 | 0.27 | 0.35  | 0.49  | 380                                                                                 | 690          |              |
| 90°         | 676.216      | ●                   | ●     | 0.40                               | 0.20                                   | –                | 0.08* | 0.11 | 0.14 | 0.18  | 0.25  | 420                                                                                 | 780          |              |
|             | 676.276      | ●                   | ●     | 0.60                               | 0.30                                   | 0.11*            | 0.16* | 0.22 | 0.27 | 0.35  | 0.49  | 430                                                                                 | 790          |              |
|             | 676.306      | ●                   | ●     | 0.70                               | 0.40                                   | 0.16*            | 0.23* | 0.32 | 0.40 | 0.51  | 0.72  | 440                                                                                 | 800          |              |
|             | 676.336      | ●                   | ●     | 0.90                               | 0.50                                   | 0.22*            | 0.32* | 0.45 | 0.55 | 0.71  | 1.00  | 440                                                                                 | 820          |              |
|             | 676.366      | ●                   | ●     | 1.00                               | 0.50                                   | 0.32*            | 0.45* | 0.63 | 0.77 | 1.00  | 1.41  | 450                                                                                 | 830          |              |
|             | 676.406      | ●                   | ●     | 1.20                               | 0.70                                   | 0.50*            | 0.71  | 1.00 | 1.22 | 1.58  | 2.23  | 450                                                                                 | 840          |              |
|             | 676.446      | ●                   | ●     | 1.35                               | 0.80                                   | 0.63*            | 0.89  | 1.25 | 1.53 | 1.98  | 2.80  | 460                                                                                 | 860          |              |
|             | 676.486      | ●                   | ●     | 1.50                               | 0.80                                   | 0.80*            | 1.13  | 1.60 | 1.96 | 2.53  | 3.58  | 470                                                                                 | 870          |              |
|             | 676.516      | ●                   | ●     | 1.65                               | 0.90                                   | 0.95*            | 1.34  | 1.90 | 2.32 | 3.00  | 4.24  | 480                                                                                 | 880          |              |
|             | 676.566      | ●                   | ●     | 2.00                               | 1.10                                   | 1.25             | 1.77  | 2.50 | 3.06 | 3.95  | 5.59  | 490                                                                                 | 900          |              |
|             | 676.606      | ●                   | ●     | 2.20                               | 1.20                                   | 1.57             | 2.23  | 3.15 | 3.86 | 4.98  | 7.04  | 500                                                                                 | 910          |              |
|             | 676.646      | ●                   | ●     | 2.50                               | 1.30                                   | 2.00             | 2.83  | 4.00 | 4.90 | 6.33  | 8.95  | 510                                                                                 | 930          |              |
|             | 676.676      | ●                   | ●     | 2.70                               | 1.40                                   | 2.37             | 3.36  | 4.75 | 5.82 | 7.51  | 10.62 | 510                                                                                 | 950          |              |
|             | 676.726      | ●                   | ●     | 3.00                               | 1.70                                   | 3.15             | 4.45  | 6.30 | 7.71 | 9.96  | 14.09 | 520                                                                                 | 980          |              |
| 120°        | 676.187      | ●                   | ●     | 0.35                               | 0.20                                   | –                | 0.06* | 0.08 | 0.10 | 0.13  | 0.18  | 630                                                                                 | 1,060        |              |
|             | 676.217      | ●                   | ●     | 0.40                               | 0.20                                   | –                | 0.08* | 0.11 | 0.14 | 0.18  | 0.25  | 650                                                                                 | 1,080        |              |
|             | 676.247      | ●                   | ●     | 0.50                               | 0.20                                   | –                | 0.12* | 0.16 | 0.20 | 0.26  | 0.37  | 660                                                                                 | 1,100        |              |
|             | 676.277      | ●                   | ●     | 0.60                               | 0.30                                   | –                | 0.16* | 0.22 | 0.27 | 0.35  | 0.49  | 670                                                                                 | 1,150        |              |
|             | 676.307      | ●                   | ●     | 0.70                               | 0.30                                   | 0.16*            | 0.23* | 0.32 | 0.40 | 0.51  | 0.72  | 710                                                                                 | 1,240        |              |
|             | 676.337      | ●                   | ●     | 0.90                               | 0.40                                   | 0.22*            | 0.32* | 0.45 | 0.55 | 0.71  | 1.00  | 740                                                                                 | 1,350        |              |
|             | 676.367      | ●                   | ●     | 1.00                               | 0.50                                   | 0.32*            | 0.45* | 0.63 | 0.77 | 1.00  | 1.41  | 800                                                                                 | 1,430        |              |
|             | 676.407      | ●                   | ●     | 1.20                               | 0.60                                   | 0.50*            | 0.71  | 1.00 | 1.22 | 1.58  | 2.23  | 830                                                                                 | 1,480        |              |
|             | 676.447      | ●                   | ●     | 1.35                               | 0.70                                   | 0.63*            | 0.89  | 1.25 | 1.53 | 1.98  | 2.80  | 840                                                                                 | 1,520        |              |
|             | 676.487      | ●                   | ●     | 1.50                               | 0.60                                   | 0.80*            | 1.13  | 1.60 | 1.96 | 2.53  | 3.58  | 850                                                                                 | 1,540        |              |
|             | 676.517      | ●                   | ●     | 1.65                               | 0.90                                   | 0.95*            | 1.34  | 1.90 | 2.32 | 3.00  | 4.24  | 850                                                                                 | 1,560        |              |
|             | 676.567      | ●                   | ●     | 2.00                               | 0.90                                   | 1.25             | 1.77  | 2.50 | 3.06 | 3.95  | 5.59  | 870                                                                                 | 1,590        |              |
|             | 676.607      | ●                   | ●     | 2.20                               | 1.10                                   | 1.57             | 2.23  | 3.15 | 3.86 | 4.98  | 7.04  | 870                                                                                 | 1,620        |              |
|             | 676.647      | ●                   | ●     | 2.50                               | 1.30                                   | 2.00             | 2.83  | 4.00 | 4.90 | 6.33  | 8.95  | 880                                                                                 | 1,640        |              |
|             | 676.677      | ●                   | ●     | 2.70                               | 1.40                                   | 2.37             | 3.36  | 4.75 | 5.82 | 7.51  | 10.62 | 890                                                                                 | 1,660        |              |
|             | 676.727      | ●                   | ●     | 3.00                               | 1.60                                   | 3.15             | 4.45  | 6.30 | 7.71 | 9.96  | 14.09 | 890                                                                                 | 1,680        |              |
|             | 676.767      | ●                   | ●     | 3.50                               | 1.70                                   | 4.00             | 5.66  | 8.00 | 9.80 | 12.65 | 17.89 | 900                                                                                 | 1,700        |              |

\* Differing spray pattern.

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$ 

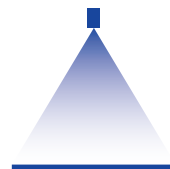
Ordering Type + Material no. = Ordering no.  
 example: 676.514 + 16 = 676.514.16



Assembly accessories can be found in Chapter 9 "Accessories".

# ➤ Nozzle systems for surface treatment

## Series 676/677 MEMOSPRAY



### Features:

- Retention of the adjusted spray direction when changing nozzles
- Simple, quick nozzle assembly without the need for tools
- Many combination options
- Large range of flow rates, spray angles and materials



### Applications:

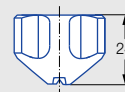
- Degreasing
- Phosphating in surface treatment
- Industrial cleaning
- Container washers

### Assembly example



### ① a Flat fan nozzle

Incl. gasket 095.015.7A.05.65  
(Material: Viton)

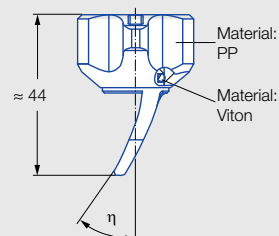


| Designation         | Spray angle | Ordering no.  |                               |                                |                                |                    | Narrowest free cross section<br>Ø [mm] | V̇ [l/min] |       |       |       |       | Weight [g]             |                         |            |                    |
|---------------------|-------------|---------------|-------------------------------|--------------------------------|--------------------------------|--------------------|----------------------------------------|------------|-------|-------|-------|-------|------------------------|-------------------------|------------|--------------------|
|                     |             | Type          | Mat. no.                      |                                |                                |                    |                                        | p [bar]    |       |       |       |       | PP/Stainless steel 303 | PP/Stainless steel 316L | PP/Ceramic | Polypropylene (PP) |
|                     |             |               | 8F                            | 8R                             | E8                             | 53                 |                                        |            |       |       |       |       |                        |                         |            |                    |
|                     |             |               | Housing: PP<br>Insert: 303 SS | Housing: PP<br>Insert: 316L SS | Housing: PP<br>Insert: Ceramic | Polypropylene (PP) |                                        | 1.0        | 1.5   | 2.0   | 2.5   | 5.0   |                        |                         |            |                    |
| ① a Flat fan nozzle | 30°         | 676.642.xx.40 | ●                             | ●                              |                                |                    | 1.60                                   | 2.83       | 3.46  | 4.00  | 4.47  | 6.33  | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.722.xx.40 | ●                             | ●                              |                                |                    | 2.10                                   | 4.46       | 5.46  | 6.30  | 7.04  | 9.96  | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.762.xx.40 | ●                             | ●                              |                                |                    | 2.30                                   | 5.66       | 6.93  | 8.00  | 8.94  | 12.65 | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.802.xx.40 | ●                             | ●                              |                                |                    | 2.60                                   | 7.07       | 8.66  | 10.00 | 11.18 | 15.81 | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.842.xx.40 | ●                             | ●                              |                                |                    | 3.00                                   | 8.84       | 10.82 | 12.50 | 13.97 | 19.76 | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.882.xx.40 | ●                             | ●                              |                                |                    | 3.40                                   | 11.31      | 13.86 | 16.00 | 17.89 | 25.30 | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.922.xx.40 | ●                             | ●                              |                                |                    | 4.10                                   | 14.14      | 17.32 | 20.00 | 22.36 | 31.62 | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.962.xx.40 | ●                             | ●                              |                                |                    | 4.20                                   | 17.68      | 21.65 | 25.00 | 27.95 | 39.53 | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 677.002.xx.40 | ●                             |                                |                                |                    | 4.70                                   | 22.27      | 27.28 | 31.50 | 35.22 | 49.81 | 15.00                  | –                       | –          | –                  |
|                     | 60°         | 676.644.xx.40 | ●                             | ●                              |                                |                    | 1.60                                   | 2.83       | 3.46  | 4.00  | 4.47  | 6.33  | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.724.xx.40 | ●                             | ●                              |                                |                    | 2.10                                   | 4.46       | 5.46  | 6.30  | 7.04  | 9.96  | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.764.xx.40 | ●                             | ●                              |                                |                    | 2.30                                   | 5.66       | 6.93  | 8.00  | 8.94  | 12.65 | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.804.xx.40 | ●                             | ●                              |                                |                    | 2.60                                   | 7.07       | 8.66  | 10.00 | 11.18 | 15.81 | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.844.xx.40 | ●                             | ●                              |                                |                    | 3.00                                   | 8.84       | 10.82 | 12.50 | 13.97 | 19.76 | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.884.xx.40 | ●                             | ●                              | ●                              | ●                  | 3.40                                   | 11.31      | 13.86 | 16.00 | 17.89 | 25.30 | 15.00                  | 15.00                   | 10.00      | 8.00               |
|                     |             | 676.924.xx.40 | ●                             | ●                              | ●                              | ●                  | 4.10                                   | 14.14      | 17.32 | 20.00 | 22.36 | 31.62 | 15.00                  | 15.00                   | 10.00      | 8.00               |
|                     |             | 676.964.xx.40 | ●                             | ●                              | ●                              | ●                  | 4.20                                   | 17.68      | 21.65 | 25.00 | 27.95 | 39.53 | 15.00                  | 15.00                   | 10.00      | 8.00               |
|                     |             | 677.004.xx.40 | ●                             | ●                              | ●                              | ●                  | 4.70                                   | 22.27      | 27.28 | 31.50 | 35.22 | 49.81 | 15.00                  | 15.00                   | 10.00      | 8.00               |
|                     |             | 677.044.xx.40 | ●                             | ●                              |                                |                    | 5.50                                   | 28.28      | 34.64 | 40.00 | 44.72 | 63.25 | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 677.084.xx.40 | ●                             | ●                              |                                |                    | 6.20                                   | 35.36      | 43.30 | 50.00 | 55.90 | 79.06 | 15.00                  | 15.00                   | –          | –                  |

| Designation         | Spray angle | Ordering no.     |                               |                                |                                |                    | Narrowest free cross section<br>Ø [mm] | V̇ [l/min] |       |       |       |       | Weight [g]             |                         |            |                    |
|---------------------|-------------|------------------|-------------------------------|--------------------------------|--------------------------------|--------------------|----------------------------------------|------------|-------|-------|-------|-------|------------------------|-------------------------|------------|--------------------|
|                     |             | Type             | Mat. no.                      |                                |                                |                    |                                        | p [bar]    |       |       |       |       | PP/Stainless steel 303 | PP/Stainless steel 316L | PP/Ceramic | Polypropylene (PP) |
|                     |             |                  | 8F                            | 8R                             | E8                             | 53                 |                                        |            |       |       |       |       |                        |                         |            |                    |
|                     |             |                  | Housing: PP<br>Insert: 303 SS | Housing: PP<br>Insert: 316L SS | Housing: PP<br>Insert: Ceramic | Polypropylene (PP) |                                        | 1.0        | 1.5   | 2.0   | 2.5   | 5.0   |                        |                         |            |                    |
| ① a Flat fan nozzle | 90°         | 676.646.xx.40    | ●                             | ●                              |                                |                    | 1.60                                   | 2.83       | 3.46  | 4.00  | 4.47  | 6.33  | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.726.xx.40    | ●                             | ●                              |                                |                    | 2.10                                   | 4.46       | 5.46  | 6.30  | 7.04  | 9.96  | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.766.xx.40    | ●                             | ●                              |                                |                    | 2.30                                   | 5.66       | 6.93  | 8.00  | 8.94  | 12.65 | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.806.xx.40    | ●                             | ●                              |                                |                    | 2.60                                   | 7.07       | 8.66  | 10.00 | 11.18 | 15.81 | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.846.xx.40    | ●                             | ●                              |                                |                    | 3.00                                   | 8.84       | 10.82 | 12.50 | 13.97 | 19.76 | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.886.xx.40    | ●                             | ●                              |                                |                    | 3.40                                   | 11.31      | 13.86 | 16.00 | 17.89 | 25.30 | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.926.xx.40    | ●                             | ●                              |                                |                    | 4.10                                   | 14.14      | 17.32 | 20.00 | 22.36 | 31.62 | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.966.xx.40    | ●                             | ●                              |                                |                    | 4.20                                   | 17.68      | 21.65 | 25.00 | 27.95 | 39.53 | 15.00                  | 15.00                   | –          | –                  |
|                     | 120°        | 676.647.xx.40    | ●                             | ●                              |                                |                    | 1.60                                   | 2.83       | 3.46  | 4.00  | 4.47  | 6.33  | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.727.xx.40    | ●                             | ●                              |                                |                    | 2.10                                   | 4.46       | 5.46  | 6.30  | 7.04  | 9.96  | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.767.xx.40    | ●                             | ●                              |                                |                    | 2.30                                   | 5.66       | 6.93  | 8.00  | 8.94  | 12.65 | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.807.xx.40    | ●                             | ●                              |                                |                    | 2.60                                   | 7.07       | 8.66  | 10.00 | 11.18 | 15.81 | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.847.xx.40    | ●                             | ●                              |                                |                    | 3.00                                   | 8.84       | 10.82 | 12.50 | 13.97 | 19.76 | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.887.xx.40    | ●                             | ●                              |                                |                    | 3.40                                   | 11.31      | 13.86 | 16.00 | 17.89 | 25.30 | 15.00                  | 15.00                   | –          | –                  |
|                     |             | 676.927.xx.40    | ●                             | ●                              |                                |                    | 4.10                                   | 14.14      | 17.32 | 20.00 | 22.36 | 31.62 | 15.00                  | 15.00                   | –          | –                  |
| Blind nozzle        | –           | 067.630.8F.40.01 | ●                             |                                |                                |                    | –                                      | –          | –     | –     | –     | 15.00 | –                      | –                       | –          |                    |

## ① b Tongue-type nozzle

Incl. gasket 095.015.7A.05.65  
(Material: Viton)



| Designation               | Spray angle | η   | Ordering no.  |                                |      | Narrowest free cross section Ø [mm] | V̇ [l/min] |       |       |       |       | Weight [g]              |       |
|---------------------------|-------------|-----|---------------|--------------------------------|------|-------------------------------------|------------|-------|-------|-------|-------|-------------------------|-------|
|                           |             |     | Type          | Mat. no.                       |      |                                     | p [bar]    |       |       |       |       | PP/Stainless steel 316L | PVDF  |
|                           |             |     |               | 8R                             | 5E   |                                     |            |       |       |       |       |                         |       |
|                           |             |     |               | Housing: PP<br>Insert: 316L SS | PVDF |                                     |            |       |       |       |       |                         |       |
|                           |             |     |               |                                |      | 1.0                                 | 1.5        | 2.0   | 2.5   | 5.0   |       |                         |       |
| ① b<br>Tongue-type nozzle | 45°         | 35° | 676.803.xx.41 | ●                              |      | 3.40                                | 7.07       | 8.66  | 10.00 | 11.18 | 15.81 | 25.00                   | –     |
|                           | 60°         | 35° | 676.874.xx.41 | ●                              |      | 4.20                                | 10.61      | 12.99 | 15.00 | 16.77 | 23.72 | 25.00                   | –     |
|                           | 60°         | 35° | 676.924.xx.41 | ●                              |      | 4.70                                | 14.14      | 17.32 | 20.00 | 22.36 | 31.62 | 25.00                   | –     |
|                           | 70°         | 40° | 677.005.xx.41 | ●                              | ●    | 6.00                                | 22.27      | 27.28 | 31.50 | 35.22 | 49.81 | 25.00                   | 11.00 |



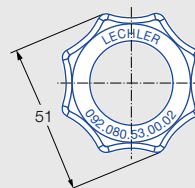
Ordering Type + Material no. = Ordering no.  
example: 676.646.xx.40 + 8F = 676.646.8F.40

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$



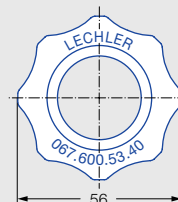
## ② a Retaining nut

092.080.xx.00.02



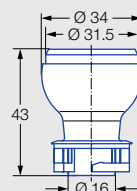
## ② b Retaining nut

067.600.xx.40



## ③ Ball bayonet base

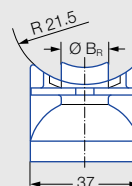
067.630.xx.40



## ④ a Ball seat

067.631.xx.40.x2

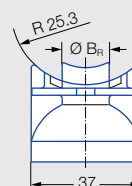
For eyelet clamp  
067.631.xx.40.00



## ④ b Ball seat

067.631.xx.50.x2

For eyelet clamp  
067.631.xx.50.00

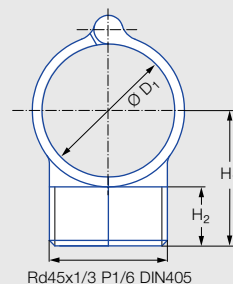


| Designation                                               | Ordering no.     |                         |                  | Ø B <sub>R</sub> <sup>1</sup><br>[mm] | Recommended<br>bore diameter<br>[mm] | Pipe Ø<br>[mm]     | Weight<br>[g]         |
|-----------------------------------------------------------|------------------|-------------------------|------------------|---------------------------------------|--------------------------------------|--------------------|-----------------------|
|                                                           | Type             | Mat. no.                |                  |                                       |                                      |                    |                       |
|                                                           |                  | 53                      | 6M               |                                       |                                      |                    |                       |
|                                                           |                  | Polypropyl-<br>ene (PP) | PP<br>reinforced |                                       |                                      |                    | Polypropylene<br>(PP) |
| ② a Retaining nut                                         | 092.080.xx.00.02 | ●                       |                  | –                                     | –                                    | –                  | 18.0                  |
| ② b Retaining nut                                         | 067.600.xx.40    | ●                       |                  | –                                     | –                                    | –                  | 18.0                  |
| ③ Ball bayonet base                                       | 067.630.xx.40    | ●                       |                  | –                                     | –                                    | –                  | 12.0                  |
| ④ a Ball seat<br>for eyelet clamp<br>no. 067.631.xx.40.00 | 067.631.xx.40.22 |                         | ●                | 13.8                                  | 14.0–14.3                            | 1 1/4" (40.0–43.0) | 9.0                   |
|                                                           | 067.631.xx.40.02 |                         | ●                | 16.0                                  | 16.5–17.0                            | 1 1/4" (40.0–43.0) | 11.0                  |
|                                                           | 067.631.xx.40.12 |                         | ●                | 19.8                                  | 20.3–20.8                            | 1 1/4" (40.0–43.0) | 13.0                  |
| ④ b Ball seat<br>for eyelet clamp<br>no. 067.631.xx.50.00 | 067.631.xx.50.22 |                         | ●                | 13.8                                  | 14.0–14.3                            | 1 1/2" (46.0–49.0) | 9.0                   |
|                                                           | 067.631.xx.50.02 |                         | ●                | 16.0                                  | 16.5–17.0                            | 1 1/2" (46.0–49.0) | 11.0                  |
|                                                           | 067.631.xx.50.12 |                         | ●                | 19.8                                  | 20.3–20.8                            | 1 1/2" (46.0–49.0) | 13.0                  |

<sup>1</sup> Ø B<sub>R</sub> = spigot diameter.

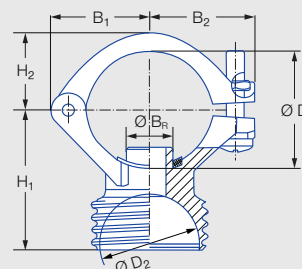
## ⑤ a Eyelet clamp

067.631.xx.x0.00



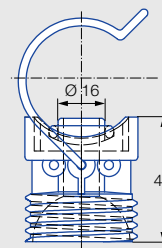
## ⑤ b Eyelet clamp

090.0x3.xx.4x.10



## ⑤ c Single clamp

092.08x.xx.00



| Designation      | Ordering no.     |          | Dimensions [mm] |                |                |                |                  |                  | Ø B <sub>R</sub> <sup>1</sup><br>[mm] | Recommend-<br>ed bore<br>diameter [mm] | Pipe Ø<br>(Ø D)<br>[mm] | Weight<br>[g]         |
|------------------|------------------|----------|-----------------|----------------|----------------|----------------|------------------|------------------|---------------------------------------|----------------------------------------|-------------------------|-----------------------|
|                  | Type             | Mat. no. | B <sub>1</sub>  | B <sub>2</sub> | H <sub>1</sub> | H <sub>2</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> |                                       |                                        |                         | Polypropylene<br>(PP) |
|                  |                  | 53       |                 |                |                |                |                  |                  |                                       |                                        |                         |                       |
| ⑤ a Eyelet clamp | 067.631.xx.40.00 | ●        | –               | –              | 47.7           | 22.0           | 43.0             | –                | –                                     | –                                      | 1 1/4" (40.0–43.0)      | 31.0                  |
|                  | 067.631.xx.50.00 | ●        | –               | –              | 51.5           | 22.0           | 50.6             | –                | –                                     | –                                      | 1 1/2" (46.0–49.0)      | 33.0                  |
| ⑤ b Eyelet clamp | 090.023.xx.44.10 | ●        | 30.0            | 32.0           | 44.5           | 23.0           | –                | 34.0             | 13.8                                  | 14.0–14.3                              | 1" (32.0–34.5)          | 48.0                  |
|                  | 090.023.xx.43.10 | ●        | 30.0            | 32.0           | 44.5           | 23.0           | –                | 34.0             | 16.0                                  | 16.5–17.0                              | 1" (32.0–34.5)          | 48.0                  |
|                  | 090.033.xx.44.10 | ●        | 33.0            | 36.0           | 48.0           | 27.0           | –                | 34.0             | 13.8                                  | 14.0–14.3                              | 1 1/4" (40.0–43.0)      | 50.0                  |
|                  | 090.033.xx.43.10 | ●        | 33.0            | 36.0           | 48.0           | 27.0           | –                | 34.0             | 16.0                                  | 16.5–17.0                              | 1 1/4" (40.0–43.0)      | 50.0                  |
|                  | 090.033.xx.40.10 | ●        | 33.0            | 36.0           | 48.0           | 27.0           | –                | 34.0             | 20.0                                  | 20.5–21.0                              | 1 1/4" (40.0–43.0)      | 50.0                  |
|                  | 090.043.xx.44.10 | ●        | 36.0            | 35.0           | 52.0           | 30.0           | –                | 34.0             | 13.8                                  | 14.0–14.3                              | 1 1/2" (46.0–49.0)      | 52.0                  |
|                  | 090.043.xx.43.10 | ●        | 36.0            | 35.0           | 52.0           | 30.0           | –                | 34.0             | 16.0                                  | 16.5–17.0                              | 1 1/2" (46.0–49.0)      | 52.0                  |
|                  | 090.043.xx.40.10 | ●        | 36.0            | 35.0           | 52.0           | 30.0           | –                | 34.0             | 20.0                                  | 20.5–21.0                              | 1 1/2" (46.0–49.0)      | 52.0                  |
| ⑤ c Single clamp | 092.080.xx.00    | ●        | –               | –              | –              | –              | –                | –                | 16.3*                                 | 16.5–17.0                              | 1" (32.0–34.5)          | 36.0                  |
|                  | 092.081.xx.00    | ●        | –               | –              | –              | –              | –                | –                | 16.3*                                 | 16.5–17.0                              | 1 1/4" (40.0–43.0)      | 38.0                  |
|                  | 092.082.xx.00    | ●        | –               | –              | –              | –              | –                | –                | 16.3*                                 | 16.5–17.0                              | 1 1/2" (46.0–49.0)      | 40.0                  |
|                  | 092.083.xx.00    | ●        | –               | –              | –              | –              | –                | –                | 16.3*                                 | 16.5–17.0                              | 2" (58.0–62.0)          | 42.0                  |

\* Other spigot diameters available on request.

<sup>1</sup> Ø B<sub>R</sub> = spigot diameter.

Ordering Type + Material no. = Ordering no.  
 example: 067.631.xx.40.00 + 53 = 067.631.53.40.00

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{P_2}{P_1}}$

# Nozzle systems for surface treatment Series 676 Easy-Clip



## Features:

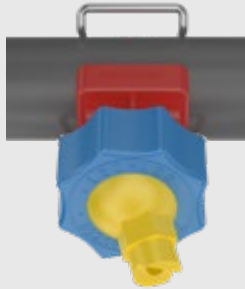
- Simple, quick nozzle assembly without the need for tools
- All-round 30° swivelling
- Easy adjustment and cleaning

## Applications:

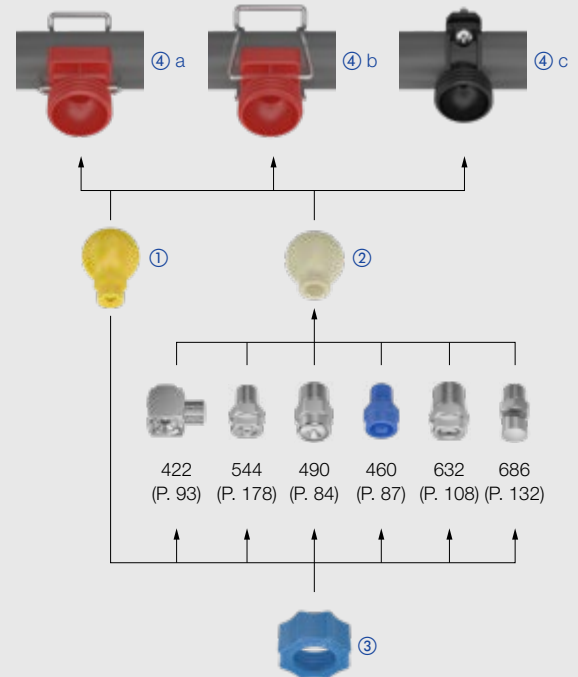
- Degreasing
- Phosphating in surface treatment
- Industrial cleaning
- Container washers

## Materials:

- Clamp: Stainless steel 301
- Gasket: EPDM
- Cylinder pin, screw, screw unit: Stainless steel 316L
- Body, retaining nut: Polypropylene, glass fibre reinforced
- Ball nozzle, ball joint: Polypropylene



## Assembly example



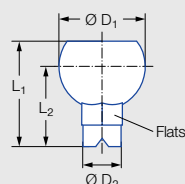
## Sets – series 676 Easy-Clip

| Designation                                                                              | Spray angle | Ordering no.  | Nozzle Color | V̇ [l/min] |       |       |       |       |
|------------------------------------------------------------------------------------------|-------------|---------------|--------------|------------|-------|-------|-------|-------|
|                                                                                          |             | Type          |              | p [bar]    |       |       |       |       |
|                                                                                          |             |               |              | 0.5        | 1.0   | 1.5   | 2.0   | 2.5   |
| Set 1 consisting of:<br><br>Ball nozzle<br>Single clamp for 1 1/4" pipe<br>Retaining nut | 60°         | 676.724.53.31 | Grey         | 3.15       | 4.45  | 5.45  | 6.30  | 7.04  |
|                                                                                          |             | 676.764.53.31 | Brown        | 4.00       | 5.66  | 6.93  | 8.00  | 8.94  |
|                                                                                          |             | 676.804.53.31 | Purple       | 5.00       | 7.07  | 8.66  | 10.00 | 11.18 |
|                                                                                          |             | 676.844.53.31 | Yellow       | 6.25       | 8.84  | 10.83 | 12.50 | 13.98 |
|                                                                                          |             | 676.884.53.31 | Red          | 8.00       | 11.31 | 13.85 | 16.00 | 17.89 |
|                                                                                          |             | 676.904.53.31 | Blue         | 9.10       | 12.87 | 15.76 | 18.20 | 20.35 |
|                                                                                          |             | 676.924.53.31 | Green        | 10.00      | 14.14 | 17.32 | 20.00 | 22.36 |

| Designation                                                                                | Ordering no.                  | Ball Color | BSPP | Matches series                    |
|--------------------------------------------------------------------------------------------|-------------------------------|------------|------|-----------------------------------|
|                                                                                            | Type                          |            |      |                                   |
| <b>Set 2</b> consisting of:<br>Ball joint<br>Single clamp for 1 1/4" pipe<br>Retaining nut | <a href="#">092.081.53.AB</a> | Beige      | 1/8  | 460, 490, 632, 686, 610, 544      |
|                                                                                            | <a href="#">092.081.53.AD</a> | Beige      | 1/4  | 422, 460, 490, 544, 612, 632, 686 |
|                                                                                            | <a href="#">092.081.53.AF</a> | Beige      | 3/8  | 422, 460, 490, 632, 686, 688      |
|                                                                                            | <a href="#">092.081.53.AH</a> | Beige      | 1/2  | 422, 460, 490, 632, 686           |

## Individual parts – series 676 Easy-Clip

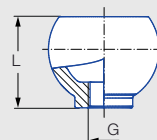
### ① Ball nozzle



| Dimensions [mm] |                |                  |                  |       |
|-----------------|----------------|------------------|------------------|-------|
| L <sub>1</sub>  | L <sub>2</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> | Flats |
| 41.5            | 31.5           | 34.0             | 15.0             | 16.0  |

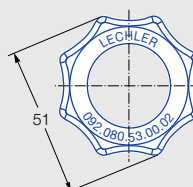
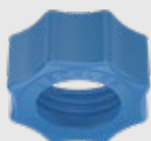
| Designation   | Spray angle | Ordering no.     | Nozzle Color | V̇ [l/min] |       |       |       |       |
|---------------|-------------|------------------|--------------|------------|-------|-------|-------|-------|
|               |             | Type             |              | p [bar]    |       |       |       |       |
|               |             |                  |              | 0.5        | 1.0   | 1.5   | 2.0   | 2.5   |
| ① Ball nozzle | 60°         | 676.724.53.30.01 | Grey         | 3.15       | 4.45  | 5.45  | 6.30  | 7.04  |
|               |             | 676.764.53.30.01 | Brown        | 4.00       | 5.66  | 6.93  | 8.00  | 8.94  |
|               |             | 676.804.53.30.01 | Purple       | 5.00       | 7.07  | 8.66  | 10.00 | 11.18 |
|               |             | 676.844.53.30.01 | Yellow       | 6.25       | 8.84  | 10.83 | 12.50 | 13.98 |
|               |             | 676.884.53.30.01 | Red          | 8.00       | 11.31 | 13.85 | 16.00 | 17.89 |
|               |             | 676.904.53.30.01 | Blue         | 9.10       | 12.87 | 15.67 | 18.20 | 20.35 |
|               |             | 676.924.53.30.01 | Green        | 10.00      | 14.14 | 17.32 | 20.00 | 22.36 |
| Blind nozzle  | –           | 092.080.53.00.01 | Grev         | –          | –     | –     | –     | –     |

### ② Ball joint



| Designation  | Ordering no.     | Ball Color | BSPP | L [mm] | Matches series                    |
|--------------|------------------|------------|------|--------|-----------------------------------|
|              | Type             |            |      |        |                                   |
| ② Ball joint | 092.080.53.AB.01 | Beige      | 1/8  | 28.4   | 460, 490, 632, 686, 610, 544      |
|              | 092.080.53.AD.01 | Beige      | 1/4  | 32.4   | 422, 460, 490, 544, 612, 632, 686 |
|              | 092.080.53.AF.01 | Beige      | 3/8  | 31.4   | 422, 460, 490, 632, 686, 688      |
|              | 092.080.53.AH.01 | Beige      | 1/2  | 33.0   | 422, 460, 490, 632, 686           |

### ③ Retaining nut



| Designation     | Ordering no.     |
|-----------------|------------------|
|                 | Type             |
| ③ Retaining nut | 092.080.53.00.02 |

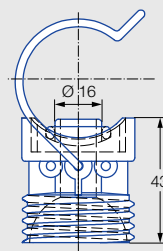


# Nozzle systems for surface treatment

## Series 676 Easy-Clip

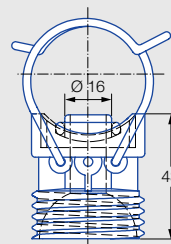
### ④ a Single clamp

092.08x.53.00



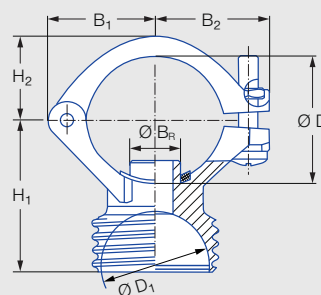
### ④ b Double clamp

092.09x.53.00



### ④ c Eyelet clamp

090.0x3.53.43.10



| Designation      | Ordering no.     | Dimensions [mm] |                |                |                |                  | Ø B <sub>R</sub> <sup>1</sup><br>[mm] | Recommend-<br>ed bore<br>diameter [mm] | Pipe Ø<br>(Ø D)<br>[mm] | Weight<br>[g]         |
|------------------|------------------|-----------------|----------------|----------------|----------------|------------------|---------------------------------------|----------------------------------------|-------------------------|-----------------------|
|                  | Type             | B <sub>1</sub>  | B <sub>2</sub> | H <sub>1</sub> | H <sub>2</sub> | Ø D <sub>1</sub> |                                       |                                        |                         | Polypropylene<br>(PP) |
| ④ a Single clamp | 092.080.53.00    | –               | –              | –              | –              | –                | 16.3*                                 | 16.5–17.0                              | 1" (32.0–34.5)          | 36.0                  |
|                  | 092.081.53.00    | –               | –              | –              | –              | –                | 16.3*                                 | 16.5–17.0                              | 1 1/4" (40.0–43.0)      | 38.0                  |
|                  | 092.082.53.00    | –               | –              | –              | –              | –                | 16.3*                                 | 16.5–17.0                              | 1 1/2" (46.0–49.0)      | 40.0                  |
|                  | 092.083.53.00    | –               | –              | –              | –              | –                | 16.3*                                 | 16.5–17.0                              | 2" (58.0–62.0)          | 42.0                  |
| ④ b Double clamp | 092.090.53.00    | –               | –              | –              | –              | –                | 16.3*                                 | 16.5–17.0                              | 1" (32.0–34.5)          | 46.0                  |
|                  | 092.091.53.00    | –               | –              | –              | –              | –                | 16.3*                                 | 16.5–17.0                              | 1 1/4" (40.0–43.0)      | 48.0                  |
|                  | 092.092.53.00    | –               | –              | –              | –              | –                | 16.3*                                 | 16.5–17.0                              | 1 1/2" (46.0–49.0)      | 50.0                  |
|                  | 092.093.53.00    | –               | –              | –              | –              | –                | 16.3*                                 | 16.5–17.0                              | 2" (58.0–62.0)          | 52.0                  |
| ④ c Eyelet clamp | 090.023.53.43.10 | 30.0            | 32.0           | 44.5           | 23.0           | 34.0             | 16.3**                                | 16.5–17.0                              | 1" (32.0–34.5)          | 48.0                  |
|                  | 090.033.53.43.10 | 33.0            | 36.0           | 48.0           | 27.0           | 34.0             | 16.3**                                | 16.5–17.0                              | 1 1/4" (40.0–43.0)      | 50.0                  |
|                  | 090.043.53.43.10 | 36.0            | 35.0           | 52.0           | 30.0           | 34.0             | 16.3**                                | 16.5–17.0                              | 1 1/2" (46.0–49.0)      | 52.0                  |

\* Other spigot diameters (13.8/19.0 mm) available on request.

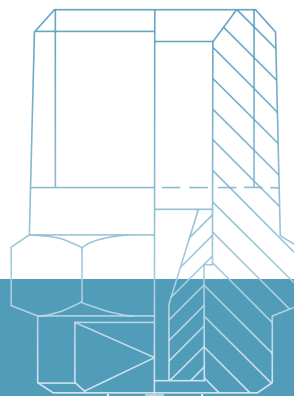
\*\* Other spigot diameters (13.8/20.0 mm) available on request.

<sup>1</sup> Ø B<sub>R</sub> = spigot diameter.





## SOLID STREAM NOZZLES



# SOLID STREAM NOZZLES

## OVERVIEW OF TYPES



Lechler solid stream nozzles are characterized by a stable and powerful jet stream, with low pressure and high pressure variants available. When concentrated spray power is required, e.g. in cleaning processes, the precision of Lechler solid stream nozzles enhances the productivity and performance for every installation.

### Low pressure and high pressure solid stream nozzles



- Concentrated solid jet stream, minimal atomization
- High impact
- Suitable for cleaning and washing processes
- Injection
- Targeted cooling
- Pasteurization

### International nozzle code

High pressure solid stream nozzle designations are governed by international standards. The two digits specify the flow rate in US gallons per minute at 40 psi. Our high pressure solid stream nozzles (series 546/548/550) are specified with this international nozzle code.

02

Flow rate in US gal/min at 40 psi

Conversion: Value · 3.22 = flow rate in l/min at 2 bar

example: 0.2 gal/min at 40 psi = 0.644 l/min at 2 bar

# SOLID STREAM NOZZLES OVERVIEW OF SERIES



|                                                                                                          |                    | Solid stream nozzles                                                              |                                                                                   |                                                                                     |                                                                                     |
|----------------------------------------------------------------------------------------------------------|--------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                                                                                          |                    |  |  |  |  |
| Series                                                                                                   |                    | 544                                                                               | 546                                                                               | 548                                                                                 | 550                                                                                 |
| Information on page                                                                                      |                    | 154                                                                               | 155                                                                               | 156                                                                                 | 157                                                                                 |
| Pressure range                                                                                           | Low pressure       | •                                                                                 |                                                                                   |                                                                                     |                                                                                     |
|                                                                                                          | High pressure      |                                                                                   | •                                                                                 | •                                                                                   | •                                                                                   |
| <br>Flow rate           | Low<br>≤ 20 l/min  | •<br>(at p = 5 bar)                                                               | •<br>(at p = 80 bar)                                                              | •<br>(at p = 80 bar)                                                                | •<br>(at p = 80 bar)                                                                |
|                                                                                                          | High<br>> 20 l/min |                                                                                   | •<br>(at p = 80 bar)                                                              | •<br>(at p = 80 bar)                                                                | •<br>(at p = 80 bar)                                                                |
| <br>Nozzle material   | Stainless steel    | •                                                                                 | •                                                                                 | •                                                                                   | •                                                                                   |
|                                                                                                          | Brass              | •                                                                                 |                                                                                   |                                                                                     |                                                                                     |
| <br>Nozzle connection |                    | 1/8 BSPT<br>1/4 BSPT                                                              | 1/4 BSPT<br>1/4 NPT                                                               | Assembly with<br>retaining nut<br>3/8 BSPP                                          | 1/8 BSPT<br>1/8 NPT                                                                 |

# Low pressure solid stream nozzles

## Series 544

### Properties:

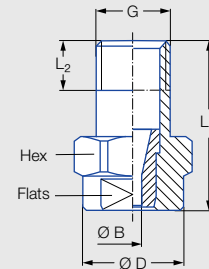
- Concentrated solid stream jet
- High impact

### Applications:

- Cleaning and washing processes
- Injection
- Targeted cooling
- Pasteurization



Series 544



| Code      | G        | Dimensions [mm] |                |      |     |       | Weight [g] (Brass) |
|-----------|----------|-----------------|----------------|------|-----|-------|--------------------|
|           |          | L <sub>1</sub>  | L <sub>2</sub> | Ø D  | Hex | Flats |                    |
| <b>CA</b> | 1/8 BSPT | 22.0            | 6.5            | 13.0 | 14  | 10    | 14.0               |
| <b>CC</b> | 1/4 BSPT | 22.0            | 10.0           | 13.0 | 14  | 10    | 16.0               |

| Ordering no. |                     |       |          |          | Bore diameter<br>B<br>[mm] | V̇ water [l/min] |      |       |       |       |       |       |       |       |
|--------------|---------------------|-------|----------|----------|----------------------------|------------------|------|-------|-------|-------|-------|-------|-------|-------|
| Type         | Mat. no.            |       | Code     |          |                            |                  |      |       |       |       |       |       |       |       |
|              | 16                  | 30    | 1/8 BSPT | 1/4 BSPT |                            | p [bar]          |      |       |       |       |       |       |       |       |
|              | Stainless steel 303 | Brass |          |          |                            |                  |      |       |       |       |       |       |       |       |
|              |                     |       |          |          |                            | 0.5              | 1.0  | 2.0   | 3.0   | 5.0   | 10.0  | 15.0  | 20.0  | 30.0  |
| 544.110      | ●                   | ●     | CA       | CC       | 0.23                       | 0.02             | 0.03 | 0.04  | 0.05  | 0.06  | 0.08  | 0.10  | 0.12  | 0.15  |
| 544.160      | ●                   |       | CA       | CC       | 0.33                       | 0.03             | 0.04 | 0.06  | 0.07  | 0.09  | 0.13  | 0.16  | 0.18  | 0.22  |
| 544.200      | ●                   | ●     | CA       | CC       | 0.39                       | 0.05             | 0.07 | 0.10  | 0.12  | 0.16  | 0.23  | 0.28  | 0.32  | 0.39  |
| 544.240      | ●                   |       | CA       | CC       | 0.50                       | 0.08             | 0.11 | 0.16  | 0.19  | 0.25  | 0.35  | 0.43  | 0.50  | 0.61  |
| 544.280      | ●                   |       | CA       | CC       | 0.63                       | 0.13             | 0.18 | 0.25  | 0.31  | 0.40  | 0.57  | 0.69  | 0.80  | 0.98  |
| 544.320      | ●                   | ●     | CA       | CC       | 0.80                       | 0.20             | 0.28 | 0.40  | 0.49  | 0.63  | 0.89  | 1.09  | 1.26  | 1.54  |
| 544.360      | ●                   | ●     | CA       | CC       | 1.05                       | 0.32             | 0.45 | 0.63  | 0.77  | 1.00  | 1.41  | 1.73  | 2.00  | 2.45  |
| 544.400      | ●                   | ●     | CA       | CC       | 1.30                       | 0.50             | 0.71 | 1.00  | 1.22  | 1.58  | 2.23  | 2.74  | 3.16  | 3.87  |
| 544.480      | ●                   | ●     | CA       | CC       | 1.33                       | 0.80             | 1.13 | 1.60  | 1.96  | 2.53  | 3.58  | 4.38  | 5.06  | 6.20  |
| 544.560      | ●                   | ●     | CA       | CC       | 1.65                       | 1.25             | 1.77 | 2.50  | 3.06  | 3.95  | 5.59  | 6.84  | 7.90  | 9.68  |
| 544.640      | ●                   | ●     | CA       | CC       | 2.09                       | 2.00             | 2.83 | 4.00  | 4.90  | 6.32  | 8.94  | 10.95 | 12.64 | 15.48 |
| 544.720      | ●                   | ●     | CA       | CC       | 2.66                       | 3.15             | 4.45 | 6.30  | 7.71  | 9.96  | 14.09 | 17.25 | 19.92 | 24.40 |
| 544.800      | ●                   | ●     | CA       | CC       | 3.30                       | 5.00             | 7.07 | 10.00 | 12.25 | 15.81 | 22.36 | 27.38 | 31.62 | 38.73 |

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. + Code = Ordering no.  
example: 544.110 + 16 + CA = 544.110.16.CA



Assembly accessories can be found in Chapter 9 "Accessories".

# High pressure solid stream nozzles

## Series 546

### Properties:

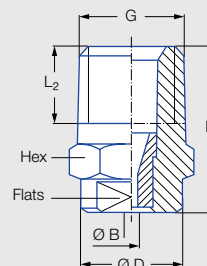
- Concentrated solid stream jet
- High impact
- Housing 303 SS, insert:  
Hardened stainless steel 420F

### Applications:

- Cleaning and washing processes



Series 546



| G        | Dimensions [mm] |                |      |     |       | Weight [g] | p <sub>max</sub> <sup>1</sup> [bar] |
|----------|-----------------|----------------|------|-----|-------|------------|-------------------------------------|
|          | L <sub>1</sub>  | L <sub>2</sub> | Ø D  | Hex | Flats |            |                                     |
| 1/4 BSPT | 22.0            | 10.0           | 13.0 | 14  | 10    | 18.0       | approx. 700                         |
| 1/4 NPT  | 22.0            | 10.0           | 13.0 | 14  | 10    | 18.0       | approx. 700                         |

<sup>1</sup> Applies only to operation at constant pressure.

| US<br>gal/min<br>at<br>40 psi | Ordering no. |          |         | Bore<br>diameter<br>B<br>[mm] | V̇ water [l/min] |       |       |       |       |       |       |        |
|-------------------------------|--------------|----------|---------|-------------------------------|------------------|-------|-------|-------|-------|-------|-------|--------|
|                               | Type         | Code     |         |                               | p [bar]          |       |       |       |       |       |       |        |
|                               |              | 1/4 BSPT | 1/4 NPT |                               |                  |       |       |       |       |       |       |        |
|                               |              |          |         |                               | 40               | 60    | 80    | 100   | 120   | 150   | 200   | 300    |
| 01                            | 546.300.A3   | 00       | 07      | 0.60                          | 1.44             | 1.77  | 2.04  | 2.28  | 2.50  | 2.79  | 3.22  | 3.95   |
| 02                            | 546.360.A3   | 00       | 07      | 0.84                          | 2.88             | 3.53  | 4.08  | 4.56  | 5.00  | 5.58  | 6.45  | 7.90   |
| 025                           | 546.380.A3   | 00       | 07      | 0.94                          | 3.60             | 4.42  | 5.10  | 5.70  | 6.24  | 6.98  | 8.06  | 9.87   |
| 027                           | 546.390.A3   | 00       | 07      | 0.99                          | 3.89             | 4.76  | 5.50  | 6.15  | 6.74  | 7.53  | 8.70  | 10.65  |
| 03                            | 546.400.A3   | 00       | 07      | 1.03                          | 4.33             | 5.30  | 6.12  | 6.84  | 7.49  | 8.38  | 9.67  | 11.85  |
| 034                           | 546.410.A3   | 00       | 07      | 1.07                          | 4.90             | 6.00  | 6.93  | 7.75  | 8.49  | 9.49  | 10.96 | 13.42  |
| 035                           | 546.420.A3   | 00       | 07      | 1.11                          | 5.05             | 6.18  | 7.14  | 7.98  | 8.74  | 9.77  | 11.29 | 13.82  |
| 038                           | 546.440.A3   | 00       | 07      | 1.15                          | 5.48             | 6.71  | 7.75  | 8.66  | 9.49  | 10.61 | 12.25 | 15.00  |
| 04                            | 546.450.A3   | 00       | 07      | 1.19                          | 5.77             | 7.06  | 8.16  | 9.12  | 9.99  | 11.17 | 12.90 | 15.80  |
| 045                           | 546.470.A3   | 00       | 07      | 1.26                          | 6.49             | 7.95  | 9.18  | 10.26 | 11.24 | 12.57 | 14.51 | 17.77  |
| 05                            | 546.480.A3   | 00       | 07      | 1.33                          | 7.21             | 8.83  | 10.20 | 11.40 | 12.49 | 13.96 | 16.12 | 19.75  |
| 055                           | 546.500.A3   | 00       | 07      | 1.39                          | 7.93             | 9.71  | 11.22 | 12.54 | 13.74 | 15.36 | 17.73 | 21.72  |
| 06                            | 546.520.A3   | 00       | 07      | 1.46                          | 8.65             | 10.60 | 12.24 | 13.68 | 14.99 | 16.75 | 19.35 | 23.69  |
| 065                           | 546.530.A3   | 00       | 07      | 1.51                          | 9.37             | 11.48 | 13.26 | 14.82 | 16.23 | 18.15 | 20.96 | 25.67  |
| 070                           | 546.540.A3   | 00       | 07      | 1.58                          | 10.09            | 12.36 | 14.28 | 15.96 | 17.48 | 19.55 | 22.57 | 27.64  |
| 074                           | 546.550.A3   | 00       | 07      | 1.62                          | 10.67            | 13.07 | 15.09 | 16.87 | 18.48 | 20.66 | 23.86 | 29.22  |
| 08                            | 546.570.A3   | 00       | 07      | 1.69                          | 11.54            | 14.13 | 16.31 | 18.24 | 19.98 | 22.34 | 25.80 | 31.59  |
| 087                           | 546.580.A3   | 00       | 07      | 1.76                          | 12.54            | 15.36 | 17.74 | 19.83 | 21.72 | 24.29 | 28.04 | 34.35  |
| 089                           | 546.590.A3   | 00       | 07      | 1.78                          | 12.83            | 15.72 | 18.15 | 20.29 | 22.23 | 24.85 | 28.69 | 35.14  |
| 10                            | 546.600.A3   | 00       | 07      | 1.88                          | 14.41            | 17.65 | 20.38 | 22.79 | 24.97 | 27.91 | 32.23 | 39.47  |
| 11                            | 546.620.A3   | 00       | 07      | 1.97                          | 15.86            | 19.42 | 22.42 | 25.07 | 27.46 | 30.70 | 35.45 | 43.42  |
| 124                           | 546.640.A3   | 00       | 07      | 2.09                          | 17.87            | 21.89 | 25.28 | 28.26 | 30.96 | 34.61 | 39.97 | 48.95  |
| 131                           | 546.650.A3   | 00       | 07      | 2.15                          | 18.89            | 23.13 | 26.71 | 29.86 | 32.71 | 36.57 | 42.23 | 51.72  |
| 139                           | 546.660.A3   | 00       | 07      | 2.22                          | 20.04            | 24.54 | 28.34 | 31.68 | 34.70 | 38.80 | 44.80 | 54.87  |
| 15                            | 546.670.A3   | 00       | 07      | 2.30                          | 21.62            | 26.48 | 30.58 | 34.19 | 37.45 | 41.87 | 48.35 | 59.22  |
| 165                           | 546.690.A3   | 00       | 07      | 2.41                          | 23.79            | 29.13 | 33.64 | 37.61 | 41.20 | 46.06 | 53.19 | 65.14  |
| 174                           | 546.700.A3   | 00       | 07      | 2.48                          | 25.08            | 30.72 | 35.47 | 39.66 | 43.45 | 48.57 | 56.09 | 68.69  |
| 183                           | 546.710.A3   | 00       | 07      | 2.55                          | 26.38            | 32.31 | 37.31 | 41.71 | 45.69 | 51.08 | 58.99 | 72.24  |
| 20                            | 546.720.A3   | 00       | 07      | 2.66                          | 28.83            | 35.31 | 40.78 | 45.59 | 49.94 | 55.84 | 64.47 | 78.96  |
| 218                           | 546.740.A3   | 00       | 07      | 2.77                          | 31.43            | 38.49 | 44.44 | 49.69 | 54.43 | 60.86 | 70.27 | 86.07  |
| 25                            | 546.760.A3   | 00       | 07      | 2.96                          | 36.04            | 44.14 | 50.97 | 56.99 | 62.43 | 69.80 | 80.60 | 98.71  |
| 294                           | 546.790.A3   | 00       | 07      | 3.22                          | 42.38            | 51.91 | 59.94 | 67.01 | 73.41 | 82.07 | 94.77 | 116.06 |
| 310                           | 546.800.A3   | 00       | 07      | 3.30                          | 44.69            | 54.73 | 63.20 | 70.66 | 77.40 | 86.54 | 99.93 | 122.39 |

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Code = Ordering no.  
example: 546.300.A3 + 00 = 546.300.A3.00



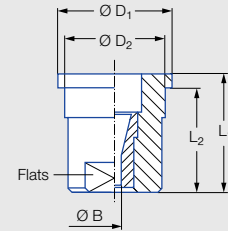
Assembly accessories can be found in Chapter 9 "Accessories".

# High pressure solid stream nozzles

## Series 548

### Properties:

- Concentrated solid stream jet
- High impact
- Housing 303 SS, insert:  
Hardened stainless steel 420F
- Assembly with retaining nut



### Applications:

- Cleaning and washing processes

Series 548

| Code                                 | Dimensions [mm] |                |                  |                  |       | Weight [g] | p <sub>max</sub> <sup>1</sup> [bar] |
|--------------------------------------|-----------------|----------------|------------------|------------------|-------|------------|-------------------------------------|
|                                      | L <sub>1</sub>  | L <sub>2</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> | Flats |            |                                     |
| Assembly with retaining nut 3/8 BSPP | 16.00           | 14.00          | 14.80            | 12.65            | 10    | 13.00      | approx. 300                         |

<sup>1</sup> Applies only to operation at constant pressure.

| US gal/min at 40 psi | Ordering no.<br><br>Type | Bore diameter B [mm] | V̇ water [l/min] |       |       |       |       |       |       |        |
|----------------------|--------------------------|----------------------|------------------|-------|-------|-------|-------|-------|-------|--------|
|                      |                          |                      | p [bar]          |       |       |       |       |       |       |        |
|                      |                          |                      | 40               | 60    | 80    | 100   | 120   | 150   | 200   | 300    |
| 01                   | 548.300.A3.29            | 0.60                 | 1.44             | 1.77  | 2.04  | 2.28  | 2.50  | 2.79  | 3.22  | 3.95   |
| 02                   | 548.360.A3.29            | 0.84                 | 2.88             | 3.53  | 4.08  | 4.56  | 5.00  | 5.58  | 6.45  | 7.90   |
| 025                  | 548.380.A3.29            | 0.94                 | 3.60             | 4.42  | 5.10  | 5.70  | 6.24  | 6.98  | 8.06  | 9.87   |
| 027                  | 548.390.A3.29            | 0.99                 | 3.89             | 4.76  | 5.50  | 6.15  | 6.74  | 7.53  | 8.70  | 10.65  |
| 03                   | 548.400.A3.29            | 1.03                 | 4.33             | 5.30  | 6.12  | 6.84  | 7.49  | 8.38  | 9.67  | 11.85  |
| 034                  | 548.410.A3.29            | 1.07                 | 4.90             | 6.00  | 6.93  | 7.75  | 8.49  | 9.49  | 10.96 | 13.42  |
| 035                  | 548.420.A3.29            | 1.11                 | 5.05             | 6.18  | 7.14  | 7.98  | 8.74  | 9.77  | 11.29 | 13.82  |
| 038                  | 548.440.A3.29            | 1.15                 | 5.48             | 6.71  | 7.75  | 8.66  | 9.49  | 10.61 | 12.25 | 15.00  |
| 04                   | 548.450.A3.29            | 1.19                 | 5.77             | 7.06  | 8.16  | 9.12  | 9.99  | 11.17 | 12.90 | 15.80  |
| 045                  | 548.470.A3.29            | 1.26                 | 6.49             | 7.95  | 9.18  | 10.26 | 11.24 | 12.57 | 14.51 | 17.77  |
| 05                   | 548.480.A3.29            | 1.33                 | 7.21             | 8.83  | 10.20 | 11.40 | 12.49 | 13.96 | 16.12 | 19.75  |
| 055                  | 548.500.A3.29            | 1.39                 | 7.93             | 9.71  | 11.22 | 12.54 | 13.74 | 15.36 | 17.73 | 21.72  |
| 06                   | 548.520.A3.29            | 1.46                 | 8.65             | 10.60 | 12.24 | 13.68 | 14.99 | 16.75 | 19.35 | 23.69  |
| 065                  | 548.530.A3.29            | 1.51                 | 9.37             | 11.48 | 13.26 | 14.82 | 16.23 | 18.15 | 20.96 | 25.67  |
| 070                  | 548.540.A3.29            | 1.58                 | 10.09            | 12.36 | 14.28 | 15.96 | 17.48 | 19.55 | 22.57 | 27.64  |
| 074                  | 548.550.A3.29            | 1.62                 | 10.67            | 13.07 | 15.09 | 16.87 | 18.48 | 20.66 | 23.86 | 29.22  |
| 08                   | 548.570.A3.29            | 1.69                 | 11.54            | 14.13 | 16.31 | 18.24 | 19.98 | 22.34 | 25.80 | 31.59  |
| 087                  | 548.580.A3.29            | 1.76                 | 12.54            | 15.36 | 17.74 | 19.83 | 21.72 | 24.29 | 28.04 | 34.35  |
| 089                  | 548.590.A3.29            | 1.78                 | 12.83            | 15.72 | 18.15 | 20.29 | 22.23 | 24.85 | 28.69 | 35.14  |
| 10                   | 548.600.A3.29            | 1.88                 | 14.41            | 17.65 | 20.38 | 22.79 | 24.97 | 27.91 | 32.23 | 39.47  |
| 11                   | 548.620.A3.29            | 1.97                 | 15.86            | 19.42 | 22.42 | 25.07 | 27.46 | 30.70 | 35.45 | 43.42  |
| 124                  | 548.640.A3.29            | 2.09                 | 17.87            | 21.89 | 25.28 | 28.26 | 30.96 | 34.61 | 39.97 | 48.95  |
| 131                  | 548.650.A3.29            | 2.15                 | 18.89            | 23.13 | 26.71 | 29.86 | 32.71 | 36.57 | 42.23 | 51.72  |
| 139                  | 548.660.A3.29            | 2.22                 | 20.04            | 24.54 | 28.34 | 31.68 | 34.70 | 38.80 | 44.80 | 54.87  |
| 15                   | 548.670.A3.29            | 2.30                 | 21.62            | 26.48 | 30.58 | 34.19 | 37.45 | 41.87 | 48.35 | 59.22  |
| 165                  | 548.690.A3.29            | 2.41                 | 23.79            | 29.13 | 33.64 | 37.61 | 41.20 | 46.06 | 53.19 | 65.14  |
| 174                  | 548.700.A3.29            | 2.48                 | 25.08            | 30.72 | 35.47 | 39.66 | 43.45 | 48.57 | 56.09 | 68.69  |
| 183                  | 548.710.A3.29            | 2.55                 | 26.38            | 32.31 | 37.31 | 41.71 | 45.69 | 51.08 | 58.99 | 72.24  |
| 20                   | 548.720.A3.29            | 2.66                 | 28.83            | 35.31 | 40.78 | 45.59 | 49.94 | 55.84 | 64.47 | 78.96  |
| 218                  | 548.740.A3.29            | 2.77                 | 31.43            | 38.49 | 44.44 | 49.69 | 54.43 | 60.86 | 70.27 | 86.07  |
| 25                   | 548.760.A3.29            | 2.96                 | 36.04            | 44.14 | 50.97 | 56.99 | 62.43 | 69.80 | 80.60 | 98.71  |
| 294                  | 548.790.A3.29            | 3.22                 | 42.38            | 51.91 | 59.94 | 67.01 | 73.41 | 82.07 | 94.77 | 116.06 |
| 310                  | 548.800.A3.29            | 3.30                 | 44.69            | 54.73 | 63.20 | 70.66 | 77.40 | 86.54 | 99.93 | 122.39 |

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$



Assembly accessories can be found in Chapter 9 "Accessories".

# High pressure solid stream nozzles

## Series 550

### Properties:

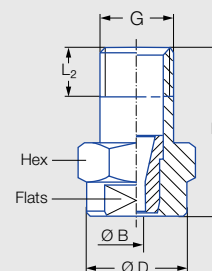
- Concentrated solid stream jet
- High impact
- Housing 303, insert:  
Hardened stainless steel 1.4034 S

### Applications:

- Cleaning and washing processes



Series 550



| G        | Dimensions [mm] |                |      |     |       | Weight [g] | p <sub>max</sub> <sup>1</sup> [bar] |
|----------|-----------------|----------------|------|-----|-------|------------|-------------------------------------|
|          | L <sub>1</sub>  | L <sub>2</sub> | Ø D  | Hex | Flats |            |                                     |
| 1/8 BSPT | 22.0            | 6.5            | 13.0 | 14  | 10    | 13.0       | approx. 700                         |
| 1/8 NPT  | 22.0            | 6.5            | 13.0 | 14  | 10    | 13.0       | approx. 700                         |

<sup>1</sup> Applies only to operation at constant pressure.

| US<br>gal/min<br>at<br>40 psi | Ordering no. |          |         | Bore<br>diameter<br>B<br>[mm] | V̇ water [l/min] |       |       |       |       |       |       |        |
|-------------------------------|--------------|----------|---------|-------------------------------|------------------|-------|-------|-------|-------|-------|-------|--------|
|                               | Type         | Code     |         |                               | p [bar]          |       |       |       |       |       |       |        |
|                               |              | 1/8 BSPT | 1/8 NPT |                               | 40               | 60    | 80    | 100   | 120   | 150   | 200   | 300    |
| 01                            | 550.300.A3   | 00       | 07      | 0.60                          | 1.44             | 1.77  | 2.04  | 2.28  | 2.50  | 2.79  | 3.22  | 3.95   |
| 02                            | 550.360.A3   | 00       | 07      | 0.84                          | 2.88             | 3.53  | 4.08  | 4.56  | 5.00  | 5.58  | 6.45  | 7.90   |
| 025                           | 550.380.A3   | 00       | 07      | 0.94                          | 3.60             | 4.42  | 5.10  | 5.70  | 6.24  | 6.98  | 8.06  | 9.87   |
| 027                           | 550.390.A3   | 00       | 07      | 0.99                          | 3.89             | 4.76  | 5.50  | 6.15  | 6.74  | 7.53  | 8.70  | 10.65  |
| 03                            | 550.400.A3   | 00       | 07      | 1.03                          | 4.33             | 5.30  | 6.12  | 6.84  | 7.49  | 8.38  | 9.67  | 11.85  |
| 034                           | 550.410.A3   | 00       | 07      | 1.07                          | 4.90             | 6.00  | 6.93  | 7.75  | 8.49  | 9.49  | 10.96 | 13.42  |
| 035                           | 550.420.A3   | 00       | 07      | 1.11                          | 5.05             | 6.18  | 7.14  | 7.98  | 8.74  | 9.77  | 11.29 | 13.82  |
| 038                           | 550.440.A3   | 00       | 07      | 1.15                          | 5.48             | 6.71  | 7.75  | 8.66  | 9.49  | 10.61 | 12.25 | 15.00  |
| 04                            | 550.450.A3   | 00       | 07      | 1.19                          | 5.77             | 7.06  | 8.16  | 9.12  | 9.99  | 11.17 | 12.90 | 15.80  |
| 045                           | 550.470.A3   | 00       | 07      | 1.26                          | 6.49             | 7.95  | 9.18  | 10.26 | 11.24 | 12.57 | 14.51 | 17.77  |
| 05                            | 550.480.A3   | 00       | 07      | 1.33                          | 7.21             | 8.83  | 10.20 | 11.40 | 12.49 | 13.96 | 16.12 | 19.75  |
| 055                           | 550.500.A3   | 00       | 07      | 1.39                          | 7.93             | 9.71  | 11.22 | 12.54 | 13.74 | 15.36 | 17.73 | 21.72  |
| 06                            | 550.520.A3   | 00       | 07      | 1.46                          | 8.65             | 10.60 | 12.24 | 13.68 | 14.99 | 16.75 | 19.35 | 23.69  |
| 065                           | 550.530.A3   | 00       | 07      | 1.51                          | 9.37             | 11.48 | 13.26 | 14.82 | 16.23 | 18.15 | 20.96 | 25.67  |
| 070                           | 550.540.A3   | 00       | 07      | 1.58                          | 10.09            | 12.36 | 14.28 | 15.96 | 17.48 | 19.55 | 22.57 | 27.64  |
| 074                           | 550.550.A3   | 00       | 07      | 1.62                          | 10.67            | 13.07 | 15.09 | 16.87 | 18.48 | 20.66 | 23.86 | 29.22  |
| 08                            | 550.570.A3   | 00       | 07      | 1.69                          | 11.54            | 14.13 | 16.31 | 18.24 | 19.98 | 22.34 | 25.80 | 31.59  |
| 087                           | 550.580.A3   | 00       | 07      | 1.76                          | 12.54            | 15.36 | 17.74 | 19.83 | 21.72 | 24.29 | 28.04 | 34.35  |
| 089                           | 550.590.A3   | 00       | 07      | 1.78                          | 12.83            | 15.72 | 18.15 | 20.29 | 22.23 | 24.85 | 28.69 | 35.14  |
| 10                            | 550.600.A3   | 00       | 07      | 1.88                          | 14.41            | 17.65 | 20.38 | 22.79 | 24.97 | 27.91 | 32.23 | 39.47  |
| 11                            | 550.620.A3   | 00       | 07      | 1.97                          | 15.86            | 19.42 | 22.42 | 25.07 | 27.46 | 30.70 | 35.45 | 43.42  |
| 124                           | 550.640.A3   | 00       | 07      | 2.09                          | 17.87            | 21.89 | 25.28 | 28.26 | 30.96 | 34.61 | 39.97 | 48.95  |
| 131                           | 550.650.A3   | 00       | 07      | 2.15                          | 18.89            | 23.13 | 26.71 | 29.86 | 32.71 | 36.57 | 42.23 | 51.72  |
| 139                           | 550.660.A3   | 00       | 07      | 2.22                          | 20.04            | 24.54 | 28.34 | 31.68 | 34.70 | 38.80 | 44.80 | 54.87  |
| 15                            | 550.670.A3   | 00       | 07      | 2.30                          | 21.62            | 26.48 | 30.58 | 34.19 | 37.45 | 41.87 | 48.35 | 59.22  |
| 165                           | 550.690.A3   | 00       | 07      | 2.41                          | 23.79            | 29.13 | 33.64 | 37.61 | 41.20 | 46.06 | 53.19 | 65.14  |
| 174                           | 550.700.A3   | 00       | 07      | 2.48                          | 25.08            | 30.72 | 35.47 | 39.66 | 43.45 | 48.57 | 56.09 | 68.69  |
| 183                           | 550.710.A3   | 00       | 07      | 2.55                          | 26.38            | 32.31 | 37.31 | 41.71 | 45.69 | 51.08 | 58.99 | 72.24  |
| 20                            | 550.720.A3   | 00       | 07      | 2.66                          | 28.83            | 35.31 | 40.78 | 45.59 | 49.94 | 55.84 | 64.47 | 78.96  |
| 218                           | 550.740.A3   | 00       | 07      | 2.77                          | 31.43            | 38.49 | 44.44 | 49.69 | 54.43 | 60.86 | 70.27 | 86.07  |
| 25                            | 550.760.A3   | 00       | 07      | 2.96                          | 36.04            | 44.14 | 50.97 | 56.99 | 62.43 | 69.80 | 80.60 | 98.71  |
| 294                           | 550.790.A3   | 00       | 07      | 3.22                          | 42.38            | 51.91 | 59.94 | 67.01 | 73.41 | 82.07 | 94.77 | 116.06 |
| 310                           | 550.800.A3   | 00       | 07      | 3.30                          | 44.69            | 54.73 | 63.20 | 70.66 | 77.40 | 86.54 | 99.93 | 122.39 |

Conversion formula for this series:  $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

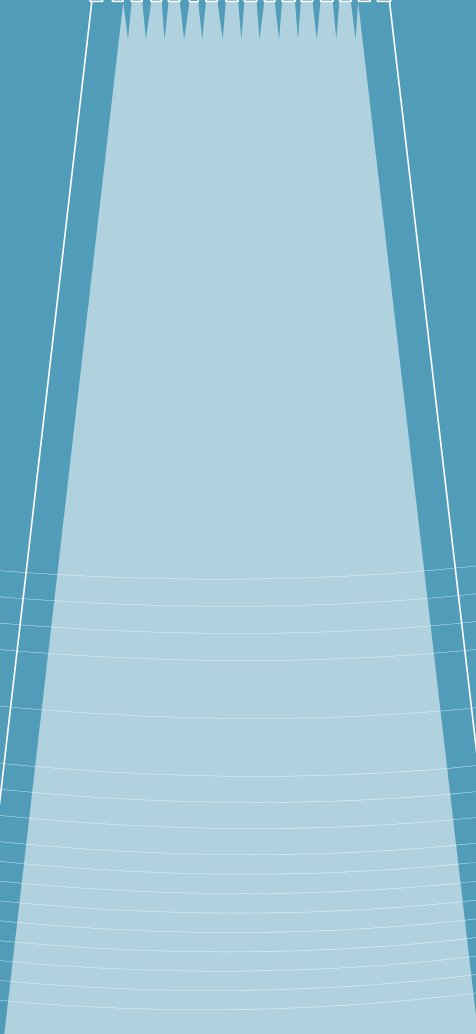
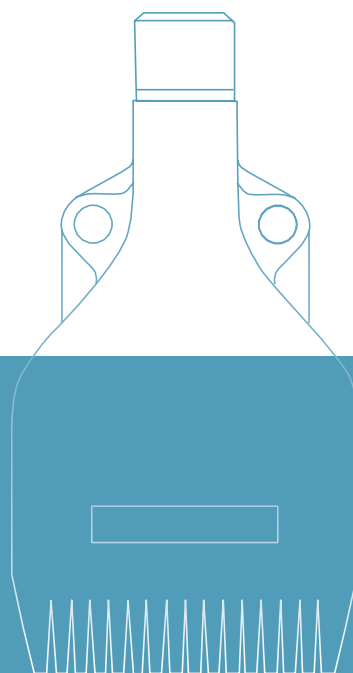
Ordering Type + Code = Ordering no.  
example: 550.300.A3 + 00 = 550.300.A3.00



Assembly accessories can be found in Chapter 9 "Accessories".

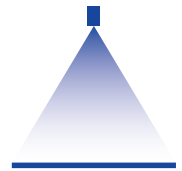


# AIR NOZZLES

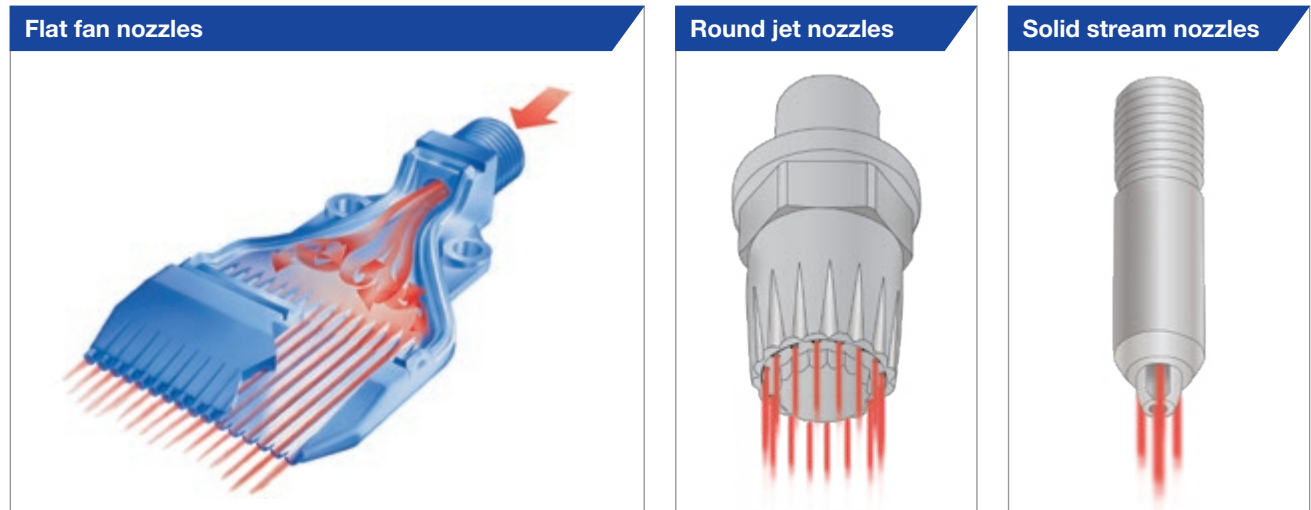


# AIR NOZZLES

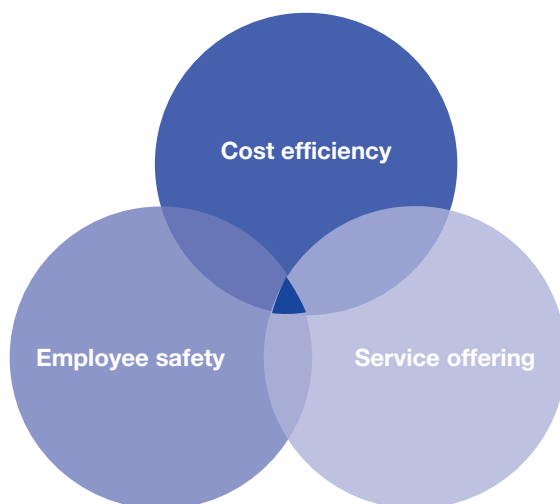
## GENERAL INFORMATION



Compressed air is an indispensable tool in many areas for drying, cooling, cleaning, conveying, blowing off and much more. Lechler air nozzles make all this possible – with the highest level of precision at extraordinarily favourable conditions.



### The three advantages of Lechler air nozzles for you



#### Cost efficiency

Lechler nozzles make it possible to reduce compressed air consumption by up to 45% compared to open pipes. In view of increasing energy costs and the growing range of compressed air applications, it is not surprising that there are extremely high potential savings in this area. An advantage that will have direct positive impact on your business.

#### Employee safety

The unique design of our nozzles allows noise levels to be verifiably reduced by up to 25% compared to conventional solutions – thus also reducing noise-related stress for your employees. Noise levels have been confirmed to reduce concentration resulting in increased levels of stress. The use of low-noise nozzles has a positive effect on production quality.

#### Service offering

A perfect solution must be optimally tailored to the local requirements. We will, therefore, gladly advise you in person about the use of air nozzles and introduce you to new possibilities. Contact us and let us come up with the best possible solution together for improved quality and optimized process reliability.

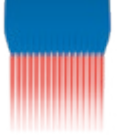
### Good to know

Detailed information can be found in our brochure "Air nozzles" as well as at [www.lechler.com/de-en/airnozzles](http://www.lechler.com/de-en/airnozzles).

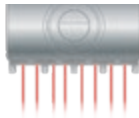
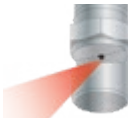
# AIR NOZZLES

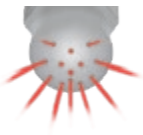
## OVERVIEW OF SERIES



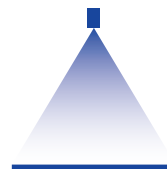
|                     |                 | Flat fan nozzles                                                                  |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
|---------------------|-----------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                     |                 |  |  |  |  |  |
| Series              |                 | 600.130.56/S2                                                                     | 600.484.56                                                                        | 600.130.1Y                                                                         | 600.283.42                                                                          | 600.606.42                                                                          |
| Information on page |                 | 164                                                                               | 165                                                                               | 166                                                                                | 167                                                                                 | 167                                                                                 |
| Spray pattern       |                 | Multi-channel flat fan                                                            | Multi-channel flat fan                                                            | Multi-channel flat fan                                                             | Multi-channel flat fan                                                              | Multi-channel flat fan                                                              |
|                     |                 |  |  |  |  |  |
| Nozzle material     | Plastic         | •                                                                                 | •                                                                                 |                                                                                    |                                                                                     |                                                                                     |
|                     | Stainless steel |                                                                                   |                                                                                   | •                                                                                  |                                                                                     |                                                                                     |
|                     | Brass           |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
|                     | Zinc            |                                                                                   |                                                                                   |                                                                                    |                                                                                     |                                                                                     |
|                     | Aluminum        |                                                                                   |                                                                                   |                                                                                    | •                                                                                   | •                                                                                   |
| Air consumption     | At 2 bar        | 16 m³/h                                                                           | 8 m³/h                                                                            | 12 m³/h                                                                            | 18 m³/h                                                                             | 12 m³/h                                                                             |
| Nozzle connection   |                 | 1/4 BSPP<br>1/4 NPT                                                               | 1/4 BSPP<br>1/4 NPT<br>M12 x 1.25<br>Quick-release coupling size 5                | 1/4 BSPP<br>1/4 NPT                                                                | 1/4 BSPP<br>1/4 NPT                                                                 | 1/4 BSPP<br>1/4 NPT                                                                 |
| Maximum pressure    |                 | 6 bar                                                                             | 6 bar                                                                             | 10 bar                                                                             | 10 bar                                                                              | 10 bar                                                                              |
| Maximum temperature |                 | PP natural: 60°C<br>POM: 50°C                                                     | 50°C                                                                              | 550°C                                                                              | 200°C                                                                               | 200°C                                                                               |
| Noise level         | At 2 bar        | 70 dB(A)                                                                          | 65 dB(A)                                                                          | 70 dB(A)                                                                           | 76 dB(A)                                                                            | 68.5 dB(A)                                                                          |
| Blowing force       | At 2 bar        | 2 N                                                                               | 0.8 N                                                                             | 2 N                                                                                | 2.4 N                                                                               | 1.4 N                                                                               |



|                                                                                                            |                 | Flat fan nozzles                                                                                            |                                                                                                              |                                                                                                                |                                                                                                                    |
|------------------------------------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
|                                                                                                            |                 |                            |                            |                             |                                 |
| Series                                                                                                     |                 | 600.493.1Y                                                                                                  | 600.562.1Y                                                                                                   | 679                                                                                                            | 686                                                                                                                |
| Information on page                                                                                        |                 | 168                                                                                                         | 169                                                                                                          | 170                                                                                                            | 172                                                                                                                |
| Spray pattern                                                                                              |                 | Multi-channel flat fan<br> | Multi-channel flat fan<br> | Flat fan slotted nozzle<br> | Flat fan tongue-type nozzle<br> |
|                                                                                                            |                 |                                                                                                             |                                                                                                              |                                                                                                                |                                                                                                                    |
| <br>Nozzle material     | Plastic         |                                                                                                             |                                                                                                              |                                                                                                                |                                                                                                                    |
|                                                                                                            | Stainless steel | •                                                                                                           | •                                                                                                            | •                                                                                                              | •                                                                                                                  |
|                                                                                                            | Brass           |                                                                                                             |                                                                                                              | •                                                                                                              | •                                                                                                                  |
|                                                                                                            | Zinc            |                                                                                                             |                                                                                                              |                                                                                                                |                                                                                                                    |
|                                                                                                            | Aluminum        |                                                                                                             |                                                                                                              |                                                                                                                |                                                                                                                    |
| <br>Air consumption     | At 2 bar        | 30 m³/h                                                                                                     | 9 m³/h                                                                                                       | 3–31 m³/h                                                                                                      | 2–16 m³/h                                                                                                          |
| <br>Nozzle connection   |                 | 1/4 BSPP<br>1/4 NPT                                                                                         | 1/8 BSPP<br>1/8 NPT                                                                                          | Assembly with retaining nut<br>3/8 BSPP                                                                        | 1/8 BSPT                                                                                                           |
| <br>Maximum pressure    |                 | 30 bar                                                                                                      | 30 bar                                                                                                       | 10 bar                                                                                                         | 30 bar                                                                                                             |
| <br>Maximum temperature |                 | 550°C                                                                                                       | 550°C                                                                                                        | 550°C (stainless steel)<br>240°C (brass)                                                                       | 550°C (stainless steel)<br>240°C (brass)                                                                           |
| <br>Noise level         | At 2 bar        | 78 dB(A)                                                                                                    | 71 dB(A)                                                                                                     | 67–92 dB(A)                                                                                                    | 73–84 dB(A)                                                                                                        |
| <br>Blowing force       | At 2 bar        | 4.2 N                                                                                                       | 1.2 N                                                                                                        |                                                                                                                |                                                                                                                    |

| Round jet nozzles                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   | Solid stream nozzle/Multiple solid stream nozzle                                    |                                                                                     |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |
| <b>600.326.5K</b>                                                                | <b>600.725.5K</b>                                                                 | <b>600.326.3W</b>                                                                 | <b>600.388.30</b>                                                                 | <b>600.625.1Y</b>                                                                 | <b>544</b>                                                                          | <b>540/541</b>                                                                      |
| 174                                                                              | 174                                                                               | 175                                                                               | 176                                                                               | 177                                                                               | 178                                                                                 | 179                                                                                 |
| Multi-channel round jet                                                          | Multi-channel round jet                                                           | Multi-channel round jet                                                           | Multi-channel round jet                                                           | Multi-channel round jet                                                           | Solid stream                                                                        | Multiple solid stream                                                               |
|  |  |  |  |  |  |  |
| •                                                                                | •                                                                                 |                                                                                   | •                                                                                 |                                                                                   |                                                                                     |                                                                                     |
|                                                                                  |                                                                                   |                                                                                   | •                                                                                 | •                                                                                 | •                                                                                   | •                                                                                   |
|                                                                                  |                                                                                   |                                                                                   | •                                                                                 |                                                                                   |                                                                                     |                                                                                     |
|                                                                                  |                                                                                   | •                                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| 15 m³/h                                                                          | 32 m³/h                                                                           | 15 m³/h                                                                           | 8 m³/h                                                                            | 2–4 m³/h                                                                          | 1–16 m³/h                                                                           | 34–251 m³/h                                                                         |
| 1/8 BSPP<br>1/4 BSPP<br>1/8 NPT<br>1/4 NPT<br>M12 x 1.25                         | 1/4 BSPP<br>1/4 NPT                                                               | 1/4 BSPP<br>1/4 NPT<br>M12 x 1.25                                                 | 1/8 BSPP<br>1/8 NPT<br>M12 x 1.25                                                 | M4 x 0.5<br>M5 x 0.5                                                              | 1/8 BSPT<br>1/4 BSPT                                                                | 1/2 BSPP                                                                            |
| 6 bar                                                                            | 6 bar                                                                             | 10 bar                                                                            | 10 bar                                                                            | 5 bar                                                                             | 30 bar                                                                              | 10 bar                                                                              |
| 50°C                                                                             | 50°C                                                                              | 90°C                                                                              | 50°C                                                                              | 550°C                                                                             | 550°C                                                                               | 550°C                                                                               |
| 74 dB(A)                                                                         | 96 dB(A)                                                                          | 79 dB(A)                                                                          | 77 dB(A)                                                                          | 63–70 dB(A)                                                                       | 65–90 dB(A)                                                                         |                                                                                     |
| 2.2 N                                                                            | 3.9 N                                                                             | 2.1 N                                                                             | 1.1 N                                                                             | 0.4–0.7 N                                                                         | 0.25–2.9 N                                                                          |                                                                                     |

# Multi-channel flat fan nozzles for air “Whisperblast”, plastic version Series 600.130.56/S2



## Features:

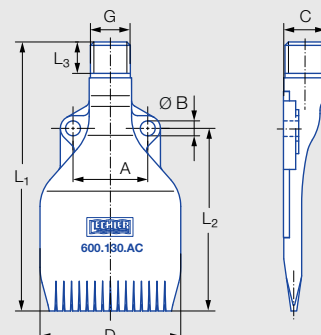
- Laminar, powerful air stream
- Low noise level  
(also at higher levels of pressure)

## Applications:

- Blowing off and out
- Cleaning
- Drying
- Cooling
- Transporting



Series 600.130.56/S2



<sup>1</sup> Meets OSHA specifications in terms of noise level.

## Cost savings and noise reduction



Cost savings

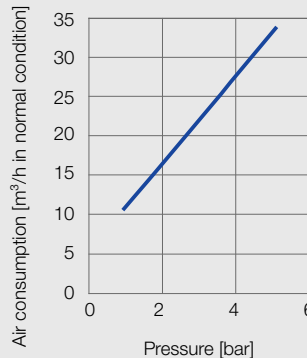
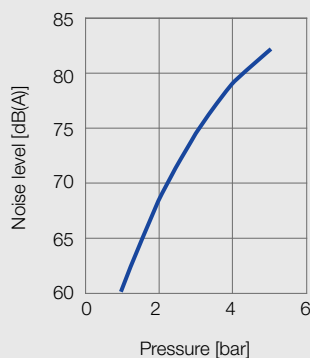
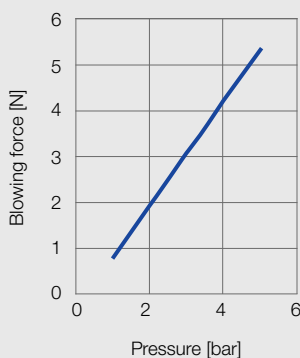
21%



Noise reduction

24%

## Technical data



| Code | G        | Dimensions [mm] |      |      |                |                |                |     | Weight [g] |
|------|----------|-----------------|------|------|----------------|----------------|----------------|-----|------------|
|      |          | A               | C    | D    | L <sub>1</sub> | L <sub>2</sub> | L <sub>3</sub> | Ø B |            |
| AC   | 1/4 BSPP | 25.0            | 14.2 | 47.0 | 90.0           | 61.0           | 10.5           | 5.0 | 20.0       |
| BC   | 1/4 NPT  | 25.0            | 14.2 | 47.0 | 90.0           | 61.0           | 10.5           | 5.0 | 20.0       |

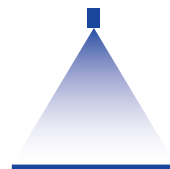
| Ordering no. |          |            |          |         |
|--------------|----------|------------|----------|---------|
| Type         | Mat. no. |            | Code     |         |
|              | 56       | S2         | 1/4 BSPP | 1/4 NPT |
|              | POM      | PP natural |          |         |
| 600.130      | ●        | ●          | AC       | BC      |

Ordering Type + Material no. + Code = Ordering no.  
example: 600.130 + 56 + AC = 600.130.56.AC



Assembly accessories can be found in Chapter 9  
“Accessories”.

# Multi-channel flat fan nozzles for air “Whisperblast”, plastic version Series 600.484.56

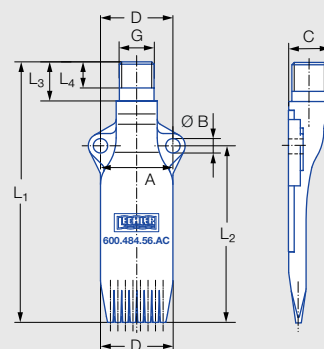


## Features:

- Compact, powerful air stream
- Low noise level (also at higher levels of pressure)
- Narrow design

## Applications:

- Blowing off and out
- Cleaning
- Drying
- Cooling
- Transporting



Series 600.484.56

<sup>1</sup> Meets OSHA specifications in terms of noise level.

## Cost savings and noise reduction



Cost savings

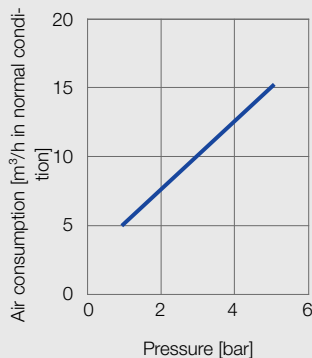
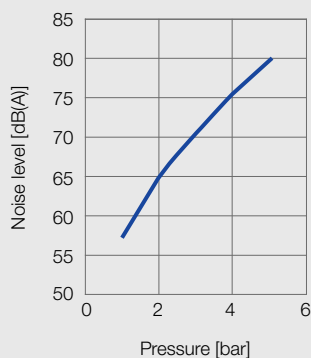
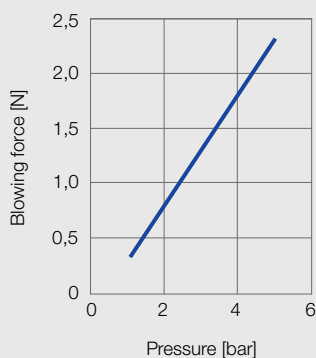
22%



Noise reduction

22%

## Technical data



| Code      | G                             | Dimensions [mm] |      |      |                |                |                |                |     | Weight [g] |
|-----------|-------------------------------|-----------------|------|------|----------------|----------------|----------------|----------------|-----|------------|
|           |                               | A               | C    | D    | L <sub>1</sub> | L <sub>2</sub> | L <sub>3</sub> | L <sub>4</sub> | Ø B |            |
| <b>AC</b> | 1/4 BSPP                      | 25.0            | 14.2 | 25.0 | 90.0           | 61.0           | 13.5           | 9.0            | 5.0 | 16.0       |
| <b>BC</b> | 1/4 NPT                       | 25.0            | 14.2 | 25.0 | 90.0           | 61.0           | 13.5           | 9.0            | 5.0 | 16.0       |
| <b>HG</b> | M12 x 1.25                    | 25.0            | 14.2 | 25.0 | 90.0           | 61.0           | 13.5           | 9.0            | 5.0 | 16.0       |
| <b>00</b> | Quick-release coupling size 5 | 25.0            | 14.2 | 25.0 | 90.0           | 61.0           | 13.5           | –              | 5.0 | 16.0       |

| Ordering no.   |           |           |           |            |                               |
|----------------|-----------|-----------|-----------|------------|-------------------------------|
| Type           | Mat. no.  | Code      |           |            |                               |
|                | <b>56</b> | 1/4 BSPP  | 1/4 NPT   | M12 x 1.25 | Quick-release coupling size 5 |
|                | POM       |           |           |            |                               |
| <b>600.484</b> | ●         | <b>AC</b> | <b>BC</b> | <b>HG</b>  | <b>00</b>                     |

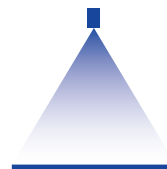
Ordering Type + Material no. + Code = Ordering no.  
example: 600.484 + 56 + AC = 600.484.56.AC



Assembly accessories can be found in Chapter 9 “Accessories”.



# Multi-channel flat fan nozzles for air “Whisperblast”, stainless steel version Series 600.130.1Y



## Features:

- Laminar, powerful air stream
- Low noise level  
(also at higher levels of pressure)
- For the highest demands

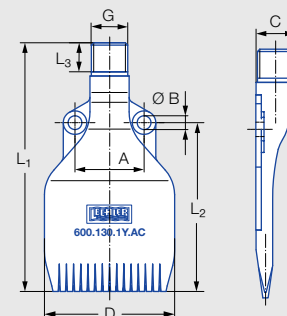
## Applications:

- Blowing off and out
- Cleaning
- Drying
- Cooling
- Transporting



OSHA<sup>1</sup>

FDA



Series 600.130.1Y

<sup>1</sup> Meets OSHA specifications in terms of noise level.

## Cost savings and noise reduction



Cost savings

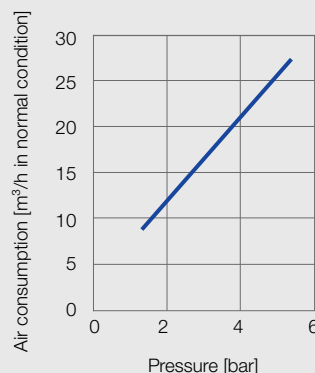
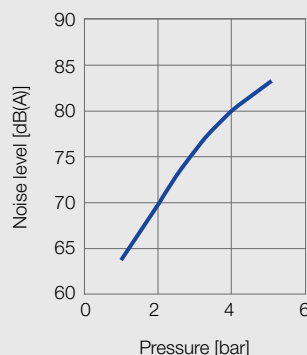
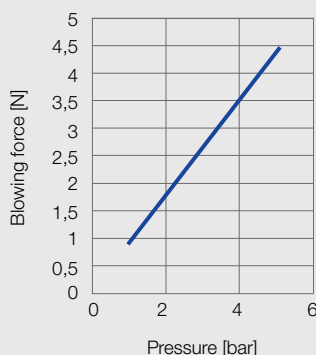
24%



Noise  
reduction

22%

## Technical data



| Code | G        | Dimensions [mm] |      |      |                |                |                |     | Weight [g] |
|------|----------|-----------------|------|------|----------------|----------------|----------------|-----|------------|
|      |          | A               | C    | D    | L <sub>1</sub> | L <sub>2</sub> | L <sub>3</sub> | Ø B |            |
| AC   | 1/4 BSPP | 22.0            | 13.0 | 42.0 | 81.0           | 53.0           | 10.5           | 4.0 | 100.0      |
| BC   | 1/4 NPT  | 22.0            | 13.0 | 42.0 | 81.0           | 53.0           | 10.5           | 4.0 | 100.0      |

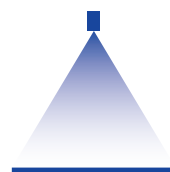
| Ordering no. |                      |          |         |
|--------------|----------------------|----------|---------|
| Type         | Mat. no.             | Code     |         |
|              | 1Y                   | 1/4 BSPP | 1/4 NPT |
|              | Stainless steel 316L |          |         |
| 600.130      | ●                    | AC       | BC      |

Ordering Type + Material no. + Code = Ordering no.  
example: 600.130 + 1Y + AC = 600.130.1Y.AC



Assembly accessories can be found in Chapter 9  
“Accessories”.

# Multi-channel flat fan nozzles for air “Whisperblast”, metal version Series 600.283.42/600.606.42

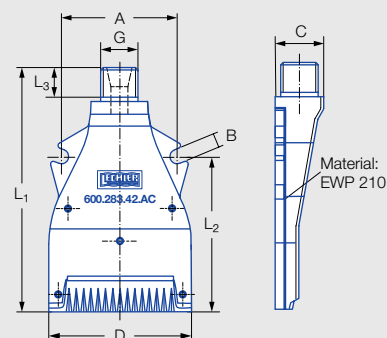


## Features:

- Laminar, powerful air stream
- High blowing force
- For high thermal and mechanical requirements

## Applications:

- Blowing off and out
- Cleaning
- Drying
- Cooling
- Transporting



Series  
600.283.42/600.606.42

<sup>1</sup> Meets OSHA specifications in terms of noise level.

## Cost savings and noise reduction

Series 600.283/  
Series 600.606



Cost savings

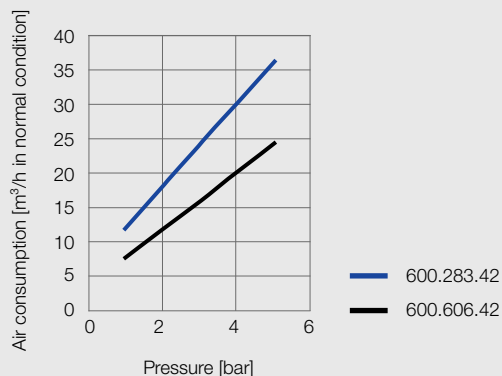
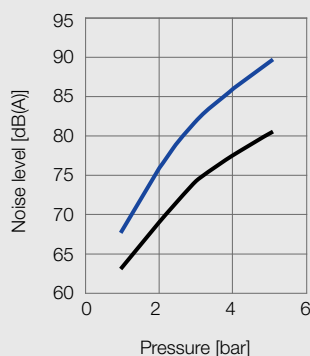
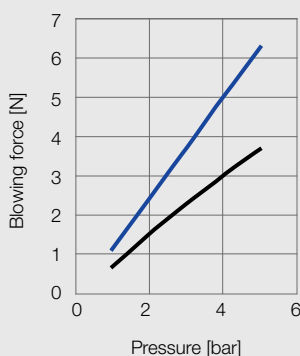
19%  
21%



Noise  
reduction

18%

## Technical data



| Code | G        | Dimensions [mm] |     |      |      |                |                |                | Weight [g] |
|------|----------|-----------------|-----|------|------|----------------|----------------|----------------|------------|
|      |          | A               | B   | C    | D    | L <sub>1</sub> | L <sub>2</sub> | L <sub>3</sub> |            |
| AC   | 1/4 BSPP | 41.0            | 5.1 | 17.0 | 51.0 | 86.5           | 55.0           | 10.5           | 60.0       |
| BC   | 1/4 NPT  | 41.0            | 5.1 | 17.0 | 51.0 | 86.5           | 55.0           | 10.2           | 60.0       |

| Ordering no. |          |          |         |
|--------------|----------|----------|---------|
| Type         | Mat. no. | Code     |         |
|              | 42       | 1/4 BSPP | 1/4 NPT |
|              | Aluminum |          |         |
| 600.283      | ●        | AC       | BC      |
| 600.606      | ●        | AC       |         |

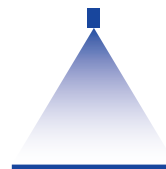
Ordering Type + Material no. + Code = Ordering no.  
example: 600.283 + 42 + AC = 600.283.42.AC



Assembly accessories can be found in Chapter 9  
“Accessories”.



# Multi-channel flat fan nozzles for air “Whisperblast”, stainless steel version Series 600.493.1Y

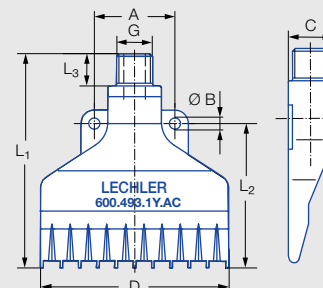


## Features:

- Extremely wide, powerful air stream
- For the highest thermal requirements
- Protecting tips prevent air penetrating your skin

## Applications:

- Blowing off and out
- Cleaning
- Drying



Series 600.493.1Y

## Cost savings and noise reduction



Cost savings

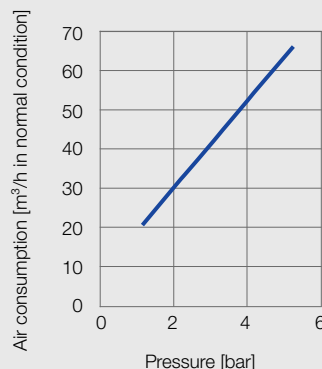
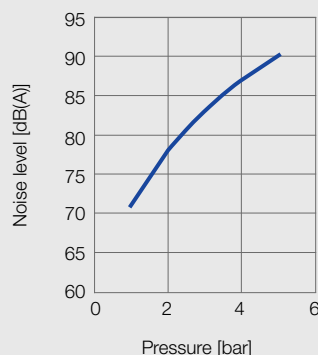
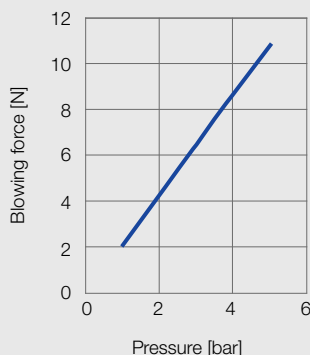
34%



Noise reduction

21%

## Technical data



| Code | G        | Dimensions [mm] |      |      |                |                |                |     | Weight [g] |
|------|----------|-----------------|------|------|----------------|----------------|----------------|-----|------------|
|      |          | A               | C    | D    | L <sub>1</sub> | L <sub>2</sub> | L <sub>3</sub> | Ø B |            |
| AC   | 1/4 BSPP | 30.0            | 16.5 | 70.0 | 79.7           | 53.7           | 12.0           | 4.2 | 130.0      |
| BC   | 1/4 NPT  | 30.0            | 16.5 | 70.0 | 79.7           | 53.7           | 12.0           | 4.2 | 130.0      |

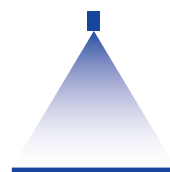
| Ordering no. |                      |          |         |
|--------------|----------------------|----------|---------|
| Type         | Mat. no.             | Code     |         |
|              | 1Y                   | 1/4 BSPP | 1/4 NPT |
|              | Stainless steel 316L |          |         |
| 600.493      | ●                    | AC       | BC      |

Ordering Type + Material no. + Code = Ordering no.  
example: 600.493 + 1Y + AC = 600.493.1Y.AC



Assembly accessories can be found in Chapter 9 “Accessories”.

# Multi-channel flat fan nozzles for air “Whisperblast”, stainless steel version Series 600.562.1Y



## Features:

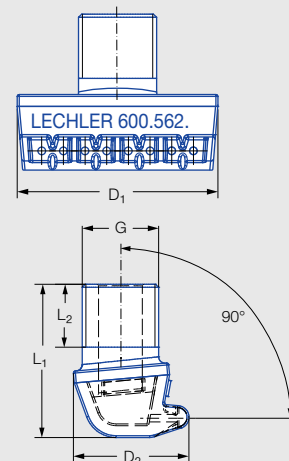
- Compact, powerful air stream
- Angled design for applications with restricted installation conditions
- Resistant to higher pressures and temperatures
- Protecting tips prevent air penetrating your skin

## Applications:

- Blowing off and out
- Cleaning
- Drying



Series 600.562.1Y



## Cost savings and noise reduction



Cost savings

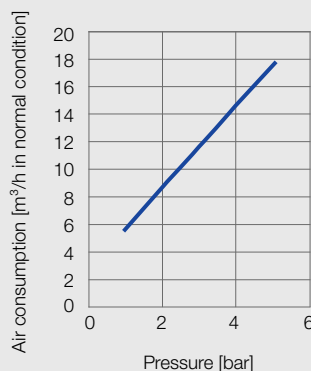
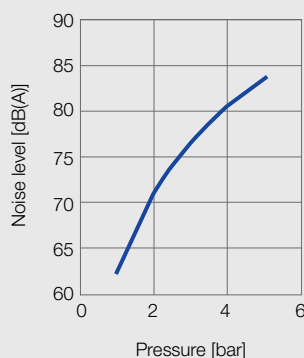
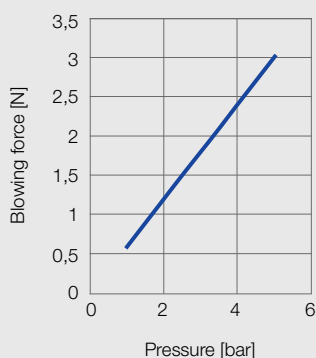
8%



Noise reduction

14%

## Technical data



| Code | G        | Dimensions [mm] |                |                |                | Weight [g] |
|------|----------|-----------------|----------------|----------------|----------------|------------|
|      |          | D <sub>1</sub>  | D <sub>2</sub> | L <sub>1</sub> | L <sub>2</sub> |            |
| 10   | 1/8 BSPP | 25.0            | 14.7           | 19.5           | 8.0            | 17.0       |
| 20   | 1/8 NPT  | 25.0            | 14.7           | 19.5           | 6.7            | 17.0       |

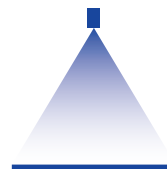
| Ordering no. |                      |          |         |
|--------------|----------------------|----------|---------|
| Type         | Mat. no.             | Code     |         |
|              | 1Y                   | 1/8 BSPP | 1/8 NPT |
|              | Stainless steel 316L |          |         |
| 600.562      | ●                    | 10       | 20      |

Ordering Type + Material no. + Code = Ordering no.  
example: 600.562 + 1Y + 10 = 600.562.1Y.10



Assembly accessories can be found in Chapter 9 “Accessories”.

# Flat fan nozzles for air or saturated steam Series 679



## Features:

- Wide, powerful air stream
- Assembly with retaining nut
- Easy nozzle changing
- Simple jet alignment

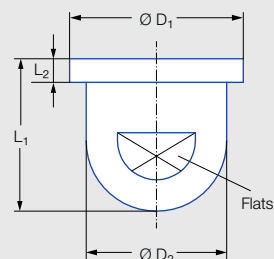
## Applications:

- Blowing off liquids
- Cooling
- Heating
- Drying



OSHA<sup>1</sup>

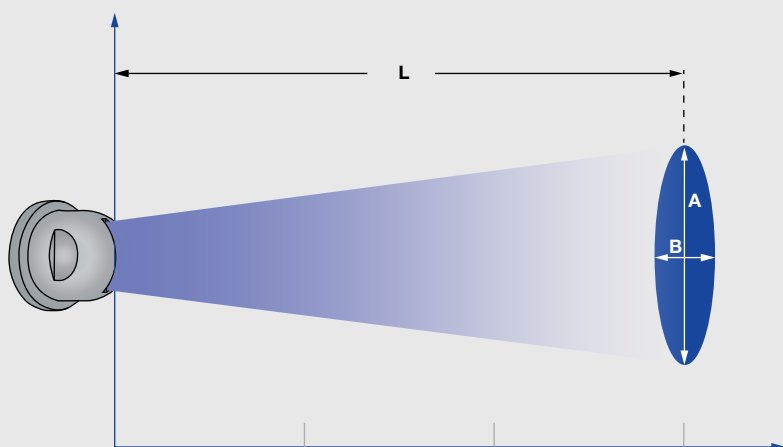
FDA<sup>2</sup>



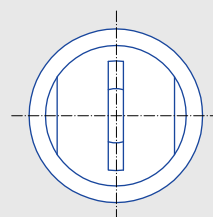
## Series 679

<sup>1</sup> Meets OSHA specifications in terms of noise level.

<sup>2</sup> Only applies to the stainless variant.



Jet pattern of series 679



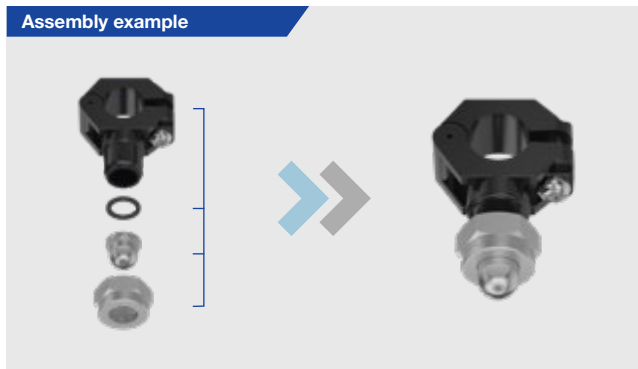
| Pressure |               | 1 bar | 3 bar | 5 bar |
|----------|---------------|-------|-------|-------|
| 679.037  | Length L [mm] | 50    | 100   | 150   |
|          | A [mm]        | 110   | 260   | 380   |
|          | B [mm]        | 25    | 35    | 45    |
| 679.117  | Length L [mm] | 50    | 125   | 150   |
|          | A [mm]        | 100   | 250   | 310   |
|          | B [mm]        | 25    | 30    | 35    |
| 679.255  | Length L [mm] | 375   | 500   | 500   |
|          | A [mm]        | 90    | 190   | 280   |
|          | B [mm]        | 90    | 90    | 90    |

| Pressure |               | 1 bar | 3 bar | 5 bar |
|----------|---------------|-------|-------|-------|
| 679.415  | Length L [mm] | 675   | 900   | 900   |
|          | A [mm]        | 160   | 300   | 460   |
|          | B [mm]        | 215   | 215   | 215   |
| 679.495  | Length L [mm] | 900   | 900   | 900   |
|          | A [mm]        | 200   | 425   | 510   |
|          | B [mm]        | 230   | 230   | 230   |

| Code                                 | Dimensions [mm] |                |                  |                  |       | Weight [g] (brass) |
|--------------------------------------|-----------------|----------------|------------------|------------------|-------|--------------------|
|                                      | L <sub>1</sub>  | L <sub>2</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> | Flats |                    |
| Assembly with retaining nut 3/8 BSPP | 13.0            | 2.0            | 14.8             | 12.0             | 10    | 8.0                |

| Spray angle         | Ordering no. |                       |       | Equivalent bore diameter<br>B<br>[mm] | Ṽ <sub>n</sub> air [m³/h] |      |      |       | Ṁ saturated steam [kg/h] |      |      |      |
|---------------------|--------------|-----------------------|-------|---------------------------------------|---------------------------|------|------|-------|--------------------------|------|------|------|
|                     | Type         | Mat. no.              |       |                                       | p [bar]                   |      |      |       | p [bar]                  |      |      |      |
|                     |              | 17                    | 30    |                                       |                           |      |      |       |                          |      |      |      |
|                     |              | Stainless steel 316Ti | Brass |                                       |                           |      |      |       |                          |      |      |      |
|                     |              |                       |       |                                       | 0.5                       | 2.0  | 5.0  | 10.0  | 0.5                      | 2.0  | 5.0  | 10.0 |
| Approx.<br>70°– 90° | 679.037      |                       | ●     | 1.2                                   | 1.5                       | 3.0  | 6.0  | 11.0  | 1.2                      | 2.3  | 4.6  | 8.3  |
|                     | 679.085      | ●                     | ●     | 1.3                                   | 2.0                       | 4.0  | 8.0  | 14.7  | 1.6                      | 3.1  | 6.1  | 11.1 |
|                     | 679.117      | ●                     | ●     | 1.5                                   | 2.1                       | 4.2  | 8.4  | 15.4  | 1.7                      | 3.3  | 6.5  | 11.7 |
|                     | 679.165      | ●                     | ●     | 1.8                                   | 2.6                       | 5.1  | 10.3 | 18.8  | 2.0                      | 4.1  | 8.0  | 14.3 |
|                     | 679.255      | ●                     | ●     | 2.1                                   | 3.6                       | 7.3  | 14.5 | 26.6  | 2.8                      | 5.7  | 11.2 | 20.2 |
|                     | 679.365      | ●                     | ●     | 2.8                                   | 6.3                       | 12.7 | 25.4 | 46.5  | 5.0                      | 10.0 | 19.6 | 35.3 |
|                     | 679.415      | ●                     | ●     | 3.6                                   | 10.2                      | 20.3 | 40.7 | 74.6  | 8.0                      | 16.0 | 31.4 | 56.7 |
|                     | 679.495      | ●                     | ●     | 4.3                                   | 15.6                      | 31.1 | 62.2 | 114.0 | 12.4                     | 24.8 | 48.5 | 87.6 |

## Assembly example

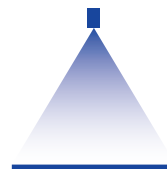


Ordering    Type    +    Material no.    =    Ordering no.  
 example: 679.037    +    30    =    679.037.30



Assembly accessories can be found in Chapter 9 "Accessories".

# Flat fan tongue-type nozzles for air or saturated steam Series 686



## Features:

- Wide, powerful air stream
- Compact design
- Large spray width, also for short blowing distances
- Brass and stainless steel versions available for high ambient temperatures

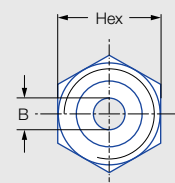
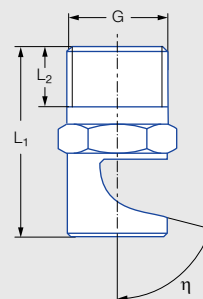
## Applications:

- Blowing off liquids
- Cooling
- Heating
- Drying



OSHA<sup>1</sup>

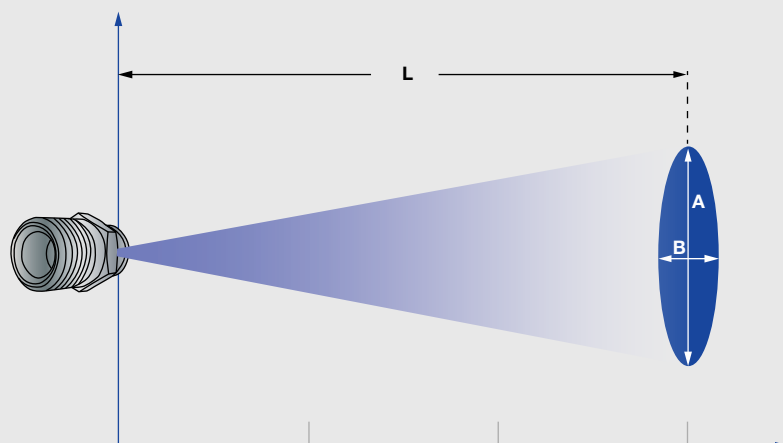
FDA<sup>2</sup>



## Series 686

<sup>1</sup> Meets OSHA specifications in terms of noise level.

<sup>2</sup> Only applies to the stainless variant.



Jet pattern of series 686

| Pressure |               | 1 bar | 3 bar | 5 bar |
|----------|---------------|-------|-------|-------|
| 686.408  | Length L [mm] | 40    | 80    | 125   |
|          | A [mm]        | 35    | 50    | 60    |
|          | B [mm]        | 15    | 40    | 50    |
| 686.528  | Length L [mm] | 60    | 100   | 150   |
|          | A [mm]        | 75    | 140   | 210   |
|          | B [mm]        | 20    | 40    | 50    |
| 686.608  | Length L [mm] | 90    | 175   | 250   |
|          | A [mm]        | 145   | 230   | 350   |
|          | B [mm]        | 25    | 45    | 55    |

| Pressure |               | 1 bar | 3 bar | 5 bar |
|----------|---------------|-------|-------|-------|
| 686.688  | Length L [mm] | 150   | 400   | 525   |
|          | A [mm]        | 230   | 560   | 740   |
|          | B [mm]        | 40    | 80    | 100   |
| 686.728  | Length L [mm] | 180   | 230   | 375   |
|          | A [mm]        | 170   | 360   | 530   |
|          | B [mm]        | 50    | 50    | 70    |

| G        | Dimensions [mm] |                |     | Weight [g] (brass) |
|----------|-----------------|----------------|-----|--------------------|
|          | L <sub>1</sub>  | L <sub>2</sub> | Hex |                    |
| 1/8 BSPT | 23.0            | 6.5            | 11  | 18.0               |

| Spray angle     | η   | Ordering no. |                     |       |      | Bore diameter B<br>[mm] | Ṽ <sub>n</sub> air [m³/h] |       |       |       | Ṁ saturated steam [kg/h] |       |       |       |
|-----------------|-----|--------------|---------------------|-------|------|-------------------------|---------------------------|-------|-------|-------|--------------------------|-------|-------|-------|
|                 |     | Type         | Mat. no.            |       | Code |                         | p [bar]                   |       |       |       | p [bar]                  |       |       |       |
|                 |     |              | 16                  | 30    |      |                         |                           |       |       |       |                          |       |       |       |
|                 |     |              | Stainless steel 303 | Brass |      |                         | 1/8 BSPT                  | 1.0   | 2.0   | 5.0   | 10.0                     | 0.5   | 2.0   | 5.0   |
| Approx. 27°–47° | 75° | 686.408      | ●                   | ●     | CA   | 1.00                    | 1.07                      | 1.60  | 3.20  | 5.86  | 0.88                     | 1.31  | 2.57  | 4.64  |
|                 | 75° | 686.488      | ●                   | ●     | CA   | 1.30                    | 1.76                      | 2.64  | 5.29  | 9.69  | 1.46                     | 2.17  | 4.25  | 7.67  |
| Approx. 70°     | 75° | 686.528      | ●                   | ●     | CA   | 1.50                    | 2.2                       | 3.31  | 6.61  | 12.13 | 1.83                     | 2.71  | 5.31  | 9.59  |
|                 | 75° | 686.568      | ●                   | ●     | CA   | 1.70                    | 2.73                      | 4.09  | 8.19  | 15.01 | 2.27                     | 3.36  | 6.57  | 11.87 |
|                 | 75° | 686.608      | ●                   | ●     | CA   | 1.90                    | 3.35                      | 5.02  | 10.04 | 18.40 | 2.78                     | 4.11  | 8.06  | 14.55 |
|                 | 75° | 686.688      | ●                   | ●     | CA   | 2.40                    | 5.45                      | 8.18  | 16.36 | 30.00 | 4.53                     | 6.71  | 13.14 | 23.72 |
|                 | 75° | 686.728      | ●                   | ●     | CA   | 2.70                    | 6.88                      | 10.33 | 20.65 | 37.86 | 5.71                     | 8.46  | 16.58 | 29.94 |
|                 | 75° | 686.808      | ●                   | ●     | CA   | 3.40                    | 10.89                     | 16.33 | 32.66 | 59.87 | 9.04                     | 13.28 | 26.22 | 47.35 |

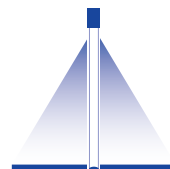
Ordering Type + Material no. + Code = Ordering no.  
 example: 686.408 + 16 + CA = 686.408.16.CA



Assembly accessories can be found in Chapter 9 "Accessories".

# Multi-channel round jet nozzles for air, plastic version

## Series 600.326.5K/600.725.5K

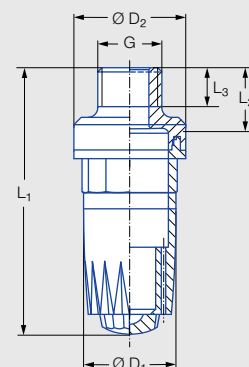


### Features:

- Powerful, circular air stream
- Low noise level
- Reduced air consumption

### Applications:

- Targeted blowing off and blowing out (e.g. in connection with a compressed air gun)



Series  
600.326.5K/600.725.5K

### Cost savings and noise reduction



Cost savings

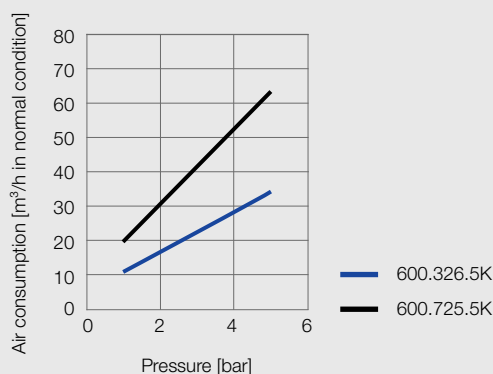
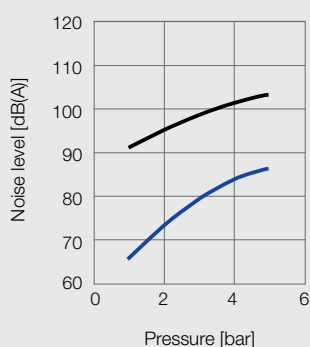
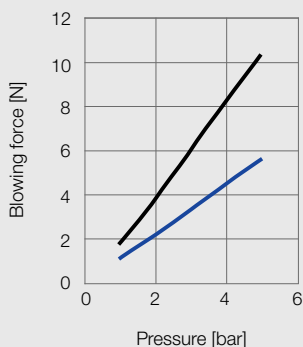
9%



Noise reduction

17%

### Technical data



| Code | G          | Dimensions [mm] |                |                |                  |                  | Weight [g] |
|------|------------|-----------------|----------------|----------------|------------------|------------------|------------|
|      |            | L <sub>1</sub>  | L <sub>2</sub> | L <sub>3</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> |            |
| AA   | 1/8 BSPP   | 54.0            | 9.5            | 6.2            | 19.0             | 23.0             | 7.0        |
| AC   | 1/4 BSPP   | 55.0            | 10.2           | 8.0            | 19.0             | 23.0             | 7.0        |
| BA   | 1/8 NPT    | 54.0            | 9.5            | 6.7            | 19.0             | 23.0             | 7.0        |
| BC   | 1/4 NPT    | 55.0            | 10.2           | 9.7            | 19.0             | 23.0             | 7.0        |
| HG   | M12 x 1.25 | 55.0            | 10.2           | 8.0            | 19.0             | 23.0             | 7.0        |

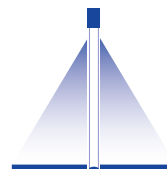
| Ordering no. |          |          |          |         |         |            |
|--------------|----------|----------|----------|---------|---------|------------|
| Type         | Mat. no. | Code     |          |         |         |            |
|              | ABS      | 1/8 BSPP | 1/4 BSPP | 1/8 NPT | 1/4 NPT | M12 x 1.25 |
| 600.326.5K   | ●        | AA       | AC       | BA      | BC      | HG         |
| 600.725.5K   | ●        |          | AC       |         | BC      |            |

Ordering Type + Code = Ordering no.  
example: 600.326.5K + AA = 600.326.5K.AA



Assembly accessories can be found in Chapter 9 "Accessories".

# Multi-channel round jet nozzles for air, zinc version Series 600.326.3W



## Features:

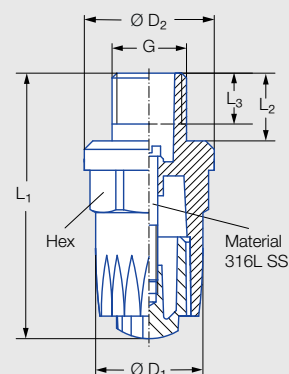
- Powerful, circular air stream
- Low noise level
- Reduced air consumption
- Zinc version: Use at high pressure and temperature levels

## Applications:

- Targeted blowing off and blowing out (e.g. in connection with a compressed air gun)



Series 600.326.3W



## Cost savings and noise reduction



Cost savings

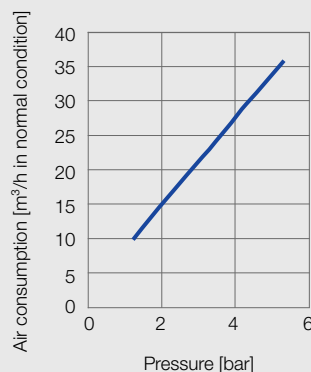
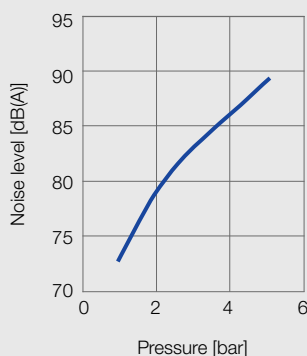
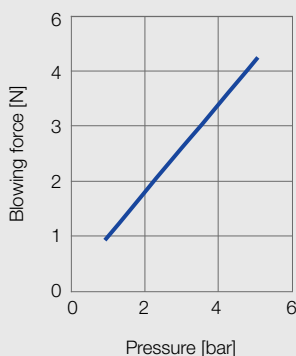
8%



Noise reduction

17%

## Technical data



| Code | G          | Dimensions [mm] |                |                |                  |                  |     | Weight [g] |
|------|------------|-----------------|----------------|----------------|------------------|------------------|-----|------------|
|      |            | L <sub>1</sub>  | L <sub>2</sub> | L <sub>3</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> | Hex |            |
| AC   | 1/4 BSPP   | 47.0            | 12.0           | 9.0            | 19.0             | 23.0             | 19  | 50.0       |
| BC   | 1/4 NPT    | 47.0            | 12.0           | 10.2           | 19.0             | 23.0             | 19  | 50.0       |
| HG   | M12 x 1.25 | 47.0            | 12.0           | 9.5            | 19.0             | 23.0             | 19  | 50.0       |

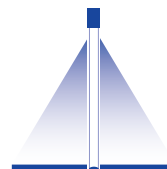
| Ordering no. |          |          |         |            |
|--------------|----------|----------|---------|------------|
| Type         | Mat. no. | Code     |         |            |
|              | Zinc     | 1/4 BSPP | 1/4 NPT | M12 x 1.25 |
| 600.326.3W   | ●        | AC       | BC      | HG         |

Ordering Type + Code = Ordering no.  
 example: 600.326.3W + AC = 600.326.3W.AC



Assembly accessories can be found in Chapter 9 "Accessories".

# Mini multi-channel round jet nozzles for air Series 600.388.30

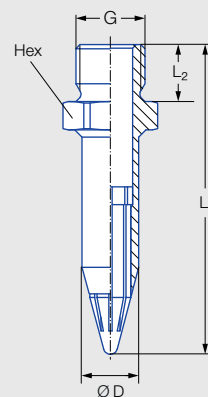


## Features:

- Powerful, punctiform air stream for large distances
- Compact design
- Low noise level
- Reduced air consumption
- Particularly suitable for difficult-to-reach locations

## Applications:

- Targeted blowing off and blowing out (e.g. in connection with a compressed air gun)



Series 600.388.30

## Cost savings and noise reduction



Cost savings

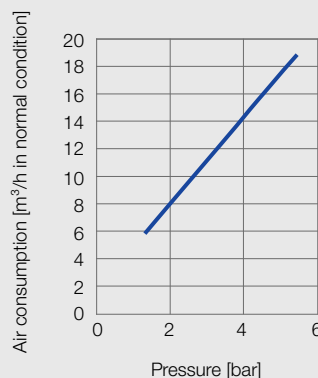
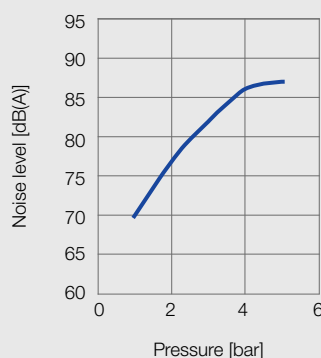
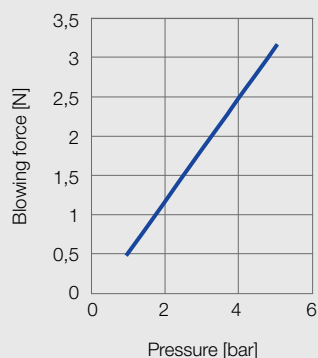
7%



Noise reduction

8%

## Technical data



| Code | G          | Dimensions [mm] |                |     |     | Weight [g] |
|------|------------|-----------------|----------------|-----|-----|------------|
|      |            | L <sub>1</sub>  | L <sub>2</sub> | Ø D | Hex |            |
| AA   | 1/8 BSPP   | 43.5            | 8.0            | 8.0 | 12  | 12.0       |
| BA   | 1/8 NPT    | 44.0            | 6.7            | 8.0 | 12  | 12.0       |
| HG   | M12 x 1.25 | 43.5            | 8.0            | 8.0 | 17  | 20.0       |

| Ordering no. |               |          |         |            |
|--------------|---------------|----------|---------|------------|
| Type         | Mat. no.      | Code     |         |            |
|              | Brass,<br>POM | 1/8 BSPP | 1/8 NPT | M12 x 1.25 |
| 600.388.30   | ●             | AA       | BA      | HG         |

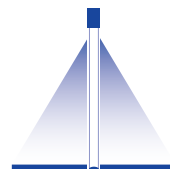
Ordering Type + Code = Ordering no.  
example: 600.388.30 + AA = 600.388.30.AA



Assembly accessories can be found in Chapter 9 "Accessories".

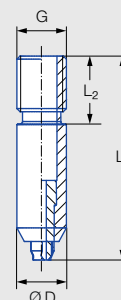
# Micro multi-channel round jet nozzles for air

## Series 600.625.1Y



### Features:

- Powerful, punctiform air stream
- Ultra-compact design for difficult-to-reach locations
- Low noise level
- Reduced air consumption
- For the highest thermal requirements



### Applications:

- Targeted blowing off and blowing out

Series 600.625.1Y

### Cost savings and noise reduction



Cost savings

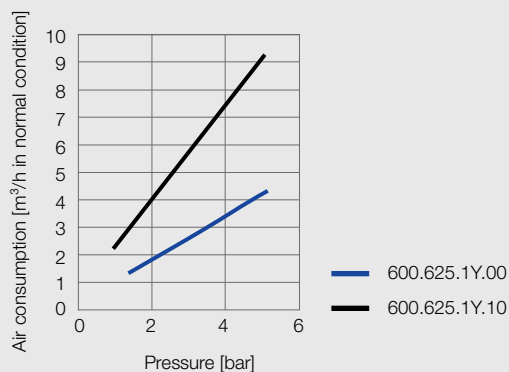
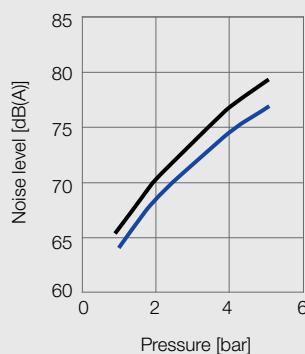
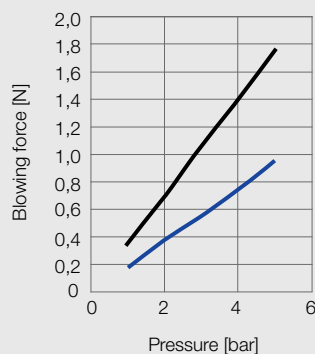
10%



Noise reduction

6%

### Technical data



| Code | G        | Dimensions [mm] |                |     | Weight [g] |
|------|----------|-----------------|----------------|-----|------------|
|      |          | L <sub>1</sub>  | L <sub>2</sub> | Ø D |            |
| 00   | M4 x 0.5 | 16.5            | 5.5            | 4.0 | 1.0        |
| 10   | M5 x 0.5 | 16.5            | 5.5            | 5.0 | 1.0        |

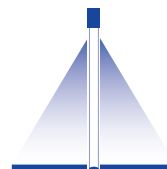
| Ordering no. |                      |          |          |
|--------------|----------------------|----------|----------|
| Type         | Mat. no.             | Code     |          |
|              | 1Y                   | M4 x 0.5 | M5 x 0.5 |
|              | Stainless steel 316L |          |          |
| 600.625      | ●                    | 00       | 10       |

Ordering Type + Material no. + Code = Ordering no.  
example: 600.625 + 1Y + 00 = 600.625.1Y.00



Assembly accessories can be found in Chapter 9 "Accessories".

# Solid stream nozzles for air or saturated steam Series 544



## Features:

- Powerful, punctiform air stream
- Stainless steel version for higher ambient temperatures

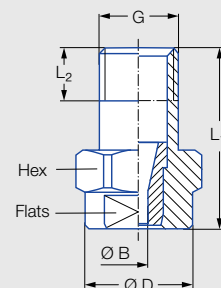
## Applications:

- Targeted blowing off and blowing out



OSHA<sup>1</sup>

FDA



## Series 544

<sup>1</sup> Meets OSHA specifications in terms of noise level.

| Code      | G        | Dimensions [mm] |                |      |     |       | Weight [g] |
|-----------|----------|-----------------|----------------|------|-----|-------|------------|
|           |          | L <sub>1</sub>  | L <sub>2</sub> | Ø D  | Hex | Flats |            |
| <b>CA</b> | 1/8 BSPT | 22.0            | 6.5            | 13.0 | 14  | 10    | 14.0       |
| <b>CC</b> | 1/4 BSPT | 22.0            | 10.0           | 13.0 | 14  | 10    | 16.0       |

| Ordering no. |                        |          |          | Bore diameter<br>B<br>[mm] | V <sub>n</sub> air [m³/h] |       |       |       | M saturated steam [kg/h] |       |       |       |
|--------------|------------------------|----------|----------|----------------------------|---------------------------|-------|-------|-------|--------------------------|-------|-------|-------|
| Type         | Mat. no.               | Code     |          |                            | p [bar]                   |       |       |       | p [bar]                  |       |       |       |
|              | 16                     |          |          |                            |                           |       |       |       |                          |       |       |       |
|              | Stainless<br>steel 303 | 1/8 BSPT | 1/4 BSPT |                            | 1.0                       | 2.0   | 3.0   | 5.0   | 1.0                      | 2.0   | 3.0   | 5.0   |
| 544.360      | ●                      | CA       | CC       | 1.05                       | 0.93                      | 1.40  | 1.92  | 2.88  | 0.77                     | 1.14  | 1.64  | 2.42  |
| 544.400      | ●                      | CA       | CC       | 1.30                       | 1.43                      | 2.14  | 2.94  | 4.41  | 1.18                     | 1.75  | 2.51  | 3.71  |
| 544.480      | ●                      | CA       | CC       | 1.33                       | 1.67                      | 2.51  | 3.42  | 5.13  | 1.39                     | 2.06  | 2.92  | 4.23  |
| 544.560      | ●                      | CA       | CC       | 1.69                       | 2.58                      | 3.87  | 5.27  | 7.90  | 2.14                     | 3.18  | 4.50  | 6.66  |
| 544.640      | ●                      | CA       | CC       | 2.09                       | 4.33                      | 6.50  | 8.81  | 13.22 | 3.60                     | 5.33  | 7.52  | 11.13 |
| 544.720      | ●                      | CA       | CC       | 2.66                       | 6.85                      | 10.27 | 14.00 | 21.02 | 5.68                     | 8.42  | 11.96 | 17.70 |
| 544.800      | ●                      | CA       | CC       | 3.30                       | 10.75                     | 16.12 | 21.87 | 32.81 | 8.92                     | 13.21 | 18.66 | 27.63 |

Ordering Type + Material no. + Code = Ordering no.  
example: 544.360 + 16 + CA = 544.360.16.CA



Assembly accessories can be found in Chapter 9 "Accessories".

# Cluster solid stream nozzles for air or saturated steam

## Series 540/541

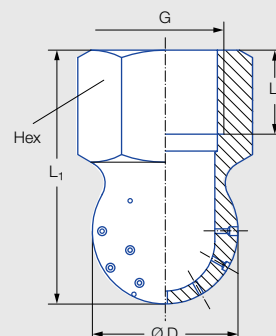
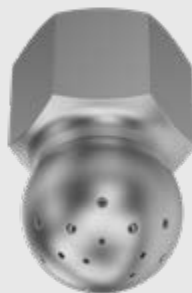


### Features:

- Powerful round jet through 40 individual bore holes
- Delivery of media at an angle of approx. 240°
- Suitable for use in difficult conditions
- Suitable for immersion in liquid media

### Applications:

- Injection of steam into liquids
- Injection of compressed air into bulk goods
- Injection of gas (acid and neutralization baths)



Series 540/541

| G        | Dimensions [mm] |                |      |     | Weight [g] |
|----------|-----------------|----------------|------|-----|------------|
|          | L <sub>1</sub>  | L <sub>2</sub> | Ø D  | Hex |            |
| 1/2 BSPP | 45.0            | 15.0           | 26.0 | 27  | 100.0      |

| Spray angle  | Ordering no. |                     | Bore diameter B [mm] | V <sub>n</sub> air [m³/h] |        |        |        | M saturated steam [kg/h] |        |        |        |
|--------------|--------------|---------------------|----------------------|---------------------------|--------|--------|--------|--------------------------|--------|--------|--------|
|              | Type         | Mat. no.            |                      | p [bar]                   |        |        |        | p [bar]                  |        |        |        |
|              |              | 16                  |                      |                           |        |        |        |                          |        |        |        |
|              |              | Stainless steel 303 |                      | 1.0                       | 2.0    | 3.0    | 5.0    | 1.0                      | 2.0    | 3.0    | 5.0    |
| Approx. 240° | 540.909      | ●                   | 0.80                 | 22.80                     | 34.20  | 45.50  | 68.30  | 18.10                    | 26.90  | 35.50  | 52.70  |
|              | 540.989      | ●                   | 1.00                 | 35.50                     | 53.30  | 71.00  | 106.50 | 28.20                    | 41.70  | 55.10  | 81.70  |
|              | 541.109      | ●                   | 1.50                 | 83.30                     | 124.90 | 166.50 | 249.80 | 66.00                    | 97.70  | 129.20 | 191.60 |
|              | 541.189      | ●                   | 2.00                 | 129.70                    | 194.50 | 259.30 | 389.00 | 103.00                   | 152.60 | 201.70 | 299.10 |
|              | 541.239      | ●                   | 2.30                 | 167.20                    | 250.80 | 334.30 | 501.50 | 133.20                   | 197.30 | 260.80 | 386.60 |

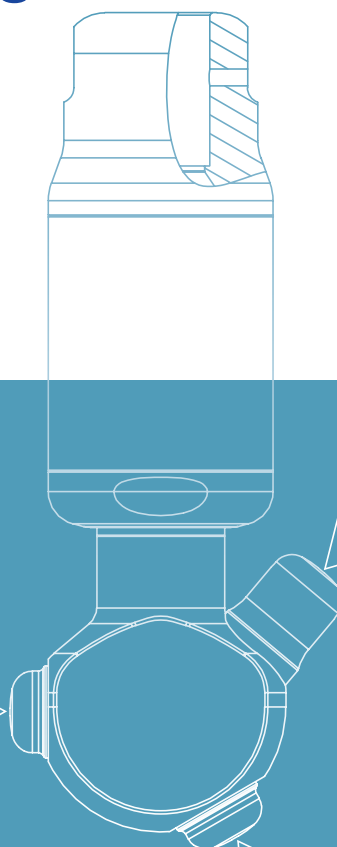
Ordering Type + Material no. = Ordering no.  
example: 540.909 + 16 = 540.909.16



Assembly accessories can be found in Chapter 9 "Accessories".



## TANK CLEANING NOZZLES



# TANK CLEANING NOZZLES

## GENERAL INFORMATION



### Static

Static spray balls do not rotate and therefore require considerably more liquid for cleaning processes. They are used primarily for rinsing tanks. Spray balls are a very robust and cost effective solution used in many processes.



### Free-spinning

Free spinning devices utilize spray nozzles that are engineered in a specific position to allow the fluid to drive/rotate the spray head. The repeated impacts of the spray remove the soil and rinse it from the tank surface. This results in optimum cleaning efficiency at low pressures in small to medium-sized tanks.



### Controlled rotation

The rotating head is driven by the fluid. A turbine wheel with an internal gear is used to control the rotation. This ensures that the speed remains in the optimum range even at higher pressures. The generated droplets are larger and impact the tank wall at higher speed. These rotating cleaning nozzles thus achieve an even higher impact which is especially important for large tanks.



### Gear-controlled

The cleaning fluid drives an internal gear by means of a turbine wheel so that the spray head rotates around two axes. The solid jet nozzles mounted on the spray head produces powerful solid stream like jets. These solid jets sweep the entire tank surface in a pre-programmed, model-specific pattern during a spray cycle. This requires a certain minimum time. These models generate the highest impact and are ideal for very large tanks and the toughest cleaning tasks.

## Materials



Lechler tank cleaning nozzles are made of high quality materials such as Stainless steel 316L, PVDF, PEEK or PTFE. In addition to the require-

ments for material resistance and wear, the materials must also be food grade for use in the beverage, food and pharmaceutical industries.

A large number of the materials used for Lechler tank cleaning nozzles comply with the requirements of the FDA or conform to regulation (EC) 1935/2004.

## Hygienic requirements



All Lechler precision nozzles for tank cleaning are designed to meet hygiene requirements. In addition, Lechler also offers special nozzles for particularly stringent hygienic applications, certified to 3-A.

## ATEX



Lechler offers several nozzle series designed especially for use in explosive atmospheres.

**The respective logo on the product pages indicates which requirements are met.**

## Good to know

Detailed information can be found in our brochure "Tank and Equipment Cleaning" as well as at [www.lechler.com/de-en/tankcleaningnozzles](http://www.lechler.com/de-en/tankcleaningnozzles).

## Cleaning efficiency classes 1 to 5



### Cleaning efficiency classes

Lechler precision nozzles for tank and equipment cleaning are divided into five different cleaning efficiency classes. This is intended to help users find the right nozzle for the respective application quickly.

Every nozzle from Lechler is assigned to a class. The respective class is suitable for specific cleaning tasks.

Dependant upon the application, several cleaning classes can be suitable to the task of removing soils from your application. Generally, it is not possible to quantify and/or differentiate between soil types. The information should be seen as a guide intended to make it easier in the selection to finding the right nozzle.

The first step is to find a cleaning efficiency class suitable for the task. If your application is to clean a non-adhering pow-

der material from a tank surface the cleaning task can be defined as "rinsing". The nozzle series in cleaning efficiency class 1, e.g. static spray ball, or class 2, e.g. MicroWhirly or MiniSpinner, would be suitable for rinsing/washing cycle.

Taking into account the maximum possible tank diameter and the flow rate range, the tables on the following pages can be used to quickly narrow down the suitable nozzles. If the focus is on a low purchase price in the above referenced example, a spray ball should be chosen. If you want to save on your cost-intensive cleaning media, the MicroWhirly or MiniSpinner would be recommended.

If there is no recommended series for the tank diameter, several nozzles can be positioned in the tank to ensure that the distance between nozzle and tank is within the required dimensions.

### Simulation software

Various inserts, such as agitators or mixing blades, can cause spray shadows. To find the ideal nozzle for such complex challenges, we have developed TankClean. The software simulates the use of various tank cleaning nozzles. The tank geometry is freely definable. As a result, subsequent cleaning can already be optimized in the planning phase.

# TankClean



**Function video**  
[www.lechler.com/tankclean](http://www.lechler.com/tankclean)  
Or scan the QR code.

# TANK CLEANING NOZZLES

## OVERVIEW OF SERIES



|                                                                                                           |                                                                                     | Cleaning efficiency class 1                                                       |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                                                                                                           |                                                                                     |  |  |  |  |  |
| Series                                                                                                    |                                                                                     | 540/541                                                                           | 5B2/5B3                                                                           | 500.234                                                                             | 566                                                                                 | 500.186                                                                             |
| Information on page                                                                                       |                                                                                     | 188                                                                               | 189                                                                               | 191                                                                                 | 192                                                                                 | 194                                                                                 |
| Type                                                                                                      |                                                                                     | Static spray ball                                                                 | Static spray ball                                                                 | Rotating cleaning nozzle                                                            | Rotating cleaning nozzle                                                            | Rotating cleaning nozzle                                                            |
| Operating principle                                                                                       | Static                                                                              | •                                                                                 | •                                                                                 |                                                                                     |                                                                                     |                                                                                     |
|                                                                                                           | Free-spinning                                                                       |                                                                                   |                                                                                   | •                                                                                   | •                                                                                   | •                                                                                   |
|                                                                                                           | Controlled rotation                                                                 |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
|                                                                                                           | Gear-controlled                                                                     |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| <br>Max. tank diameter | Very small<br>(up to ≈ 1 m)                                                         | •                                                                                 | •                                                                                 | •                                                                                   | •                                                                                   | •                                                                                   |
|                                                                                                           | Small<br>(up to ≈ 2 m)                                                              | •                                                                                 | •                                                                                 |                                                                                     | •                                                                                   |                                                                                     |
|                                                                                                           | Medium<br>(up to ≈ 3 m)                                                             | •                                                                                 | •                                                                                 |                                                                                     |                                                                                     |                                                                                     |
|                                                                                                           | Large<br>(up to ≈ 8 m)                                                              | •                                                                                 | •                                                                                 |                                                                                     |                                                                                     |                                                                                     |
|                                                                                                           | Very large<br>(> 8 m)                                                               | •                                                                                 |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| <br>Flow rate          | Very low<br>(up to ≈ 25 l/min)                                                      | •                                                                                 | •                                                                                 | •                                                                                   | •                                                                                   | •                                                                                   |
|                                                                                                           | Low<br>(up to ≈ 50 l/min)                                                           | •                                                                                 | •                                                                                 |                                                                                     |                                                                                     |                                                                                     |
|                                                                                                           | Medium<br>(up to ≈ 100 l/min)                                                       | •                                                                                 | •                                                                                 |                                                                                     |                                                                                     |                                                                                     |
|                                                                                                           | High<br>(up to ≈ 400 l/min)                                                         |                                                                                   | •                                                                                 |                                                                                     |                                                                                     |                                                                                     |
|                                                                                                           | Very high<br>(up to ≈ 700 l/min)                                                    |                                                                                   | •                                                                                 |                                                                                     |                                                                                     |                                                                                     |
| <br>Nozzle material    | Stainless steel                                                                     | •                                                                                 | •                                                                                 | •                                                                                   | •                                                                                   |                                                                                     |
|                                                                                                           | Plastic                                                                             |                                                                                   |                                                                                   |                                                                                     |                                                                                     | •                                                                                   |
| <br>Nozzle connection  | Thread                                                                              | •                                                                                 |                                                                                   | •                                                                                   | •                                                                                   | •                                                                                   |
|                                                                                                           | Slip-on connection                                                                  |                                                                                   | •                                                                                 |                                                                                     |                                                                                     |                                                                                     |
|                                                                                                           | Tri-Clamp                                                                           |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |
| ATEX available                                                                                            |  |                                                                                   |                                                                                   |                                                                                     | •                                                                                   |                                                                                     |

## Cleaning efficiency class 2

|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |
| <b>500.191</b>                                                                   | <b>5M1</b>                                                                        | <b>5M2</b>                                                                        | <b>5M3</b>                                                                        | <b>5M4</b>                                                                        | <b>573/583</b>                                                                      | <b>5P2/5P3</b>                                                                      |
| 195                                                                              | 196                                                                               | 198                                                                               | 200                                                                               | 202                                                                               | 204                                                                                 | 206                                                                                 |
| Rotating cleaning nozzle                                                         | Rotating cleaning nozzle                                                          | Rotating cleaning nozzle                                                          | Rotating cleaning nozzle                                                          | Rotating cleaning nozzle                                                          | Rotating cleaning nozzle                                                            | Rotating cleaning nozzle                                                            |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| •                                                                                | •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                   | •                                                                                   |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| •                                                                                | •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                   | •                                                                                   |
|                                                                                  |                                                                                   | •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                   | •                                                                                   |
|                                                                                  |                                                                                   |                                                                                   | •                                                                                 | •                                                                                 | •                                                                                   |                                                                                     |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   | •                                                                                 |                                                                                     |                                                                                     |
| •                                                                                | •                                                                                 | •                                                                                 |                                                                                   |                                                                                   |                                                                                     | •                                                                                   |
|                                                                                  |                                                                                   | •                                                                                 | •                                                                                 |                                                                                   | •                                                                                   | •                                                                                   |
|                                                                                  |                                                                                   |                                                                                   | •                                                                                 | •                                                                                 | •                                                                                   |                                                                                     |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   | •                                                                                 |                                                                                     |                                                                                     |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |
| •                                                                                | •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                 |                                                                                     | •                                                                                   |
| •                                                                                |                                                                                   |                                                                                   |                                                                                   |                                                                                   | •                                                                                   |                                                                                     |
| •                                                                                | •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                   |                                                                                     |
|                                                                                  |                                                                                   | •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                   |                                                                                     |
|                                                                                  |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     | •                                                                                   |
|                                                                                  | •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                 |                                                                                     | •                                                                                   |



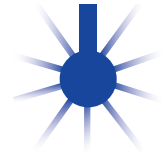


|                                                                                                           |                                                                                     | Cleaning efficiency class 3                                                       |                                                                                     |                                                                                     |  |
|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|                                                                                                           |                                                                                     |  |  |  |  |
| Series                                                                                                    |                                                                                     | 594/595                                                                           | 5W9                                                                                 | 577                                                                                 |  |
| Information on page                                                                                       |                                                                                     | 208                                                                               | 210                                                                                 | 212                                                                                 |  |
| Type                                                                                                      |                                                                                     | Rotating cleaning nozzle                                                          | Rotating cleaning nozzle                                                            | Rotating cleaning nozzle                                                            |  |
| <br>Operating principle  | Static                                                                              |                                                                                   |                                                                                     |                                                                                     |  |
|                                                                                                           | Free-spinning                                                                       | •                                                                                 | •                                                                                   | •                                                                                   |  |
|                                                                                                           | Controlled rotation                                                                 |                                                                                   |                                                                                     |                                                                                     |  |
|                                                                                                           | Gear-controlled                                                                     |                                                                                   |                                                                                     |                                                                                     |  |
| <br>Max. tank diameter | Very small<br>(up to ≈ 1 m)                                                         | •                                                                                 | •                                                                                   |                                                                                     |  |
|                                                                                                           | Small<br>(up to ≈ 2 m)                                                              | •                                                                                 | •                                                                                   | •                                                                                   |  |
|                                                                                                           | Medium<br>(up to ≈ 3 m)                                                             | •                                                                                 | •                                                                                   | •                                                                                   |  |
|                                                                                                           | Large<br>(up to ≈ 8 m)                                                              |                                                                                   |                                                                                     | •                                                                                   |  |
|                                                                                                           | Very large<br>(> 8 m)                                                               |                                                                                   |                                                                                     |                                                                                     |  |
| <br>Flow rate          | Very low<br>(up to ≈ 25 l/min)                                                      | •                                                                                 |                                                                                     |                                                                                     |  |
|                                                                                                           | Low<br>(up to ≈ 50 l/min)                                                           | •                                                                                 | •                                                                                   |                                                                                     |  |
|                                                                                                           | Medium<br>(up to ≈ 100 l/min)                                                       | •                                                                                 | •                                                                                   |                                                                                     |  |
|                                                                                                           | High<br>(up to ≈ 400 l/min)                                                         |                                                                                   |                                                                                     | •                                                                                   |  |
|                                                                                                           | Very high<br>(up to ≈ 700 l/min)                                                    |                                                                                   |                                                                                     | •                                                                                   |  |
| <br>Nozzle material    | Stainless steel                                                                     | •                                                                                 | •                                                                                   | •                                                                                   |  |
|                                                                                                           | Plastic                                                                             |                                                                                   |                                                                                     |                                                                                     |  |
| <br>Nozzle connection  | Thread                                                                              | •                                                                                 | •                                                                                   | •                                                                                   |  |
|                                                                                                           | Slip-on connection                                                                  | •                                                                                 | •                                                                                   |                                                                                     |  |
|                                                                                                           | Tri-Clamp                                                                           |                                                                                   |                                                                                     |                                                                                     |  |
| ATEX available                                                                                            |  |                                                                                   | •                                                                                   |                                                                                     |  |

| Cleaning efficiency class 4                                                       |                                                                                   | Cleaning efficiency class 5                                                       |                                                                                    |                                                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |
| <b>5S6/5S7</b>                                                                    | <b>5S5</b>                                                                        | <b>5T2/5T3</b>                                                                    | <b>5TB</b>                                                                         | <b>5TM</b>                                                                          |
| 213                                                                               | 215                                                                               | 217                                                                               | 219                                                                                | 220                                                                                 |
| Rotating cleaning nozzle                                                          | Rotating cleaning nozzle                                                          | High impact cleaner                                                               | High impact cleaner                                                                | High impact cleaner                                                                 |
|                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |
|                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |
| •                                                                                 | •                                                                                 |                                                                                   |                                                                                    |                                                                                     |
|                                                                                   |                                                                                   | •                                                                                 | •                                                                                  | •                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |
| •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                  | •                                                                                   |
| •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                  | •                                                                                   |
| •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                  | •                                                                                   |
|                                                                                   | •                                                                                 | •                                                                                 | •                                                                                  | •                                                                                   |
|                                                                                   |                                                                                   | •                                                                                 |                                                                                    |                                                                                     |
| •                                                                                 |                                                                                   | •                                                                                 |                                                                                    |                                                                                     |
| •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                  | •                                                                                   |
| •                                                                                 | •                                                                                 |                                                                                   | •                                                                                  | •                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |
| •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                  | •                                                                                   |
|                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |
| •                                                                                 | •                                                                                 | •                                                                                 | •                                                                                  | •                                                                                   |
| •                                                                                 | •                                                                                 | •                                                                                 |                                                                                    |                                                                                     |
|                                                                                   |                                                                                   |                                                                                   |                                                                                    |                                                                                     |
| •                                                                                 |                                                                                   | •                                                                                 | •                                                                                  | •                                                                                   |

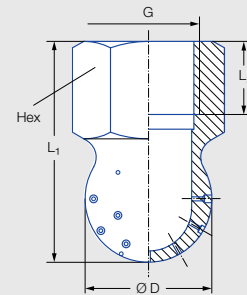
# Static spray balls

## Series 540/541



### Features:

- Robust and particularly compact design
- Threaded connection
- Suitable for very high temperatures
- Also suitable for operation with steam and air



Series 540/541

Female thread

| Max. tank diameter [m] | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------------------------|---|---|---|---|---|---|---|---|---|---|
|------------------------|---|---|---|---|---|---|---|---|---|---|



**Cleaning efficiency class**  
1



**Max. temperature**  
200°C



**Installation**  
Operation in every direction is possible



**Material**  
Stainless steel 303



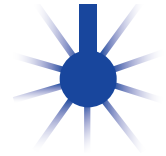
**Recommended operating pressure**  
3 bar

| Spray angle                                                                                 | Ordering no. | Narrowest free cross section<br>Ø<br>[mm] | V̇ water [l/min]                    |     |     |     |     |                           | Max. tank diameter [m] |
|---------------------------------------------------------------------------------------------|--------------|-------------------------------------------|-------------------------------------|-----|-----|-----|-----|---------------------------|------------------------|
|                                                                                             | Type         |                                           | p [bar] (p <sub>max</sub> = 10 bar) |     |     |     |     |                           |                        |
|                                                                                             |              |                                           | 0.5                                 | 1.0 | 2.0 | 3.0 | 5.0 | at 40 psi<br>[US gal/min] |                        |
| 240°<br> | 540.909.16   | 0.8                                       | 9                                   | 13  | 18  | 22  | 28  | 6                         | 6.5                    |
|                                                                                             | 540.989.16   | 1.0                                       | 14                                  | 20  | 28  | 34  | 44  | 9                         | 7.0                    |
|                                                                                             | 541.109.16   | 1.5                                       | 29                                  | 40  | 57  | 70  | 90  | 18                        | 7.5                    |
|                                                                                             | 541.189.16   | 2.0                                       | 45                                  | 64  | 90  | 110 | 142 | 28                        | 8.3                    |
|                                                                                             | 541.239.16   | 2.3                                       | 59                                  | 83  | 118 | 145 | 187 | 37                        | 9.5                    |

NPT thread available on request.

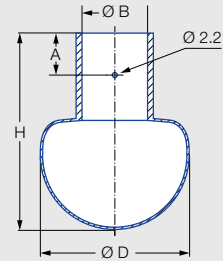
The maximum tank diameter applies to the recommended operating pressure and is meant as a recommendation only.  
The cleaning result is also affected by the type of soiling.

# Static spray balls RinseClean Series 5B2/5B3



## Features:

- No moving parts
- Self-draining
- Proven use in many applications
- Suitable for very high temperatures and hygienic requirements

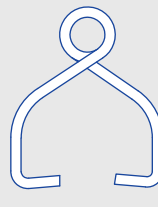


## Series 5B2/5B3

With the slip-on connection, the spray ball is pushed onto the customer's connection pipe and secured with the supplied Pin.



Pin 1



Pin 2-5

Dimension of the slip-on connection according to DIN 10357, Series B

| Max. tank diameter [m] | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------------------------|---|---|---|---|---|---|---|---|---|---|
|------------------------|---|---|---|---|---|---|---|---|---|---|



**Cleaning efficiency class**  
1



**Max. temperature**  
200°C



**Installation**  
Operation in every direction is possible



**Material**  
Stainless steel 316L,  
pin stainless steel 316L



**Recommended operating pressure**  
2 bar

**Function video**

[www.lechler.com/staticsprayball](http://www.lechler.com/staticsprayball)  
Or scan the QR code.





| Spray angle                                                                       | Ordering no.     | Narrowest free cross section<br>Ø [mm] | V̇ water [l/min]                   |     |     |     |                        | Dimensions [mm]    |                   |          |      | Pin | Max. tank diameter [m] |
|-----------------------------------------------------------------------------------|------------------|----------------------------------------|------------------------------------|-----|-----|-----|------------------------|--------------------|-------------------|----------|------|-----|------------------------|
|                                                                                   | Type             |                                        | p [bar] (p <sub>max</sub> = 5 bar) |     |     |     |                        | Distance to bore A | Conne-<br>ction B | Height H | Ø D  |     |                        |
|                                                                                   |                  |                                        | 0.5                                | 1.0 | 2.0 | 3.0 | at 40 psi [US gal/min] |                    |                   |          |      |     |                        |
|  | 5B3.083.1Y.D1.80 | 1.2                                    | 25                                 | 35  | 50  | 61  | 16                     | 9.0                | 18.2              | 42.0     | 28.0 | 1   | 2.2                    |
|                                                                                   | 5B3.253.1Y.D2.20 | 1.8                                    | 65                                 | 92  | 130 | 159 | 40                     | 18.0               | 22.2              | 84.0     | 64.0 | 2   | 3.0                    |
|                                                                                   | 5B3.323.1Y.D2.80 | 2.3                                    | 100                                | 141 | 200 | 245 | 62                     | 18.0               | 28.2              | 84.0     | 64.0 | 3   | 3.5                    |
|                                                                                   | 5B3.463.1Y.D5.20 | 3.3                                    | 230                                | 325 | 460 | 563 | 143                    | 25.0               | 52.3              | 111.0    | 90.0 | 5   | 5.4                    |
|  | 5B3.114.1Y.D1.80 | 1.4                                    | 30                                 | 42  | 60  | 74  | 19                     | 9.0                | 18.2              | 42.0     | 28.0 | 1   | 2.2                    |
|                                                                                   | 5B3.274.1Y.D2.20 | 2.3                                    | 75                                 | 106 | 150 | 184 | 47                     | 18.0               | 22.2              | 84.0     | 64.0 | 2   | 3.0                    |
|                                                                                   | 5B3.394.1Y.D2.80 | 3.0                                    | 145                                | 205 | 290 | 355 | 90                     | 18.0               | 28.2              | 84.0     | 64.0 | 3   | 5.0                    |
|                                                                                   | 5B3.444.1Y.D5.20 | 3.2                                    | 200                                | 283 | 400 | 490 | 124                    | 25.0               | 52.3              | 111.0    | 90.0 | 5   | 5.2                    |
|  | 5B2.879.1Y.D0.80 | 0.8                                    | 8                                  | 11  | 15  | 18  | 5                      | 9.0                | 8.2               | 37.0     | 20.0 | 1   | 2.0                    |
|                                                                                   | 5B3.089.1Y.D1.20 | 1.0                                    | 25                                 | 35  | 50  | 61  | 16                     | 9.0                | 12.2              | 42.0     | 28.0 | 1   | 2.2                    |
|                                                                                   | 5B3.139.1Y.D1.20 | 1.6                                    | 33                                 | 46  | 65  | 80  | 20                     | 9.0                | 12.2              | 42.0     | 28.0 | 1   | 2.3                    |
|                                                                                   | 5B3.209.1Y.D1.80 | 1.5                                    | 50                                 | 71  | 100 | 123 | 31                     | 9.0                | 18.2              | 42.0     | 28.0 | 1   | 2.5                    |
|                                                                                   | 5B3.309.1Y.D2.20 | 1.7                                    | 90                                 | 127 | 180 | 221 | 56                     | 18.0               | 22.2              | 84.0     | 64.0 | 2   | 3.5                    |
|                                                                                   | 5B3.379.1Y.D2.80 | 2.1                                    | 130                                | 184 | 260 | 318 | 81                     | 18.0               | 28.2              | 84.0     | 64.0 | 3   | 5.2                    |
|                                                                                   | 5B3.389.1Y.D4.00 | 2.1                                    | 140                                | 198 | 280 | 343 | 87                     | 18.0               | 40.3              | 84.0     | 64.0 | 4   | 5.2                    |
|                                                                                   | 5B3.409.1Y.D3.40 | 2.3                                    | 160                                | 226 | 320 | 392 | 99                     | 18.0               | 34.2              | 84.0     | 64.0 | 4   | 5.2                    |
|                                                                                   | 5B3.449.1Y.D2.80 | 3.0                                    | 205                                | 290 | 410 | 502 | 127                    | 18.0               | 28.2              | 84.0     | 64.0 | 3   | 5.4                    |
|                                                                                   | 5B3.489.1Y.D3.40 | 2.9                                    | 255                                | 361 | 510 | 625 | 158                    | 18.0               | 34.2              | 84.0     | 64.0 | 4   | 5.5                    |
|                                                                                   | 5B3.499.1Y.D4.00 | 2.8                                    | 270                                | 382 | 540 | 661 | 168                    | 18.0               | 40.3              | 84.0     | 64.0 | 4   | 5.5                    |
|                                                                                   | 5B3.539.1Y.D5.20 | 3.2                                    | 335                                | 474 | 670 | 821 | 208                    | 25.0               | 52.3              | 111.0    | 90.0 | 5   | 5.6                    |

Spray balls with other spray angles and connection options (various slip-on connections as well as threaded and welded connections) can be found in our brochure "Precision nozzles for tank and equipment cleaning".

| Pin | Ordering no.     |
|-----|------------------|
| 1   | 095.013.1Y.06.55 |
| 2   | 095.013.1Y.06.58 |
| 3   | 095.013.1Y.06.56 |
| 4   | 095.013.1Y.06.59 |
| 5   | 095.013.1Y.06.57 |

The maximum tank diameter applies to the recommended operating pressure and is meant as a recommendation only.  
The cleaning result is also affected by the type of soiling.

#### Information about slip-on connections

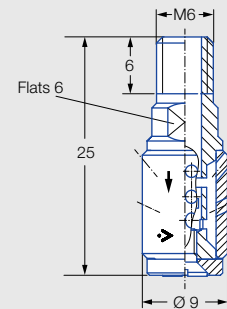
- Stainless steel 316L pin supplied.
- Depending on the diameter of the adapter, the flow rate can increase due to a leakage between the adapter and the spray ball.

# Rotating cleaning nozzle PicoWhirly Series 500.234



## Features:

- Cleaning with rotating solid jet
- Compact design for confined spaces
- Suitable for very high temperatures
- Full stainless steel design



Series 500.234

Male thread

| Max. tank diameter [m] | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------------------------|---|---|---|---|---|---|---|---|---|---|
|------------------------|---|---|---|---|---|---|---|---|---|---|



**Cleaning efficiency class**  
2



**Max. temperature**  
200°C



**Installation**  
Operation in every direction is possible



**Bearing**  
Kolsterised slide bearing



**Material**  
Stainless steel 316L



**Recommended operating pressure**  
3 bar



**Filtration**  
Line strainer with a mesh size of 0.3 mm/50 mesh

Function video

[www.lechler.com/picowhirly](http://www.lechler.com/picowhirly)  
Or scan the QR code.



| Spray angle                                                                                 | Ordering no.  | Narrowest free cross section<br>Ø<br>[mm] | V̇ water [l/min]                   |     |     |      |                           | Max. tank diameter<br>[m] |
|---------------------------------------------------------------------------------------------|---------------|-------------------------------------------|------------------------------------|-----|-----|------|---------------------------|---------------------------|
|                                                                                             | Type          |                                           | p [bar] (p <sub>max</sub> = 5 bar) |     |     |      |                           |                           |
|                                                                                             |               |                                           | 1.0                                | 2.0 | 3.0 | 5.0  | at 40 psi<br>[US gal/min] |                           |
| 300°<br> | 500.234.G9.00 | 1.8                                       | 5.7                                | 8.0 | 9.8 | 12.7 | 2.5                       | 0.9                       |

The maximum tank diameter applies to the recommended operating pressure and is meant as a recommendation only.  
The cleaning result is also affected by the type of soiling.

Compressed air should be used for dry blowing for a short time only. Operation above the recommended operating pressure has a negative impact on the cleaning result and wear.

# Rotating cleaning nozzle MicroWhirly Series 566



## Features:

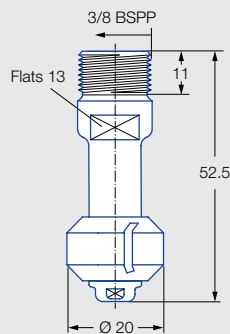
- Cleaning with effective flat jets
- Robust slide bearing made of PEEK
- Equipped with a thread or slip-on connection
- Food grade compatibility



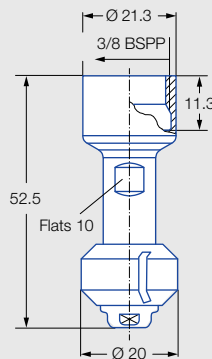
**ATEX version  
available on  
request**



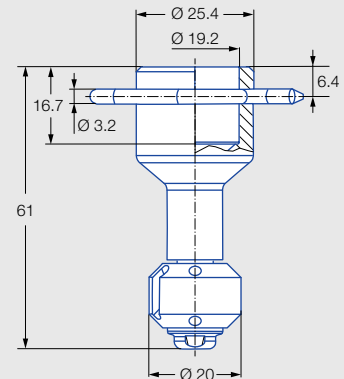
**Series 566**



**Male thread**



**Female thread**



**Dimension of the  
slip-on connection according to  
ASME-BPE (OD tube)**

| Max. tank diameter [m] | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------------------------|---|---|---|---|---|---|---|---|---|---|
|------------------------|---|---|---|---|---|---|---|---|---|---|



**Cleaning efficiency class**  
2



**Max. temperature**  
130°C



**Installation**  
Operation in every direction is possible



**Bearing**  
Slide bearing made of PEEK



**Material**  
Stainless steel 316L, PEEK



**Recommended operating pressure**  
2 bar



**Filtration**  
Line strainer with a mesh size of 0.3 mm/50 mesh

**Function video**

[www.lechler.com/microwhirly](http://www.lechler.com/microwhirly)  
Or scan the QR code.



| Spray angle                                                                            | Ordering no. |          |          |                                | Narrowest free cross section<br>Ø<br>[mm] | V̇ water [l/min]                   |     |     |                           | Max. tank diameter<br>[m] |
|----------------------------------------------------------------------------------------|--------------|----------|----------|--------------------------------|-------------------------------------------|------------------------------------|-----|-----|---------------------------|---------------------------|
|                                                                                        | Type         | Code     |          |                                |                                           | p [bar] (p <sub>max</sub> = 6 bar) |     |     |                           |                           |
|                                                                                        |              | 3/8 BSPP | 3/8 BSPP | 3/4"-<br>Slip-on<br>connection |                                           | 1.0                                | 2.0 | 3.0 | at 40 psi<br>[US gal/min] |                           |
|  180° | 566.873.1Y   | AE       | AF       | TF07                           | 1.0                                       | 12                                 | 15  | 18  | 5                         | 1.6                       |
|                                                                                        | 566.933.1Y   | AE       | AF       | TF07                           | 2.4                                       | 15                                 | 21  | 26  | 7                         | 1.7                       |
|  180° | 566.874.1Y   | AE       | AF       | TF07                           | 1.0                                       | 12                                 | 15  | 18  | 5                         | 1.6                       |
|                                                                                        | 566.934.1Y   | AE       | AF       | TF07                           | 2.4                                       | 15                                 | 21  | 26  | 7                         | 1.7                       |
|  360° | 566.879.1Y   | AE       | AF       | TF07                           | 1.0                                       | 12                                 | 15  | 18  | 5                         | 1.6                       |
|                                                                                        | 566.939.1Y   | AE       | AF       | TF07                           | 2.4                                       | 15                                 | 21  | 26  | 7                         | 1.7                       |

NPT thread and weld-on version available on request.

The maximum tank diameter applies to the recommended operating pressure and is meant as a recommendation only.  
The cleaning result is also affected by the type of soiling.

Compressed air should be used for dry blowing for a short time only. Operation above the recommended operating pressure has a negative impact on the cleaning result and wear.

#### Information about slip-on connections

- Stainless steel 316L pin supplied.
- Depending on the diameter of the adapter, the flow rate can increase due to a leakage between the adapter and the rotating cleaning nozzle.

Ordering    Type       +    Code       =    Ordering no.  
example: 566.873.1Y   +   AE       =   566.873.1Y.AE

# Rotating cleaning nozzle MiniWhirly Series 500.186

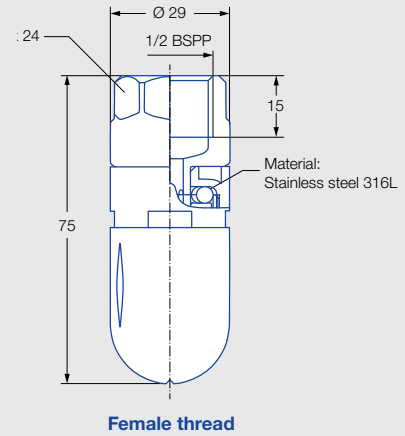


## Features:

- Economical entry-level model
- Cleaning with effective flat jets
- Specifically designed for barrel and canister cleaning



Series 500,186



| Max. tank diameter [m] | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------------------------|---|---|---|---|---|---|---|---|---|---|
|------------------------|---|---|---|---|---|---|---|---|---|---|



**Cleaning efficiency class**  
2



**Max. temperature**  
50°C



**Installation**  
Vertically facing downwards



**Bearing**  
Ball bearing made of stainless steel



**Material**  
POM, stainless steel 316L



**Recommended operating pressure**  
2 bar



**Filtration**  
Line strainer with a mesh size of 0.3 mm/50 mesh

**Function video**

[www.lechler.com/miniwhirly](http://www.lechler.com/miniwhirly)  
Or scan the QR code.



| Spray angle                                                                                 | Ordering no.  | Narrowest free cross section<br>Ø<br>[mm] | V̇ water [l/min]                   |     |     |                           | Max. tank diameter<br>[m] |
|---------------------------------------------------------------------------------------------|---------------|-------------------------------------------|------------------------------------|-----|-----|---------------------------|---------------------------|
|                                                                                             | Type          |                                           | p [bar] (p <sub>max</sub> = 5 bar) |     |     |                           |                           |
|                                                                                             |               |                                           | 1.0                                | 2.0 | 3.0 | at 40 psi<br>[US gal/min] |                           |
| 300°<br> | 500.186.56.AH | 1.9                                       | 13                                 | 18  | 22  | 6                         | 1.3                       |

The maximum tank diameter applies to the recommended operating pressure and is meant as a recommendation only.  
The cleaning result is also affected by the type of soiling.

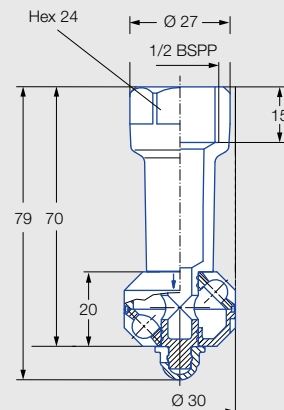
Compressed air should be used for dry blowing for a short time only. Operation above the recommended operating pressure has a negative impact on the cleaning result and wear.

# Rotating cleaning nozzle PVDF MicroWhirly Series 500.191



## Features:

- Designed for work in a corrosive environment
- Suitable for contact with food and the application of foam
- Very good price-performance ratio
- Made entirely of PVDF



Series 500.191

Female thread

| Max. tank diameter [m] | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------------------------|---|---|---|---|---|---|---|---|---|---|
|------------------------|---|---|---|---|---|---|---|---|---|---|



**Cleaning efficiency class**  
2



**Max. temperature**  
90°C



**Installation**  
Operation in every direction is possible



**Bearing**  
Slide bearing made of PVDF



**Material**  
PVDF



**Recommended operating pressure**  
2 bar



**Filtration**  
Line strainer with a mesh size of 0.3 mm/50 mesh

**Function video**

[www.lechler.com/microwhirly](http://www.lechler.com/microwhirly)  
Or scan the QR code.



| Spray angle                                                                                 | Ordering no.  | Narrowest free cross section<br>Ø<br>[mm] | V̇ water [l/min]                   |     |     |                           | Max. tank diameter<br>[m] |
|---------------------------------------------------------------------------------------------|---------------|-------------------------------------------|------------------------------------|-----|-----|---------------------------|---------------------------|
|                                                                                             | Type          |                                           | p [bar] (p <sub>max</sub> = 5 bar) |     |     |                           |                           |
|                                                                                             |               |                                           | 1.0                                | 2.0 | 3.0 | at 40 psi<br>[US gal/min] |                           |
| 180°<br> | 500.191.5E.02 | 2.2                                       | 9                                  | 13  | 16  | 4                         | 0.8                       |
| 180°<br> | 500.191.5E.01 | 2.2                                       | 9                                  | 13  | 16  | 4                         | 0.8                       |
| 270°<br> | 500.191.5E.31 | 2.2                                       | 14                                 | 20  | 25  | 6                         | 1.1                       |
| 360°<br> | 500.191.5E.00 | 2.2                                       | 14                                 | 20  | 25  | 6                         | 1.1                       |

The maximum tank diameter applies to the recommended operating pressure and is meant as a recommendation only.  
The cleaning result is also affected by the type of soiling.

The PVDF MicroWhirly is not suitable for operation with compressed air or any other gas. Operation above the recommended operating pressure has a negative impact on the cleaning result and wear.

# Rotating cleaning nozzle NanoSpinner2

## Series 5M1



### Features:

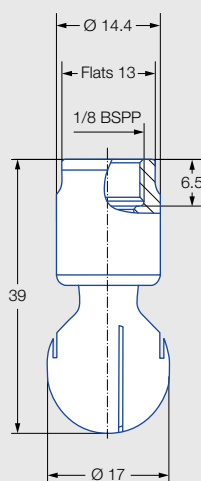
- Compact design for confined spaces
- Hygienic design
- Suitable for high temperatures
- Made entirely of stainless steel



**ATEX version  
available on  
request**



Series 5M1



Female thread

| Max. tank diameter [m] | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------------------------|---|---|---|---|---|---|---|---|---|---|
|------------------------|---|---|---|---|---|---|---|---|---|---|



**Cleaning efficiency class**  
2



**Max. temperature**  
250 °C



**Installation**  
Operation in every direction is possible



**Bearing**  
Double ball bearing made of stainless steel 316L



**Material**  
Stainless steel 316L



**Recommended operating pressure**  
2 bar



**Filtration**  
Line strainer with a mesh size of 0,1mm/170 mesh

[Function video](#)

[www.lechler.com/de-en/medialibrary](http://www.lechler.com/de-en/medialibrary)  
Or scan the QR Code.



| Spray angle                                                                                                  | Ordering number  | Narrowest free cross section<br>Ø<br>[mm] | V̇ water [l/min]                   |     |     |                           | Max. tank diameter<br>[m] |
|--------------------------------------------------------------------------------------------------------------|------------------|-------------------------------------------|------------------------------------|-----|-----|---------------------------|---------------------------|
|                                                                                                              | Type<br>1/8 BSPP |                                           | p [bar] (p <sub>max</sub> = 7 bar) |     |     |                           |                           |
|                                                                                                              |                  |                                           | 1.0                                | 2.0 | 3.0 | at 40 psi<br>[US gal/min] |                           |
| <div>360°</div> <div></div> | 5M1.879.1Y.AB    | 0.4                                       | 11                                 | 15  | 18  | 5                         | 1.4                       |
|                                                                                                              | 5M1.929.1Y.AB    | 0.5                                       | 14                                 | 20  | 25  | 6                         | 1.6                       |

NPT thread available on request.

The maximum tank diameter applies to the recommended operating pressure and is meant as a recommendation only.  
The cleaning result is also affected by the type of soiling.

Compressed air should be used for dry blowing for a short time only. Operation above the recommended operating pressure has a negative impact on the cleaning result and wear.

# Rotating cleaning nozzle MicroSpinner 2

## Series 5M2



### Features:

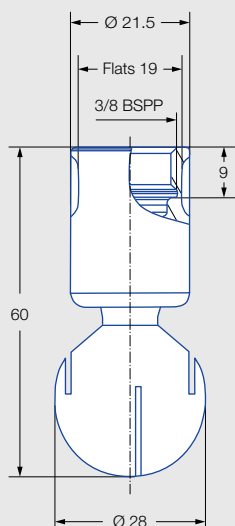
- Hygienic design
- Suitable for high temperatures
- Made entirely of stainless steel



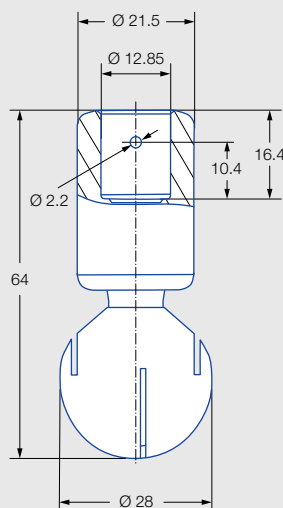
**ATEX version  
available on  
request**



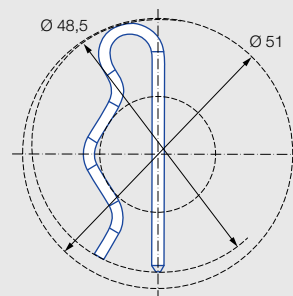
Series 5M2



Female thread



Dimensions of the  
slip-on connection according  
to ASME-BE (OD-tube)



Dimensions of the  
slip-on connection  
top view

| Max. tank diameter [m] | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------------------------|---|---|---|---|---|---|---|---|---|---|
|------------------------|---|---|---|---|---|---|---|---|---|---|



**Cleaning  
efficiency class**  
2



**Max. temperature**  
250 °C



**Installation**  
Operating in every direction  
possible



**Bearing**  
Double ball bearing made  
of stainless steel 316L



**Material**  
Stainless steel 316L



**Recommended  
operating pressure**  
2 bar



**Filtration**  
Line strainer with a mesh  
size of 0,1mm/170 mesh



**Adapter**  
3/8 BSPP is compatible  
with HygienicFit

[Function video](#)

[www.lechler.com/de-en/medialibrary](http://www.lechler.com/de-en/medialibrary)  
Or scan the QR Code.



| Spray angle                                                                            | Ordering number |            |              | Narrowest free cross section<br>Ø [mm] | V̇ water [l/min]                   |     |     |                        | Max. tank diameter [m] |
|----------------------------------------------------------------------------------------|-----------------|------------|--------------|----------------------------------------|------------------------------------|-----|-----|------------------------|------------------------|
|                                                                                        | Type            | Connection |              |                                        | p [bar] (p <sub>max</sub> = 7 bar) |     |     |                        |                        |
|                                                                                        |                 | 3/8 BSPP   | 1/2"-Slip-on |                                        | 1.0                                | 2.0 | 3.0 | at 40 psi [US gal/min] |                        |
|  60°  | 5M2.952.1Y      | AF         | TF05         | 1.5                                    | 16                                 | 23  | 28  | 7                      | –                      |
|                                                                                        | 5M2.042.1Y      | AF         | TF05         | 3.0                                    | 28                                 | 40  | 49  | 12                     | –                      |
|  180° | 5M2.004.1Y      | AF         | TF05         | 0.9                                    | 22                                 | 32  | 39  | 10                     | 1.8                    |
|  360° | 5M2.969.1Y      | AF         | TF05         | 0.8                                    | 18                                 | 25  | 31  | 8                      | 1.7                    |
|                                                                                        | 5M2.049.1Y      | AF         | TF05         | 0.9                                    | 28                                 | 39  | 48  | 12                     | 1.8                    |

NPT thread, weld-on and further slip-on versions on request.

The max. tank diameter shown above applies for the recommended operating pressure and has to be seen as a recommendation.  
The cleaning result is also affected by the type of soiling.

Operating with compressed air only for short-term usage. Operation above the recommended operating pressure has negative effects on the cleaning result and wear.

#### Information slip-on connection

- Pin made of stainless steel 316L included (ordering no. 05M.230.1Y.00.00.0).
- Depending on diameter of the adapter, the flow rate increase due to leakage between connecting pipe and rotating cleaning nozzle.
- Minimum insertion diameter (with mounted pin) is 48,5 mm

Example of ordering: Type 5M2.952.1Y + Connection AF = Ordering no. 5M2.952.1Y.AF

# Rotating cleaning nozzle MiniSpinner 2

## Series 5M3



### Features:

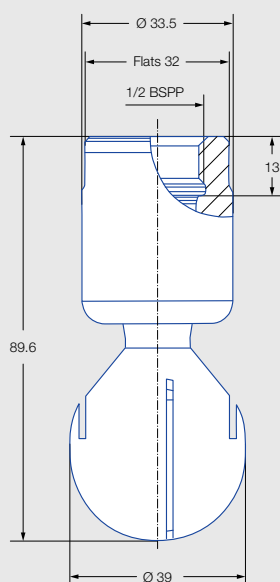
- Hygienic design
- Suitable for high temperatures
- Made entirely of stainless steel



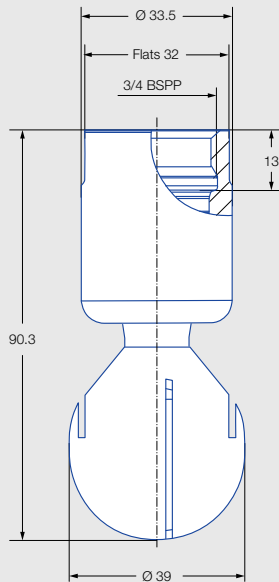
**ATEX version  
available on  
request**



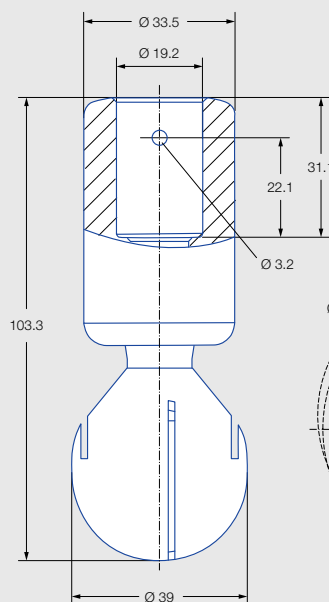
Series 5M3



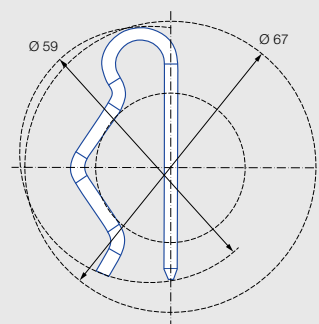
Female thread



Female thread



Dimensions of the  
slip-on connection according  
to ASME-BE (OD-tube)



Dimensions of the  
slip-on connection  
top view

| Max. tank diameter [m] | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------------------------|---|---|---|---|---|---|---|---|---|---|
|------------------------|---|---|---|---|---|---|---|---|---|---|



**Cleaning efficiency class**  
2



**Max. temperature**  
250 °C



**Installation**  
Operating in every  
direction possible



**Bearing**  
Double ball bearing made  
of stainless steel 316L



**Material**  
Stainless steel 316L



**Recommended operating pressure**  
2 bar



**Filtration**  
Line strainer with a mesh  
size of 0,1mm/170 mesh



**Adapter**  
1/2 BSPP and 3/4 BSPP  
are compatible with  
HygienicFit

**Function video**

[www.lechler.com/de-en/medialibrary](http://www.lechler.com/de-en/medialibrary)  
Or scan the QR Code.



| Spray angle                                                                                | Ordering no. |            |          |               | Narrowest free cross section<br>Ø [mm] | V̇ water [l/min]                   |     |     |                        | Max. tank diameter [m] |
|--------------------------------------------------------------------------------------------|--------------|------------|----------|---------------|----------------------------------------|------------------------------------|-----|-----|------------------------|------------------------|
|                                                                                            | Type         | Connection |          |               |                                        | p [bar] (p <sub>max</sub> = 7 bar) |     |     |                        |                        |
|                                                                                            |              | 1/2 BSPP   | 3/4 BSPP | 3/4"- Slip-on |                                        | 1.0                                | 2.0 | 3.0 | at 40 psi [US gal/min] |                        |
| 60°<br>   | 5M3.122.1Y   | AH         |          | TF07          | 2.6                                    | 45                                 | 63  | 77  | 20                     | –                      |
| 180°<br>  | 5M3.133.1Y   |            | AL       | TF07          | 1.2                                    | 47                                 | 67  | 82  | 21                     | 2.6                    |
| 180°<br>  | 5M3.134.1Y   |            | AL       | TF07          | 1.3                                    | 47                                 | 67  | 82  | 21                     | 2.6                    |
| 360°<br> | 5M3.999.1Y   |            | AL       | TF07          | 0.4                                    | 21                                 | 30  | 37  | 9                      | 1.8                    |
|                                                                                            | 5M3.089.1Y   |            | AL       | TF07          | 0.7                                    | 35                                 | 49  | 60  | 15                     | 2.1                    |
|                                                                                            | 5M3.139.1Y   |            | AL       | TF07          | 0.8                                    | 49                                 | 69  | 85  | 21                     | 2.3                    |
|                                                                                            | 5M3.209.1Y   |            | AL       | TF07          | 1.5                                    | 71                                 | 100 | 122 | 31                     | 2.6                    |

NPT thread, weld-on and further slip-on versions on request.

The max. tank diameter shown above applies for the recommended operating pressure and has to be seen as a recommendation.  
The cleaning result is also affected by the type of soiling.

Operating with compressed air only for short-term usage. Operation above the recommended operating pressure has negative effects on the cleaning result and wear.

#### Information slip-on connection

- Pin made of stainless steel 316L included (Ordering no. 05M.330.1Y.00.00.0).
- Depending on diameter of the adapter, the flow rate increase due to leakage between connecting pipe and rotating cleaning nozzle.
- Minimum insertion diameter (with mounted pin) is 59 mm.

Example    Type    +    Connection    =    Ordering no.  
of ordering: 5M3.122.1Y    +    AH    =    5M3.122.1Y.AH

# Rotating cleaning nozzle MaxiSpinner 2

## Series 5M4



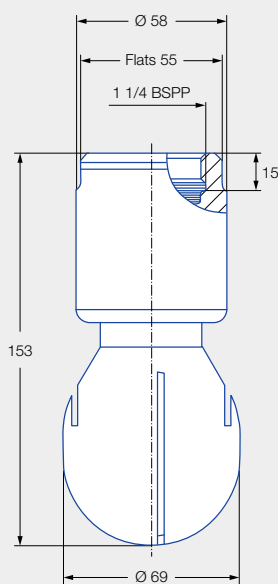
### Features:

- Hygienic design
- Suitable for high temperatures
- Made entirely of stainless steel

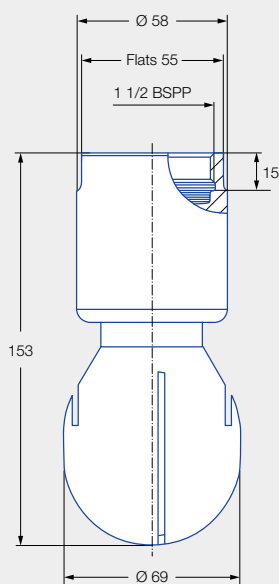


**ATEX version  
available on  
request**

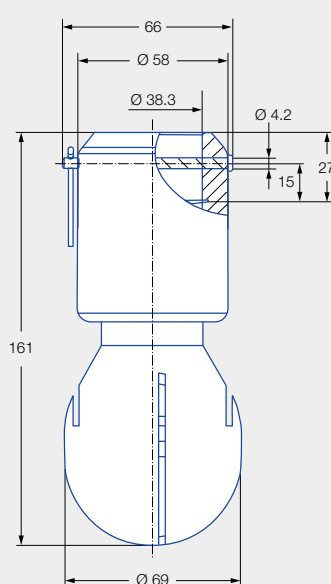
Series 5M4



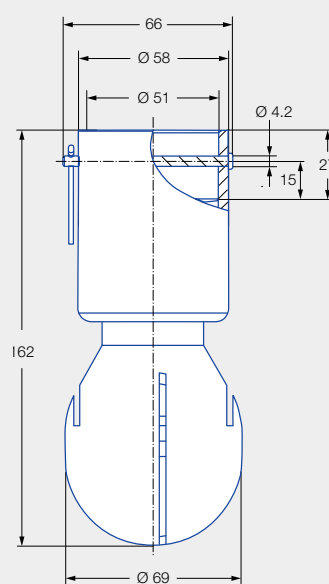
Female thread



Female thread



Dimensions of the  
1 1/2" slip-on connection according  
to ASME-BE (OD-tube)



Dimensions of the  
2" slip-on connection according  
to ASME-BE (OD-tube)

| Max. tank diameter [m] | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------------------------|---|---|---|---|---|---|---|---|---|---|
|------------------------|---|---|---|---|---|---|---|---|---|---|



**Cleaning  
efficiency class**  
2



**Max. temperature**  
250 °C



**Installation**  
Operating in every  
direction possible



**Bearing**  
Double ball bearing made  
of stainless steel 316L



**Material**  
Stainless steel 316L



**Recommended  
operating pressure**  
2 bar



**Filtration**  
Line strainer with a mesh  
size of 0,1mm/170 mesh



**Adapter**  
1 1/4 BSPP and  
1 1/2 BSPP are compatible  
with HygienicFit

**Function video**

[www.lechler.com/de-en/medialibrary](http://www.lechler.com/de-en/medialibrary)  
Or scan the QR Code.



| Spray angle                                                                                                  | Ordering no. |            |            |                |             | Narrowest free cross section<br>Ø [mm] | V̇ water [l/min]                    |     |     |                        | Max. tank diameter [m] |
|--------------------------------------------------------------------------------------------------------------|--------------|------------|------------|----------------|-------------|----------------------------------------|-------------------------------------|-----|-----|------------------------|------------------------|
|                                                                                                              | Type         | Connection |            |                |             |                                        | p [bar] (p <sub>max</sub> = 7 bar)* |     |     |                        |                        |
|                                                                                                              |              | 1 1/4 BSPP | 1 1/2 BSPP | 1 1/2" Slip-on | 2"- Slip-on |                                        | 1,0                                 | 2,0 | 3.0 | at 40 psi [US gal/min] |                        |
| <div>360°</div> <div></div> | 5M4.279.1Y   | AQ         | AS         | TF15           | TF20        | 1.7                                    | 107                                 | 150 | 184 | 46                     | 4.0                    |
|                                                                                                              | 5M4.329.1Y   | AQ         | AS         | TF15           | TF20        | 2.0                                    | 141                                 | 200 | 245 | 62                     | 4.5                    |
|                                                                                                              | 5M4.369.1Y   | AQ         | AS         | TF15           | TF20        | 2.3                                    | 177                                 | 250 | 306 | 78                     | 5.0                    |

NPT thread and weld-on versions on request.

\* Please note the maximum operating pressure of 4 bar for the 2" slip-on connection.

The max. tank diameter shown above applies for the recommended operating pressure and has to be seen as a recommendation.

The cleaning result is also affected by the type of soiling

Operating with compressed air only for short-term usage. Operation above the recommended operating pressure has negative effects on the cleaning result and wear.

#### Information slip-on connection

- Bolt with head incl. pin made of stainless steel 316L included (Ordering no. 05M.431.1Y.00.00.0).
- Depending on diameter of the adapter, the flow rate increase due to leakage between connecting pipe and rotating cleaning nozzle.
- Minimum insertion diameter (with mounted bolt) is the same as for the threaded variants 69 mm.

Example    Type    +    Connection    =    Ordering no.  
of ordering: 5M4.369. 1Y    +    AQ    =    5M4.369.1Y.AQ

# Rotating cleaning nozzle PTFE Whirly Series 573/583

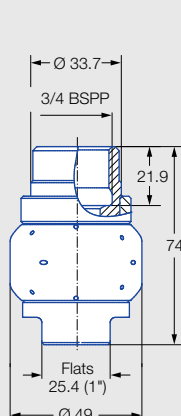


## Features:

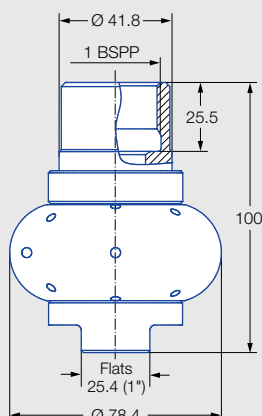
- Made entirely of PTFE
- Slip-on connection conforms to 3-A
- Suitable for corrosive environments
- Suitable for very hygienic requirements (e.g. contact with food)



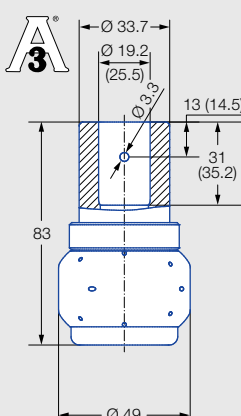
## Series 573/583



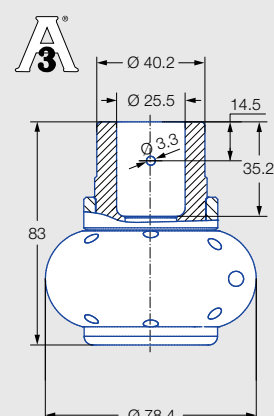
Female thread  
3/4 BSPP



Female thread  
1 BSPP



3/4" and 1" slip-on connection  
(conforms to 3-A)  
Dimension of the slip-on  
connection according to  
ASME-BPE (OD tube)



1" slip-on connection  
(conforms to 3-A)  
Dimension of the slip-on  
connection according to  
ASME-BPE (OD tube)

Data in brackets refers to  
1" version marked with "1".

| Max. tank diameter [m] | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------------------------|---|---|---|---|---|---|---|---|---|---|
|------------------------|---|---|---|---|---|---|---|---|---|---|



**Cleaning efficiency class**  
2



**Max. temperature**  
95 °C (version for  
higher temperatures  
[130 °C] available on  
request)



**Installation**  
Operation in every  
direction is possible



**Bearing**  
Slide bearing made of PTFE



**Material**  
PTFE



**Recommended operating pressure**  
2 bar



**Filtration**  
Line strainer with a mesh  
size of 0.3 mm/50 mesh

Function video

[www.lechler.com/ptfewhirly](http://www.lechler.com/ptfewhirly)  
Or scan the QR code.



| Spray angle                                                                       | Ordering no. |          |        |                         |                       | Narrowest free cross section<br>Ø [mm] | V̇ water [l/min]                   |     |     |                        | Pin | Max. tank diameter [m] |
|-----------------------------------------------------------------------------------|--------------|----------|--------|-------------------------|-----------------------|----------------------------------------|------------------------------------|-----|-----|------------------------|-----|------------------------|
|                                                                                   | Type         | Code     |        |                         |                       |                                        | p [bar] (p <sub>max</sub> = 6 bar) |     |     |                        |     |                        |
|                                                                                   |              | 3/4 BSPP | 1 BSPP | 3/4" Slip-on connection | 1" Slip-on connection |                                        | 1.0                                | 2.0 | 3.0 | at 40 psi [US gal/min] |     |                        |
|                                                                                   |              |          |        |                         |                       |                                        |                                    |     |     |                        |     |                        |
|  | 583.116.55   | AL       |        | TF07                    |                       | 2.4                                    | 47                                 | 67  | 82  | 21                     | 1   | 2.5                    |
|                                                                                   | 583.346.55   |          |        |                         | TF10                  | 5.9                                    | 159                                | 225 | 276 | 70                     | 2   | 3.2                    |
|  | 573.116.55   | AL       |        | TF07                    |                       | 2.4                                    | 47                                 | 67  | 82  | 21                     | 1   | 2.5                    |
|  | 583.119.55   | AL       |        | TF07                    | TF10 <sup>1</sup>     | 1.8                                    | 41                                 | 58  | 71  | 18                     | 1   | 2.4                    |
|                                                                                   | 583.209.55   | AL       |        | TF07                    | TF10 <sup>1</sup>     | 3.5                                    | 71                                 | 100 | 122 | 31                     | 1   | 2.5                    |
|                                                                                   | 583.269.55   | AL       |        | TF07                    |                       | 4.8                                    | 103                                | 145 | 178 | 45                     | 1   | 2.8                    |
|                                                                                   | 583.279.55   |          | AN     |                         | TF10                  | 3.7                                    | 106                                | 150 | 184 | 47                     | 2   | 3.0                    |
|                                                                                   | 583.349.55   |          | AN     |                         | TF10                  | 5.6                                    | 159                                | 225 | 276 | 70                     | 2   | 3.2                    |

NPT thread available on request.

<sup>1</sup> See drawing 3 for details (Page 204).

The maximum tank diameter applies to the recommended operating pressure and is meant as a recommendation only.  
The cleaning result is also affected by the type of soiling.

Compressed air should be used for dry blowing for a short time only. Operation above the recommended operating pressure has a negative impact on the cleaning result and wear.

#### Information about slip-on connections

- Pin made of stainless steel 316L supplied (Ordering no. Pin 1: 095.013.17.06.60, Pin 2: 095.013.17.06.61).
- Depending on the diameter of the adapter, the flow rate can increase due to a leakage between the adapter and the rotating cleaning nozzle.

|          |            |   |      |   |               |
|----------|------------|---|------|---|---------------|
| Ordering | Type       | + | Code | = | Ordering no.  |
| example: | 583.116.55 | + | AL   | = | 583.116.55.AL |

# Extendable rotating cleaning nozzle PopUp Whirly Series 5P2/5P3



## Features:

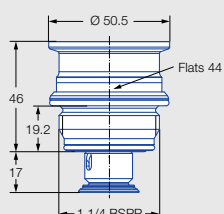
- Pressure-dependent automatically extending rotating cleaning nozzle
- Can be installed flush in the tank wall
- Suitable for cleaning pipes and applications that use foam
- Particularly suitable for applications in the pharmaceutical, chemical and food and beverage industry



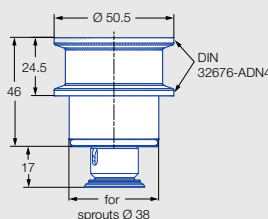
**ATEX version  
available on  
request**



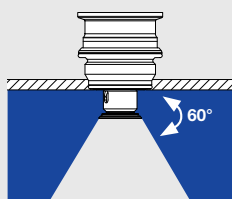
**Series 5P2**



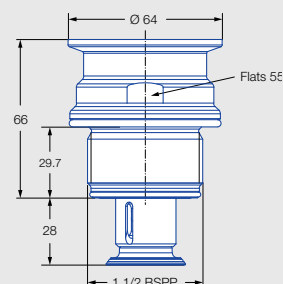
**Male thread**



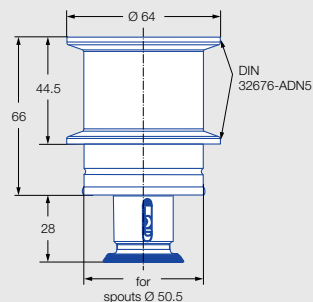
**Tri-Clamp connection<sup>1</sup>**



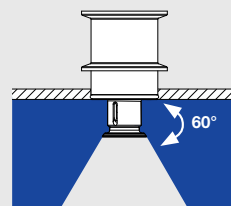
**Series 5P3**



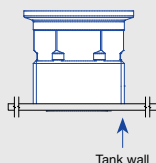
**Male thread**



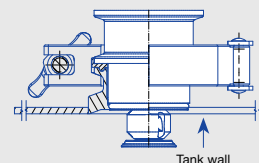
**Tri-Clamp connection<sup>2</sup>**



## Installation situation



**Via thread in idle position**



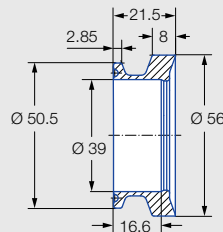
**Via Tri-Clamp in operating position**

<sup>1</sup> A clamp according to DIN 32676-A with a connection diameter of 50.5 mm is required to connect the nozzle to the weld-in flange.

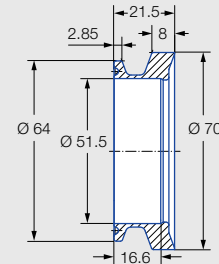
<sup>2</sup> A clamp according to DIN 32676-A with a connection diameter of 64.0 mm is required to connect the nozzle to the weld-in flange.

## Weld-in flange for Tri-Clamp connection

A 2 mm thick gasket must be used if the PopUp Whirly is installed with the weld-in flange.



Ordering no.: 050.020.1Y.01.00  
Material: Stainless steel 316L



Ordering no.: 050.020.1Y.01.01  
Material: Stainless steel 316L

| Max. tank diameter [m] | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------------------------|---|---|---|---|---|---|---|---|---|---|
|------------------------|---|---|---|---|---|---|---|---|---|---|



**Cleaning efficiency class**  
2



**Max. temperature**  
140°C



**Installation**  
Operation in every direction is possible



**Bearing**  
Slide bearing



**Material**  
Stainless steel 316L,  
stainless steel 316Ti,  
stainless steel 316,  
FKM



**Recommended operating pressure**  
2 bar  
5P2: Opening pressure approx. 1.0 bar, closing pressure approx. 0.5 bar,  
5P3: Opening pressure approx. 0.9 bar, closing pressure approx. 0.5 bar



**Filtration**  
Line strainer with a mesh size of 0.3 mm/50 mesh

Function video

[www.lechler.com/popupwhirly](http://www.lechler.com/popupwhirly)  
Or scan the QR code.



| Spray angle                                                                         | Ordering no.  |            |            |           | Narrowest free cross section<br>Ø<br>[mm] | V̇ water [l/min]                   |     |     |                           | Max. tank diameter<br>[m] |
|-------------------------------------------------------------------------------------|---------------|------------|------------|-----------|-------------------------------------------|------------------------------------|-----|-----|---------------------------|---------------------------|
|                                                                                     | Type          | Code       |            |           |                                           | p [bar] (p <sub>max</sub> = 5 bar) |     |     |                           |                           |
|                                                                                     |               | 1 1/4 BSPP | 1 1/2 BSPP | Tri-Clamp |                                           | 1.0                                | 2.0 | 3.0 | at 40 psi<br>[US gal/min] |                           |
|  | 5P2.873.1Y.AP | ●          |            |           | 2.5                                       | 11                                 | 15  | 18  | 5                         | 0.8                       |
|                                                                                     | 5P2.873.1Y.00 |            |            | ●         | 2.5                                       | 11                                 | 15  | 18  | 5                         | 0.8                       |
|                                                                                     | 5P2.923.1Y.AP | ●          |            |           | 3.5                                       | 14                                 | 20  | 25  | 6                         | 1.0                       |
|                                                                                     | 5P2.923.1Y.00 |            |            | ●         | 3.5                                       | 14                                 | 20  | 25  | 6                         | 1.0                       |
|                                                                                     | 5P3.043.1Y.AR |            | ●          |           | 3.3                                       | 28                                 | 40  | 49  | 12                        | 2.2                       |
|                                                                                     | 5P3.043.1Y.00 |            |            | ●         | 3.3                                       | 28                                 | 40  | 49  | 12                        | 2.2                       |

The maximum tank diameter applies to the recommended operating pressure and is meant as a recommendation only.  
The cleaning result is also affected by the type of soiling.

### Information on operation

- The PopUp Whirly is not suitable for operation with compressed air or any other gas.
- Operation above the recommended operating pressure has a negative impact on the cleaning result and wear.

# Rotating cleaning nozzle HygienicWhirly Series 594/595

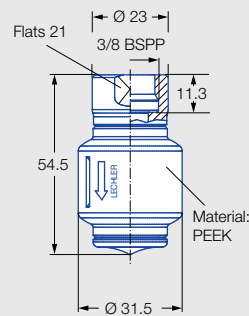


## Features:

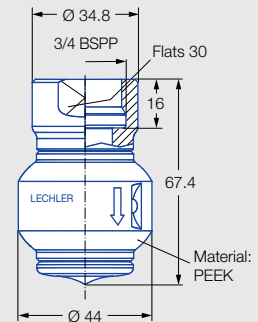
- Cleaning with highly effective flat jets
- Good cleaning effect even at low pressure
- Suitable for the application of foam



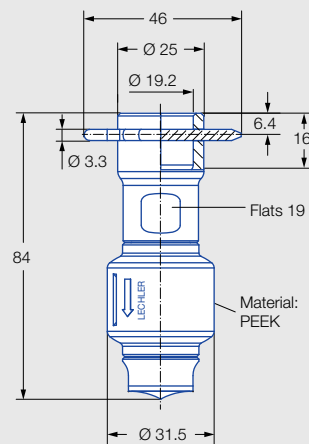
Series 594/595



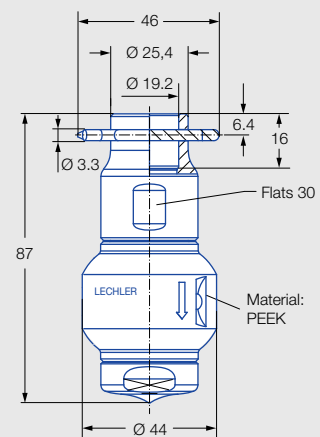
Standard version/Female thread  
59x.xx9.1Y.AF



Standard version/Female thread  
595.139.1Y.AL



Dimension of the slip-on  
connection according to  
ASME-BPE (OD tube)  
59x.xx9.1Y.67



Dimension of the slip-on  
connection according to  
ASME-BPE (OD tube)  
595.139.1Y.67

|                                                                                                                 |   |   |   |   |   |   |   |   |   |   |
|-----------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|
|  <b>Max. tank diameter [m]</b> | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|-----------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|---|



**Cleaning efficiency class**  
3



**Max. temperature**  
100 °C, short term  
up to 140 °C



**Installation**  
Operation in every  
direction is possible



**Bearing**  
Slide bearing made of  
PEEK



**Material**  
Stainless steel 316L,  
PEEK, version with slip-on  
connection O-ring made  
of EPDM



**Recommended operating pressure**  
3 bar



**Filtration**  
Line strainer with a mesh  
size of 0.3 mm/50 mesh

**Function video**

[www.lechler.com/hygienicwhirly](http://www.lechler.com/hygienicwhirly)  
Or scan the QR code.



| Spray angle                                                                                                    | Ordering no. |          |          |                         | Narrowest free cross section<br>Ø [mm] | V̇ water [l/min]                   |     |     |     |     |                        | Max. tank diameter [m] |
|----------------------------------------------------------------------------------------------------------------|--------------|----------|----------|-------------------------|----------------------------------------|------------------------------------|-----|-----|-----|-----|------------------------|------------------------|
|                                                                                                                | Type         | Code     |          |                         |                                        | p [bar] (p <sub>max</sub> = 5 bar) |     |     |     |     |                        |                        |
|                                                                                                                |              | 3/8 BSPP | 3/4 BSPP | 3/4" slip-on connection |                                        | 0.5                                | 1.0 | 2.0 | 3.0 | 5.0 | at 40 psi [US gal/min] |                        |
|                                                                                                                |              |          |          |                         |                                        |                                    |     |     |     |     |                        |                        |
| <div>360°</div> <div></div> | 594.829.1Y   | AF       |          | 67                      | 1.7                                    | 6                                  | 8   | 11  | 14  | 18  | 3                      | 0.8                    |
|                                                                                                                | 594.879.1Y   | AF       |          | 67                      | 2.5                                    | 8                                  | 11  | 15  | 18  | 23  | 5                      | 1.2                    |
|                                                                                                                | 595.009.1Y   | AF       |          | 67                      | 4.0                                    | 16                                 | 22  | 32  | 39  | 50  | 10                     | 1.5                    |
|                                                                                                                | 595.049.1Y   | AF       |          | 67                      | 4.2                                    | 20                                 | 28  | 40  | 49  | 63  | 12                     | 2.0                    |
|                                                                                                                | 595.139.1Y   |          | AL       | 67                      | 5.0                                    | 34                                 | 47  | 67  | 82  | 106 | 21                     | 2.7                    |

NPT thread available on request.

The maximum tank diameter applies to the recommended operating pressure and is meant as a recommendation only.  
The cleaning result is also affected by the type of soiling.

Compressed air should be used for dry blowing for a short time only. Operation above the recommended operating pressure has a negative impact on the cleaning result and wear.

#### Information about slip-on connections

- Pin made of stainless steel 316L supplied (Ordering no.: 095.022.1Y.50.94.E).
- Depending on the diameter of the adapter, the flow rate can increase due to a leakage between the adapter and the rotating cleaning nozzle.

|          |            |   |      |   |               |
|----------|------------|---|------|---|---------------|
| Ordering | Type       | + | Code | = | Ordering no.  |
| example: | 594.829.1Y | + | AF   | = | 594.829.1Y.AF |

# Rotating cleaning nozzle Whirly 2 Series 5W9



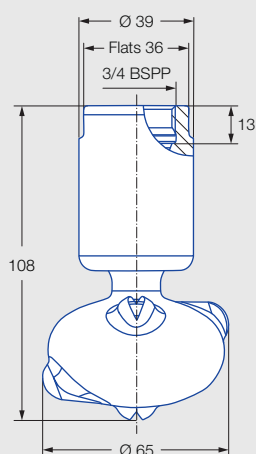
## Features:

- Popular and proven design
- Cleaning with effective flat jets
- Various connection options
- Available with a wide range of flow rates and spray angles

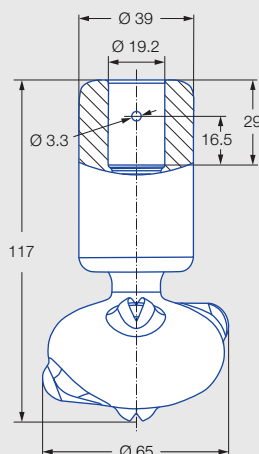


**ATEX version  
available on  
request**

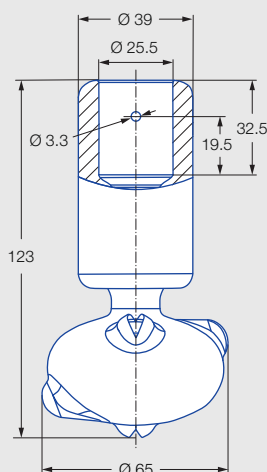
## Series 5W9



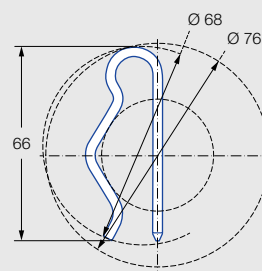
Female thread



Dimensions slip-on connection  
according to ASME-BPE (OD-tube)



Dimensions slip-on connection  
according to ASME-BPE (OD-tube)



Dimensions slip-on connection  
top view

| Max. tank diameter [m] | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------------------------|---|---|---|---|---|---|---|---|---|---|
|------------------------|---|---|---|---|---|---|---|---|---|---|



**Cleaning efficiency class**  
3



**Max. temperature**  
140°C



**Installation**  
Operation in every direction is possible



**Bearing**  
Double ball bearing made of stainless steel



**Material**  
Stainless steel 316L, PEEK



**Recommended operating pressure**  
2 bar



**Filtration**  
Line strainer with a mesh size of 0.1 mm/170 mesh



**Adapter**  
3/4 BSPP is compatible with HygienicFit

**Function video**

[www.lechler.com/de-en/medialibrary](http://www.lechler.com/de-en/medialibrary)  
Or scan the QR Code.



| Spray<br>angle                                                                                    | Ordering no. |          |                               |                             | Narrowest<br>free cross<br>section<br>Ø<br>[mm] | V̇ water [l/min]                   |     |     |                           | Max. tank<br>diameter<br>[m] |
|---------------------------------------------------------------------------------------------------|--------------|----------|-------------------------------|-----------------------------|-------------------------------------------------|------------------------------------|-----|-----|---------------------------|------------------------------|
|                                                                                                   | Type         | Code     |                               |                             |                                                 | p [bar] (p <sub>max</sub> = 6 bar) |     |     |                           |                              |
|                                                                                                   |              | 3/4 BSPP | 3/4"<br>Slip-on<br>connection | 1"<br>Slip-on<br>connection |                                                 | 1.0                                | 2.0 | 3.0 | at 40 psi<br>[US gal/min] |                              |
|                                                                                                   |              |          |                               |                             |                                                 |                                    |     |     |                           |                              |
| <div>270°</div>  | 5W9.075.1Y   | AL       | TF07                          | TF10                        | 2.0                                             | 34                                 | 48  | 59  | 15                        | 1.8                          |
|                                                                                                   | 5W9.145.1Y   | AL       | TF07                          | TF10                        | 2.8                                             | 50                                 | 71  | 87  | 22                        | 2.1                          |
|                                                                                                   | 5W9.195.1Y   | AL       | TF07                          | TF10                        | 3.3                                             | 69                                 | 97  | 119 | 30                        | 2.6                          |
| <div>270°</div>  | 5W9.076.1Y   | AL       | TF07                          | TF10                        | 2.0                                             | 34                                 | 48  | 59  | 15                        | 1.8                          |
|                                                                                                   | 5W9.106.1Y   | AL       | TF07                          | TF10                        | 2.5                                             | 41                                 | 58  | 71  | 18                        | 2.1                          |
|                                                                                                   | 5W9.196.1Y   | AL       | TF07                          | TF10                        | 3.4                                             | 69                                 | 97  | 119 | 30                        | 2.6                          |
| <div>360°</div>  | 5W9.079.1Y   | AL       | TF07                          | TF10                        | 1.6                                             | 34                                 | 48  | 59  | 15                        | 1.8                          |
|                                                                                                   | 5W9.149.1Y   | AL       | TF07                          | TF10                        | 2.4                                             | 50                                 | 71  | 87  | 22                        | 2.1                          |
|                                                                                                   | 5W9.199.1Y   | AL       | TF07                          | TF10                        | 3.0                                             | 69                                 | 97  | 119 | 30                        | 2.6                          |
|                                                                                                   | 5W9.279.1Y   | AL       | TF07                          | TF10                        | 3.5                                             | 103                                | 145 | 178 | 45                        | 3.0                          |

NPT thread available on request.

The maximum tank diameter applies to the recommended operating pressure and is meant as a recommendation only.  
The cleaning result is also affected by the type of soiling.

Compressed air should be used for dry blowing for a short time only. Operation above the recommended operating pressure has a negative impact on the cleaning result and wear.

#### Information about slip-on connections

- Pin made of stainless steel 316L supplied (Ordering no.: 095.013.1Y.06.72.0).
- Depending on the diameter of the adapter, the flow rate can increase due to a leakage between the adapter and the rotating cleaning nozzle.
- Minimum insertion diameter (with mounted pin) is 68 mm.

|          |            |   |      |   |               |
|----------|------------|---|------|---|---------------|
| Ordering | Type       | + | Code | = | Ordering no.  |
| example: | 5W9.075.1Y | + | AL   | = | 5W9.075.1Y.AL |

# Rotating cleaning nozzle Gyro Series 577

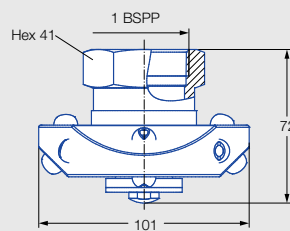


## Features:

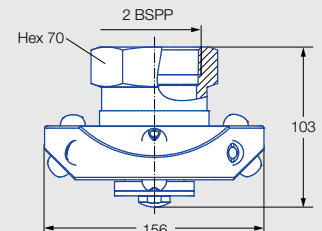
- Cleaning with powerful nozzle inserts
- Suitable for very large tanks
- Available with a wide range of flow rates
- Non clogging and large free cross sections



Series 577



Female thread



Female thread

| Max. tank diameter [m] | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------------------------|---|---|---|---|---|---|---|---|---|---|
|------------------------|---|---|---|---|---|---|---|---|---|---|



**Cleaning efficiency class**  
3



**Max. temperature**  
90°C



**Installation**  
Vertically facing downwards



**Bearing**  
Slide bearing made of PTFE



**Material**  
Stainless steel 316L, PTFE



**Recommended operating pressure**  
3 bar



**Filtration**  
Line strainer with a mesh size of 0.3 mm/50 mesh

**Function video**  
[www.lechler.com/gyro](http://www.lechler.com/gyro)  
Or scan the QR code.



| Spray angle                                                                                 | Ordering no. |        |        | Ṽ water [l/min]                    |     |     |     |                        | Max. tank diameter [m] |
|---------------------------------------------------------------------------------------------|--------------|--------|--------|------------------------------------|-----|-----|-----|------------------------|------------------------|
|                                                                                             | Type         | Code   |        | p [bar] (p <sub>max</sub> = 5 bar) |     |     |     |                        |                        |
|                                                                                             |              | 1 BSPP | 2 BSPP |                                    |     |     |     | at 40 psi [US gal/min] |                        |
|                                                                                             |              |        |        | 1.0                                | 2.0 | 3.0 | 5.0 |                        |                        |
| 360°<br> | 577.289.1Y   | AN     |        | 115                                | 163 | 200 | 258 | 50                     | 3.4                    |
|                                                                                             | 577.369.1Y   | AN     |        | 182                                | 258 | 316 | 408 | 80                     | 3.9                    |
|                                                                                             | 577.409.1Y   |        | AW     | 228                                | 322 | 394 | 509 | 100                    | 4.2                    |
|                                                                                             | 577.439.1Y   |        | AW     | 273                                | 386 | 473 | 610 | 120                    | 4.6                    |
|                                                                                             | 577.499.1Y   |        | AW     | 380                                | 538 | 659 | 851 | 170                    | 5.4                    |

NPT thread available on request.

The maximum tank diameter applies to the recommended operating pressure and is meant as a recommendation only.  
The cleaning result is also affected by the type of soiling.

Compressed air should be used for dry blowing for a short time only. Operation above the recommended operating pressure has a negative impact on the cleaning result and wear.

Ordering example: **577.289.1Y + AN = 577.289.1Y.AN**

# Rotating cleaning nozzle XactClean HP 2 Series 5S6/5S7



## Features:

- Flat fan nozzle with high impact
- Uniform cleaning
- High efficiency due to controlled rotation
- High operating reliability thanks to robust drive unit



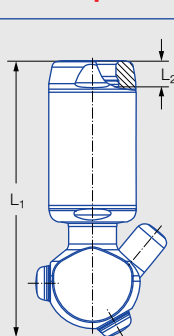
**ATEX version  
available on  
request**



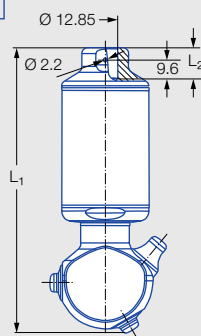
**FDA**



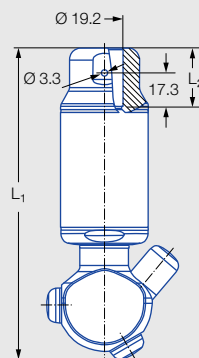
**Series 5S6/5S7**



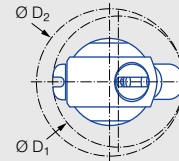
**Female thread**



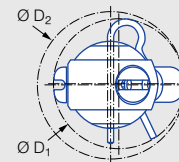
**Dimensions of  
1/2" slip-on connection  
according to  
ASME-BPE (OD tube)**



**Dimensions of  
3/4" slip-on connection  
according to  
ASME-BPE (OD tube)**



**Insertion diameter  $D_1$   
and interference circle diameter  $D_2$   
of the threaded connection**



**Insertion diameter  $D_1$   
and interference circle diameter  $D_2$   
of the slip-on connection**

| Connection  |                         | Dimensions [mm] |       |                          |                                    |
|-------------|-------------------------|-----------------|-------|--------------------------|------------------------------------|
|             |                         | $L_1$           | $L_2$ | Insertion diameter $D_1$ | Interference circle diameter $D_2$ |
| <b>AF</b>   | 3/8 BSPP                | 141.0           | 9.0   | 50.0–66.0                | 50.0–67.0                          |
| <b>AH</b>   | 1/2 BSPP                | 143.0           | 13.0  | 50.0–74.0                | 50.0–76.0                          |
| <b>AL</b>   | 3/4 BSPP                | 143.0           | 13.2  | 50.0–79.0                | 50.0–81.0                          |
| <b>AN</b>   | 1 BSPP                  | 140.0           | 16.5  | 51.0–79.0                | 53.0–80.0                          |
| <b>TF05</b> | 1/2" slip-on connection | 150.0           | 16.0  | 52.0–66.0                | 50.0–67.0                          |
| <b>TF07</b> | 3/4" slip-on connection | 160.0           | 30.0  | 66.0–79.0                | 50.0–81.0                          |

| Max. tank diameter [m] | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------------------------|---|---|---|---|---|---|---|---|---|---|
|------------------------|---|---|---|---|---|---|---|---|---|---|



**Cleaning  
efficiency class**  
4



**Max. temperature**  
150 °C



**Installation**  
Operation in every  
direction is possible



**Bearing**  
Double ball bearing



**Material**  
Stainless steel 1.4404  
(316L), PEEK, EPDM



**Recommended  
operating pressure**  
3 bar



**Filtration**  
Line strainer with a mesh  
size of 0.3 mm/50 mesh



**Rotation monitoring**  
Sensor compatible,  
for information:  
See Page 221



**Adapter**  
3/8 BSPP, 1/2 BSPP,  
3/4 BSPP and 1 BSPP are  
compatible with HygienicFit

[www.lechler.com/de-en/medialibrary/videos-general-industry](http://www.lechler.com/de-en/medialibrary/videos-general-industry)  
Or scan the QR code.

**Function video**





| Spray<br>angle                                                                      | Order no.  |             |             |             |           |                                    |                                    | Narrowest<br>cross-<br>section<br>Ø<br>[mm] | V̇ water [l/min]                    |     |     |      |                           | Max.<br>tank<br>diameter<br>[m] |
|-------------------------------------------------------------------------------------|------------|-------------|-------------|-------------|-----------|------------------------------------|------------------------------------|---------------------------------------------|-------------------------------------|-----|-----|------|---------------------------|---------------------------------|
|                                                                                     | Type       | Connection  |             |             |           |                                    |                                    |                                             | p [bar] (p <sub>max</sub> = 15 bar) |     |     |      |                           |                                 |
|                                                                                     |            | 3/8<br>BSPP | 1/2<br>BSPP | 3/4<br>BSPP | 1<br>BSPP | 1/2"<br>slip-on<br>connec-<br>tion | 3/4"<br>slip-on<br>connec-<br>tion |                                             | 2.0                                 | 3.0 | 5.0 | 10.0 | at 40 psi<br>[US gal/min] |                                 |
|                                                                                     |            |             |             |             |           |                                    |                                    |                                             |                                     |     |     |      |                           |                                 |
|    | 5S6.963.1Y | AF          | AH          |             |           | TF05                               |                                    | 1.7                                         | 25                                  | 31  | 40  | 57   | 8                         | 3.5                             |
|                                                                                     | 5S7.043.1Y |             | AH          |             |           |                                    | TF07                               | 2.0                                         | 41                                  | 50  | 65  | 92   | 13                        | 4.0                             |
|                                                                                     | 5S7.113.1Y |             | AH          | AL          |           |                                    | TF07                               | 2.0                                         | 60                                  | 73  | 94  | 133  | 18                        | 6.0                             |
|                                                                                     | 5S7.183.1Y |             |             | AL          |           |                                    | TF07                               | 2.0                                         | 89                                  | 109 | 141 | 199  | 28                        | 7.0                             |
|                                                                                     | 5S7.223.1Y |             |             | AL          |           |                                    | TF07                               | 2.0                                         | 111                                 | 136 | 175 | 248  | 34                        | 7.5                             |
|                                                                                     | 5S7.253.1Y |             |             | AL          | AN        |                                    | TF07                               | 2.0                                         | 135                                 | 165 | 213 | 301  | 42                        | 8.0                             |
|    | 5S6.964.1Y | AF          | AH          |             |           | TF05                               |                                    | 1.7                                         | 25                                  | 31  | 40  | 57   | 8                         | 3.5                             |
|                                                                                     | 5S7.044.1Y |             | AH          |             |           |                                    | TF07                               | 2.0                                         | 41                                  | 50  | 65  | 92   | 13                        | 4.0                             |
|                                                                                     | 5S7.114.1Y |             | AH          | AL          |           |                                    | TF07                               | 2.0                                         | 60                                  | 73  | 94  | 133  | 18                        | 6.0                             |
|                                                                                     | 5S7.184.1Y |             |             | AL          |           |                                    | TF07                               | 2.0                                         | 89                                  | 109 | 141 | 199  | 28                        | 7.0                             |
|                                                                                     | 5S7.224.1Y |             |             | AL          |           |                                    | TF07                               | 2.0                                         | 111                                 | 136 | 175 | 248  | 34                        | 7.5                             |
|                                                                                     | 5S7.254.1Y |             |             | AL          | AN        |                                    | TF07                               | 2.0                                         | 135                                 | 165 | 213 | 301  | 42                        | 8.0                             |
|    | 5S6.965.1Y | AF          | AH          |             |           | TF05                               |                                    | 1.7                                         | 25                                  | 31  | 40  | 57   | 8                         | 3.5                             |
|                                                                                     | 5S7.045.1Y |             | AH          |             |           |                                    | TF07                               | 2.0                                         | 41                                  | 50  | 65  | 92   | 13                        | 4.0                             |
|                                                                                     | 5S7.115.1Y |             | AH          | AL          |           |                                    | TF07                               | 2.0                                         | 60                                  | 73  | 94  | 133  | 18                        | 6.0                             |
|                                                                                     | 5S7.185.1Y |             |             | AL          |           |                                    | TF07                               | 2.0                                         | 89                                  | 109 | 141 | 199  | 28                        | 7.0                             |
|                                                                                     | 5S7.225.1Y |             |             | AL          |           |                                    | TF07                               | 2.0                                         | 111                                 | 136 | 175 | 248  | 34                        | 7.5                             |
|                                                                                     | 5S7.255.1Y |             |             | AL          | AN        |                                    | TF07                               | 2.0                                         | 135                                 | 165 | 213 | 301  | 42                        | 8.0                             |
|  | 5S6.966.1Y | AF          | AH          |             |           | TF05                               |                                    | 1.7                                         | 25                                  | 31  | 40  | 57   | 8                         | 3.5                             |
|                                                                                     | 5S7.046.1Y |             | AH          |             |           |                                    | TF07                               | 2.0                                         | 41                                  | 50  | 65  | 92   | 13                        | 4.0                             |
|                                                                                     | 5S7.116.1Y |             | AH          | AL          |           |                                    | TF07                               | 2.0                                         | 60                                  | 73  | 94  | 133  | 18                        | 6.0                             |
|                                                                                     | 5S7.186.1Y |             |             | AL          |           |                                    | TF07                               | 2.0                                         | 89                                  | 109 | 141 | 199  | 28                        | 7.0                             |
|                                                                                     | 5S7.226.1Y |             |             | AL          |           |                                    | TF07                               | 2.0                                         | 111                                 | 136 | 175 | 248  | 34                        | 7.5                             |
|                                                                                     | 5S7.256.1Y |             |             | AL          | AN        |                                    | TF07                               | 2.0                                         | 135                                 | 165 | 213 | 301  | 42                        | 8.0                             |
|  | 5S6.969.1Y | AF          | AH          |             |           | TF05                               |                                    | 1.5                                         | 25                                  | 31  | 40  | 57   | 8                         | 3.5                             |
|                                                                                     | 5S7.049.1Y |             | AH          |             |           |                                    | TF07                               | 2.0                                         | 41                                  | 50  | 65  | 92   | 13                        | 4.0                             |
|                                                                                     | 5S7.119.1Y |             | AH          | AL          |           |                                    | TF07                               | 2.0                                         | 60                                  | 73  | 94  | 133  | 18                        | 6.0                             |
|                                                                                     | 5S7.189.1Y |             |             | AL          |           |                                    | TF07                               | 2.0                                         | 89                                  | 109 | 141 | 199  | 28                        | 7.0                             |
|                                                                                     | 5S7.229.1Y |             |             | AL          |           |                                    | TF07                               | 2.0                                         | 111                                 | 136 | 175 | 248  | 34                        | 7.5                             |
|                                                                                     | 5S7.259.1Y |             |             | AL          | AN        |                                    | TF07                               | 2.0                                         | 135                                 | 165 | 213 | 301  | 42                        | 8.0                             |

NPT thread available on request.

The maximum tank diameter applies to the recommended operating pressure and is meant as a recommendation only.

The cleaning result is also affected by the type of soiling.

Compressed air should be used for dry blowing for a short time only. Operation above the recommended operating pressure has a negative impact on the cleaning result and wear.

#### Information about slip-on connections

- Pin made of stainless steel 316L supplied (Ordering no.: 095.013.1Y.06.45).
- Depending on the diameter of the adapter, the flow rate can increase due to a leakage between the adapter and the rotating cleaning nozzle.

|          |            |   |      |   |               |
|----------|------------|---|------|---|---------------|
| Ordering | Type       | + | Code | = | Ordering no.  |
| example: | 5S6.963.1Y | + | AF   | = | 5S6.963.1Y.AF |



# Rotating cleaning nozzle XactClean HP+ Series 5S5

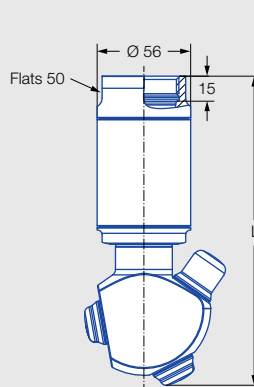


## Features:

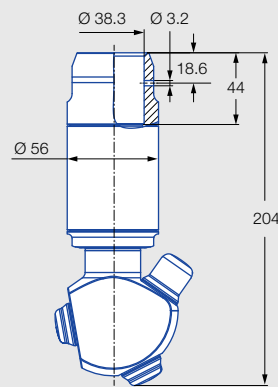
- High impact and uniform cleaning due to specially developed flat fan nozzles
- Effective cleaning of larger tanks due to higher flow rates
- High dependability and operational reliability due to robust drive unit
- Compatible with Lechler rotation monitoring sensor



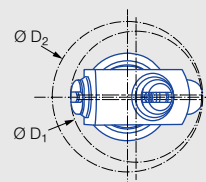
Series 5S5



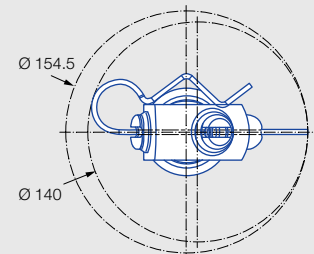
Female thread



Dimensions of slip-on connection according to ASME-BPE (OD tube)



Insertion diameter  $D_1$  and interference circle diameter  $D_2$  of the threaded connection



Insertion diameter and interference circle diameter of the slip-on connection

| Connection |            | Dimensions [mm] |                          |                                    |
|------------|------------|-----------------|--------------------------|------------------------------------|
|            |            | L               | Insertion diameter $D_1$ | Interference circle diameter $D_2$ |
| AN         | 1 BSPP     | 185             | 81–92                    | 82–98                              |
| AQ         | 1 1/4 BSPP | 185             | 81–92                    | 82–98                              |
| AS         | 1 1/2 BSPP | 187             | 81–92                    | 82–98                              |

|  |                        |   |   |   |   |   |   |   |   |   |   |
|--|------------------------|---|---|---|---|---|---|---|---|---|---|
|  | Max. tank diameter [m] | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|------------------------|---|---|---|---|---|---|---|---|---|---|



**Cleaning efficiency class**  
4



**Max. temperature**  
150 °C



**Installation**  
Operation in every direction is possible



**Bearing**  
Double ball bearing



**Material**  
Stainless steel 1.4404 (316L), stainless steel 1.4401 (316), PEEK, EPDM



**Recommended operating pressure**  
3 bar



**Filtration**  
Line strainer with a mesh size of 0.3 mm/50 mesh



**Rotation monitoring**  
Sensor compatible, for information: See Page 221



**Adapter**  
1 BSPP, 1 1/4 BSPP and 1 1/2 BSPP are compatible with HygienicFit

**Function video**

[www.lechler.com/de-en/medialibrary/videos-general-industry](http://www.lechler.com/de-en/medialibrary/videos-general-industry)  
Or scan the QR code.





| Spray angle                                                                                | Ordering no. |        |            |            |                               | Narrowest free cross section<br>Ø<br>[mm] | V̇ water [l/min]                    |     |     |                           | Max. tank diameter<br>[m] |
|--------------------------------------------------------------------------------------------|--------------|--------|------------|------------|-------------------------------|-------------------------------------------|-------------------------------------|-----|-----|---------------------------|---------------------------|
|                                                                                            | Type         | Code   |            |            |                               |                                           | p [bar] (p <sub>max</sub> = 10 bar) |     |     |                           |                           |
|                                                                                            |              | 1 BSPP | 1 1/4 BSPP | 1 1/2 BSPP | 1 1/2"-<br>Slip-on connection |                                           | 2.0                                 | 3.0 | 5.0 | at 40 psi<br>[US gal/min] |                           |
| 180°<br>  | 5S5.293.1Y   | AN     |            |            | TF15                          | 3.0                                       | 165                                 | 202 | 261 | 51                        | 9.0                       |
|                                                                                            | 5S5.323.1Y   | AN     | AQ         |            | TF15                          | 3.0                                       | 200                                 | 245 | 316 | 62                        | 9.2                       |
|                                                                                            | 5S5.363.1Y   |        | AQ         | AS         | TF15                          | 3.0                                       | 250                                 | 306 | 395 | 78                        | 9.4                       |
| 180°<br>  | 5S5.294.1Y   | AN     |            |            | TF15                          | 3.0                                       | 165                                 | 202 | 261 | 51                        | 9.0                       |
|                                                                                            | 5S5.324.1Y   | AN     | AQ         |            | TF15                          | 3.0                                       | 200                                 | 245 | 316 | 62                        | 9.2                       |
|                                                                                            | 5S5.364.1Y   |        | AQ         | AS         | TF15                          | 3.0                                       | 250                                 | 306 | 395 | 78                        | 9.4                       |
| 270°<br>  | 5S5.295.1Y   | AN     |            |            | TF15                          | 3.0                                       | 165                                 | 202 | 261 | 51                        | 9.0                       |
|                                                                                            | 5S5.325.1Y   | AN     | AQ         |            | TF15                          | 3.0                                       | 200                                 | 245 | 316 | 62                        | 9.2                       |
|                                                                                            | 5S5.365.1Y   |        | AQ         | AS         | TF15                          | 3.0                                       | 250                                 | 306 | 395 | 78                        | 9.4                       |
| 270°<br>  | 5S5.296.1Y   | AN     |            |            | TF15                          | 3.0                                       | 165                                 | 202 | 261 | 51                        | 9.0                       |
|                                                                                            | 5S5.326.1Y   | AN     | AQ         |            | TF15                          | 3.0                                       | 200                                 | 245 | 316 | 62                        | 9.2                       |
|                                                                                            | 5S5.366.1Y   |        | AQ         | AS         | TF15                          | 3.0                                       | 250                                 | 306 | 395 | 78                        | 9.4                       |
| 360°<br> | 5S5.299.1Y   | AN     |            |            | TF15                          | 3.0                                       | 165                                 | 202 | 261 | 51                        | 9.0                       |
|                                                                                            | 5S5.329.1Y   | AN     | AQ         |            | TF15                          | 3.0                                       | 200                                 | 245 | 316 | 62                        | 9.2                       |
|                                                                                            | 5S5.369.1Y   |        | AQ         | AS         | TF15                          | 3.0                                       | 250                                 | 306 | 395 | 78                        | 9.4                       |
|                                                                                            | 5S5.399.1Y   |        | AQ         | AS         | TF15                          | 3.0                                       | 300                                 | 367 | 474 | 93                        | 9.6                       |

NPT thread available on request.

The maximum tank diameter applies to the recommended operating pressure and is meant as a recommendation only.  
The cleaning result is also affected by the type of soiling.

Compressed air should be used for dry blowing for a short time only. Operation above the recommended operating pressure has a negative impact on the cleaning result and wear.

#### Information about slip-on connections

- Pin made of stainless steel 316L supplied (Ordering no.: 095.013.1Y.06.45).
- Depending on the diameter of the adapter, the flow rate can increase due to a leakage between the adapter and the rotating cleaning nozzle.

|          |            |   |      |   |               |
|----------|------------|---|------|---|---------------|
| Ordering | Type       | + | Code | = | Ordering no.  |
| example: | 5S5.293.1Y | + | AN   | = | 5S5.293.1Y.AN |

# High impact tank cleaning machine

## MeshClean

### Series 5T2/5T3



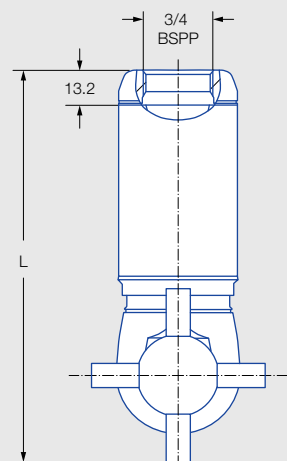
#### Features:

- High efficiency thanks to especially powerful solid jet nozzles
- Also suitable for smaller tanks with stubborn soiling
- Active self-cleaning through special nozzle geometry
- Particularly low-maintenance

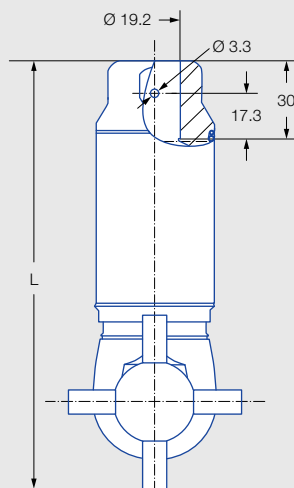


**ATEX version  
available on  
request**

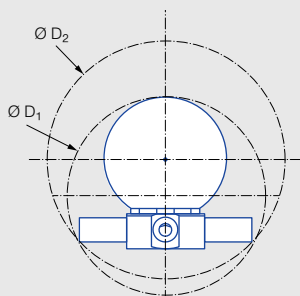
Series 5T2/5T3



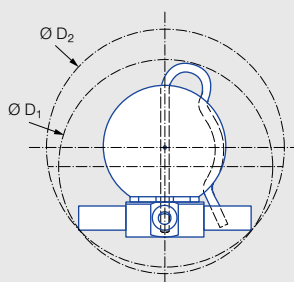
Female thread



Dimensions of slip-on connection  
according to ASME-BPE (OD tube)



Insertion diameter  $D_1$  and  
interference circle diameter  $D_2$   
of the threaded connection



Insertion diameter  $D_1$  and  
interference circle diameter  $D_2$   
of the slip-on connection





|                                                                                                                 |   |   |   |   |    |    |    |    |    |    |
|-----------------------------------------------------------------------------------------------------------------|---|---|---|---|----|----|----|----|----|----|
|  <b>Max. tank diameter [m]</b> | 0 | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 |
|-----------------------------------------------------------------------------------------------------------------|---|---|---|---|----|----|----|----|----|----|



**Cleaning efficiency class**  
5



**Max. temperature**  
150 °C



**Installation**  
Operation in every installation position



**Bearing**  
Ball bearing



**Material**  
Stainless steel 1.4404 (316L), PTFE, PEEK, EPDM



**Recommended operating pressure**  
5 bar



**Filtration**  
Line strainer with a mesh size of 0.2 mm/80 mesh



**Rotation monitoring**  
Sensor compatible, for information: See Page 221



**Weight**  
1,0 kg



**Adapter**  
3/4 BSPP is compatible with HygienicFit

[Function video](#)

[www.lechler.com/de-en/medialibrary/videos-general-industry](http://www.lechler.com/de-en/medialibrary/videos-general-industry)

Or scan the QR code.



| Spray angle                                                                              | Order no.  |            |                         | V̇ water [l/min] |     |                        | Dimensions [mm]                     |    |    |               |                  |                  | Max. tank diameter [m] |
|------------------------------------------------------------------------------------------|------------|------------|-------------------------|------------------|-----|------------------------|-------------------------------------|----|----|---------------|------------------|------------------|------------------------|
|                                                                                          | Type       | Connection |                         |                  |     |                        | p [bar] (p <sub>max</sub> = 15 bar) |    |    | Female thread |                  |                  |                        |
|                                                                                          |            | 3/4 BSPP   | 3/4" slip-on connection | 2.0              | 5.0 | at 40 psi [US gal/min] |                                     |    |    | L             | Ø D <sub>1</sub> | Ø D <sub>2</sub> |                        |
|                                                                                          |            |            |                         |                  |     |                        |                                     |    |    |               |                  |                  |                        |
|  360° | 5T2.849.1Y | AL         | TF07                    | 13               | 20  | 4                      | 142                                 | 68 | 82 | 157           | 77               | 82               | 11.5                   |
|                                                                                          | 5T2.969.1Y | AL         | TF07                    | 25               | 40  | 8                      | 142                                 | 68 | 82 | 157           | 77               | 82               | 12.0                   |
|                                                                                          | 5T3.029.1Y | AL         | TF07                    | 35               | 55  | 11                     | 142                                 | 68 | 82 | 157           | 77               | 82               | 12.5                   |
|                                                                                          | 5T3.089.1Y | AL         | TF07                    | 50               | 79  | 16                     | 148                                 | 74 | 91 | 163           | 82               | 91               | 13.0                   |

The maximum tank diameter applies to the recommended operating pressure and is meant as a recommendation only.  
The cleaning result is also affected by the type of soiling.

Ordering Type + Code = Ordering no.  
example: 5T2.849.1Y + AL = 5T2.849.1Y.AL

# High impact cleaner IntenseClean Hygienic Series 5TB



## Features:

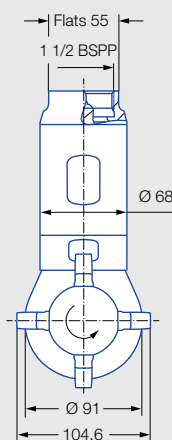
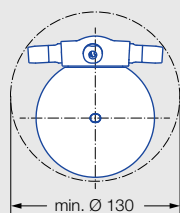
- Extremely high degree of effectiveness due to particularly powerful solid stream nozzles
- High level of efficiency due to gear-controlled rotation
- Proven in the pharmaceutical and food and beverage industry
- Suitable for pressure levels up to 25 bar
- High surface quality



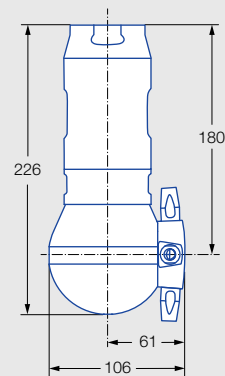
Series 5TB



**ATEX version available on request**



Female thread



| Max. tank diameter [m] | 0 | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 |
|------------------------|---|---|---|---|----|----|----|----|----|----|
|------------------------|---|---|---|---|----|----|----|----|----|----|



**Cleaning efficiency class**  
5



**Max. temperature**  
95°C



**Installation**  
Operation in every direction is possible



**Bearing**  
Ball bearing



**Material**  
Stainless steel 316L, stainless steel 632, PTFE, PEEK, zirconium oxide, EPDM



**Recommended operating pressure**  
5 bar



**Filtration**  
Line strainer with a mesh size of 0.2 mm/80 mesh



**Rotation monitoring**  
Sensor compatible, for information: See Page 221



**Weight**  
4.0 kg

**Function video**

[www.lechler.com/intensecleanhygienic5tb](http://www.lechler.com/intensecleanhygienic5tb)

Or scan the QR code.



| Spray angle                                                                                                    | Ordering no.  | Narrowest free cross section<br>Ø<br>[mm] | Number,<br>Ø Nozzles<br>[mm] | V̇ water [l/min]                    |     |      |                           | Max.<br>tank diameter<br>[m] |
|----------------------------------------------------------------------------------------------------------------|---------------|-------------------------------------------|------------------------------|-------------------------------------|-----|------|---------------------------|------------------------------|
|                                                                                                                | Type          |                                           |                              | p [bar] (p <sub>max</sub> = 25 bar) |     |      |                           |                              |
|                                                                                                                |               |                                           |                              | 2.0                                 | 5.0 | 10.0 | at 40 psi<br>[US gal/min] |                              |
| <div>360°</div> <div></div> | 5TB.406.1Y.AS | 6.0                                       | 4 × 6.0                      | 107                                 | 169 | 239  | 33                        | 14.0                         |
|                                                                                                                | 5TB.407.1Y.AS | 6.0                                       | 4 × 7.0                      | 132                                 | 209 | 296  | 41                        | 14.0                         |
|                                                                                                                | 5TB.408.1Y.AS | 6.0                                       | 4 × 8.0                      | 150                                 | 238 | 336  | 47                        | 15.0                         |

NPT thread available on request.

The maximum tank diameter applies to the recommended operating pressure and is meant as a recommendation only. The cleaning result is also affected by the type of soiling.

# High impact cleaner IntenseClean Series 5TM



## Features:

- Very robust design
- High degree of effectiveness due to particularly powerful solid stream nozzles
- High level of efficiency due to gear-controlled rotation
- Proven in the petrochemical industry

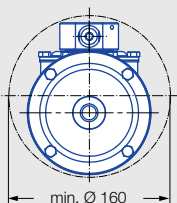


FDA

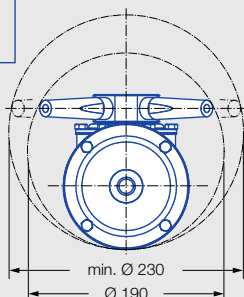


**ATEX version  
available on  
request**

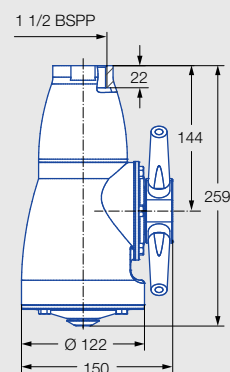
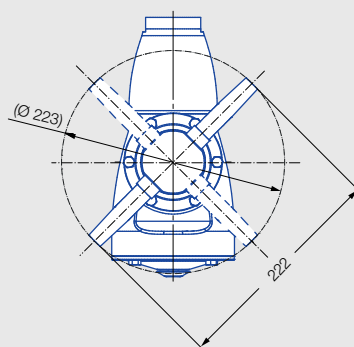
## Series 5TM



**5TM.2xx.1Y.AS**  
(2 nozzles)



**5TM.4xx.1Y.AS**  
(4 nozzles)



**Female thread**

| Max. tank diameter [m] | 0 | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 |
|------------------------|---|---|---|---|----|----|----|----|----|----|
|------------------------|---|---|---|---|----|----|----|----|----|----|



**Cleaning efficiency class**  
5



**Max. temperature**  
95°C



**Installation**  
Operation in every direction is possible



**Bearing**  
Ball bearing



**Material**  
Stainless steel 316L, stainless steel 304, stainless steel 302, PTFE, PEEK



**Recommended operating pressure**  
5 bar



**Filtration**  
Line strainer with a mesh size of 0.2 mm/80 mesh



**Rotation monitoring**  
Sensor compatible, for information: See Page 221



**Weight**  
7.5 kg

**Function video**

[www.lechler.com/intenseclean](http://www.lechler.com/intenseclean)  
Or scan the QR code.



| Spray angle                                                                                 | Ordering no.  | Narrowest free cross section<br>Ø [mm] | Number, Ø Nozzles [mm] | V̇ water [l/min]                   |     |     |     |                        | Max. tank diameter [m] |
|---------------------------------------------------------------------------------------------|---------------|----------------------------------------|------------------------|------------------------------------|-----|-----|-----|------------------------|------------------------|
|                                                                                             | Type          |                                        |                        | p [bar] (p <sub>max</sub> = 7 bar) |     |     |     |                        |                        |
|                                                                                             |               |                                        |                        | 2.0                                | 3.0 | 5.0 | 7.0 | at 40 psi [US gal/min] |                        |
| 360°<br> | 5TM.208.1Y.AS | 8.0                                    | 2 × 8.0                | 125                                | 153 | 198 | 234 | 39                     | 24.0                   |
|                                                                                             | 5TM.210.1Y.AS | 10.0                                   | 2 × 10.0               | 160                                | 196 | 253 | 299 | 50                     | 24.0                   |
|                                                                                             | 5TM.406.1Y.AS | 6.0                                    | 4 × 6.0                | 140                                | 171 | 221 | 261 | 43                     | 18.0                   |
|                                                                                             | 5TM.407.1Y.AS | 7.0                                    | 4 × 7.0                | 170                                | 208 | 269 | 318 | 53                     | 20.0                   |
|                                                                                             | 5TM.408.1Y.AS | 8.0                                    | 4 × 8.0                | 200                                | 245 | 316 | 374 | 62                     | 22.0                   |
|                                                                                             | 5TM.410.1Y.AS | 10.0                                   | 4 × 10.0               | 260                                | 318 | 411 | 486 | 81                     | 23.0                   |

NPT thread available on request.

The maximum tank diameter applies to the recommended operating pressure and is meant as a recommendation only.  
The cleaning result is also affected by the type of soiling.

# Rotation monitoring sensor



## Features:

Cleaning procedures can be monitored easily and reliably with the Lechler rotation monitoring sensor. The sensor records the quantity of liquid flowing past the sensor tip. With the aid of software<sup>1</sup>, the sensor function can be specifically adjusted to the tank size, pressure and nozzle.

## Electrical data:

- Supply voltage:  
 $U_b = 24\text{ V} \pm 20\%$   
 (18 to 32 VDC)
- Power requirements:  
 $< 20\text{ mA}$
- Output signal:  
 PNP, 50 mA, short circuit protected, active

## Operating conditions:

- Ambient temperature:  
 $-10\text{ °C}$  to  $+60\text{ °C}$
- Process temperature:  
 $0\text{ °C}$  to  $+100\text{ °C}$

## Materials:

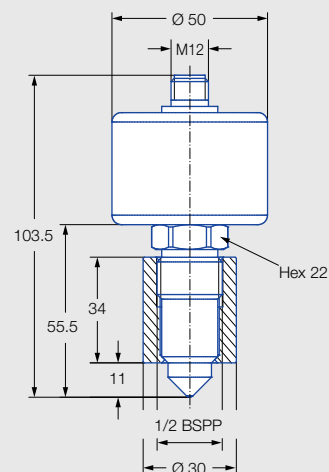
- Socket (1/2 BSPP):  
 Stainless steel 316L
- Probe tip: PEEK
- Housing: Stainless steel 303

## Operating principle:

- Capacitive

## Advantages:

- Reliable recognition of any faults during the cleaning cycle
- The process connection of the sensor is in compliance with the hygiene guidelines of EHEDG
- Simple operation
- Can be connected to a PLC
- Only needs to be set up once using the software provided
- Can be specifically adapted to each cleaning task



## Rotation monitoring sensor, incl. weld-in sleeve



## Cable set for commissioning



Mains adapter



USB adapter with cable



Programming adapter Y-piece



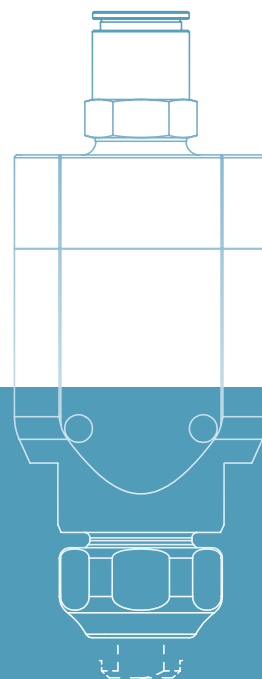
Weld-in mandrel

| Ordering data                                    | Ordering no.     |
|--------------------------------------------------|------------------|
| Rotation monitoring sensor, incl. weld-in sleeve | 050.040.00.00.00 |
| Cable set for commissioning                      | 050.040.00.00.01 |

<sup>1</sup> Software download (free): [www.lechler.com/software/rotationcontrolsystem](http://www.lechler.com/software/rotationcontrolsystem)

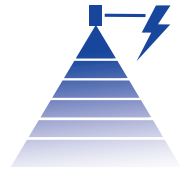


# NOZZLE-VALVE COMBINATIONS



# NOZZLE-VALVE COMBINATIONS

## VarioSpray SYSTEMS



### Innovative and flexible spraying solutions opens up for new application areas.

Faster, precisely, more sustainable: The demand for more efficient production processes is increasing in almost every industry. Even already extremely efficient spraying technology processes are affected – particularly when spraying very small liquid volumes. Pneumatic systems are often used here, as very small flow rates can be achieved by using compressed air. However, the control and installation activities are extremely complex. Additionally, the use of air can have an unfavourable effect on operating costs. Aerosols may also be formed and liquid is lost due to the rebound effect. With the VarioSpray HP and VarioSpray II hydraulic pulse-width-modulated nozzle-valve systems, Lechler offers two alternatives that are as versatile as they are reliable.

With hydraulic nozzle systems, the narrowest cross section of the spray nozzle determines the liquid flow rate. Due to economical and production-related reasons, the narrowest cross section can't be randomly minimized. Instead, we use flexible timing of the spray duration to achieve minimal flow rates – without the need for an expensive and complex pneumatic atomizing system. In addition to the VarioSpray HP and

VarioSpray II nozzle-valve systems, a control unit is also required to permit simple modification of the pulse-width and cycle frequency.

### Applications

- Oil application for applying seasoning
- Web humidification
- Application of separating agent
- Humidification
- Coating
- Anti-scuffing

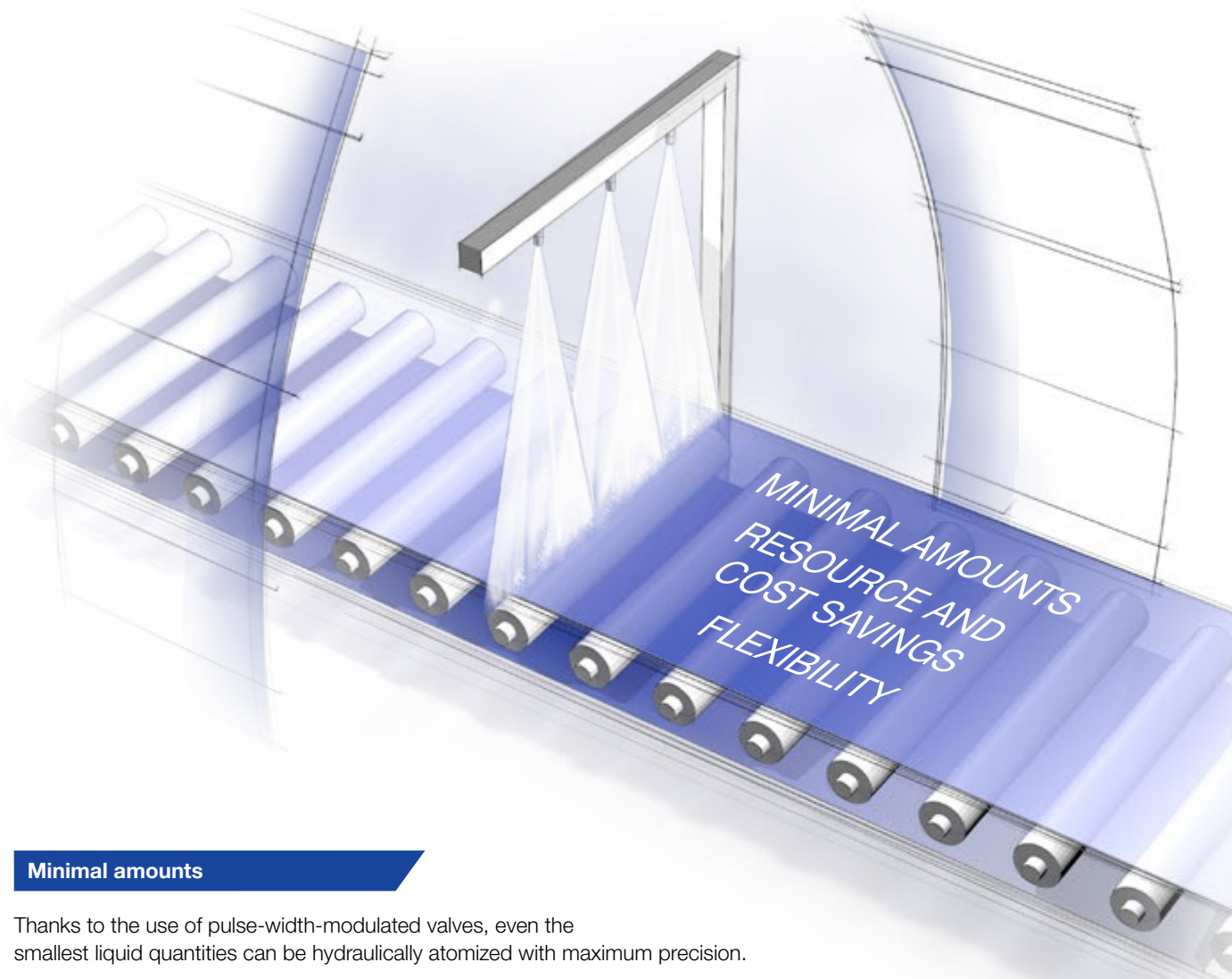
### Your advantages

- Simple adjustment of the pulse-width and the cycle frequency
- Modular design and modular system
- Start/Stop signal (e.g. via light barrier)
- Individual valve control for VarioSpray HP
- Rinsing function



### Good to know

Detailed information can be found in our brochure "VarioSpray" as well as at [www.lechler.com/de-en/variospray](http://www.lechler.com/de-en/variospray).



#### Minimal amounts

Thanks to the use of pulse-width-modulated valves, even the smallest liquid quantities can be hydraulically atomized with maximum precision.

This control method permits:

- Flexible and immediate response to changed ambient parameters (e.g. belt speed)
- Uniform jet and spray quality
- Further application benefits due to a significantly increased turn-down ratio

#### Resource and cost savings

The aerosol-free atomization of smallest liquid volumes offers specific benefits for spray nozzle operation. The fact that no atomizing air is used means a huge reduction in rebound effects.

The following costs are reduced as a result:

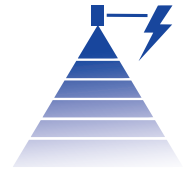
- Equipment cleaning
- Operating costs of extraction systems
- Liquid losses because the liquid being atomized is applied to the product in a more targeted manner

#### Flexibility

The Lechler VarioSpray system is completely modular, allowing it to be adapted to individual requirements as flexibly as possible.

The result is a perfectly coordinated product portfolio including:

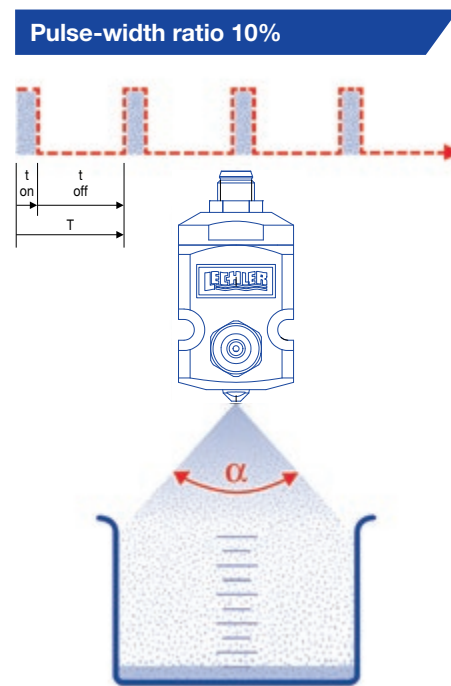
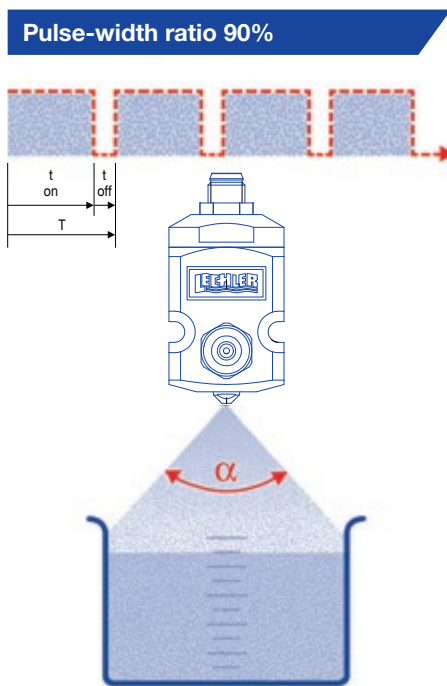
- Optimum valve control due to perfectly matched electronic components
- Modular spray bars
- Various predefined Lechler control concepts
- Individual advice from our sales staff



## What is pulse-width modulation?

Pulse-width modulation refers to the variation of the ON time  $t_{on}$  / OFF time  $t_{off}$  of a square-wave signal when the frequency  $f$  remains constant. Here, the frequency  $f$  corresponds to the reciprocal value of the period duration  $T$ .

The ratio of the ON time  $t_{on}$  to the period duration  $T$  is referred to as the pulse-width ratio (DC = duty cycle). The pulse-width ratio determines the flow rate. The valve is open during the ON time  $t_{on}$ . The shorter the DC, the less the flow rate. Depending on the frequency selected, the pulsation is barely visible to the human eye.



## Which fluids can be sprayed?

The two innovative Lechler products VarioSpray HP and VarioSpray II can be used to precisely spray a wide range of different liquids. The two nozzle-valve systems are individually designed to optimally perform these tasks.

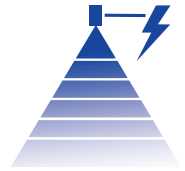
VarioSpray HP was developed to permit flexible spraying of a wide variety of liquids. Even high-viscosity media (up to 75 mPas, depending on the liquid density) can be easily atomized.

VarioSpray II is ideal for applying small volumes of low-viscosity, easily atomized liquids.

## Sprayable liquids

| VarioSpray HP                  | VarioSpray II |
|--------------------------------|---------------|
| Water                          |               |
| Low-viscosity separating agent |               |
| Disinfectant                   |               |
| Oils                           | –             |
| Fats                           | –             |
| Emulsions                      | –             |
| Liquid egg                     | –             |
| Milk                           | –             |
| Sugar solutions                | –             |
| etc.                           | –             |

# **COMPARISON** **VarioSpray HP – VarioSpray II**



## **VarioSpray HP** High Performance

**Flow rate: Up to 1,000 ml/min at 3 bar<sup>1</sup>**

**For high viscosity media up to 75 mPa·s**

**Liquid supply at the rear**

**Flow-optimised liquid supply**

**Simple nozzle changeover**

**Turn-down ratio up to 29 : 1**

**Filter optionally available**

**Push-in connection for  
8 mm hose diameter**

**Voltage 12 V DC/24 V DC for Peak & Hold  
activation**

**Electrical connection via M8 slip-on connection**

**Control via colour touch panel**

**Two control unit versions:**

- **SMART** (max. 8 valves)
- **FLEX** (max. 16 valves)

**Individual valve control (FLEX)**

**Frequencies: 10/20/30/40/50/75/100/200 Hz**

## **VarioSpray II**

**Flow rate: Up to 140 ml/min at 3 bar<sup>1</sup>**

**For low viscosity media up to 15 mPa·s**

**Liquid supply at the side**

**Low liquid volume in the valve**

**Very small design**

**Turn-down ratio up to 11 : 1**

**Integrated last-chance filter**

**Push-on connection  
for 6 × 1 mm hose diameter**

**Voltage 24 V DC**

**M8 slip-on connection**

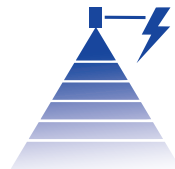
**Compact control unit**

**Simple operation  
(max. 8 valves)**

**All valves activated simultaneously**

**Frequencies: 25/50/75/100 Hz**

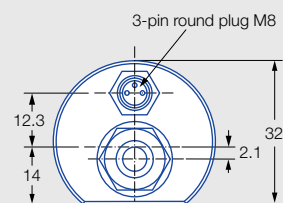
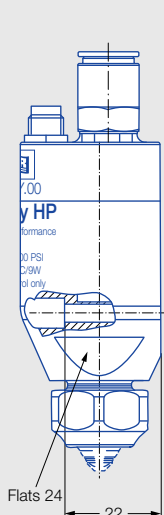
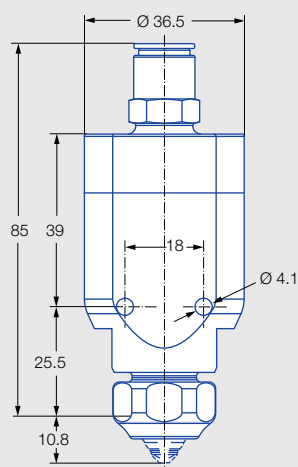
<sup>1</sup> Nominal flow rate without nozzle.



## VarioSpray HP

High Performance

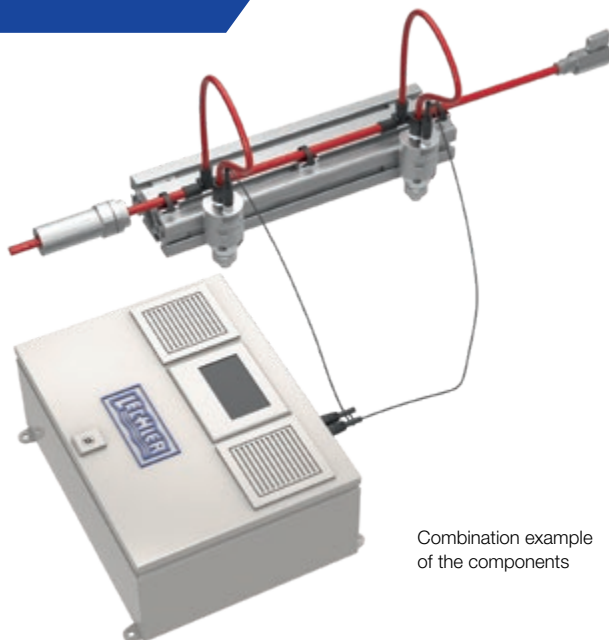
The HP series can be used to atomise a wide variety of liquids. All parts that come into contact with liquids are made of stainless steel, thereby complying with Directives EC 1935/2004 and FDA regulations.



### Components and combination options



Individual valve



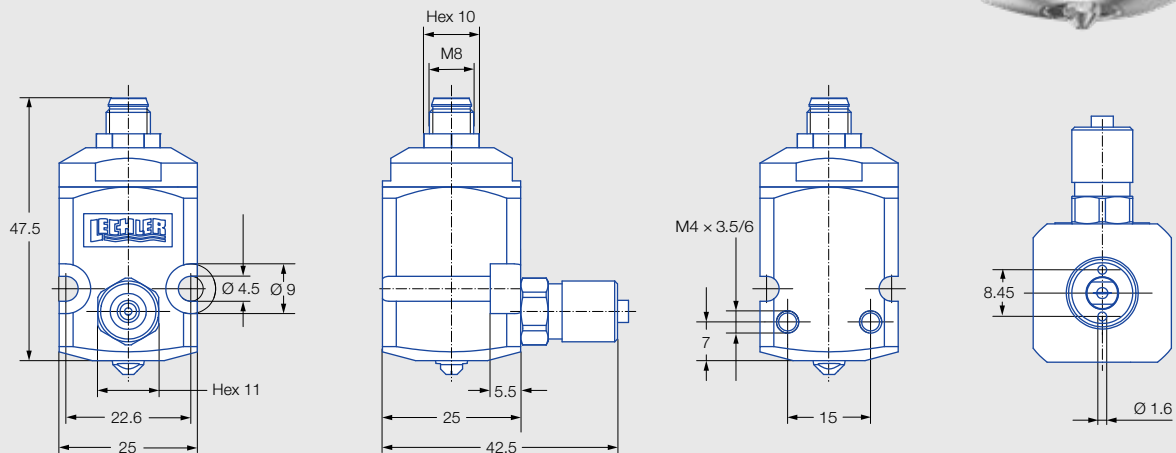
Combination example  
of the components

### Good to know

Detailed information on VarioSpray HP along with the order numbers of the system components can be found in our brochure "VarioSpray". A PDF is available for download at [www.lechler.com/de-en/variospray](http://www.lechler.com/de-en/variospray)

## VarioSpray II

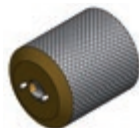
Nozzle valves of the VarioSpray II series can efficiently atomise the smallest liquid volumes. Their size makes these valves ideal for use in tight spaces. The VarioSpray II system is also available as a food grade version, thereby complying with Directives EC 1935/2004 and FDA regulations.



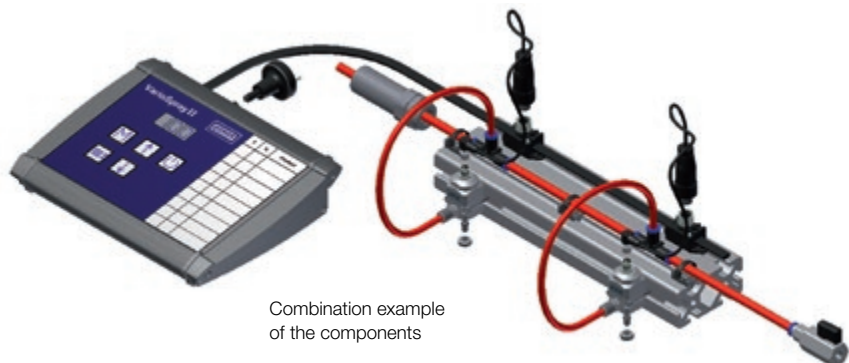
### Components and combination options



Individual valve



Assembly tool

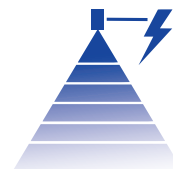


Combination example of the components

### Good to know

Detailed information on VarioSpray II along with the order numbers of the system components can be found in our brochure "VarioSpray". A PDF is available for download at [www.lechler.com/de-en/variospray](http://www.lechler.com/de-en/variospray)

# NOZZLE VALVE SERIES 166H



The stainless steel housing in combination with a solenoid valve offers the possibility to clock the spray application flexibly.

## Applications:

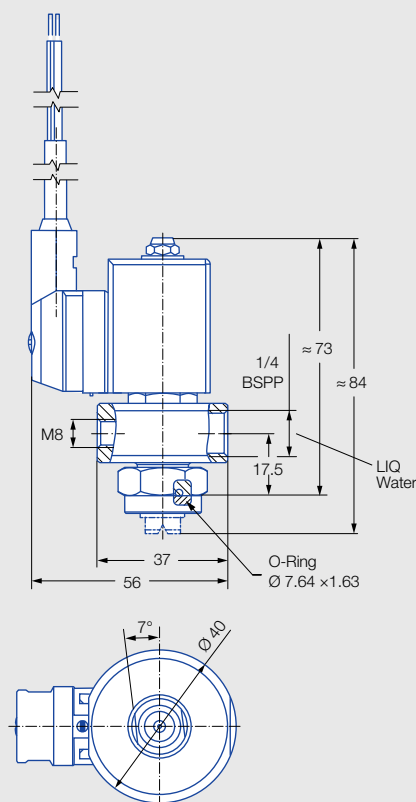
- Cleaning
- Surface treatment
- Humidification
- Lubrication processes

## Scope of supply:

- Nozzle valve with housing, retaining nut and a 5 m long plugged power cable
- Nozzle must be ordered separately



Series 166H



## Material:

Housing: Stainless steel 316L  
Inner parts: Stainless steel 316L,  
stainless steel 304,  
stainless steel 434  
Gasket material: FKM  
(conforms to FDA)

## Water flow rate:

Max. 6.5 l/min at 5 bar

## Max. operating pressure:

10 bar

## Power:

8 W

## Voltage:

24 V DC

## Protection class:

IP 65

## Max. switching frequency:

500/min at 5 bar

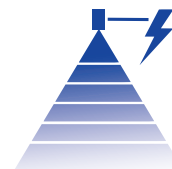
|  | Type | Nozzle size up to | Spray character                     | Spray angle/Material |
|--|------|-------------------|-------------------------------------|----------------------|
|  | 652  | 64x               | Flat fan                            | Page 118             |
|  | 684  | 608               | Flat fan<br>(tongue-type<br>nozzle) | Page 134             |
|  | 468  | 68x               | Full cone spray                     | Page 92              |
|  | 226  | 285               | Hollow cone                         | Page 67              |

## Your advantages

- Quick and simple nozzle assembly using a retaining nut guarantees an easy nozzle changeover
- Simple spray alignment
- Flexible design that allows the use of flat fan nozzles, hollow cone nozzles and full cone nozzles
- With integrated gasket for sealing between the nozzle and the valve

Ordering no.  
166.000.1Y.H1.00.0

# POSITIONABLE FLAT FAN NOZZLE FOR SERIES 166H AND VarioSpray HP

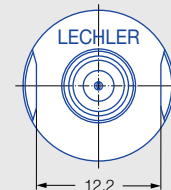
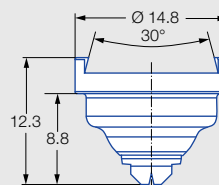


## Properties:

- Outer geometry of the nozzle housing fluidically optimised for pulsed operation
- Positioning takes place via the attached dovetail
- Nozzle sizes and spray angles identical to standard nozzle series 652



Series 652.xxx.16.56



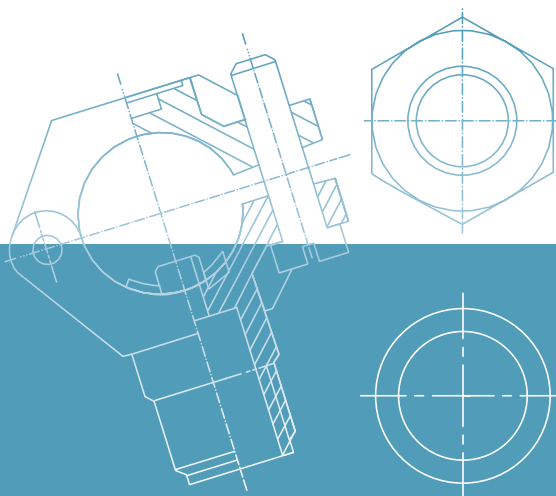
| Type          | Nozzle size up to | Spray character | Spray angle | Material |
|---------------|-------------------|-----------------|-------------|----------|
| 652.xxx.16.56 | 64x               | Flat fan        | Page 118    | 303 SS   |

Please refer to the data of series 652 on w for the nozzle size (flow rate and spray angle).

Ordering Type + Nozzle size = Ordering no.  
example: 652.xxx.16.56 + 301 = 652.301.16.56



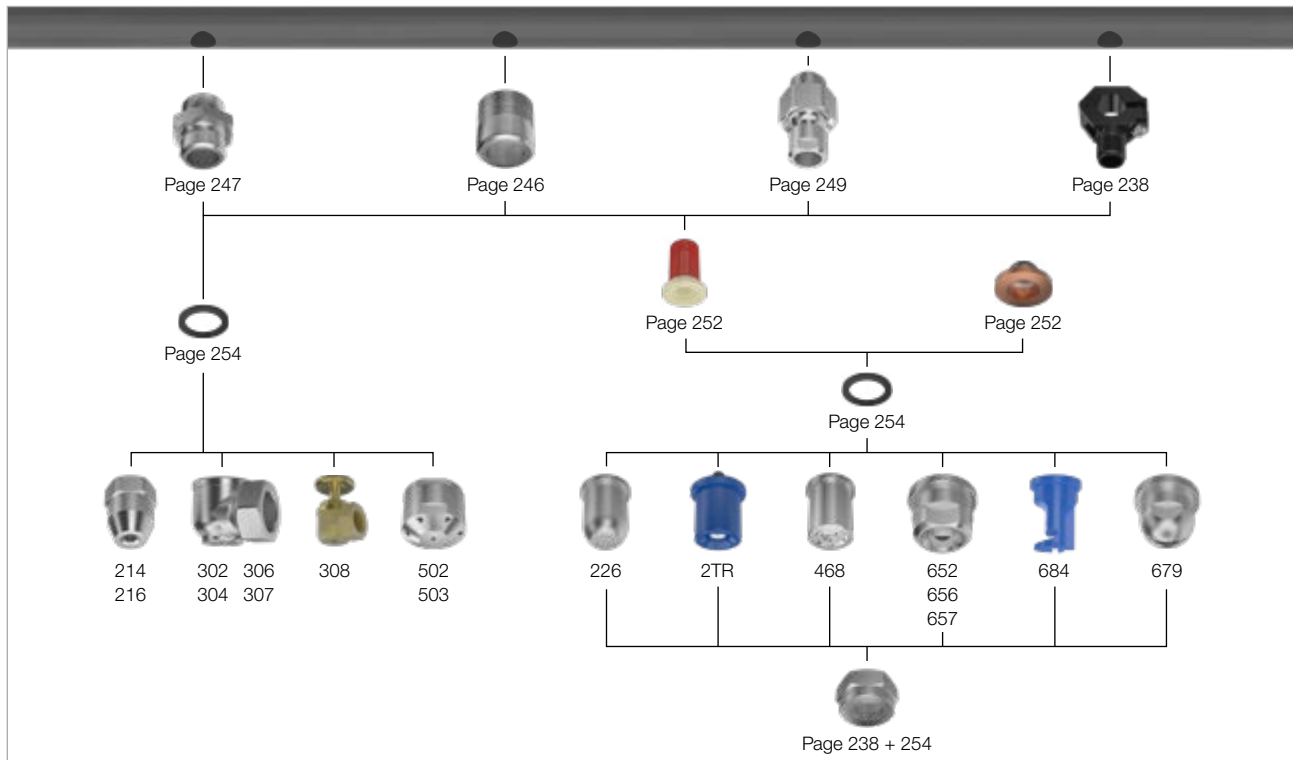
## ACCESSORIES



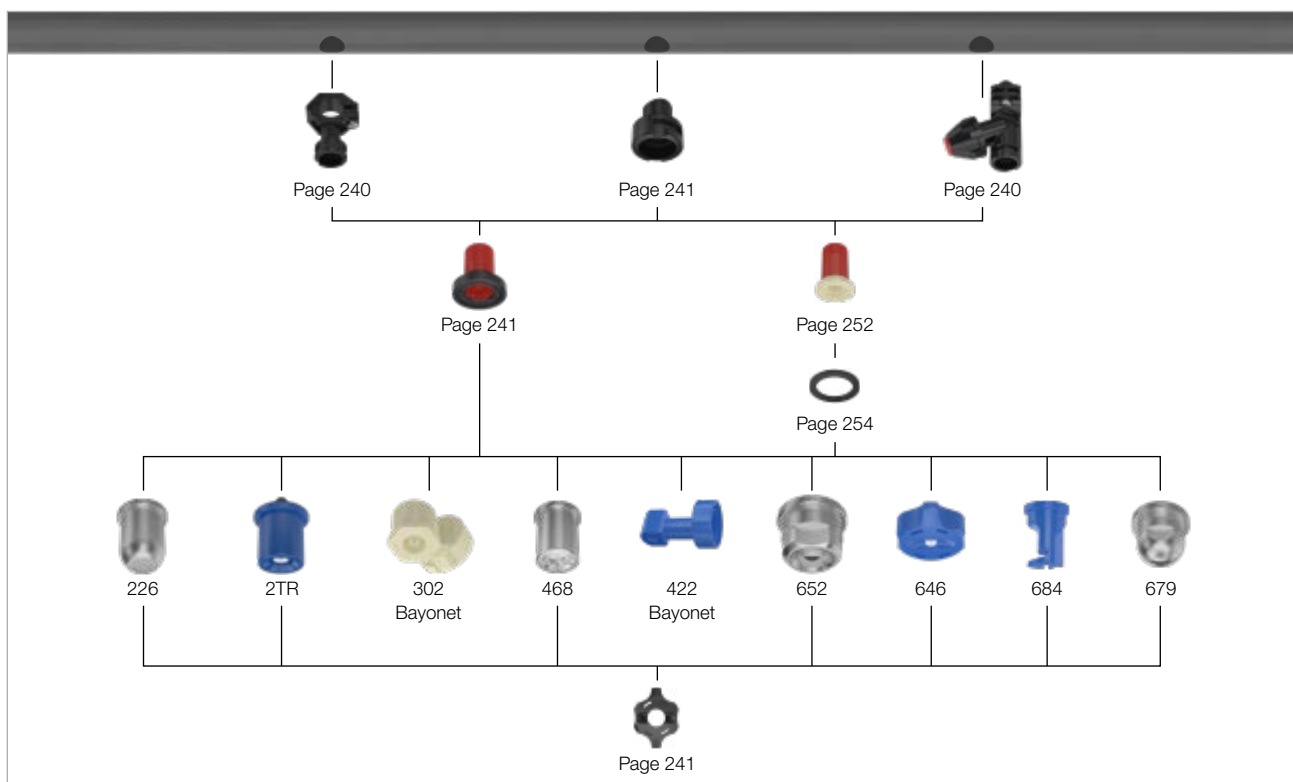
# NOZZLE FASTENING ASSEMBLING OPTIONS FOR ALL PURPOSES



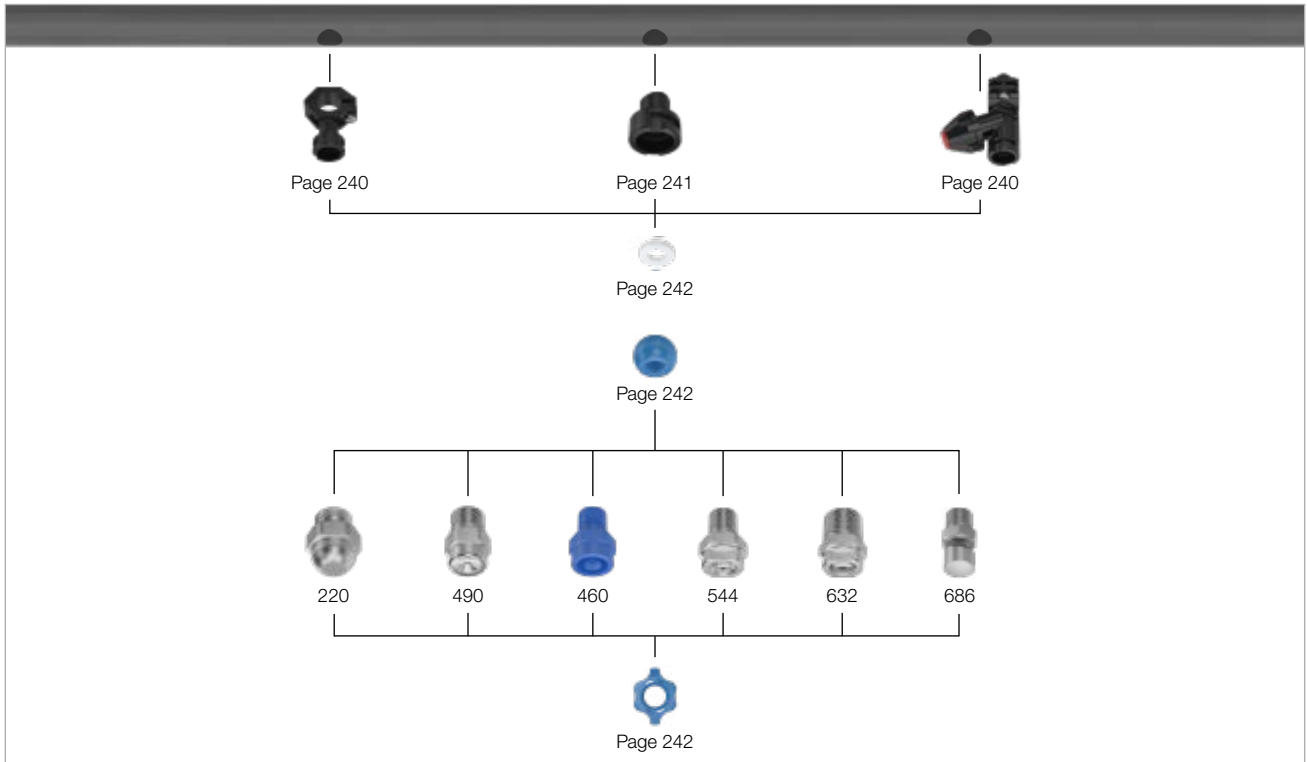
## Assembly accessories for nozzles without thread or with female thread



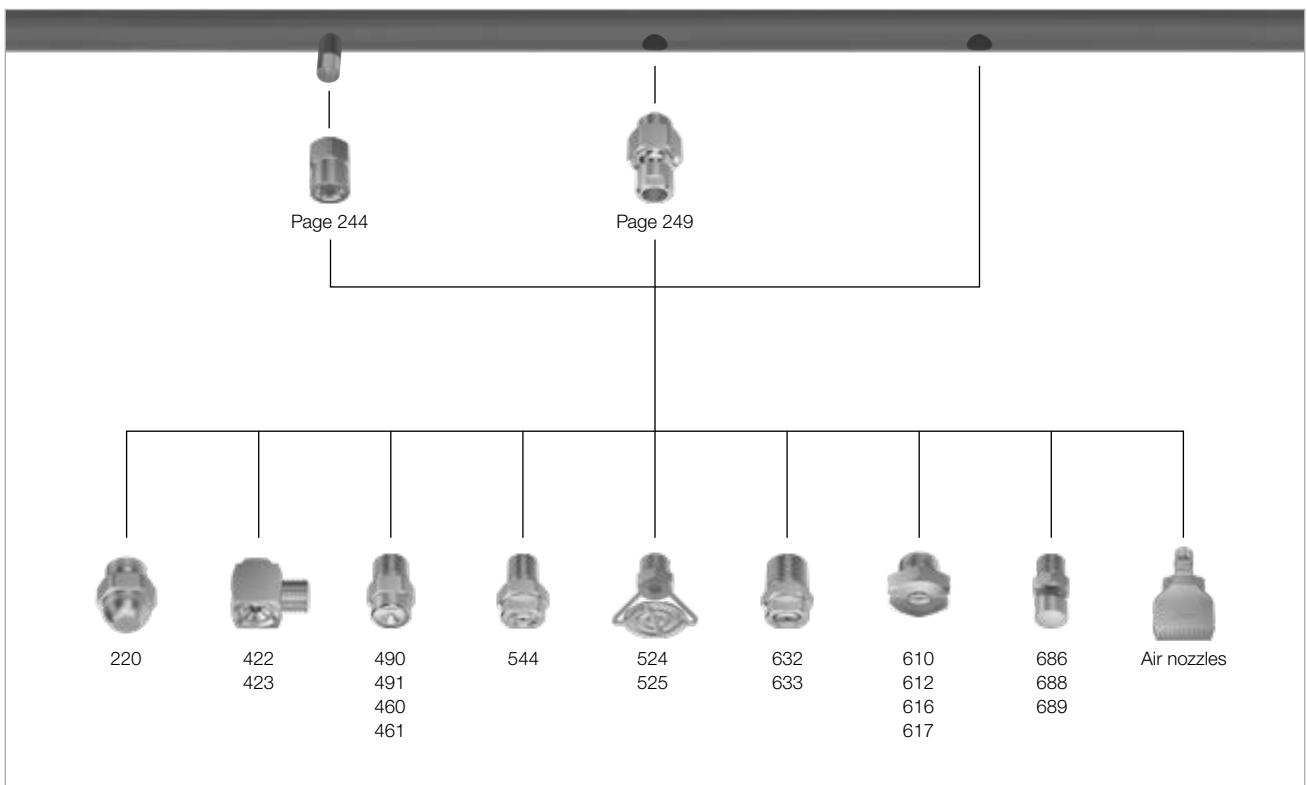
## Bayonet quick-release system for nozzles without thread or with bayonet connection



## Bayonet quick-release system with ball joint for nozzles with male thread

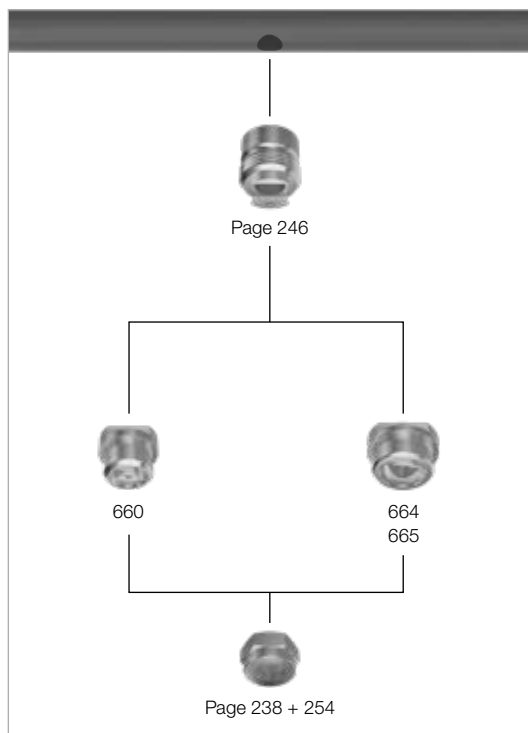


## Assembly accessories for nozzles with male thread

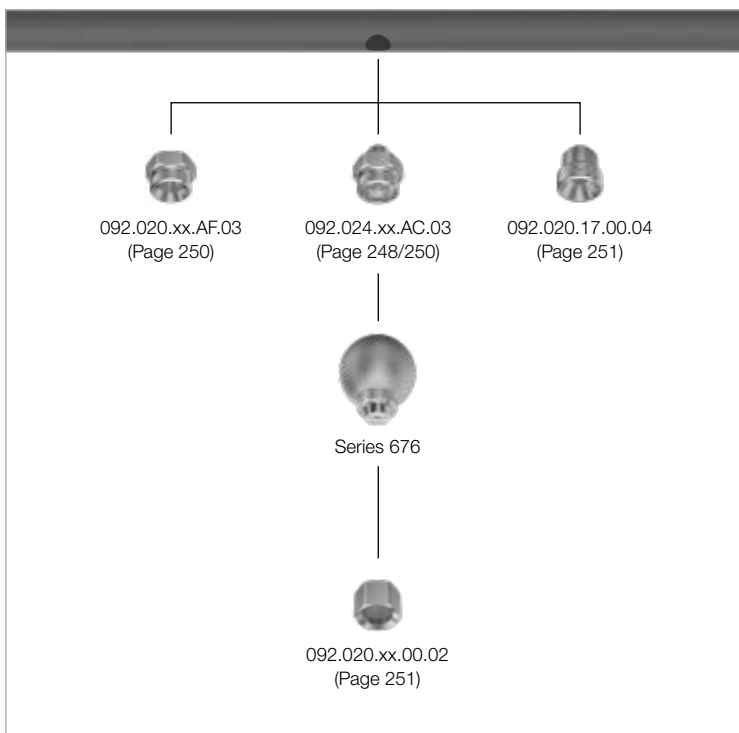




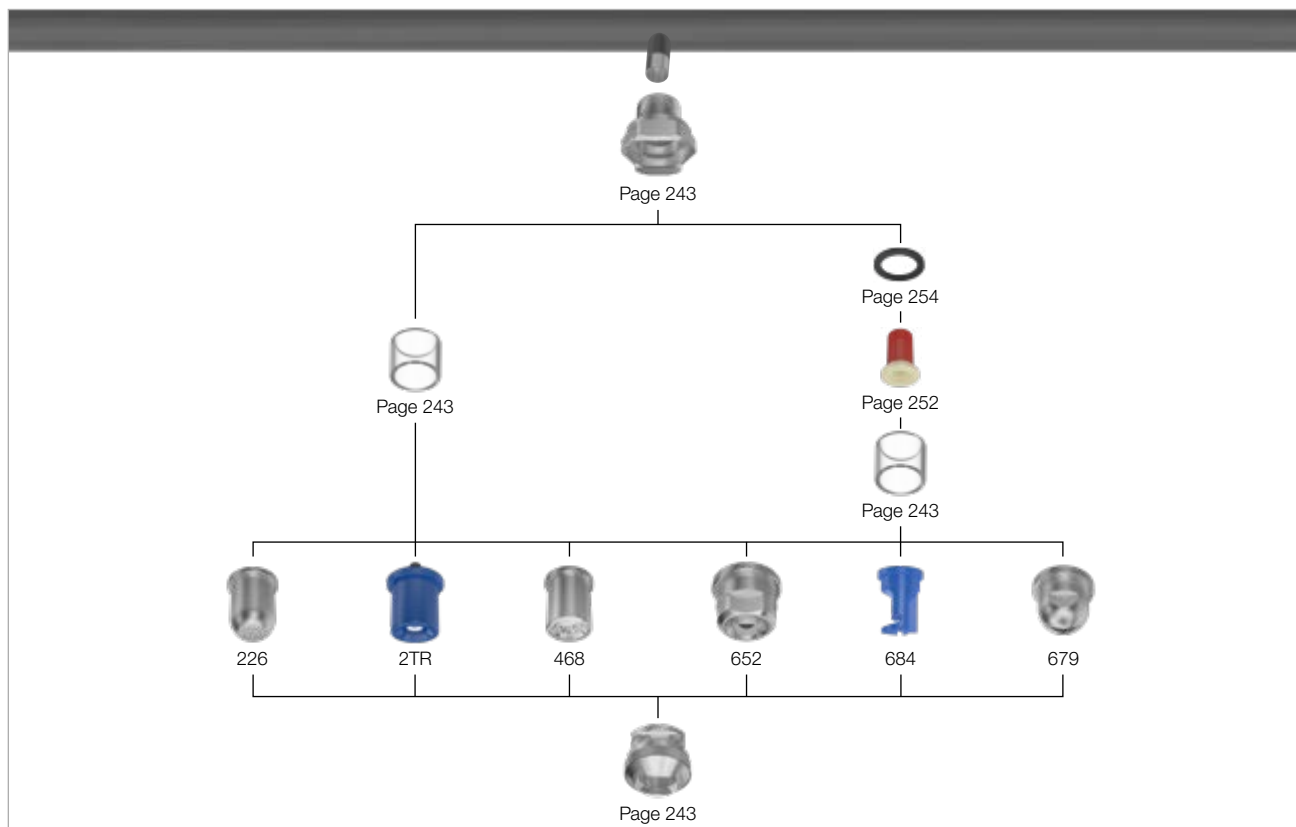
### Assembly accessories for nozzles with dovetail version



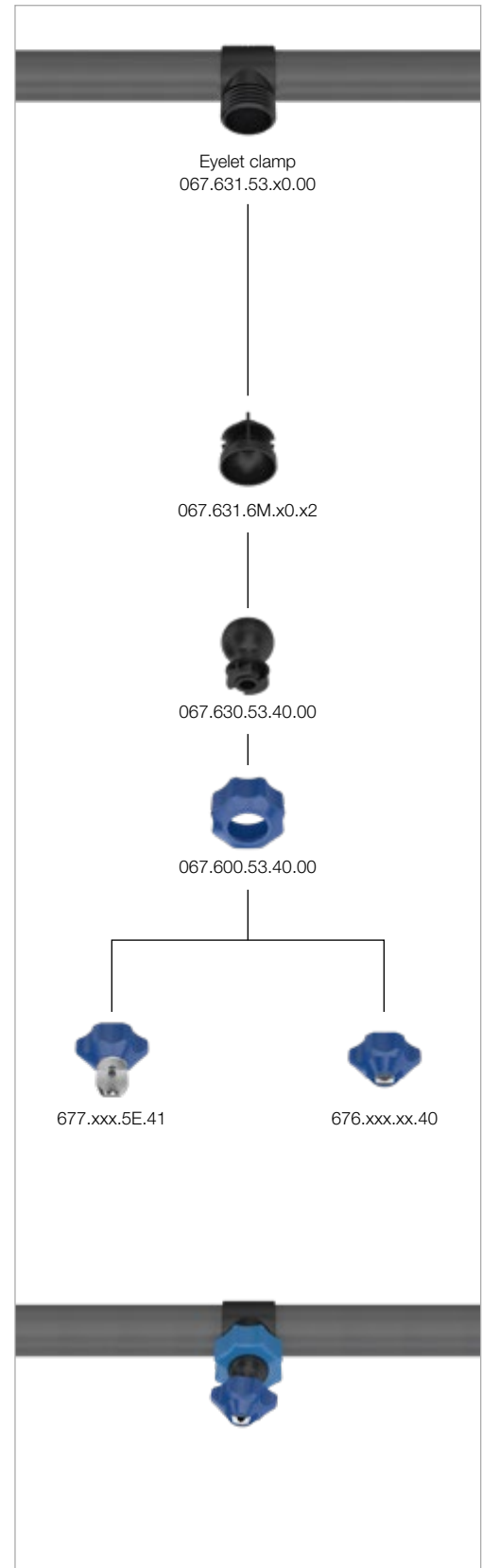
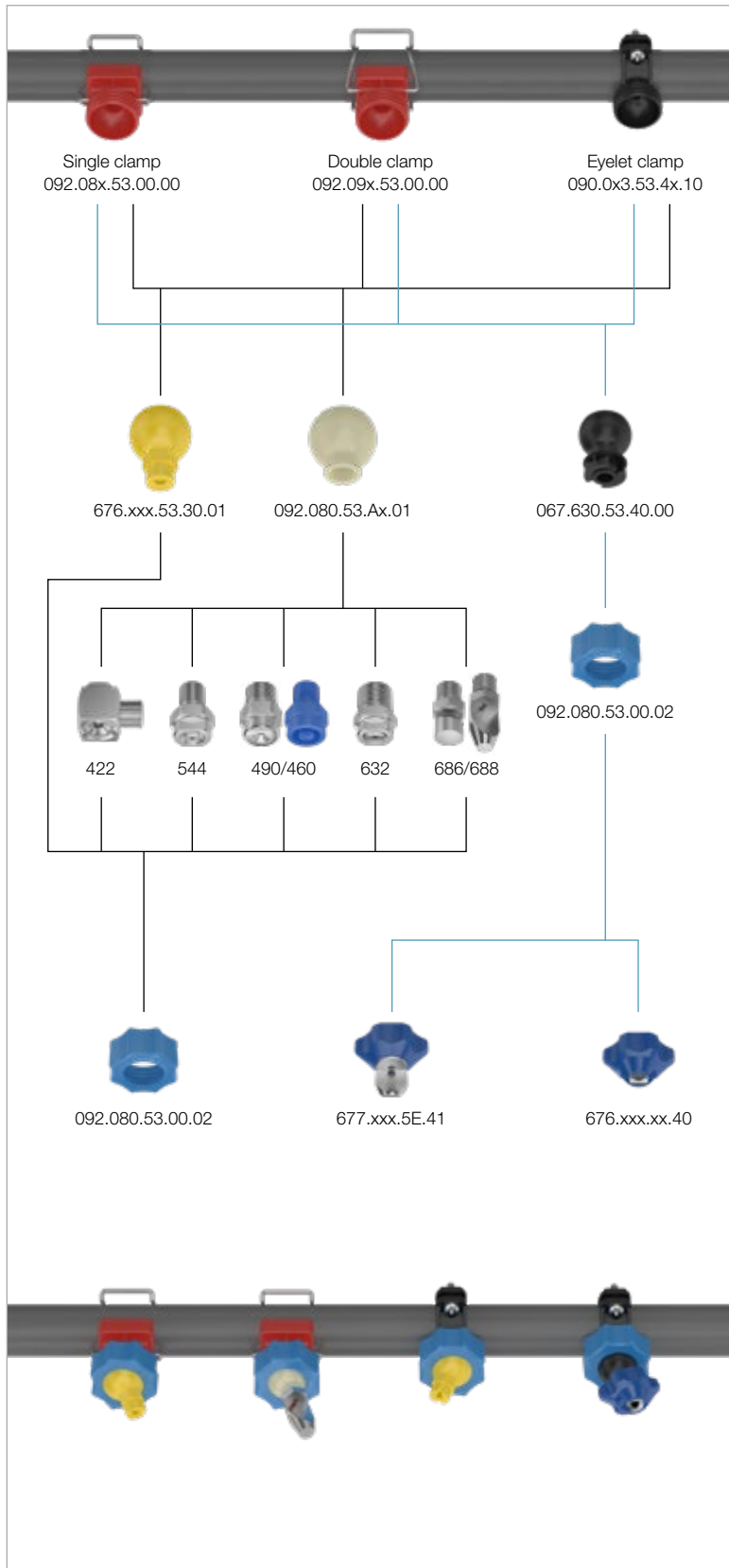
### Assembly accessories for nozzles with integrated ball joint



### TWISTLOC quick-release system for nozzles without thread



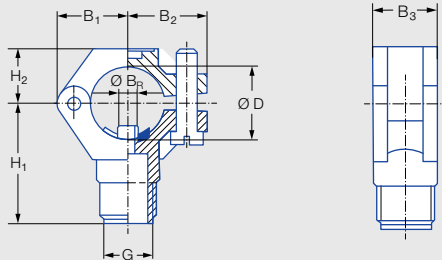
## MEMOSPRAY/Easy-Clip combination options



# Eyelet clamps with male thread



## Eyelet clamps with male thread

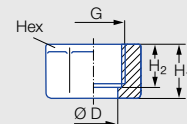


| Series                                              | Ordering no. |                |                    |            | Screw<br>(material)    | G<br>BSPP | Pipe<br>Ø | Dimensions<br>[mm] |                |                |                |                |                               |                  |           | Weight<br>[g]<br>(polyamide) |
|-----------------------------------------------------|--------------|----------------|--------------------|------------|------------------------|-----------|-----------|--------------------|----------------|----------------|----------------|----------------|-------------------------------|------------------|-----------|------------------------------|
|                                                     | Type         | Mat. no.       |                    |            |                        |           |           | B <sub>1</sub>     | B <sub>2</sub> | B <sub>3</sub> | H <sub>1</sub> | H <sub>2</sub> | Ø B <sub>R</sub> <sup>1</sup> | Ø B <sup>2</sup> | Ø D       |                              |
|                                                     |              | 51<br>Black    | 53<br>White        | 5E<br>Blue |                        |           |           |                    |                |                |                |                |                               |                  |           |                              |
|                                                     |              | Polyam-<br>ide | Polypro-<br>pylene | PVDF       |                        |           |           |                    |                |                |                |                |                               |                  |           |                              |
| 226/2TR/<br>216/302/<br>308/350/468/<br>652/679/684 | 090.053      | ●              | ●                  | ●          | Stainless<br>steel 304 | 3/8       | 3/8"      | 19.0               | 22.0           | 18.5           | 34.5           | 14.5           | 6.0                           | 6.2-6.4          | 16.5–18.0 | 20.0                         |
|                                                     | 090.003      | ●              | ●                  | ●          |                        | 3/8       | 1/2"      | 21.2               | 23.8           | 18.5           | 36.5           | 16.5           | 6.0                           | 6.2-6.4          | 20.0–22.0 | 20.0                         |
|                                                     | 090.013      | ●              | ●                  | ●          |                        | 3/8       | 3/4"      | 24.5               | 26.5           | 22.0           | 39.5           | 17.5           | 7.6                           | 7.8-8.0          | 25.0–27.5 | 25.0                         |
|                                                     | 090.023      | ●              | ●                  | ●          |                        | 3/8       | 1"        | 30.0               | 31.0           | 22.0           | 44.0           | 21.0           | 10.6                          | 10.8-11.0        | 32.0–34.5 | 32.0                         |
|                                                     | 090.033      | ●              | ●                  | ●          |                        | 3/8       | 1 1/4"    | 34.0               | 35.5           | 25.0           | 48.0           | 25.0           | 12.6                          | 12.8-13.0        | 40.0–43.0 | 38.0                         |

<sup>1</sup> Ø B<sub>R</sub> = spigot diameter.

<sup>2</sup> Ø B = recommended bore diameter.

## Retaining nuts for eyelet clamps



| Series                                      | Ordering no. |                           |                             |       |             |            | G<br>BSPP | Dimensions<br>[mm] |                |      |     | Weight<br>[g]   |
|---------------------------------------------|--------------|---------------------------|-----------------------------|-------|-------------|------------|-----------|--------------------|----------------|------|-----|-----------------|
|                                             | Type         | Mat. no.                  |                             |       |             |            |           |                    |                |      |     |                 |
|                                             |              | 16                        | 17 <sup>1</sup>             | 30    | 56<br>Black | 5E<br>Blue |           |                    |                |      |     |                 |
|                                             |              | Stainless<br>steel<br>303 | Stainless<br>steel<br>316Ti | Brass | POM         | PVDF       |           | H <sub>1</sub>     | H <sub>2</sub> | Ø D  | Hex |                 |
| 226/2TR/<br>468/548/<br>652/660/679/<br>684 | 065.200      | ●                         | ●                           | ●     |             |            | 3/8       | 13.0               | 10.0           | 12.8 | 22  | 25.0<br>(Brass) |
|                                             | 065.200      |                           |                             |       | ●           | ●          | 3/8       | 14.5               | 11.5           | 12.8 | 22  | 5.0<br>(PVDF)   |

<sup>1</sup> We reserve the right to supply material 316Ti or 316L under material no. 17.

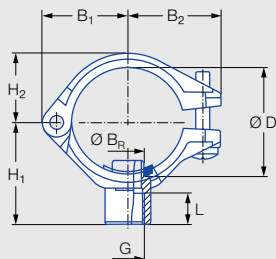
Ordering Type + Material no. = Ordering no.  
example: 090.053 + 51 = 090.053.51

Strainers and ball-type non-return valves can be found on Page 252/253.

# Eyelet clamps with female thread



Eyelet clamps  
with female thread



| For all<br>nozzles with             | Ordering no. |                |                    |            |             |             | Screw<br>(material)    | Pipe<br>Ø | Dimensions<br>[mm] |                |                |                |                |      |                               |                  |           | Weight<br>[g]<br>(polyam-<br>ide) |
|-------------------------------------|--------------|----------------|--------------------|------------|-------------|-------------|------------------------|-----------|--------------------|----------------|----------------|----------------|----------------|------|-------------------------------|------------------|-----------|-----------------------------------|
|                                     | Type         | Mat. no.       |                    |            | Code        |             |                        |           |                    |                |                |                |                |      |                               |                  |           |                                   |
|                                     |              | 51<br>Black    | 53<br>White        | 5E<br>Blue |             |             |                        |           |                    |                |                |                |                |      |                               |                  |           |                                   |
|                                     |              | Poly-<br>amide | Polypro-<br>pylene | PVDF       | 1/8<br>BSPP | 1/4<br>BSPP |                        |           | B <sub>1</sub>     | B <sub>2</sub> | B <sub>3</sub> | H <sub>1</sub> | H <sub>2</sub> | L    | Ø B <sub>R</sub> <sup>1</sup> | Ø B <sup>2</sup> | Ø D       |                                   |
| Male thread<br>1/8 BSPP<br>1/4 BSPP | 090.100      | ●              | ●                  | ●          | AB          | AD          | Stainless<br>steel 316 | 3/8"      | 20.0               | 23.0           | 18.5           | 28.0           | 14.0           | 12.0 | 6.0                           | 6.2–6.4          | 16.5–18.0 | 18.0                              |
|                                     | 090.110      | ●              | ●                  | ●          | AB          | AD          |                        | 1/2"      | 22.0               | 25.0           | 18.5           | 31.0           | 16.0           | 12.0 | 6.0                           | 6.2–6.4          | 20.0–22.0 | 19.0                              |
|                                     | 090.120      | ●              | ●                  | ●          | AB          | AD          |                        | 3/4"      | 25.0               | 28.0           | 22.0           | 33.0           | 19.0           | 12.0 | 7.6                           | 7.8–8.0          | 25.0–27.5 | 24.0                              |
|                                     | 090.130      | ●              | ●                  | ●          | AB          | AD          |                        | 1"        | 30.0               | 33.0           | 22.0           | 36.0           | 23.0           | 12.0 | 10.6                          | 10.8–11.0        | 32.0–34.5 | 34.0                              |
|                                     | 090.140      | ●              | ●                  | ●          | AB          | AD          |                        | 1 1/4"    | 34.0               | 37.0           | 25.0           | 40.0           | 28.0           | 12.0 | 12.6                          | 12.8–13.0        | 40.0–43.0 | 39.0                              |

<sup>1</sup> Ø B<sub>R</sub> = spigot diameter.

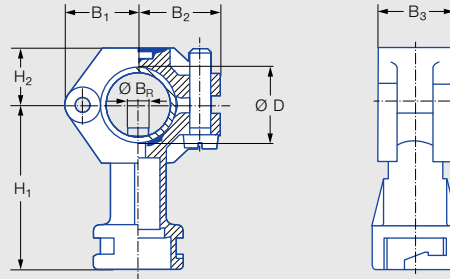
<sup>2</sup> Ø B = recommended bore diameter.

Ordering Type + Material no. + Code = Ordering no.  
example: 090.100 + 51 + AB = 090.100.51.AB

# Eyelet clamps with bayonet connection



Eyelet clamps with bayonet quick-release system

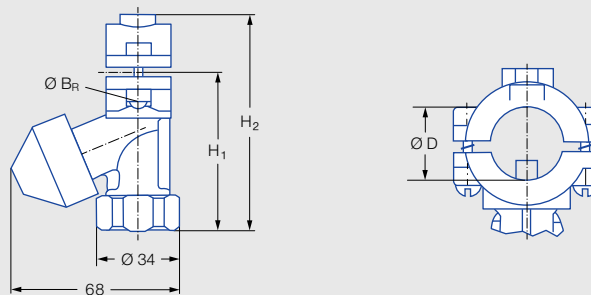


| Series                                                              | Ordering no. |                |                    |            |      | Screw<br>(material)    | Pipe<br>Ø      | Dimensions<br>[mm] |                |                |                |                               |                  |           | Weight<br>[g]<br>(Polyamide) |      |
|---------------------------------------------------------------------|--------------|----------------|--------------------|------------|------|------------------------|----------------|--------------------|----------------|----------------|----------------|-------------------------------|------------------|-----------|------------------------------|------|
|                                                                     | Type         | Mat. no.       |                    |            | Code |                        |                |                    |                |                |                |                               |                  |           |                              |      |
|                                                                     |              | 51<br>Black    | 53<br>White        | 5E<br>Blue |      |                        |                |                    |                |                |                |                               |                  |           |                              |      |
|                                                                     |              | Poly-<br>amide | Polyprop-<br>ylene | PVDF       |      |                        |                |                    |                |                |                |                               |                  |           |                              |      |
|                                                                     |              |                |                    |            |      |                        | B <sub>1</sub> | B <sub>2</sub>     | B <sub>3</sub> | H <sub>1</sub> | H <sub>2</sub> | Ø B <sub>R</sub> <sup>1</sup> | Ø B <sup>2</sup> | Ø D       |                              |      |
| 226/2TR/<br>302 bayonet/<br>422 bayonet/<br>468/652/646/<br>684/679 | 090.003      | ●              | ●                  | ●          | KA   | Stainless<br>steel 304 | 1/2"           | 21.2               | 23.8           | 18.5           | 49.5           | 16.5                          | 6.0              | 6.2–6.4   | 20.0–22.0                    | 22.0 |
|                                                                     | 090.013      | ●              | ●                  | ●          | KA   |                        | 3/4"           | 24.5               | 26.5           | 22.0           | 52.5           | 17.5                          | 7.6              | 7.8–8.0   | 25.0–27.5                    | 26.0 |
|                                                                     | 090.023      | ●              | ●                  | ●          | KA   |                        | 1"             | 30.0               | 31.0           | 22.0           | 57.0           | 21.0                          | 10.6             | 10.8–11.0 | 32.0–34.5                    | 32.0 |

<sup>1</sup> Ø B<sub>R</sub> = spigot diameter.

<sup>2</sup> Ø B = recommended bore diameter.

Diaphragm non-return valve with bayonet quick-release system



| Series                                                              | Ordering no. |             |      | Screw<br>(material)    | Pipe<br>Ø | Ø D<br>[mm] | Pressure<br>[bar]   |                     | Dimensions<br>[mm] |                |                               |                  | Weight<br>[g] |
|---------------------------------------------------------------------|--------------|-------------|------|------------------------|-----------|-------------|---------------------|---------------------|--------------------|----------------|-------------------------------|------------------|---------------|
|                                                                     | Type         | Mat. no.    | Code |                        |           |             |                     |                     |                    |                |                               |                  |               |
|                                                                     |              | 56<br>Black |      |                        |           |             |                     |                     |                    |                |                               |                  |               |
|                                                                     |              | POM         |      |                        |           |             | Opening<br>pressure | Closing<br>pressure | H <sub>1</sub>     | H <sub>2</sub> | Ø B <sub>R</sub> <sup>1</sup> | Ø B <sup>2</sup> |               |
| 226/2TR/<br>302 bayonet/<br>422 bayonet/<br>468/652/646/<br>684/679 | 065.272      | ●           | KH   | Stainless<br>steel 303 | 1/2"      | 20.0–22.0   | 0.8                 | 0.6                 | 59.0               | 84.0           | 6.0                           | 6.2–6.4          | 48.0          |
|                                                                     | 065.272      | ●           | KL   |                        | 3/4"      | 25.0–27.5   | 0.8                 | 0.6                 | 66.0               | 90.0           | 9.6                           | 9.8–10.0         | 53.0          |

<sup>1</sup> Ø B<sub>R</sub> = spigot diameter.

<sup>2</sup> Ø B = recommended bore diameter.

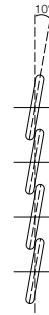
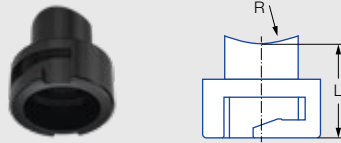
| Material          | Max. temperature [°C] | Max. pressure [bar] |
|-------------------|-----------------------|---------------------|
| PA, PP, PVDF, POM | 65                    | 10                  |
| PA, PP, PVDF, POM | 80                    | 8                   |
| PVDF              | 100                   | 4                   |

**Notice:** Please consider the material combination when using bayonet eyelet clamps with bayonet quick-release system nuts. The nuts may be difficult to turn when using different materials.

# Accessories for bayonet system



## Bayonet welded nipple



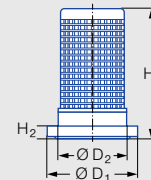
Twist angle to the right in relation to the pipe axis. Twist angle 10°. Other twist angles available on request.

| Series                                                      | Ordering no.                  |  | Mat. no. |               | Dimensions [mm] |      | Weight [g] |
|-------------------------------------------------------------|-------------------------------|--|----------|---------------|-----------------|------|------------|
|                                                             |                               |  | 50       | 53            |                 |      |            |
|                                                             | Type                          |  | PVC      | Polypropylene | L               | R    |            |
| 226/2TR/302 bayonet/<br>422 bayonet/468/<br>652/646/684/679 | 095.016.xx.08.05 <sup>1</sup> |  | ●        | ●             | 25.0            | 16.0 | 10.0       |

<sup>1</sup> Replace "xx" with the desired material no.

## Strainer with gasket

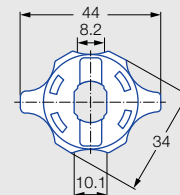
Suitable for bayonet quick-release system nuts 065.202



| Performance size | Ordering no. |                                  | Colour | Dimensions [mm] |                |                |                  |                  | Weight [g] |
|------------------|--------------|----------------------------------|--------|-----------------|----------------|----------------|------------------|------------------|------------|
|                  |              |                                  |        |                 |                |                |                  |                  |            |
|                  | Type         | Mat. no.<br>7J<br>POM/Santoprene |        | Mesh size       | H <sub>1</sub> | H <sub>2</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> |            |
| xxx.32x-xxx.44x  | 065.268      | ●                                | Blue   | 0.25            | 19.20          | 3.00           | 18.00            | 12.00            | 2.00       |
| xxx.48x-xxx.56x  | 065.269      | ●                                | Red    | 0.65            | 19.20          | 3.00           | 18.00            | 12.00            | 2.00       |

## Bayonet quick-release system nuts

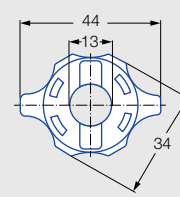
Incl. gasket 065.242.73 (material: Rubber)



| Series  | Ordering no.  |          |               |      | Colour | Weight [g] |
|---------|---------------|----------|---------------|------|--------|------------|
|         | Type          | Mat. no. |               |      |        |            |
|         |               | POM      | Polypropylene | PVDF |        |            |
| 652/679 | 065.202.56.00 | ●        |               |      | Red    | 10.0       |
|         | 065.202.53.00 |          | ●             |      | Grey   | 10.0       |
|         | 065.202.5E.00 |          |               | ●    | Blue   | 10.0       |

## Bayonet quick-release system nuts

Incl. gasket 065.242.73 (material: Rubber)



| Series              | Ordering no.  |                                  | Colour | Weight [g] |
|---------------------|---------------|----------------------------------|--------|------------|
|                     |               |                                  |        |            |
|                     | Type          | Mat. no.<br>POM<br>Polypropylene |        |            |
| 226/2TR/<br>468/684 | 065.202.56.11 | ●                                | Black  | 10.0       |
|                     | 065.202.53.11 | ●                                | Grey   | 10.0       |

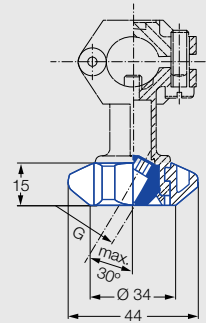
**Notice:** Please consider the material combination when using bayonet eyelet clamps with bayonet quick-release system nuts. The nuts may be difficult to turn when using different materials.



## Ball joints for bayonet quick-release system

Ball joint system for nozzles with 1/8" and 1/4" male thread.

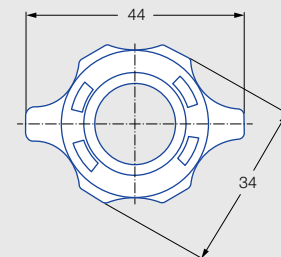
Ball joint for eyelet clamps with bayonet quick-release system



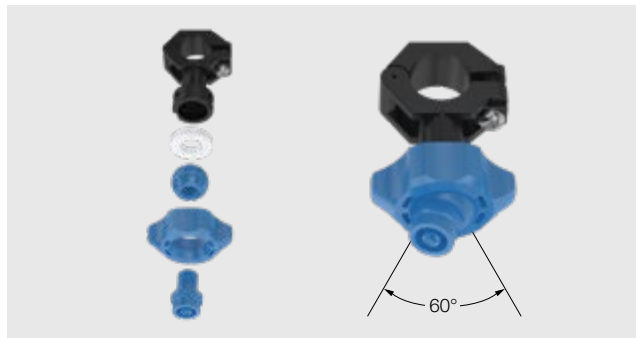
| For all nozzles with<br>1/8" or<br>1/4" male thread | Ordering no. |          |          |          | Colour | Weight<br>[g] |
|-----------------------------------------------------|--------------|----------|----------|----------|--------|---------------|
|                                                     | Type         | Mat. no. | Code     |          |        |               |
|                                                     |              | PVDF     | 1/8 BSPP | 1/4 BSPP |        |               |
| Ball joint                                          | 092.150      | 5E       | AB       | AD       | Blue   | 5.0           |

Bayonet quick-release system nut for ball joint

Incl. O-ring  
Ordering no. 095.015.7C.04.16.0  
(material: 72 NBR 872)



| For all nozzles with<br>1/8" or<br>1/4" male thread | Ordering no.  |          | Colour | Weight<br>[g] |
|-----------------------------------------------------|---------------|----------|--------|---------------|
|                                                     | Type          | Mat. no. |        |               |
|                                                     |               | PVDF     |        |               |
| Quick-release system nut                            | 092.150.5E.00 | ●        | Blue   | 28.0          |



| Max. temperature [°C] | Max. pressure [bar] |
|-----------------------|---------------------|
| 65                    | 10                  |
| 80                    | 8                   |
| 100                   | 4                   |

Ordering Type + Material no. + Code = Ordering no.  
example: 092.150 + 5E + AB = 092.150.5E.AB

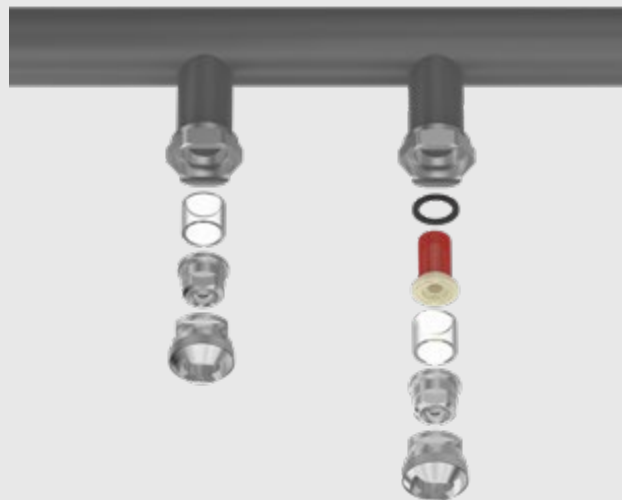
# **TWISTLOC** Quick-change nozzle system

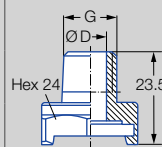
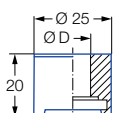
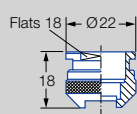


## **Lechler TWISTLOC, nozzle changing in less than no time.**

Save time and money with the quick-change nozzle system.

- **Quick:**  
It takes just one twist to install or remove the nozzle.
- **Easy:**  
Can be installed without tools – even in difficult-to-access locations and in bad lighting conditions.
- **Safe:**  
Installation errors are avoided, as the nozzles are always set to the correct direction.
- **Max. pressure:**  
15 bar.

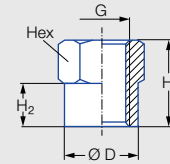


| System components                                                                               |                                                                                     | Ordering no. |                                 |                                 |            |             |      |             | Inner<br>Ø D<br>[mm] | Weight<br>[g]             |                                                                                                                                                                                                      |                           |
|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------|---------------------------------|---------------------------------|------------|-------------|------|-------------|----------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                                                                                                 |                                                                                     | Type         | Mat. no.                        |                                 |            |             | Code |             |                      |                           |                                                                                                                                                                                                      |                           |
|                                                                                                 |                                                                                     |              | 1C<br>Stainless<br>steel<br>304 | 16<br>Stainless<br>steel<br>303 | 5E<br>PVDF | 7A<br>Viton |      | 1/4<br>BSPT | 3/8<br>BSPT          |                           |                                                                                                                                                                                                      | Welded<br>connec-<br>tion |
| Threaded nipple                                                                                 |  | 092.102      |                                 | ●                               |            |             | CC   |             | 8.0                  | 25.0                      | <br><b>Non-return valves, strainers</b><br>For installation in nipples with inner Ø 11.6 mm (see Page 252/253). |                           |
|                                                                                                 |                                                                                     | 092.102      |                                 | ●                               |            |             |      | CE          |                      | 11.6                      |                                                                                                                                                                                                      | 25.0                      |
|                                                                                                 |                                                                                     | 092.102      |                                 |                                 | ●          |             |      | CE          |                      | 8.0                       |                                                                                                                                                                                                      | 10.0                      |
| Welded nipple                                                                                   |  | 092.104      | ●                               |                                 |            |             |      | 00          | 11.6                 | 45.0                      |                                                                                                                                                                                                      |                           |
| Gasket for material 304 SS and 303 SS                                                           |  | 092.113      |                                 |                                 |            | ●           |      |             | –                    | 1.0                       |                                                                                                                                                                                                      |                           |
| Gasket for material PVDF                                                                        |                                                                                     | 092.115      |                                 |                                 |            | ●           |      |             | –                    | 1.0                       |                                                                                                                                                                                                      |                           |
| Gasket, incl. rubber gasket ring for use with non-return valves or strainers                    |  | 092.116      |                                 |                                 |            | ●           |      |             | –                    | 2.0                       |                                                                                                                                                                                                      |                           |
| Gasket, incl. rubber gasket ring for use with non-return valves or strainers, for PVDF material |                                                                                     | 092.114      |                                 |                                 |            | ●           |      |             | –                    | 2.0                       |                                                                                                                                                                                                      |                           |
| Quick-release system<br>For nozzle series 652/679                                               |  | 092.106      |                                 | ●                               | ●          |             |      |             | –                    | 20.0<br>(stainless steel) |                                                                                                                                                                                                      |                           |
| Quick-release system<br>For nozzle series 226/468/684                                           |                                                                                     | 092.108      |                                 | ●                               | ●          |             |      |             | –                    | 20.0<br>(stainless steel) |                                                                                                                                                                                                      |                           |

Ordering Type + Material no. + Code = Ordering no.  
example: 092.102 + 16 + CC = 092.102.16.CC



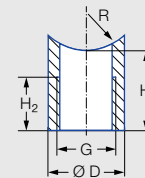
## Sockets



| For all<br>nozzles with | Ordering no. |                         |                          |       |                    | G<br>BSPP | Dimensions<br>[mm] |                |      |     | Weight<br>[g]<br>(Brass) |
|-------------------------|--------------|-------------------------|--------------------------|-------|--------------------|-----------|--------------------|----------------|------|-----|--------------------------|
|                         | Type         | Mat. no.                |                          |       |                    |           | H <sub>1</sub>     | H <sub>2</sub> | Ø D  | Hex |                          |
|                         |              | 1Y                      | 17                       | 30    | 53                 |           |                    |                |      |     |                          |
|                         |              | Stainless<br>steel 316L | Stainless<br>steel 316Ti | Brass | Polypropyl-<br>ene |           |                    |                |      |     |                          |
| 1/8" male thread        | 040.270      | ●                       |                          | ●     |                    | 1/8       | 20.0               | 10.0           | 13.8 | 14  | 20.0                     |
| 1/4" male thread        | 061.220      | ●                       |                          | ●     |                    | 1/4       | 20.0               | 10.0           | 16.8 | 17  | 20.0                     |
| 3/8" male thread        | 040.271      | ●                       |                          | ●     |                    | 3/8       | 20.0               | 10.0           | 21.8 | 22  | 25.0                     |
|                         | 040.271      |                         |                          |       | ●                  | 3/8       | 20.0               | 11.0           | 25.0 | 22  | 25.0                     |
| 1/2" male thread        | 040.272      |                         | ●                        | ●     |                    | 1/2       | 30.0               | 15.0           | 26.5 | 27  | 70.0                     |
| 3/4" male thread        | 061.620      |                         | ●                        | ●     |                    | 3/4       | 40.0               | 20.0           | 31.5 | 32  | 108.0                    |

**Notice:** Sockets are also suitable for welding.

## Sockets with radius

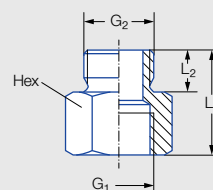


| For all<br>nozzles with | Ordering no.               |                         | G<br>BSP | Dimensions<br>[mm] |                |      | Weight<br>[g] |
|-------------------------|----------------------------|-------------------------|----------|--------------------|----------------|------|---------------|
|                         | Type                       | Mat. no.                |          | H <sub>1</sub>     | H <sub>2</sub> | Ø D  |               |
|                         |                            | 1Y                      |          |                    |                |      |               |
|                         |                            | Stainless<br>steel 316L |          |                    |                |      |               |
| 1/4" male thread        | 040.228.1Y.yy <sup>1</sup> | ●                       | 1/4      | 18.0               | 12.0           | 17.0 | 16.0          |

<sup>1</sup> Replace "yy" with the desired radius R (R = 10/13/16/20/25 or 31 mm).

Ordering Type + Material no. = Ordering no.  
example: 040.270 + 1Y = 040.270.1Y

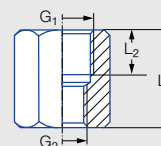
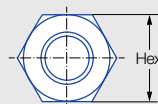
## Sockets



| Connection components | Ordering no. |                          |       | G <sub>1</sub><br>BSPP | G <sub>2</sub><br>BSPP | Dimensions<br>[mm] |                |     | Weight<br>[g]<br>(Brass) |
|-----------------------|--------------|--------------------------|-------|------------------------|------------------------|--------------------|----------------|-----|--------------------------|
|                       | Type         | Mat. no.                 |       |                        |                        | L <sub>1</sub>     | L <sub>2</sub> | Hex |                          |
|                       |              | 17                       | 30    |                        |                        |                    |                |     |                          |
|                       |              | Stainless<br>steel 316Ti | Brass |                        |                        |                    |                |     |                          |
| 1/8" to 3/8"          | 040.211      | ●                        | ●     | 1/8                    | 3/8                    | 20.0               | 10.0           | 22  | 40.0                     |
| 1/4" to 3/8" short    | 065.221      | ●                        | ●     | 1/4                    | 3/8                    | 23.0               | 10.0           | 22  | 40.0                     |
| 1/4" to 3/8" long     | 065.228      | ●                        | ●     | 1/4                    | 3/8                    | 36.0 <sup>1</sup>  | 14.0           | 19  | 45.0                     |
| 3/8" to 3/8"          | 065.220      | ●                        | ●     | 3/8                    | 3/8                    | 25.0               | 10.0           | 22  | 40.0                     |
| 3/4" to 3/4"          | 065.620      | ●                        | ●     | 3/4                    | 3/4                    | 35.0               | 14.0           | 32  | 280.0                    |

<sup>1</sup> Mounting of nozzle filters and ball-type non-return valves possible (see Page 252/253).

## Reduction socket

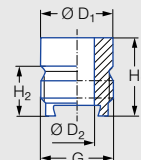


| Connection components | Ordering no.     |                         |       | G <sub>1</sub><br>BSPP | G <sub>2</sub><br>BSPP | Dimensions<br>[mm] |                |     | Weight<br>[g] |
|-----------------------|------------------|-------------------------|-------|------------------------|------------------------|--------------------|----------------|-----|---------------|
|                       | Type             | Mat. no.                |       |                        |                        | L <sub>1</sub>     | L <sub>2</sub> | Hex |               |
|                       |                  | 1Y                      | 30    |                        |                        |                    |                |     |               |
|                       |                  | Stainless<br>steel 316L | Brass |                        |                        |                    |                |     |               |
| 3/8" to 1/4"          | 095.019.30.00.23 |                         | ●     | 3/8                    | 1/4                    | 26.0               | 12.0           | 22  | 55.0          |

Ordering Type + Material no. = Ordering no.  
example: 040.211 + 17 = 040.211.17

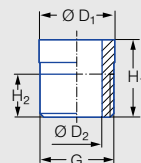


**Welded nipple with dovetail guide**



| Series  | Ordering no. |                          | G<br>BSPP | Dimensions<br>[mm] |                |                  |                  | Weight<br>[g] |
|---------|--------------|--------------------------|-----------|--------------------|----------------|------------------|------------------|---------------|
|         | Type         | Mat. no.                 |           | H <sub>1</sub>     | H <sub>2</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> |               |
|         |              | 17                       |           |                    |                |                  |                  |               |
|         |              | Stainless<br>steel 316Ti |           |                    |                |                  |                  |               |
| 660     | 066.011      | ●                        | 3/8       | 18.0               | 11.5           | 16.5             | 8.0              | 21.0          |
| 664/665 | 066.410      | ●                        | 3/4       | 27.0               | 15.5           | 28.0             | 14.0             | 65.0          |

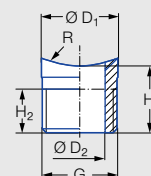
**Welded nipple**



| Series                                          | Ordering no. |          |                             |       |                    | G<br>BSPP | Dimensions [mm] |                |                  |                  | Weight<br>[g]<br>(Brass) |
|-------------------------------------------------|--------------|----------|-----------------------------|-------|--------------------|-----------|-----------------|----------------|------------------|------------------|--------------------------|
|                                                 | Type         | Mat. no. |                             |       |                    |           | H <sub>1</sub>  | H <sub>2</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> |                          |
|                                                 |              | 02       | 17                          | 30    | 53                 |           |                 |                |                  |                  |                          |
|                                                 |              | Steel    | Stainless<br>steel<br>316Ti | Brass | Polypro-<br>pylene |           |                 |                |                  |                  |                          |
| 226/216/2TR/302/308/350/<br>468/652/684/548/679 | 065.210      | ●        | ●                           | ●     | ●                  | 3/8       | 18.0            | 10.0           | 17.2             | 11.6             | 20.0                     |
| 306/307/502/<br>503/656/657                     | 065.610      | ●        | ●                           |       | ●                  | 3/4       | 27.0            | 14.0           | 28.0             | 18.0             | 61.0                     |

Ordering Type + Material no. = Ordering no.  
example: 066.011 + 17 = 066.011.17

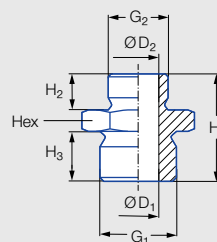
### Welded nipple with radius



| Series                                          | Ordering no.               |                          | G<br>BSPP | Dimensions<br>[mm] |                |                  |                  | Weight<br>[g] |
|-------------------------------------------------|----------------------------|--------------------------|-----------|--------------------|----------------|------------------|------------------|---------------|
|                                                 | Type                       | Mat. no.                 |           | H <sub>1</sub>     | H <sub>2</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> |               |
|                                                 |                            | 17                       |           |                    |                |                  |                  |               |
|                                                 |                            | Stainless<br>steel 316Ti |           |                    |                |                  |                  |               |
| 226/216/2TR/302/308/350/<br>468/652/684/548/679 | 065.217.17.yy <sup>1</sup> | ●                        | 3/8 A     | 15.0               | 10.0           | 17.2             | 11.5             | 20.0          |
| 306/307/502/503/656/657                         | 065.612.17.yy <sup>1</sup> | ●                        | 3/4 A     | 23.0               | 14.0           | 28.0             | 18.0             | 61.0          |

<sup>1</sup> Replace "yy" with the desired radius R (R = 10/13/16/20/25 or 31 mm).

### Double nipple



| Series                                                  | Ordering no.               |                                   |             | G <sub>1</sub><br>BSPP | G <sub>2</sub><br>BSPP | Dimensions<br>[mm] |                |                |                  |                  |     | Weight<br>[g]<br>(Brass) |
|---------------------------------------------------------|----------------------------|-----------------------------------|-------------|------------------------|------------------------|--------------------|----------------|----------------|------------------|------------------|-----|--------------------------|
|                                                         | Type                       | Mat. no.                          |             |                        |                        | H <sub>1</sub>     | H <sub>2</sub> | H <sub>3</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> | Hex |                          |
|                                                         |                            | 17<br>Stainless<br>steel<br>316Ti | 30<br>Brass |                        |                        |                    |                |                |                  |                  |     |                          |
| 226/216/2TR/<br>302/308/350/<br>468/652/684/<br>548/679 | 065.215 <sup>1</sup>       | ●                                 | ●           | 3/8                    | 1/4                    | 25.0               | 10.0           | 10.0           | 10.0             | 7.0              | 22  | 30.0                     |
|                                                         | 065.215.xx.02 <sup>2</sup> | ●                                 | ●           | 3/8                    | 1/4                    | 35.0               | 10.0           | 10.0           | 11.6             | 7.0              | 22  | 32.0                     |
|                                                         | 065.211                    | ●                                 | ●           | 3/8                    | 3/8                    | 25.0               | 10.0           | 10.0           | 11.5             | –                | 22  | 25.0                     |
|                                                         | 065.211.xx.04 <sup>2</sup> | ●                                 | ●           | 3/8                    | 1/2                    | 30.0               | 10.0           | 14.0           | 11.5             | –                | 27  | 62.0                     |
| 306/307/502/503/<br>656/657                             | 065.611                    | ●                                 | ●           | 3/4                    | 3/4                    | 35.0               | 14.0           | 14.0           | 18.0             | –                | 32  | 90.0                     |

<sup>1</sup> Not to be used with non-return valve or strainer.

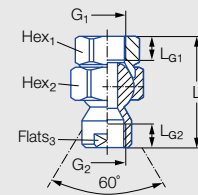
<sup>2</sup> Replace "xx" with the desired material no.

Ordering Type + Material no. = Ordering no.  
example: 065.217.17.yy + 17 = 065.217.17.yy.17

# Ball joints with threaded connection

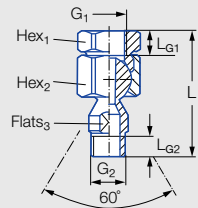


## Ball joints with female thread



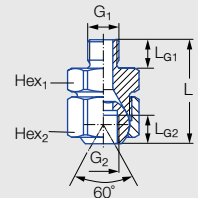
| For all<br>nozzles with | Ordering no. |                        |       |      | G <sub>1</sub><br>BSPP | G <sub>2</sub><br>BSPP | Dimensions<br>[mm] |                 |                 |                  |                  |       | Weight<br>[g]<br>(Brass) |
|-------------------------|--------------|------------------------|-------|------|------------------------|------------------------|--------------------|-----------------|-----------------|------------------|------------------|-------|--------------------------|
|                         | Type         | Mat. no.               |       | Code |                        |                        | L                  | L <sub>G1</sub> | L <sub>G2</sub> | Hex <sub>1</sub> | Hex <sub>2</sub> | Flats |                          |
|                         |              | 16                     | 30    |      |                        |                        |                    |                 |                 |                  |                  |       |                          |
|                         |              | Stainless<br>steel 303 | Brass |      |                        |                        |                    |                 |                 |                  |                  |       |                          |
| 1/8" male thread        | 092.010      | ●                      | ●     | AB   | 1/8                    | 1/8                    | 43.1               | 8.0             | 8.0             | 22               | 24               | 13    | 110.0                    |
| 1/4" male thread        | 092.020      | ●                      | ●     | AD   | 1/4                    | 1/4                    | 60.3               | 12.0            | 11.5            | 27               | 27               | 17    | 200.0                    |
|                         | 092.021      | ●                      | ●     | AF   | 3/8                    | 1/4                    | 58.3               | 12.0            | 11.5            | 27               | 27               | 17    | 160.0                    |
| 3/8" male thread        | 092.030      | ●                      | ●     | AF   | 3/8                    | 3/8                    | 56.0               | 12.0            | 12.0            | 27               | 30               | 19    | 185.0                    |
| 1/2" male thread        | 092.040      | ●                      | ●     | AH   | 1/2                    | 1/2                    | 71.0               | 15.5            | 15.5            | 36               | 41               | 24    | 425.0                    |
| 3/4" male thread        | 092.050      | ●                      | ●     | AL   | 3/4                    | 3/4                    | 80.0               | 17.0            | 17.0            | 41               | 46               | 30    | 595.0                    |

## Ball joints with male thread



| Series                                                  | Ordering no. |                        |       |      | G <sub>1</sub><br>BSPP | G <sub>2</sub><br>BSPP | Dimensions<br>[mm] |                 |                 |                  |                  |       | Weight<br>[g]<br>(Brass) |
|---------------------------------------------------------|--------------|------------------------|-------|------|------------------------|------------------------|--------------------|-----------------|-----------------|------------------|------------------|-------|--------------------------|
|                                                         | Type         | Mat. no.               |       | Code |                        |                        |                    |                 |                 |                  |                  |       |                          |
|                                                         |              | 16                     | 30    |      |                        |                        |                    |                 |                 |                  |                  |       |                          |
|                                                         |              | Stainless<br>steel 303 | Brass |      |                        |                        | L                  | L <sub>G1</sub> | L <sub>G2</sub> | Hex <sub>1</sub> | Hex <sub>2</sub> | Flats |                          |
| 226/216/2TR/<br>302/308/350/<br>468/652/684/<br>548/679 | 092.022      | ●                      | ●     | AD   | 1/4                    | 3/8                    | 64.0               | 12.0            | 10.0            | 27               | 27               | 17    | 135.0                    |
|                                                         | 092.022      | ●                      | ●     | AF   | 3/8                    | 3/8                    | 62.0               | 12.0            | 10.0            | 27               | 27               | 17    | 165.0                    |

## Compact ball joints



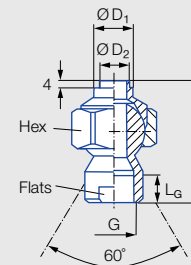
| For all<br>nozzles with | Ordering no. |                        |       |      | G <sub>1</sub><br>BSPP | G <sub>2</sub><br>BSPP | Dimensions<br>[mm] |                 |                 |                  |                  | Weight<br>[g]<br>(Brass) |
|-------------------------|--------------|------------------------|-------|------|------------------------|------------------------|--------------------|-----------------|-----------------|------------------|------------------|--------------------------|
|                         | Type         | Mat. no.               |       | Code |                        |                        |                    |                 |                 |                  |                  |                          |
|                         |              | 16                     | 30    |      |                        |                        |                    |                 |                 |                  |                  |                          |
|                         |              | Stainless<br>steel 303 | Brass |      |                        |                        | L                  | L <sub>G1</sub> | L <sub>G2</sub> | Hex <sub>1</sub> | Hex <sub>2</sub> |                          |
| 1/8" male thread        | 092.010      | ●                      | ●     | AA   | 1/8                    | 1/8                    | 29.3               | 8.0             | 8.0             | 22               | 24               | 70.0                     |
| 1/4" male thread        | 092.024      | ●                      | ●     | AC   | 1/4                    | 1/4                    | 44.0               | 12.0            | 12.0            | 27               | 27               | 140.0                    |
| 3/8" male thread        | 092.030      | ●                      | ●     | AE   | 3/8                    | 3/8                    | 44.0               | 12.0            | 12.0            | 27               | 30               | 160.0                    |

Ordering Type + Material no. + Code = Ordering no.  
example: 092.010 + 16 + AB = 092.010.16.AB

# Ball joints with welding connection

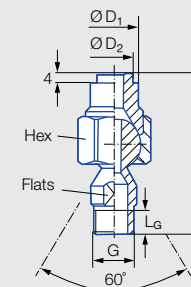


Ball joints with  
welding connection and  
female thread



| For all<br>nozzles with | Ordering no. |                                  |                                     |      | G<br>BSPP | Dimensions<br>[mm] |                |                  |                  |     |       | Weight<br>[g]<br>(Brass) |
|-------------------------|--------------|----------------------------------|-------------------------------------|------|-----------|--------------------|----------------|------------------|------------------|-----|-------|--------------------------|
|                         | Type         | Mat. no.                         |                                     | Code |           |                    |                |                  |                  |     |       |                          |
|                         |              | 16                               | 30                                  |      |           |                    |                |                  |                  |     |       |                          |
|                         |              | Stainless<br>steel 303/<br>316Ti | Brass/<br>Stainless<br>steel 1.0159 |      |           | L                  | L <sub>G</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> | Hex | Flats |                          |
| 1/8" male thread        | 092.010      | ●                                | ●                                   | SB   | 1/8       | 43.0               | 8.0            | 18.0             | 12.0             | 24  | 13    | 70.0                     |
| 1/4" male thread        | 092.020      | ●                                | ●                                   | SD   | 1/4       | 64.5               | 11.5           | 20.0             | 15.0             | 27  | 17    | 150.0                    |
| 3/8" male thread        | 092.030      | ●                                | ●                                   | SF   | 3/8       | 59.0               | 12.0           | 22.0             | 15.0             | 30  | 19    | 165.0                    |
| 1/2" male thread        | 092.040      | ●                                | ●                                   | SH   | 1/2       | 71.1               | 15.5           | 22.0             | 15.0             | 41  | 24    | 350.0                    |
| 3/4" male thread        | 092.050      | ●                                | ●                                   | SL   | 3/4       | 74.8               | 17.0           | 22.0             | 18.0             | 46  | 30    | 470.0                    |

Ball joints with  
welding connection and  
male thread



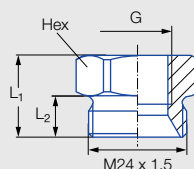
| Series                                                  | Ordering no. |                              |      | G<br>BSPP | Dimensions<br>[mm] |                  |                  |      |       |    | Weight<br>[g] |
|---------------------------------------------------------|--------------|------------------------------|------|-----------|--------------------|------------------|------------------|------|-------|----|---------------|
|                                                         | Type         | Mat. no.                     | Code |           |                    |                  |                  |      |       |    |               |
|                                                         |              | 16                           |      |           |                    |                  |                  |      |       |    |               |
|                                                         |              | Stainless steel<br>303/316Ti |      |           |                    |                  |                  |      |       |    |               |
|                                                         |              |                              |      | L         | L <sub>G</sub>     | Ø D <sub>1</sub> | Ø D <sub>2</sub> | Hex  | Flats |    |               |
| 226/216/2TR/<br>302/308/350/<br>468/652/684/<br>548/679 | 092.022      | ●                            | SE   | 3/8 A     | 68.0               | 10.0             | 20.0             | 15.0 | 27    | 17 | 155.0         |

Ordering Type + Material no. + Code = Ordering no.  
example: 092.010 + 16 + SB = 092.010.16.SB

# Accessories for nozzle series 676 with integrated ball joint



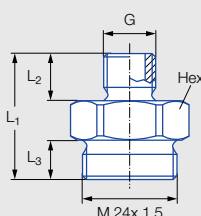
## Threaded sockets



| Series | Ordering no.                  |                        |       | G<br>BSPP | Dimensions<br>[mm] |                |     | Weight<br>[g]<br>(Brass) |
|--------|-------------------------------|------------------------|-------|-----------|--------------------|----------------|-----|--------------------------|
|        | Type                          | Mat. no.               |       |           | L <sub>1</sub>     | L <sub>2</sub> | Hex |                          |
|        |                               | 16                     | 30    |           |                    |                |     |                          |
|        |                               | Stainless<br>steel 303 | Brass |           |                    |                |     |                          |
| 676    | 092.020.xx.AF.03 <sup>1</sup> | ●                      | ●     | 3/8       | 20.0               | 10.0           | 27  | 50.0                     |

<sup>1</sup> Replace "xx" by material no.

## Threaded nipple

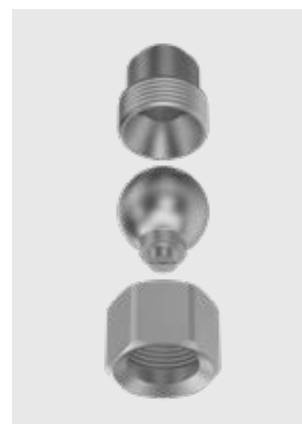
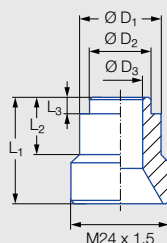


| Series | Ordering no.                  |                        |       | G<br>BSPP | Dimensions<br>[mm] |                |                |     | Weight<br>[g]<br>(Brass) |
|--------|-------------------------------|------------------------|-------|-----------|--------------------|----------------|----------------|-----|--------------------------|
|        | Type                          | Mat. no.               |       |           | L <sub>1</sub>     | L <sub>2</sub> | L <sub>3</sub> | Hex |                          |
|        |                               | 16                     | 30    |           |                    |                |                |     |                          |
|        |                               | Stainless<br>steel 303 | Brass |           |                    |                |                |     |                          |
| 676    | 092.024.xx.AC.03 <sup>1</sup> | ●                      | ●     | 1/4       | 32.0               | 12.0           | 10.0           | 27  | 70.0                     |

<sup>1</sup> Replace "xx" by material no.

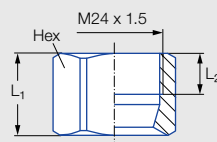
Order    Type            +    Material no.    =    Ordering no.  
example: 092.020.xx.AF.03    +    16                    =    092.020.16.AF.03

### Welded nipple



| Series | Ordering no.     |                       | Dimensions [mm] |                |                |                  |                  |                  | Weight [g] |
|--------|------------------|-----------------------|-----------------|----------------|----------------|------------------|------------------|------------------|------------|
|        | Type             | Mat. no.              |                 |                |                |                  |                  |                  |            |
|        |                  | 17                    |                 |                |                |                  |                  |                  |            |
|        |                  | Stainless steel 316Ti | L <sub>1</sub>  | L <sub>2</sub> | L <sub>3</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> | Ø D <sub>3</sub> |            |
| 676    | 092.020.17.00.04 | ●                     | 26.0            | 14.0           | 4.0            | 20.0             | 15.0             | 11.0             | 45.0       |

### Retaining nuts



| Series | Ordering no.                  |                        |       | Dimensions<br>[mm] |                |     | Weight<br>[g]<br>(Brass) |
|--------|-------------------------------|------------------------|-------|--------------------|----------------|-----|--------------------------|
|        | Type                          | Mat. no.               |       |                    |                |     |                          |
|        |                               | 16                     | 30    |                    |                |     |                          |
|        |                               | Stainless<br>steel 303 | Brass | L <sub>1</sub>     | L <sub>2</sub> | Hex |                          |
| 676    | 092.020.xx.00.02 <sup>1</sup> | ●                      | ●     | 20.0               | 10.0           | 27  | 35.0                     |

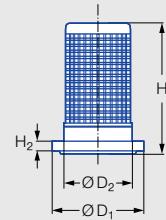
<sup>1</sup> Replace "xx" by material no.

**Notice:** The assembly accessories shown can be used with the low pressure flat fan nozzle with ball joint (series 676) (see Page 140/252).

Order    Type            +    Material no.    =    Ordering no.  
example: 092.020.xx.00.02    +    16                    =    092.020.16.00.02

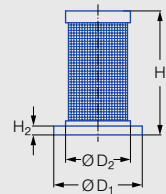


## Filter



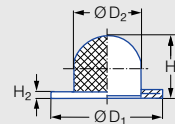
| Series                                              | Nozzle size     | Ordering no. |          | Colour | Dimensions [mm] |                |                |                  |                  | Weight [g] |
|-----------------------------------------------------|-----------------|--------------|----------|--------|-----------------|----------------|----------------|------------------|------------------|------------|
|                                                     |                 | Type         | Mat. no. |        | Mesh size       | H <sub>1</sub> | H <sub>2</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> |            |
|                                                     |                 |              | 56       |        |                 |                |                |                  |                  |            |
|                                                     |                 |              | POM      |        |                 |                |                |                  |                  |            |
| 216/2TR/<br>302/468/<br>422 bayonet/<br>652/646/684 | xxx.32x-xxx.44x | 065.257      | ●        | Blue   | 0.25            | 21.40          | 2.00           | 14.80            | 11.00            | 2.00       |
|                                                     | xxx.48x-xxx.56x | 065.256      | ●        | Red    | 0.65            | 21.40          | 2.00           | 14.80            | 11.00            | 2.00       |

## Filter



| Series                                              | Nozzle size     | Ordering no.                                  |                                                                                     | Colour     | Dimensions [mm] |                |                |                  |                  | Weight [g] |
|-----------------------------------------------------|-----------------|-----------------------------------------------|-------------------------------------------------------------------------------------|------------|-----------------|----------------|----------------|------------------|------------------|------------|
|                                                     |                 | Type                                          | Mat. no.                                                                            |            | Mesh size       | H <sub>1</sub> | H <sub>2</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> |            |
|                                                     |                 |                                               | 53                                                                                  |            |                 |                |                |                  |                  |            |
|                                                     |                 |                                               | Polypropylene                                                                       |            |                 |                |                |                  |                  |            |
| 216/2TR/<br>302/468/<br>422 bayonet/<br>652/646/684 | xxx.32x-xxx.44x | 095.016.53.15.62<br>Strainer insert<br>304 SS |  | Light pink | 0.08            | 21.00          | 1.60           | 15.00            | 11.00            | 1.00       |

## Cup strainer



| Series                                              | Nozzle size     | Ordering no. |              | Dimensions<br>[mm] |                |                |                  |                  | Weight<br>[g] |
|-----------------------------------------------------|-----------------|--------------|--------------|--------------------|----------------|----------------|------------------|------------------|---------------|
|                                                     |                 | Type         | Mat. no.     |                    |                |                |                  |                  |               |
|                                                     |                 |              | 26           |                    |                |                |                  |                  |               |
|                                                     |                 |              | Monel/Copper | Mesh size          | H <sub>1</sub> | H <sub>2</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> |               |
| 216/2TR/<br>302/468/<br>422 bayonet/<br>652/646/684 | xxx.32x-xxx.44x | 065.252      | ●            | 0.5                | 8.5            | 1.6            | 14.8             | 9.0              | 1.0           |

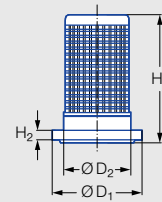
Ordering Type + Material no. = Ordering no.  
example: 065.257 + 56 = 065.257.56

# Filters

## with ball-type non-return valve

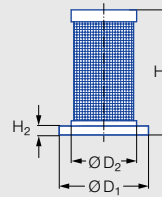


Ball-type non-return valve  
with integrated filter  
 $p_{max} = 20 \text{ bar}$



| Series                                              | Nozzle size     | Ordering no.                                   |          | Colour | Pressure [bar]   |                  | Dimensions [mm] |                |                |                  |                  | Weight [g] |
|-----------------------------------------------------|-----------------|------------------------------------------------|----------|--------|------------------|------------------|-----------------|----------------|----------------|------------------|------------------|------------|
|                                                     |                 | Type                                           | Mat. no. |        |                  |                  |                 |                |                |                  |                  |            |
|                                                     |                 |                                                | 56       |        | Opening pressure | Closing pressure | Mesh size       | H <sub>1</sub> | H <sub>2</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> |            |
| 216/2TR/<br>302/468/<br>422 bayonet/<br>652/646/684 | xxx.32x-xxx.44x | <b>065.265</b><br>Ball 420 SS<br>Spring 302 SS | ●        | Blue   | 0.40-0.50        | 0.35-0.45        | 0.25            | 21.40          | 2.00           | 14.80            | 11.00            | 2.00       |
|                                                     | xxx.48x-xxx.56x | <b>065.266</b><br>Ball 420 SS<br>Spring 302 SS | ●        | Red    | 0.40-0.50        | 0.35-0.45        | 0.65            | 21.40          | 2.00           | 14.80            | 11.00            | 2.00       |

Ball-type non-return valve  
with integrated filter



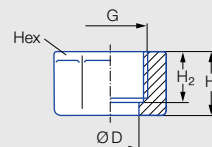
| Series                                              | Nozzle size     | Ordering no.                                                                |          | Colour | Pressure [bar]   |                  | Dimensions [mm] |                |                |                  |                  | Weight [g] |
|-----------------------------------------------------|-----------------|-----------------------------------------------------------------------------|----------|--------|------------------|------------------|-----------------|----------------|----------------|------------------|------------------|------------|
|                                                     |                 | Type                                                                        | Mat. no. |        |                  |                  |                 |                |                |                  |                  |            |
|                                                     |                 |                                                                             | 53       |        | Opening pressure | Closing pressure | Mesh size       | H <sub>1</sub> | H <sub>2</sub> | Ø D <sub>1</sub> | Ø D <sub>2</sub> |            |
| 216/2TR/<br>302/468/<br>422 bayonet/<br>652/646/684 | xxx.14x-xxx.36x | <b>095.016.53.11.00</b><br>Strainer insert/<br>Ball 304 SS<br>Spring 302 SS | ●        | Blue   | approx.<br>0.50  | approx.<br>0.30  | 0.08            | 21.00          | 1.60           | 15.00            | 11.00            | 2.00       |
|                                                     | xxx.14x-xxx.36x | <b>095.016.53.14.63</b><br>Strainer insert/<br>Ball 304 SS<br>Spring 302 SS | ●        | Green  | approx.<br>2.80  | approx.<br>1.60  | 0.08            | 21.00          | 1.50           | 15.00            | 11.00            | 2.00       |

Ordering Type + Material no. = Ordering no.  
example: 065.265 + 56 = 065.265.56

# Retaining nuts and gaskets



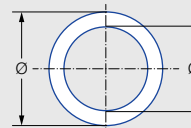
## Retaining nuts



| Series                                  | Ordering no. |                           |                             |                            |       |             |            | G<br>BSPP | Dimensions<br>[mm] |                |      |      | Weight<br>[g]<br>(Brass) |
|-----------------------------------------|--------------|---------------------------|-----------------------------|----------------------------|-------|-------------|------------|-----------|--------------------|----------------|------|------|--------------------------|
|                                         | Type         | Mat. no.                  |                             |                            |       |             |            |           | H <sub>1</sub>     | H <sub>2</sub> | Ø D  | Hex  |                          |
|                                         |              | 16                        | 17 <sup>1</sup>             | 1Y                         | 30    | 56<br>Black | 5E<br>Blue |           |                    |                |      |      |                          |
|                                         |              | Stainless<br>steel<br>303 | Stainless<br>steel<br>316Ti | Stainless<br>steel<br>316L | Brass | POM         | PVDF       |           |                    |                |      |      |                          |
| 226/2TR/<br>468/652/660/<br>684/548/679 | 065.200      | ●                         | ●                           |                            | ●     |             |            | 3/8       | 13.0               | 10.0           | 12.8 | 22   | 25.0                     |
|                                         | 065.200      |                           |                             |                            |       | ●           | ●          | 3/8       | 14.5               | 11.5           | 13.0 | 22   | 25.0                     |
|                                         | 069.000      | ●                         |                             | ●                          | ●     |             |            | UNF 11/16 | 14.3               | 9.7            | 13.1 | 20.6 | 25.0                     |
| 656/657/<br>664/665                     | 065.600      | ●                         | ●                           |                            | ●     |             | ●          | 3/4       | 16.0               | 13.0           | 20.1 | 32   | 60.0                     |

<sup>1</sup> We reserve the right to supply material 316Ti or 316L under material no. 17.

## Gaskets



| Series                                                                                          | Nozzle Code       | Ordering no.       |          |                     |                            |             | Dimensions<br>[mm]       | Weight<br>[g] |
|-------------------------------------------------------------------------------------------------|-------------------|--------------------|----------|---------------------|----------------------------|-------------|--------------------------|---------------|
|                                                                                                 |                   | Type               | Mat. no. |                     |                            |             |                          |               |
|                                                                                                 |                   |                    | 55       | 71                  | 72                         | 73          |                          |               |
|                                                                                                 |                   |                    | PTFE     | Cu. ISO PL.<br>7504 | EWP 210<br>(asbestos-free) | Soft rubber |                          |               |
| 610                                                                                             | 1/8 BSPP          | 061.040            |          |                     | ●                          |             | Ø 10.00 x Ø 14.00 x 1.00 | 0.13          |
| 220/612                                                                                         | 1/4 BSPP          | 061.240            | ●        | ● <sup>1</sup>      | ●                          |             | Ø 13.20 x Ø 17.00 x 1.00 | 0.20          |
| 490/491/<br>460/461/<br>616/617/689                                                             | 3/4 BSPP          | 061.640            |          | ● <sup>2</sup>      | ●                          |             | Ø 26.50 x Ø 32.00 x 1.00 | 0.50          |
| 405                                                                                             | 1 1/4 BSPP        | 062.140            |          |                     | ●                          |             | Ø 42.00 x Ø 50.00 x 1.00 | 1.20          |
| 405                                                                                             | 2 BSPP            | 062.540            |          |                     | ●                          |             | Ø 60.00 x Ø 70.00 x 2.00 | 3.92          |
| 226/468/652/<br>684/679                                                                         | Retaining nut 3/8 | 065.240            | ●        |                     | ●                          | ●           | Ø 11.00 x Ø 15.00 x 1.00 | 0.14          |
| 656/657                                                                                         | Retaining nut 3/4 | 065.640            |          |                     | ●                          |             | Ø 18.00 x Ø 24.00 x 1.00 | 0.50          |
| PTFE sealing tape<br>For connecting cylindrical female threads<br>and tapered male threads BSPT |                   | 095.009.55.09.30.0 |          |                     |                            |             | 12 mm x 0.1 mm x 12 m    | –             |

<sup>1</sup> Dimensions [mm] for mat. no. 71: 13.20 x 17.00 x 2.00.

<sup>2</sup> Dimensions [mm] for mat. no. 71: 26.50 x 32.00 x 2.50.

Ordering Type + Material no. = Ordering no.  
example: 065.200 + 16 = 065.200.16

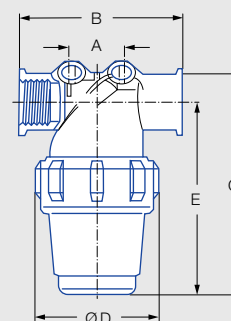
# Strainers

## Max. 12 bar



### Standard strainer for industrial application

- For operating pressure levels up to 12 bar.  
With large filter surfaces
- Mesh size is colour coded:
  - 0.6 mm = red
  - 0.3 mm = blue
  - 0.2 mm = green
- Easy handling
- Robust version
- Slender design



| Type          |               | Code BSPP | Dimensions [mm] |       |       |       |       | Weight [g] |
|---------------|---------------|-----------|-----------------|-------|-------|-------|-------|------------|
|               |               |           | A               | B     | C     | E     | Ø D   |            |
| <b>S.GA2.</b> | <b>S.GI2.</b> | 1/2       | 27.0            | 97.0  | 140.0 | 118.0 | 74.0  | 200.0      |
| <b>S.GA3.</b> | <b>S.GI3.</b> | 3/4       | 27.0            | 97.0  | 140.0 | 118.0 | 74.0  | 200.0      |
| <b>S.GA4.</b> | <b>S.GI4.</b> | 1         | 40.0            | 112.0 | 175.0 | 143.0 | 86.0  | 300.0      |
| <b>S.GA5.</b> | <b>S.GI5.</b> | 1 1/4     | 39.0            | 146.0 | 280.0 | 239.0 | 116.0 | 630.0      |
| <b>S.GA6.</b> | <b>S.GI6.</b> | 1 1/2     | 39.0            | 146.0 | 280.0 | 239.0 | 116.0 | 630.0      |

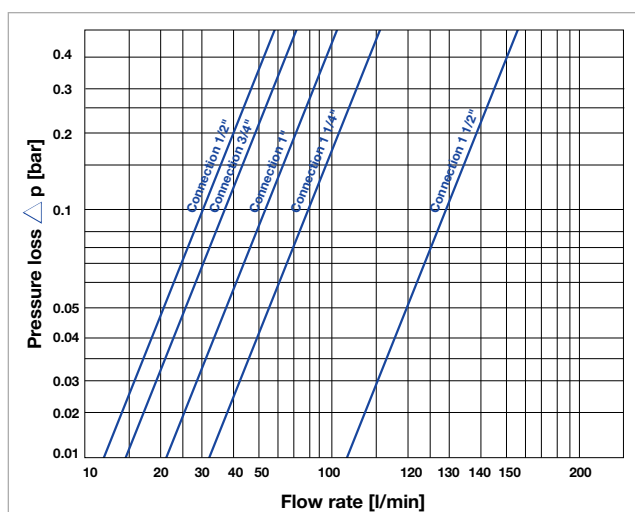
### Pressure/Temperature ranges

| Max. temperature [°C] | p <sub>max</sub> [bar] |
|-----------------------|------------------------|
| 20                    | 12                     |
| 60                    | 7                      |

|               | Ordering no.  |             | Standard strainer insert/Standard filter |                |                    |
|---------------|---------------|-------------|------------------------------------------|----------------|--------------------|
|               | Type          | Size        | Mat. no.                                 | Mesh size [mm] | Type (blue)        |
|               |               |             | 53<br>Polypropylene                      |                |                    |
| Male thread   | <b>S.GA2.</b> | <b>012.</b> | ●                                        | 0.3            | S.000.012.00.26.03 |
|               | <b>S.GA3.</b> | <b>034.</b> | ●                                        | 0.3            | S.000.012.00.26.03 |
|               | <b>S.GA4.</b> | <b>100.</b> | ●                                        | 0.3            | S.000.100.00.26.03 |
|               | <b>S.GA5.</b> | <b>114.</b> | ●                                        | 0.3            | S.000.114.00.26.03 |
|               | <b>S.GA6.</b> | <b>112.</b> | ●                                        | 0.3            | S.000.114.00.26.03 |
| Female thread | <b>S.GI2.</b> | <b>012.</b> | ●                                        | 0.3            | S.000.012.00.26.03 |
|               | <b>S.GI3.</b> | <b>034.</b> | ●                                        | 0.3            | S.000.012.00.26.03 |
|               | <b>S.GI4.</b> | <b>100.</b> | ●                                        | 0.3            | S.000.100.00.26.03 |
|               | <b>S.GI5.</b> | <b>114.</b> | ●                                        | 0.3            | S.000.114.00.26.03 |
|               | <b>S.GI6.</b> | <b>112.</b> | ●                                        | 0.3            | S.000.114.00.26.03 |

| Optional strainer inserts |                    |                |                    |
|---------------------------|--------------------|----------------|--------------------|
| Mesh size [mm]            | Type (red)         | Mesh size [mm] | Type (green)       |
| 0.6                       | S.000.012.00.26.06 | 0.2            | S.000.012.00.26.02 |
| 0.6                       | S.000.012.00.26.06 | 0.2            | S.000.012.00.26.02 |
| 0.6                       | S.000.100.00.26.06 | 0.2            | S.000.100.00.26.02 |
| 0.6                       | S.000.100.00.26.06 | 0.2            | S.000.100.00.26.02 |
| 0.6                       | S.000.114.00.26.06 | 0.2            | S.000.114.00.26.02 |
| 0.6                       | S.000.114.00.26.06 | 0.2            | S.000.114.00.26.02 |
| 0.6                       | S.000.012.00.26.06 | 0.2            | S.000.012.00.26.02 |
| 0.6                       | S.000.012.00.26.06 | 0.2            | S.000.012.00.26.02 |
| 0.6                       | S.000.012.00.26.06 | 0.2            | S.000.012.00.26.02 |
| 0.6                       | S.000.100.00.26.06 | 0.2            | S.000.100.00.26.02 |
| 0.6                       | S.000.114.00.26.06 | 0.2            | S.000.114.00.26.02 |
| 0.6                       | S.000.114.00.26.06 | 0.2            | S.000.114.00.26.02 |

**Notice:** Standard strainer insert (blue) included in the scope of supply.



### Correction factors for $\Delta p$

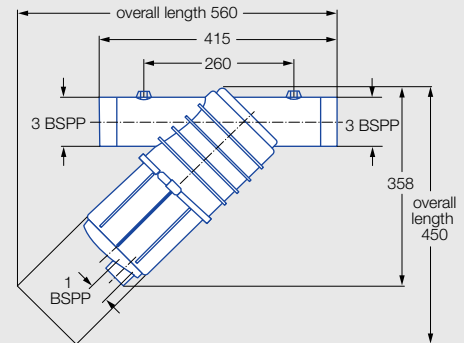
| Viscosity [mPa·s] | Basket – mesh size [mm] |     |     |
|-------------------|-------------------------|-----|-----|
|                   | 0.6                     | 0.3 | 0.2 |
| 1.0 (water)       | 1.0                     | 1.2 | 1.4 |
| 100.0             | 1.6                     | 1.9 | 2.0 |
| 200.0             | 1.7                     | 2.2 | 2.3 |

Ordering Type + Size + Material no. = Ordering no.  
example: S.GA2. + 012. + 53 = S.GA2.012.53



## Strainer with high flow rate and low resistance

- Integrated flow deflector prevents clogging of the filter insert
- Dirt particles can be removed via an offset outlet port
- Prepared for the install of two pressure gauges



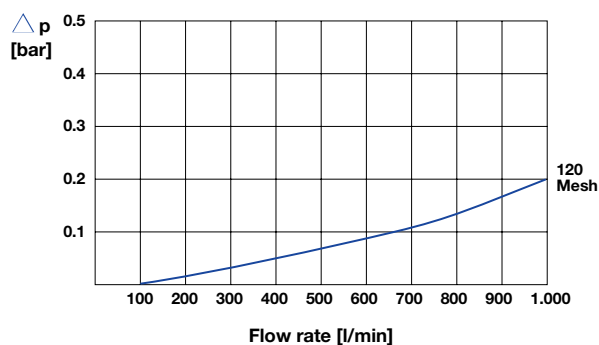
## Strainer with screen

| Ordering no. |      | Screen mesh size<br>[µm/mesh] |
|--------------|------|-------------------------------|
| Type         | Size | Mat. no.                      |
|              |      | 53                            |
|              |      | Polypropylene                 |
| S.GA2.       | 300. | ●                             |
| S.GA3.       | 300. | ●                             |
| S.GA4.       | 300. | ●                             |
| S.GA5.       | 300. | ●                             |
|              |      |                               |

## Screen

| Ordering no. |         | Screen mesh size<br>[µm/mesh] |
|--------------|---------|-------------------------------|
| Type         | Size    | Mat. no.                      |
|              |         | 26                            |
|              |         | 5A                            |
|              |         | Stainless steel 304           |
|              |         | Polyester/Stainless steel     |
| S.002.       | 300.00. | ●                             |
| S.003.       | 300.00. | ●                             |
| S.004.       | 300.00. | ●                             |
| S.005.       | 300.00. | ●                             |
|              |         |                               |

## Pressure loss chart



## Technical data

|                             |                     |
|-----------------------------|---------------------|
| Screening surface           | 860 cm <sup>2</sup> |
| Screening insert Ø          | 145 mm              |
| Height of screening insert  | 320 mm              |
| Inflow/Outflow port Ø       | 3"                  |
| Pressure gauge connection Ø | 1/4 BSPP            |
| Max. operating pressure     | 8 bar               |

## Ordering example for strainer:

Ordering Type + Size + Material no. = Ordering no.  
example: S.GA2. + 300. + 53 = S.GA2.300.53

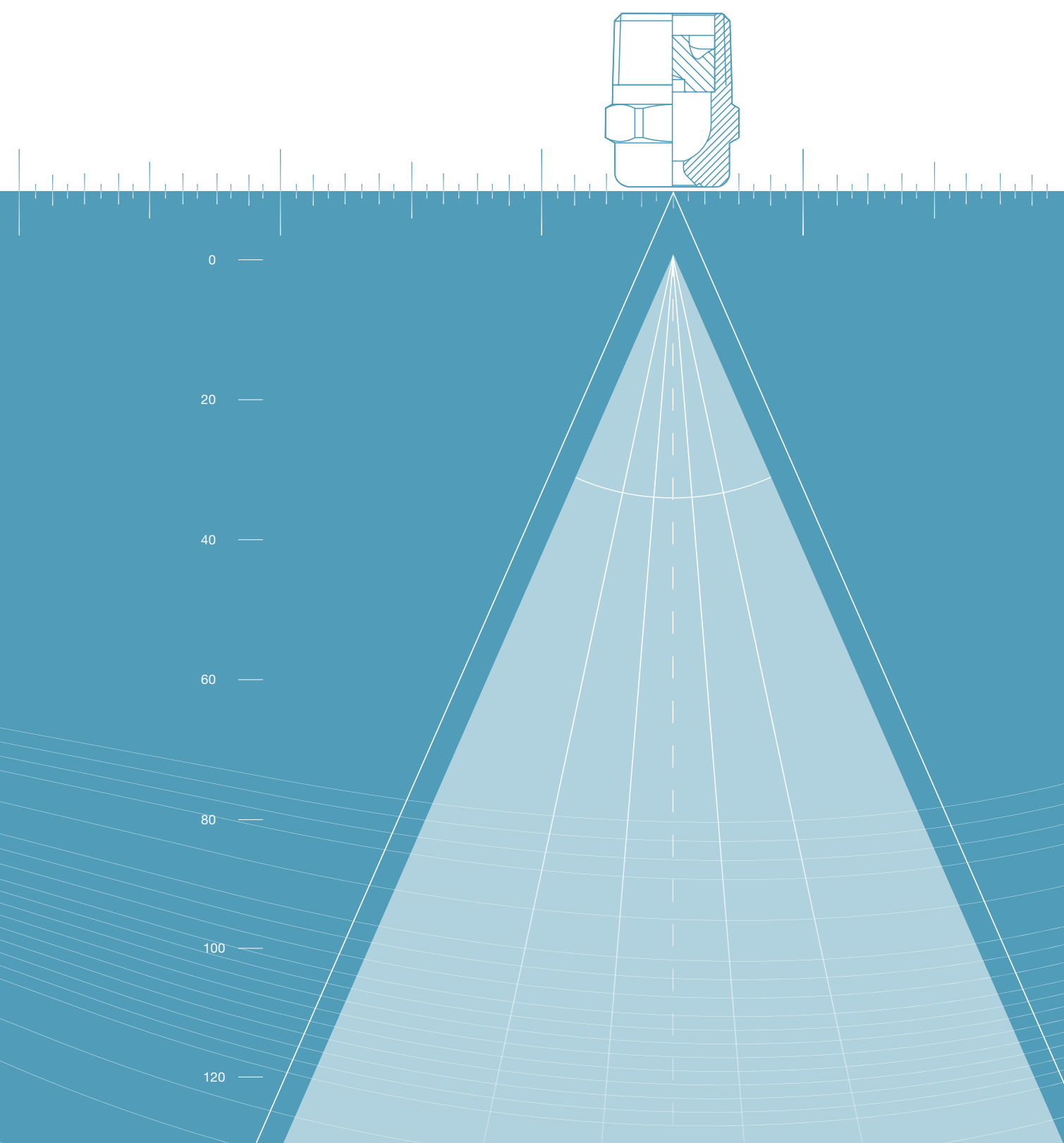
## Ordering example for strainer insert:

Ordering Type + Size + Material no. = Ordering no.  
example: S.002. + 300.00. + 26 = S.002.300.00.26





# PLANNING AIDS



# »» PLANNING AIDS YOU CAN COUNT ON OUR SUPPORT



To achieve the optimum spray pattern for your application, numerous influencing factors must be taken into account. The following provides an overview of the key parameters. Needless to say, we will be more than happy to help you find the ideal nozzle.

- **Flow rate**
- **Droplet size**
- **Spray angle**
- **Viscosity**
- **Impact**
- **Nozzle arrangement**
- **Determination of the pipe diameter**
- **Conversion tables**
- **Lechler online services**
- **Certificates and declarations**





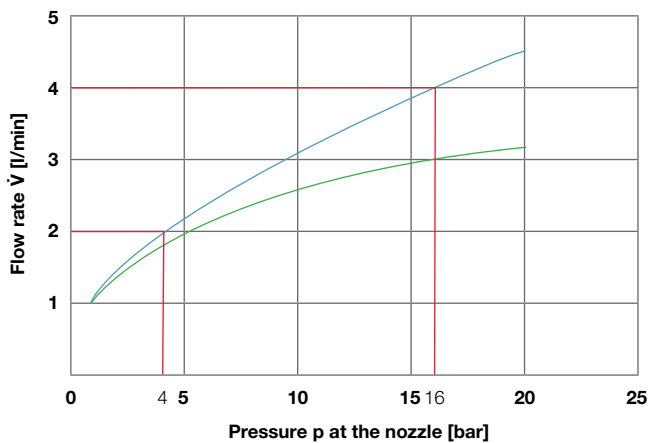
### Flow rate conversion

With single element nozzles, the flow rate is controlled exclusively via the connection pressure.  
The following correlation applies:

|                                                                              | Axial-flow full cone nozzles                                     | All other single element nozzles                             |
|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------|
| Calculation of the flow rate $\dot{V}$ [l/min] at a given pressure $p$ [bar] | $\dot{V}_2 = \left(\frac{p_2}{p_1}\right)^{0.4} \cdot \dot{V}_1$ | $\dot{V}_2 = \sqrt{\frac{p_2}{p_1}} \cdot \dot{V}_1$         |
| Calculation of the pressure $p$ [bar] at a given flow rate $\dot{V}$ [l/min] | $p_2 = \left(\frac{\dot{V}_2}{\dot{V}_1}\right)^{2.5} \cdot p_1$ | $p_2 = \left(\frac{\dot{V}_2}{\dot{V}_1}\right)^2 \cdot p_1$ |

### Flow rate via pressure

#### Pressure-flow rate chart for two single element nozzles



- Flow rate axial-flow full cone nozzle
- Flow rate of all other single element nozzles

All pressure values refer to the difference  $\Delta p$  between the connection pressure and the ambient pressure.

$$\Delta p = p_1 - p_2$$



To double the flow rate, four times the connection pressure is, thus, required for all single element nozzles, except for axial-flow full cone nozzles.

### Flow rate as a function of the medium density

For media with a lower density than water, the volume rate increases.

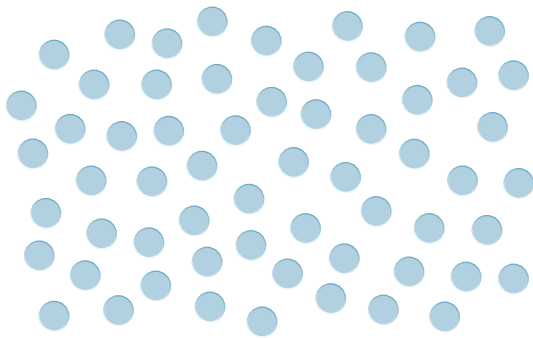
|                                                                                |      |      |      |      |      |                                                                                    |       |       |       |       |       |       |       |       |       |       |  |  |  |
|--------------------------------------------------------------------------------|------|------|------|------|------|------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|--|--|
| $\dot{V}_W = \frac{\dot{V}_{FI}}{X}$                                           |      |      |      |      |      | $\dot{V}_W$ = flow rate of water [l/min, l/h]                                      |       |       |       |       |       |       |       |       |       |       |  |  |  |
| $\dot{V}_{FI} = \dot{V}_W \sqrt{\frac{\rho_W}{\rho_{FI}}} = \dot{V}_W \cdot X$ |      |      |      |      |      | $\dot{V}_{FI}$ = flow rate of the liquid whose density deviates from 1,000 [kg/m³] |       |       |       |       |       |       |       |       |       |       |  |  |  |
| $X = \sqrt{\frac{\rho_W}{\rho_{FI}}}$                                          |      |      |      |      |      | $X$ = multiplier $\rho$ = density [kg/m³]                                          |       |       |       |       |       |       |       |       |       |       |  |  |  |
| $\rho_{FI}$                                                                    | 500  | 600  | 700  | 800  | 900  | 1,000                                                                              | 1,100 | 1,200 | 1,300 | 1,400 | 1,500 | 1,600 | 1,700 | 1,800 | 1,900 | 2,000 |  |  |  |
| X                                                                              | 1.41 | 1.29 | 1.20 | 1.12 | 1.06 | 1.00                                                                               | 0.95  | 0.91  | 0.88  | 0.85  | 0.82  | 0.79  | 0.77  | 0.75  | 0.73  | 0.71  |  |  |  |



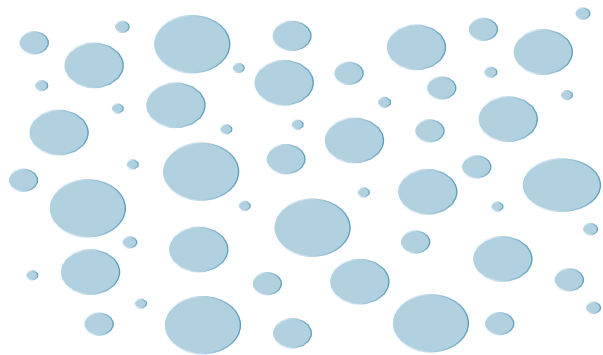
Each nozzle produces a spray of differently sized droplets (polydisperse spray). For many applications (e.g. evaporative cooling, absorption processes), the size of the total surface area of all the droplets is crucial. The Sauter mean diameter ( $D_{32}$ ) was defined for this reason.

If you transform the total volume of the droplets of a spray into droplets of equal size, which in sum would have the identical volume/surface ratio as the actual spray, these droplets would have the Sauter mean diameter.

### Monodisperse spray (quite rare in reality)

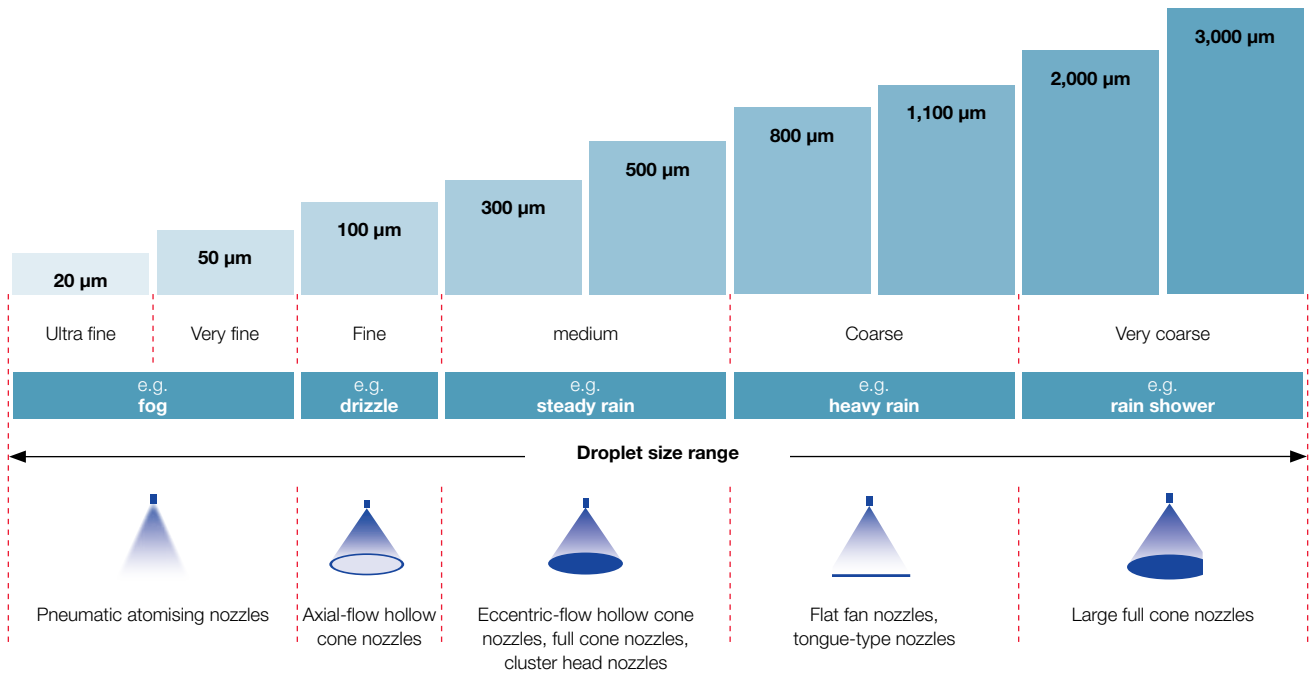


### Typical droplet distribution of the spray of a single element nozzle

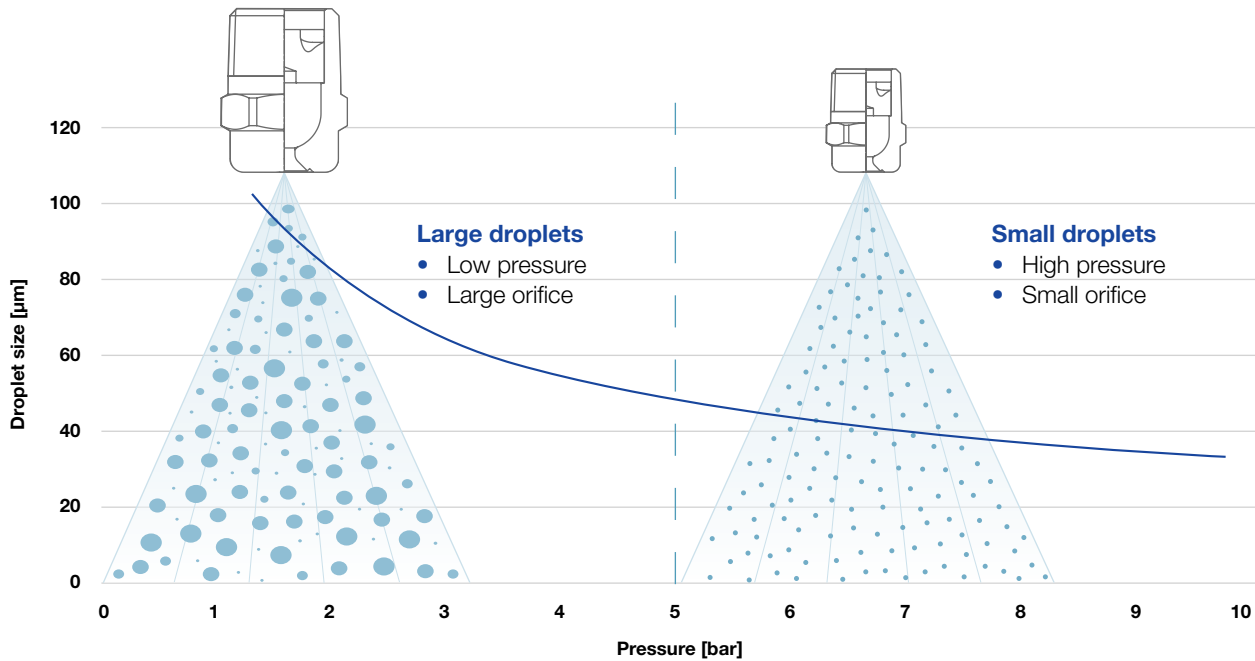


The sprays have varying droplet sizes. However, the ratio of surface area to volume is the same for both and thus also their Sauter mean diameter.

### Rough classification of droplet sizes



## Droplet diameter as a function of the operating pressure



## Influences on the droplet size

The following applies in general to all single element nozzles:

- The higher the **operating pressure**, the finer the droplets.
- The smaller the **nozzle outlet bore**, the finer the droplets.
- The higher the **viscosity** of the medium being atomised, the larger the droplets.



Cone and flat fan nozzles are available with varying spray angles. The spray angle can significantly influence the result of the process and should, therefore, be chosen carefully. The angles specified in the tables apply to operation with water at the respective design pressure. In case of deviating operating conditions, the angle may deviate from this value.

## Influences on the spray angle

The following factors influence the size of the spray angle:

- Pressure**

The operating pressure has a significant influence on the spray angle. At very low or very high pressure levels, the spray angle is smaller than at the optimum operating pressure.

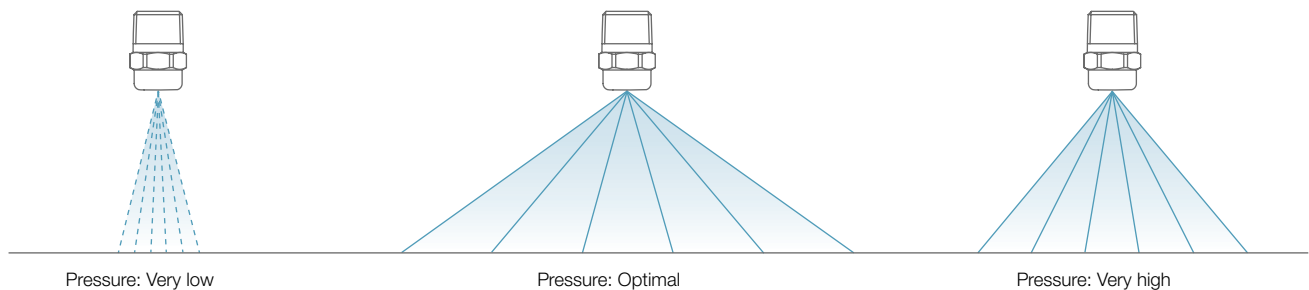
- Distance**

At small distances, the spray width initially increases with the distance and can be determined easily using the trigonometric function. Straight-line pattern can be assumed. With greater spraying heights, the trajectory points increasingly downwards, thus reducing the effective spray angle.

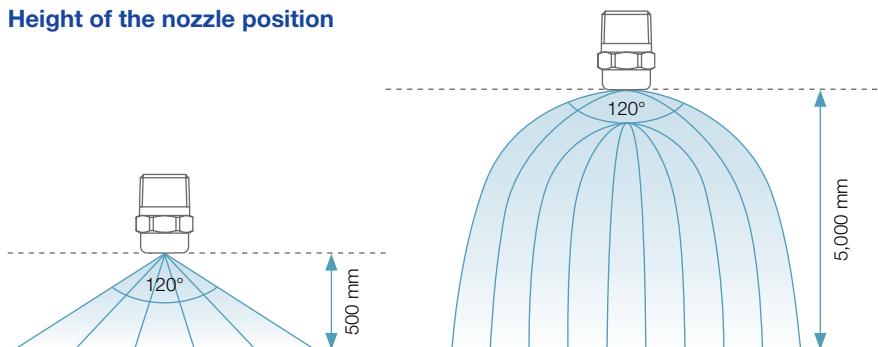
- Viscosity**

The higher the viscosity of the liquid being sprayed, the smaller the spray angle. The viscosity of liquids can usually be reduced by heating them up.

## Change in the spray pressure



## Height of the nozzle position

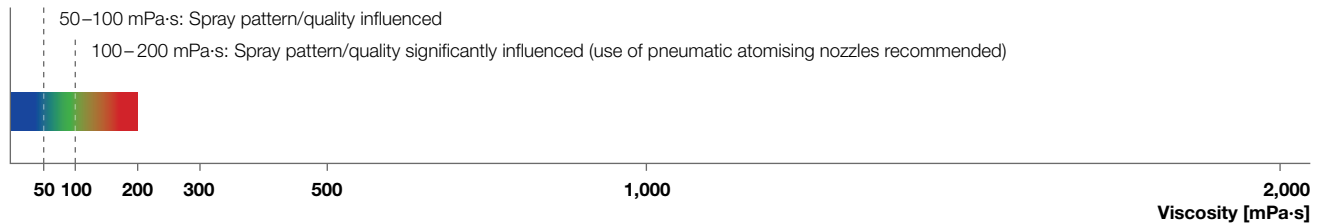




The viscosity of a liquid has a significant influence on the spray behaviour of the nozzle. When selecting the right nozzle, the viscosity must, therefore, be taken into account.

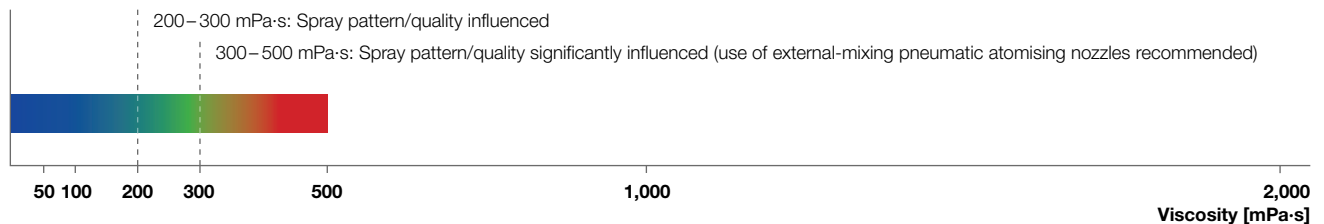
### Single element nozzle

Example: Hollow cone, full cone, flat fan nozzles



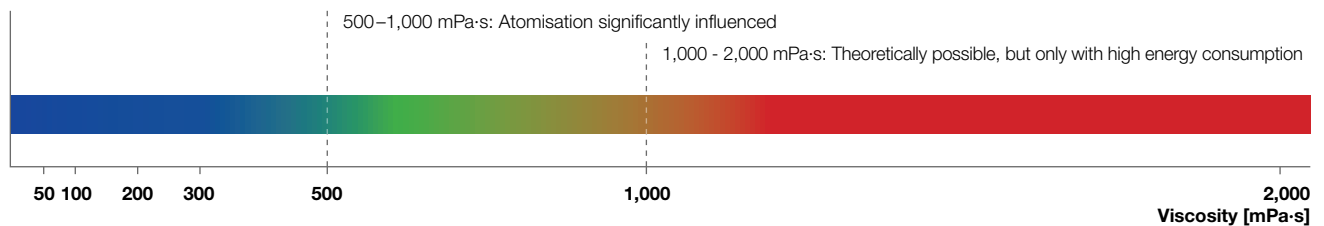
### Pneumatic atomising nozzles (internal mixing)

Example: Series 136.1, 136.2, 136.4, 136.5, 166.1, 166.2, 166.4, 140



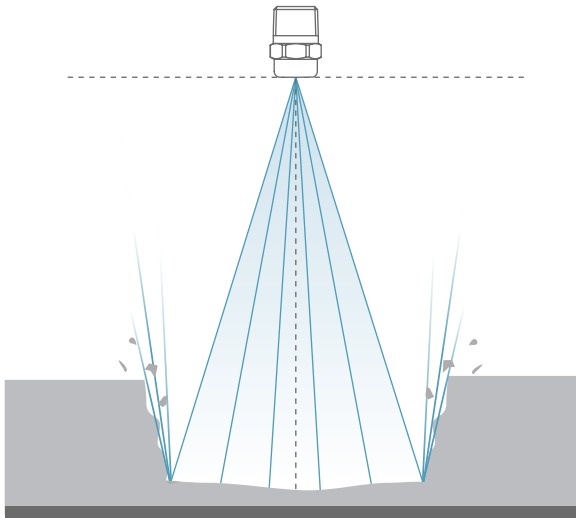
### Pneumatic atomising nozzles (external mixing)

Example: Series 136.3, 136.6, 166.6, 176



- No influence on the spray pattern
- Influence on the spray pattern
- Significant influence on the spray pattern

| Medium                | Temperature [°C] | Viscosity [mPa·s] |
|-----------------------|------------------|-------------------|
| Water                 | 20               | 1                 |
| Milk                  | 20               | 2                 |
| Olive oil             | 20               | 108               |
| Olive oil             | 60               | 20                |
| Sugar solution 65° Bx | 20               | 120               |
| Sugar solution 70° Bx | 20               | 400               |
| Gelatine              | 45               | 1,200             |



Impact is the pressure in  $\text{N/mm}^2$  that the spray jet generates as it strikes the surface. This is crucial for the majority of cleaning tasks. The greater the impact, the better the cleaning result. Lechler high pressure nozzles are characterised by a uniformly high impact across the entire spray width.

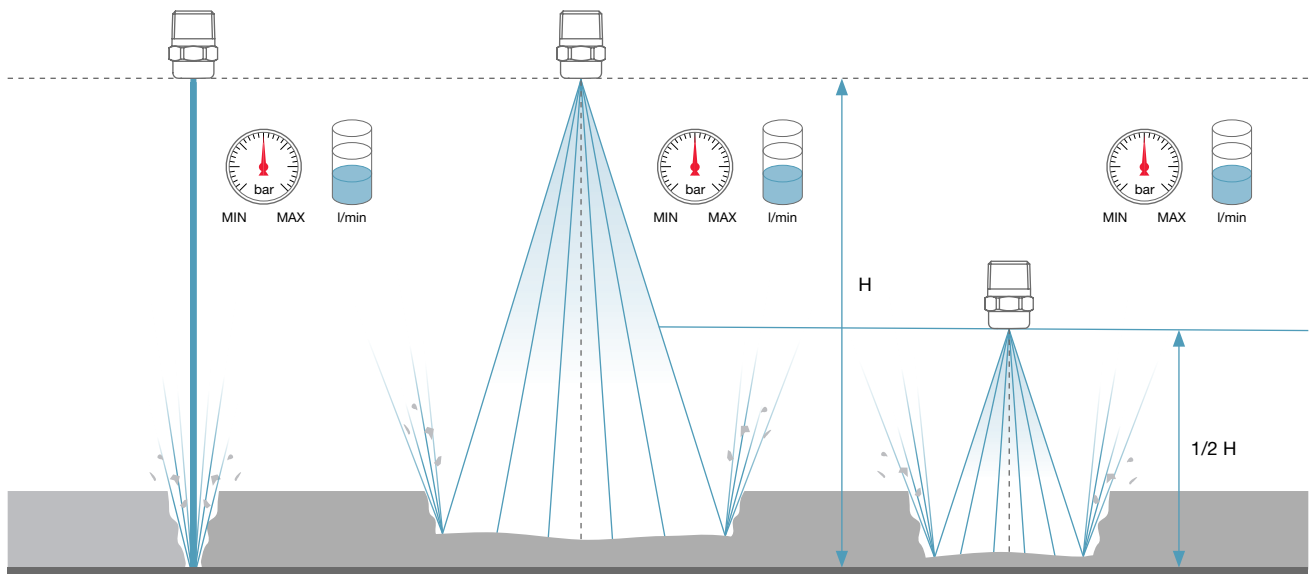
$$I = \frac{\text{Impact force}}{\text{Impact surface}} = \frac{F}{A} \quad [\text{N/mm}^2]$$

## Influences on the impact

The following factors influence the size of the impact:

- **Impact surface and jet shape**

The impact surface is the area where the spray jet strikes. The smaller the impact surface, the greater the impact. The highest impact values can be achieved with solid stream nozzles and flat fan nozzles with a small spray angle.



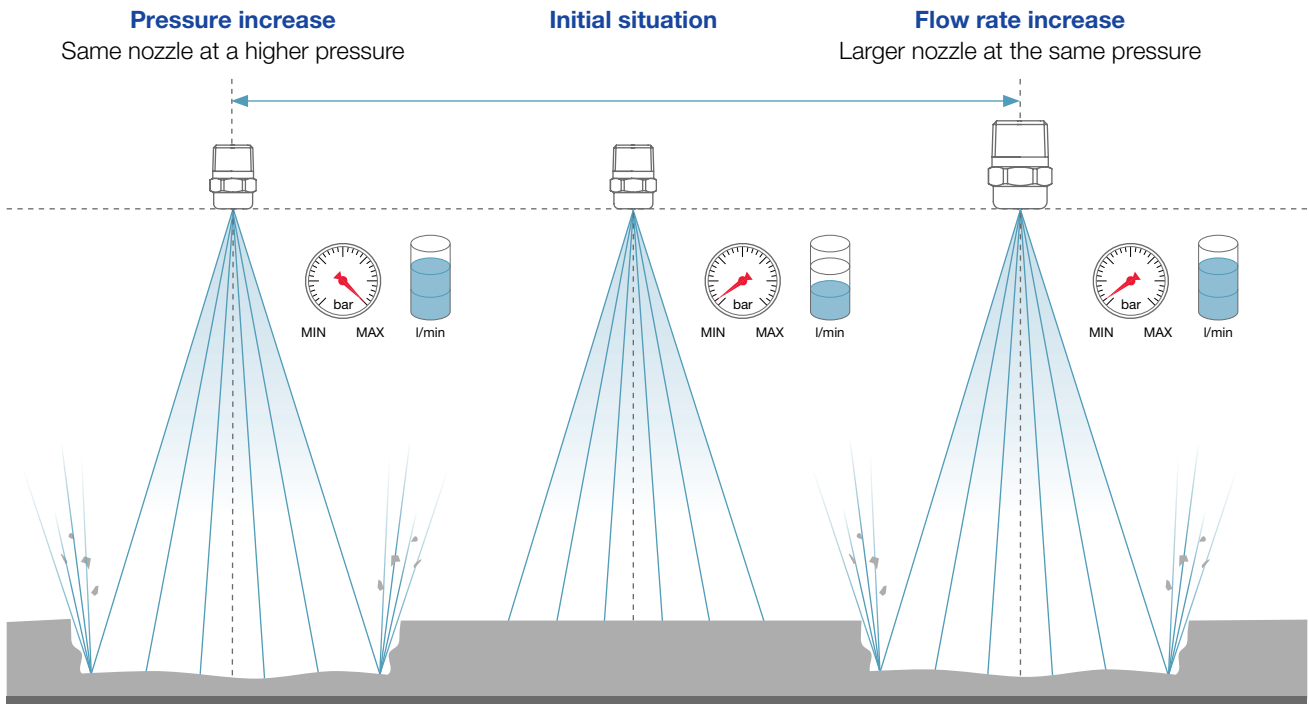
Comparison of the cleaning result of three nozzles at an identical pressure level and flow rate.

- **Pressure**

An increase in the connection pressure leads to an increase in the impact.

- **Flow rate**

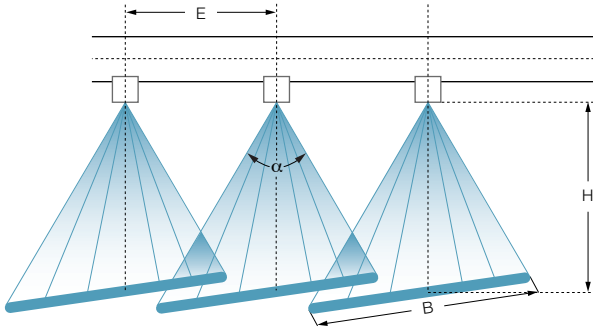
An increase in the flow rate by using a larger nozzle leads to a higher impact with otherwise unchanged parameters (spray angle, pressure and medium).



Comparison of the cleaning result of three nozzles with an increase in the pressure level and flow rate.

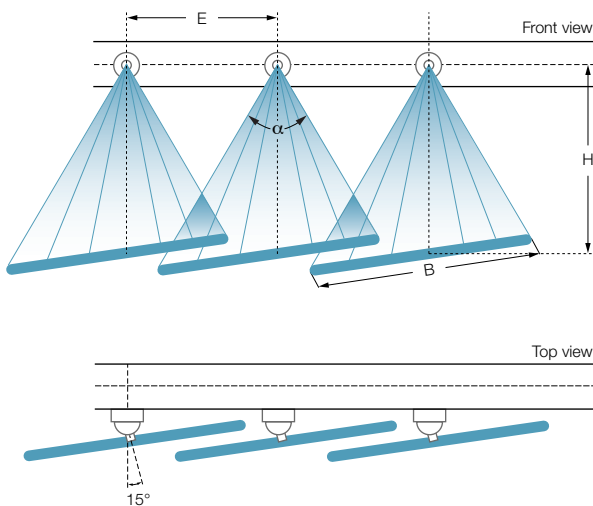


### Arrangement of flat fan nozzles with parabolic liquid distribution



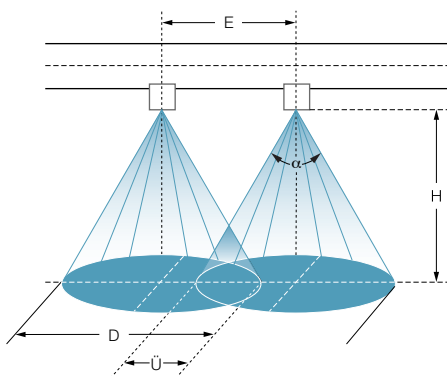
Lechler flat fan nozzles ensure consistent, uniform coverage over the impact surface. For this purpose, the spray widths  $B$  should overlap by approx.  $1/3$  to  $1/4$ . To stop the sprays interfering with each other, the nozzles should be aligned at an angle of approx.  $5-15^\circ$  to the longitudinal axis of the pipe.

### Arrangement of tongue-type nozzles



To achieve uniform impact surface coverage, the tongue-type nozzles must be arranged in such a way that the spray widths  $B$  overlap by  $1/3$  to  $1/4$ . Therefore, the nozzles should be inclined at an angle of  $15^\circ$  to the vertical of the longitudinal axis of the pipe (either with a nipple welded on at an angle or a Lechler ball joint) to prevent interference of the spray.

### Arrangement of full cone nozzles and hollow cone nozzles

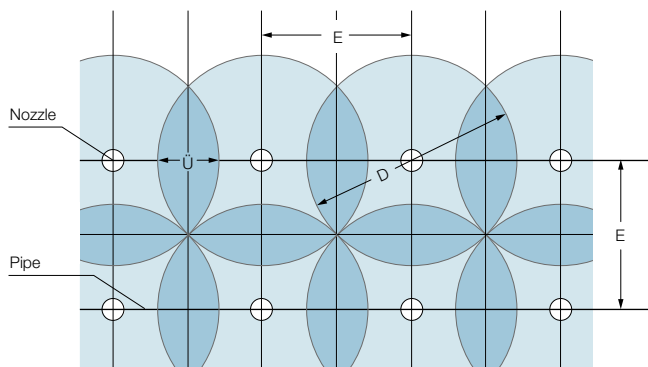


With full cone and hollow cone nozzles, the size of the nozzle distance  $E$  must ensure that the circular impact surfaces overlap by approx.  $1/3$  to  $1/4$ .

$E$  = nozzle distance     $H$  = nozzle installation height     $B$  = spray width     $\alpha$  = spray angle     $\ddot{U}$  = overlapping of the spray angle     $D$  = spray diameter

## Square and offset arrangement of full cone nozzles and hollow cone nozzles

### Square arrangement

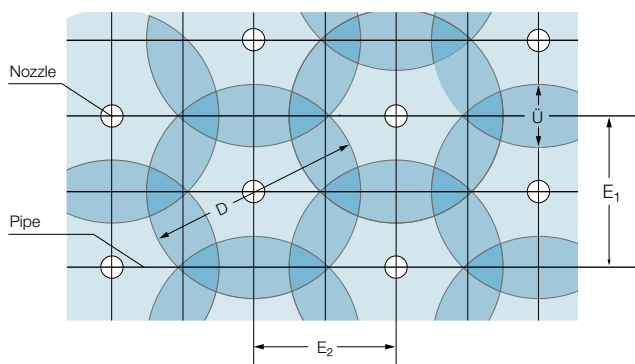


$$\text{Nozzle distance: } E = \frac{D}{\sqrt{2}}$$

$$\text{Overlapping: } \ddot{U} = D - E$$

In addition to these arrangement suggestions, please note the information on the spray angle on Page 264 and request a detailed spray width diagram, if required.

### Offset arrangement



$$\text{Nozzle distance: } E_1 = \frac{D}{2} \cdot \sqrt{3}$$

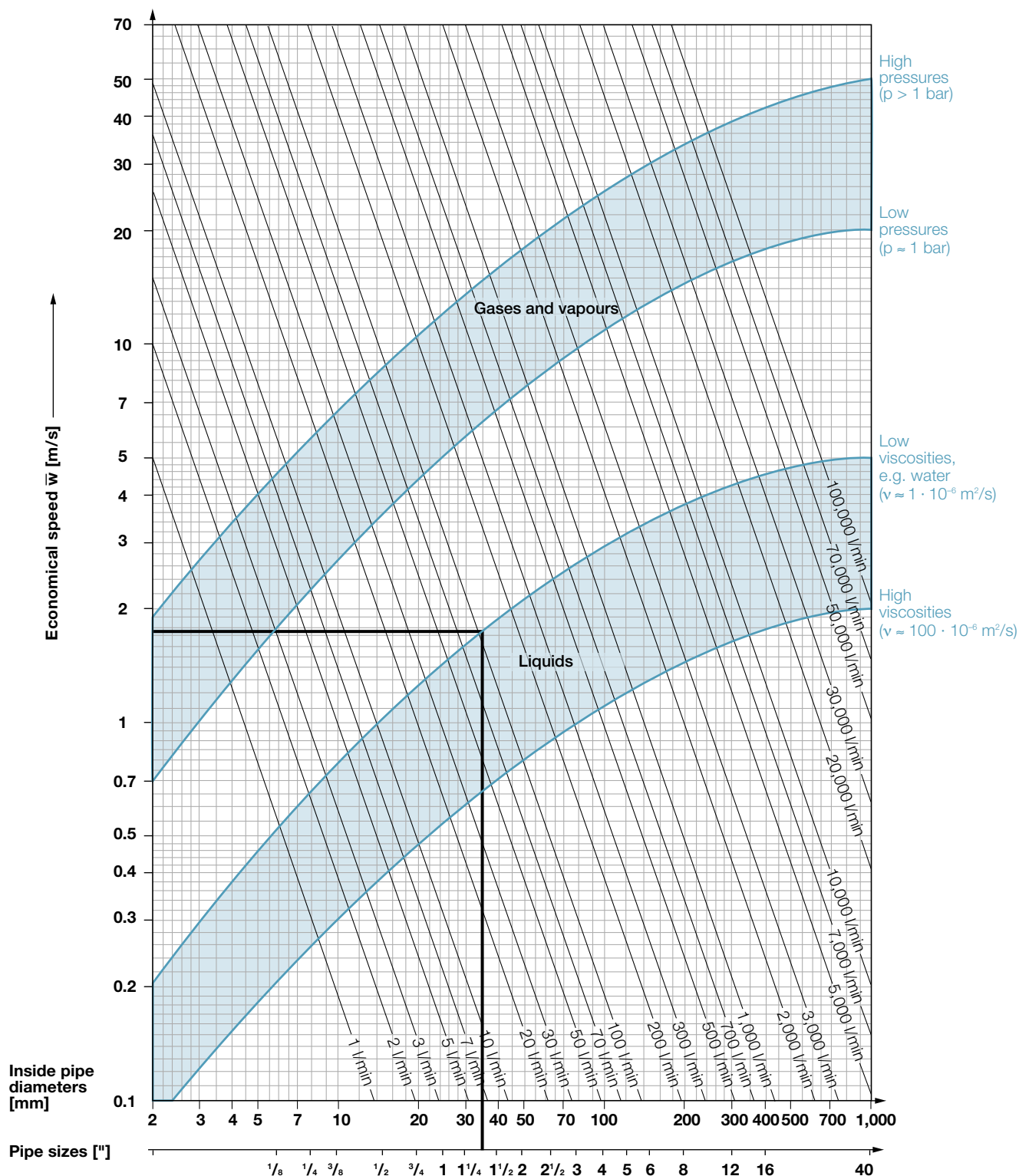
$$\text{Nozzle distance: } E_2 = \frac{3}{4} \cdot D$$

$$\text{Overlapping: } \ddot{U} = D - E_1$$



# PLANNING AIDS

## DETERMINATION OF THE PIPE DIAMETER



The flow rate data in the diagram refers to gases and steam in operating condition.

### Example

You want to atomise 100 litres of water a minute. The viscosity of water is  $\nu \approx 1 \cdot 10^{-6} \text{ m}^2/\text{s}$ . In the diagram above, look for the intersection of the corresponding viscosity curve and the flow rate lines. Using the coordinates of this point, you can discover the correct inner pipe diameter or pipe size and the most efficient speed.



All the flow rate data in this catalogue is based on measurements with water and takes into account the individual flow parameters of the various nozzle designs.

## p pressure

| Unit               | Conversion            |                       |                      |           |
|--------------------|-----------------------|-----------------------|----------------------|-----------|
|                    | bar                   | Pa = N/m <sup>2</sup> | psi                  | lb/sq ft. |
| <b>1 bar</b>       | 1                     | 100,000               | 14.5                 | 2,089     |
| <b>1 Pa</b>        | $1 \cdot 10^{-5}$     | 1                     | $14.5 \cdot 10^{-5}$ | 0.0209    |
| <b>1 psi</b>       | 0.06895               | 6,895                 | 1                    | 144       |
| <b>1 lb/sq ft.</b> | $0.479 \cdot 10^{-3}$ | 47.9                  | $6.94 \cdot 10^{-3}$ | 1         |

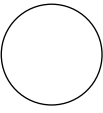
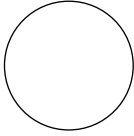
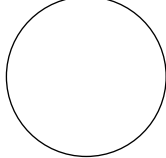
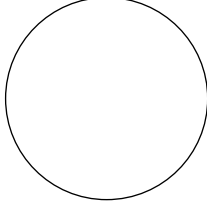
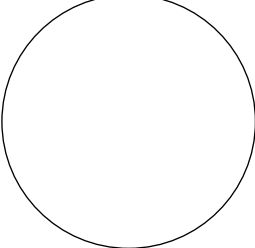
## V volume

| Unit                          | Conversion |                       |          |        |
|-------------------------------|------------|-----------------------|----------|--------|
|                               | l          | m <sup>3</sup>        | Imp. gal | US gal |
| <b>1 l (1 dm<sup>3</sup>)</b> | 1          | $1 \cdot 10^{-3}$     | 0.22     | 0.264  |
| <b>1 m<sup>3</sup></b>        | 1,000      | 1                     | 220      | 264.2  |
| <b>1 Imp. gal</b>             | 4,546      | $4,546 \cdot 10^{-3}$ | 1        | 1,201  |
| <b>1 US gal</b>               | 3,785      | $3,785 \cdot 10^{-3}$ | 0.8327   | 1      |

## V flow rate

| Unit                     | Conversion |       |                   |          |        |
|--------------------------|------------|-------|-------------------|----------|--------|
|                          | l/s        | l/min | m <sup>3</sup> /h | Imp. gal | US gal |
| <b>1 l/s</b>             | 1          | 60    | 3.6               | 15.85    | 13.2   |
| <b>1 l/min</b>           | 0.0167     | 1     | 0.06              | 0.2642   | 0.22   |
| <b>1 m<sup>3</sup>/h</b> | 0.2778     | 16.67 | 1                 | 4.4      | 3.66   |
| <b>1 Imp. gal/min</b>    | 0.0631     | 3.785 | 0.227             | 1        | 0.8327 |
| <b>1 US gal/min</b>      | 0.076      | 4.546 | 0.273             | 1.201    | 1      |

## Determination of the external thread diameter

|                                                            |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                      |                                                                                       |
|------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|                                                            |  |  |  |  |  |  |
| <b>Nominal size of thread ["] for ISO 228 and EN 10226</b> | 1/8                                                                                 | 1/4                                                                                 | 3/8                                                                                 | 1/2                                                                                 | 3/4                                                                                  | 1                                                                                     |

ISO 228 threads are cylindrical and usually require a separate flat gasket or R-ring for sealing.  
EN 10226 threads are conical and can be sealed with sealing tape, etc.



You can find all the latest information about Lechler, our products and services at any time at [www.lechler.com](http://www.lechler.com).

## 3D design data

With the free 3D design data of Lechler nozzles and accessories, we support your design needs at every step.



After registering free of charge, you can download the required data packs in all common CAD formats at <http://lechler.partcommunity.com>.

- Time-saving, direct download of construction drawings and technical data
- Simple product selection similar to the Lechler print catalogue
- Preview function with product photo and 3D graphics
- Available in all common 3D file formats

## Always at hand – the Lechler industry app

The Lechler industry app provides all important calculation and conversion programs combined in one interface:

- Unit calculator for pressure, volume and flow rate
- Pressure/Flow rate calculator for single element nozzles, including axial-flow full cone nozzles
- Determination of the pipe diameter



iOS (Apple)



Android (Google)

Available free of charge in the Apple App Store and the Google Play Store.



We can issue various certificates and attestations for our products. Whether the desired document can be issued for a specific product must be checked in advance. We will be more than happy to inform you of the conditions for the documents upon request.

## **Declaration of Compliance EN 10204 - 2.1**

This declaration of compliance confirms that the products supplied have been manufactured and tested in accordance with the relevant specifications.

## **Test Report EN 10204 - 2.2**

The test report can be issued either with regard to the material (including the non-specific material certificate of the supplier) or with regard to the spray parameters (spray angle and flow rate, without an additional document).

## **Inspection Certificate EN 10204 - 3.1**

The inspection certificate is usually issued with regard to the material. In this case, the parts are manufactured order-related with re-stamping.

However, a specific certificate can also be issued with regard to the flow rate, spray angle, dimensions of nozzles, etc.

## **FDA Declaration of Conformity**

Confirmation that the material used complies with FDA regulations.

## **Declaration of Conformity to regulation (EC) no. 1935/2004 and (EC) no. 10/2011**

Confirmation that the product supplied is suitable for use with foodstuffs and that the material complies with the stated regulations.

## **Supplier's Declaration**

Certificate issued by Lechler confirming that the products have been wholly produced or originate in the European Union. A supplier's declaration can be issued in relation to a specific order (individual supplier's declaration) or as a long-term supplier's declaration that remains valid for two years.

## **Certificate of Origin**

Official confirmation of the origin of a product, certified by the Chamber of Commerce and Industry.



GREAT ATTENTION  
TO DETAIL  
PRECISION BY  
LECHLER



**ENGINEERING  
YOUR SPRAY SOLUTION**



**Lechler GmbH · Precision Nozzles · Nozzle Systems**  
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