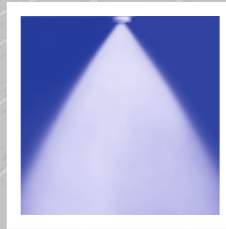
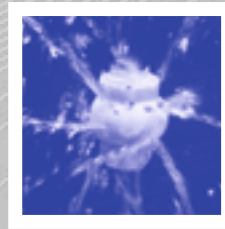
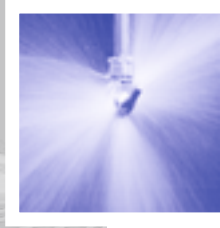
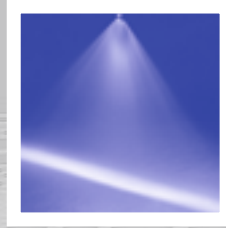
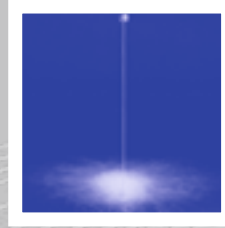
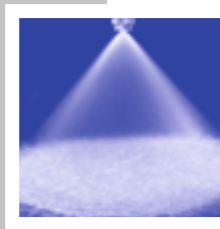
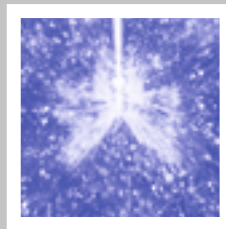


ENGINEERING
YOUR SPRAY SOLUTION



Precision Spray Nozzles and Accessories Edition 112



Spray Nozzles

OUR CORE PRODUCT LINES: BEST VALUE, PRECISION, RELIABILITY, QUICK DELIVERY.

INCREASE YOUR PRODUCTIVITY WITH LECHLER SPRAY TECHNOLOGY

Competition is getting fiercer by the day. Your customers' requests for the highest quality and lowest price force you to use your full potential for rationalization. Lechler spray technology helps you improve your processes and technologies.

For further information on nozzle technology please visit www.lechler.com



What really matters is that you have the competent partner for the job right from the planning stage. We supply the vital measuring data right from the beginning to ensure your process runs smoothly. Even unusual nozzles are part of our core nozzle range, therefore we can offer you a really individual solution.












Opting for an experienced partner like Lechler means that you run no risks: perfect products, unmatched quality, international know-how, straight off our stock shelves. Isn't that an offer? You should profit from this for your own sake.

Our new catalogue is a unique reference book for you that facilitates your daily work. Its clear layout and the wealth of professional information make it a valuable tool for finding a better solution.

There's a lot more information on spray nozzles, spray technologies and applications available for you which is not contained in this catalogue.

The experienced Lechler personnel is always willing to supply you additional information. Please do not hesitate to ask any time.

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TRADITION AND PROGRESS IN SPRAY TECHNOLOGY

The Lechler brand has an excellent reputation among experts worldwide.

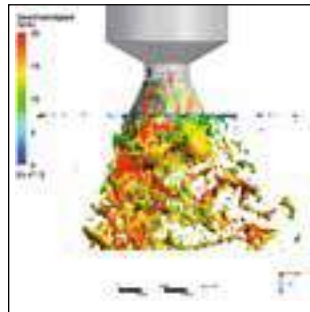
Unrivalled expertise, an interdisciplinary approach and the use of state-of-the-art production methods have led to superb product results in all areas. Today, the Lechler brand is synonymous with innovative spraying technology and applications that enjoy exemplary success.



Research and development for a better future

For more than 140 years Lechler has been searching for new solutions and developed and manufactured spray nozzles for trendsetting applications. Internal and external information systems and international data bases give us the leading edge in R&D.

A comprehensive information system, connection to international databases and collaboration with external institutes supplement our own work in this area and create the broad interdisciplinary basis that is required today for excellent developments.



Ultra-modern techniques for construction and simulation are converted into products of high practical value by our staff of engineers and technicians. Full scale tests simulate real life conditions. Only when all details comply with our requirements, production is released.



Your advantage lies in our productivity

New custom-made manufacturing techniques guarantee productivity and flexibility.



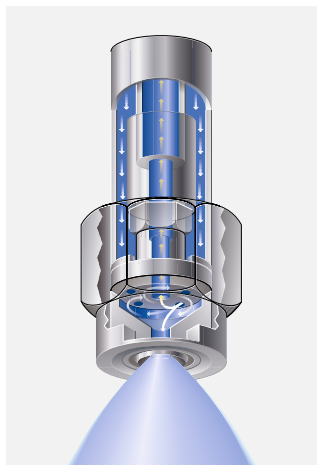
Process automation ensures repeatability and steady properties. For us, this means that not only one nozzle looks like the other, but that spray patterns are identical, too. This applies to 25,000 different variants, materials and sizes.

Lechler is one of the most important spray nozzle manufacturers worldwide. High production quantities allow us more easily to amortize costly research and development and machinery. That's why even a complicated nozzle can be offered at a reasonable price. At the known Lechler quality!

A few words on quality

Lechler products are used in many different industries and applications.

Therefore, the requirements of the products have to meet certain specifications. Lechler define "quality" as the ability of our products to surpass the customers individual requirements for performance.



Lechler is certified by ISO 9001:2008. Lechler staff have always worked carefully and carried out permanent quality control from material reception through manufacturing to shipment.

Our products will keep in daily service what we are promising here and now.

What can be measured, can be documented

Already a long time before its daily use, we know the exact flow rate, spray angle and uniformity of distribution of each Lechler nozzle.



Right from the beginning, functions and spray characteristics are accurately defined and recorded by our sophisticated measuring techniques and reliable documentation.

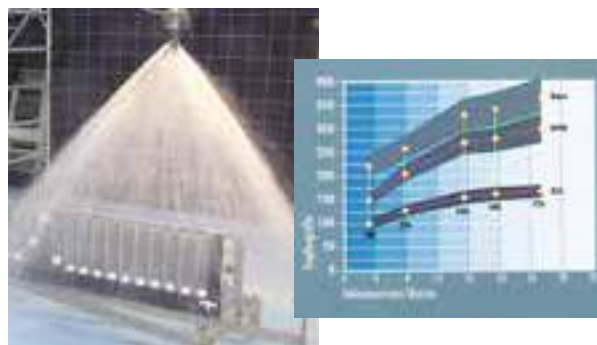


Our computer-controlled measuring facilities such as the Laser-Doppler Particle Analyzer, the spray jet measuring device with 3D presentation, liquid distribution systems, and many more are the essential prerequisite for precise measuring data.

We offer reliability

Our computer-controlled inventory ensures rapid delivery of your nozzles. Stock items ordered before 2 p.m. will leave our factory the same day. Yet, our real service starts much earlier: technical advice on spray applications and assistance by our experienced Lechler sales representatives.

Actually, there is always a Lechler sales office or representation close by, wherever you are in this world. And it goes without saying that there is always a competent technical advisor in our head-quarters who is pleased to help you even a long time after the sale. You can rely on our word.



Thanks to this data we can help solve your spraying problem.

PERFECT NOZZLE TECHNOLOGY TO SOLVE MANY INDUSTRIAL TASKS

In many industries there is a number of tasks that can be economically accomplished with the aid of spraying techniques.

However, optimum effects only can be achieved when a spray nozzle manufacturer's wide knowledge of specific requirements and particular service conditions is taken into account, too – right from the project stage. Where this is not the case, a job may quickly end up in a costly experiment for the user.

Lechler, aware of this risk, has put up special teams for the various fields of applications. These teams are joined by external consultants for various industries. In addition, there is the know-how Lechler has accumulated over many years of direct activity in all industries. These synergies are also useful for other, new spray applications. That's why our spray nozzle specialists are often asked to participate as competent consultants in the first planning phases.

As a result, solutions are found that are technically perfect as well as economically sound.

This catalogue contains a wide selection of nozzles that can be used in many different areas of industry. Where special information is useful for special applications, we would be happy to send you our trade brochures.



Surface treatment

- Degreasing
- Phosphating
- Spray painting
- Galvanizing
- Cleaning
- etc.



Paper industry

- Foam suppression
- Jet cutting
- Humidification
- Cleaning
- etc.



Electronic industry

- Circuit board cleaning
- Spray etching
- Coating
- etc.



Chemical and pharmaceutical industry

- Cleaning
- Humidification
- Coating
- Mixing
- Disinfection
- Atomization of viscous liquids
- etc.



Food and beverage industry

- Cleaning
- Pasteurisation
- Conveyor belt lubrication
- Disinfection
- Humidification
- Cooling
- etc.



Automotive industry

- Degreasing
- Cleaning
- Preservation
- Coating
- Cooling
- Lubricating
- Drying
- etc.



Fire protection

- Tank cooling
- Spraying aboard ships
- Water curtains
- Shavings hopper etc.



Machine tools

- Cooling
- Lubricating
- Cleaning
- Blowing off etc.



You can use the order form in chapter 10 to request specific, special information on nozzles and their areas of use that are not covered in this catalogue.

SPECIAL TASKS REQUIRE SPECIAL SOLUTIONS

Very individual demands are placed on nozzle technology in the metallurgical industry, environmental engineering and agriculture. That's why Lechler maintains specialist teams who have the specific expertise in these areas. We have compiled product information in separate brochures for these specialist areas, which can be requested by using the form at the end of this catalogue.

A photograph of an industrial facility, likely a steel mill, with large structures and pipes, overlaid with a semi-transparent orange filter.

Metallurgy

A photograph of a bright blue sky with scattered white clouds, overlaid with a semi-transparent light blue filter.

Environmental Technology

A photograph of a lush green field with a dirt path leading through it, overlaid with a semi-transparent light green filter.

Agriculture

A whole range of specially developed and proven nozzles in different versions and materials is available to meet the special requirements of this specialist area. Descaling, secondary cooling in continuous casting systems and roll cooling are just a few of the many different applications. Nozzles and nozzle systems play a crucial role in all production stages in terms of process optimization aimed at increasing quality and perfecting production.

A wide range of standard nozzles is supplemented by the possibilities that are available for individual special solutions. At the same time, customers have at their disposal a competent team of experienced specialists employing state-of-the-art design and production methods.

Flue gas desulfurization, gas treatment and droplet separation are important areas of work in energy and environmental technology in which Lechler nozzles, systems and droplet separators are used. Internationally, our wide-ranging expert knowledge and experience has made Lechler a competent partner in this sector.

Leading system manufacturers and operators all over the world have opted to become Lechler partners because they have been impressed by our innovative strength, our high level of competence in solving problems and our global organization.

Find out about the possibilities for collaboration, and how you can profit from our expert knowledge.

All over the world, Lechler agricultural nozzles and accessories are synonymous with efficiency and economy, while also taking account of environmental aspects. Lechler has taken a leading role in drift reducing technology in particular. Lechler nozzles ensure that the pesticide lands on the plant exactly where it's needed. This makes a decisive contribution towards optimizing the use of pesticides and protecting the environment.

A comprehensive range of nozzle accessories and some useful tools help the farmer to optimize the application technology and thereby increase his earnings.

WHICH (SPRAY) CHARACTER GOES WITH YOU?

Spray technology has its own rules

When a liquid flow is made to disintegrate into more or less fine droplets, this is called atomization. The necessary prerequisites are mainly reached by the following principles of atomization:

Single-fluid atomization

By narrowing the cross-sections of passage within a nozzle, flow speed increases. Static energy is transformed into kinetic energy (speed). When tension is released at the nozzle orifice, a laminar liquid flow with aerodynamic waves is produced, causing the liquid flow to disintegrate into droplets of different sizes.

Pneumatic atomization

The different flow speeds of gas and liquid generate pressure waves, breaking up the liquid into extremely fine drop particles. The different relative speeds allow atomizing e.g. of viscous liquids at low pressure. Pneumatic atomizers operate both according to internal and external mixing principles, whereby gas and liquid mix inside or outside the nozzle. Depending on the nozzle design, liquid is either supplied by siphon action or by gravity. According to the configuration of the nozzle tip, different spray patterns may be obtained.



Pneumatic atomizing nozzles

Pneumatic flat fan atomizing nozzles

produce a flat spray pattern with extremely fine droplets and spray angles up to 80°. These nozzles are particularly suited for applications requiring fine droplets and a wide linear impact.

Pneumatic full cone atomizing nozzles,

however, are preferably used for applications demanding uniform circular impact patterns or larger spray distances. Generally, a narrow full cone with approx. 20°–30° is formed. Wider spray angles can be achieved by using special multi-orifice designs.



Hollow cone spray

Axial-flow hollow cone nozzles

The liquid supply is axial, rotary motion of the liquid is generated by so-called swirl inserts or vanes. Axial-flow hollow cone nozzles allow to produce the finest droplets achievable with pressure-operated nozzle designs. This is also called hydraulic atomization.

Eccentric-flow hollow cone nozzles

The liquid supply, which is tangentially positioned to the mixing chamber, causes the liquid to rotate. A liquid layer forms around the inside walls of the nozzle which influences heavily the drop size.

A rotary motion of the liquid flow is transformed at the nozzle orifice into axial and tangential speeds. A circular liquid screen is formed which disintegrates into fine droplets soon after leaving the nozzle orifice. This nozzle design has wide free cross-sections making it highly clog-proof.



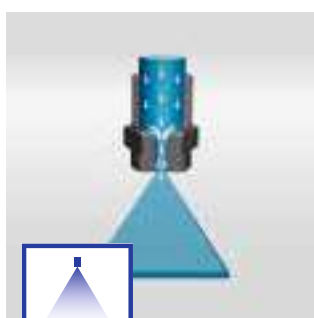
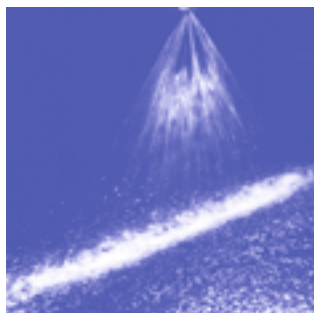
Full cone spray

Axial-flow full cone nozzles

achieve a uniform liquid distribution over a circular area. A rotary motion of the liquid is achieved with the aid of swirl inserts inside the free cross-section of the nozzle. Spray formation, liquid distribution, and shaping of droplets are influenced by the dimensioning and functional coordination of the rotary motions and the swirl chamber. Turbulent flows with different axial and tangential speed components lead to overall coarser droplets than with a comparable hollow-cone nozzle.

Tangential-flow full cone nozzles

are free from swirl inserts. Therefore, they are not at all prone to clogging. The full cone spray pattern is produced by grooves milled into the bottom of the nozzle which provide a defined deviation of the liquid flow to the mixing chamber's center, whereby an extremely uniform area distribution of the atomized liquid is obtained.



Flat fan spray

The spray pattern of **flat fan nozzles** features a sharply delimited line due to internal flow characteristics. The coverage width can be varied by modifying the geometric configuration of the nozzle orifices, where the liquid is shaped into flat, fan-like spray patterns. The flat liquid body takes on a laminar form and disintegrates into droplets as its distance from the nozzle orifice increases. Parabolic, trapezoidal or rectangular impact areas are achieved by adequately determining the functional and geometric dimensions.

Tongue-type nozzles are of a special kind.

The flat fan pattern is generated by a solid stream, impinging upon an external deflector plate (»the tongue«). Tongue-type nozzles are particularly clog-proof and produce a sharply delimited flat fan pattern.



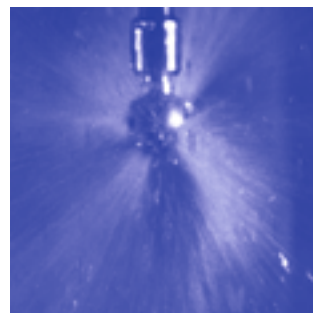
Solid stream

The smooth solid stream is also known as the so-called "primary jet". Actually, the solid stream nozzle is not supposed to produce an atomized spray pattern, because it has been designed for maximum jet power. Here, the skill of Lechler design engineers was challenged to prevent concentrated, straight jets from disintegrating into drops at large distances.



Air nozzles

Air nozzles are used for dispersing air or steam in a concentrated and straight fan. Generally, air nozzles have a flat fan or solid stream spray pattern. When using conventional air nozzles, air is blown through a single hole. Often a loud, ear-splitting and hissing noise is produced. To avoid this unpleasant noise, Lechler has designed special **multi-channel air nozzles**. Sound level and air consumption of these nozzles are very low.



Tank cleaning nozzles

Tank cleaning nozzles can be used for both small and large tanks and are available as both rotating and static sprays. The **rotating nozzles** (rotational cleaners) are driven by the cleaning liquid by means of specially positioned nozzles or by turbine or internal gears. Rotational cleaners achieve very good cleaning of the entire tank surface as rapid-repetition impact loosens the dirt and washes it off of the inside tank surfaces.

Static spray balls do not rotate. They are used primarily for washing down relatively small tanks and vessels. All tank cleaning nozzles are operating at low pressures.

NOZZLE PERFORMANCE AND SERVICE DATA

The essential operating data of spray nozzles is

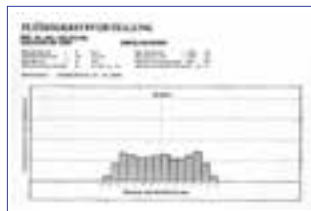
- Flow rate
- Spray angle
- Liquid distribution
- Spray impact
- Droplet size and droplet spectrum

Flow rate, pressure and spray angle

Flow rates and spray angles are dependent on feed pressure and viscosity of the liquid to be sprayed. We have measured the flow rates stated in the catalogue with painstaking accuracy, using inductive flow meters. The spray angle is determined right at the nozzle's orifice. The indications given on spray widths and coverage diameters are more useful at larger distances from the orifice. Air friction losses and ballistic phenomena influence the spray behavior and the size of the impact area in dependence on the chosen service pressure. The pressure (p) is the feed pressure above atmospheric, which is available at the liquid inlet into the nozzle. The spraying operation is performed under counterpressure, the flow rate is dependent on the differential pressure. Minimum and maximum pressures are adjusted to the required flow rates and the spray quality.

Distribution of liquid

A uniform distribution of liquid is of paramount importance, e.g. for coating. We have developed special measuring methods which instantaneously deliver test results that are repeatable any time. Thanks to our electronic image processing measurement accuracy is approx. +/- 1%. The test results are documented and made available to customers for design and construction tasks.



Thus they'll be sure in advance that Lechler spray nozzles exactly comply with their requirements.

Spray impact

For measuring the jet distribution of the spray impact and the impact itself a highly sensitive device is guided through the jet pattern. The measuring values detected by the sensor are transformed into electric signals and stored in a computer. Jet impact measurements show how uniformly the jet impact is acting on the impacted area. This data is very useful, in particular for high pressure applications where a maximum of pump energy has to be transformed into cleaning power.

Jet pressure (impact)

In the case of nozzles, the jet pressure (i.e. the effect of a spray jet on a surface) is normally referred to as the impact and is expressed in N/mm². This is the conversion of the jet force on the impacted surface. In the jet pressure measurement, a highly sensitive sensor with a defined surface area is guided through the spray jet. The spray jet exerts a constantly changing force on the sensor, which is saved in the computer. The jet pressure can be determined from the force measured at the respective location and the surface of the sensor.



Jet pressure distribution measurements show the regularity of the jet force curve on the impacted surface. In high pressure applications in particular, this data is of great practical use because it relates to the maximum conversion of pump energy into cleaning effect.

Low jet pressures are obtained by using full-taper or wide-angle flat jet nozzles (120°).

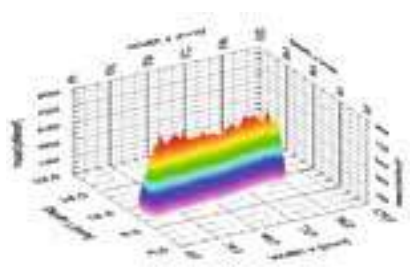
High jet pressures are produced by flat jet nozzles with narrower jet angles (15° to 60°). Full-jet nozzles produce **maximum jet pressures**.

Droplet sizes and droplet spectrum

For many areas of use, it is necessary to know the size of the droplet spectrum produced by the nozzle.



One of the most precise measuring devices for this is the laser doppler particle analyser. Since this measuring method simultaneously measures both droplet size and droplet velocities, we obtain a complete description of the atomization characteristic.



YOUR REQUIREMENTS DEFINE THE NOZZLE MATERIAL

Since the atomized liquid does not dissipate into droplets of a uniform size, we document the droplet size distribution by stating the **Sauter mean diameter d_{32}** . This shows the relationship between the total surface area of all droplets and the volume enclosed by it. This enables conclusions to be readily drawn about the expected reaction behaviour of a spray.

This makes this key indicator very important in process technology in particular. Other droplet size definitions can also be derived from the measured values, e.g. the arithmetical mean d_{10} , the mean volume diameter MVD, the logarithmic standard deviation LS and other variables. These must be known for a complete description of a measured droplet spectrum.

All operating data of nozzles have been measured with water.

There are more than 100 materials for you to choose from.

Brass nozzles, now as before, are commonly used for many applications, such as low pressure and humidification processes. We commonly use brass grade C38500. It is necessary to use chemically resistant stainless steel grades, hastelloy, titanium, tantalum, as well as plastic materials, such as PVC, PP, PVDF and TEFLON for spraying corrosive liquids or for the use in aggressive environments. If materials that are highly resistant to wear are required, quality nozzles in hardened stainless steel, oxide ceramics or silicon carbide are available.

Many nozzles of our range are available in high-grade thermoplastics. These nozzles are produced by injection moulding on process-controlled machines.

Service life

Material	Factor
Brass	1
Stainless steel	4-6
Hardened SS	10-15
Carbide	30-40
Ceramics	90-200

The service life of nozzles is dependent on various circumstances such as spray applications, service conditions, the quality of the liquid to be sprayed – to quote just a few. According to the material used, service life of nozzles can considerably differ.

This short survey is just to give you an idea on service life of some metallic and ceramic nozzle materials commonly used. Depending on service conditions, plastic materials have very different service lives. Hence, a classification is hardly possible.



Brass



Stainless steel



Plastic material



Silicon carbide

ACCESSORIES MAKE YOU BENEFIT FROM OUR KNOW-HOW, TOO

Our comprehensive range of accessories significantly contributes to optimizing the adaptability of Lechler nozzles to special requirements and prerequisites.

No matter whether you want to change nozzles easily, to provide sealing or just to have an alternative fixing facility, you'll profit in every respect from Lechler's technical know-how and practical experience with accessories. As a result, your work is made easier, your capacity is better utilized and you'll be saving cost to an extent you wouldn't have thought possible. As you see, it's worthwhile spending a few thoughts on the subject.

Now a short survey on the various Lechler fixing system:

Standard fixing accessories
The great variety of mounting clamps, bases, ball joints etc., available in a multitude of designs, models, sizes and materials, allow accurate matching of nozzles and fixing accessories to meet your spray applications, your liquid and its properties.

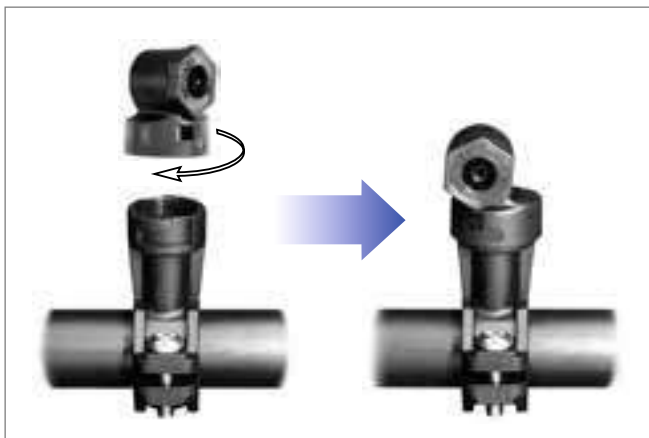
Special accessories for flat fan nozzles with dove-tail guide
(positive guide) provide a perfect presetting of the spray alignment and a quick nozzle change.

TWISTLOC and Bayonet - Assembly systems for changing nozzles in less than no time
The Lechler invention for quick nozzle change without any tool. Additionally, a correct spray alignment is always guaranteed.

Nozzle filters and strainers to prevent clogging
The advantages: Steady spray quality, cost reduction because of less maintenance, and, above all, a better quality of your finished products.

Professional sealing material
Lechler offers special proven sealing materials to stop unnecessary sprinkling or dripping: gaskets, Teflon sealing tapes, Teflon glue and a lot more.

For your daily work with the Lechler catalogue, all fixing possibilities are clearly listed in the folded page at the end of the catalogue. You'll find the complete accessory range, detailed descriptions and full technical data under the heading »Accessories«.



Bayonet quick-release system

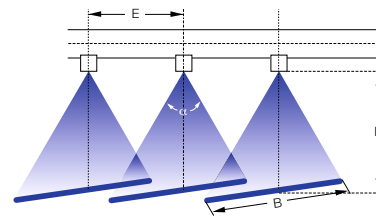


Dove-tail guide

EXAMPLES FOR NOZZLE ARRANGEMENT

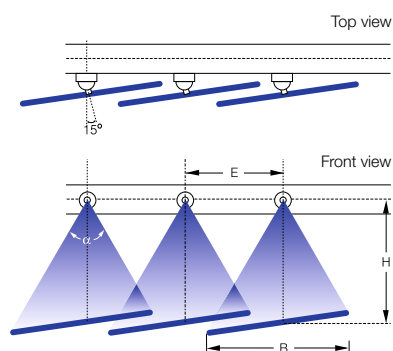
Arrangement of flat fan nozzles with parabolic liquid distribution

Lechler flat fan nozzles provide a consistent, uniform coverage over the impact area. For this purpose, the spray widths B ought to overlap each other by $1/3$ to $1/4$. To avoid interferences of the sprays, the nozzle orifices must be offset 5° - 15° to the pipe axis.



Alignment of tongue-type nozzles

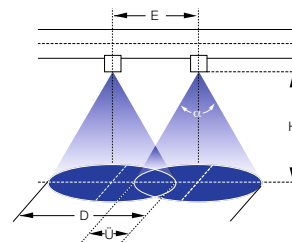
In order to achieve an even surface coverage the nozzles need to be aligned in such a way that spray widths B overlap by $1/3$ to $1/4$. Therefore the nozzles should be inclined in an angle of 15° to the vertical of the horizontal axis of the tube (either with a weld base at an angle or a Lechler ball joint nozzle mount) in order to prevent a disturbance of the spray.



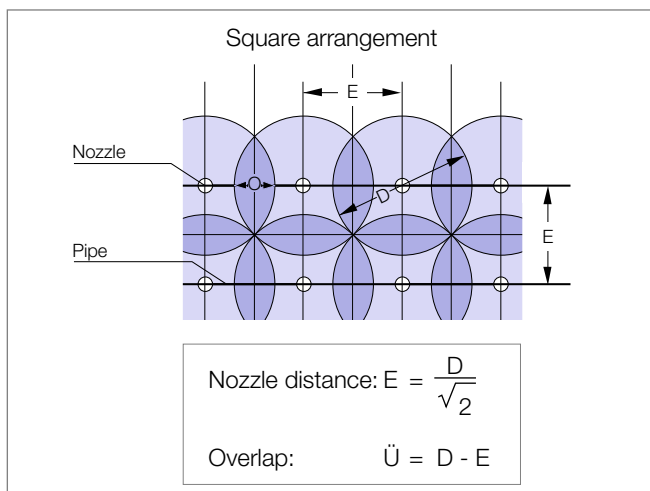
Arrangement of full cone and hollow cone nozzles

For full cone and hollow cone nozzles, the distance E should be sized so that the spray cones overlap by about $1/3$ to $1/4$.

- O = Overlap of spray angles
- D = Spray diameter
- E = Nozzle distance
- H = Installation distance of nozzles
- α = Spray angle

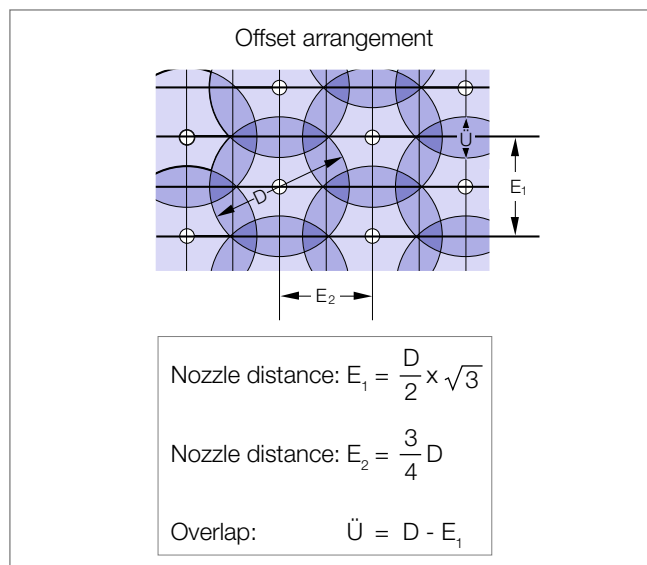


Square or offset arrangement of full cone or hollow cone nozzles



The spray angles stated in this catalogue are based on a specific design pressure.

Different pressures and production tolerances lead to differing spray angles. Please consider our adjustment proposals on this page and ask us for a detailed spray width diagram if needed.



TECHNICAL INFORMATION

Here you will find explanations of the special terms and abbreviations used in the tables on the following pages.

Droplet sizes

The droplet size information refers to the Sauter mean diameter d_{32} . This is defined as the droplet diameter measured on the basis of surface area. The volume/surface area ratio of a droplet of this diameter is the same as for the sum of all droplets in the spray jet.

Lechler nozzles are manufactured with the highest precision and undergo permanent quality checks. Nevertheless, production-related tolerances can affect the jet angle, volume flow, droplet size and droplet distribution.

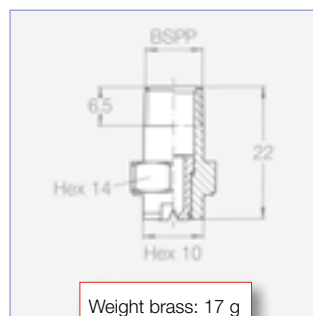
A (equivalent bore diameter)
Applies to elliptical discharge holes of flat fan nozzles. A cylindrical hole with a diameter A has the same surface area as the ellipse.

E (narrowest free cross section of the nozzle)
Important characteristic for determining the pre-filtration. Can be less than A due to several swirl ducts. (Nozzle filter see page 9.8)

V̇ (flow rate)
All 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.

B (spray width)
The spray sizes can deviate at reference pressures different to those listed in the tables.

Spray angle α	Part	Material	Code	A \varnothing (mm)	E \varnothing (mm)	V̇ (l/min)					Spray width B at p = 2 bar	
						p (bar)						
30°	832 301	St	OK	0.75	0.65	0.16	0.27	0.38	0.51	0.64	80	150
	832 301	St	EA	1.00	0.85	0.21	0.34	0.46	0.60	0.74	70	130
	832 441	St	EA	1.00	0.85	0.07	0.11	0.15	0.20	0.25	70	140
	832 441	St	EA	1.00	0.85	0.07	0.11	0.15	0.20	0.25	70	140
35°	832 302	St	OK	0.75	0.65	0.16	0.27	0.38	0.51	0.64	70	130
	832 362	St	EA	1.00	0.85	0.07	0.11	0.15	0.20	0.25	70	130
	832 402	St	EA	1.00	0.85	0.07	0.11	0.15	0.20	0.25	70	130
	832 432	St	EA	1.00	0.85	0.07	0.11	0.15	0.20	0.25	70	130



Weight brass: 17 g

Weight
All weight information refers to brass, unless otherwise stated. See page 18 for conversion factors for other materials.

Spray angle α	Part	Material	Code	B \varnothing (mm)	V̇ (l/min)					Spray width B at p = 2 bar		
					p (bar)							
110°	834 800	St	OK	0.75	0.65	0.16	0.27	0.38	0.51	0.64	80	150
	834 800	St	EA	1.00	0.85	0.21	0.34	0.46	0.60	0.74	70	130
	834 800	St	EA	1.00	0.85	0.07	0.11	0.15	0.20	0.25	70	140
	834 800	St	EA	1.00	0.85	0.07	0.11	0.15	0.20	0.25	70	140

B (bore diameter)
This is usually definitive for the flow rate.

p (liquid pressure)
Pressure p is the differential pressure to the nozzle surrounding. If you require a liquid pressure stage not given in the tables, you can calculate the flow rate with the formula at the bottom of the respective table page.

CONVERSION TABLES

Droplet sizes

- 0.5 mm
- 1 mm
- 5 mm

1 mm = 1000 μm

The volume of a large droplet corresponds to the volume of 8 droplets of half the diameter. The surface of the large droplet is four times as big as the one of a small droplet. The total surface of the 8 small droplets, however, is twice as big as the surface of a large droplet.

Droplet size range according to nozzle type (Sauter diameter d_{32})

Single fluid nozzles	Liquid Pressure [bar]					
	1		2		5	
	Flow rate \dot{V} [l/min]	Droplet size [μm]	Flow rate \dot{V} [l/min]	Droplet size [μm]	Flow rate \dot{V} [l/min]	Droplet size [μm]
Axial-flow hollow cone nozzle	-	-	0.1 1	140 240	0.17 1.6	100 180
Tangential-flow hollow cone nozzle	- 1.8	- 700	1 25	320 640	1.44 36	240 490
Full cone nozzle	0.8 19	540 1,300	1 25	400 1,100	1.4 36	300 750
Cluster head nozzle	0.9 20	200 400	1.25 28	175 265	2 44	150 190
Flat fan nozzle	0.7 18	400 1,200	1 25	360 1,000	1.6 40	300 690

Pneumatic atomizing nozzles	Air-/water ratio [m³/h : l/min]					
	5		10		20	
	Flow rate \dot{V} [l/min]	Droplet size [μm]	Flow rate \dot{V} [l/min]	Droplet size [μm]	Flow rate \dot{V} [l/min]	Droplet size [μm]
others	others	90	others	55	others	40

p Pressure

Unit	Conversion			
	bar	Pascal [Pa] = N/m²	psi	lb/sq ft
1 bar	1	100,000	14.5	2,089
1 Pascal [Pa]	1·10 ⁻⁵	1	14.5·10 ⁻⁵	0.0209
1 psi	0.06895	6,895	1	144
1lb/sq ft	0.479·10 ⁻³	47.9	6.94·10 ⁻³	1

V Volume

Unit	Conversion			
	l	m³	Imp. gal	US gal
1 l (1 dm³)	1	1·10 ⁻³	0.22	0.264
1 m³	1,000	1	220	264.2
1 Imp. gallon	4.546	4.546·10 ⁻³	1	1.201
1 US gallon	3.785	3.785·10 ⁻³	0.8327	1

\dot{V} Flow rate

Unit	Conversion				
	l/min	l/s	m³/h	US gal/min	Imp. gal/min
1 l/s	60	1	3.6	15.85	13.20
1 l/min	1	0.01667	0.06	0.2642	0.22
1 m³/h	16.67	0.28	1	4.40	3.66
1 US gal./min	3.785	0.0631	0.227	1	0.8327
1 Imp. gal./min	4.546	0.076	0.273	1.201	1

All flow rate data of the catalogue have been measured with water and consider the individual flow parameters of the nozzle designs.

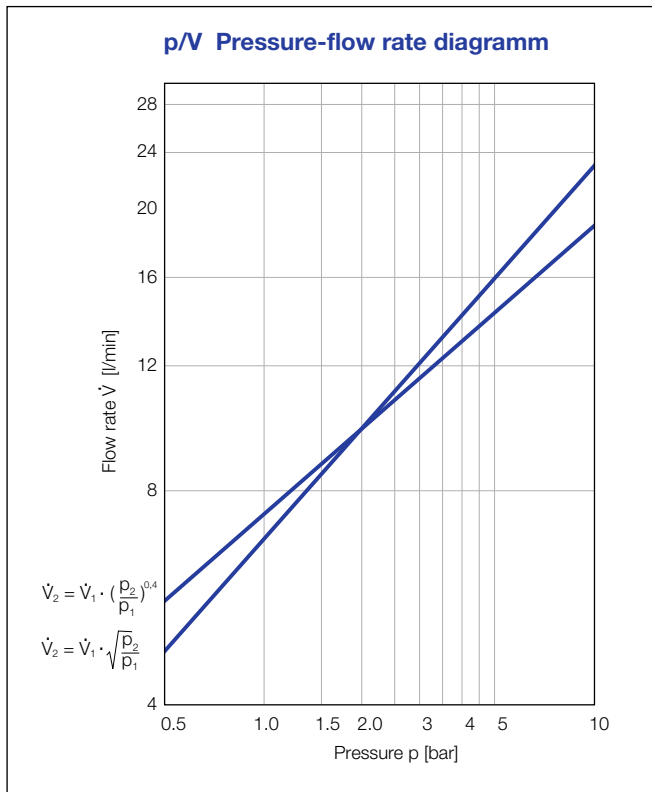
ρ Change in specific weight

$\dot{V}_w = \frac{\dot{V}_{F1}}{X}$	$\dot{V}_w =$ Flow rate (water) [l/min, l/h]
$\dot{V}_{F1} = \dot{V}_w \sqrt{\frac{\rho_w}{\rho_{F1}}} = \dot{V}_w \cdot X$	$\dot{V}_{F1} =$ Flow rate of liquid, with a specific weight that differs from 1
$X = \sqrt{\frac{\rho_w}{\rho_{F1}}}$	X = Multiplier $\rho =$ Specific weight [kg/m³]
ρ_{F1}	500 600 700 800 900 1,000 1,100 1,200
X	1.41 1.29 1.20 1.12 1.06 1.0 0.95 0.91
ρ_{F1}	1,300 1,400 1,500 1,600 1,700 1,800 1,900 2,000
X	0.88 0.85 0.82 0.79 0.77 0.75 0.73 0.71

p/\dot{V} Pressure/Flow rate

Valid for single-fluid nozzles , except axial-flow full cone nozzles	$\dot{V}_2 = \sqrt{\frac{p_2}{p_1}} \cdot \dot{V}_1$ [l/min]	Ratio of both, given and required pressure – flow rate values
	$p_2 = \left(\frac{\dot{V}_2}{\dot{V}_1}\right)^2 \cdot p_1$ [bar]	
Valid for axial-flow full cone nozzles	$\dot{V}_2 = \left(\frac{p_2}{p_1}\right)^{0.4} \cdot \dot{V}_1$ [l/min]	
	$p_2 = \left(\frac{\dot{V}_2}{\dot{V}_1}\right)^{2.5} \cdot p_1$ [bar]	

WORKING AIDS



Conversion factors for determining the weight of various materials

Material	Factor
Brass	1.00
Stainless steel	0.95
Plastics (PVDF)	0.21
Aluminium	0.33
Silicon carbide	0.39
Titanium	0.54
Cast iron	0.89

As a rule, the weight indications in this catalogue refer to brass. By applying the conversion factors stated, the approximate weight of nozzles in other materials can easily be calculated.

For further information on nozzle technology please visit www.lechler.com

Determination of male thread sizes/diameters

R"	1/8	1/4	3/8	1/2	3/4	1
A Ø mm	10.2	13.5	17.2	21.3	26.9	33.7
DN	6	8	10	14	20	25



NEW



Android (Google)



iOS (Apple)

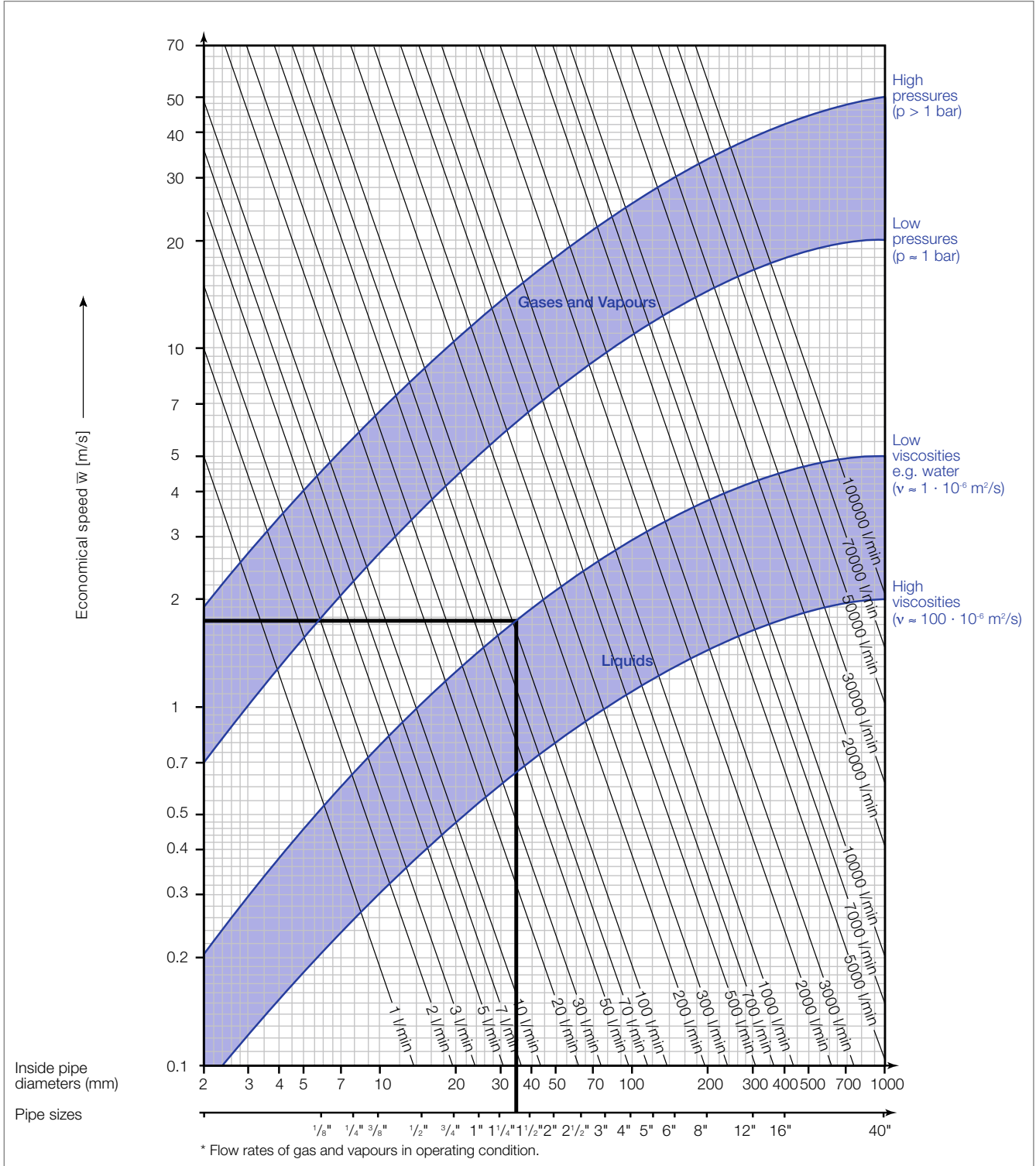
Online nozzle calculator

Lechler Industry App:

all important calculation and conversion programs for nozzle technology combined in one App.

- Unit converter for pressure, volume and flow rate
- Pressure/flow rate calculator for single-fluid nozzles incl. axial-flow full cone nozzles
- Calculation of pipe diameters

DETERMINATION OF PIPE DIAMETERS



Example: You want to spray a total of 100 l water per minute. Water has a viscosity of $\nu \approx 1 \cdot 10^{-6} \text{ m}^2/\text{s}$. So in your diagram please look for the intersection of the corresponding viscosity curve and the flow rate line. From the coordinates of this point, you gather the correct pipe inside diameter or pipe size, and the economical flow speed.

ENGINEERING
YOUR SPRAY SOLUTION



Pneumatic
atomizing
nozzles

Pneumatic nozzles

- Atomization of viscous liquids
- Cooling
- Gas cooling
- Humidification of air
- Humidification of goods
- Lubrication
- Web dampening
- and many others...

The background features a technical drawing of a pneumatic nozzle with various dimensions: 39,6 mm, 62 mm, ca. 90 mm, M8x0,75, 46 mm, and 0,2 mm. A spray pattern is shown emerging from the nozzle tip. The text 'Pneumatic nozzles' is overlaid in a large, bold, blue font. Below the title, a list of applications is provided. The drawing also includes a cross-section of the nozzle body with a diameter of 42 mm and a length of 12 mm.



Pneumatic atomizing nozzles

Pneumatic atomizing nozzles are available in various designs to comply with specific spray and flow requirements:

- self-aspiration (siphon principle)
- supply of liquid from a vessel located at a higher level (gravity principle)
- supply of liquid under pressure (pressure principle)
- mixing of fluids inside or outside the nozzle
- full cone or flat fan spray pattern

Criteria for selecting pneumatic atomizing nozzles

1. Spray pattern

Pneumatic flat fan atomizing nozzles should be chosen for humidifying and cooling of goods, for web dampening and for a number of painting tasks; in short, wherever a broad linear impact is required. **Pneumatic full cone atomizing nozzles**, however, should be used, when a compact, circular impact or a major reach is required, e.g. for direct air humidifying, for gas cooling or for chemical process applications.

2. Mode of liquid supply

Whenever liquid can be supplied under pressure, it is recommended to use nozzles functioning by the **liquid pressure principle**. Use of pneumatic atomizing nozzles operating to the **siphon or the gravity principle** is recommended when liquid is to be sprayed in small quantities, e.g. for spraying of disinfectants.

3. Mixing of fluids

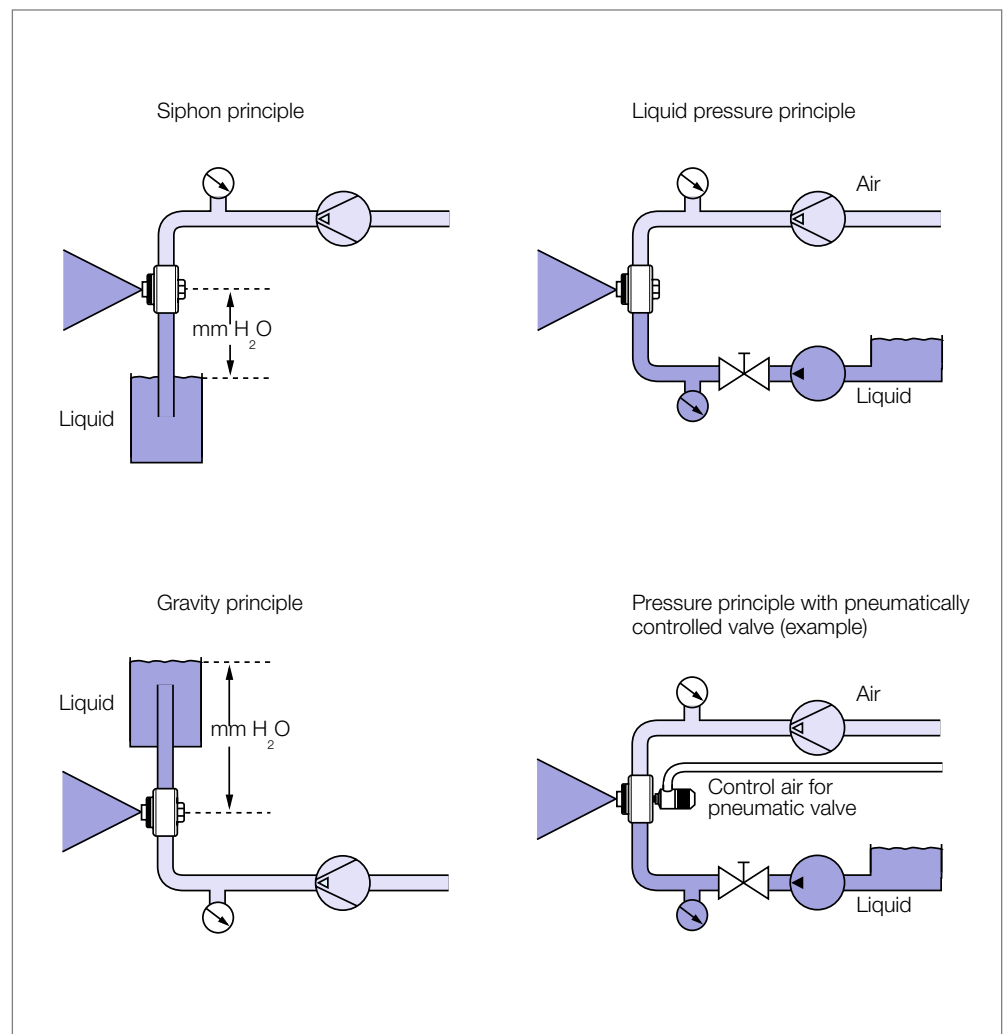
The supply of air or gas provides an additional breaking up of the liquid flow into finest drop particles. This supply and mixing can either take place inside or outside the nozzle. **Inside mixing** should be preferred, when water, low viscosity liquids or liquids without solid matter are to be atomized. **Outside mixing** is particularly suited for atomizing viscous liquids which are prone to impurities and therefore tend to cause clogging of the nozzle. Low liquid pressures are used with this type of nozzle due to its design.

For many applications, adjustability of liquid flow and, thereby, of the droplet size, is possible with the aid of manually operated accessory components.

A pneumatically controlled piston (series 136) or magnetic valve (series 166) allows to perform automatic or intermittent operations. A number of special customized designs complete the nozzle range.
















We can also supply complete modular nozzle lances on request. We would be happy to send you detailed product information.





Pneumatic atomizing nozzles










Series 136

Spray pattern	Mode of liquid supply	Mixing of fluids		Series		\dot{V} Water [l/h]	Application	Page
Full cone 	Pressure principle	Inside		136.1	20°	0.40 – 93.20	Humidification of air, cooling.	1.6
Full cone 	Pressure principle	Inside		136.2	60°	0.40 – 132.90	Humidification of air, cooling.	1.8
Full cone 	Siphon or gravity principle	Outside		136.3	20°	0.30 – 66.70	Chemical industry, cooling, spraying of viscous liquids.	1.9
Flat fan 	Pressure principle	Inside		136.4	45° 60° 80°	0.10 – 76.10	Web dampening, humidification of goods, cooling.	1.12
Flat fan 	Siphon or gravity principle	Inside		136.5	60°	0.80 – 3.20	Web dampening, humidification of goods, cooling.	1.14
Flat fan 	Pressure principle	Outside		136.6	45° 60°	1.70 – 102.10	Web dampening, humidification of goods, atomization of viscous fluids.	1.16












Pneumatic atomizing nozzles

Series 166

Spray pattern	Mode of liquid supply	Mixing of fluids		Series		\dot{V} Water [l/h]	Application	Page
Full cone 	Pressure principle	Inside		166.1	20°	0.40 – 93.20	Humidification of air, cooling. Version with magnetic valve.	1.20
Full cone 	Pressure principle	Inside		166.2	60°	0.40 – 132.90	Humidification of air, cooling. Version with magnetic valve.	1.22
Flat fan 	Pressure principle	Inside		166.4	45° 60° 80°	0.10 – 76.10	Web dampening, humidification of goods, cooling. Version with magnetic valve.	1.23
Flat fan 	Pressure principle	Outside		166.6	45° 60°	1.70 – 102.10	Web dampening, humidification of goods, atomization of viscous fluids. Version with magnetic valve.	1.25



Pneumatic atomizing nozzles

Spray pattern	Mode of liquid supply	Mixing of fluids		Series		\dot{V} Water [l/h]	Application	Page
Full cone 	Siphon or gravity principle	Inside		140	20°–30°	4.50 – 12.00	Lubrication, cooling, humidification of air.	1.29
Solid stream Full cone Flat fan 	Pressure principle	Outside		176 ViscoMist™	variable	7.80 – 307.00 [l/h]	Coating processes, moistening, lubrication, glazing, disinfection,	1.30
Full cone 	Pressure principle	Inside		170	15°	8.50 – 290.00 [l/min]	Gas cooling, flue gas desulphurisation, exhaust gas conditioning, dust control.	On request.
Full cone 	Pressure principle	Outside		150	20°–30°	0.15 – 63.00 [l/min]	Chemical process engineering, cooling, atomizing of viscous liquids.	On request.

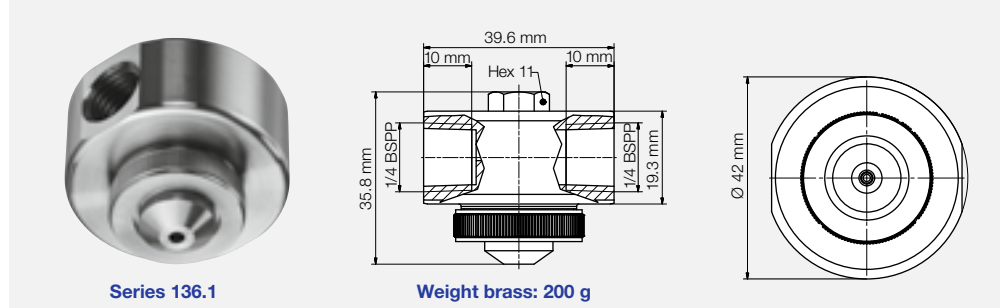


Pneumatic atomizing nozzles, **Full cone,** pressure principle, internal mixing **Series 136.1**

Fine full cone atomization and fogging with air or gas. Liquid pressure principle. Internal mixing of fluids.

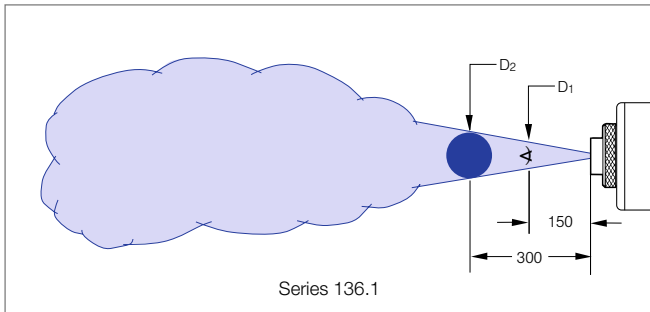
Applications:

Humidification of air, cooling.

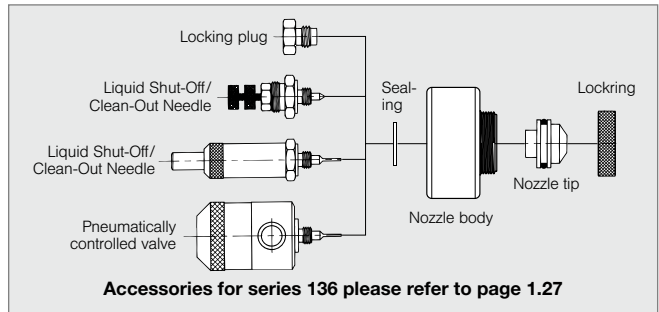


Series 136.1


Weight brass: 200 g



Series 136.1



Accessories for series 136 please refer to page 1.27

Spray angle 	Ordering no.		E 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]	D ₁ [mm]	D ₂ [mm]		
		1Y		35	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]					V̇ Air [m³/h]	
20°	136.115.xx.A2	○	○	0.50	0.40	5.90	0.30	1.40	5.80	0.80	2.40	9.10	1.10	3.00	11.00	1.20	0.80	0.70	60	100	
					0.80	3.80	0.60	1.80	4.10	1.00	2.80	7.50	1.20	3.40	9.60	1.40	1.80	1.50	60	95	
					1.20	1.70	0.90	2.20	2.20	1.40	3.20	5.90	1.50	3.80	8.20	1.60	2.60	2.00	60	100	
					-	-	-	2.60	1.20	1.70	3.60	4.40	1.80	4.20	6.80	1.90	3.20	3.00	55	95	
					-	-	-	-	-	-	4.00	2.90	2.10	4.60	5.50	2.20	4.40	4.00	55	100	
					-	-	-	-	-	-	4.40	2.00	2.50	5.00	4.10	2.50	-	-	-	-	-
					-	-	-	-	-	-	4.80	1.10	2.80	5.40	2.90	2.80	-	-	-	-	-
	136.125.xx.A2	○	○	0.50	0.80	4.70	1.50	1.20	7.00	1.80	2.80	9.10	3.30	3.40	10.60	3.90	1.40	0.70	55	90	
					1.20	4.40	1.90	1.60	6.60	2.20	3.20	8.70	3.70	3.80	10.30	4.30	2.20	1.50	55	95	
					1.60	4.00	2.30	2.00	6.20	2.60	3.60	8.40	4.10	4.20	9.90	4.60	2.80	2.00	55	100	
					2.00	3.50	2.60	2.40	5.80	3.00	4.00	8.00	4.50	4.60	9.60	5.00	3.40	3.00	60	100	
					2.40	3.00	3.00	2.80	5.40	3.40	4.40	7.70	4.80	5.00	9.30	5.40	4.20	4.00	60	100	
					2.80	2.70	3.20	3.20	4.90	3.70	4.80	7.30	5.20	5.40	8.90	5.80	-	-	-	-	
					3.20	2.00	3.70	3.60	4.40	4.10	5.20	7.00	5.60	5.80	8.60	6.10	-	-	-	-	
3.60	1.60	4.10	4.00	3.90	4.50	5.60	6.60	5.90	-	-	-	-	-	-	-						
4.00	1.30	4.50	4.40	3.50	4.80	6.00	6.20	6.30	-	-	-	-	-	-	-						
4.40	1.00	4.90	4.80	3.10	5.20	-	-	-	-	-	-	-	-	-	-						
4.80	0.60	5.20	5.20	2.70	5.60	-	-	-	-	-	-	-	-	-	-						
-	-	-	5.60	2.30	5.90	-	-	-	-	-	-	-	-	-	-						
-	-	-	6.00	1.90	6.30	-	-	-	-	-	-	-	-	-	-						

E = narrowest free cross section (water)


Continued on next page.

Example Type + Material no. (xx) = Ordering no.
for ordering: 136.115.xx.A2 + 1Y = 136.115.1Y.A2



Pneumatic atomizing nozzles, **Full cone,** pressure principle, internal mixing **Series 136.1**



Spray angle 	Ordering no.		E 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]	D ₁ [mm]	D ₂ [mm]	
		1Y		35	p Air [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p Air [bar]	V̇ Water [l/h]					V̇ _n Air [m³/h]
		316L SS		Brass plated																
20°	136.134.xx.A2	○	○	0.7	1.20	13.20	2.70	2.00	19.40	3.90	3.00	28.30	5.20	3.80	32.60	6.20	1.80	0.70	55	95
					1.60	12.40	3.30	2.40	18.10	4.40	3.40	27.50	5.70	4.20	32.00	6.80	2.80	1.50	60	105
					2.00	11.80	3.90	2.80	17.30	4.90	3.80	26.70	6.30	4.60	31.30	7.30	3.80	2.00	60	105
					2.40	11.40	4.40	3.20	16.70	5.50	4.20	25.90	6.80	5.00	30.60	7.80	5.20	3.00	65	110
					2.80	11.10	4.90	3.60	16.10	6.00	4.60	25.00	7.30	5.40	29.90	8.40	6.00	4.00	65	110
					3.20	10.80	5.50	4.00	15.60	6.50	5.00	24.20	7.80	5.80	29.30	8.90				
					3.60	10.60	6.00	4.40	15.20	7.00	5.40	23.60	8.40	-	-	-				
					4.00	10.40	6.50	4.80	15.00	7.60	5.80	23.10	8.90	-	-	-				
					4.40	10.10	7.00	5.20	14.60	8.10	-	-	-	-	-	-				
					4.80	9.90	7.60	5.60	14.10	8.60	-	-	-	-	-	-				
	5.20	9.50	8.10	6.00	13.80	9.10	-	-	-	-	-	-								
	5.60	9.00	8.60	-	-	-	-	-	-	-	-	-								
	6.00	8.50	9.20	-	-	-	-	-	-	-	-	-								
	136.142.xx.A2	○	○	2.5	1.40	24.20	5.10	1.60	53.40	4.70	3.20	70.80	8.00	3.80	93.20	9.20	0.80	0.70	60	100
					1.80	20.40	6.30	2.00	42.60	5.90	3.60	62.50	9.20	4.20	83.10	10.10	1.60	1.50	65	105
					2.20	20.00	7.20	2.40	35.30	7.20	4.00	55.70	10.60	4.60	75.30	11.30	3.00	2.00	60	105
					2.60	19.30	8.20	2.80	30.40	8.40	4.40	49.30	11.70	5.00	69.00	12.50	4.00	3.00	65	110
					3.00	17.60	9.30	3.20	28.60	9.50	4.80	44.60	12.90	5.40	63.40	13.70	6.00	4.00	65	110
					3.40	16.50	10.40	3.60	28.20	10.50	5.20	41.90	14.10	5.80	57.50	14.90				
					3.80	17.00	11.40	4.00	27.30	11.50	5.60	40.40	15.10	-	-	-				
4.20					16.30	12.40	4.40	25.90	12.50	6.00	39.70	16.10	-	-	-					
4.60					15.10	13.30	4.80	24.30	13.50	-	-	-	-	-	-					
5.00					14.00	14.30	5.20	22.30	14.60	-	-	-	-	-	-					
5.40	13.10	15.30	5.60	21.80	15.70	-	-	-	-	-	-									
5.80	12.40	16.20	6.00	21.40	16.70	-	-	-	-	-	-									

E = narrowest free cross section (water)

Example Type + Material no. (xx) = Ordering no.
for ordering: 136.134.xx.A2 + 1Y = 136.134.1Y.A2

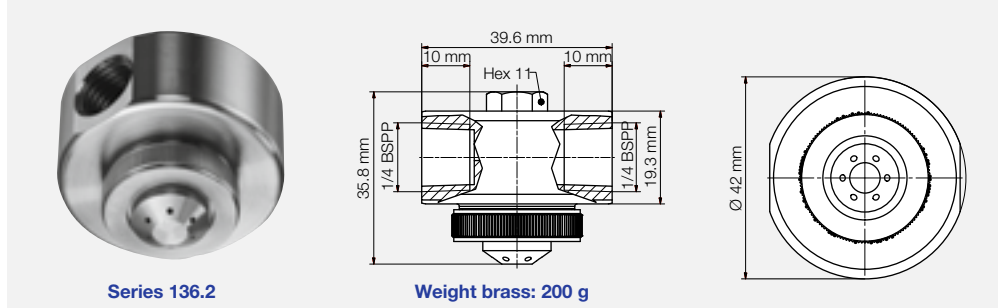


Pneumatic atomizing nozzles, **Full cone,** pressure principle, internal mixing **Series 136.2**

Fine full cone atomization and fogging with air or gas. Especially wide spray angle of 60°. Pressure principle. Internal mixing of fluids.

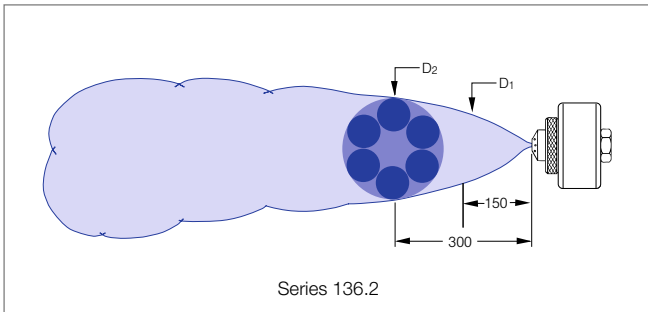
Applications:

Humidification of air, cooling.

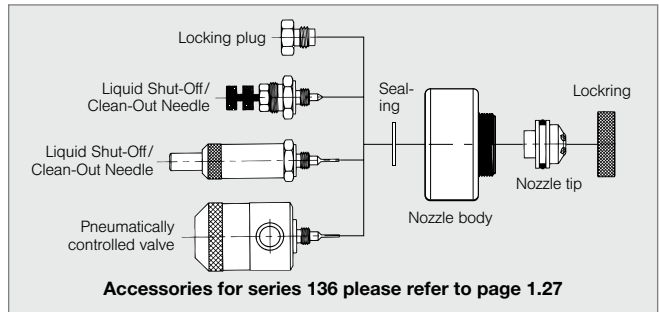


Series 136.2

Weight brass: 200 g



Series 136.2



Accessories for series 136 please refer to page 1.27

Spray angle	Ordering no.		E 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]	D ₁ [mm]	D ₂ [mm]	
		1Y		35	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]					V̇ Air [m³/h]
60°	136.215.xx.A2	○	○	0.5	1.00	3.00	1.30	1.60	5.80	1.70	2.80	8.50	2.40	3.80	9.40	3.10	1.00	0.70	200	330
					1.20	1.80	1.50	1.80	4.90	1.90	3.20	7.20	2.80	4.20	8.20	3.50	1.60	1.50	230	380
		1.40	0.70		1.80	2.00	3.80	2.10	3.60	5.70	3.20	4.60	6.90	3.90	2.40	2.00	230	385		
		-	-		-	2.20	2.80	2.30	4.00	4.00	3.60	5.00	5.40	4.20	3.20	3.00	245	390		
		-	-		-	2.40	1.70	2.50	4.40	2.20	4.10	5.40	3.80	4.70	4.20	4.00	250	410		
		-	-		-	2.60	0.80	2.80	4.80	0.80	4.50	5.80	2.30	5.20	-	-	-	-	-	-
	136.222.xx.A2	○	○	1.0	0.80	17.50	2.80	1.60	25.90	4.00	3.00	40.40	5.80	3.80	54.90	6.40	0.80	0.70	250	450
					1.00	6.00	4.30	1.80	14.70	5.30	3.20	31.50	6.90	4.00	45.60	7.30	1.60	1.50	245	465
		-	-		-	2.00	6.70	6.70	3.40	22.20	8.20	4.20	37.60	8.50	2.30	2.00	245	465		
		-	-		-	2.20	1.90	8.10	3.60	14.60	9.50	4.40	29.60	9.70	3.20	3.00	250	465		
		-	-		-	-	-	-	-	-	-	4.00	4.50	12.30	4.80	5.00	9.70	13.80	-	-
		-	-		-	-	-	-	-	-	-	-	-	5.20	6.00	15.20	-	-	-	-
136.231.xx.A2	○	○	1.4	1.60	25.60	5.10	2.60	44.20	7.00	3.60	93.70	7.90	4.20	132.90	7.30	2.00	0.70	235	380	
				2.00	17.80	6.20	3.00	33.00	8.20	4.00	78.30	9.30	4.60	117.20	9.00	2.60	1.50	245	415	
	2.40	11.30		7.20	3.40	24.70	9.20	4.40	65.80	10.60	5.00	101.10	10.40	2.40	2.00	255	420			
	2.80	6.90		8.10	3.80	18.10	10.20	4.80	54.90	11.90	5.40	87.90	11.80	3.60	3.00	255	425			
	-	-		-	4.20	13.20	11.20	5.20	45.60	13.00	5.80	76.60	13.20	4.20	4.00	265	430			
	-	-		-	4.60	9.30	12.00	5.60	38.00	14.10	6.00	71.20	13.80	-	-	-	-	-	-	

E = narrowest free cross section (water)

Example Type + Material no. (xx) = Ordering no.
for ordering: 136.215.xx.A2 + 1Y = 136.215.1Y.A2



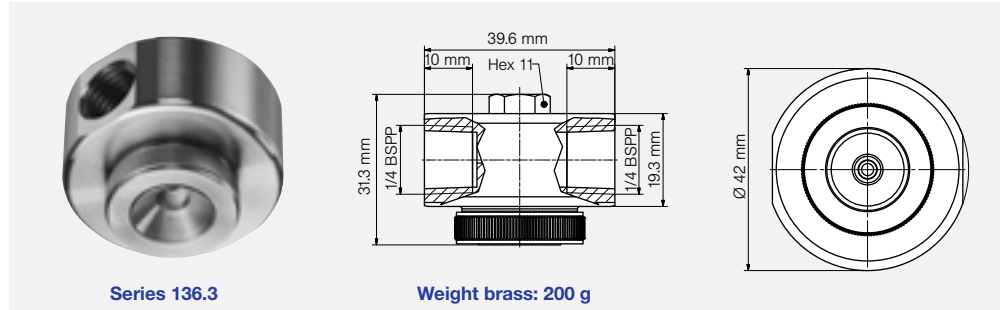
Pneumatic atomizing nozzles, **Full cone,** siphon principle, external mixing **Series 136.3**



Particularly fine full cone atomization with air or gas. Siphon principle or gravity principle. External mixing of fluids.

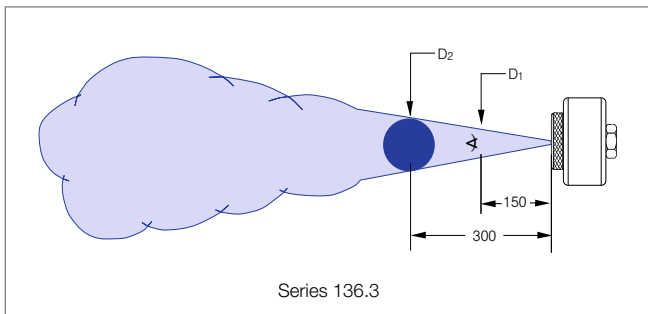
Applications:

Chemical industry, cooling, atomization of viscous liquids.

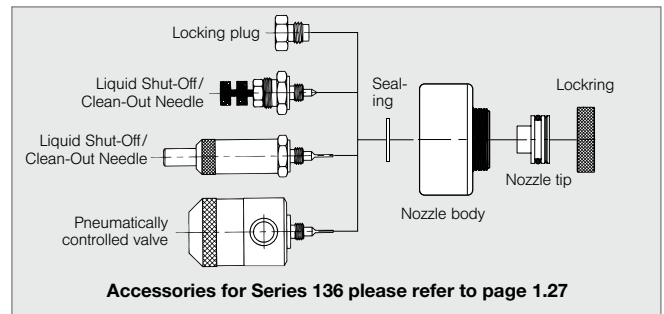


Series 136.3

Weight brass: 200 g



Series 136.3



Accessories for Series 136 please refer to page 1.27

Spray angle	Ordering no.		E Ø [mm]	Air		Water [l/h]					Spray dimensions										
	Type	Mat. no.		p [bar]	V _l [m³/h]	Water column [mm H ₂ O]			Aspiration height [mm H ₂ O]		p Air [bar]	Aspiration-height [mm WS]	D ₁ [mm]	D ₂ [mm]							
		1Y				35	150	300	450	100					200	300	600	900			
20°	136.316.xx.A2	316L SS	Brass plated	0.4	0.6	0.70	-	1.38	1.32	-	-	-	-	-	1.40	300	60	110			
					0.8	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	-	-	-	-	-	-	-	-	-					

E = narrowest free cross section (water)

Continued on next page.

Operational information:


Liquid flow of pneumatic atomizing nozzles with external mixing can be turned down to 0 with air pressure remaining constant.

Example for ordering: Type 136.316.xx.A2 + Material no. (xx) = Ordering no. + 1Y = 136.316.1Y.A2



Pneumatic atomizing nozzles, **Full cone,** siphon principle, external mixing **Series 136.3**



Spray angle 	Ordering no.		E Ø [mm]	Air		V̇ Water [l/h]									Spray dimensions					
	Type	Mat. no.		p [bar]	V̇ _n [m³/h]	Water column [mm H ₂ O]			Aspiration height [mm H ₂ O]					p Air [bar]	Aspiration-height [mm WS]	D ₁ [mm]	D ₂ [mm]			
		1Y 316L SS	35 Brass plated			150	300	450	100	200	300	600	900							
20°	136.324.xx.A2	○	○	0.7	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	○	○	0.7	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	-	-	-	-	-						
136.342.xx.A2	○	○	1.5	1.40	3.60	-	-	-	8.82	-	-	3.93	-	1.80	300	70	120			
				1.80	4.20	-	-	-	9.45	8.49	7.5	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	-	-	-	-	-		


E = narrowest free cross section (water)

Continued on next page.





Pneumatic atomizing nozzles, **Full cone,** siphon principle, external mixing **Series 136.3**

Spray angle 	Ordering no.		E Ø [mm]	Air		V̇ Water [l/h]									Spray dimensions					
	Type	Mat. no.		p [bar]	V̇ _n [m³/h]	Water column [mm H ₂ O]			Aspiration height [mm H ₂ O]					p Air [bar]	Aspiration-height [mm WS]	D ₁ [mm]	D ₂ [mm]			
		1Y	35			150	300	450	100	200	300	600	900							
20°	136.351.xx.A2	316L SS	Brass plated	2.5	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						

E = narrowest free cross section (water)

Example **Type** + **Material no. (xx)** = **Ordering no.**
for ordering: 136.351.xx.A2 + 1Y = 136.351.1Y.A2

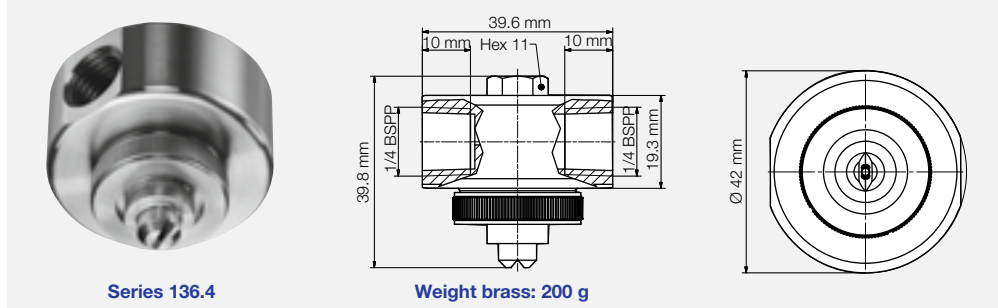


Pneumatic atomizing nozzles, **Flat fan,** pressure principle, internal mixing **Series 136.4**

Particularly fine flat fan atomization with air or gas. Pressure principle. Internal mixing of fluids.

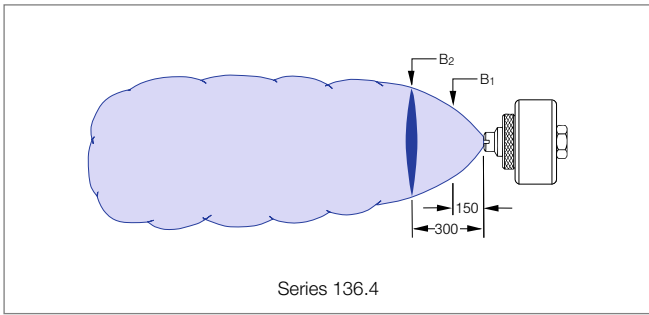
Applications:

Web dampening, cooling, humidification of goods.

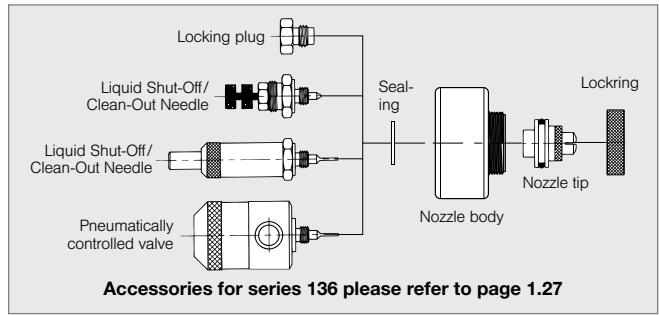


Series 136.4


Weight brass: 200 g



Series 136.4



Accessories for series 136 please refer to page 1.27

Spray angle 	Ordering no.		E 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 ₁ [mm]	B ₂ [mm]	
		1Y		35	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]					V̇ Air [m³/h]
45°	136.414.xx.A2	○	○	0.7	1.00	7.70	1.30	1.40	14.30	1.50	2.20	22.40	2.00	3.00	25.10	2.50	1.40	0.70	85	125
					1.20	6.00	1.50	1.60	13.00	1.60	2.60	20.00	2.30	3.40	23.00	2.80	2.40	1.50	100	145
		1.40	4.20		1.70	1.80	11.60	1.80	3.00	17.70	2.60	3.80	20.90	3.10	3.20	2.00	105	155		
		1.60	2.70		1.90	2.00	10.20	2.00	3.40	15.50	3.00	4.20	18.90	3.50	3.80	3.00	120	170		
		1.80	1.30		2.10	2.20	8.90	2.20	3.80	13.30	3.40	4.60	16.90	3.80	4.60	4.00	130	210		
		-	-		-	2.40	7.40	2.40	4.20	11.00	3.70	5.00	14.90	4.20	-	-	-	-	-	-
		-	-		-	2.60	5.90	2.60	4.60	8.80	4.10	5.40	12.80	4.60	-	-	-	-	-	-
		-	-		-	2.80	4.60	2.80	5.00	6.60	4.50	5.80	10.80	5.00	-	-	-	-	-	-
		-	-		-	3.00	3.20	3.00	5.40	4.30	4.90	6.00	9.80	5.20	-	-	-	-	-	-
		-	-		-	3.20	2.10	3.20	5.80	2.50	5.30	-	-	-	-	-	-	-	-	-
	-	-	-	3.40	1.10	3.40	6.00	1.60	5.50	-	-	-	-	-	-	-	-	-		
	136.443.xx.A2	○	○	1.0	1.20	13.90	1.50	1.60	26.60	1.60	3.00	37.10	2.60	3.60	45.60	2.90	1.20	0.70	110	165
					1.40	11.90	1.70	1.80	24.30	1.80	3.40	33.10	3.00	4.00	41.90	3.30	2.00	1.50	115	190
		1.60	9.50		1.90	2.00	22.00	2.00	3.80	29.50	3.40	4.40	38.30	3.70	2.80	2.00	145	190		
		1.80	7.80		2.10	2.20	19.90	2.20	4.20	26.20	3.80	4.80	35.00	4.00	3.80	3.00	150	210		
		-	-		-	2.40	18.00	2.40	4.60	23.00	4.20	5.20	31.80	4.50	4.80	4.00	160	230	-	-
		-	-		-	2.60	16.20	2.60	5.00	20.20	4.60	5.60	29.00	4.90	-	-	-	-	-	-
		-	-		-	2.80	14.40	2.80	5.40	17.60	4.90	6.00	26.20	5.20	-	-	-	-	-	-
		-	-		-	3.00	12.80	3.00	5.80	14.90	5.30	-	-	-	-	-	-	-	-	-
		-	-		-	3.20	11.30	3.20	6.00	14.10	5.50	-	-	-	-	-	-	-	-	-
-		-	-		3.40	9.90	3.40	-	-	-	-	-	-	-	-	-	-	-	-	
-	-	-	3.60	8.80	3.60	-	-	-	-	-	-	-	-	-	-	-	-			

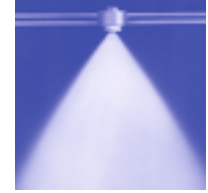
E = narrowest free cross section (water)


Continued on next page.

Example **Type** + **Material no. (xx) = Ordering no.**
for ordering: 136.414.xx.A2 + 1Y = 136.414.1Y.A2



Pneumatic atomizing nozzles, Flat fan, pressure principle, internal mixing Series 136.4



Spray angle 	Ordering no.		E 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 ₁ [mm]	B ₂ [mm]			
		1Y		35	p Air [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p Air [bar]	V̇ Water [l/h]					V̇ _n Air [m³/h]		
		316L SS		Brass plated																		
45°	136.462.xx.A2	○	○	1.5	1.20	19.00	2.60	2.00	22.00	2.00	3.00	61.80	4.00	3.80	76.10	4.60	1.20	0.70	120	140		
					1.60	12.20	3.40	2.40	18.00	2.40	3.40	51.90	4.80	4.00	70.40	5.10	2.40	1.50	120	170		
					2.00	9.40	4.10	2.80	14.40	2.80	3.80	44.60	5.80	4.20	65.60	5.50	3.20	2.00	120	175		
					2.40	7.10	4.80	3.20	11.30	3.20	4.20	39.00	6.60	4.40	61.30	5.90	3.80	3.00	140	205		
					2.80	5.70	5.40	3.60	8.80	3.60	4.60	33.40	7.40	4.60	57.30	6.40	6.00	4.00	145	205		
					3.20	5.00	6.00	4.00	8.10	3.90	5.00	29.40	8.10	4.80	54.10	6.70						
					3.60	3.60	6.60	4.40	6.20	4.30	5.40	25.50	8.90	5.00	51.30	7.20						
					4.00	3.20	7.20	4.80	4.60	4.60	5.80	22.00	9.60	5.20	49.30	7.70						
					4.40	2.20	7.80	5.20	3.20	4.90	6.00	20.60	9.90	5.40	46.50	8.20						
					-	-	-	5.60	1.60	5.30	-	-	-	5.60	43.70	8.60						
					-	-	-	5.80	0.80	5.40	-	-	-	5.80	41.30	8.90						
					-	-	-	-	-	-	-	-	-	6.00	39.00	9.30						
					60°	136.425.xx.A2	○	○	0.5	0.80	6.50	1.20	1.40	9.40	1.70	2.40	13.20	2.50	2.40	16.10	2.50	1.20
1.20	5.50	1.60	1.80	8.70						2.10	2.60	12.90	2.70	2.80	15.50	2.90	2.20	1.50	165	255		
1.60	4.70	1.90	2.20	7.90						2.40	3.00	12.30	3.00	3.20	15.00	3.20	3.00	2.00	170	265		
2.00	4.00	2.30	2.60	7.20						2.70	3.40	11.80	3.40	3.60	14.50	3.50	3.40	3.00	200	330		
2.40	3.20	2.60	3.00	6.40						3.10	3.80	11.10	3.70	4.00	13.90	3.80	5.60	4.00	200	330		
2.80	2.60	2.90	3.40	5.70						3.40	4.20	10.40	4.00	4.40	13.40	4.10						
3.00	2.20	3.10	3.80	5.10						3.70	4.60	9.80	4.30	4.80	12.80	4.50						
-	-	-	4.00	4.80						3.90	5.00	9.20	4.60	5.20	12.20	4.80						
-	-	-	4.40	4.20						4.20	5.40	8.60	5.00	5.60	11.70	5.10						
-	-	-	4.80	3.60						4.50	5.80	8.10	5.30	6.00	11.20	5.40						
-	-	-	5.20	2.80		4.80	6.00	7.80	5.40	-	-	-										
-	-	-	5.60	2.20		5.10	-	-	-	-	-	-										
-	-	-	6.00	1.60		5.50	-	-	-	-	-	-										
-	-	-	-	-		-	-	-	-	-	-	-										
-	-	-	-	-		-	-	-	-	-	-	-										
-	-	-	-	-		-	-	-	-	-	-	-										
-	-	-	-	-		-	-	-	-	-	-	-										
-	-	-	-	-		-	-	-	-	-	-	-										
-	-	-	-	-		-	-	-	-	-	-	-										
80°	136.433.xx.A2	○	○	0.4		1.00	11.60	2.00	1.80	18.30	2.80	3.00	31.00	3.70	3.80	37.50	4.40	1.40	0.70	150	210	
					1.20	8.10	2.40	2.00	15.30	3.20	3.40	25.40	4.40	4.20	32.40	5.00	2.20	1.50	185	255		
					1.40	5.30	2.80	2.20	12.20	3.60	3.80	20.60	5.10	4.60	27.70	5.70	3.00	2.00	205	300		
					1.60	3.70	3.20	2.40	9.80	4.00	4.20	16.30	5.90	5.00	23.40	6.50	3.80	4.00	300	485		
					-	-	-	2.60	7.60	4.30	4.60	12.50	6.60	5.40	19.40	7.20	5.20	4.00	260	395		
					-	-	-	2.80	5.90	4.70	5.00	9.30	7.30	5.80	15.90	7.90						
					-	-	-	3.00	4.40	5.00	5.40	6.50	8.00	6.00	14.20	8.30						

E = narrowest free cross section (water)

Example Type + Material no. (xx) = Ordering no.
for ordering: 136.462.xx.A2 + 1Y = 136.462.1Y.A2

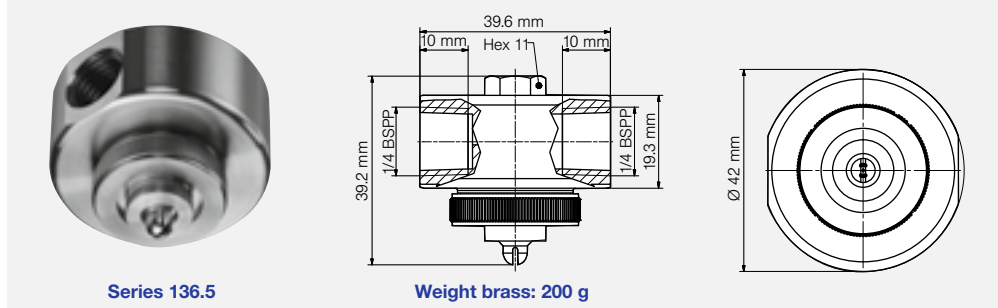


Pneumatic atomizing nozzles, Flat fan, siphon principle, internal mixing Series 136.5

Particularly fine flat fan atomization with air or gas. Siphon principle or gravity principle. Internal mixing of fluids.

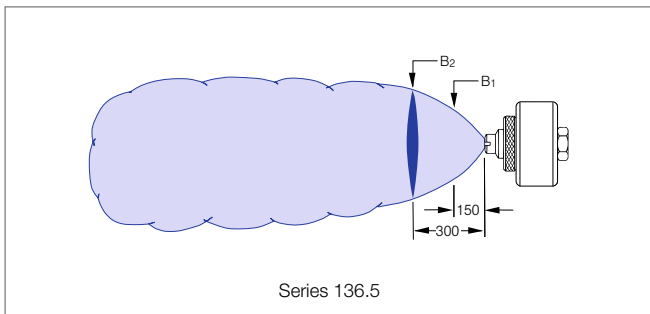
Applications:

Web dampening, cooling, humidification of goods.

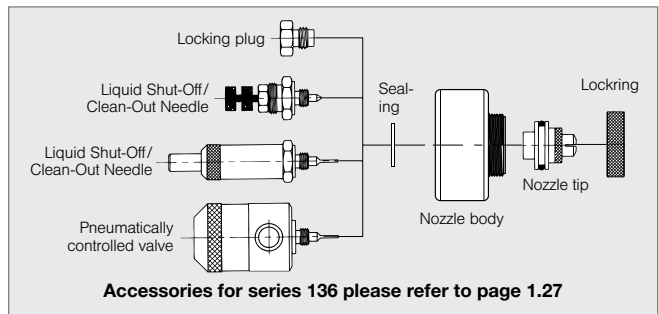


Series 136.5


Weight brass: 200 g



Series 136.5



Accessories for series 136 please refer to page 1.27

Spray angle 	Ordering no.		E Ø [mm]	Air		V Water [l/h]									Spray dimensions				
	Type	Mat. no.		p [bar]	V ₀ [m³/h]	Water column [mm H ₂ O]			Aspiration height [mm H ₂ O]					p Air [bar]	Aspiration height [mm WS]	D ₁ [mm]	D ₂ [mm]		
		1Y				35	150	300	450	100	200	300	600					900	
60°	136.516.xx.A2	316L SS	Brass plated	0.4	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										

E = narrowest free cross section (water)

Continued on next page.

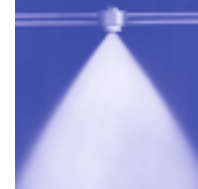
Operational information:


Liquid flow of pneumatic atomizing nozzles with external mixing can be turned down to 0 with air pressure remaining constant.

Example Type + Material no. (xx) = Ordering no.
for ordering: 136.516.xx.A2 + 1Y = 136.516.1Y.A2



Pneumatic atomizing nozzles, Flat fan, siphon principle, internal mixing Series 136.5



Spray angle 	Ordering no.		E Ø [mm]	Air		V̇ Water [l/h]										Spray dimensions			
	Type	Mat. no.		p [bar]	V̇ _n [m³/h]	Water column [mm H ₂ O]			Aspiration height [mm H ₂ O]					p Air [bar]	Aspiration-height [mm WS]	D ₁ [mm]	D ₂ [mm]		
		1Y 316L SS	35 Brass plated			150	300	450	100	200	300	600	900						
60°	136.525.xx.A2	○	○	0.5	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										

E = narrowest free cross section (water)

Example Type + Material no. (xx) = Ordering no.
for ordering: 136.525.xx.A2 + 1Y = 136.525.1Y.A2

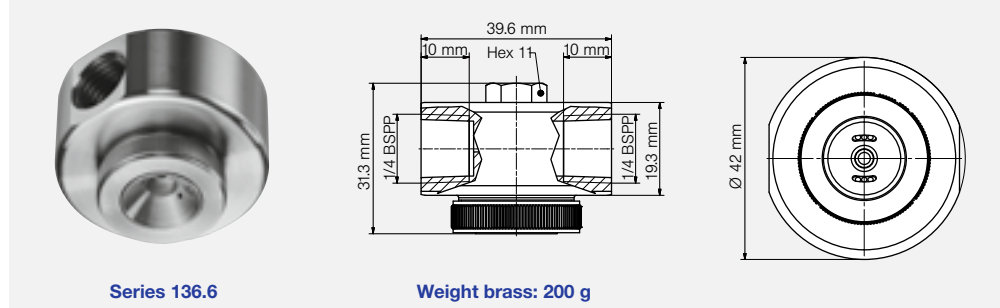


Pneumatic atomizing nozzles, **Flat fan,** pressure principle, external mixing **Series 136.6**

Fine flat fan atomization with the aid of air or gas. Liquid pressure principle. External mixing of fluids.

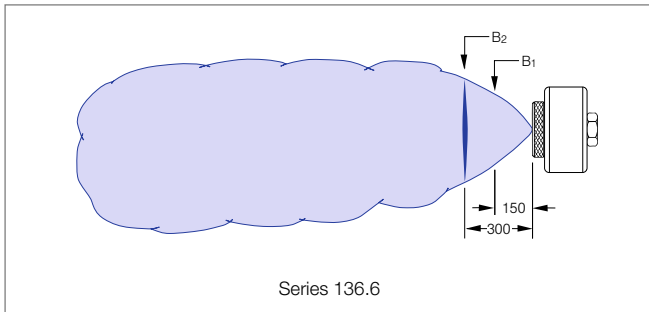
Applications:

Web dampening, cooling, humidification of goods, atomization of viscous liquids.

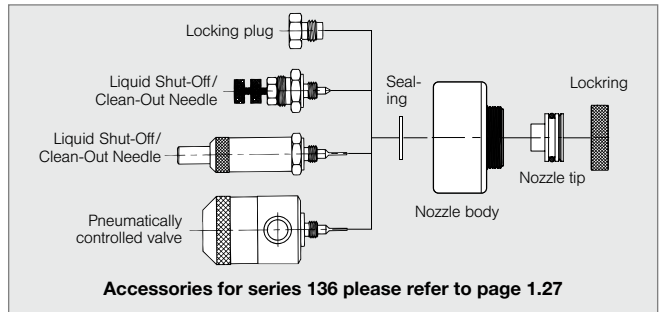


Series 136.6


Weight brass: 200 g



Series 136.6



Accessories for series 136 please refer to page 1.27

Spray angle 	Ordering no.		E 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 ₁ [mm]	B ₂ [mm]		
		1Y		35	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]					V̇ Air [m³/h]	
45°	136.616.xx.A2	○	○	0.4	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					
		136.635.xx.A2	○	○	0.5	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					


E = narrowest free cross section (water)

Continued on next page.



Pneumatic atomizing nozzles, Flat fan, pressure principle, external mixing Series 136.6



Spray angle 	Ordering no.				E Ø [mm]	Liquid pressure p [bar]												Spray dimensions			
	Type	Mat. no.		316L SS Brass plated		0.07			0.15			0.30			0.35			p Air [bar]	p Water [bar]	B ₁ [mm]	B ₂ [mm]
		1Y	35			p Air [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ _n Air [m³/h]				
		316L SS	Brass plated																		
45°	136.654.xx.A2	○	○	0.7	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	○	○	0.4	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					
	136.645.xx.A2	○	○	0.5	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					

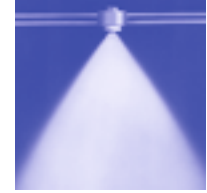
E = narrowest free cross section (water)


Continued on next page.

Example Type + Material no. (xx) = Ordering no.
for ordering: 136.654.xx.A2 + 1Y = 136.654.1Y.A2



Pneumatic atomizing nozzles, **Flat fan,** pressure principle, external mixing **Series 136.6**



Spray angle 	Ordering no.				E ∅ [mm]	Liquid pressure p [bar]												Spray dimensions					
	Type	Mat. no.		35		0.07			0.15			0.30			0.35			p Air [bar]	p Water [bar]	B ₁ [mm]	B ₂ [mm]		
		1Y	316L SS			p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]						
		Brass plated																					
60°	136.664.xx.A2	○	○	0.7	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	○	○	1.0	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	-	-	-	-	-	-	-	-	-							
					136.682.xx.A2	○	○	1.5	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
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	-	-	-	-	-	-	-	-	-												

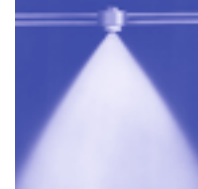
E = narrowest free cross section (water)


Continued on next page.

Example Type + Material no. (xx) = Ordering no.
for ordering: 136.664.xx.A2 + 1Y = 136.664.1Y.A2



Pneumatic atomizing nozzles, Flat fan, pressure principle, external mixing Series 136.6



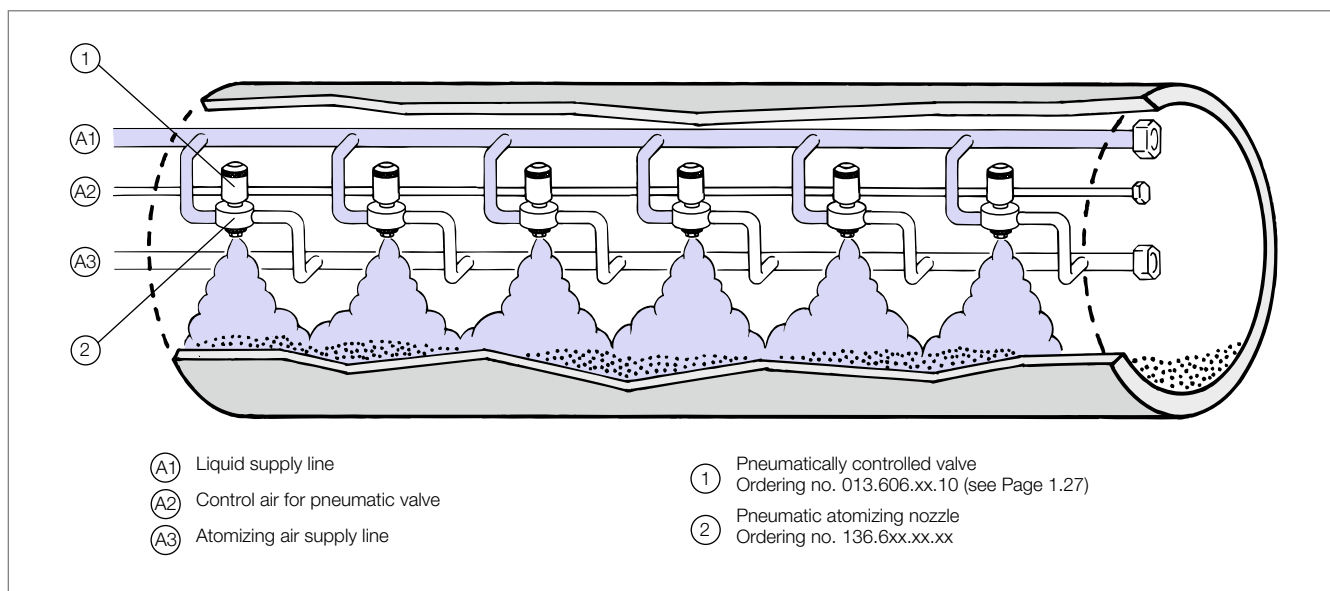
Spray angle 	Ordering no.				E Ø [mm]	Liquid pressure p [bar]												Spray dimensions			
	Type	Mat. no.		316L SS Brass plated		0.07			0.15			0.30			0.35			p Air [bar]	p Water [bar]	B ₁ [mm]	B ₂ [mm]
		1Y	35			p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]				
		316L SS	Brass plated																		
60°	136.691.xx.A2	○	○	2.5	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	-	-	-	-	-	-	-	-	-						

E = narrowest free cross section (water)

Operational information:

Liquid flow of pneumatic atomizing nozzles with external mixing can be turned down to 0 with air pressure remaining constant.

Example **Type** + **Material no. (xx) = Ordering no.**
for ordering: 136.691.xx.A2 + 1Y = 136.691.1Y.A2



Cereal dampening in a mixing drum



Pneumatic atomizing nozzles, **Full cone,** pressure principle, internal mixing **Series 166.1**



Version with magnetic valve. Fine full cone atomization and fogging with air or gas. Liquid pressure principle. Internal mixing of fluids.

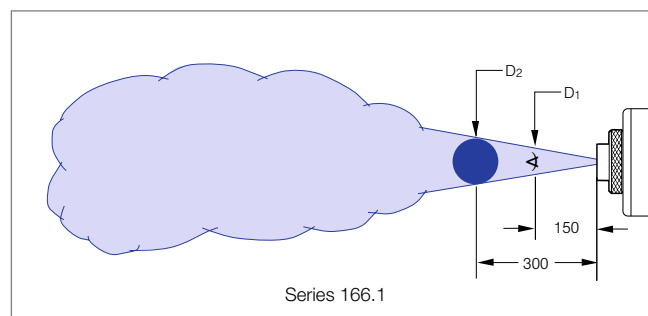
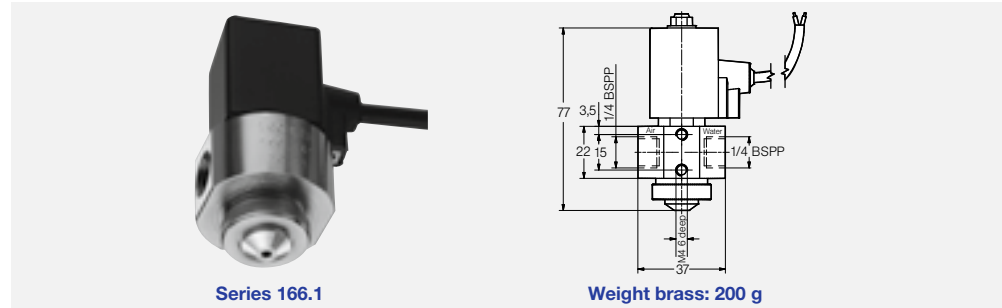
Applications:

Humidification of air, cooling.

Technical Data:

- Service pressure: 0-6 bar
- Voltage: 24 V DC
- Power: 8 W
- Switching frequency: ca. 500/min
- Protective system: IP 67
- Ambient temperature: 10 °C/+50 °C
- Cable length: 1.000 mm
- Material of gasket: EPDM

Accessories for series 166 please refer to page 1.28



Spray angle	Ordering no.		E Ø [mm]	Liquid pressure p [bar]												Spray dimensions					
	Type	Mat. no. 16		0.7			1.5			3.0			4.0			p Air [bar]	p Water [bar]	D ₁ [mm]	D ₂ [mm]		
				p Air [bar]	V̇ Water [l/h]	V̇ _v Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ _v Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ _v Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ _v Air [m³/h]						
20°	166.115.xx.A2	○	0.50	0.40	5.90	0.30	1.40	5.80	0.80	2.40	9.10	1.10	3.00	11.00	1.20	0.80	0.70	60	100		
				0.80	3.80	0.60	1.80	4.10	1.00	2.80	7.50	1.20	3.40	9.60	1.40	1.80	1.50	60	95		
1.20				1.70	0.90	2.20	2.20	1.40	3.20	5.90	1.50	3.80	8.20	1.60	2.60	2.00	60	100			
-				-	-	2.60	1.20	1.70	3.60	4.40	1.80	4.20	6.80	1.90	3.20	3.00	55	95			
-				-	-	-	-	-	4.00	2.90	2.10	4.60	5.50	2.20	4.40	4.00	55	100			
-				-	-	-	-	-	4.40	2.00	2.50	5.00	4.10	2.50	-	-	-	-	-		
-				-	-	-	-	-	4.80	1.10	2.80	5.40	2.90	2.80	-	-	-	-	-		
-				-	-	-	-	-	5.20	0.40	3.00	5.80	2.10	3.10	-	-	-	-	-		
166.125.xx.A2				○	0.50	0.80	4.70	1.50	1.20	7.00	1.80	2.80	9.10	3.30	3.40	10.60	3.90	1.40	0.70	55	90
						1.20	4.40	1.90	1.60	6.60	2.20	3.20	8.70	3.70	3.80	10.30	4.30	2.20	1.50	55	95
	1.60	4.00	2.30			2.00	6.20	2.60	3.60	8.40	4.10	4.20	9.90	4.60	2.80	2.00	55	100			
	2.00	3.50	2.60			2.40	5.80	3.00	4.00	8.00	4.50	4.60	9.60	5.00	3.40	3.00	60	100			
	2.40	3.00	3.00			2.80	5.40	3.40	4.40	7.70	4.80	5.00	9.30	5.40	4.20	4.00	60	100			
	2.80	2.70	3.20			3.20	4.90	3.70	4.80	7.30	5.20	5.40	8.90	5.80	-	-	-	-			
	3.20	2.00	3.70			3.60	4.40	4.10	5.20	7.00	5.60	5.80	8.60	6.10	-	-	-	-			
	3.60	1.60	4.10			4.00	3.90	4.50	5.60	6.60	5.90	-	-	-	-	-	-	-			
	4.00	1.30	4.50			4.40	3.50	4.80	6.00	6.20	6.30	-	-	-	-	-	-	-			
	4.40	1.00	4.90			4.80	3.10	5.20	-	-	-	-	-	-	-	-	-	-			
4.80	0.60	5.20	5.20	2.70	5.60	-	-	-	-	-	-	-	-	-	-						
-	-	-	5.60	2.30	5.90	-	-	-	-	-	-	-	-	-	-						
-	-	-	6.00	1.90	6.30	-	-	-	-	-	-	-	-	-	-						

E = narrowest free cross section (water)


Continued on next page.

Example Type + Material no. (xx) = Ordering no.
for ordering: 166.115.xx.A2 + 16 = 166.115.16.A2



Pneumatic atomizing nozzles, **Full cone,** pressure principle, internal mixing **Series 166.1**



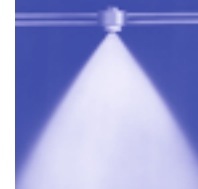
Spray angle 	Ordering no.		E Ø [mm]	Liquid pressure p [bar]												Spray dimensions			
	Type	Mat. no.		0.7			1.5			3.0			4.0			p Air [bar]	p Water [bar]	D ₁ [mm]	D ₂ [mm]
		16		p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]				
20°	166.134.xx.A2	○	0.7	1.20	13.20	2.70	2.00	19.40	3.90	3.00	28.30	5.20	3.80	32.60	6.20	1.80	0.70	55	95
				1.60	12.40	3.30	2.40	18.10	4.40	3.40	27.50	5.70	4.20	32.00	6.80	2.80	1.50	60	105
				2.00	11.80	3.90	2.80	17.30	4.90	3.80	26.70	6.30	4.60	31.30	7.30	3.80	2.00	60	105
				2.40	11.40	4.40	3.20	16.70	5.50	4.20	25.90	6.80	5.00	30.60	7.80	5.20	3.00	65	110
				2.80	11.10	4.90	3.60	16.10	6.00	4.60	25.00	7.30	5.40	29.90	8.40	6.00	4.00	65	110
				3.20	10.80	5.50	4.00	15.60	6.50	5.00	24.20	7.80	5.80	29.30	8.90				
				3.60	10.60	6.00	4.40	15.20	7.00	5.40	23.60	8.40	-	-	-				
				4.00	10.40	6.50	4.80	15.00	7.60	5.80	23.10	8.90	-	-	-				
				4.40	10.10	7.00	5.20	14.60	8.10	-	-	-	-	-	-				
				4.80	9.90	7.60	5.60	14.10	8.60	-	-	-	-	-	-				
	5.20	9.50	8.10	6.00	13.80	9.10	-	-	-	-	-	-							
	5.60	9.00	8.60	-	-	-	-	-	-	-	-	-							
	6.00	8.50	9.20	-	-	-	-	-	-	-	-	-							
	166.142.xx.A2	○	2.5	1.40	24.20	5.10	1.60	53.40	4.70	3.20	70.80	8.00	3.80	93.20	9.20	0.80	0.70	60	100
				1.80	20.40	6.30	2.00	42.60	5.90	3.60	62.50	9.20	4.20	83.10	10.10	1.60	1.50	65	105
				2.20	20.00	7.20	2.40	35.30	7.20	4.00	55.70	10.60	4.60	75.30	11.30	3.00	2.00	60	105
				2.60	19.30	8.20	2.80	30.40	8.40	4.40	49.30	11.70	5.00	69.00	12.50	4.00	3.00	65	110
				3.00	17.60	9.30	3.20	28.60	9.50	4.80	44.60	12.90	5.40	63.40	13.70	6.00	4.00	65	110
				3.40	16.50	10.40	3.60	28.20	10.50	5.20	41.90	14.10	5.80	57.50	14.90				
				3.80	17.00	11.40	4.00	27.30	11.50	5.60	40.40	15.10	-	-	-				
4.20				16.30	12.40	4.40	25.90	12.50	6.00	39.70	16.10	-	-	-					
4.60				15.10	13.30	4.80	24.30	13.50	-	-	-	-	-	-					
5.00				14.00	14.30	5.20	22.30	14.60	-	-	-	-	-	-					
5.40	13.10	15.30	5.60	21.80	15.70	-	-	-	-	-	-								
5.80	12.40	16.20	6.00	21.40	16.70	-	-	-	-	-	-								

E = narrowest free cross section (water)

Example Type + Material no. (xx) = Ordering no.
for ordering: 166.134.xx.A2 + 16 = 166.134.16.A2



Pneumatic atomizing nozzles, Flat fan, pressure principle, internal mixing Series 166.4



Version with magnetic valve. Particularly fine flat fan atomization with air or gas. Siphon principle. Internal mixing of fluids.

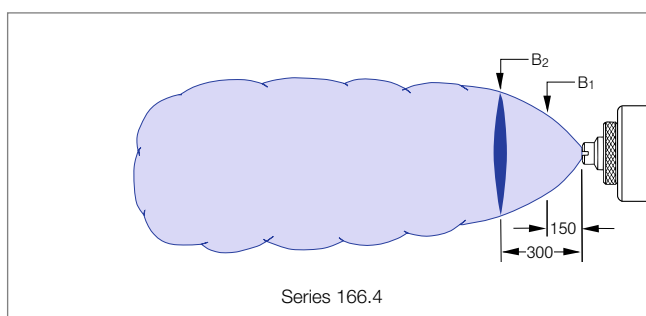
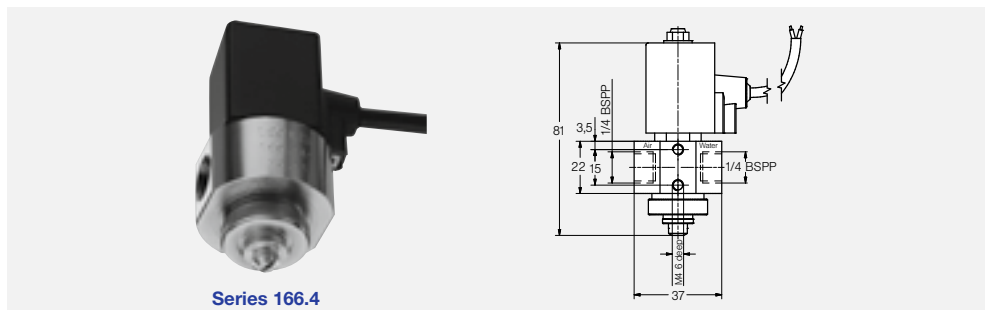
Applications:


Web dampening, cooling, humidification of goods.

Technical Data:

- Service pressure: 0-6 bar
- Voltage: 24 V DC
- Power: 8 W
- Switching frequency: ca. 500/min
- Protective system: IP 67
- Ambient temperature: 10 °C/+50 °C
- Cable length: 1.000 mm
- Material of gasket: EPDM

Accessories for series 166 please refer to page 1.28



Spray angle 	Ordering no.		E Ø [mm]	Liquid pressure p [bar]												Spray dimensions							
	Type	Mat. no. 16		0.7				1.5				3.0				4.0				p Air [bar]	p Water [bar]	B ₁ [mm]	B ₂ [mm]
				p Air [bar]	V Water [l/h]	V _i Air [m³/h]	p Air [bar]	V Water [l/h]	V _i Air [m³/h]	p Air [bar]	V Water [l/h]	V _i Air [m³/h]	p Air [bar]	V Water [l/h]	V _i Air [m³/h]								
45°	166.414.xx.A2	○	0.7	1.00	7.70	1.30	1.40	14.30	1.50	2.20	22.40	2.00	3.00	25.10	2.50	1.40	0.70	85	125				
				1.20	6.00	1.50	1.60	13.00	1.60	2.60	20.00	2.30	3.40	23.00	2.80	2.40	1.50	100	145				
				1.40	4.20	1.70	1.80	11.60	1.80	3.00	17.70	2.60	3.80	20.90	3.10	3.20	2.00	105	155				
				1.60	2.70	1.90	2.00	10.20	2.00	3.40	15.50	3.00	4.20	18.90	3.50	3.80	3.00	120	170				
				1.80	1.30	2.10	2.20	8.90	2.20	3.80	13.30	3.40	4.60	16.90	3.80	4.60	4.00	130	210				
				-	-	-	2.40	7.40	2.40	4.20	11.00	3.70	5.00	14.90	4.20	-	-	-	-	-			
				-	-	-	2.60	5.90	2.60	4.60	8.80	4.10	5.40	12.80	4.60	-	-	-	-	-			
				-	-	-	2.80	4.60	2.80	5.00	6.60	4.50	5.80	10.80	5.00	-	-	-	-	-			
				-	-	-	3.00	3.20	3.00	5.40	4.30	4.90	6.00	9.80	5.20	-	-	-	-	-			
				-	-	-	3.20	2.10	3.20	5.80	2.50	5.30	-	-	-	-	-	-	-	-			
	-	-	-	3.40	1.10	3.40	6.00	1.60	5.50	-	-	-	-	-	-	-	-						
	136.462.xx.A2	○	1.5	1.20	19.00	2.60	2.00	22.00	2.00	3.00	61.80	4.00	3.80	76.10	4.60	1.20	0.70	120	140				
				1.60	12.20	3.40	2.40	18.00	2.40	3.40	51.90	4.80	4.00	70.40	5.10	2.40	1.50	120	170				
				2.00	9.40	4.10	2.80	14.40	2.80	3.80	44.60	5.80	4.20	65.60	5.50	3.20	2.00	120	175				
				2.40	7.10	4.80	3.20	11.30	3.20	4.20	39.00	6.60	4.40	61.30	5.90	3.80	3.00	140	205				
				2.80	5.70	5.40	3.60	8.80	3.60	4.60	33.40	7.40	4.60	57.30	6.40	6.00	4.00	145	205				
				3.20	5.00	6.00	4.00	8.10	3.90	5.00	29.40	8.10	4.80	54.10	6.70	-	-	-	-				
				3.60	3.60	6.60	4.40	6.20	4.30	5.40	25.50	8.90	5.00	51.30	7.20	-	-	-	-				
				4.00	3.20	7.20	4.80	4.60	4.60	5.80	22.00	9.60	5.20	49.30	7.70	-	-	-	-				
				4.40	2.20	7.80	5.20	3.20	4.90	6.00	20.60	9.90	5.40	46.50	8.20	-	-	-	-				
-				-	-	5.60	1.60	5.30	-	-	-	5.60	43.70	8.60	-	-	-	-	-				
-	-	-	5.80	0.80	5.40	-	-	-	5.80	41.30	8.90	-	-	-	-	-							
-	-	-	-	-	-	-	-	-	6.00	39.00	9.30	-	-	-	-	-							

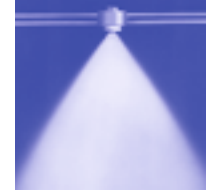
E = narrowest free cross section (water)


Continued on next page.

Example Type + Material no. (xx) = Ordering no.
for ordering: 166.414.xx.A2 + 16 = 166. 414. 16. A2



Pneumatic atomizing nozzles, **Flat fan,** pressure principle, internal mixing **Series 166.4**



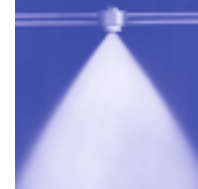
Spray angle 	Ordering no.		E Ø [mm]	Liquid pressure p [bar]												Spray dimensions							
	Type	Mat. no.		0.7			1.5			3.0			4.0			p Air [bar]	p Water [bar]	B ₁ [mm]	B ₂ [mm]				
		16		p Air [bar]	v̇ Water [l/h]	v̇ Air [m³/h]	p Air [bar]	v̇ Water [l/h]	v̇ Air [m³/h]	p Air [bar]	v̇ Water [l/h]	v̇ Air [m³/h]	p Air [bar]	v̇ Water [l/h]	v̇ Air [m³/h]								
60°	166.425.xx.A2	○	0.5	0.80	6.50	1.20	1.40	9.40	1.70	2.40	13.20	2.50	2.40	16.10	2.50	1.20	0.70	155	195				
				1.20	5.50	1.60	1.80	8.70	2.10	2.60	12.90	2.70	2.80	15.50	2.90	2.20	1.50	165	255				
1.60				4.70	1.90	2.20	7.90	2.40	3.00	12.30	3.00	3.20	15.00	3.20	3.00	2.00	170	265					
2.00				4.00	2.30	2.60	7.20	2.70	3.40	11.80	3.40	3.60	14.50	3.50	3.40	3.00	200	330					
2.40				3.20	2.60	3.00	6.40	3.10	3.80	11.10	3.70	4.00	13.90	3.80	5.60	4.00	200	330					
2.80				2.60	2.90	3.40	5.70	3.40	4.20	10.40	4.00	4.40	13.40	4.10									
3.00				2.20	3.10	3.80	5.10	3.70	4.60	9.80	4.30	4.80	12.80	4.50									
-				-	-	4.00	4.80	3.90	5.00	9.20	4.60	5.20	12.20	4.80									
-				-	-	4.40	4.20	4.20	5.40	8.60	5.00	5.60	11.70	5.10									
-				-	-	4.80	3.60	4.50	5.80	8.10	5.30	6.00	11.20	5.40									
-				-	-	5.20	2.80	4.80	6.00	7.80	5.40	-	-	-									
-				-	-	5.60	2.20	5.10	-	-	-	-	-	-									
-	-	-	6.00	1.60	5.50	-	-	-	-	-	-												
60°	166.452.xx.A2	○	1.5	1.00	18.80	3.90	1.80	31.00	5.30	3.20	50.10	7.70	3.80	70.70	8.20	1.00	0.70	130	185				
				1.40	8.60	5.70	2.00	25.40	6.30	3.60	39.50	9.40	4.20	58.60	9.60	1.80	1.50	150	240				
				1.80	7.40	7.00	2.20	20.10	7.20	4.00	31.30	11.20	4.60	48.60	11.20	2.60	2.00	155	245				
				2.20	4.10	8.40	2.40	15.50	8.00	4.40	24.00	12.90	5.00	41.20	13.10	3.60	3.00	175	280				
				2.60	1.00	9.80	2.60	12.40	8.90	4.80	17.70	14.50	5.40	33.60	14.80	5.00	4.00	180	285				
				2.80	0.10	10.30	2.80	10.40	9.60	5.20	13.40	16.00	5.80	27.50	16.40								
				-	-	-	-	-	-	5.60	10.60	17.50	6.00	24.40	17.20								
				-	-	-	-	-	-	6.00	8.60	18.80	-	-	-								
				80°	166.433.xx.A2	○	0.4	1.00	11.60	2.00	1.80	18.30	2.80	3.00	31.00	3.70	3.80	37.50	4.40	1.40	0.70	150	210
								1.20	8.10	2.40	2.00	15.30	3.20	3.40	25.40	4.40	4.20	32.40	5.00	2.20	1.50	185	255
								1.40	5.30	2.80	2.20	12.20	3.60	3.80	20.60	5.10	4.60	27.70	5.70	3.00	2.00	205	300
								1.60	3.70	3.20	2.40	9.80	4.00	4.20	16.30	5.90	5.00	23.40	6.50	3.80	4.00	300	485
-	-	-	2.60					7.60	4.30	4.60	12.50	6.60	5.40	19.40	7.20	5.20	4.00	260	395				
-	-	-	2.80					5.90	4.70	5.00	9.30	7.30	5.80	15.90	7.90								
-	-	-	3.00					4.40	5.00	5.40	6.50	8.00	6.00	14.20	8.30								

E = narrowest free cross section (water)

Example **Type** + **Material no. (xx)** = **Ordering no.**
for ordering: 166.425.xx.A2 + 16 = 166.425.16.A2



Pneumatic atomizing nozzles, Flat fan, pressure principle, external mixing Series 166.6



Version with magnetic valve.
Fine flat fan atomization with the aid of air or gas.
Liquid pressure principle.
External mixing of fluids.

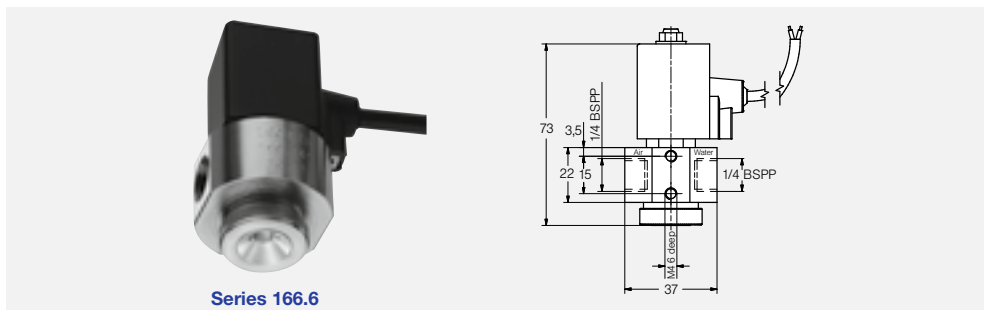
Applications:

Web dampening, cooling, humidification of goods, atomization of viscous liquids.

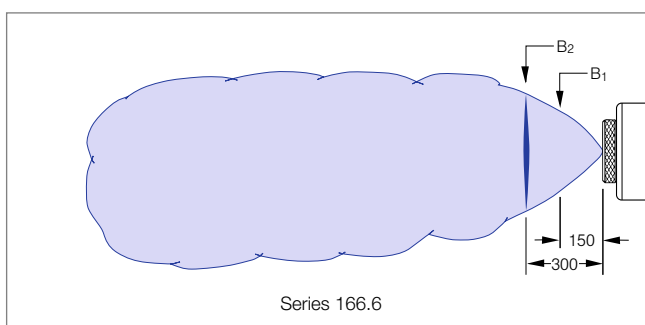
Technical Data:

- Service pressure: 0-6 bar
- Voltage: 24 V DC
- Power: 8 W
- Switching frequency: ca. 500/min
- Protective system: IP 67
- Ambient temperature: 10 °C/+50 °C
- Cable length: 1.000 mm
- Material of gasket: EPDM

Accessories for series 166 please refer to page 1.28



Series 166.6



Series 166.6

Spray angle 	Ordering no.		E 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 ₁ [mm]	B ₂ [mm]	
		16		p Air [bar]	V̇ Water [l/h]	V̇ _r Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ _r Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ _r Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ _r Air [m³/h]					
45°	166.616.xx.A2	○	0.4	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								
	166.654.xx.A2	○	0.7	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	-	-	-	-	-	-									


E = narrowest free cross section (water)

Continued on next page.



Pneumatic atomizing nozzles, Flat fan, pressure principle, external mixing Series 166.6



Spray angle 	Ordering no.		E 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 ₁ [mm]	B ₂ [mm]	
		16		p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]	p Air [bar]	V̇ Water [l/h]	V̇ Air [m³/h]					
60°	166.626.xx.A2	○	0.4	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								
	166.682.xx.A2	○	1.5	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	-	-	-	-	-	-	-	-	-								
	166.691.xx.A2	○	2.5	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	-	-	-	-	-	-	-	-	-						

E = narrowest free cross section (water)

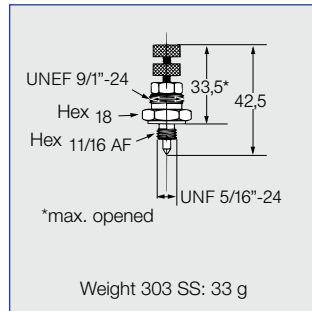
Example Type + Material no. (xx) = Ordering no.
for ordering: 166.626.xx.A2 + 16 = 166.626.16.A2



Accessories for pneumatic atomizing nozzles

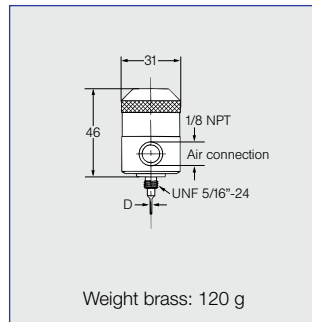
Series 136.1 - 136.6

Regulating device and shutting-off needle:



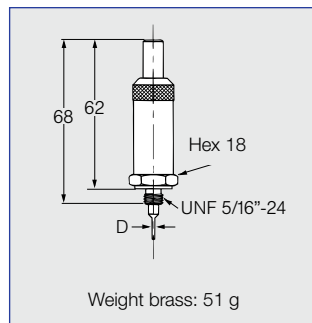
Ordering no.		For all nozzles of the series 136
Type	Mat. no.	
	16	
	303 SS	
015.600	○	

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



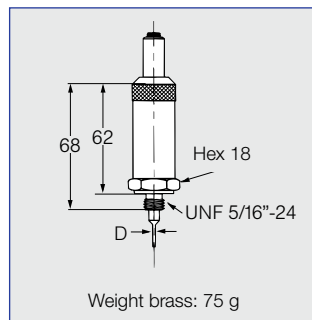
Ordering no.			For nozzles	Needle diameter D [mm]
Type	Mat. no.			
	16	35		
	303 SS	Brass plated		
013.601.xx.10	○	○	136.xx1	2.1
013.602.xx.10	○	○	136.xx2	1.2
013.603.xx.10	○	○	136.xx3	0.8
013.604.xx.10	○	○	136.xx4	0.6
013.605.xx.10	○	○	136.xx5	0.4
013.606.xx.10	○	○	136.xx6	0.3

Quick-cleaning device



Ordering no.			For nozzles	Needle diameter D [mm]
Type	Mat. no.			
	16	35		
	303 SS	Brass plated		
013.601.xx.20	○	○	136.xx1	2.1
013.602.xx.20	○	○	136.xx2	1.2
013.603.xx.20	○	○	136.xx3	0.8
013.604.xx.20	○	○	136.xx4	0.6
013.605.xx.20	○	○	136.xx5	0.4
013.606.xx.20	○	○	136.xx6	0.3

Regulating device with quick-cleaning needle



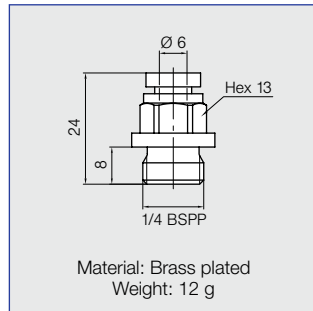
Ordering no.			For nozzles	Needle diameter D [mm]
Type	Mat. no.			
	16	35		
	303 SS	Brass plated		
013.601.xx.30	○	○	136.xx1	2.1
013.602.xx.30	○	○	136.xx2	1.2
013.603.xx.30	○	○	136.xx3	0.8
013.604.xx.30	○	○	136.xx4	0.6
013.605.xx.30	○	○	136.xx5	0.4
013.606.xx.30	○	○	136.xx6	0.3

Example **Type** + **Material no. (xx)** = **Ordering no.**
for ordering: 013.601.xx.10 + 16 = 013.601.16.10



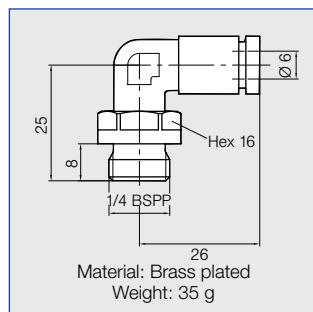
Accessories for pneumatic atomizing nozzles Series 136 and 166

Screwed connection for hose diameter 6 mm



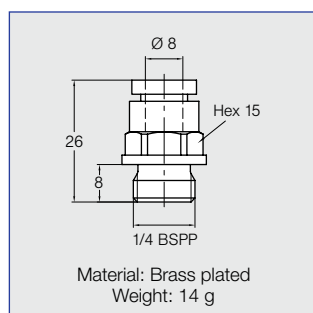
Ordering no.	For all nozzles of the series 136 and 166
095.016.35.11.79.0	

Angled screwed connection for hose diameter 6 mm



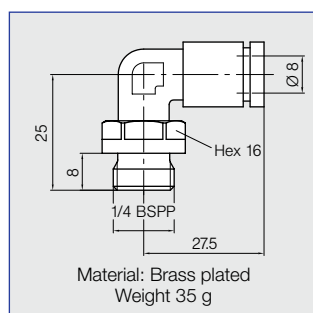
Ordering no.	For all nozzles of the series 136 and 166
095.016.35.13.13.0	

Screwed connection for hose diameter 8 mm



Ordering no.	For all nozzles of the series 136 and 166
095.016.35.11.80.0	

Angled screwed connection for hose diameter 8 mm



Ordering no.	For all nozzles of the series 136 and 166
095.016.35.13.14.0	

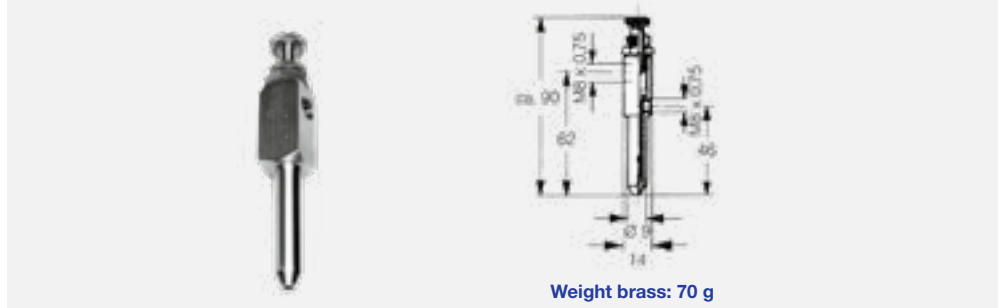



Pneumatic atomizing nozzles, **Full cone,** siphon principle, internal mixing **Series 140**

Particularly fine full cone atomization. Siphon principle. Internal mixing of fluids. Integrated regulating device.

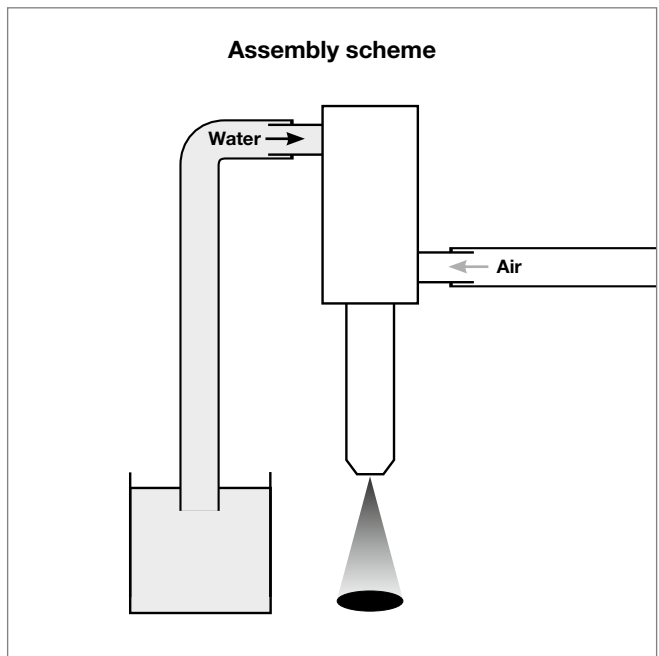
Applications:

Lubrication, cooling, humidification of air.


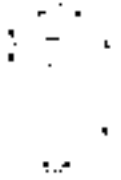


Spray angle 	Ordering no.	E Ø [mm]		Hs Aspiration-height [mm WS]	$\dot{V}_W = \text{Liquid}$ $\dot{V}_L = \text{Air}$							
		p [bar] Air Pressure										
		0.5			1.0		2.0		3.0			
	Type	Water	Air		W [l/h]	L [m³/h]	W [l/h]	L [m³/h]	W [l/h]	L [m³/h]	W [l/h]	L [m³/h]
20° - 30°	140.252.30.01	0.50	0.75	500 200	- 4.50	- 2.50	4.50 7.00	4.00 4.00	8.00 10.00	6.00 6.00	10.50 12.00	8.00 8.00

E = narrowest free cross section (water)



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™

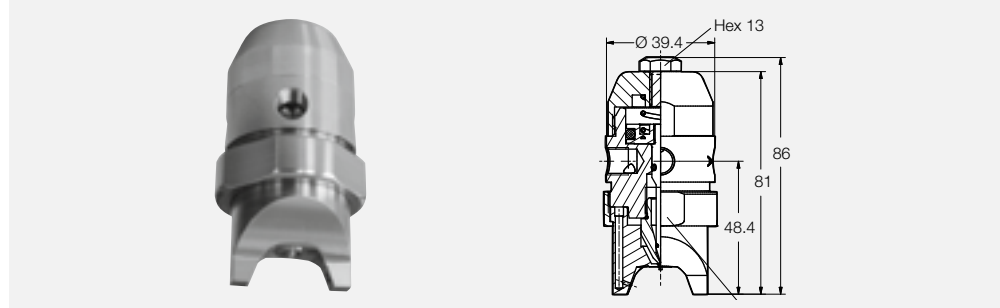


The ViscoMist™ series offers independent regulation of both atomizing air and fan air, which provides the user with infinite control over the viscous fluid's spray pattern and droplet size.

The ViscoMist™ nozzle features a standard 'Liquid Shut-Off/ Clean-Out Needle' function. This design element activates and deactivates the liquid supply, while simultaneously removing excess fluid from the fluid nozzle preventing clogging. This feature is especially vital when the viscous liquids are being applied in continuous process environments.

The modular design of the ViscoMist™ allows maximum flexibility to meet the exact spray requirements.

Interchangeable air caps and various flow capacities are available to suit any spraying application needs.



One nozzle – three spray characters

- – Solid stream
- Full cone
- Flat fan
- Independent regulation of liquid, atomizing air and fan air
- Fluid circulation possible (Nozzle body with 5 connections)

Outside mixing to spray viscous liquids, for example:

- Coating
- Moisturising
- Lubrication
- Glazing
- Sanitising

Fluid cap options

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 (short term)

180 cycles/min

Material

1Y (316L SS)

Ports

01 (1/8 NPT (F))
11 (1/8 BSPP (F))

Flow rate range

- Water: 7.8 to 307 l/h, at 2 bar
- Air: 7.5 to 32 m³/h i.N., at 2 bar

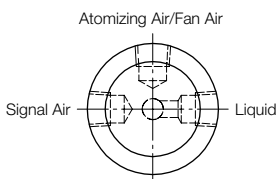


Atomizing air/Fan air/Signal air

The atomizing air causes the liquid to atomize at the nozzle orifice. The spray character can be adjusted with the fan air to suit the application. The signal air activates the nozzle.

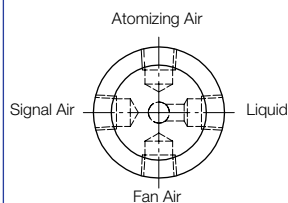
Nozzle body configurations

Nozzle body configuration 2



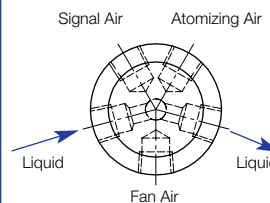
3 connections

Nozzle body configuration 4



4 connections

Nozzle body configuration 5



5 connections

ENGINEERING
YOUR SPRAY SOLUTION



Hollow cone nozzles

- Absorption
- Chemical process engineering
- Cooling
- Disinfection
- Desuperheating
- Dust control
- Fire protection
- Foam destruction
- Gas treatment
- Humidification of air
- Humidification of goods
- Humidification of textiles
- Oil spraying
- Protection of storage tanks
- Spraying onto filters
- Spraying over germinating boxes
- Water recooling
- and many others...



Hollow cone nozzles

Axial-flow hollow cone nozzles	Series		\dot{V} [l/min] at p = 2 bar	Connection	Application/ Design	Page
	220	60° 80°	0.013 – 0.390 (at p = 5 bar)	1/4 BSPP	Disinfection, humidification, cooling. Extremely fine, fog-like hollow cone spray.	2.5
	226	60° 80°	0.013 – 0.390 (at p = 5 bar)	Assembly with 3/8 retaining nut	Disinfection, humidification, cooling. Hollow cone nozzle for assembly with retaining nut. Extremely fine, fog-like hollow cone spray.	2.6
	214	60° 80°	0.08 – 0.32	1/8 BSPP	Cooling and cleaning of air and gas, dust control, spraying onto filters, spray drying, desuperheating.	2.7
	216	60° 90°	0.40 – 8.50	3/8 BSPP		
	2TR	80°	0.16 – 1.57	Assembly with 3/8 retaining nut	Humidification of air, cooling and cleaning of gases, dust control, spraying onto filters. Fine, uniform hollow cone spray.	2.8
Tangential-flow hollow cone nozzles	Series		\dot{V} [l/min] at p = 2 bar	Connection	Application/ Design	Page
	302	60° 80° 90° 130°	0.40 – 25.00	3/8 BSPP	Humidification of air in air washers, dust control, spraying onto filters, foam control, cooling. Non-clogging nozzle design, without swirl insert.	2.9 2.10



Hollow cone nozzles

Tangential-flow hollow cone nozzles	Series		\dot{V} [l/min] at p = 2 bar	Connection	Application/ Design	Page
	308	90°	0.63 – 3.15	3/8 BSPP	Foam destruction, dust control. Flow rate adjustable.	2.9
	302 with bayonet-quick-release system	45° 60° 80° 90° 130°	0.40 – 3.15	Assembly with bayonet quick-release system.	Humidification of air in air washers, dust control, spraying onto filters, foam control, cooling. Quick and safe assembly with the aid of a bayonet quick-lock system. Automatic setting of spray plane. A time-saving alternative to threaded nozzle designs.	2.11
	350	130°	0.63 – 3.15	3/8 BSPP or quick-lock	Humidification of air in air washers, dust control, spraying onto filters, foam control. Extremely fine atomization with a narrow droplet distribution.	2.12
	304 306 307	90° 130°	5.60 – 33.50	1/2 BSPP 3/4 BSPP	Fire fighting, protection of storage tanks, foam control. Non-clogging nozzle design, without swirl insert.	2.13
	373 "Ramp Bottom"	70° 80° 90°	63.00 – 227.00	1 BSPP 1 1/4 BSPP 1 1/2 BSPP	Cooling and cleaning of gas, dust control, water recooling, chemical process engineering. Longer service life thanks to the patented »ramp bottom« design of the mixing chamber.	2.14



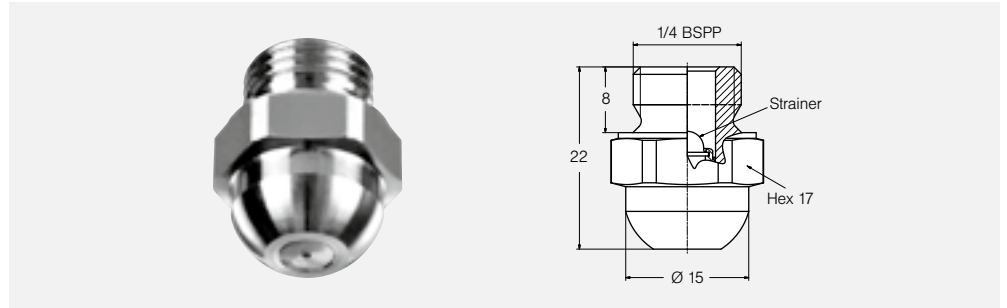
Axial-flow hollow cone nozzles Series 220





Extremely fine, fog-like hollow cone spray.

Applications:

Disinfection, humidification, cooling.



Hollow cone nozzles

Spray angle 	Ordering no.				B Ø [mm]	E Ø [mm]	Mesh size [mm]	V̇ [l/min]								Spray diameter D at p = 5 bar  H = 100 mm
	Type	Mat. no.		Code				p [bar]								
		11 430F SS*	1Y 316L SS*					1/4 BSPP	2.0	3.0	5.0	7.0	10.0	20.0	50.0	
60°	220.004	○	○	AC	0.10	0.10	0.04	-	-	0.013	0.015	0.018	0.026	0.041	0.058	100
	220.014	○	○	AC	0.15	0.15	0.04	-	0.015	0.019	0.022	0.027	0.038	0.060	0.085	100
	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	100
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	140
	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	140
	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	140
	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	140
	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	140
	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	140
	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	140
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	140	

B = bore diameter · E = narrowest free cross section

Example Type + Material-no. + Code = Ordering no.
for ordering: 220.004 + 1Y + AC = 220.004.1Y.AC

The integrated strainer avoids clogging of the nozzle and increases its service life.

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to »Accessories«.

*** Materials**

Mat. no.	Housing	Nozzle insert	Strainer
11	430F SS	430F SS	316L SS
1Y	316L SS	316L SS	316L SS

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



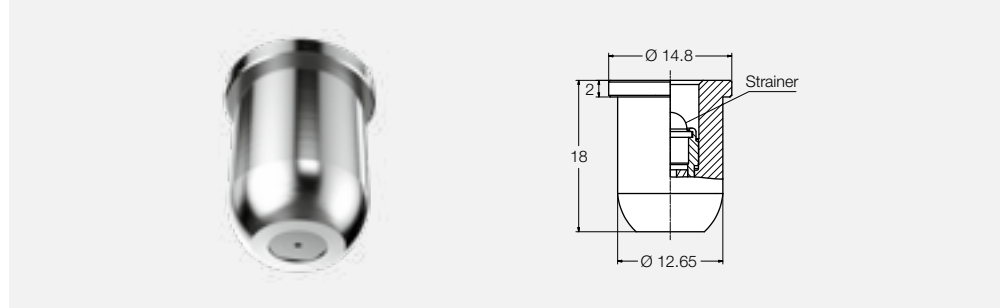
Axial-flow hollow cone nozzles for retaining nut Series 226





Hollow cone nozzle for assembly with retaining nut. Extremely fine, fog-like hollow cone spray.

Applications:

Disinfection, humidification, cooling.



Spray angle 	Ordering no.		B Ø [mm]	E Ø [mm]	Mesh size [mm]	V̇ [l/min]								Spray diameter D at p = 5 bar  H = 100 mm
	Type	Mat. no.				p [bar]								
		16 303 SS*				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	100
	226.014	○	0.15	0.15	0.04	-	0.015	0.019	0.022	0.027	0.038	0.060	0.085	100
	226.054	○	0.20	0.15	0.04	0.017	0.021	0.027	0.032	0.038	0.054	0.085	0.121	100
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	140
	226.125	○	0.35	0.35	0.10	0.039	0.048	0.062	0.073	0.088	0.124	0.196	0.277	140
	226.145	○	0.40	0.40	0.10	0.052	0.064	0.082	0.097	0.116	0.164	0.259	0.367	140
	226.165	○	0.45	0.45	0.10	0.065	0.080	0.103	0.122	0.146	0.206	0.326	0.461	140
	226.185	○	0.55	0.35	0.20	0.082	0.101	0.130	0.154	0.184	0.260	0.411	0.581	140
	226.205	○	0.60	0.35	0.20	0.106	0.130	0.168	0.199	0.238	0.336	0.531	0.751	140
	226.245	○	0.70	0.50	0.20	0.165	0.202	0.261	0.309	0.369	0.522	0.825	1.167	140
	226.285	○	0.90	0.55	0.20	0.247	0.302	0.390	0.461	0.552	0.780	1.233	1.744	140

B = bore diameter · E = narrowest free cross section

Example for ordering: Type **226.004** + Material-no. **16** = Ordering no. **226.004.16**

The integrated strainer avoids clogging of the nozzle and increases its service life.

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to »Accessories«.

*** Materials**

Mat. no.	Housing	Nozzle insert	Strainer
16	303 SS	430F SS	316L SS



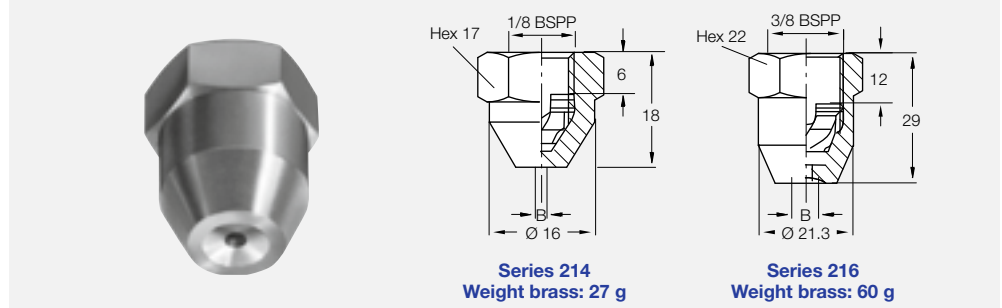
Axial-flow hollow cone nozzles Series 214/216





Fine, uniform hollow cone spray.

Applications:

Cooling and cleaning of air and gas, dust control, spraying onto filters, spray drying, desuperheating.



Hollow cone nozzles

Spray angle 	Ordering no.		G	B Ø [mm]	E Ø [mm]	V̇ [l/min]							Spray diameter D at p = 3 bar  H = 250 mm	
	Type	Mat. no.				p [bar]								
		17 316Ti SS				30 Brass	0.5	1.0	2.0	3.0	5.0	10.0		20.0
60°	214.184	○	○	1/8	0.50	0.50	-	-	0.08	0.10	0.13	0.18	0.25	200
		○	○				-	-	0.16	0.20	0.25	0.36	0.51	
80°	214.245	○	○	1/8	1.00	0.50	-	-	0.16	0.20	0.25	0.36	0.51	450
		○	○				-	0.23	0.32	0.39	0.51	0.72	1.01	
60°	216.324	○	○	3/8	1.00	1.00	-	0.28	0.40	0.49	0.63	0.89	1.26	200
		○	○				-	0.45	0.63	0.77	1.00	1.41	1.99	
		○	○				-	0.71	1.00	1.22	1.58	2.24	3.16	
90°	216.496	○	○	3/8	3.00	2.00	-	1.20	1.70	2.08	2.69	3.80	5.38	500
		○	○				-	1.77	2.50	3.06	3.95	5.59	7.91	
		○	○				2.00	2.83	4.00	4.90	6.32	8.94	12.65	
		○	○				2.50	3.54	5.00	6.12	7.91	11.18	15.81	
		○	○				3.15	4.45	6.30	7.72	9.96	14.09	19.92	
		○	○				4.30	6.00	8.50	10.40	13.40	19.00	26.90	

B = bore diameter · E = narrowest free cross section

Example for ordering	Type	+	Material no.	=	Ordering no.
	214.184	+	17	=	214.184.17

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to »Accessories«.

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



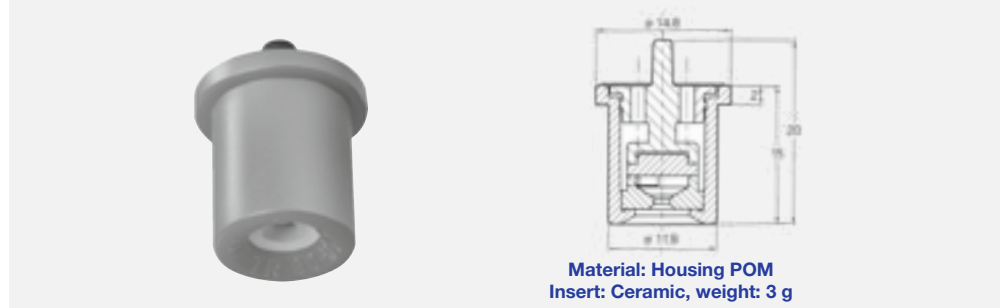
Axial-flow hollow cone nozzles for retaining nut Series 2TR





Hollow cone nozzle with ceramic insert. Assembly with retaining nut. Fine, uniform hollow cone spray.

Applications:

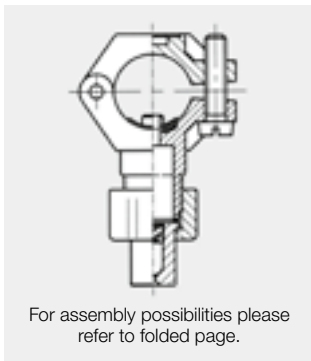
Humidification of air, cooling and cleaning of gases, dust control, spraying onto filters.



**Material: Housing POM
Insert: Ceramic, weight: 3 g**

Spray angle 	Ordering no. Type	Colour	B Ø [mm]	E Ø [mm]	Ṃ [l/min]						Spray diameter D at p = 3 bar  H = 250 mm
					p [bar] [p _{max} = 20 bar]						
					1.0	2.0	3.0	5.0	7.0	10.0	
80°	2TR.245.C8	lilac	0.65	0.55	-	0.16	0.20	0.25	0.30	0.36	450
	2TR.275.C8	black	0.80	0.70	0.16	0.22	0.27	0.35	0.41	0.49	450
	2TR.305.C8	orange	0.90	0.80	0.23	0.32	0.39	0.51	0.60	0.72	450
	2TR.345.C8	green	1.10	0.90	0.34	0.48	0.59	0.76	0.90	1.07	450
	2TR.365.C8	yellow	1.40	0.95	0.45	0.63	0.78	1.01	1.19	1.42	450
	2TR.405.C8	blue	1.70	1.10	0.68	0.96	1.17	1.52	1.79	2.14	450
	2TR.445.C8	red	2.00	1.20	0.89	1.26	1.55	2.02	2.37	2.83	450
	2TR.485.C8	brown	2.20	1.30	1.11	1.57	1.94	2.50	2.96	3.54	450

B = bore diameter · E = narrowest free cross section



For assembly possibilities please refer to folded page.

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to »Accessories«.



Tangential-flow hollow cone nozzles

Brass versions

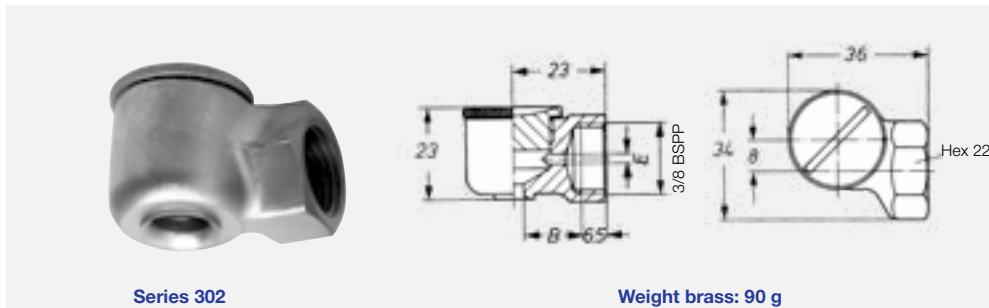
Series 302/308



Uniform hollow cone spray. Non-clogging nozzle, without swirl insert.

Applications:

Humidification of air in air washers, dust control, spraying onto filters, foam control, cooling.



Series 302

Weight brass: 90 g

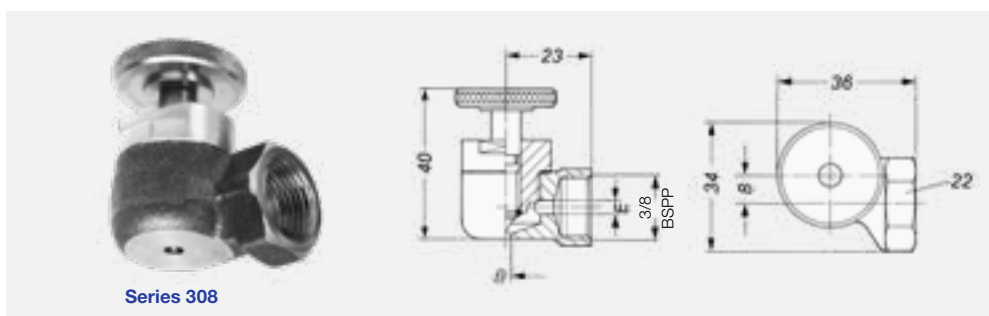
Spray angle	Ordering no.		B Ø [mm]	E Ø [mm]	V̇ [l/min]								Spray diameter D at p = 2 bar		
	Type	Mat. no.			p [bar]								H = 250 mm	H = 500 mm	
		30			1Y	0.5	1.0	2.0	3.0	5.0	7.0	10.0			
60°	302.364	○	-	1.50	1.50	0.31	0.45	0.63	0.77	1.00	1.18	1.41	200	350	
	302.464	○	○	2.00	2.00	0.70	0.99	1.40	1.71	2.21	2.62	3.13	300	560	
80°	302.545	○	○	4.90	2.30	1.12	1.58	2.24	2.74	3.54	4.19	5.01	400	700	
90°	302.606	○	○	4.60	4.00	1.57	2.23	3.15	3.86	4.98	5.89	7.04	450	750	
130°	302.368	○	○	3.00	1.00	0.31	0.45	0.63	0.77	1.00	1.18	1.41	800	1,500	
	302.468	○	○	5.00	1.70	0.70	0.99	1.40	1.71	2.21	2.62	3.13	800	1,500	
	302.548	○	-	5.00	2.50	1.12	1.58	2.24	2.74	3.54	4.19	5.01	800	1,500	
	302.608	○	○	5.00	3.50	1.57	2.23	3.15	3.86	4.98	5.89	7.04	1,000	1,800	
	302.668	○	-	7.50	3.60	2.25	3.18	4.50	5.51	7.12	8.42	10.06	1,200	2,000	
	302.748	○	-	7.50	4.80	3.55	5.02	7.10	8.70	11.23	13.28	15.88	1,200	2,000	

B = bore diameter · E = narrowest free cross section

Flow rate adjustable. Decrease in flow rate causes narrower spray angle.

Applications:

Dust control, foam control.



Series 308

Spray angle	Ordering no.		B Ø [mm]	E Ø [mm]	V̇ _{max} [l/min]						Spray diameter D at p = 2 bar		
	Type	Mat. no.			p [bar]						H = 250 mm	H = 500 mm	
		30			Brass	0.3	0.5	1.0	2.0	5.0			10.0
90°	308.466	○	○	2.0	2.0	0.54	0.70	1.00	1.40	2.21	3.13	400	880
	308.606	○	○	4.0	4.0	1.22	1.58	2.23	3.15	4.98	7.04	450	950

B = bore diameter · E = narrowest free cross section

Example for ordering	Type	+	Material no.	=	Ordering no.
	308. 466	+	30	=	308. 466. 30

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



Tangential-flow hollow cone nozzles

Plastic version

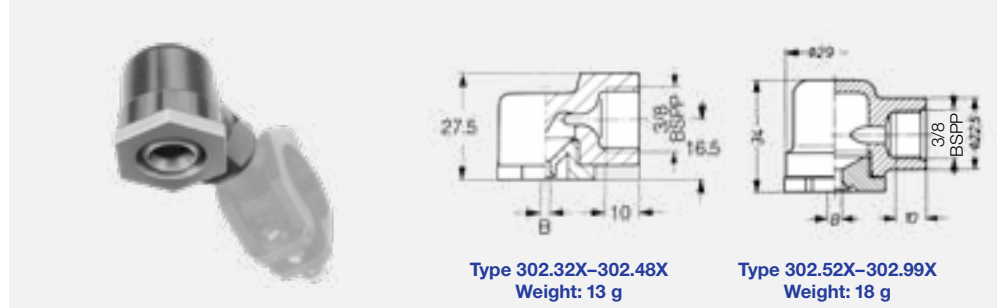
Series 302



Uniform hollow cone spray. Non-clogging nozzle, without swirl insert.



Applications:

Humidification of air in air washers, dust control, spraying onto filters, foam control, cooling.



Type 302.32X-302.48X
Weight: 13 g

Type 302.52X-302.99X
Weight: 18 g

Spray angle 	Ordering no.				B ∅ [mm]	E ∅ [mm]	V̇ [l/min]						Spray diameter D at p = 2 bar 	
	Type	Mat. no.					p [bar]						H = 250 mm	H = 500 mm
		5E	51	53			0.5	1.0	2.0	3.0	5.0	10.0		
		PVDF	PA	PP										
60°	302.364	-	○	○	1.30	1.30	0.31	0.45	0.63	0.77	1.00	1.41	200	350
	302.464	-	○	○	1.95	1.95	0.70	0.99	1.40	1.71	2.21	3.13	300	560
90°	302.326	○	○	-	1.05	1.05	0.20	0.28	0.40	0.49	0.63	0.89	400	700
	302.366	○	○	-	1.30	1.30	0.31	0.45	0.63	0.77	1.00	1.41	400	880
	302.406	○	○	○	1.55	1.55	0.50	0.71	1.00	1.22	1.58	2.24	400	880
	302.486	-	○	○	2.10	2.10	0.80	1.13	1.60	1.96	2.53	3.58	400	880
	302.526	-	○	○	5.00	2.00	1.00	1.41	2.00	2.45	3.16	4.47	400	880
	302.566	-	○	○	5.00	2.40	1.25	1.77	2.50	3.06	3.95	5.59	400	880
	302.606	-	○	○	5.00	3.20	1.57	2.23	3.15	3.86	4.98	7.04	450	950
	302.686	-	○	-	7.50	3.40	2.50	3.45	5.00	6.12	7.91	11.18	500	1,050
	302.766	-	○	-	9.00	4.30	4.00	5.66	8.00	9.80	12.65	17.89	500	1,050
	302.846	-	○	○	11.00	5.20	6.25	8.84	12.50	15.31	19.67	27.95	550	1,130
	302.886	○	○	○	11.00	6.40	8.00	11.31	16.00	19.60	25.30	35.78	550	1,130
	302.966	-	○	-	11.00	8.60	12.50	17.68	25.00	30.62	39.53	55.90	550	1,130
130°	302.328	○	-	-	1.35	0.80	0.20	0.28	0.40	0.49	0.63	0.89	700	1,380
	302.368	○	○	-	1.85	1.10	0.31	0.45	0.63	0.77	1.00	1.41	700	1,380
	302.408	○	○	-	3.65	1.30	0.50	0.71	1.00	1.22	1.58	2.24	700	1,380
	302.488	-	○	○	5.20	1.60	0.80	1.13	1.60	1.96	2.53	3.58	700	1,380
	302.528	-	○	-	5.00	2.00	1.00	1.41	2.00	2.45	3.16	4.47	700	1,380
	302.568	-	○	-	5.00	2.40	1.25	1.77	2.50	3.06	3.95	5.59	780	1,520
	302.608	○	○	○	5.00	3.20	1.57	2.23	3.15	3.86	4.98	7.04	780	1,520
	302.648	-	○	-	7.50	3.00	2.00	2.83	4.00	4.90	6.32	8.94	950	1,850
	302.688	-	○	-	7.50	3.40	2.50	3.54	5.00	6.12	7.91	11.18	950	1,850
	302.728	-	○	-	7.50	4.10	3.15	4.45	6.30	7.72	9.96	14.09	950	1,850
	302.768	-	○	-	9.00	4.30	4.00	5.66	8.00	9.80	12.65	17.89	950	1,850
	302.848	-	○	-	11.00	5.20	6.25	8.84	12.50	15.31	19.76	27.95	950	1,850
	302.888	-	○	○	11.00	6.40	8.00	11.31	16.00	19.60	25.30	35.78	950	1,850
	302.968	○	○	-	11.00	8.60	12.50	17.68	25.00	30.62	39.53	55.90	950	1,850

B = bore diameter · E = narrowest free cross section

Example for ordering	Type	+	Material no.	=	Ordering no.
	302.364	+	51	=	302.364.51

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to »Accessories«.



Tangential-flow hollow cone nozzles

Bayonet quick-release system

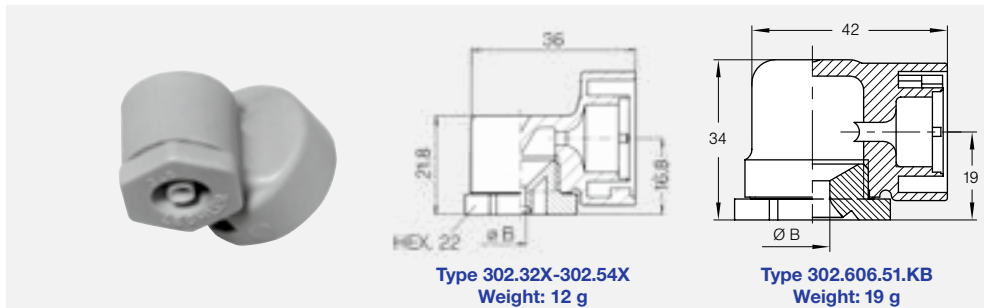
Series 302



A time-saving alternative to threaded design. Quick and secure assembling. Automatic setting of spray direction.

Applications:

Humidification of air in air washers, dust control, spraying onto filters, foam control.



Type 302.32X-302.54X
Weight: 12 g

Type 302.606.51.KB
Weight: 19 g

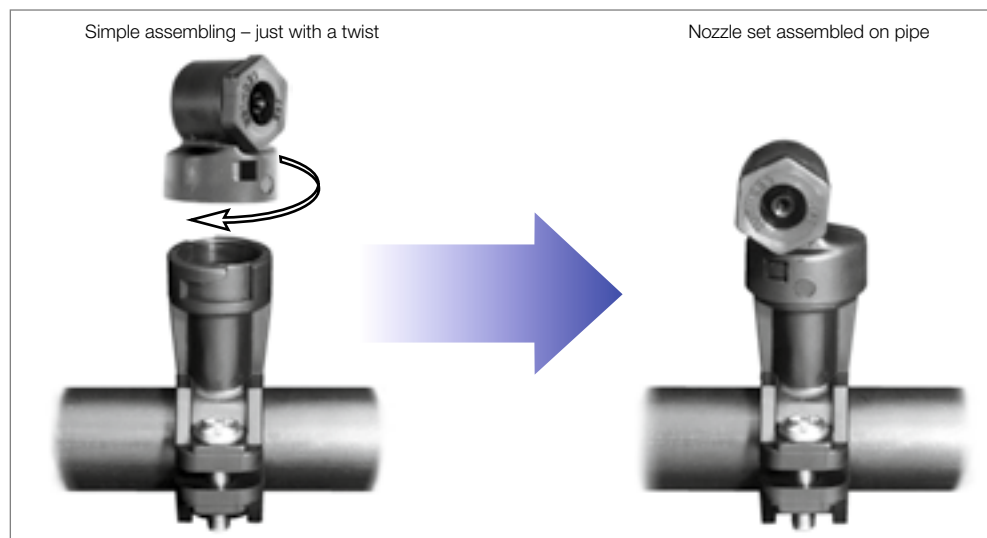
Hollow cone nozzles

Spray angle	Ordering no.				B Ø [mm]	E Ø [mm]	V̇ [l/min]							Spray diameter D at p = 2 bar	
	Type	Mat. no.		Code			p [bar]							H = 250 mm	H = 500 mm
		51	56				0.5	1.0	2.0	US [gal/min] at 40 psi	3.0	4.0	10.0		
45°	302.503	○	-	KB	2.05	2.05	0.90	1.27	1.80	0.56	2.20	2.85	4.02	220	560
60°	302.464	-	○	KB	1.95	1.95	0.70	0.99	1.40	0.43	1.71	2.21	3.13	300	560
80°	302.545	-	○	KB	2.30	2.30	1.12	1.58	2.24	0.69	2.74	3.54	5.01	400	700
90°	302.326	○	○	KB	1.05	1.05	0.20	0.28	0.40	0.12	0.49	0.63	0.89	400	700
	302.406	○	○	KB	1.55	1.55	0.50	0.71	1.00	0.31	1.22	1.58	2.24	400	880
	302.486	○	-	KB	2.10	2.10	0.80	1.13	1.60	0.50	1.96	2.53	3.58	400	880
	302.606	○	-	KB	5.00	3.20	1.58	2.23	3.15	0.98	3.86	4.98	7.04	450	880
130°	302.368	-	○	KB	1.30	1.30	0.31	0.45	0.63	0.20	0.77	1.00	1.41	700	1,380
	302.408	○	○	KB	2.00	2.00	0.50	0.71	1.00	0.31	1.22	1.58	2.24	700	1,380
	302.468	○	-	KB	2.40	2.40	0.70	0.99	1.40	0.43	1.71	2.21	3.13	700	1,380
	302.488	○	-	KB	2.75	2.75	0.80	1.13	1.60	0.50	1.96	2.53	3.58	700	1,380

B = bore diameter · E = narrowest free cross section

Example for ordering: Type 302.503 + Material no. 51 + Code KB = Ordering no. 302.503.51.KB

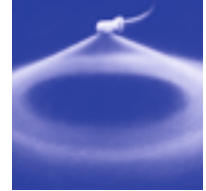
The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to »Accessories«.



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



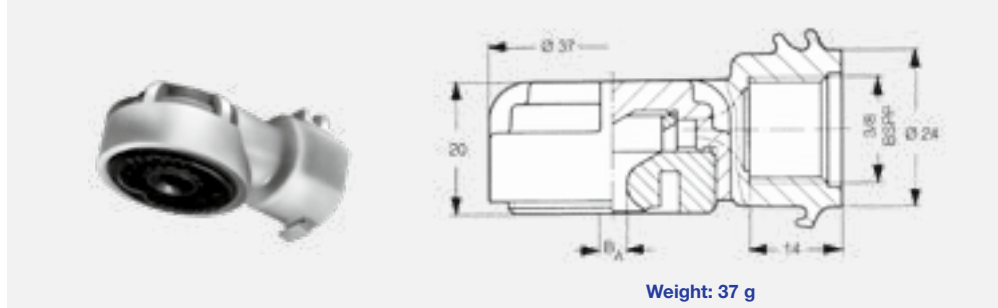
Tangential-flow hollow cone nozzles Series 350





High-performance eccentric spray nozzles for air-conditioning. Narrow drop spectrum and extremely uniform distribution of liquid over the entire spray pattern.

Applications:

Humidification of air in air washers, dust control, spraying onto filters, foam control.



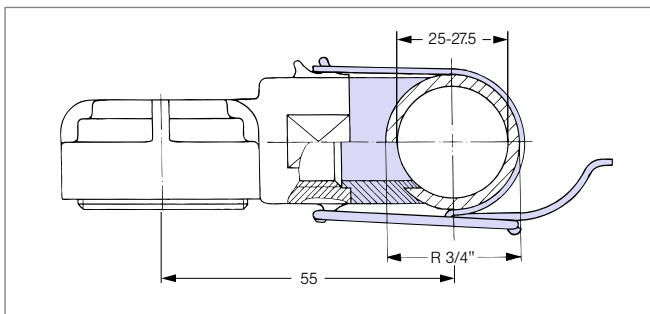
Weight: 37 g

Spray angle 	Ordering no.		B Ø [mm]	E Ø [mm]	V [l/min]							Spray diameter D at p = 2 bar 	
	Type	Mat. no.			p [bar]							p _{max} : 20 bar	
			56			0.5	1.0	2.0	3.0	5.0	7.0	10.0	
130°	350.368	○	1.55	0.70	0.32	0.45	0.63	0.77	1.00	1.18	1.41	1,120	2,000
	350.608	○	5.00	1.40	1.58	2.23	3.15	3.86	4.98	5.89	7.04	1,140	2,100

B = bore diameter · E = narrowest free cross section

Example	Type	+	Material no.	=	Ordering no.
for ordering:	350.368	+	56	=	350.368.56

Accessories



Quick snap clamp unit · **Ord.-no.: 035. 030. 15. 05. 00. 0**
consisting of: Stainless steel clamp and polyurethane gasket



Bore-Ø: 18 mm



Tangential-flow hollow cone nozzles

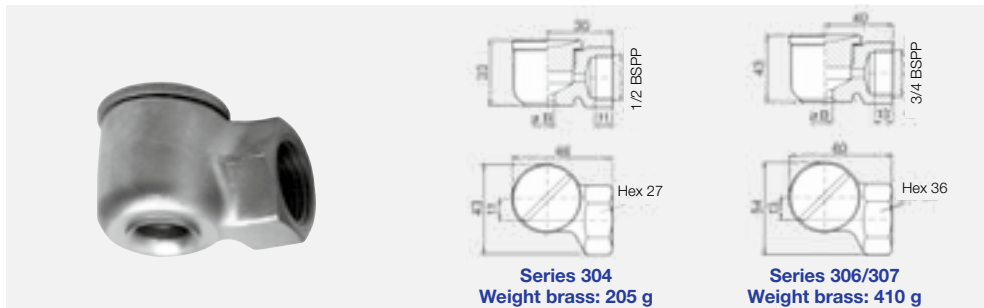
Series 304/306/307



Uniform hollow cone spray. Non-clogging nozzle, without swirl insert.

Applications:

Fire fighting, protection of storage tanks, foam control.



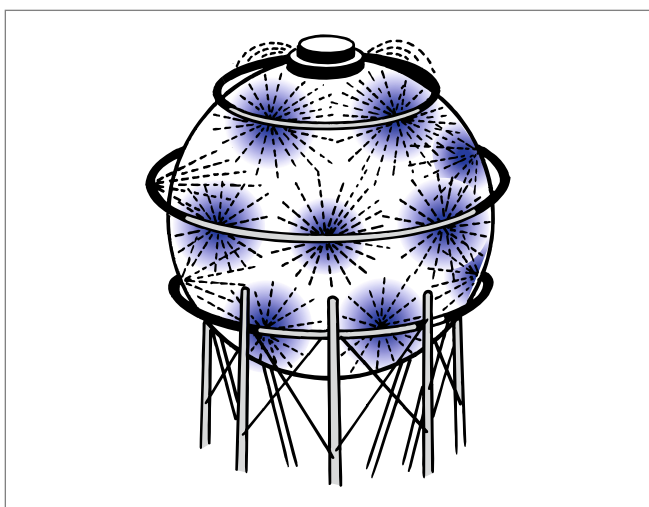
Hollow cone nozzles

Spray angle	Ordering no.		G	B Ø [mm]	E Ø [mm]	V̇ [l/min]								Spray diameter D at p = 2 bar		
	Type	Mat. no.				p [bar]								H = 250 mm	H = 500 mm	
		30				1Y	0.5	1.0	2.0	3.0	5.0	7.0	10.0			
90°	304.706	○	○	1/2	5.10	5.10	2.80	3.96	5.60	6.86	8.85	10.47	12.52	450	750	
	304.796	○	○	1/2	8.90	6.00	4.75	6.72	9.50	11.64	15.02	17.77	21.24	450	750	
	306.906	○	○	3/4	9.00	9.00	9.00	12.73	18.00	22.05	28.46	33.68	40.25	470	850	
	306.976	○	○	3/4	13.50	10.00	13.25	18.74	26.50	32.46	41.90	49.58	59.26	470	850	
130°	304.818	○	-	1/2	12.00	5.00	5.30	7.50	10.60	12.98	16.76	19.83	23.70	1,400	1,800	
	304.898	○	○	1/2	12.00	7.00	8.50	12.02	17.00	20.82	26.88	31.80	38.01	1,400	1,800	
	306.978	○	-	3/4	19.00	7.30	13.25	18.74	26.50	32.46	41.90	49.58	59.25	1,450	2,400	
	307.018	○	○	3/4	19.00	8.60	16.75	23.69	33.50	41.03	52.97	62.67	74.91	1,450	2,400	

B = bore diameter · E = narrowest free cross section

Example for ordering:	Type	+	Material no.	=	Ordering no.
	304.706	+	30	=	304.706.30

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to »Accessories«.



Fire protection on spherical storage tank.



Eccentric hollow cone nozzles Series 373 "Ramp Bottom"

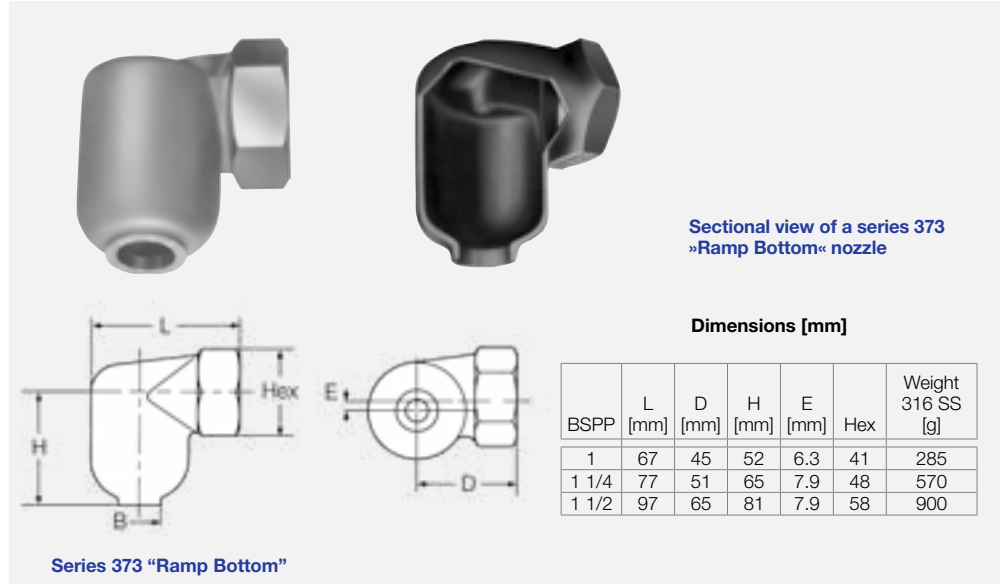




Fine, uniform hollow cone spray, also at low pressures.

Applications:

cooling and cleaning of gas,
water re-cooling, dust control,
chemical process engineering.

»Ramp Bottom« design
offering a longer service
life, due to the patented
»sloping« shape of the swirl
chamber.



Spray angle 	Ordering no.				B Ø [mm]	V̇ [l/min]						Spray diameter D at p=2 bar 		
	Type	Mat. no. 17	Code			p [bar]						H = 500 mm	H = 1000 mm	
			316 SS	1 BSPP		1 1/4 BSPP	1 1/2 BSPP	0.3	0.5	1.0	2.0			5.0
70°	373.115	○	AN	-	-	11.40	24.40	31.50	44.50	63.00	99.60	141.00	650	1,300
80°	373.175	○	AN	-	-	12.90	31.00	40.00	56.60	80.00	126.00	179.00	800	1,550
	373.235	○	-	AQ	-	16.20	45.70	59.00	83.40	118.00	187.00	264.00	700	1,350
	373.285	○	-	AQ	-	20.50	62.00	80.00	113.00	160.00	253.00	358.00	800	1,550
	373.325	○	-	-	AS	22.20	77.50	100.00	141.00	200.00	316.00	447.00	800	1,550
	373.365	○	-	-	AS	23.60	67.90	114.00	161.00	227.00	359.00	508.00	700	1,400

B = bore diameter · E = narrowest free cross section

Example **Type** + **Material no.** + **Code** = **Ordering no.**
for ordering: **373.115** + **17** + **AN** = **373.115.17.AN**

**ENGINEERING
YOUR SPRAY SOLUTION**



Full cone nozzles

- Absorption
- Chemical process engineering
- Chlorine precipitation
- Cleaning
- Cooling
- Desuperheating
- Dust control
- Fire protection
- Foam control
- Gas treatment
- Spraying onto mats in air washers
- Spraying over packings
- Surface spraying
- Water treatment
- and many others...



Full cone nozzles

Axial-flow full cone nozzles

Lechler full cone nozzles have an extraordinarily uniform liquid distribution over the whole circular impact area. The high precision of distribution is achieved by orienting the liquid inlet to the centre of the swirl chamber of the nozzle. The optimized x-style swirl insert ensures a high operating safety due to its large free cross-sections.

Axial-flow full cone nozzles are available with different spray angles and in many flow rates. Therefore, matching to specific service conditions is possible without any difficulties.

- Extremely uniform liquid distribution
- Wide flow rate range
- Large number of available spray angles



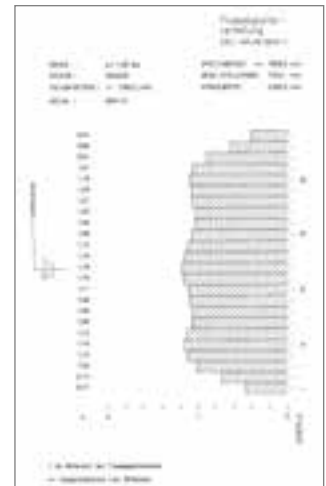
Special design for fire fighting: Deflector-plate nozzle

Tangential-flow full cone nozzles

Tangential-flow full cone nozzles are, for instance, particularly suited for closed-circuit spraying of liquids with a high quota of solid matter, or for fire fighting applications. The atomizing fluid is tangentially supplied to a swirl chamber, where it is put into rotation. Tangential-flow full cone nozzles are free of swirl inserts. Hence, they are not at all prone to clogging. The full cone spray is obtained with

the aid of specially arranged grooves, milled into the nozzle bottom, which cause an adequate part of the rotating liquid flow to diverge to the center of the swirl chamber. Thereby, an extremely uniform area distribution of the sprayed liquid is achieved.

- Reliable in service
- Non-clogging
- Stable spray angles, unaffected by transient pressures

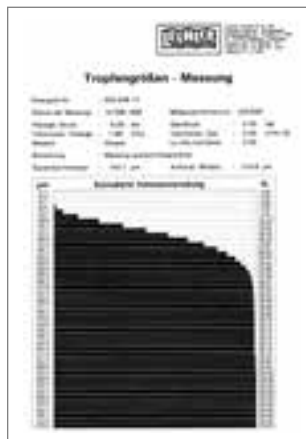


Typical liquid distribution chart

Cluster Head Nozzles

Lechler cluster head nozzles achieve a very large surface of the sprayed liquid by adding various finely atomizing single nozzles. Whenever a fine fog-like full cone atomization with relatively large flow rates is necessary, e.g. gas exchange processes, steam cooling or dust suppression, Lechler cluster head nozzles have decisive advantages: overlapping hollow cones form a fine full cone atomization with an increased droplet surface area. These very fine droplets cannot be achieved by a

single-orifice spray nozzle of the same flow rate size. The increased droplet surface area of the atomized liquid provides great efficiency in gas treatment and cooling applications.










Cumulated volume distribution



Number distribution


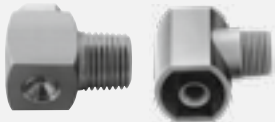







Full cone nozzles

Axial-flow full cone nozzles	Series		\dot{V} [l/min] at p = 2 bar	Connection	Application/ Design	Page
	490 491	45° 60° 90° 120°	0.63 – 71.00	1/8 BSPT 1/4 BSPT 3/8 BSPT 1/2 BSPT 3/4 BSPP 1 BSPP	Cleaning and washing processes, surface spraying, Container cleaning, foam precipitation, degassing of liquids. Non-clogging nozzle design.	3.5
	460 461	60° 90° 120°	0.40 – 50.00	1/8 BSPT 1/4 BSPT 3/8 BSPT 1/2 BSPT 3/4 BSPP 1 BSPP	Cleaning and washing process, cooling of gaseous fluids and solids, surface spraying, spraying onto mats in air washers, improving on chemical reactions. Large free cross-sections, due to optimized x-style swirl insert.	3.7
	405	60° 90° 120°	100.00 – 315.00	1 1/4 BSPP 1 1/2 BSPP 2 BSPP	Surface spraying, spraying over packings, cleaning and washing process, chemical process engineering, cooling of gaseous fluids and solids, water treatment. Uniform full cone spray.	3.9
	403	90° 120°	400.00 – 1250.00	2 1/2 BSPP 3 BSPP 3 1/2 BSPP 4 BSPP	Surface spraying, spraying over packings, cleaning and washing process, chemical process engineering, cooling of gaseous fluids and solids, water treatment. Uniform full cone spray.	3.10
	419	90° 120°	250.00 – 1250.00	2 BSPP 2 1/2 BSPP 3 BSPP	Gas washing, spraying over packings, dust control, absorption, Distillation. Particularly insusceptible to clogging thanks to very large free cross sections. Stable spray angle. Uniform spray pattern.	3.11
	468	60° 90° 120°	0.63 – 12.50	Assembly with 3/8 retaining nut	Surface spraying, spraying over packings, chemical process engineering, cleaning and washing processes, cooling of gaseous fluids and solids. Uniform full cone spray.	3.12



Full cone nozzles

Tangential-flow full cone nozzles	Series		\dot{V} [l/min] at p = 2 bar	Connection	Application/ Design	Page
	422	60°	1.00 – 100.00	1/4 BSPT 3/8 BSPT 1/2 BSPT 3/4 BSPT 1 BSPT	Cleaning and washing process, cooling of gaseous fluids and solids, surface spraying, spraying onto mats in air washers, improving on chemical reactions, continuous casting. Without swirl inserts, non-clogging.	3.13
	423	90° 120°				3.14 3.15
	422 Bayonet quick-release system	60° 90° 120°	1.00 – 4.00	Assembly with bayonet quick-release system	Cleaning problems, cooling process, foam control. Quick and safe assembly, without tools. Space-saving installation.	3.16
Cluster head nozzles	Series		\dot{V} [l/min] at p = 2 bar	Connection	Application/ Design	Page
	502 503	70° 130°	1.25 – 60.00	1/2 BSPP 3/4 BSPP	Cooling of gaseous and solid material, desuperheating, chlorine precipitation, absorption as well as for improvement of chemical reaction by enlarging the contact area. Fine full cone atomization with the aid of several hollow cones spraying into one another.	3.17
Deflector-plate nozzle	Series		\dot{V} [l/min] at p = 2 bar	Connection	Application/ Design	Page
	524 525	180°	10.0 – 140.00	1/2 BSPP	Fire fighting and broadcast spraying. Non-clogging nozzle without swirl inserts.	3.18



Axial-flow full cone nozzles Series 490/491

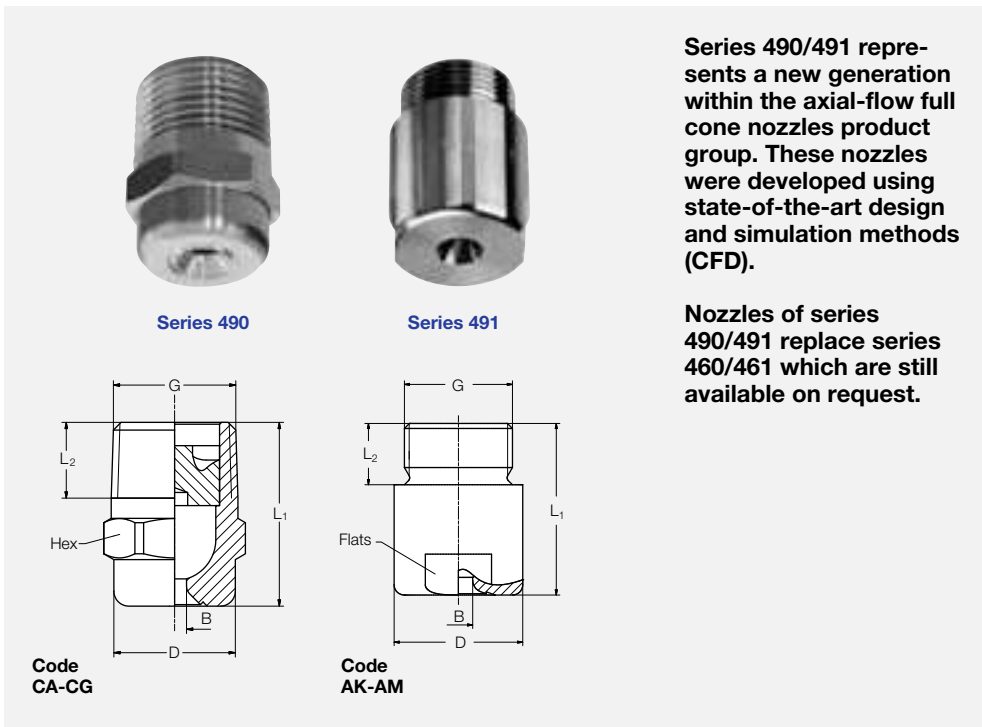
Patented



Non-clogging nozzle design with a very stable spray angle, particularly even liquid distribution and large free cross sections.

Applications:

Cleaning and washing processes, surface spraying, Container cleaning, foam precipitation, degassing of liquids.



Series 490/491 represents a new generation within the axial-flow full cone nozzles product group. These nozzles were developed using state-of-the-art design and simulation methods (CFD).

Nozzles of series 490/491 replace series 460/461 which are still available on request.

Full cone nozzles

Code	Dimensions [mm]					Weight
	G	L ₁	L ₂	D	Hex/Flats	
CA	1/8 BSPT	18.0	6.5	10.0	11	13 g
CC	1/4 BSPT	22.0	10.0	13.0	14	16 g
CE	3/8 BSPT	24.5	10.0	16.0	17	30 g
CE	3/8 BSPT	30.0	10.0	16.0	17	50 g
CG	1/2 BSPT	32.5	13.0	21.0	22	60 g
CG	1/2 BSPT	43.5	13.0	21.0	22	85 g
AK	3/4 BSPP	42.0	15.0	32.0	27	190 g
AM	1 BSPP	56.0	17.0	40.0	36	350 g

Spray angle	Type	Ordering no.								B Ø [mm]	E Ø [mm]	V̇ [l/min]								Spray diameter D at p=2 bar	
		Mat. no.		Code								p [bar]								at p=2 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 = 200 mm	H = 500 mm	
45°	490.403	○	○	CA	-	-	-	-	-	1.25	1.25	0.57	0.76	1.00	1.18	1.44	1.65	1.90	160	400	
	490.523	○	○	CA	-	-	-	-	-	1.70	1.70	1.15	1.52	2.00	2.35	2.89	3.30	3.81	160	400	
	490.603	○	○	-	CC	CE*	-	-	-	2.00	2.00	1.81	2.39	3.15	3.70	4.54	5.20	6.00	160	400	
	490.643	○	○	-	CC	CE*	-	-	-	2.45	2.45	2.30	3.03	4.00	4.70	5.77	6.60	7.61	160	400	
	490.683	-	○	-	-	CE	-	-	-	2.55	2.55	2.87	3.79	5.00	5.88	7.21	8.25	9.52	160	400	
	490.703	-	○	-	-	CE	-	-	-	2.65	2.65	3.22	4.24	5.60	6.59	8.08	9.24	10.66	160	400	
	490.723	○	○	-	-	CE	-	-	-	2.85	2.85	3.62	4.77	6.30	7.41	9.09	10.40	11.99	160	400	
	490.783	-	○	-	-	-	CG	-	-	3.45	3.45	5.17	6.82	9.00	10.58	12.98	14.85	17.12	160	400	
	490.843	-	○	-	-	-	CG	-	-	3.80	3.80	7.18	9.47	12.50	14.70	18.03	20.63	23.80	160	400	
60°	490.404	○	○	CA	-	-	-	-	-	1.15	1.15	0.57	0.76	1.00	1.18	1.44	1.65	1.90	220	560	
	490.444	○	-	CA	-	-	-	-	-	1.25	1.25	0.72	0.95	1.25	1.47	1.80	2.06	2.38	220	560	
	490.484	○	○	CA	-	-	-	-	-	1.45	1.45	0.92	1.21	1.60	1.88	2.31	2.64	3.05	220	560	
	490.524	○	○	CA	-	-	-	-	-	1.60	1.60	1.15	1.52	2.00	2.35	2.89	3.30	3.81	220	560	
	490.564	○	○	CA	-	-	-	-	-	1.80	1.80	1.44	1.89	2.50	2.94	3.61	4.13	4.76	220	560	
	490.604	○	○	CA	CC	CE	-	-	-	2.05	2.05	1.81	2.39	3.15	3.70	4.54	5.20	6.00	220	560	

*Only available in material 30 · B = bore diameter · E = narrowest free cross section

Continued on next page.

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






Axial-flow full cone nozzles Series 490/491

Patented



Spray angle 	Ordering no.									B Ø [mm]	E Ø [mm]	V̇ [l/min]								Spray diameter D at p=2 bar	
	Type	Mat. no.		Code								p [bar]								H = 200 mm	H = 500 mm
		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			
																			316L SS		
60°	490.644	○	○	-	CC	CE	-	-	-	2.30	2.30	2.30	3.03	4.00	4.70	5.77	6.60	7.61	220	560	
	490.684	○	○	-	CC	CE	-	-	-	2.60	2.60	2.87	3.79	5.00	5.88	7.21	8.25	9.52	220	560	
	490.724	○	○	-	CC	CE	-	-	-	2.95	2.80	3.62	4.77	6.30	7.41	9.09	10.40	11.99	220	560	
	490.764	○	○	-	-	CE	-	-	-	3.25	3.25	4.59	6.06	8.00	9.41	11.54	13.20	15.22	220	560	
	490.804	○	○	-	-	CE	-	-	-	3.70	3.70	5.74	7.58	10.00	11.76	14.43	16.51	19.04	220	560	
	490.844	○	○	-	-	-	CG	-	-	4.05	4.05	7.18	9.47	12.50	14.70	18.03	20.63	23.80	220	560	
	490.884	○	○	-	-	-	CG	-	-	4.65	4.65	9.19	12.13	16.00	18.82	23.08	26.41	30.46	220	560	
	490.924	○	○	-	-	-	-	AK	-	5.20	5.20	11.49	15.16	20.00	23.52	28.85	33.01	38.07	220	560	
	490.964	○	○	-	-	-	-	AK	-	5.80	5.80	14.36	18.95	25.00	29.40	36.07	41.26	47.59	220	560	
	491.044	○	○	-	-	-	-	-	AM	7.25	7.25	22.97	30.31	40.00	47.04	57.71	66.02	76.15	220	560	
491.084	○	○	-	-	-	-	-	AM	8.15	8.15	28.72	37.89	50.00	58.80	72.14	82.53	95.18	220	560		
90°	490.406	○	○	CA	-	-	-	-	-	1.20	1.20	0.57	0.76	1.00	1.18	1.44	1.65	1.90	380	860	
	490.446	-	○	CA	-	-	-	-	-	1.30	1.30	0.72	0.95	1.25	1.47	1.80	2.06	2.38	380	860	
	490.486	○	○	CA	-	-	-	-	-	1.45	1.45	0.92	1.21	1.60	1.88	2.31	2.64	3.05	380	860	
	490.526	○	○	CA	-	-	-	-	-	1.70	1.55	1.15	1.52	2.00	2.35	2.89	3.30	3.81	380	860	
	490.566	○	○	CA	-	-	-	-	-	1.90	1.90	1.44	1.89	2.50	2.94	3.61	4.13	4.76	380	860	
	490.606	○	○	CA	-	CE	-	-	-	2.10	2.05	1.81	2.39	3.15	3.70	4.54	5.20	6.00	380	860	
	490.646	○	○	-	CC	CE	-	-	-	2.40	2.40	2.30	3.03	4.00	4.70	5.77	6.60	7.61	390	960	
	490.686	○	○	-	CC	CE	-	-	-	2.70	2.70	2.87	3.79	5.00	5.88	7.21	8.25	9.52	390	960	
	490.726	○	○	-	CC	CE	-	-	-	3.20	2.80	3.62	4.77	6.30	7.41	9.09	10.40	11.99	390	960	
	490.746	○	○	-	-	CE	-	-	-	3.15	3.15	4.08	5.38	7.10	8.35	10.24	11.72	13.52	390	960	
	490.766	○	○	-	-	CE	-	-	-	3.40	3.40	4.59	6.06	8.00	9.41	11.54	13.20	15.22	390	960	
	490.806	○	○	-	-	CE	-	-	-	3.90	3.90	5.74	7.58	10.00	11.76	14.43	16.51	19.04	390	960	
	490.846	○	○	-	-	CE	-	-	-	4.65	4.00	7.18	9.47	12.50	14.70	18.03	20.63	23.80	390	960	
	490.886	○	○	-	-	-	CG	-	-	5.45	4.50	9.19	12.13	16.00	18.82	23.08	26.41	30.46	390	960	
	490.926	○	○	-	-	-	CG	-	-	5.90	4.50	11.49	15.16	20.00	23.52	28.85	33.01	38.07	390	960	
	490.966	○	○	-	-	-	CG	AK	-	6.55	4.85	14.36	18.95	25.00	29.40	36.07	41.26	47.59	390	960	
	491.006	○	○	-	-	-	-	AK	-	7.55	5.50	18.09	23.87	31.50	37.05	45.45	51.99	59.97	390	960	
	491.046	○	○	-	-	-	-	AK	-	8.60	6.60	22.97	30.31	40.00	47.04	57.71	66.02	76.15	390	960	
	491.086	○	○	-	-	-	-	-	AM	9.45	7.25	28.72	37.89	50.00	58.80	72.14	82.53	95.18	390	960	
	491.126	○	○	-	-	-	-	-	AM	10.40	8.00	36.18	47.75	63.00	74.09	90.89	103.98	119.93	390	960	
491.146	○	-	-	-	-	-	-	AM	11.00	7.50	40.78	53.81	71.00	83.50	102.43	117.19	135.16	390	960		
120°	490.368	○	○	CA	-	-	-	-	-	0.85	0.65	0.36	0.48	0.63	0.74	0.91	1.04	1.20	680	1,220	
	490.408	○	○	CA	-	-	-	-	-	1.20	1.20	0.57	0.76	1.00	1.18	1.44	1.65	1.90	680	1,220	
	490.448	○	○	CA	-	-	-	-	-	1.30	1.30	0.72	0.95	1.25	1.47	1.80	2.06	2.38	680	1,220	
	490.488	○	○	CA	-	-	-	-	-	1.45	1.45	0.92	1.21	1.60	1.88	2.31	2.64	3.05	680	1,220	
	490.528	○	○	CA	-	-	-	-	-	1.70	1.70	1.15	1.52	2.00	2.35	2.89	3.30	3.81	680	1,220	
	490.568	○	○	CA	-	-	-	-	-	1.90	1.90	1.44	1.89	2.50	2.94	3.61	4.13	4.76	680	1,220	
	490.608	○	○	CA	-	-	-	-	-	2.10	2.05	1.81	2.39	3.15	3.70	4.54	5.20	6.00	680	1,220	
	490.648	○	○	-	CC	CE	-	-	-	2.40	2.40	2.30	3.03	4.00	4.70	5.77	6.60	7.61	680	1,330	
	490.688	○	○	-	CC	CE	-	-	-	2.75	2.75	2.87	3.79	5.00	5.88	7.21	8.25	9.52	680	1,330	
	490.728	○	○	-	CC	CE	-	-	-	3.20	2.80	3.62	4.77	6.30	7.41	9.09	10.40	11.99	680	1,330	
	490.748	○	○	-	-	CE	-	-	-	3.20	3.20	4.08	5.38	7.10	8.35	10.24	11.72	13.52	680	1,330	
	490.768	○	○	-	-	CE	-	-	-	3.45	3.45	4.59	6.44	8.00	9.41	11.54	13.20	15.22	680	1,330	
	490.808	○	○	-	-	CE	-	-	-	3.90	3.90	5.74	7.58	10.00	11.76	14.43	16.51	19.04	680	1,330	
	490.848	○	○	-	-	CE	-	-	-	4.70	4.00	7.18	9.47	12.50	14.70	18.03	20.63	23.80	680	1,330	
	490.888	○	○	-	-	-	CG	-	-	5.10	4.50	9.19	12.13	16.00	18.82	23.08	26.41	30.46	680	1,330	
	490.928	○	○	-	-	-	CG	-	-	5.80	4.75	11.49	15.16	20.00	23.52	28.85	33.01	38.07	680	1,330	
	490.968	○	○	-	-	-	CG	AK	-	6.65	4.85	14.36	18.95	25.00	29.40	36.07	41.26	47.59	680	1,330	
	491.048	○	○	-	-	-	-	AK	-	9.20	5.85	22.97	30.31	40.00	47.04	57.71	66.02	76.15	680	1,330	
	491.128	○	○	-	-	-	-	-	AM	10.80	7.75	36.18	47.75	63.00	74.09	90.89	103.98	119.93	680	1,330	
	491.148	○	-	-	-	-	-	-	AM	11.40	7.65	40.78	53.81	71.00	83.50	102.43	117.19	135.16	680	1,330	

B = bore diameter · E = narrowest free cross section

Other nozzle materials (special alloys, plastics) are available on request.

Example Type + Material no. + Code = Ordering no.
for ordering: 490.644 + 1Y + CC = 490.644.1Y.CC



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



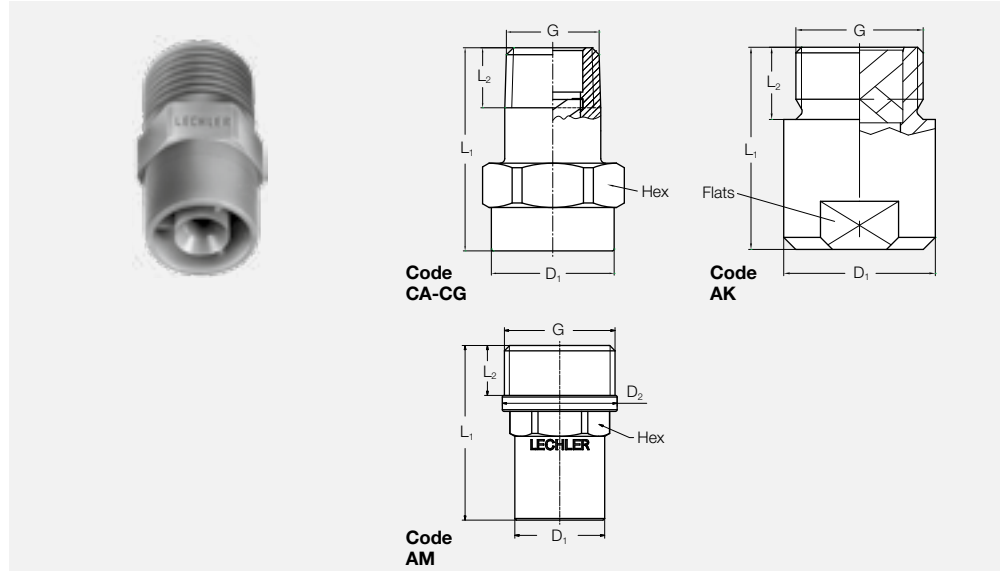
Axial-flow full cone nozzles Series 460/461



Very uniform spray pattern.

Applications:

Cleaning and washing process, cooling of gaseous fluids and solids, surface spraying, spraying onto mats in air washers, improving of chemical reactions.



Full cone nozzles

Code	Dimensions [mm]					
	G	L ₁	L ₂	D ₁	D ₂	Hex/Flats
CA	1/8 BSPT	22.0	6.5	13.0	-	14
CC	1/4 BSPT	22.0	9.7	13.0	-	14
CE	3/8 BSPT	30.0	10.0	17.0	-	17
CG	1/2 BSPT	43.5	13.2	22.0	-	22
AK	3/4 BSPP	42.0	15.0	31.5	-	27
AM	1 BSPP	52.5	15.0	27.0	34.5	27

Subject to technical modifications. Please enquire about the exact dimensions if the installation situation is critical!

Spray angle	Ordering no.								B Ø [mm]	E Ø [mm]	V [l/min]								Spray diameter D at p = 2 bar	
	Type	Mat. no.	Code					p [bar]								H = 200 mm	H = 500 mm			
			5E	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
60°	460.524	○	CA	-	-	-	-	-	1.60	1.60	1.00	1.41	2.00	2.45	2.83	3.16	4.47	220	560	
	460.644	○	-	CC	-	-	-	-	2.40	1.90	2.30	3.03	4.00	4.70	5.77	6.60	7.61	220	560	
	460.724	○	-	CC	-	-	-	-	2.80	2.10	3.15	4.45	6.30	7.72	8.91	9.96	14.09	220	560	
	460.964	○	-	-	-	-	-	AK	-	5.80	4.90	14.36	18.95	25.00	29.40	36.07	41.26	47.59	220	560
90°	460.326	○	CA	-	-	-	-	-	0.80	0.55	0.23	0.30	0.40	0.47	0.58	0.66	0.76	380	860	
	460.406	○	CA	-	-	-	-	-	1.20	0.85	0.57	0.76	1.00	1.18	1.44	1.65	1.90	380	860	
	460.486	○	CA	-	-	-	-	-	1.45	1.20	0.92	1.21	1.60	1.88	2.31	2.64	3.05	380	860	
	460.526	○	CA	-	-	-	-	-	1.65	1.30	1.15	1.52	2.00	2.35	2.89	3.30	3.81	380	860	
	460.606	○	CA	-	CE	-	-	-	2.05	1.45	1.81	2.39	3.15	3.70	4.54	5.20	6.00	380	860	
	460.646	○	-	CC	-	-	-	-	2.30	1.80	2.30	3.03	4.00	4.70	5.77	6.60	7.61	390	960	
	460.726	○	-	-	CE	-	-	-	2.95	2.00	3.62	4.77	6.30	7.41	9.09	10.40	11.99	390	960	
	460.746	○	-	-	CE	-	-	-	3.30	1.90	4.08	5.38	7.10	8.35	10.24	11.72	13.52	390	960	
	460.766	○	-	-	CE	-	-	-	3.30	2.40	4.59	6.06	8.00	9.41	11.54	13.20	15.22	390	960	
	460.806	○	-	-	CE	-	-	-	3.70	2.70	5.74	7.58	10.00	11.76	14.43	16.51	19.04	390	960	
	460.846	○	-	-	CE	-	-	-	4.05	3.20	7.18	9.47	12.50	14.70	18.03	20.63	23.80	390	960	
	460.886	○	-	-	CE	CG	-	-	4.70	3.10	9.19	12.13	16.00	18.82	23.08	26.41	30.46	390	960	
	460.926	○	-	-	-	CG	-	-	5.10	2.80	10.00	14.14	20.00	24.49	28.28	31.62	44.72	390	960	
	460.966	○	-	-	-	CG	-	-	5.80	3.80	14.36	18.95	25.00	29.40	36.07	41.26	47.59	390	960	
	461.006	○	-	-	-	CG	-	-	6.40	3.80	18.09	23.87	31.50	37.05	45.45	51.99	59.97	390	960	
	461.046	○	-	-	-	-	CK*	-	7.20	5.30	22.97	30.31	40.00	47.04	57.71	66.02	76.15	390	960	
	461.086	○	-	-	-	-	AM	-	8.40	5.00	25.00	35.36	50.00	61.24	70.71	79.06	111.80	390	860	

B = bore diameter · E = narrowest free cross section
* Connection 3/4 BSPT



Continued on next page.

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



Axial-flow full cone nozzles Series 460/461



Spray angle 	Ordering no.								B Ø [mm]	E Ø [mm]	V̇ [l/min]								Spray diameter D at p=2 bar 	
	Type	Mat. no.	Code								p [bar]								H = 200 mm	H = 500 mm
		5E	1/8 BSPT	1/4 BSPT	3/8 BSPT	1/2 BSPT	3/4 BSPT	1 BSPP			0.5	1.0	2.0	3.0	5.0	7.0	10.0			
120°	460.368	○	CA	-	-	-	-	-	0.95	0.45	0.32	0.45	0.63	0.77	0.89	1.00	1.41	680	1,220	
	460.408	○	CA	-	-	-	-	-	1.20	0.85	0.57	0.76	1.00	1.18	1.44	1.65	1.90	680	1,220	
	460.488	○	CA	-	-	-	-	-	1.50	1.00	0.92	1.21	1.60	1.88	2.31	2.64	3.05	680	1,220	
	460.528	○	CA	-	-	-	-	-	1.65	1.20	1.15	1.52	2.00	2.35	2.89	3.30	3.81	680	1,220	
	460.608	○	CA	-	-	-	-	-	2.10	1.40	1.81	2.39	3.15	3.70	4.54	5.20	6.00	680	1,220	
	460.648	○	-	CC	CE	-	-	-	2.45	1.60	2.30	3.03	4.00	4.70	5.77	6.60	7.61	680	1,330	
	460.728	○	-	-	CE	-	-	-	3.10	1.90	3.62	4.77	6.30	7.41	9.09	10.40	11.99	680	1,330	
	460.748	○	-	-	CE	-	-	-	3.30	1.90	4.08	5.38	7.10	8.35	10.24	11.72	13.52	680	1,330	
	460.768	○	-	-	CE	-	-	-	3.50	1.90	4.59	6.44	8.00	9.41	11.54	13.20	15.22	680	1,330	
	460.808	○	-	-	CE	-	-	-	3.80	2.40	5.74	7.58	10.00	11.76	14.43	16.51	19.04	680	1,330	
	460.848	○	-	-	CE	-	-	-	4.20	2.70	7.18	9.47	12.50	14.70	18.03	20.63	23.80	680	1,330	
	460.888	○	-	-	-	CG	-	-	4.60	3.10	9.19	12.13	16.00	18.82	23.08	26.41	30.46	680	1,330	
	460.968	○	-	-	-	CG	-	-	5.90	4.10	14.36	18.95	25.00	29.40	36.07	41.26	47.59	680	1,330	
	461.048	⊗	-	-	-	-	CK*	-	7.60	4.90	22.97	30.31	40.00	47.04	57.71	66.02	76.15	680	1,330	

B = bore diameter · E = narrowest free cross section

⊗ Material PP (material no. 53)

* Connection 3/4 BSPT

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to »Accessories«.

Example Type + Material no. + Code = Ordering no.
for ordering: 460.368 + 5E + CA = 460.368.5E.CA



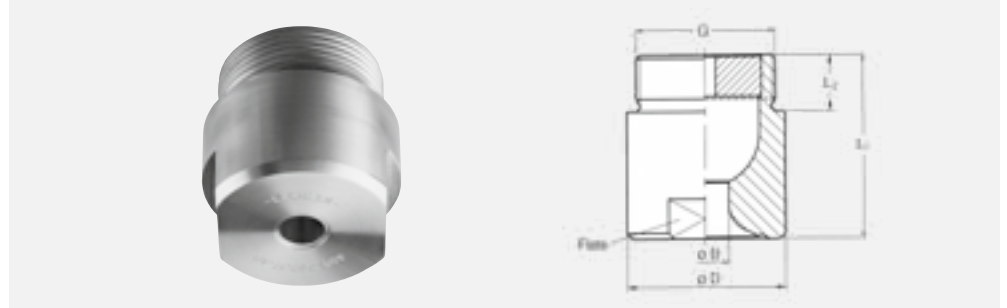
Axial-flow full cone nozzles Series 405



Very uniform spray pattern.

Applications:

Surface spraying, spraying over packings, cleaning and washing process, chemical process engineering, cooling of gaseous fluids and solids, water treatment.



Full cone nozzles

G	Dimensions [mm]				Weight Brass
	L ₁	L ₂	D	Flats	
1 1/4 BSPP	50	19	49	41	525 g
1 1/2 BSPP	60	19	59	50	920 g
2 BSPP	78	24	68	60	1,550 g

Spray angle	Ordering no.						B Ø [mm]	E Ø [mm]	V̇ [l/min]						Spray diameter D at p = 2 bar	
	Type	Mat. no.		Code		p [bar]						H = 0.5 m	H = 1 m			
		1Y	30	1 1/4 BSPP	1 1/2 BSPP	2 BSPP			0.3	0.5	1.0			2.0	3.0	5.0
60°	405.204	○	○	AP	-	-	11.20	5.80	47	57	76	100	118	144	560	1,040
	405.284	○	○	-	AR	-	14.30	7.00	75	92	121	160	188	231	580	1,080
	405.324	○	○	-	-	AV	16.40	7.50	94	115	152	200	235	289	580	1,080
	405.364	○	○	-	-	AV	18.40	8.50	117	144	189	250	294	361	580	1,080
	405.404	○	○	-	-	AV	20.00	7.00	147	181	239	315	370	454	580	1,100
90°	405.206	○	○	AP	-	-	12.00	5.00	47	57	76	100	118	144	780	1,450
	405.286	○	○	-	AR	-	15.20	6.20	75	92	121	160	188	231	800	1,550
	405.326	○	○	-	-	AV	17.20	7.70	94	115	152	200	235	289	850	1,600
	405.366	○	○	-	-	AV	19.50	8.70	117	144	189	250	294	361	850	1,600
	405.406	○	○	-	-	AV	22.00	9.50	147	181	239	315	370	454	850	1,600
120°	405.208	○	○	AP	-	-	12.70	5.00	47	57	76	100	118	144	1,450	2,600
	405.288	○	○	-	AR	-	16.00	6.60	75	92	121	160	188	231	1,500	2,700
	405.328	○	○	-	-	AV	17.80	7.90	94	115	152	200	235	289	1,500	2,800
	405.368	○	○	-	-	AV	20.10	8.80	117	144	189	250	294	361	1,500	2,800
	405.408	○	○	-	-	AV	22.40	9.10	147	181	239	315	370	454	1,500	2,800

B = bore diameter · E = narrowest free cross section

Example	Type	+	Material-no.	+	Code	=	Ordering no.
for ordering:	405.204	+	1Y	+	AP	=	405.204.1Y.AP

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



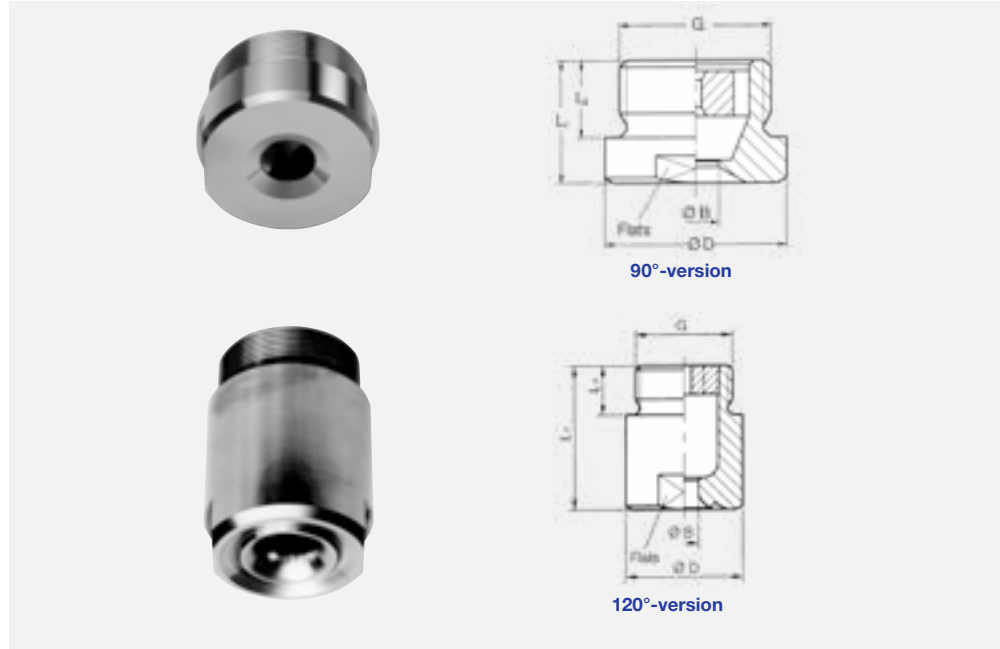
Axial-flow full cone nozzles Series 403



Very uniform spray pattern.

Applications:

Surface spraying, spraying over packings, chemical process engineering, cooling of gaseous fluids and solids.



90°-version

Type	Dimensions [mm]					Weight
	BSPP	L ₁	L ₂	D	Flats	
403.446/403.486	2 1/2	52	27	83	75	1,300 g
403.526	3	60	30	98	85	2,000 g
403.606	3 1/2	70	32	118	105	3,600 g

120°-version

Type	Dimensions [mm]					Weight
	BSPP	L ₁	L ₂	D	Flats	
403.448/403.488	2 1/2	124	27	83	75	3,200 g
403.528	3	153	30	98	85	5,400 g
403.608	3 1/2	156	32	118	105	8,300 g
403.628	4	165	36	128	110	9,600 g

Spray angle	Ordering no.		B Ø [mm]	E Ø [mm]	V̇ [l/min]							Spray diameter D at p = 2 bar	
	Type	Mat. no. 1Y			p [bar]							H = 0.5 m	H = 1 m
					0.3	0.5	1.0	2.0	3.0	5.0	7.0		
90°	403.446	○	25.00	12.00	187	230	303	400	470	577	660	900	1,700
	403.486	○	29.50	12.00	234	287	379	500	588	721	825	900	1,700
	403.526	○	32.00	13.80	295	362	477	630	741	909	1,040	900	1,700
	403.606	○	40.00	15.00	468	574	758	1,000	1,176	1,443	1,651	980	1,750
120°	403.448	○	25.50	10.00	187	230	303	400	470	577	660	1,500	2,850
	403.488	○	29.50	11.00	234	287	379	500	588	721	825	1,500	2,850
	403.528	○	32.00	15.00	295	362	477	630	741	909	1,040	1,500	2,850
	403.608	○	42.00	12.00	469	574	758	1,000	1,176	1,443	1,651	1,500	2,850
	403.628	○	45.00	15.00	585	718	947	1,250	1,470	1,903	2,063	1,600	2,900

B = bore diameter · E = narrowest free cross section

Example for ordering: Type + Material no. = Ordering no.
403.446 + 1Y = 430.446.1Y



Axial-flow full cone nozzles Series 419 »FreeFlow«



FreeFlow

Particularly insensitive to clogging thanks to very large free cross sections. Stable spray angle. Uniform spray pattern.

Applications:

- Gas washing
- Spraying over packings
- Dust control
- Absorption
- Distillation

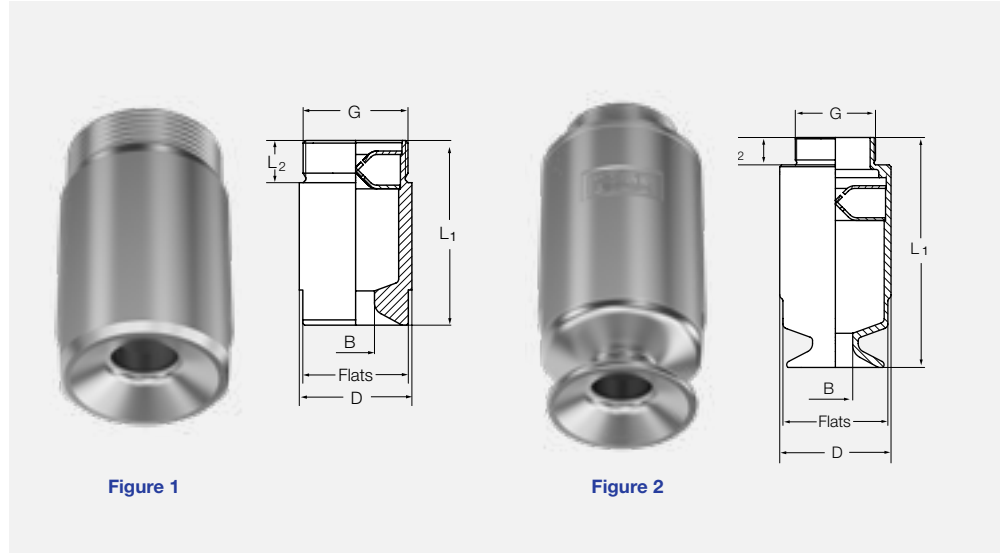


Figure 1

Figure 2

Full cone nozzles

Spray angle	Type	Code	Figure	Dimensions [mm]					Weight
				G	L ₁	L ₂	D	Flats	
90° + 120°	419.3XX	AV	1	2 BSPP	114	24	64	60	1,200 g
	419.4XX	AV	2	2 BSPP	163	24	80	75	2,000 g
	419.51X	AV	2	2 BSPP	199	24	102	95	3,700 g
	419.54X	AY	2	2 1/2 BSPP	202	27	102	95	3,800 g
	419.57X	AY	2	2 1/2 BSPP	231	27	115	105	5,200 g
		LA	2	3 BSPP	233	30	115	105	5,200 g
419.6XX	LA	2	3 BSPP	252	30	122	115	5,400 g	

Spray angle*	Type	Ordering no.				B Ø [mm]	E Ø [mm]	V̇ [l/min]					Spray diameter D at p = 1 bar	
		Mat.no.	Code					p [bar] (p _{max} = 10 bar)					D	
			1Y	2 BSPP	2 1/2 BSPP			3 BSPP	0,3	0,5	1,0	2,0	5,0	H = 500 mm
90°	419.366	○	AV	-	-	18.0	17.5	117	144	189	250	361	1,000	2,000
	419.396	○	AV	-	-	20.5	17.5	140	172	227	300	433	1,000	2,000
	419.446	○	AV	-	-	23.0	20.5	187	230	303	400	577	1,000	2,000
	419.486	○	AV	-	-	28.0	20.5	234	287	379	500	721	1,000	2,000
	419.516	○	AV	AY	-	27.2	24.1	281	345	455	600	866	1,000	2,000
	419.546	○	AV	-	-	33.0	24.1	332	408	538	710	1,024	1,000	2,000
	419.576	○	-	AY	LA	34.0	27.2	398	488	644	850	1,226	1,000	2,000
	419.606	○	-	-	LA	37.5	30.1	468	574	758	1,000	1,443	1,000	2,000
419.626	○	-	-	LA	43.0	30.1	585	718	947	1,250	1,803	1,000	2,000	
120°	419.368	○	AV	-	-	20.5	17.4	117	144	189	250	361	1,700	2,900
	419.398	○	AV	-	-	23.5	17.4	140	172	227	300	433	1,700	2,900
	419.448	○	AV	-	-	24.5	20.5	187	230	303	400	577	1,700	2,900
	419.488	○	AV	-	-	29.5	20.5	234	287	379	500	721	1,700	2,900
	419.518	○	AV	AY	-	27.2	24.1	281	345	455	600	866	1,700	2,900
	419.548	○	AV	-	-	34.0	24.1	332	408	538	710	1,024	1,700	2,900
	419.578	○	-	AY	LA	34.0	28.6	398	488	644	850	1,226	1,700	2,900
	419.608	○	-	-	LA	38.0	32.2	468	574	758	1,000	1,443	1,700	2,900
419.628	○	-	-	LA	43.5	32.2	585	718	947	1,250	1,803	1,700	2,900	

B = bore diameter · E = narrowest free cross section · * Spray angle at 1 bar

Example for ordering: Type 419.366 + Material no. 1Y + Code AV = Ordering no. 419.366.1Y.AV

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





Axial-flow full cone nozzles for retaining nut Series 468





Full cone nozzle for assembly with retaining nut. Uniform full cone spray.

Applications:

Surface spraying, spraying over packings, chemical process engineering, cleaning and washing processes, cooling of gaseous fluids and solids.

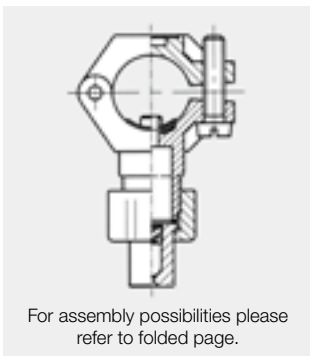


Spray angle 	Ordering no.				B ∅ [mm]	E ∅ [mm]	V̇ [l/min]								L [mm]	Spray diameter D at p = 2 bar 	
	Type	Mat. no.					p [bar]									H = 200 mm	H = 500 mm
		17 ¹ 316Ti SS/ 316L SS	30 Brass	5E PVDF			0.5	1.0	2.0	US [gal/ min] at 40 psi	3.0	5.0	10.0				
60°	468.604	○	○	-	2.05	1.40	1.81	2.39	3.15	0.98	3.70	4.54	6.00	18	220	560	
	468.644	-	○	○	2.40	1.90	2.30	3.03	4.00	1.20	4.70	5.77	7.61	24.5	220	560	
	468.684	-	○	-	2.60	2.00	2.87	3.79	5.00	1.55	5.88	7.21	9.52	24.5	220	560	
	468.724	○	○	-	2.90	2.00	3.62	4.77	6.30	1.89	7.41	9.09	11.99	24.5	220	560	
90°	468.526	○	○	○	1.65	1.30	1.15	1.52	2.00	0.60	2.35	2.89	3.81	18	380	860	
	468.846	○	○	-	4.05	3.20	7.18	9.47	12.50	3.75	14.70	18.03	23.80	24.5	380	960	
120°	468.368	-	○	-	0.95	0.70	0.36	0.48	0.63	0.20	0.74	0.91	1.20	18	680	1,540	
	468.408	○	○	-	1.20	0.85	0.57	0.76	1.00	0.30	1.18	1.44	1.90	18	680	1,540	
	468.488	○	○	-	1.50	1.00	0.92	1.21	1.60	0.48	1.88	2.31	3.05	18	680	1,540	
	468.528	○	○	-	1.65	1.20	1.15	1.52	2.00	0.60	2.35	2.89	3.81	18	680	1,540	

¹ We reserve the right to deliver 316Ti SS or 316L SS under the material no. 17.
B = bore diameter · E = narrowest free cross section

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to »Accessories«.

Example for ordering	Type	+	Material-no.	=	Ordering no.
	468.604	+	17	=	468.604.17



For assembly possibilities please refer to folded page.



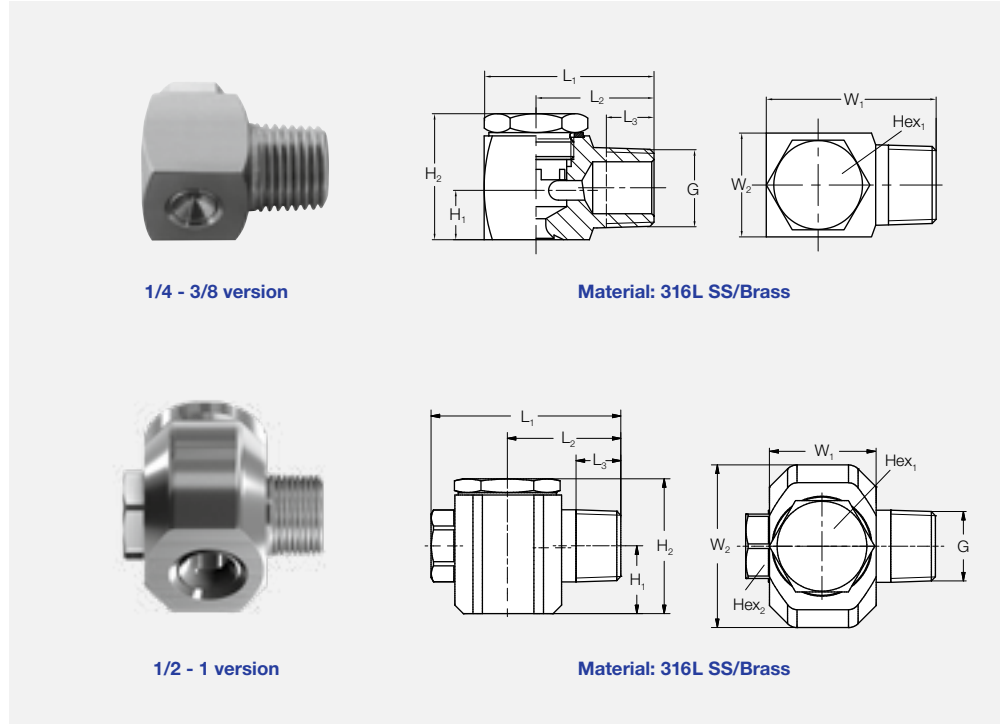
Tangential-flow full cone nozzles Series 422/423



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

Applications:

Cleaning and washing process, cooling of gaseous fluids and solids, surface spraying, spraying onto mats in air washers, improving on chemical reactions, continuous casting, foam control.



1/4 - 3/8 version


Material: 316L SS/Brass

1/2 - 1 version

Material: 316L SS/Brass

Full cone nozzles

Dimensions [mm]										Weight 316L SS
G	L ₁	L ₂	L ₃	H ₁	H ₂	W ₁	W ₂	Hex ₁	Hex ₂	
1/4 BSPT	28.0	20.0	9.7	8.0	21.0	15.6	16.0	11	-	44 g
3/8 BSPT	36.0	25.0	10.1	11.0	26.7	23.2	22.0	19	-	101 g
1/2 BSPT	56.0	33.5	13.2	20.0	40.0	32.0	48.0	27	19	370 g
3/4 BSPT	65.5	38.5	14.5	23.5	57.0	40.0	63.0	36	27	830 g
1 BSPT	85.0	48.5	16.8	27.3	66.0	55.0	78.0	41	36	1,581 g

Spray angle 	Ordering no.								B Ø [mm]	E Ø [mm]	V̇ [l/min]						Spray diameter D at p = 1-10 bar	
	Type	Mat. no.		Code				p [bar]						H = 200 mm	H = 500 mm			
		30 Brass	1Y 316L SS	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	225	510
90°	422.406	○	○	CC	-	-	-	-	1.40	1.40	0.50	0.71	1.00	1.22	1.58	2.24	380	860
	422.486	-	○	CC	-	-	-	-	1.85	1.85	0.80	1.13	1.60	1.96	2.53	3.58	380	860
	422.566	○	○	CC	-	-	-	-	2.25	2.25	1.25	1.77	2.50	3.06	3.95	5.59	380	860
	422.606	○	○	-	CE	-	-	-	2.55	2.55	1.57	2.23	3.15	3.86	4.98	7.04	380	860
	422.646	○	○	-	CE	-	-	-	2.90	2.90	2.00	2.83	4.00	4.90	6.32	8.94	390	960
	422.726	○	-	-	CE	-	-	-	3.70	3.70	3.15	4.45	6.30	7.72	9.96	14.09	390	960
	422.766	-	○	-	CE	-	-	-	4.15	4.15	4.00	5.66	8.00	9.80	12.65	17.89	390	960
	422.806	○	-	-	CE	-	-	-	4.65	4.65	5.00	7.07	10.00	12.25	15.81	22.36	390	960
	422.846	○	○	-	CE	-	-	-	5.30	5.30	6.25	8.84	12.50	15.31	19.76	27.95	390	960
	422.886	○	○	-	CE	-	-	-	5.85	6.00	8.00	11.31	16.00	19.60	25.30	35.78	390	960
422.966	-	○	-	-	CG	-	-	8.00	8.00	12.50	17.68	25.00	30.62	39.53	55.90	390	960	

B = bore diameter · E = narrowest free cross section

Continued on next page.

Example Type + Material-no. + Code = Ordering no.
for ordering: 422.644 + 30 + CE = 422.644.30.CE



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



Tangential-flow full cone nozzles

Series 422/423



Spray angle 	Ordering no.								B ∅ [mm]	E ∅ [mm]	V̇ [l/min]						Spray diameter D at p = 1-10 bar 	
	Type	Mat.no.		Code							p [bar]						H = 200 mm	H = 500 mm
		30 Brass	1Y 316L SS	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		
120°	422.488	○	-	CC	-	-	-	-	1.90	1.90	0.80	1.13	1.60	1.96	2.53	3.58	680	1,220
	422.568	○	○	CC	-	-	-	-	2.45	2.40	1.25	1.77	2.50	3.06	3.95	5.59	680	1,220
	422.608	○	-	-	CE	-	-	-	2.70	2.70	1.57	2.23	3.15	3.86	4.98	7.04	680	1,600
	422.728	○	○	-	CE	-	-	-	4.00	3.90	3.15	4.45	6.30	7.72	9.96	14.09	680	1,600
	422.808	-	○	-	CE	-	-	-	4.90	4.90	5.00	7.07	10.00	12.25	15.81	22.36	680	1,600
	422.848	○	○	-	CE	-	-	-	5.30	5.30	6.25	8.84	12.50	15.31	19.76	27.95	680	1,600
	422.888	○	○	-	CE	-	-	-	6.60	6.00	8.00	11.31	16.00	19.60	25.30	35.78	680	1,600
	422.928	-	○	-	-	CG	-	-	7.30	7.30	10.00	14.14	20.00	24.49	31.62	44.72	680	1,600
	422.968	○	○	-	-	CG	-	-	8.00	8.00	12.50	17.68	25.00	30.62	39.53	55.90	680	1,600
	423.008	-	○	-	-	CG	-	-	8.70	8.70	15.75	22.27	31.50	38.88	49.81	70.44	680	1,600
	423.128	-	○	-	-	-	-	CK	12.70	12.30	31.50	44.55	63.00	77.16	99.61	140.87	680	1,600
	423.208	-	○	-	-	-	-	CM	17.00	16.00	50.00	70.71	100.00	122.47	158.11	223.61	680	1,600

B = bore diameter · E = narrowest free cross section

Example Type + Material-no. + Code = Ordering no.
for ordering: 422.488 + 30 + CC = 422.488.30.CC



Tangential-flow full cone nozzles

Plastic version

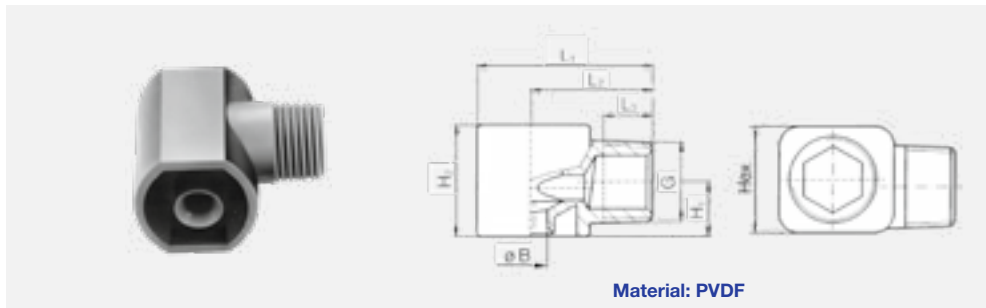
Series 422/423



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

Applications:

Cleaning and washing processes, surface spraying, bottle cleaning, keg cleaning, sausage showers, foam control, degassing, pasteurization.



Material: PVDF

Full cone nozzles

Dimensions [mm]							Weight
G	L ₁	L ₂	L ₃	H ₁	H ₂	Hex	
1/4 BSPT	28.0	20.0	9.8	8.0	16.0	16.0	7 g
3/8 BSPT	36.0	25.0	10.1	11.2	23.0	22.0	16 g
1/2 BSPT	49.5	33.5	13.2	19.2	38.0	32.0	40 g
3/4 BSPT	58.5	38.5	18.5	24.5	50.0	41.0	50 g

Spray angle	Ordering no.						B Ø [mm]	E Ø [mm]	V̇ [l/min]							Spray diameter D at p = 1-10 bar		
	Type	Mat. no.	Code						p [bar]							H = 200 mm	H = 500 mm	
		5E	PVDF	1/4 BSPT	3/8 BSPT	1/2 BSPT			3/4 BSPT	0.5	1.0	2.0	US [gal/min] at 40 psi	3.0	5.0			10.0
60°	422.724	○	-	CE	-	-	3.60	3.60	3.15	4.45	6.30	1.95	7.72	9.96	14.09	225	510	
90°	422.406	○	CC	-	-	-	1.50	1.45	0.50	0.71	1.00	0.31	1.22	1.58	2.24	680	1,220	
	422.566	○	CC	-	-	-	2.30	2.20	1.25	1.77	2.50	0.78	3.06	3.95	5.59	380	860	
	422.606	○	-	CE	-	-	2.60	2.50	1.57	2.23	3.15	0.98	3.86	4.98	7.04	380	860	
	422.646	○	-	CE	-	-	3.00	2.90	2.00	2.83	4.00	1.24	4.90	6.32	8.94	390	960	
	422.726	○	-	CE	-	-	3.70	3.60	3.15	4.45	6.30	1.95	7.72	9.96	14.09	390	960	
	422.806	○	-	CE	-	-	4.65	4.60	5.00	7.07	10.00	3.10	12.25	15.81	22.36	390	960	
	422.846	○	-	CE	-	-	5.30	5.30	6.25	8.84	12.50	3.88	15.31	19.76	27.95	390	960	
	422.886	○	-	CE	-	-	5.85	5.85	8.00	11.31	16.00	4.96	19.60	25.30	35.78	390	960	
	422.926	○	-	-	CG	-	-	7.30	7.30	10.00	14.14	20.00	6.20	24.49	31.62	44.72	390	960
	422.966	○	-	-	CG	-	-	8.00	8.00	12.50	17.68	25.00	7.75	30.62	39.53	55.90	390	960
423.006	○	-	-	CG	-	-	8.70	8.70	15.75	22.27	31.50	9.77	38.58	49.81	70.44	390	960	
423.126	○	-	-	-	CK	-	12.00	12.00	31.50	44.55	63.00	19.54	77.16	99.61	140.87	390	960	
120°	422.408	○	CC	-	-	-	1.50	1.45	0.50	0.71	1.00	0.31	1.22	1.58	2.24	680	1,220	
	422.448	○	CC	-	-	-	1.65	1.60	0.62	0.88	1.25	0.39	1.53	1.98	2.80	680	1,220	
	422.488	○	CC	-	-	-	1.90	1.90	0.80	1.13	1.60	0.50	1.96	2.53	3.58	680	1,220	
	422.568	○	CC	-	-	-	2.40	2.40	1.25	1.77	2.50	0.78	3.06	3.95	5.59	680	1,220	
	422.728	○	-	CE	-	-	4.00	3.90	3.15	4.45	6.30	1.95	7.72	9.96	14.09	680	1,600	
	422.888	○	-	CE	-	-	6.60	6.00	8.00	11.31	16.00	4.96	19.60	25.30	35.78	680	1,600	
	422.968	○	-	-	CG	-	-	8.00	8.00	12.50	17.68	25.00	7.75	30.62	39.53	55.90	680	1,600
	423.008	○	-	-	CG	-	-	8.70	8.70	15.75	22.27	31.50	9.77	38.58	49.81	70.44	680	1,600
	423.128	○	-	-	-	CK	-	12.70	12.30	31.50	44.55	63.00	19.54	77.16	99.61	140.87	680	1,600

B = bore diameter · E = narrowest free cross section

Example of ordering: Type 422.724 + Material-no. 5E + Code CE = Ordering no. 422.724.5E.CE

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to »Accessories«.

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



Tangential-flow full cone nozzles

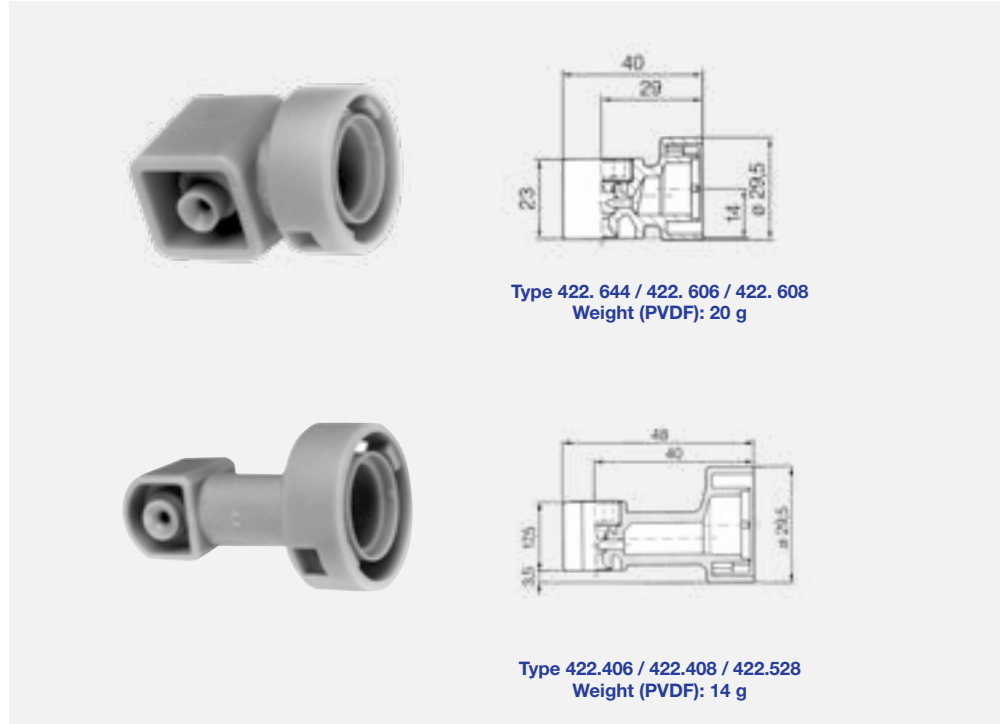
Bayonet quick-release system



Series 422

Quick and safe assembly, without tool. Space-saving installation. Non-clogging and maintenance-free. High resistance to temperatures and chemicals.

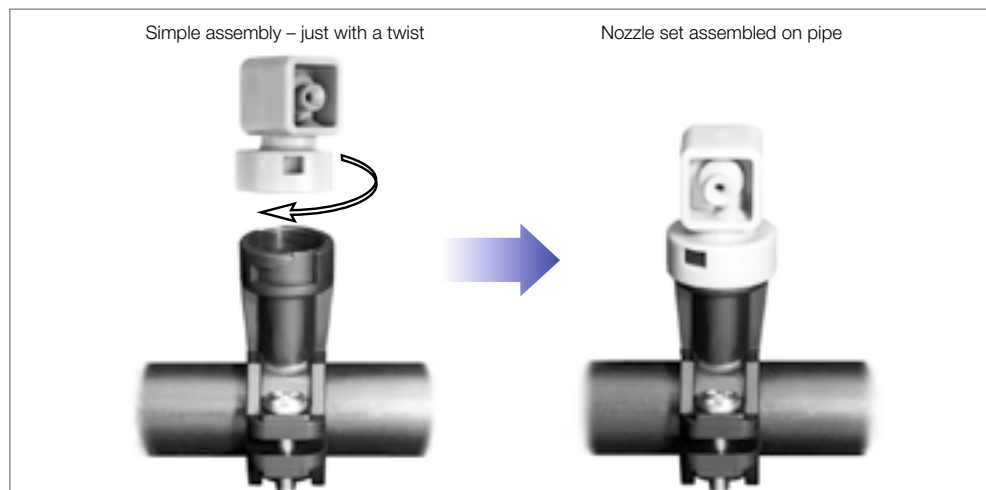
Applications:

Cleaning problems, cooling process, foam control.



Spray angle 	Ordering no.				B Ø [mm]	E Ø [mm]	V̇ [l/min]							Spray diameter D at p = 1-10 bar 	
	Type	Mat. no.		Code			p [bar]							H = 200 mm	H = 500 mm
		5E	53				0.5	1.0	2.0	US [gal/min] at 40 psi	3.0	5.0	10.0		
60°	422.644	-	○	KB	2.90	2.90	2.00	2.83	4.00	1.24	4.90	6.32	8.94	225	510
	422.406	○	-	KB	1.50	1.45	0.50	0.71	1.00	0.31	1.22	1.58	2.24	380	860
90°	422.606	○	-	KB	2.60	2.50	1.57	2.23	3.15	0.98	3.86	4.98	7.04	380	860
	422.408	○	-	KB	1.50	1.45	0.50	0.71	1.00	0.31	1.22	1.58	2.24	680	1,220
	422.528	○	-	KB	2.10	2.00	1.00	1.41	2.00	0.62	2.45	3.16	4.47	680	1,220
120°	422.608	○	-	KB	2.60	2.50	1.57	2.23	3.15	0.98	3.86	4.98	7.04	680	1,600

B = bore diameter · E = narrowest free cross section



The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to »Accessories«.




Cluster head nozzles Series 502/503



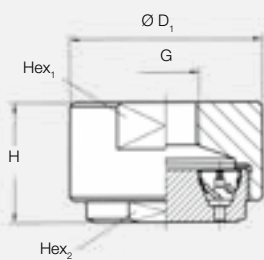
Fine full cone atomization with the aid of several hollow cones spraying into one another.

Applications:

Cooling of gaseous and solid material, desuperheating, chlorine precipitation, absorption as well as for improvement of chemical reaction by enlarging the contact area.




↯ 70°

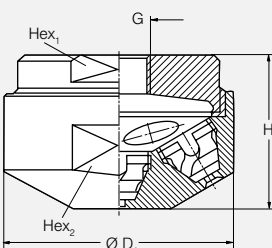


Dimensions [mm]

	1/2	3/4
Hex ₁	46	65
Hex ₂	38	55
H	25	46
D ₁	50	75
Weight (Brass)	250 g	870 g



↯ 130°



Dimensions [mm]

	1/2	3/4
Hex ₁	27	50
Hex ₂	36	55
H	28	53
D ₁	40	60
Weight (Brass)	150 g	410 g

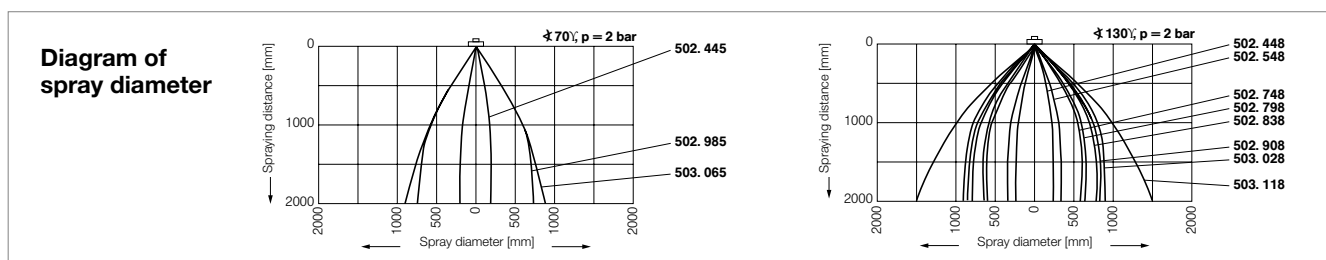
Full cone nozzles

Spray angle	Ordering no.			G	B Ø [mm]	E Ø [mm]	V̇ [l/min]					Spray diameter D at p = 2 bar		
	Type	Mat. no.					p [bar]					H = 1000 mm	H = 2000 mm	
		17 ¹	30				0.5	1.0	2.0	US [gal/min] at 40 psi	5.0			10.0
70°	502.445	-	○	1/2	0.90	0.50	-	-	1.25	0.39	1.98	2.80	400	400
	502.985	○	-	3/4	3.30	2.00	14.00	19.80	28.00	8.68	44.30	62.60	1,200	1,500
	503.065	○	-	3/4	4.90	2.00	22.10	31.80	45.00	13.96	71.10	100.60	1,200	1,800
130°	502.448	○	○	1/2	0.90	0.50	-	-	1.25	0.39	1.98	2.80	500	500
	502.548	○	○	1/2	1.80	0.50	-	1.58	2.24	0.69	3.54	5.01	700	700
	502.748	○	○	3/4	1.90	2.00	3.50	5.00	7.10	2.20	11.20	15.90	1,100	1,200
	502.838	○	○	3/4	2.90	2.00	4.60	8.30	11.80	3.66	18.70	26.40	1,400	1,600
	502.908	○	○	3/4	4.00	2.00	8.80	12.70	18.00	5.58	28.40	40.20	1,500	1,800
	503.028	○	○	3/4	4.20	2.00	17.70	25.10	35.50	11.01	56.10	79.40	1,600	1,800
	503.118	○	○	3/4	6.50	2.00	30.00	42.00	60.00	18.61	95.00	134.00	2,000	3,000

¹ We reserve the right to deliver 316Ti SS or 316L SS under the material no. 17.
B = bore diameter · E = narrowest free cross section

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to "Accessories".

Example	Type	+	Material-no.	=	Ordering no.
for ordering:	502.445	+	30	=	502.445.30

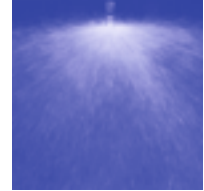


Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$





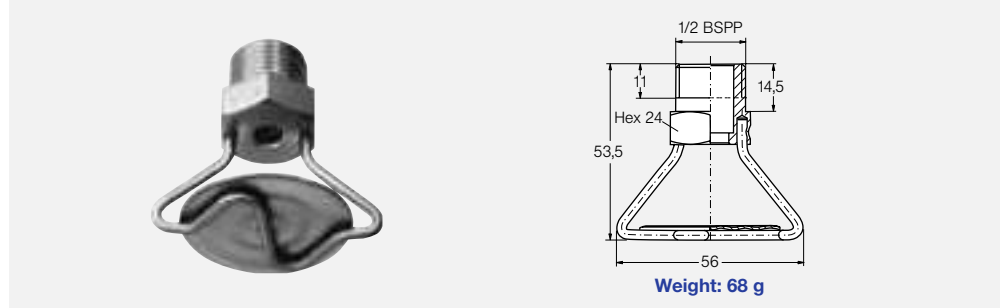
Deflector-plate nozzle Series 524/525





Full cone spray. Non clogging nozzle without swirl insert.

Applications:

Fire fighting and broadcast spraying, wide area spray.



Spray angle 	Ordering no.		B Ø [mm]	V̇ [l/min]						Spray diameter D at p=3 bar approx. 		
	Type	Mat. no.		p [bar]						H = 1 m	H = 3 m	
		30		17 ¹	0.5	1.0	US [gal/min] at 40 psi	3.0	5.0			10.0
180°	524.809	○	○	4.00	5.00	7.10	3.10	12.20	15.80	22.40	5.60 m	6.40 m
	525.049	○	○	8.00	20.00	28.30	12.41	49.00	63.20	89.40	10.00 m	13.20 m
	525.109	○	-	9.30	28.00	40.00	17.37	69.00	89.00	125.00	10.20 m	13.40 m
	525.169	○	-	10.90	40.00	57.00	24.81	98.00	126.00	179.00	10.60 m	13.60 m
	525.229	○	-	12.20	56.00	79.00	34.73	137.00	177.00	250.00	6.80 m	10.40 m
	525.269	○	○	12.30	70.00	99.00	43.42	171.00	221.00	313.00	5.20 m	10.20 m

¹ We reserve the right to deliver 316Ti SS or 316L SS under the material no. 17.
B = bore diameter

Version with dust protection cap on request.

Example	Type	+	Material-no.	=	Ordering no.
of ordering:	524.809	+	30	=	524.809.30

**ENGINEERING
YOUR SPRAY SOLUTION**



Flat fan nozzles

- Belt cleaning
- Coating
- Steam cleaning
- Degreasing
- High pressure cleaning
- Gravel washing
- Cooling
- Surface treatment
- Phosphating
- Rain curtains
- Foam control
- Foam spraying
- Lubrication
- Filter cleaning
- Spray cleaning
- Washing processes
- and many others...



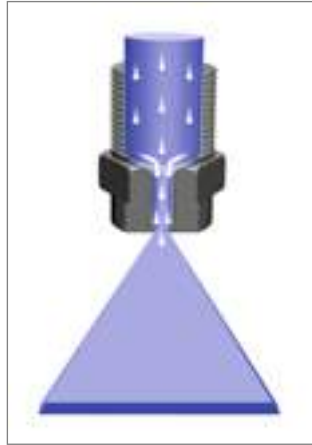
Flat fan nozzles

Lechler flat fan nozzles stand for uniform liquid distribution and jet pressures. Particularly powerful jets are generated with spray angles up to 60°. Nozzles with small flow rates are especially suited for humidifying and spraying in general. The flow geometry of the nozzle allows to produce accurate, compact jets, available with different liquid distribution patterns.

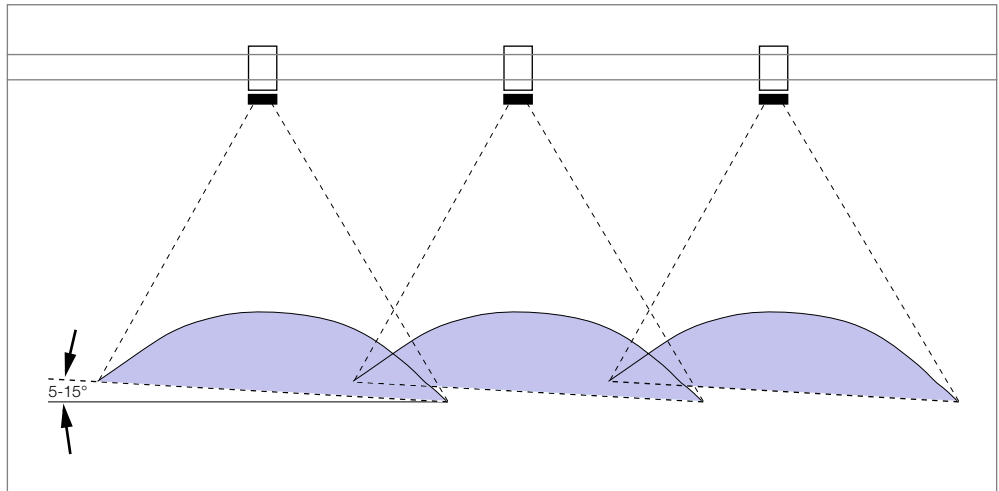
Basically, Lechler flat fan nozzles are designed for parabolic liquid distribution. Unaffected by transient pressures, they are suited for universal application. Their performance data are exactly defined. Operational values, such as flow rates, spray width, jet thickness and liquid distribution are readily available for a great variety of feed pressures. There are also special-design nozzles with rectangular or trapezoidal distribution of liquid.

Simple and cost-saving fixing attachments, as for instance dove-tail guides and eyelet clamps, considerably facilitate assembling and aligning of the nozzles.

For all cleaning operations, in steelmaking and in many other fields of surface treatment, in short, wherever powerful, uniform water jets are required, Lechler flat fan nozzles constitute a decisive basis for achieving reliable process results.



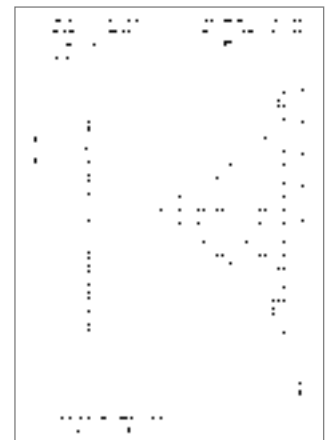
The **tongue-type nozzle** design represents a special kind of flat fan nozzle. With this nozzle type, the flat fan spray pattern is produced by a solid stream, impinging upon and deflecting from an outside deflector plate. As a result, a powerful, sharply delimited flat jet is shaped. The deflector plate has the form of a tongue, which determines the spray angle formation. Due to large free cross-sections, tongue-type nozzles are particularly clog-proof.



Arrangement of nozzles









Total liquid distribution



Liquid distribution single nozzle





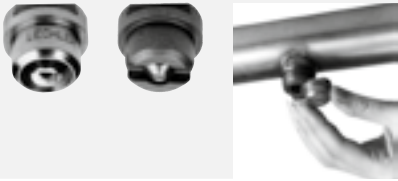



Flat fan nozzles

Low-pressure nozzles	Series		\dot{V} [l/min] at p = 2 bar	Connection	Application/ Design	Page
	632	20° 30° 45° 60° 75° 90° 120°	0.05 – 50.00	1/8 BSPP 1/4 BSPP 3/8 BSPP 1/2 BSPP	Spray cleaning, surface treatment, filter cleaning, belt cleaning, lubricating, coating. Standard design with conical, self-sealing thread.	4.8
	633					
	610	20° 30° 45° 60° 75° 90° 120°	0.05 – 4.00	1/8 BSPP	Cleaning installations, cooling headers, spray pipes. Compact design, suited for narrow installation conditions.	4.10
	612	20° 30° 45° 60° 75° 90° 120°	0.05 – 16.00	1/4 BSPP	Cleaning installations, cooling headers, spray pipes. Compact design, suited for narrow installation conditions.	4.12
	616 617	20° 30° 45° 60° 90° 120°	6.30 – 63.00	3/4 BSPP	Cleaning installations, rain curtains, gravel washing, spray pipes, foam spraying, roll cooling, cooling of rolled stock. Non-clogging features, more jet power.	4.14
	652	20° 30° 45° 60° 75° 90° 120°	0.05 – 16.00	Assembly with 3/8 lock nut	Spray cleaning, surface treatment, filter cleaning, belt cleaning, lubricating, coating. Easy nozzle changing. Simple jet alignment.	4.16



Flat fan nozzles

Low-pressure nozzles	Series		\dot{V} [l/min] at p = 2 bar	Connection	Application/ Design	Page
 Belt lubrication nozzles	652	75° 120°	0.05 – 0.22	Assembly with 3/8 lock nut	Belt lubrication, moistening, spraying of food products, moisturization of rollers, oiling, lubrication of metal sheets. Especially low flow rates. Parabolic liquid distribution.	4.18
 Nozzles for pressing into pipes	612. xxx. 5E. 03	90° 120°	0.63 – 4.00	For pressing into pipes	Cleaning and rinsing operations, dish washing machines. For pressing into pipes.	4.19
	656 657	20° 30° 45° 60° 90° 120°	6.30 – 40.00	Assembly with 3/4 lock nut	Cleaning installations, gravel washing, cooling headers, spray pipes, roll cooling, cooling of rolled stock. Easy nozzle changing, simple jet alignment.	4.20
	660	20° 30° 45° 60° 75° 90° 120°	0.05 – 10.00	Assembly with 3/8 lock nut and dove-tail guide	Cleaning installations, cooling headers, spray pipes. Automatic jet alignment, due to dove-tail guide.	4.22
	664 665	20° 30° 45° 60° 90° 120°	6.30 – 63.00	Assembly with 3/4 lock nut and dove-tail guide	Cleaning installations, cooling headers, spray pipes, roll cooling cooling of rolled stock. Automatic jet alignment, due to dove-tail guide.	4.24



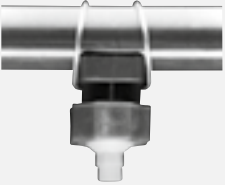





Flat fan nozzles

Low-pressure nozzles	Series		\dot{V} [l/min] at p = 2 bar	Connection	Application/ Design	Page
	646	20° 30° 45° 60° 90° 120°	0.32 – 3.15	Assembly with bayonet quick release system	Belt cleaning, surface treatment, cleaning, coating processes. Quick and easy assembly, adjusted spray direction.	4.26
	688 689	45°	8.00 – 31.50	3/8 BSPT 3/4 BSPP	Cleaning, washing and phosphating process. Particularly clog proof.	4.28
	686	90° 140°	0.50 – 28.00	1/8 BSPT 1/4 BSPT 3/8 BSPT 1/2 BSPT	Foam control in storage tanks and sewage treatment plants, for cleaning and washing process. Particularly clog proof.	4.29
 	684 Assembly with lock nut	140°	0.50 – 10.00	Assembly with 3/8 lock nut	Foam control in storage tanks and sewage treatment plants, for cleaning and washing process. Particularly clog proof.	4.30
High pressure nozzles	Series		\dot{V} [l/min] at p = 80 bar	Connection	Application/ Design	Page
	602 608 652	20° 30° 45° 60°	4.08 - 61.16	1/8 BSPT 1/4 BSPT 1/8 NPT 1/4 NPT Assembly with 3/8 lock nut	High pressure cleaning, steam cleaning.	4.31
	6FH	20° 30° 45° 60°	4.08 - 61.16	1/8 BSPT 1/4 BSPT 1/8 NPT 1/4 NPT Retaining nut	High pressure cleaning	4.32



Flat fan nozzles

Nozzle systems for surface technology		Series		\dot{V} [l/min] at p = 2 bar	Connection	Application/ Design	Page
	676/677 MEMO- SPRAY®	30° 60° 90° 120°		4.00 – 50.00	Assembly with clamp for the following pipe sizes: 1 1 1/4 1 1/2 2	Cleaning problems, phosphating, degreasing, rinsing in surface treatment techniques. Ball joint, omnidirectional swivelling range of 20°. Simple quick assembling. Easy adjusting and cleaning.	4.33
	676 “Easy-Clip”	60°		6.30 – 20.00	Assembly with clip for the following pipe sizes: 1 1 1/4 1 1/2 2	Cleaning problems, phosphating, degreasing, rinsing in surface treatment techniques. Ball joint, omnidirectional swivelling range of 30°. Simple quick assembling. Easy adjusting and cleaning.	4.37
Swivelling nozzles		Series		\dot{V} [l/min] at p = 2 bar	Connection	Application/ Design	Page
	676	20° 30° 45° 60° 75° 90° 120°		0.05 – 10.00	Welding nipple Retaining nipple Socket	Cleaning, cooling and lubricating process. Swivelling nozzle to meet exact jet alignment require- ments. Omnidirectional swivelling range of 30°.	4.39
Descaling nozzles							
	Descaling nozzles SCALEMASTER® – the standard in descaling technology.						Upon request: Please ask for our brochures »SCALEMASTER®«.



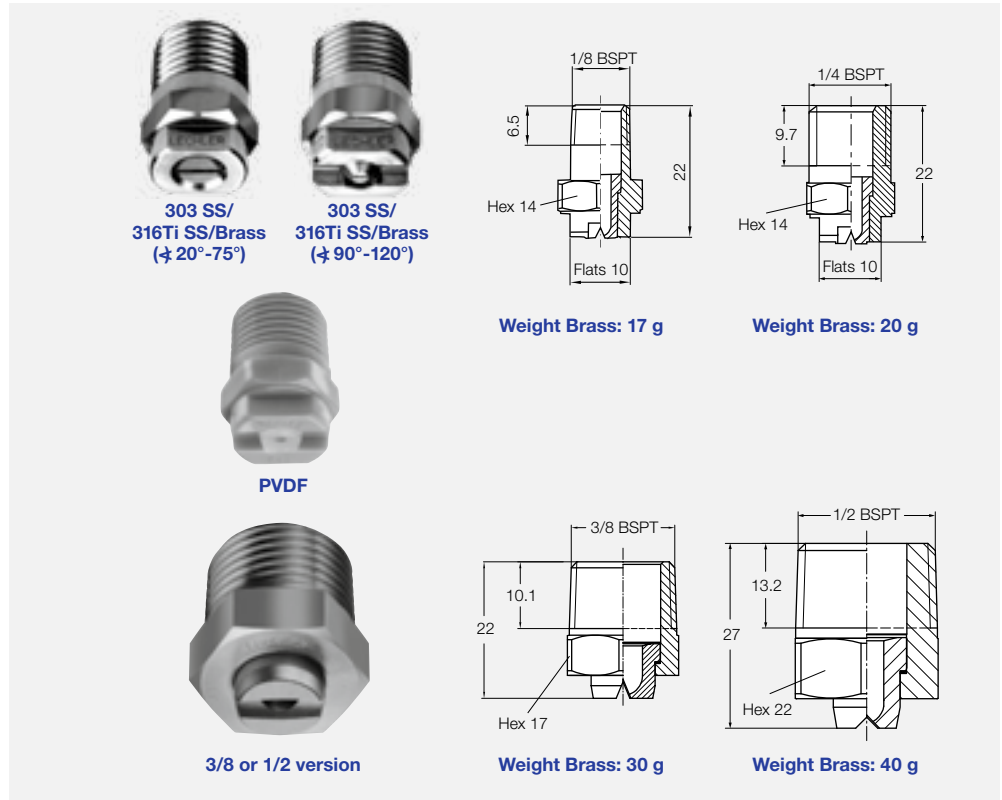
Flat fan nozzles Series 632/633



Standard design with conical, self-sealing thread connection. Stable spray angle. Uniform, parabolical distribution of liquid. Spray pipes equipped with these nozzles show an extremely uniform total distribution of liquid.

Applications:

Spray cleaning, surface treatment, filter cleaning, belt cleaning, lubricating, coating.



Spray angle	Ordering no.								A Ø [mm]	E Ø [mm]	V [l/min]								Spray width B at p=2 bar		
	Type	Mat. no.				Code					p [bar]								H = 200 mm	H = 500 mm	
		16 ¹	17 ²	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			
20°	632.301	○	○	○	○	CA	CC	-	-	0.70	0.60	0.16*	0.23*	0.32	0.39	0.51	0.60	0.72	65	120	
	632.361	○	○	○	○	CA	CC	-	-	1.00	0.80	0.31*	0.44*	0.63	0.77	1.00	1.18	1.40	70	130	
	632.441	○	○	○	○	CA	CC	-	-	1.35	1.10	0.62*	0.88	1.25	1.53	1.98	2.34	2.80	75	145	
	632.481	○	○	○	○	CA	CC	-	-	1.50	1.20	0.80*	1.13	1.60	1.96	2.53	2.99	3.58	75	150	
30°	632.302	○	○	○	○	CA	CC	-	-	0.60	0.50	0.16*	0.23*	0.32	0.39	0.51	0.60	0.72	120	235	
	632.362	○	○	○	○	CA	CC	-	-	1.00	0.70	0.31*	0.44*	0.63	0.77	1.00	1.18	1.40	120	235	
	632.402	○	○	○	○	CA	CC	-	-	1.20	0.90	0.50*	0.71	1.00	1.23	1.58	1.87	2.24	120	235	
	632.482	○	○	○	○	CA	CC	-	-	1.50	1.10	0.80*	1.13	1.60	1.96	2.53	2.99	3.58	120	235	
	632.562	○	○	○	○	CA	CC	-	-	2.00	1.50	1.25	1.77	2.50	3.06	3.95	4.68	5.59	120	235	
	632.642	○	○	○	-	-	CC	-	-	2.50	1.80	2.00	2.83	4.00	4.90	6.33	7.48	8.94	120	240	
	632.722	○	○	○	-	-	CC	-	-	3.00	2.40	3.15	4.46	6.30	7.72	9.96	11.79	14.09	125	240	
	632.762	○	○	○	-	-	CC	-	-	3.50	2.70	4.00	5.66	8.00	9.80	12.65	14.97	17.89	125	240	
632.802	○	○	○	-	-	CC	-	-	4.00	3.10	5.00	7.07	10.00	12.25	15.81	18.71	22.36	130	250		

1) We reserve the right to deliver 303 SS or 304 SS under the material no. 16.
 2) We reserve the right to deliver 316Ti SS or 316L SS under the material no. 17.
 A = equivalent bore diameter · E = narrowest free cross section
 *Differing spray pattern
 Subject to technical modifications.

Continued on next page.

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to "Accessories".



Example	Type	+	Material-no.	+	Code	=	Ordering no.
for ordering:	632.301	+	16	+	CA	=	632.301.16.CA

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



Flat fan nozzles Series 632/633



Spray angle 	Ordering no.								A Ø [mm]	E Ø [mm]	V̇ [l/min]								Spray width B at p=2 bar 		
	Type	Mat. no.				Code					p [bar]								H = 200 mm	H = 500 mm	
		16 ¹	17 ²	30	5E							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	150	270	
	632.363	○	○	○	○	CA	CC	-	-	1.00	0.60	0.31*	0.44*	0.63	0.77	1.00	1.18	1.40	155	280	
	632.403	○	○	○	○	CA	CC	-	-	1.20	0.90	0.50*	0.71	1.00	1.23	1.58	1.87	2.24	175	320	
	632.483	○	○	○	○	CA	CC	-	-	1.50	1.10	0.80*	1.13	1.60	1.96	2.53	2.99	3.58	180	340	
	632.563	○	○	○	○	CA	CC	-	-	2.00	1.40	1.25	1.77	2.50	3.06	3.95	4.68	5.59	185	355	
	632.643	○	○	○	○	CA	CC	-	-	2.50	1.80	2.00	2.83	4.00	4.90	6.33	7.48	8.94	195	370	
	632.673	○	○	○	-	-	CC	CE	-	-	2.70	2.00	2.83	3.36	4.75	5.82	7.51	8.89	10.62	200	375
	632.723	○	○	○	-	-	CC	CE	-	-	3.00	2.40	3.15	4.46	6.30	7.72	9.96	11.79	14.09	200	375
	632.763	○	○	○	-	-	CC	CE	-	-	3.50	2.60	4.00	5.66	8.00	9.80	12.65	14.97	17.89	200	380
	632.803	○	○	○	-	-	CC	CE	CG	-	4.00	3.00	5.00	7.07	10.00	12.25	15.81	18.71	22.36	205	385
	632.843	○	○***	○	-	-	CC	-	CG	-	4.50	3.40	6.25	8.84	12.50	15.31	19.76	23.39	27.95	205	385
	632.883	○	○	○	-	-	-	-	CG	-	5.00	3.80	8.00	11.31	16.00	19.60	25.30	29.93	35.78	220	440
632.923	○	○	○	-	-	-	-	CG	-	5.50	4.20	10.00	14.14	20.00	24.50	31.62	37.42	44.72	220	440	
632.963	○	○	○	-	-	-	-	CG	-	6.00	4.40	12.50	17.68	25.00	30.62	39.53	46.77	55.90	220	440	
60°	632.304	○	○	○	○	CA	CC	-	-	0.70	0.40	0.16*	0.23*	0.32	0.39	0.51	0.60	0.72	215	425	
	632.334	○	○	○	○	CA	CC	-	-	0.90	0.50	0.22*	0.32*	0.45	0.55	0.71	0.84	1.01	220	440	
	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	
	632.514	○	○	○	○	CA	CC	-	-	1.65	1.10	0.95*	1.34	1.90	2.33	3.00	3.56	4.25	270	520	
	632.564	○	○	○	○	CA	CC	-	-	2.00	1.30	1.25	1.77	2.50	3.06	3.95	4.68	5.59	280	535	
	632.604	○	○	○	○	CA	CC	-	-	2.20	1.50	1.58	2.23	3.15	3.86	4.98	5.89	7.04	290	550	
	632.644	○	○	○	○**	-	CC	CE	-	2.50	1.60	2.00	2.83	4.00	4.90	6.33	7.48	8.94	295	565	
	632.674	○	○	○	○**	-	CC	CE	-	2.70	1.80	2.38	3.36	4.75	5.82	7.51	8.89	10.62	300	575	
	632.724	○	○	○	○**	-	CC	CE	-	3.00	2.10	3.15	4.46	6.30	7.72	9.96	11.79	14.09	305	590	
	632.764	○	○	○	-	-	CC	CE	-	3.50	2.30	4.00	5.66	8.00	9.80	12.65	14.97	17.89	310	595	
	632.804	○	○***	○	○**	-	CC	-	CG	4.00	2.60	5.00	7.07	10.00	12.25	15.81	18.71	22.36	310	595	
	632.844	○	○***	○	○**	-	CC	-	CG	4.50	3.00	6.25	8.84	12.50	15.31	19.76	23.39	27.95	310	590	
	632.884	○	○***	○	○**	-	CC	-	CG	5.00	3.40	8.00	11.31	16.00	19.60	25.30	29.93	35.78	300	570	
	632.924	○	○	○	-	-	-	-	CG	5.50	4.10	10.00	14.14	20.00	24.50	31.62	37.42	44.72	330	630	
	632.964	○	○	○	-	-	-	-	CG	6.00	4.20	12.50	17.68	25.00	30.62	39.53	46.77	55.90	330	630	
633.004	○	○	-	-	-	-	-	CG	7.00	4.80	15.75	22.27	31.50	38.57	49.80	58.92	70.43	330	630		
633.044	○	○	○	-	-	-	-	CG	8.00	5.50	20.00	28.28	40.00	48.99	63.25	74.83	89.44	340	640		
633.084	○	○	○	-	-	-	-	CG	9.00	6.80	25.00	35.36	50.00	61.24	79.06	93.54	111.80	340	640		
75°	632.145	○	-	○	-	CA	CC	-	-	0.20	0.12	-	0.04*	0.05	0.06	0.08	0.09	0.11	280	550	
	632.165	○	-	○	-	CA	CC	-	-	0.20	0.14	-	0.05*	0.07	0.08	0.10	0.12	0.15	290	560	
	632.185	○	-	○	-	CA	CC	-	-	0.20	0.16	-	0.06*	0.08	0.10	0.13	0.15	0.18	300	575	
	632.215	○	-	○	-	CA	CC	-	-	0.40	0.20	-	0.08*	0.11	0.14	0.18	0.21	0.25	300	580	
	632.245	○	-	○	-	CA	CC	-	-	0.50	0.30	-	0.12*	0.16	0.20	0.26	0.30	0.36	310	585	
	632.275	○	-	○	-	CA	CC	-	-	0.60	0.30	0.11*	0.16*	0.22	0.27	0.35	0.41	0.49	310	590	

1) We reserve the right to deliver 303 SS or 304 SS under the material no. 16.
 2) We reserve the right to deliver 316Ti SS or 316L SS under the material no. 17.
 A = equivalent bore diameter · E = narrowest free cross section
 *Differing spray pattern
 **Only available with code CC.
 ***Only available with code CG.
 Subject to technical modifications.

Continued on next page.


The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to "Accessories".

Example	Type	+	Material-no.	+	Code	=	Ordering no.
for ordering:	632.303.	+	16	+	CA	=	632.303.16.CA



Flat fan nozzles Series 632/633



Spray angle 	Ordering no.								A Ø [mm]	E Ø [mm]	V [l/min]							Spray width B at p=2 bar		
	Type	Mat. no.				Code					p [bar]							H = 200 mm	H = 500 mm	
		16 ¹	17 ²	30	5E							0.5	1.0	2.0	3.0	5.0	7.0			10.0
90°	632.216	○	-	○	-	CA	CC	-	-	0.40	0.20	-	0.08*	0.11	0.14	0.18	0.21	0.25	370	700
	632.276	○	-	○	-	CA	CC	-	-	0.60	0.30	0.11*	0.16*	0.22	0.27	0.35	0.41	0.49	375	720
	632.306	○	○	○	○	CA	CC	-	-	0.70	0.40	0.16*	0.23*	0.32	0.39	0.51	0.60	0.72	380	740
	632.336	○	○	○	○	CA	CC	-	-	0.90	0.50	0.22*	0.32*	0.45	0.55	0.71	0.84	1.01	415	800
	632.366	○	○	○	○	CA	CC	-	-	1.00	0.50	0.31*	0.44*	0.63	0.77	1.00	1.18	1.41	420	810
	632.406	○	○	○	○	CA	CC	-	-	1.20	0.70	0.50*	0.71	1.00	1.23	1.58	1.87	2.24	430	820
	632.446	○	○	○	○	CA	CC	-	-	1.35	0.80	0.62*	0.88	1.25	1.53	1.98	2.34	2.80	435	830
	632.486	○	○	○	○	CA	CC	-	-	1.50	0.80	0.80*	1.13	1.60	1.96	2.53	2.99	3.58	440	835
	632.516	○	○	○	○	CA	CC	-	-	1.65	0.90	0.95*	1.34	1.90	2.33	3.00	3.56	4.25	440	840
	632.566	○	○	○	○	CA	CC	-	-	2.00	1.10	1.25	1.77	2.50	3.06	3.95	4.68	5.59	445	850
	632.606	○	○	○	○	CA	CC	-	-	2.20	1.20	1.58	2.23	3.15	3.86	4.98	5.89	7.04	450	860
	632.646	○	○	○	○**	-	CC	CE	-	2.50	1.30	2.00	2.83	4.00	4.90	6.33	7.48	8.94	455	865
	632.676	○	○	○	○**	-	CC	CE	-	2.70	1.40	2.38	3.36	4.75	5.82	7.51	8.89	10.62	465	875
	632.726	○	○	○	○**	-	CC	CE	-	3.00	1.70	3.15	4.46	6.30	7.72	9.96	11.79	14.09	470	885
	632.766	○	○	○	○**	-	CC	CE	-	3.50	1.90	4.00	5.66	8.00	9.80	12.65	14.97	17.89	475	890
	632.806	○	○***	○	○**	-	CC	-	CG	4.00	2.40	5.00	7.07	10.00	12.25	15.81	18.71	22.36	480	900
	632.846	○	○***	○	○**	-	CC	-	CG	4.50	2.40	6.25	8.84	12.50	15.31	19.76	23.39	27.95	480	900
	632.886	○	○***	○	○**	-	CC	-	CG	5.00	3.10	8.00	11.31	16.00	19.60	25.30	29.93	35.78	480	910
632.926	○	○	○	-	-	-	-	CG	5.50	3.60	10.00	14.14	20.00	24.50	31.62	37.42	44.72	525	1,020	
632.966	○	○	○	-	-	-	-	CG	6.00	3.90	12.50	17.68	25.00	30.62	39.53	46.77	55.90	525	1,020	
120°	632.187	○	-	○	-	CA	CC	-	-	0.35	0.20	-	0.06*	0.08	0.10	0.13	0.15	0.18	630	1,200
	632.217	○	-	○	-	CA	CC	-	-	0.40	0.20	-	0.08*	0.11	0.14	0.18	0.21	0.25	640	1,210
	632.247	○	-	○	-	CA	CC	-	-	0.50	0.20	-	0.12*	0.16	0.20	0.26	0.30	0.36	650	1,230
	632.277	○	-	○	-	CA	CC	-	-	0.60	0.30	-	0.16*	0.22	0.27	0.35	0.41	0.49	660	1,250
	632.307	○	○	○	○	CA	CC	-	-	0.70	0.30	0.16*	0.23*	0.32	0.39	0.51	0.60	0.72	660	1,250
	632.337	○	○	○	○	CA	CC	-	-	0.90	0.40	0.22*	0.32*	0.45	0.55	0.71	0.84	1.01	670	1,270
	632.367	○	○	○	○	CA	CC	-	-	1.00	0.50	0.31*	0.44*	0.63	0.77	1.00	1.18	1.41	670	1,270
	632.407	○	○	○	○	CA	CC	-	-	1.20	0.60	0.50*	0.71	1.00	1.23	1.58	1.87	2.24	670	1,270
	632.447	○	○	○	○	CA	CC	-	-	1.35	0.60	0.62*	0.88	1.25	1.53	1.98	2.34	2.80	675	1,270
	632.487	○	○	○	○	CA	CC	-	-	1.50	0.60	0.80*	1.13	1.60	1.96	2.53	2.99	3.58	680	1,275
	632.517	○	○	○	○	CA	CC	-	-	1.65	0.90	0.95*	1.34	1.90	2.33	3.00	3.56	4.25	685	1,280
	632.567	○	○	○	○	CA	CC	-	-	2.00	0.90	1.25	1.77	2.50	3.06	3.95	4.68	5.59	690	1,285
	632.607	○	○	○	○	CA	CC	-	-	2.20	1.10	1.58	2.23	3.15	3.86	4.98	5.89	7.04	700	1,300
	632.647	○	○	○	-	-	CC	CE	-	2.50	1.30	2.00	2.83	4.00	4.90	6.33	7.48	8.94	700	1,300
	632.677	○	○	○	○**	-	CC	CE	-	2.70	1.40	2.38	3.36	4.75	5.82	7.51	8.89	10.62	720	1,330
	632.727	○	○	○	○**	-	CC	CE	-	3.00	1.60	3.15	4.46	6.30	7.72	9.96	11.79	14.09	740	1,360
	632.767	○	○	○	○**	-	CC	CE	-	3.50	1.70	4.00	5.66	8.00	9.80	12.65	14.97	17.89	760	1,400
	632.807	○	○***	○	-	-	CC	-	CG	4.00	2.00	5.00	7.07	10.00	12.25	15.81	18.71	22.36	790	1,450
632.847	○***	○***	○***	○**	-	CC	-	CG	4.50	2.30	6.25	8.84	12.50	15.31	19.76	23.39	27.95	790	1,450	
632.887	○	○	○	-	-	-	-	CG	5.00	2.60	8.00	11.31	16.00	19.60	25.30	29.93	35.78	800	1,460	
632.927	○	○	○	-	-	-	-	CG	5.50	2.90	10.00	14.14	20.00	24.50	31.62	37.42	44.72	800	1,460	

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 2) We reserve the right to deliver 316Ti SS or 316L SS under the material no. 17.
 A = equivalent bore diameter · E = narrowest free cross section
 *Differing spray pattern
 **Only available with code CC.
 ***Only available with code CG.
 Subject to technical modifications.

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to "Accessories".

Example Type + Material-no. + Code = Ordering no.
 for ordering: 632.216. + 16 + CA = 632.216.16.CA

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



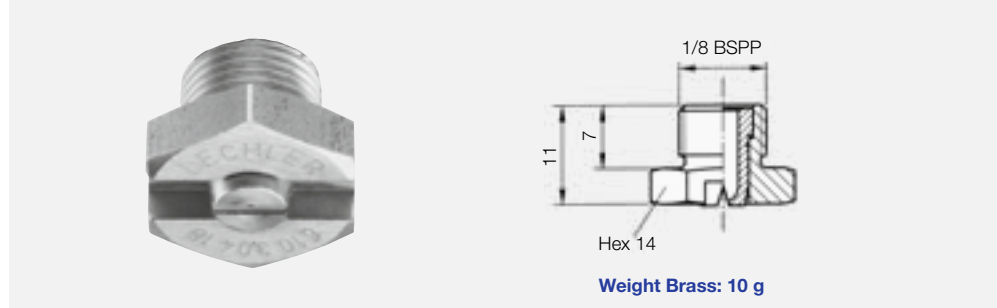
Flat fan nozzles Series 610





Compact design, suitable for narrow installation conditions. Stable spray angle. Uniform, parabolic distribution of liquid.

Applications:

Cleaning installations, cooling headers, spray pipes.



Spray angle 	Ordering no.		A Ø [mm]	E Ø [mm]	V̇ [l/min]							Spray width B at p=2 bar 		
	Type	Mat. no.			p [bar]							H = 250 mm	H = 500 mm	
		16			30	0.5	1.0	2.0	[US gal./min] at 40 psi	3.0	5.0			10.0
20°	610.301	○	○	0.70	0.60	0.16*	0.23*	0.32	0.10	0.39	0.51	0.72	65	125
	610.361	○	○	1.00	0.80	0.31*	0.44*	0.63	0.20	0.77	1.00	1.40	65	125
	610.441	○	○	1.35	1.10	0.62*	0.88	1.25	0.39	1.53	1.98	2.80	65	125
	610.481	○	○	1.50	1.20	0.80*	1.13	1.60	0.50	1.96	2.53	3.58	65	125
30°	610.302	○	○	0.70	0.50	0.16*	0.23*	0.32	0.10	0.39	0.51	0.72	115	230
	610.362	○	○	1.00	0.70	0.31*	0.44*	0.63	0.20	0.77	1.00	1.40	115	230
	610.402	○	○	1.20	0.90	0.50*	0.71	1.00	0.31	1.23	1.58	2.24	115	230
	610.482	○	○	1.50	1.10	0.80*	1.13	1.60	0.50	1.96	2.53	3.58	115	230
	610.562	○	○	2.00	1.50	1.25	1.77	2.50	0.78	3.06	3.95	5.59	115	230
45°	610.303	○	○	0.70	0.50	0.16*	0.23*	0.32	0.10	0.39	0.51	0.72	185	340
	610.363	○	○	1.00	0.60	0.31*	0.44*	0.63	0.20	0.77	1.00	1.40	185	340
	610.403	○	○	1.20	0.90	0.50*	0.71	1.00	0.31	1.23	1.58	2.24	185	340
	610.483	○	○	1.50	1.10	0.80*	1.13	1.60	0.50	1.96	2.53	3.58	185	340
	610.563	○	○	2.00	1.40	1.25	1.77	2.50	0.78	3.06	3.95	5.59	185	340
	610.643	○	○	2.50	1.80	2.00	2.83	4.00	1.24	4.90	6.33	8.94	185	340
60°	610.304	○	○	0.70	0.40	0.16*	0.23*	0.32	0.10	0.39	0.51	0.72	275	525
	610.334	○	○	0.90	0.50	0.22*	0.32*	0.45	0.14	0.55	0.71	1.01	275	525
	610.364	○	○	1.00	0.60	0.31*	0.44*	0.63	0.20	0.77	1.00	1.40	275	525
	610.404	○	○	1.20	0.80	0.50*	0.71	1.00	0.31	1.23	1.58	2.24	275	525
	610.444	○	○	1.35	0.90	0.62*	0.88	1.25	0.39	1.53	1.98	2.80	280	530
	610.484	○	○	1.50	1.00	0.80*	1.13	1.60	0.50	1.96	2.53	3.58	280	530
	610.514	○	○	1.65	1.10	0.95*	1.34	1.90	0.59	2.33	3.00	4.25	280	530
	610.564	○	○	2.00	1.30	1.25	1.77	2.50	0.78	3.06	3.95	5.59	280	530
75°	610.604	○	○	2.20	1.50	1.58	2.23	3.15	0.98	3.86	4.98	7.04	280	530
	610.145	○	○	0.20	0.12	-	0.04*	0.05	0.02	0.06	0.08	0.11	285	550
	610.165	○	○	0.20	0.14	-	0.05*	0.07	0.02	0.08	0.10	0.15	285	555
	610.185	○	○	0.20	0.16	-	0.06*	0.08	0.11	0.10	0.13	0.18	290	560
	610.215	○	○	0.40	0.20	-	0.08*	0.11	0.03	0.14	0.18	0.25	290	560
	610.245	○	○	0.50	0.30	-	0.12*	0.16	0.05	0.20	0.26	0.36	290	560
	610.275	○	○	0.60	0.30	0.11*	0.16*	0.22	0.07	0.27	0.35	0.49	290	560

A = equivalent bore diameter · E = narrowest free cross section

* Differing spray pattern

Subject to technical modifications.

Continued on next page.



The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to "Accessories".

Example for ordering:	Type	+	Material-no.	=	Ordering no.
	610.301	+	16	=	610.301.16



Flat fan nozzles Series 610



Spray angle 	Ordering no.			A Ø [mm]	E Ø [mm]	V̇ [l/min]							Spray width B at p=2 bar 	
	Type	Mat. no.				p [bar]							H = 250 mm	H = 500 mm
		16	30			0.5	1.0	2.0	[US gal./ min] at 40 psi	3.0	5.0	10.0		
90°	610.216	○	○	0.40	0.20	-	0.08*	0.11	0.03	0.14	0.18	0.25	380	670
	610.276	○	○	0.60	0.30	0.11*	0.16*	0.22	0.07	0.27	0.35	0.49	450	795
	610.306	○	○	0.70	0.40	0.16*	0.23*	0.32	0.10	0.39	0.51	0.72	450	795
	610.336	○	○	0.90	0.50	0.22*	0.32*	0.45	0.14	0.55	0.71	1.01	450	795
	610.366	○	○	1.00	0.50	0.31*	0.44*	0.63	0.20	0.77	1.00	1.41	450	795
	610.406	○	○	1.20	0.70	0.50*	0.71	1.00	0.31	1.23	1.58	2.24	450	800
	610.446	○	○	1.35	0.80	0.62*	0.88	1.25	0.39	1.53	1.98	2.80	450	800
	610.486	○	○	1.50	0.80	0.80*	1.13	1.60	0.50	1.96	2.53	3.58	450	800
	610.516	○	○	1.65	0.90	0.95*	1.34	1.90	0.59	2.33	3.00	4.25	450	800
	610.566	○	○	2.00	1.10	1.25	1.77	2.50	0.78	3.06	3.95	5.59	450	805
610.606	○	○	2.20	1.20	1.58	2.23	3.15	0.98	3.86	4.98	7.04	450	805	
120°	610.187	○	○	0.35	0.20	-	0.06*	0.08	0.02	0.10	0.13	0.18	640	1,220
	610.217	○	○	0.40	0.20	-	0.08*	0.11	0.03	0.14	0.18	0.25	650	1,230
	610.247	○	○	0.50	0.20	-	0.12*	0.16	0.05	0.20	0.26	0.36	655	1,245
	610.277	○	○	0.60	0.30	-	0.16*	0.22	0.07	0.27	0.35	0.49	655	1,250
	610.307	○	○	0.70	0.30	0.16*	0.23*	0.32	0.10	0.39	0.51	0.72	660	1,260
	610.337	○	○	0.90	0.40	0.22*	0.32*	0.45	0.14	0.55	0.71	1.01	660	1,260
	610.367	○	○	1.00	0.50	0.31*	0.44*	0.63	0.20	0.77	1.00	1.41	660	1,265
	610.407	○	○	1.20	0.60	0.50*	0.71	1.00	0.31	1.23	1.58	2.24	660	1,270
	610.447	○	○	1.35	0.60	0.62*	0.88	1.25	0.39	1.53	1.98	2.80	665	1,270
	610.487	○	○	1.50	0.60	0.80*	1.13	1.60	0.50	1.96	2.53	3.58	665	1,270
	610.517	○	○	1.65	0.90	0.95*	1.34	1.90	0.59	2.33	3.00	4.25	670	1,275
	610.567	○	○	2.00	0.90	1.25	1.77	2.50	0.78	3.06	3.95	5.59	670	1,280
	610.607	○	○	2.20	1.10	1.58	2.23	3.15	0.98	3.86	4.98	7.04	675	1,285

A = equivalent bore diameter · E = narrowest free cross section
 * Differing spray pattern
 Subject to technical modifications.

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to "Accessories".

Example for ordering:	Type	+	Material-no.	=	Ordering no.
	610.216	+	16	=	610.216.16



Flat fan nozzles Series 612





Compact design, suitable for narrow installation conditions. Stable spray angle. Uniform, parabolic distribution of liquid.

Applications:

Cleaning installations. cooling headers spray pipes.



Spray angle 	Ordering no.				A Ø [mm]	E Ø [mm]	V̇ [l/min]						Spray width B at p=2 bar 		
	Type	Mat. no.					p [bar]						H = 250 mm	H = 500 mm	
		16 303 SS	17 ¹ 316Ti SS/ 316L SS	30 Brass			0.5	1.0	2.0	[US gal./ min] at 40 psi	3.0	5.0			10.0
20°	612.301	○	○	○	0.70	0.60	0.16*	0.23*	0.32	0.10	0.39	0.51	0.72	75	150
	612.361	○	○	○	1.00	0.80	0.31*	0.44*	0.63	0.20	0.77	1.00	1.40	80	150
	612.441	○	○	○	1.30	1.10	0.62*	0.88	1.25	0.39	1.53	1.98	2.80	80	155
	612.481	○	○	○	1.50	1.20	0.80*	1.13	1.60	0.50	1.96	2.53	3.58	80	155
30°	612.302	○	○	○	0.60	0.50	0.16*	0.23*	0.32	0.10	0.39	0.51	0.72	85	140
	612.362	○	○	○	1.00	0.70	0.31*	0.44*	0.63	0.20	0.77	1.00	1.40	95	160
	612.402	○	○	○	1.20	0.90	0.50*	0.71	1.00	0.31	1.23	1.58	2.24	105	190
	612.482	○	○	○	1.50	1.10	0.80*	1.13	1.60	0.50	1.96	2.53	3.58	120	225
	612.562	○	○	○	2.00	1.50	1.25	1.77	2.50	0.78	3.06	3.95	5.59	135	240
	612.642	○	○	○	2.50	1.80	2.00	2.83	4.00	1.24	4.90	6.33	8.94	145	285
	612.722	○	○	○	3.00	2.40	3.15	4.46	6.30	1.95	7.72	9.96	14.09	150	290
	612.762	○	○	○	3.50	2.70	4.00	5.66	8.00	2.48	9.80	12.65	17.89	150	290
612.802	○	○	○	4.00	3.10	5.00	7.07	10.00	3.10	12.25	15.81	22.36	150	290	
45°	612.303	○	○	○	0.70	0.50	0.16*	0.23*	0.32	0.10	0.39	0.51	0.72	160	315
	612.363	○	○	○	1.00	0.60	0.31*	0.44*	0.63	0.20	0.77	1.00	1.40	170	340
	612.403	○	○	○	1.20	0.90	0.50*	0.71	1.00	0.31	1.23	1.58	2.24	175	345
	612.483	○	○	○	1.50	1.10	0.80*	1.13	1.60	0.50	1.96	2.53	3.58	195	375
	612.563	○	○	○	2.00	1.40	1.25	1.77	2.50	0.78	3.06	3.95	5.59	190	365
	612.643	○	○	○	2.50	1.80	2.00	2.83	4.00	1.24	4.90	6.33	8.94	190	365
	612.723	○	○	○	3.00	2.40	3.15	4.46	6.30	1.95	7.72	9.96	14.09	195	370
	612.763	○	○	○	3.50	2.60	4.00	5.66	8.00	2.48	9.80	12.65	17.89	195	370
612.803	○	○	○	4.00	3.00	5.00	7.07	10.00	3.10	12.25	15.81	22.36	195	370	
60°	612.304	○	○	○	0.70	0.40	0.16*	0.23*	0.32	0.10	0.39	0.51	0.72	245	490
	612.334	○	○	○	0.90	0.50	0.22*	0.32*	0.45	0.14	0.55	0.71	1.01	250	495
	612.364	○	○	○	1.00	0.60	0.31*	0.44*	0.63	0.20	0.77	1.00	1.40	255	500
	612.404	○	○	○	1.20	0.80	0.50*	0.71	1.00	0.31	1.23	1.58	2.24	260	510
	612.444	○	○	○	1.35	0.90	0.62*	0.88	1.25	0.39	1.53	1.98	2.80	260	510
	612.484	○	○	○	1.50	1.00	0.80*	1.13	1.60	0.50	1.96	2.53	3.58	270	525
	612.514	○	○	○	1.65	1.10	0.95*	1.34	1.90	0.59	2.33	3.00	4.25	260	510
	612.564	○	○	○	2.00	1.30	1.25	1.77	2.50	0.78	3.06	3.95	5.59	260	505
	612.604	○	○	○	2.20	1.50	1.58	2.23	3.15	0.98	3.86	4.98	7.04	265	505
	612.644	○	○	○	2.50	1.60	2.00	2.83	4.00	1.24	4.90	6.33	8.94	265	505
	612.674	○	○	○	2.70	1.80	2.38	3.36	4.75	1.47	5.82	7.51	10.62	265	505
	612.724	○	○	○	3.00	2.10	3.15	4.46	6.30	1.95	7.72	9.96	14.09	265	505
	612.764	○	○	○	3.50	2.30	4.00	5.66	8.00	2.48	9.80	12.65	17.89	260	500
	612.804	○	○	○	4.00	2.60	5.00	7.07	10.00	3.10	12.25	15.81	22.36	255	490
612.884	○	-	○	5.00	3.40	8.00	11.31	16.00	4.96	19.60	25.30	35.78	255	490	

¹ We reserve the right to deliver 316Ti SS or 316L SS under the material no. 17.

A = equivalent bore diameter · E = narrowest free cross section



*Differing spray pattern Subject to technical modifications.

Continued on next page.



Flat fan nozzles Series 612



Spray angle 	Ordering no.				A Ø [mm]	E Ø [mm]	V̇ [l/min]							Spray width B at p=2 bar 	
	Type	Mat. no.					p [bar]							H = 250 mm	H = 500 mm
		16 303 SS	17 ¹ 316Ti SS/ 316L SS	30 Brass			0.5	1.0	2.0	[US gal./min] at 40 psi	3.0	5.0	10.0		
75°	612.145	○	-	○	0.20	0.12	-	0.04*	0.05	0.02	0.06	0.08	0.11	300	580
	612.165	○	-	○	0.20	0.14	-	0.05*	0.07	0.02	0.08	0.10	0.15	310	590
	612.185	○	-	○	0.20	0.16	-	0.06*	0.08	0.02	0.10	0.13	0.18	320	600
	612.215	○	-	○	0.40	0.20	-	0.08*	0.11	0.03	0.14	0.18	0.25	325	610
	612.245	○	-	○	0.50	0.30	-	0.12*	0.16	0.05	0.20	0.26	0.36	330	615
	612.275	○	-	○	0.60	0.30	0.11*	0.16*	0.22	0.07	0.27	0.35	0.49	340	630
90°	612.216	○	-	○	0.40	0.20	-	0.08*	0.11	0.03	0.14	0.18	0.25	420	820
	612.276	○	-	○	0.60	0.30	0.11*	0.16*	0.22	0.07	0.27	0.35	0.49	420	820
	612.306	○	○	○	0.70	0.40	0.16*	0.23*	0.32	0.10	0.39	0.51	0.72	425	840
	612.336	○	○	○	0.90	0.50	0.22*	0.32*	0.45	0.14	0.55	0.71	1.01	425	840
	612.366	○	○	○	1.00	0.50	0.31*	0.44*	0.63	0.20	0.77	1.00	1.41	425	835
	612.406	○	○	○	1.20	0.70	0.50*	0.71	1.00	0.31	1.23	1.58	2.24	425	835
	612.446	○	○	○	1.35	0.80	0.62*	0.88	1.25	0.39	1.53	1.98	2.80	425	835
	612.486	○	○	○	1.50	0.80	0.80*	1.13	1.60	0.50	1.96	2.53	3.58	425	830
	612.516	○	○	○	1.65	0.90	0.95*	1.34	1.90	0.59	2.33	3.00	4.25	425	830
	612.566	○	○	○	2.00	1.10	1.25	1.77	2.50	0.78	3.06	3.95	5.59	425	825
	612.606	○	○	○	2.20	1.20	1.58	2.23	3.15	0.98	3.86	4.98	7.04	425	820
	612.646	○	○	○	2.50	1.30	2.00	2.83	4.00	1.24	4.90	6.33	8.94	425	820
	612.676	○	○	○	2.70	1.40	2.38	3.36	4.75	1.47	5.82	7.51	10.62	425	815
	612.726	○	○	○	3.00	1.70	3.15	4.46	6.30	1.95	7.71	9.96	14.09	425	810
	612.766	○	○	○	3.50	1.90	4.00	5.66	8.00	2.48	9.80	12.65	17.89	425	810
612.806	○	-	○	4.00	2.40	5.00	7.07	10.00	3.10	12.25	15.81	22.36	425	805	
120°	612.187	○	-	○	0.35	0.20	-	0.06*	0.08	0.02	0.10	0.13	0.18	610	1,140
	612.217	○	-	○	0.40	0.20	-	0.08*	0.11	0.03	0.14	0.18	0.25	615	1,150
	612.247	○	-	○	0.50	0.20	-	0.12*	0.16	0.05	0.20	0.26	0.36	620	1,160
	612.277	○	-	○	0.60	0.30	-	0.16*	0.22	0.07	0.27	0.35	0.49	620	1,170
	612.307	○	-	○	0.70	0.30	0.16*	0.23*	0.32	0.10	0.39	0.51	0.72	625	1,175
	612.337	○	○	○	0.90	0.40	0.22*	0.32*	0.45	0.14	0.55	0.71	1.01	630	1,180
	612.367	○	○	○	1.00	0.40	0.31*	0.44*	0.63	0.20	0.77	1.00	1.41	635	1,190
	612.407	○	○	○	1.20	0.60	0.50*	0.71	1.00	0.31	1.23	1.58	2.24	640	1,195
	612.447	○	○	○	1.35	0.60	0.62*	0.88	1.25	0.39	1.53	1.98	2.80	645	1,200
	612.487	○	○	○	1.50	0.60	0.80*	1.13	1.60	0.50	1.96	2.53	3.58	650	1,200
	612.517	○	○	○	1.65	0.90	0.95*	1.34	1.90	0.59	2.33	3.00	4.25	650	1,205
	612.567	○	○	○	2.00	0.90	1.25	1.77	2.50	0.78	3.06	3.95	5.59	655	1,210
	612.607	○	○	○	2.20	1.10	1.58	2.23	3.15	0.98	3.86	4.98	7.04	660	1,215
	612.647	○	○	○	2.50	1.30	2.00	2.83	4.00	1.24	4.90	6.33	8.94	660	1,220
	612.677	○	○	○	2.70	1.40	2.38	3.36	4.75	1.47	5.82	7.51	10.62	665	1,230
	612.727	○	○	○	3.00	1.60	3.15	4.46	6.30	1.95	7.71	9.96	14.09	675	1,245
	612.767	○	○	○	3.50	1.70	4.00	5.66	8.00	2.48	9.80	12.65	17.89	680	1,260
	612.807	○	-	○	4.00	2.00	5.00	7.07	10.00	3.10	12.25	15.81	22.36	690	1,280

¹ We reserve the right to deliver 316Ti SS or 316L SS under the material no. 17.
A = equivalent bore diameter · E = narrowest free cross section
*Differing spray pattern Subject to technical modifications.

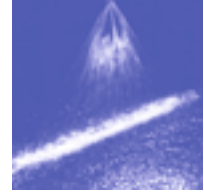
The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to "Accessories".

Example for ordering:	Type	+	Material-no.	=	Ordering no.
	612.145	+	16	=	612.145.16

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



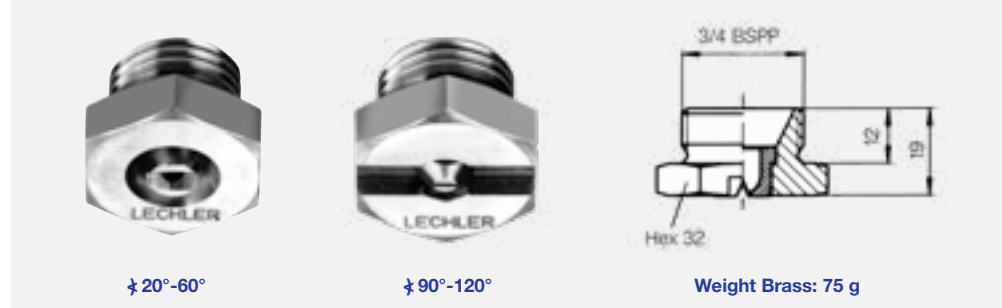
Flat fan nozzles Series 616/617





Uniform, parabolic distribution of liquid. Increased non-clogging features, more jet power, less fog.

Applications:

Cleaning installations, rain curtains, gravel washing, spray pipes, foam spraying, roll cooling, cooling of rolled stock.



Spray angle 	Ordering no.				A Ø [mm]	E Ø [mm]	V̇ [l/min]						Spray width B at p=2 bar 		
	Type	Mat. no.					p [bar]						H = 250 mm	H = 500 mm	
		16 303 SS	17 ¹ 316Ti SS/ 316L SS	30 Brass			0.5	1.0	2.0	[US gal./ min] at 40 psi	3.0	5.0			10.0
20°	616.721	○	○	○	3.00	2.50	3.15	4.45	6.30	1.95	7.72	9.96	14.09	80	140
	616.801	○	○	○	4.00	3.20	5.00	7.07	10.00	3.10	12.25	15.81	22.36	80	145
	616.881	○	○	○	5.00	4.00	8.00	11.31	16.00	4.96	19.60	25.30	35.78	80	145
	616.921	○	○	○	5.50	4.40	10.00	14.14	20.00	6.20	24.49	31.62	44.72	80	145
	616.961	○	○	○	6.00	5.10	12.50	17.68	25.00	7.75	30.62	39.53	55.90	80	145
30°	616.722	○	○	○	3.00	2.40	3.15	4.45	6.30	1.95	7.72	9.96	14.09	120	230
	616.762	○	○	○	3.50	2.70	4.00	5.66	8.00	2.48	9.80	12.65	17.89	120	230
	616.802	○	○	○	4.00	3.10	5.00	7.07	10.00	3.10	12.25	15.81	22.36	120	235
	616.882	○	○	○	5.00	4.00	8.00	11.31	16.00	4.96	19.60	25.30	35.78	120	235
	616.922	○	○	○	5.50	4.40	10.00	14.14	20.00	6.20	24.49	31.62	44.72	120	235
45°	616.723	○	○	○	3.00	2.40	3.15	4.45	6.30	1.95	7.72	9.96	14.09	175	330
	616.763	○	○	○	3.50	2.60	4.00	5.66	8.00	2.48	9.80	12.65	17.89	175	330
	616.803	○	○	○	4.00	3.00	5.00	7.07	10.00	3.10	12.25	15.81	22.36	175	335
	616.843	○	○	○	4.50	3.40	6.25	8.84	12.50	3.88	15.31	19.76	27.95	180	335
	616.883	○	○	○	5.00	3.80	8.00	11.31	16.00	4.96	19.60	25.30	35.78	185	350
60°	616.923	○	○	○	5.50	4.20	10.00	14.14	20.00	6.20	24.49	31.62	44.72	190	360
	616.963	○	○	○	6.00	4.40	12.50	17.68	25.00	7.75	30.62	39.53	55.90	200	375
	616.724	○	○	○	3.00	2.10	3.15	4.45	6.30	1.95	7.72	9.96	14.09	295	575
	616.764	○	○	○	3.50	2.30	4.00	5.66	8.00	2.48	9.80	12.65	17.89	300	580
	616.804	○	○	○	4.00	2.60	5.00	7.07	10.00	3.10	12.25	15.81	22.36	300	580
90°	616.844	○	○	○	4.50	3.00	6.25	8.84	12.50	3.88	15.31	19.76	27.95	300	580
	616.884	○	○	○	5.00	3.40	8.00	11.31	16.00	4.96	19.60	25.30	35.78	300	580
	616.924	○	○	○	5.50	4.10	10.00	14.14	20.00	6.20	24.49	31.62	44.72	300	580
	616.964	○	○	○	6.00	4.20	12.50	17.68	25.00	7.75	30.62	39.53	55.90	300	580
	617.044	○	-	○	8.00	5.50	20.00	28.28	40.00	12.41	48.99	63.25	89.44	300	580
90°	617.124	-	-	○	10.00	7.40	31.50	44.55	63.00	19.54	77.16	99.61	140.87	300	580
	616.726	○	○	○	3.00	1.70	3.15	4.45	6.30	1.95	7.72	9.96	14.09	540	1,000
	616.766	○	○	○	3.50	1.90	4.00	5.66	8.00	2.48	9.80	12.65	17.89	550	1,010
	616.806	○	○	○	4.00	2.40	5.00	7.07	10.00	3.10	12.25	15.81	22.36	550	1,010
	616.846	○	○	○	4.50	2.40	6.25	8.84	12.50	3.88	15.31	19.76	27.95	550	1,020
90°	616.886	○	○	○	5.00	3.10	8.00	11.31	16.00	4.96	19.60	25.30	35.78	550	1,020
	616.926	○	○	○	5.50	3.60	10.00	14.14	20.00	6.20	24.49	31.62	44.72	555	1,025
	616.966	○	○	○	6.00	3.90	12.50	17.68	25.00	7.75	30.62	39.53	55.90	560	1,030



¹ We reserve the right to deliver 316Ti SS or 316L SS under the material no. 17.
A = equivalent bore diameter · E = narrowest free cross section
Subject to technical modifications.

Continued on next page.



Flat fan nozzles Series 616/617



Spray angle 	Ordering no.				A Ø [mm]	E Ø [mm]	V̇ [l/min]							Spray width B at p=2 bar 	
	Type	Mat. no.					p [bar]							H = 250 mm	H = 500 mm
		16 303 SS	17 ¹ 316Ti SS/ 316L SS	30 Brass			0.5	1.0	2.0	[US gal./ min] at 40 psi	3.0	5.0	10.0		
120°	616.727	○	○	○	3.00	1.60	3.15	4.45	6.30	1.95	7.72	9.96	14.09	975	1,755
	616.767	○	○	○	3.50	1.70	4.00	5.66	8.00	2.48	9.80	12.65	17.89	970	1,750
	616.807	○	○	○	4.00	2.00	5.00	7.07	10.00	3.10	12.25	15.81	22.36	965	1,740
	616.887	○	○	○	5.00	2.60	8.00	11.31	16.00	4.96	19.60	25.30	35.78	955	1,730
	616.927	○	○	○	5.50	2.90	10.00	14.14	20.00	6.20	24.49	31.62	44.72	950	1,720
	616.967	-	-	○	6.00	3.20	12.50	17.68	25.00	7.75	30.62	39.53	55.90	950	1,720
	617.047	-	-	○	8.00	4.40	20.00	28.28	40.00	12.41	48.99	63.25	89.44	950	1,720

¹ We reserve the right to deliver 316Ti SS or 316L SS under the material no. 17.
A = equivalent bore diameter · E = narrowest free cross section
Subject to technical modifications.

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to "Accessories".

Example	Type	+	Material-no.	=	Ordering no.
for ordering:	616.727	+	16	=	616.727.16



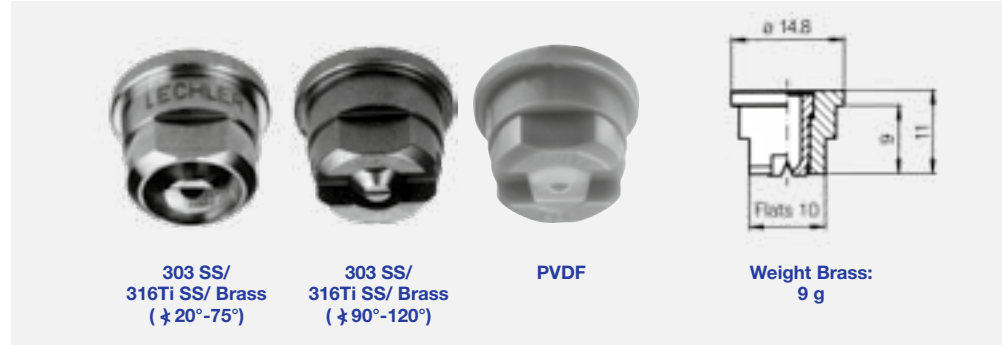
Flat fan nozzles for retaining nut Series 652



Assembly with retaining nut. Easy nozzle changing, simple jet alignment. Uniform, parabolic distribution of liquid. Spray pipes equipped with these nozzles show an extremely uniform total liquid distribution.

Applications:

Spray cleaning, surface treatment, filter cleaning, belt cleaning, lubricating, coating.



Spray angle 	Ordering no.					A Ø [mm]	E Ø [mm]	V [l/min]						Spray width B at p=2 bar 	
	Type	Mat. no.						p [bar]						H = 250 mm	H = 500 mm
		16	17 ¹	30	5E			0.5	1.0	2.0	3.0	5.0	10.0		
	303 SS	316Ti SS/316L SS	Brass	PVDF											
20°	652.301	○	○	○	○	0.70	0.60	0.16*	0.23*	0.32	0.39	0.51	0.72	65	125
	652.361	○	○	○	○	1.00	0.80	0.31*	0.44*	0.63	0.77	1.00	1.40	65	125
	652.441	○	○	○	○	1.35	1.10	0.62*	0.88	1.25	1.53	1.98	2.80	65	125
	652.481	○	○	○	○	1.50	1.20	0.80*	1.13	1.60	1.96	2.53	3.58	65	125
30°	652.302	○	○	○	○	0.60	0.50	0.16*	0.23*	0.32	0.39	0.51	0.72	115	230
	652.362	○	○	○	○	1.00	0.70	0.31*	0.44*	0.63	0.77	1.00	1.40	115	230
	652.402	○	○	○	○	1.20	0.90	0.50*	0.71	1.00	1.23	1.58	2.24	115	230
	652.482	○	○	○	○	1.50	1.10	0.80*	1.13	1.60	1.96	2.53	3.58	115	230
	652.562	○	○	○	○	2.00	1.50	1.25	1.77	2.50	3.06	3.95	5.59	115	230
	652.642	○	○	○	-	2.50	1.80	2.00	2.83	4.00	4.90	6.33	8.94	120	230
	652.722	○	○	○	-	3.00	2.40	3.15	4.46	6.30	7.72	9.96	14.09	120	235
	652.762	○	○	○	-	3.50	2.70	4.00	5.66	8.00	9.80	12.65	17.89	120	235
652.802	○	○	○	-	4.00	3.10	5.00	7.07	10.00	12.25	15.81	22.36	120	240	
45°	652.303	○	○	○	-	0.70	0.50	0.16*	0.23*	0.32	0.39	0.51	0.72	180	340
	652.363	○	○	○	○	1.00	0.60	0.31*	0.44*	0.63	0.77	1.00	1.40	185	340
	652.403	○	○	○	○	1.20	0.90	0.50*	0.71	1.00	1.23	1.58	2.24	185	340
	652.483	○	○	○	○	1.50	1.10	0.80*	1.13	1.60	1.96	2.53	3.58	185	340
	652.563	○	○	○	○	2.00	1.40	1.25	1.77	2.50	3.06	3.95	5.59	185	340
	652.643	○	○	○	○	2.50	1.80	2.00	2.83	4.00	4.90	6.33	8.94	185	345
	652.723	○	○	○	-	3.00	2.40	3.15	4.46	6.30	7.72	9.96	14.09	190	355
	652.763	○	○	○	-	3.50	2.60	4.00	5.66	8.00	9.80	12.65	17.89	190	355
652.803	○	○	○	-	4.00	3.00	5.00	7.07	10.00	12.25	15.81	22.36	195	360	
60°	652.304	○	○	○	○	0.70	0.40	0.16*	0.23*	0.32	0.39	0.51	0.72	275	525
	652.334	○	○	○	○	0.90	0.50	0.22*	0.32*	0.45	0.55	0.71	1.01	275	525
	652.364	○	○	○	○	1.00	0.60	0.31*	0.44*	0.63	0.77	1.00	1.40	275	525
	652.404	○	○	○	○	1.20	0.80	0.50*	0.71	1.00	1.23	1.58	2.24	275	525
	652.444	○	○	○	○	1.35	0.90	0.62*	0.88	1.25	1.53	1.98	2.80	280	530
	652.484	○	○	○	○	1.50	1.00	0.80*	1.13	1.60	1.96	2.53	3.58	280	530
	652.514	○	○	○	○	1.65	1.10	0.95*	1.34	1.90	2.33	3.00	4.25	280	530
	652.564	○	○	○	○	2.00	1.30	1.25	1.77	2.50	3.06	3.95	5.59	280	525
	652.604	○	○	○	○	2.20	1.50	1.58	2.23	3.15	3.86	4.98	7.04	280	520
	652.644	○	○	○	○	2.50	1.60	2.00	2.83	4.00	4.90	6.33	8.94	275	520
	652.674	○	○	○	○	2.70	1.80	2.38	3.36	4.75	5.82	7.51	10.62	275	520
	652.724	○	○	○	○	3.00	2.10	3.15	4.46	6.30	7.72	9.96	14.09	275	520
	652.764	○	○	○	-	3.50	2.30	4.00	5.66	8.00	9.80	12.65	17.89	270	515
	652.804	○	○	○	○	4.00	2.60	5.00	7.07	10.00	12.25	15.81	22.36	270	510
	652.844	○	-	-	○	4.50	3.00	6.25	8.84	12.50	15.31	19.76	27.95	270	510
	652.884	○	-	○	-	5.00	3.40	8.00	11.31	16.00	19.60	25.30	35.78	270	505

¹We reserve the right to deliver 316Ti SS or 316L SS under the material no. 17.

A = equivalent bore diameter · E = narrowest free cross section · *Differing spray pattern



Continued on next page.





Flat fan nozzles for retaining nut Series 652



Spray angle 	Ordering no.					A Ø [mm]	E Ø [mm]	V̇ [l/min]						Spray width B at p=2 bar 	
	Type	Mat. no.						p [bar]						H = 250 mm	H = 500 mm
		16 303 SS	17 ¹ 316Ti SS/ 316L SS	30 Brass	5E PVDF			0.5	1.0	2.0	3.0	5.0	10.0		
75°	652.145	○	-	○	-	0.20	0.12	-	0.04*	0.05	0.06	0.08	0.11	285	550
	652.165	○	-	○	-	0.20	0.14	-	0.05*	0.07	0.08	0.10	0.15	285	555
	652.185	○	-	○	-	0.20	0.16	-	0.06*	0.08	0.10	0.13	0.18	290	560
	652.215	○	-	○	-	0.40	0.20	-	0.08*	0.11	0.14	0.18	0.25	290	560
	652.245	○	-	○	-	0.50	0.30	-	0.12*	0.16	0.20	0.26	0.36	290	560
	652.275	○	-	○	-	0.60	0.30	0.11*	0.16*	0.22	0.27	0.35	0.49	290	560
90°	652.216	○	-	○	-	0.40	0.20	0.06*	0.08*	0.11	0.14	0.18	0.25	380	760
	652.246	○	-	○	-	0.50	0.30	0.08*	0.12*	0.16	0.20	0.26	0.36	380	760
	652.276	○	-	○	-	0.60	0.30	0.11*	0.16*	0.22	0.27	0.35	0.49	450	795
	652.306	○	○	○	○	0.70	0.40	0.16*	0.23*	0.32	0.39	0.51	0.72	450	795
	652.336	○	○	○	○	0.90	0.50	0.22*	0.32*	0.45	0.55	0.71	1.01	450	795
	652.366	○	○	○	○	1.00	0.50	0.31*	0.44*	0.63	0.77	1.00	1.41	450	795
	652.406	○	○	○	○	1.20	0.70	0.50*	0.71	1.00	1.23	1.58	2.24	450	800
	652.446	○	○	○	○	1.35	0.80	0.62*	0.88	1.25	1.53	1.98	2.80	450	800
	652.486	○	○	○	○	1.50	0.80	0.80*	1.13	1.60	1.96	2.53	3.58	450	800
	652.516	○	○	○	○	1.65	0.90	0.95*	1.34	1.90	2.33	3.00	4.25	450	800
	652.566	○	○	○	○	2.00	1.10	1.25	1.77	2.50	3.06	3.95	5.59	450	805
	652.606	○	○	○	○	2.20	1.20	1.58	2.23	3.15	3.86	4.98	7.04	450	805
	652.646	○	○	○	○	2.50	1.30	2.00	2.83	4.00	4.90	6.33	8.94	450	805
	652.676	○	○	○	○	2.70	1.40	2.38	3.36	4.75	5.82	7.51	10.62	450	810
	652.726	○	○	○	○	3.00	1.70	3.15	4.46	6.30	7.72	9.96	14.09	450	810
	652.766	○	○	○	-	3.50	1.90	4.00	5.66	8.00	9.80	12.65	17.89	450	815
	652.806	○	○	○	○	4.00	2.40	5.00	7.07	10.00	12.25	15.81	22.36	450	820
	652.846	-	-	○	○	4.50	2.40	6.25	8.84	12.50	15.31	19.76	27.95	450	820
652.886	○	-	○	○	5.00	3.10	8.00	11.31	16.00	19.60	25.30	35.78	450	835	
120°	652.187	○	-	○	-	0.35	0.20	-	0.06*	0.08	0.10	0.13	0.18	640	1,220
	652.217	○	-	○	-	0.40	0.20	-	0.08*	0.11	0.14	0.18	0.25	650	1,230
	652.247	○	-	○	-	0.50	0.20	-	0.12*	0.16	0.20	0.26	0.36	655	1,245
	652.277	○	-	○	-	0.60	0.30	-	0.16*	0.22	0.27	0.35	0.49	655	1,250
	652.307	○	-	○	○	0.70	0.30	0.16*	0.23*	0.32	0.39	0.51	0.72	660	1,260
	652.337	○	○	○	○	0.90	0.40	0.22*	0.32*	0.45	0.55	0.71	1.01	660	1,260
	652.367	○	○	○	○	1.00	0.50	0.31*	0.44*	0.63	0.77	1.00	1.41	660	1,265
	652.407	○	○	○	○	1.20	0.60	0.50*	0.71	1.00	1.23	1.58	2.24	660	1,270
	652.447	○	○	○	○	1.35	0.60	0.62*	0.88	1.25	1.53	1.98	2.80	665	1,270
	652.487	○	○	○	○	1.50	0.60	0.80*	1.13	1.60	1.96	2.53	3.58	665	1,270
	652.517	○	○	○	○	1.65	0.90	0.95*	1.34	1.90	2.33	3.00	4.25	670	1,275
	652.567	○	○	○	○	2.00	0.90	1.25	1.77	2.50	3.06	3.95	5.59	670	1,280
	652.607	○	○	○	○	2.20	1.10	1.58	2.23	3.15	3.86	4.98	7.04	675	1,285
	652.647	○	○	○	-	2.50	1.30	2.00	2.83	4.00	4.90	6.33	8.94	680	1,295
	652.677	○	○	○	-	2.70	1.40	2.38	3.36	4.75	5.82	7.51	10.62	685	1,300
	652.727	○	○	○	○	3.00	1.60	3.15	4.46	6.30	7.72	9.96	14.09	695	1,315
	652.767	○	○	○	-	3.50	1.70	4.00	5.66	8.00	9.80	12.65	17.89	705	1,330
	652.807	○	-	○	-	4.00	2.00	5.00	7.07	10.00	12.25	15.81	22.36	705	1,330
652.847	-	-	-	○	4.50	2.30	6.25	8.84	12.50	15.31	19.76	27.95	800	1,460	
652.887	-	-	-	○	5.00	2.60	8.00	11.31	16.00	19.60	25.30	35.78	800	1,460	

¹We reserve the right to deliver 316Ti SS or 316L SS under the material no. 17.
A = equivalent bore diameter · E = narrowest free cross section
*Differing spray pattern · Subject to technical modifications.

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to "Accessories".

Example of ordering:	Type	+	Material no.	= Ordering no.
	652.145	+	16	= 652.145.16

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



Flat fan nozzles for belt lubrication

Series 652



Especially low flow rates.
Parabolic liquid distribution.

Applications:

Belt lubrication, moistening, spraying of food products, moisturization of rollers, oiling, lubrication of metal sheets.

Operating pressure range:
1 to 5 bar

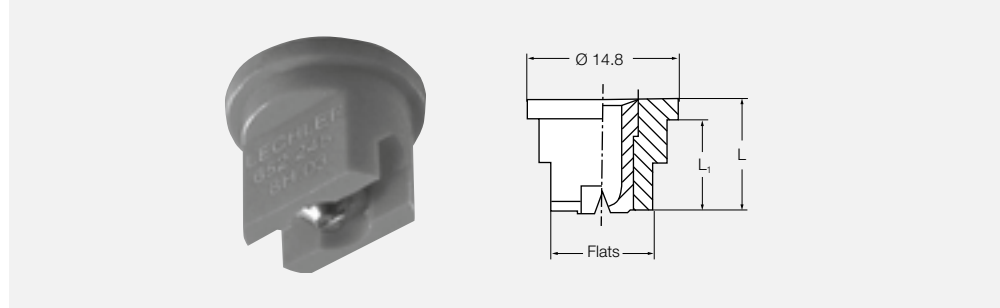
Recommended operating pressure:
3 bar

Viscosity:

The nozzles can be operated with viscous media, e. g. transmission fluid (max. approx. 200 mPas). However the spray angle decreases.

Return valve with filter:

- Prevents dripping and saves medium
- Size of filter mesh: 0.08 mm (200 mesh)
- **095.016.53.11.00**
Opening pressure: approx. 0.5 bar
Closing pressure: approx. 0.3 bar
- **095.016.53.14.63**
Opening pressure: approx. 2.8 bar
Closing pressure: approx. 1.6 bar

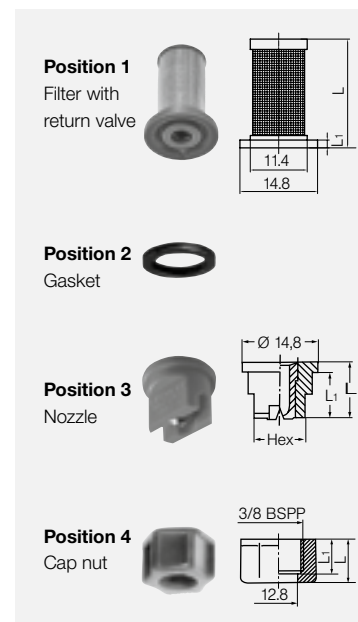


Spray angle	Ordering no.				Colour	E Ø [mm]	V̇ [l/min]			
	Type	Mat. no.					p [bar]			
		16 303 SS	8H.03* POM/ 303 SS	56.03 POM			1.0	2.0	3.0	5.0
75°	652.145	○	○	○	green	0.12	0.04**	0.05	0.06	0.08
	652.165	○	○	-	black	0.14	0.05**	0.07	0.08	0.10
	652.185	○	○	○	red	0.16	0.06**	0.08	0.10	0.13
	652.215	○	○	-	blue	0.20	0.08**	0.11	0.14	0.18
	652.245	○	○	-	orange	0.30	0.12**	0.16	0.20	0.26
120°	652.275	○	○	-	brown	0.30	0.16**	0.22	0.27	0.35
	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

E = narrowest free cross section
* Housing POM, nozzle insert 303 SS
** Differing spray pattern.
Subject to technical modifications.

Pos.	Name	Ordering no.	Material	Colour	Dimensions [mm]			Filter mesh [mm]
					L	L ₁	Flats	
1	Filter with return valve	095.016.53.11.00	PP	blue	21	1.5	-	0.08
		095.016.53.14.63	PP	green	21	1.5	-	0.08
2	Gasket	065.240.55	PTFE	-	-	-	-	-
		065.240.72	EWP 210	-	-	-	-	-
3	Nozzle	Ordering no. see flow tables	303 SS	-	11	9	10	-
			POM/303 SS*	-	12	10	8	-
4	Cap nut	065.200.16	303 SS	-	13	10	22	-
		065.200.56	POM	black	14.5	11.5	22	-

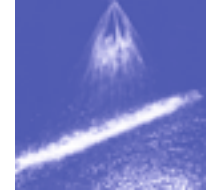
* Housing POM, Nozzle insert 303 SS
** Size of mesh





Flat fan nozzles for pressing into pipes

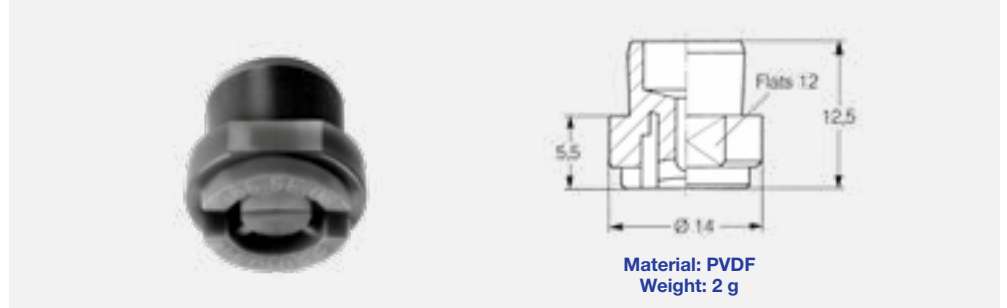
Series 612.xxx.5E.03



For pressing into pipes.
Stable spray pattern.
Uniform, parabolic
distribution of liquid.

Applications:

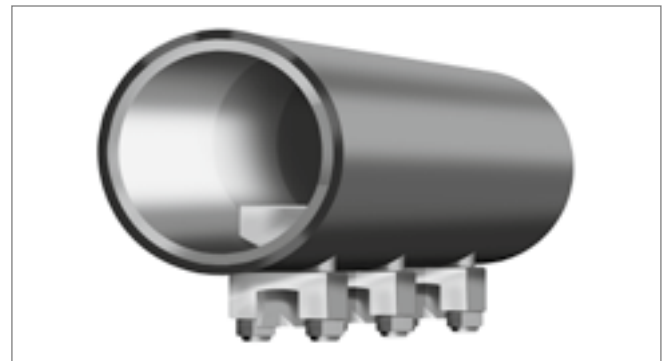
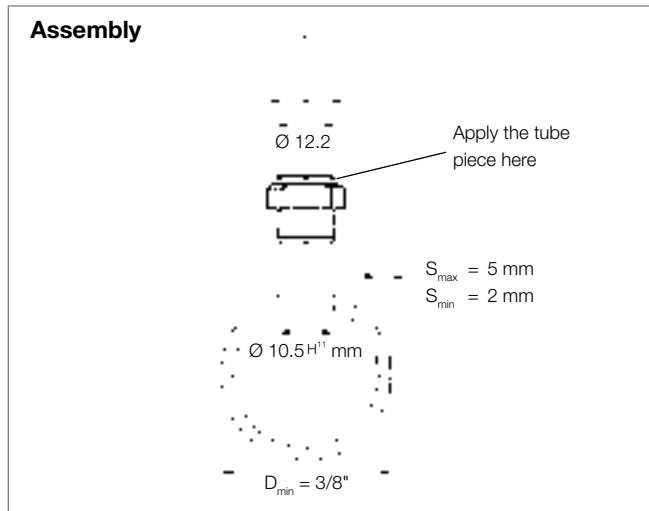
Cleaning and rinsing,
 dish washing.



Spray angle	Ordering no.		A Ø [mm]	E Ø [mm]	V̇ [l/min]						Spray width B at p=2 bar	
	Type	Mat. no.			p [bar]						H = 250 mm	H = 500 mm
		5E.03			0.3	0.5	0.7	1.0	1.5	2.0		
90°	612.366	○	1.0	0.5	0.24	0.31	0.37	0.44	0.55	0.63	505	980
	612.486	○	1.5	0.6	0.62	0.80	0.95	1.13	1.39	1.60	525	1,020
120°	612.487	○	1.5	0.6	0.62	0.80	0.95	1.13	1.39	1.60	800	1,460
	612.647	○	2.5	1.2	1.55	2.00	2.37	2.83	3.46	4.00	800	1,460

A = equivalent bore diameter · E = narrowest free cross section

Further nozzle sizes on request.



Assembly:

Drill pipe (Ø 10 mm), ream to Ø 10.5^{H11} mm, adjust, put tube (Ø 12.2 mm) on nozzle and drive in with a rubber mallet. Flow velocity in the pipe max. 2–3 m/s.

Example	Type	+	Mat.-no.	= Ordering no.
for ordering:	612.366	+	5E.03	= 612.366.5E.03

Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \sqrt{\frac{p_2}{p_1}}$



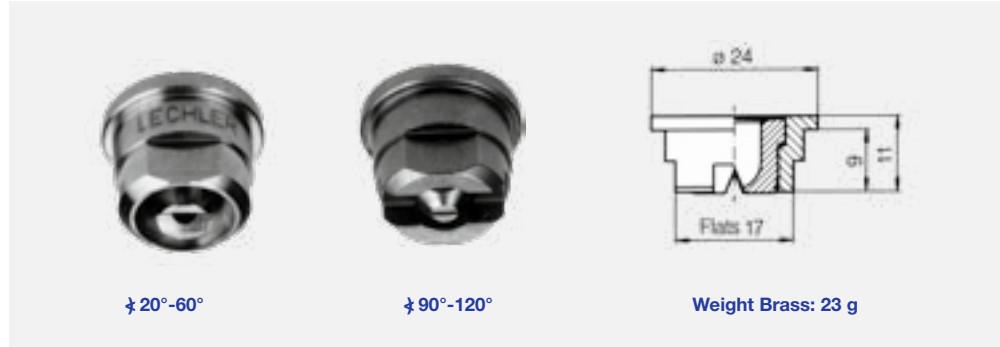
Flat fan nozzles for retaining nut Series 656/657



Assembly with retaining nut. Easy nozzle changing, simple jet alignment. Uniform, parabolic distribution of liquid. Increased non-clogging features, more jet power, less fog.

Applications:



Cleaning installations, gravel washing, cooling headers, spray pipes, roll cooling, cooling of rolled stock.



± 20°-60°

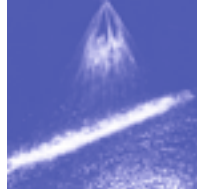
± 90°-120°

Weight Brass: 23 g



Spray angle 	Ordering no.				A Ø [mm]	E Ø [mm]	V̇ [l/min]						Spray width B at p=2 bar 		
	Type	Mat. no.					p [bar]						H = 250 mm	H = 500 mm	
		16 303 SS	17 ¹ 316Ti SS/ 316L SS	30 Brass			0.5	1.0	2.0	[US gal./ min] at 40 psi	3.0	5.0			10.0
20°	656.721	○	○	○	3.00	2.50	3.15	4.45	6.30	1.95	7.72	9.96	14.09	110	205
	656.801	○	○	○	4.00	3.20	5.00	7.07	10.00	3.10	12.25	15.81	22.36	110	205
	656.881	○	○	○	5.00	4.00	8.00	11.31	16.00	4.96	19.60	25.30	35.78	110	205
	656.921	○	○	○	5.50	4.40	10.00	14.14	20.00	6.20	24.49	31.62	44.72	110	205
	656.961	○	○	○	6.00	5.30	12.50	17.68	25.00	7.75	30.62	39.53	55.90	110	205
30°	656.722	○	○	○	3.00	2.40	3.15	4.45	6.30	1.95	7.72	9.96	14.09	150	280
	656.762	○	○	○	3.50	2.70	4.00	5.66	8.00	2.48	9.80	12.65	17.89	150	280
	656.802	○	○	○	4.00	3.10	5.00	7.07	10.00	3.10	12.25	15.81	22.36	150	280
	656.882	○	○	○	5.00	4.00	8.00	11.31	16.00	4.96	19.60	25.30	35.78	150	280
	656.922	○	○	○	5.50	4.40	10.00	14.14	20.00	6.20	24.49	31.62	44.72	150	280
	656.962	○	○	○	6.00	5.00	12.50	17.68	25.00	7.75	30.62	39.53	55.90	150	280
45°	656.723	○	○	○	3.00	2.40	3.15	4.45	6.30	1.95	7.72	9.96	14.09	280	520
	656.763	○	○	○	3.50	2.60	4.00	5.66	8.00	2.48	9.80	12.65	17.89	280	520
	656.803	○	○	○	4.00	3.00	5.00	7.07	10.00	3.10	12.25	15.81	22.36	280	520
	656.843	○	○	○	4.50	3.40	6.25	8.84	12.50	3.88	15.31	19.76	27.95	280	520
	656.883	○	○	○	5.00	3.80	8.00	11.31	16.00	4.96	19.60	25.30	35.78	280	520
	656.923	○	○	○	5.50	4.20	10.00	14.14	20.00	6.20	24.49	31.62	44.72	280	520
	656.963	○	○	○	6.00	4.40	12.50	17.68	25.00	7.75	30.62	39.53	55.90	280	520
60°	656.724	○	○	○	3.00	2.10	3.15	4.45	6.30	1.95	7.72	9.96	14.09	320	595
	656.764	○	○	○	3.50	2.30	4.00	5.66	8.00	2.48	9.80	12.65	17.89	320	595
	656.804	○	○	○	4.00	2.60	5.00	7.07	10.00	3.10	12.25	15.81	22.36	320	595
	656.844	○	○	○	4.50	3.00	6.25	8.84	12.50	3.88	15.31	19.76	27.95	320	595
	656.884	○	○	○	5.00	3.40	8.00	11.31	16.00	4.96	19.60	25.30	35.78	320	595
	656.924	○	○	○	5.50	4.10	10.00	14.14	20.00	6.20	24.49	31.62	44.72	320	595
	656.964	○	○	○	6.00	4.20	12.50	17.68	25.00	7.75	30.62	39.53	55.90	320	595
	657.044	-	○	○	8.00	5.50	20.00	28.28	40.00	12.41	48.99	63.25	89.44	320	595
90°	656.726	○	○	○	3.00	1.70	3.15	4.45	6.30	1.95	7.72	9.96	14.09	420	800
	656.766	○	○	○	3.50	1.90	4.00	5.66	8.00	2.48	9.80	12.65	17.89	420	800
	656.806	○	○	○	4.00	2.40	5.00	7.07	10.00	3.10	12.25	15.81	22.36	420	800
	656.846	○	○	○	4.50	2.40	6.25	8.84	12.50	3.88	15.31	19.76	27.95	420	800
	656.886	○	○	○	5.00	3.10	8.00	11.31	16.00	4.96	19.60	25.30	35.78	420	800
	656.926	○	○	○	5.50	3.60	10.00	14.14	20.00	6.20	24.49	31.62	44.72	420	800
	656.966	○	○	○	6.00	3.90	12.50	17.68	25.00	7.75	30.62	39.53	55.90	420	800
	657.046	-	-	○	8.00	4.90	20.00	28.28	40.00	12.41	48.99	63.25	89.44	420	800

¹We reserve the right to deliver 316Ti SS or 316L SS under the material no. 17.
A = equivalent bore diameter · E = narrowest free cross section
Subject to technical modifications.

Continued on next page.



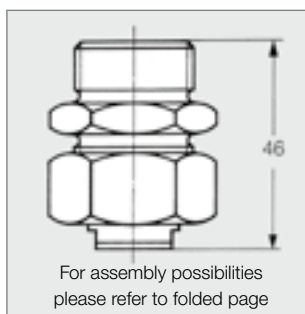
Flat fan nozzles for retaining nut Series 656/657

Spray angle 	Ordering no.				A Ø [mm]	E Ø [mm]	V̇ [l/min]							Spray width B at p=2 bar 	
	Type	Mat. no.					p [bar]							H = 250 mm	H = 500 mm
		16	17 ¹	30			0.5	1.0	2.0	[US gal./min] at 40 psi	3.0	5.0	10.0		
120°	656.727	○	○	○	3.00	1.60	3.15	4.45	6.30	1.95	7.72	9.96	14.09	675	1,350
	656.767	○	○	○	3.50	1.70	4.00	5.66	8.00	2.48	9.80	12.65	17.89	800	1,600
	656.807	○	○	○	4.00	2.00	5.00	7.07	10.00	3.10	12.25	15.81	22.36	740	1,485
	656.887	○	○	○	5.00	2.60	8.00	11.31	16.00	4.96	19.60	25.30	35.78	775	1,540
	656.927	○	○	○	5.50	2.90	10.00	14.14	20.00	6.20	24.49	31.62	44.72	815	1,630

¹We reserve the right to deliver 316Ti SS or 316L SS under the material no. 17.
A = equivalent bore diameter · E = narrowest free cross section
Subject to technical modifications.

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to "Accessories".

Example	Type	+	Material-no.	= Ordering no.
for ordering:	656.727	+	16	= 656.727.16





Flat fan nozzles with dove-tail guide Series 660



Assembly with retaining nut. Automatic jet alignment due to dove-tail guide. Stable spray angle. Uniform, parabolic distribution of liquid. Spray pipes with these nozzles show an extremely uniform total liquid distribution.

Applications:



Cleaning installations. cooling headers. spray pipes.



↕ 20°-75°

↕ 90°-120°

Weight Brass: 10 g

Spray angle 	Ordering no.				A Ø [mm]	E Ø [mm]	V̇ [l/min]							Spray width B at p=2 bar 	
	Type	Mat. no.					p [bar]							H = 250 mm	H = 500 mm
		16 303 SS	17 ¹ 316Ti SS/ 316L SS	30 Brass			0.5	1.0	2.0	[US gal./ min] at 40 psi	3.0	5.0	10.0		
20°	660.301	○	○	○	0.70	0.60	0.16*	0.23*	0.32	0.10	0.39	0.51	0.72	60	110
	660.361	○	○	○	1.00	0.80	0.31*	0.44*	0.63	0.20	0.77	1.00	1.40	65	125
	660.441	○	○	○	1.35	1.10	0.62*	0.88	1.25	0.39	1.53	1.98	2.80	65	125
	660.481	○	○	○	1.50	1.20	0.80*	1.13	1.60	0.50	1.96	2.53	3.58	70	130
30°	660.302	○	○	○	0.60	0.50	0.16*	0.23*	0.32	0.10	0.39	0.51	0.72	110	205
	660.362	○	○	○	1.00	0.70	0.31*	0.44*	0.63	0.20	0.77	1.00	1.40	110	205
	660.402	○	○	○	1.20	0.90	0.50*	0.71	1.00	0.31	1.23	1.58	2.24	110	205
	660.482	○	○	○	1.50	1.10	0.80*	1.13	1.60	0.50	1.96	2.53	3.57	110	210
	660.562	○	○	○	2.00	1.50	1.25	1.76	2.50	0.78	3.06	3.95	5.59	110	210
45°	660.303	○	○	○	0.70	0.50	0.16*	0.23*	0.32	0.10	0.39	0.51	0.72	180	340
	660.363	○	○	○	1.00	0.60	0.31*	0.44*	0.63	0.20	0.77	1.00	1.40	185	340
	660.403	○	○	○	1.20	0.90	0.50*	0.71	1.00	0.31	1.23	1.58	2.24	185	340
	660.483	○	○	○	1.50	1.10	0.80*	1.13	1.60	0.50	1.96	2.53	3.58	185	340
	660.563	○	○	○	2.00	1.40	1.25	1.76	2.50	0.78	3.06	3.95	5.59	190	345
60°	660.643	○	○	○	2.50	1.80	2.00	2.83	4.00	1.24	4.90	6.33	8.94	190	350
	660.304	○	○	○	0.70	0.40	0.16*	0.23*	0.32	0.10	0.39	0.51	0.72	275	525
	660.334	○	○	○	0.90	0.50	0.22*	0.32*	0.45	0.14	0.55	0.71	1.01	275	525
	660.364	○	○	○	1.00	0.60	0.31*	0.44*	0.63	0.20	0.77	1.00	1.40	275	525
	660.404	○	○	○	1.20	0.80	0.50*	0.71	1.00	0.31	1.23	1.58	2.24	275	525
	660.444	○	○	○	1.35	0.90	0.62*	0.88	1.25	0.39	1.53	1.98	2.80	275	525
	660.484	○	○	○	1.50	1.00	0.80*	1.13	1.60	0.50	1.96	2.53	3.58	275	525
	660.514	○	○	○	1.65	1.10	0.95*	1.34	1.90	0.59	2.33	3.00	4.25	275	525
	660.564	○	○	○	2.00	1.30	1.25	1.77	2.50	0.78	3.06	3.95	5.59	275	525
	660.604	○	○	○	2.20	1.50	1.58	2.23	3.15	0.98	3.86	4.98	7.04	275	525
	660.644	○	○	○	2.50	1.60	2.00	2.83	4.00	1.24	4.90	6.33	8.94	275	525
75°	660.724	○	○	○	3.00	2.10	3.15	4.46	6.30	1.95	7.72	9.96	14.09	275	520
	660.804	○	-	○	4.00	2.60	5.00	7.07	10.00	3.10	12.25	15.81	22.36	270	520
	660.145	○	-	○	0.20	0.12	-	0.04*	0.05	0.02	0.06	0.08	0.11	320	600
	660.165	○	-	○	0.20	0.14	-	0.05*	0.07	0.02	0.08	0.10	0.15	330	620
	660.185	○	-	○	0.20	0.16	-	0.06*	0.08	0.02	0.10	0.13	0.18	335	625
	660.215	○	-	○	0.50	0.20	-	0.08*	0.11	0.03	0.14	0.18	0.25	340	630
	660.245	○	-	○	0.50	0.30	-	0.12*	0.16	0.05	0.20	0.26	0.36	345	640
660.275	○	-	○	0.60	0.30	0.11*	0.16*	0.22	0.07	0.27	0.35	0.49	345	645	

¹ We reserve the right to deliver 316Ti SS or 316L SS under the material no. 17.

A = equivalent bore diameter · E = narrowest free cross section

* Differing spray pattern

Continued on next page.



Flat fan nozzles with dove-tail guide Series 660



Spray angle	Ordering no.				A Ø [mm]	E Ø [mm]	V̇ [l/min]						Spray width B at p=2 bar		
	Type	Mat. no.					p [bar]						H = 250 mm	H = 500 mm	
		16	17 ¹	30			0.5	1.0	2.0	[US gal./min] at 40 psi	3.0	5.0			10.0
90°	660.216	○	-	○	0.40	0.20	-	0.08*	0.11	0.03	0.14	0.18	0.25	500	900
	660.276	○	-	○	0.60	0.30	0.11*	0.16*	0.22	0.07	0.27	0.35	0.49	500	900
	660.306	○	○	○	0.70	0.40	0.16*	0.23*	0.32	0.10	0.39	0.51	0.72	515	930
	660.336	○	○	○	0.90	0.50	0.22*	0.32*	0.45	0.14	0.55	0.71	1.01	515	930
	660.366	○	○	○	1.00	0.50	0.31*	0.44*	0.63	0.20	0.77	1.00	1.41	515	930
	660.406	○	○	○	1.20	0.70	0.50*	0.71	1.00	0.31	1.23	1.58	2.24	515	930
	660.446	○	○	○	1.35	0.80	0.62*	0.88	1.25	0.39	1.53	1.98	2.80	510	925
	660.486	○	○	○	1.50	0.80	0.80*	1.13	1.60	0.50	1.96	2.53	3.58	510	925
	660.516	○	○	○	1.65	0.90	0.95*	1.34	1.90	0.59	2.33	3.00	4.25	510	925
	660.566	○	○	○	2.00	1.10	1.25	1.77	2.50	0.78	3.06	3.95	5.59	505	920
	660.606	○	○	○	2.20	1.20	1.58	2.23	3.15	0.98	3.86	4.98	7.04	505	915
	660.646	○	○	○	2.50	1.30	2.00	2.83	4.00	1.24	4.90	6.33	8.94	500	910
	660.676	○	○	○	2.70	1.40	2.38	3.36	4.75	1.47	5.82	7.51	10.62	495	905
	660.726	○	○	○	3.00	1.70	3.15	4.46	6.30	1.95	7.72	9.96	14.09	490	900
660.806	-	○	○	4.00	2.40	5.00	7.07	10.00	3.10	12.25	15.81	22.36	470	875	
120°	660.187	○	-	○	0.35	0.20	-	0.06*	0.08	0.02	0.10	0.13	0.18	650	1,220
	660.217	○	-	○	0.40	0.20	-	0.08*	0.11	0.03	0.14	0.18	0.25	655	1,230
	660.247	○	-	○	0.50	0.20	-	0.12*	0.16	0.05	0.20	0.26	0.36	655	1,240
	660.277	○	-	○	0.60	0.30	-	0.16*	0.22	0.07	0.27	0.35	0.49	660	1,250
	660.307	○	-	○	0.70	0.30	0.16*	0.23*	0.32	0.10	0.39	0.51	0.72	660	1,260
	660.337	○	○	○	0.90	0.40	0.22*	0.32*	0.45	0.14	0.55	0.71	1.00	660	1,260
	660.367	○	○	○	1.00	0.40	0.31*	0.44*	0.63	0.20	0.77	1.00	1.41	660	1,265
	660.407	○	○	○	1.20	0.60	0.50*	0.71	1.00	0.31	1.23	1.58	2.24	665	1,270
	660.447	○	○	○	1.35	0.60	0.62*	0.88	1.25	0.39	1.53	1.98	2.80	670	1,270
	660.487	○	○	○	1.50	0.60	0.80*	1.13	1.60	0.50	1.96	2.53	3.58	675	1,270
	660.517	○	○	○	1.65	0.90	0.95*	1.34	1.90	0.59	2.33	3.00	4.25	675	1,275
	660.567	○	○	○	2.00	0.90	1.25	1.77	2.50	0.78	3.06	3.95	5.59	685	1,280
	660.607	○	○	○	2.20	1.10	1.58	2.23	3.15	0.98	3.86	4.98	7.04	695	1,285
	660.647	○	○	○	2.50	1.30	2.00	2.83	4.00	1.24	4.90	6.33	8.94	705	1,295
	660.727	○	○	○	3.00	1.60	3.15	4.46	6.30	1.95	7.72	9.96	14.09	735	1,315
	660.807	○	-	○	4.00	2.00	5.00	7.07	10.00	3.10	12.25	15.81	22.36	780	1,345

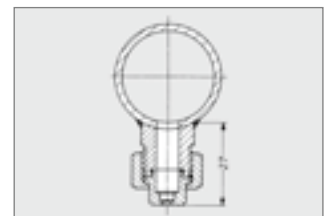
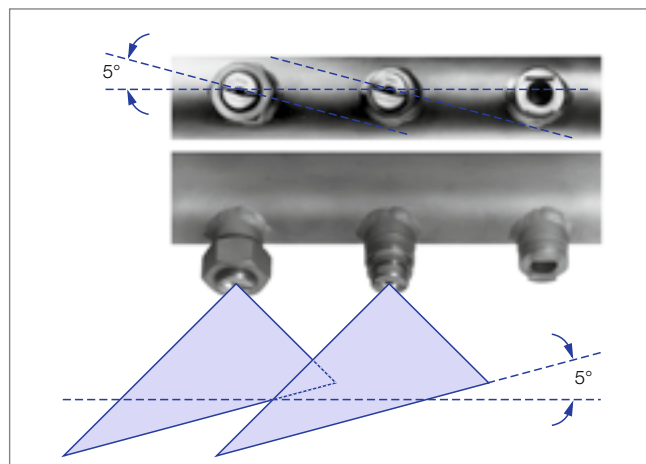
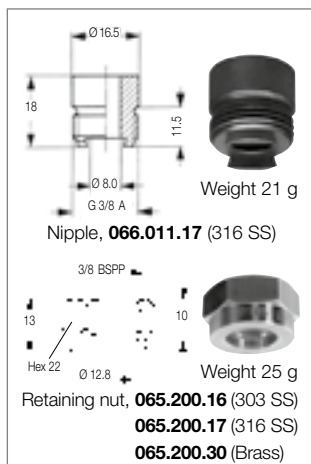
¹ We reserve the right to deliver 316Ti SS or 316L SS under the material no. 17.

A = equivalent bore diameter · E = narrowest free cross section

* Differing spray pattern

Example for ordering:	Type	+	Material-no.	=	Ordering no.
	660.216.	+	16	=	660.216.16

Accessories



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



Flat fan nozzles with dove-tail guide Series 664/665





Assembly with retaining nut. Automatic jet alignment due to dove-tail guide. Stable spray angle. Uniform, parabolic distribution of liquid. Spray pipes with these nozzles show an extremely uniform total liquid distribution.

Applications:

Cleaning installations, cooling headers, spray pipes, roll cooling, cooling of rolled stock.



Spray angle 	Ordering no.				A Ø [mm]	E Ø [mm]	V̇ [l/min]						Spray width B at p=2 bar 		
	Type	Mat. no.					p [bar]						H = 250 mm	H = 500 mm	
		16 303 SS	17 ¹ 316Ti SS/ 316L SS	30 Brass			0.5	1.0	2.0	[US gal./ min] at 40 psi	3.0	5.0			10.0
20°	664.721	○	○	○	3.00	2.50	3.15	4.45	6.30	1.95	7.72	9.96	14.09	110	205
	664.801	○	○	○	4.00	3.20	5.00	7.07	10.00	3.10	12.25	15.81	22.36	110	205
	664.881	○	○	○	5.00	4.00	8.00	11.31	16.00	4.96	19.60	25.30	35.78	110	205
	664.921	○	○	○	5.50	4.40	10.00	14.14	20.00	6.20	24.49	31.62	44.72	110	205
	664.961	○	○	○	6.00	5.10	12.50	17.68	25.00	7.75	30.62	39.53	55.90	100	205
30°	664.722	○	○	○	3.00	2.40	3.15	4.45	6.30	1.95	7.72	9.96	14.09	150	280
	664.762	○	○	○	3.50	2.70	4.00	5.66	8.00	2.48	9.80	12.65	17.89	150	280
	664.802	○	○	○	4.00	3.10	5.00	7.07	10.00	3.10	12.25	15.81	22.36	150	280
	664.882	○	○	○	5.00	4.00	8.00	11.31	16.00	4.96	19.60	25.30	35.78	150	280
	664.922	○	○	○	5.50	4.40	10.00	14.14	20.00	6.20	24.49	31.62	44.72	150	280
	664.962	○	○	○	6.00	5.00	12.50	17.68	25.00	7.75	30.62	39.53	55.90	150	280
	665.042	○	-	○	8.00	6.40	20.00	28.28	40.00	12.41	48.99	63.25	89.44	150	280
	665.122	-	-	○	10.00	8.20	31.50	44.55	63.00	19.54	77.16	99.61	140.87	150	280
45°	664.723	○	○	○	3.00	2.40	3.15	4.45	6.30	1.95	7.72	9.96	14.09	260	490
	664.763	○	○	○	3.50	2.60	4.00	5.66	8.00	2.48	9.80	12.65	17.89	260	490
	664.803	○	○	○	4.00	3.00	5.00	7.07	10.00	3.10	12.25	15.81	22.36	265	495
	664.843	○	○	○	4.50	3.40	6.25	8.84	12.50	3.88	15.31	19.76	27.95	265	495
	664.883	○	○	○	5.00	3.80	8.00	11.31	16.00	4.96	19.60	25.30	35.78	265	500
	664.923	○	○	○	5.50	4.20	10.00	14.14	20.00	6.20	24.49	31.62	44.72	270	505
	664.963	○	○	○	6.00	4.40	12.50	17.68	25.00	7.75	30.62	39.53	55.90	270	510
	665.043	-	-	○	8.00	5.90	20.00	28.28	40.00	12.41	48.99	63.25	89.44	275	520
60°	664.724	○	○	○	3.00	2.10	3.15	4.45	6.30	1.95	7.72	9.96	14.09	300	560
	664.764	○	○	○	3.50	2.30	4.00	5.66	8.00	2.48	9.80	12.65	17.89	300	565
	664.804	○	○	○	4.00	2.60	5.00	7.07	10.00	3.10	12.25	15.81	22.36	300	565
	664.844	○	○	○	4.50	3.00	6.25	8.84	12.50	3.88	15.31	19.76	27.95	300	570
	664.884	○	○	○	5.00	3.40	8.00	11.31	16.00	4.96	19.60	25.30	35.78	305	570
	664.924	○	○	○	5.50	4.10	10.00	14.14	20.00	6.20	24.49	31.62	44.72	305	575
	664.964	○	○	○	6.00	4.20	12.50	17.68	25.00	7.75	30.62	39.53	55.90	310	580
	665.044	○	○	○	8.00	5.50	20.00	28.28	40.00	12.41	48.99	63.25	89.44	315	585
	665.084	-	○	○	9.00	6.20	25.00	35.36	50.00	15.51	61.24	79.06	111.80	320	590
	665.124	-	-	○	10.00	7.40	31.50	44.55	63.00	19.54	77.16	99.61	140.87	325	600

¹We reserve the right to deliver 316Ti SS or 316L SS under the material no. 17.


A = equivalent bore diameter · E = narrowest free cross section
Subject to technical modifications.

Continued on next page.



Flat fan nozzles with dove-tail guide Series 664/665



Spray angle	Ordering no.				A Ø [mm]	E Ø [mm]	V̇ [l/min]						Spray width B at p=2 bar		
	Type	Mat. no.					p [bar]						 H = 250 mm H = 500 mm		
		16	17 ¹	30			0.5	1.0	2.0	[US gal./min] at 40 psi	3.0	5.0			10.0
90°	664.726	○	○	○	3.00	1.70	3.15	4.45	6.30	1.95	7.72	9.96	14.09	420	800
	664.766	○	○	○	3.50	1.90	4.00	5.66	8.00	2.48	9.80	12.65	17.89	420	800
	664.806	○	○	○	4.00	2.40	5.00	7.07	10.00	3.10	12.25	15.81	22.36	420	800
	664.846	○	○	○	4.50	2.40	6.25	8.84	12.50	3.88	15.31	19.76	27.95	420	800
	664.886	○	○	○	5.00	3.10	8.00	11.31	16.00	4.96	19.60	25.30	35.78	420	800
	664.926	○	○	○	5.50	3.60	10.00	14.14	20.00	6.20	24.49	31.62	44.72	420	800
	664.966	○	○	○	6.00	3.90	12.50	17.68	25.00	7.75	30.62	39.53	55.90	420	800
	665.046	-	-	○	8.00	4.90	20.00	28.28	40.00	12.41	48.99	63.25	89.44	420	800
665.126	-	-	○	10.00	6.40	31.50	44.55	63.00	19.54	77.16	99.61	140.87	420	800	
120°	664.727	○	○	○	3.00	1.60	3.15	4.45	6.30	1.95	7.72	9.96	14.09	1,240	2,150
	664.767	○	○	○	3.50	1.70	4.00	5.66	8.00	2.48	9.80	12.65	17.89	1,240	2,150
	664.807	○	○	○	4.00	2.00	5.00	7.07	10.00	3.10	12.25	15.81	22.36	1,240	2,150
	664.887	○	○	○	5.00	2.60	8.00	11.31	16.00	4.96	19.60	25.30	35.78	1,240	2,150
	664.927	○	○	○	5.50	2.90	10.00	14.14	20.00	6.20	24.49	31.62	44.72	1,240	2,150
	664.967	-	-	○	6.00	3.20	12.50	17.68	25.00	7.75	30.62	39.53	55.90	1,240	2,150
	665.047	-	-	○	8.00	4.40	20.00	28.28	40.00	12.41	48.99	63.25	89.44	1,240	2,150

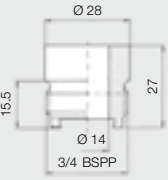
¹We reserve the right to deliver 316Ti SS or 316L SS under the material no. 17.
A = equivalent bore diameter · E = narrowest free cross section
Subject to technical modifications.

Example for ordering:	Type	+	Material-no.	=	Ordering no.
	664.726	+	16	=	664.726.16

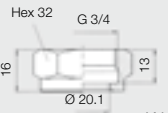


Pretreatment in a pickling line

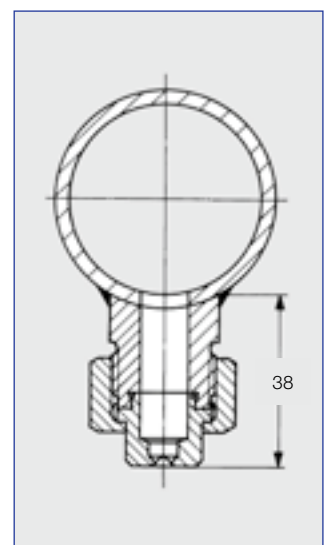
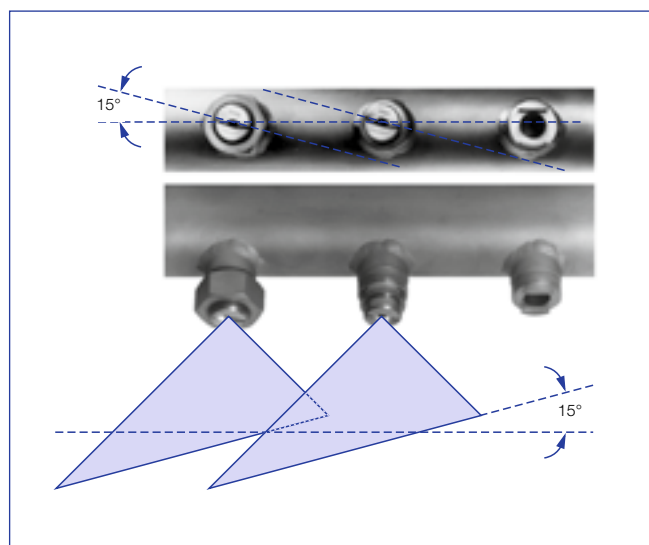
Accessories



Weight: 65 g
Nipple, **066.410.17** (316Ti SS)



Weight Brass: 60 g
Retaining nut, **065.600.16** (303 SS)
065.600.17 (316Ti SS)
065.600.30 (Brass)



Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \sqrt{\frac{p_2}{p_1}}$



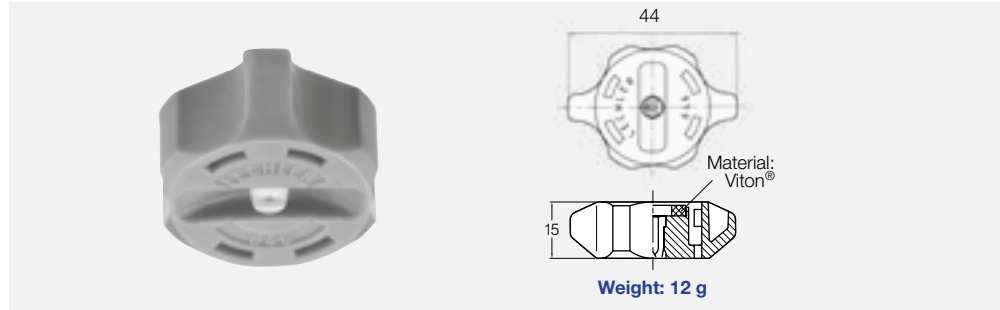
Flat fan nozzles with bayonet quick release cap Series 646





Quick and easy assembly with bayonet quick release cap. Adjusted spray direction. Uniform liquid distribution.

Applications:

Belt cleaning, surface treatment, cleaning, coating processes.



Spray angle 	Ordering no.		A Ø [mm]	E Ø [mm]	V [l/min]							Spray width B at p=2 bar 	
	Type	Mat. no.			p [bar]							H = 250 mm	H = 500 mm
		5E			0.5	1.0	2.0	[US gal./min] at 40 psi	3.0	5.0	10.0		
20°	646.301	○	0.70	0.60	0.16*	0.23*	0.32	0.10	0.39	0.51	0.72	75	150
	646.361	○	1.00	0.80	0.31*	0.44*	0.63	0.20	0.77	1.00	1.40	80	150
	646.441	○	1.35	1.10	0.62*	0.88	1.25	0.39	1.53	1.98	2.80	80	155
	646.481	○	1.50	1.20	0.80*	1.13	1.60	0.50	1.96	2.53	3.58	80	155
30°	646.302	○	0.70	0.50	0.16*	0.23*	0.32	0.10	0.39	0.51	0.72	85	140
	646.362	○	1.00	0.70	0.31*	0.44*	0.63	0.20	0.77	1.00	1.40	95	160
	646.402	○	1.20	0.90	0.50*	0.71	1.00	0.39	1.23	1.58	2.24	105	190
	646.482	○	1.50	1.10	0.80*	1.13	1.60	0.50	1.96	2.53	3.58	120	225
	646.562	○	2.00	1.50	1.25	1.77	2.50	0.78	3.06	3.95	5.59	135	240
45°	646.363	○	1.00	0.60	0.31*	0.44*	0.63	0.20	0.77	1.00	1.40	185	340
	646.403	○	1.20	0.90	0.50*	0.71	1.00	0.31	1.23	1.58	2.24	185	340
	646.483	○	1.50	1.10	0.80*	1.13	1.60	0.50	1.96	2.53	3.58	185	340
	646.563	○	2.00	1.40	1.20	1.77	2.50	0.78	3.06	3.95	5.59	185	340
	646.643	○	2.50	1.80	2.00	2.83	4.00	1.24	4.90	6.33	8.94	185	345
60°	646.304	○	0.70	0.40	0.16*	0.23*	0.32	0.10	0.39	0.51	0.72	245	490
	646.334	○	0.90	0.50	0.22*	0.32*	0.45	0.14	0.55	0.71	1.01	250	495
	646.364	○	1.00	0.60	0.31*	0.44*	0.63	0.20	0.77	1.00	1.40	255	500
	646.404	○	1.20	0.80	0.50*	0.71	1.00	0.31	1.23	1.58	2.24	260	510
	646.444	○	1.35	0.90	0.62	0.88	1.25	0.39	1.53	1.98	2.80	260	510
	646.484	○	1.50	1.00	0.80	1.13	1.60	0.50	1.96	2.53	3.58	270	525
	646.514	○	1.65	1.10	0.95	1.34	1.90	0.59	2.33	3.00	4.25	260	510
	646.564	○	2.00	1.30	1.25	1.77	2.50	0.78	3.06	3.95	5.59	260	505
	646.604	○	2.20	1.50	1.58	2.23	3.15	0.98	3.86	4.98	7.04	265	505
90°	646.306	○	0.70	0.40	0.16*	0.23*	0.32	0.10	0.39	0.51	0.72	425	840
	646.336	○	0.90	0.50	0.22*	0.32*	0.45	0.14	0.55	0.71	1.01	425	840
	646.366	○	1.00	0.50	0.31*	0.44*	0.63	0.20	0.77	1.00	1.41	425	840
	646.406	○	1.20	0.70	0.50*	0.71	1.00	0.31	1.23	1.58	2.24	425	835
	646.446	○	1.35	0.80	0.62*	0.88	1.25	0.39	1.53	1.98	2.80	425	835
	646.486	○	1.50	0.80	0.80*	1.13	1.60	0.50	1.96	2.53	3.58	425	830
	646.516	○	1.65	0.90	0.95*	1.34	1.90	0.59	2.33	3.00	4.25	425	830
	646.566	○	2.00	1.10	1.25	1.77	2.50	0.78	3.06	3.95	5.59	425	825
	646.606	○	2.20	1.20	1.58	2.23	3.15	0.98	3.86	4.98	7.04	425	820

A = equivalent bore diameter · E = narrowest free cross section

* Differing spray pattern

Subject to technical modifications.

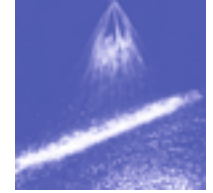
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The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to "Accessories".

Example	Type	+	Material-no.	=	Ordering no.
for ordering:	646.301	+	5E	=	646.301.5E



Flat fan nozzles with bayonet quick release cap Series 646



Spray angle 	Ordering no.		A Ø [mm]	E Ø [mm]	V̇ [l/min]							Spray width B at p=2 bar 	
	Type	Mat. no.			p [bar]							H = 250 mm	H = 500 mm
		5E			0.5	1.0	2.0	[US gal./min] at 40 psi	3.0	5.0	10.0		
120°	646.307	○	0.70	0.30	0.16*	0.23*	0.32	0.10	0.39	0.51	0.72	625	1,175
	646.337	○	0.90	0.40	0.22*	0.32*	0.45	0.14	0.55	0.71	1.01	630	1,180
	646.367	○	1.00	0.50	0.31*	0.44*	0.63	0.20	0.77	1.00	1.41	635	1,190
	646.407	○	1.20	0.60	0.50*	0.71	1.00	0.31	1.23	1.58	2.24	640	1,195
	646.447	○	1.35	0.60	0.62*	0.88	1.25	0.39	1.53	1.98	2.80	645	1,200
	646.487	○	1.50	0.60	0.80*	1.13	1.60	0.50	1.96	2.53	3.58	650	1,200
	646.517	○	1.65	0.90	0.95*	1.34	1.90	0.59	2.33	3.00	4.25	650	1,205
	646.567	○	2.00	0.90	1.25	1.77	2.50	0.78	3.06	3.95	5.59	655	1,210
	646.607	○	2.20	1.10	1.58	2.23	3.15	0.98	3.86	4.98	7.04	660	1,215

A = equivalent bore diameter · E = narrowest free cross section
* Differing spray pattern
Subject to technical modifications.

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to "Accessories".

Example for ordering: Type 646.307 + Material-no. 5E = Ordering no. 646.307.5E



Assembly accessories see page 9.4



Tongue-type nozzles Series 688/689





**Hard, sharp flat fan,
narrowly delimited jet
pattern. Not prone to
clogging.**

Applications:

Cleaning, washing,
degreasing and phosphating,
preparation techniques.

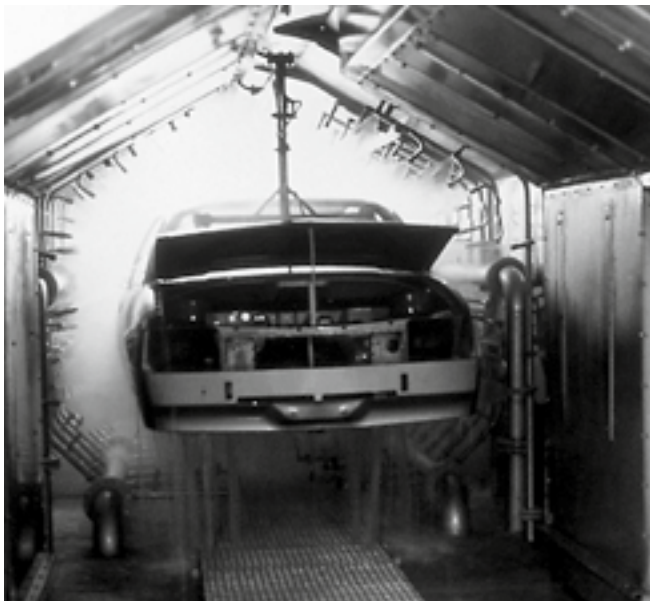


Spray angle 	η	Ordering no.					B \varnothing [mm]	\dot{V} [l/min]				Dimensions		Weight	Spray width B at p=2 bar 	
		Type	Mat. no.		Code G			p [bar]				L [mm]	Hex [mm]		H = 250 mm	H = 500 mm
			16	5E	303 SS	PVDF		3/8 BSPT	3/4 BSPP	0.5	1.0					
45°	35°	688.763	○	-	CE	-	3.0	4.00	5.66	8.00	12.65	43	19	114 g	220	440
	30°	688.843	○	-	CE	-	3.8	6.25	8.84	12.50	19.76	50	19	133 g	220	440
	29°	688.923	○	-	CE	-	4.8	10.00	14.14	20.00	31.62	59	22	247 g	220	440
	35°	689.003	○	○	-	90	6.0	15.75	22.27	31.50	49.81	80/80	32/24	306/33	250	490

B = bore diameter

Example Type + Material-no. + Code = Ordering no.
for ordering: **688.763** + **16** + **CE** = **688.763.16.CE**

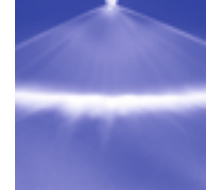
The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to "Accessories".



Phosphating line



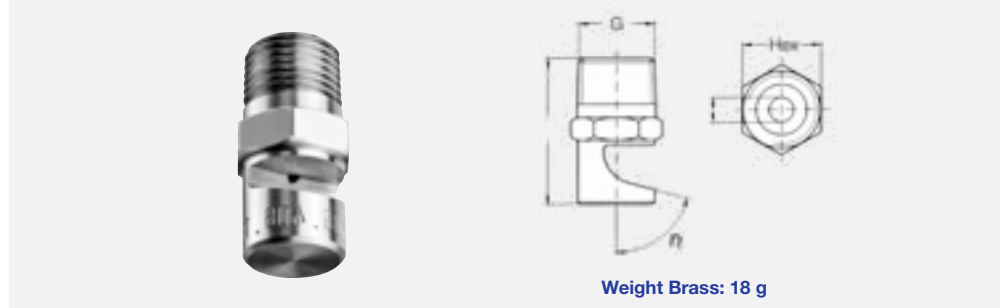
Tongue-type nozzles Series 686




Wide flat fan with a sharply delimited jet pattern. Particularly clog-proof.

Applications:

Foam control in storage tanks, crate washers, cleaning and washing processes requiring powerful and concentrated water jets.



Spray angle	η	Ordering no.							B Ø [mm]	\dot{V} [l/min]			Dimensions								Spray width B at p=2 bar  H = 250 mm	
		Type	Mat. no.			Code G				p [bar]			L [mm]				Hex [mm]					
			16 303 SS	30 Brass	5E PVDF	1/8 BSPT	1/4 BSPT	3/8 BSPT		1/2 BSPT	1.0	2.0	5.0	R 1/8	R 1/4	R 3/8	R 1/2	R 1/8	R 1/4	R 3/8		R 1/2
90°	75°	686.366	-	○	-	CA	-	-	-	0.80	0.45	0.63	1.00	22	-	-	-	11	-	-	-	520
	75°	686.406	○	○	-	CA	-	-	-	1.00	0.71	1.00	1.58	23	-	-	-	11	-	-	-	525
	40°	686.686	○	○	-	-	CC	-	-	2.40	3.54	5.00	7.91	-	29	-	-	-	14	-	-	530
	40°	686.726	-	○	-	CA	-	-	-	2.70	4.45	6.30	9.96	26	-	-	-	11	-	-	-	530
	40°	686.806	○	○	-	-	CC	-	-	3.40	7.07	10.00	15.81	-	34	-	-	-	14	-	-	530
	40°	686.886	○	-	-	-	CC	-	-	4.20	11.31	16.00	25.30	-	36	-	-	-	17	-	-	530
	40°	686.926	○	-	-	-	-	CE	-	4.70	14.14	20.00	31.62	-	-	-	39	-	-	-	17	-
140°	75°	686.368	○	○	-	CA	-	-	-	0.80	0.45	0.63	1.00	23	-	-	-	11	-	-	-	1,360
		686.408	○	○	-	CA	-	-	-	1.00	0.71	1.00	1.58	23	-	-	-	11	-	-	-	1,370
		686.448	○	○	-	-	CC	-	-	1.20	0.88	1.25	1.98	-	28	-	-	-	14	-	-	1,370
		686.488	○	○	-	CA	CC	-	-	1.30	1.13	1.60	2.53	23	28	-	-	11	14	-	-	1,370
		686.528	○	○	-	CA	CC	-	-	1.50	1.41	2.00	3.16	23	28	-	-	11	14	-	-	1,370
		686.568	○	○	○*	CA	CC	-	-	1.70	1.77	2.50	3.59	23	-	-	-	11	-	-	-	1,370
		686.608	○	○	-	CA	CC	-	-	1.90	2.23	3.15	4.98	23	28	-	-	11	14	-	-	1,370
		686.648	○	○	-	-	CC	-	-	2.20	2.83	4.00	6.32	-	28	-	-	-	14	-	-	1,370
		686.688	○	○	-	CA	CC	-	-	2.40	3.54	5.00	7.91	23	28	-	-	11	14	-	-	1,370
		686.728	○	○	-	CA	CC	-	-	2.70	4.45	6.30	9.96	23	-	-	-	11	-	-	-	1,370
		686.768	○	○	-	-	CC	-	-	3.00	5.66	8.00	12.65	-	28	-	-	-	14	-	-	1,370
		686.808	○	○	-	CA	CC	-	-	3.40	7.07	10.00	15.81	23	28	-	-	11	14	-	-	1,370
		686.828	○	○	-	-	CC	-	-	3.60	7.92	11.20	17.71	-	28	-	-	-	14	-	-	1,370
		686.848	○	○	-	-	CC	-	-	3.80	8.80	12.50	19.76	-	28	-	-	-	14	-	-	1,370
		686.868	○	○	-	-	CC	-	-	4.00	9.90	14.00	22.14	-	28	-	-	-	14	-	-	1,370
		686.888	○	○	-	-	CC	-	-	4.20	11.31	16.00	25.30	-	28	-	-	-	14	-	-	1,370
		686.908	○	○	-	-	CC	-	-	4.50	12.73	18.00	28.46	-	28	-	-	-	14	-	-	1,370
		686.928	○	-	-	-	-	CE	-	4.70	14.14	20.00	31.62	-	-	-	32	-	-	17	-	1,370
		686.968	-	○	-	-	-	-	CG	5.30	17.68	25.00	39.53	-	-	-	32	40	-	-	17	22
686.988	○	-	-	-	-	CE	CG	5.60	19.80	28.00	44.27	-	-	-	32	40	-	-	17	22	1,370	

B = bore diameter
Can also be used for air or saturated steam (see page 6.8).
*Only available with code CA

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to "Accessories".

Example Type + Material no. + Code = Ordering no.
of ordering: 686.366 + 30 + CA = 686.366.30.CA

Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \sqrt{\frac{p_2}{p_1}}$



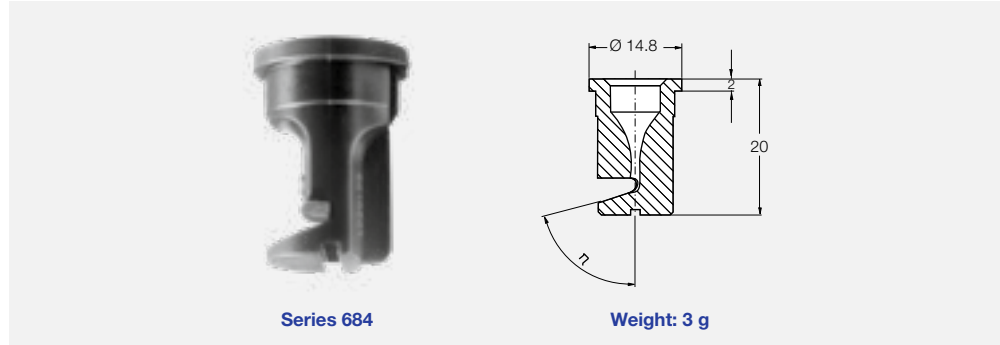
Tongue-type nozzles for retaining nut Series 684



Assembly with retaining nut. Wide flat fan with a sharply delimited spray pattern. Particularly clog-proof. Easy nozzle changing, simple jet alignment.



Applications:

Foam control in storage tanks and sewage treatment plants. Cleaning and washing process, requiring powerful and concentrated water jets.



Series 684

Weight: 3 g

Spray angle 	η	Ordering no.		Colour**	B Ø [mm]	V̇ [l/min]			L [mm]	Spray width B at p=2 bar  H = 250 mm	
		Type	Mat. no.			p [bar]					
			56 POM			5E PVDF	1.0	2.0			5.0
140°	75°	684.348	○	-	green	0.7	0.35*	0.50	0.79	20	1,360
	75°	684.368	○	○	yellow	0.8	0.45*	0.63	1.00	20	1,360
	75°	684.408	○	-	blue	1.0	0.71	1.00	1.58	20	1,370
	75°	684.448	○	-	red	1.2	0.88	1.25	1.98	20	1,370
	75°	684.488	○	○	brown	1.3	1.13	1.60	2.53	20	1,370
	75°	684.528	○	-	grey	1.5	1.41	2.00	3.16	20	1,370
	75°	684.568	○	○	white	1.7	1.77	2.50	3.95	19	1,370
	75°	684.608	○	-	light blue	1.9	2.23	3.15	4.98	19	1,370
	75°	684.688	○	-	green	2.4	3.54	5.00	7.91	17	1,370
	75°	684.728	○	○	black	2.7	4.45	6.30	9.96	17	1,370
	75°	684.808	○	-	beige	3.4	7.07	10.00	15.81	16	1,370

B = bore diameter

* Differing spray pattern.

** Material PVDF generally blue

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to »Accessories«.

Example	Type	+	Material-no.	=	Ordering no.
for ordering:	684.348	+	56	=	684.348.56





High pressure flat fan nozzles Series 602/608/652



Sharp uniform flat fan with an extremely narrow jet depth.

Applications:

High pressure cleaners, steam jet cleaners.

Materials:

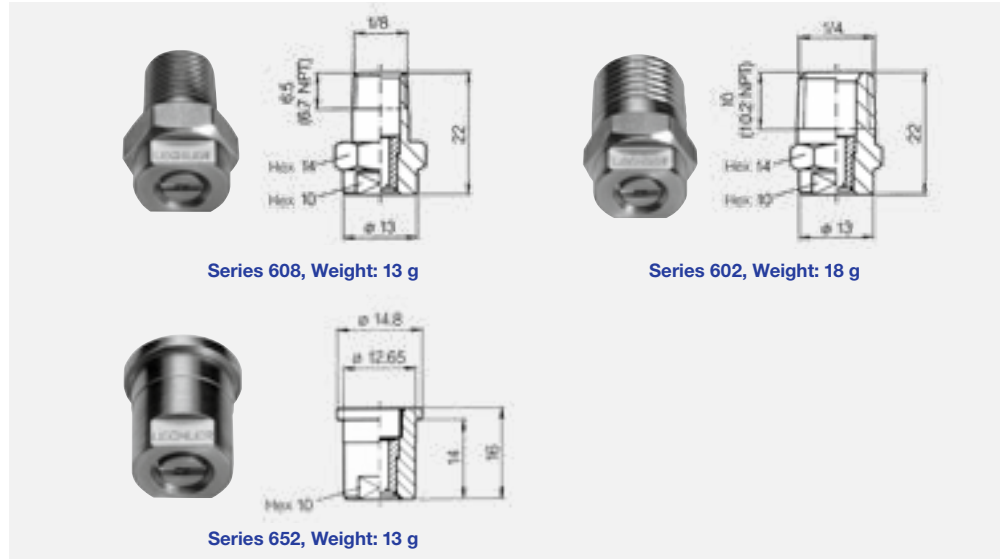
Nozzle body:

303 SS

Insert:

hardened stainless steel

420F SS



Series 608, Weight: 13 g

Series 602, Weight: 18 g

Series 652, Weight: 13 g

US gal/min. at 40 psi	Nozzle-Code			Flow rate code				A Ø [mm]	V̇ [l/min]						
	Connection			Spray angle					p [bar]						
	1/8	1/4	nut	20°	30°	45°	60°		40	60	80	100	120	150	200
02	608	602	652	361	362	363	364	1.00	2.88	3.53	4.08	4.56	5.00	5.58	6.45
021	608	602	652	371	372	373	374	1.02	3.03	3.71	4.28	4.79	5.25	5.87	6.77
025	608	602	652	381	382	383	384	1.10	3.60	4.42	5.10	5.70	6.24	6.98	8.06
028	608	602	652	391	392	393	394	1.16	4.04	4.94	5.71	6.38	6.99	7.81	9.02
03	608	602	652	401	402	403	404	1.18	4.32	5.29	6.11	6.83	7.48	8.37	9.66
034	608	602	652	411	412	413	414	1.30	4.90	6.00	6.93	7.75	8.49	9.49	10.96
038	608	602	652	441	442	443	-	1.33	5.48	6.72	7.75	8.67	9.50	10.62	12.26
04	608	602	652	451	452	453	454	1.35	5.77	7.06	8.16	9.12	9.99	11.17	12.90
043	608	602	652	461	462	-	-	1.38	6.20	7.59	8.77	9.80	10.74	12.00	13.86
045	608	602	652	471	472	473	474	1.40	6.49	7.95	9.18	10.26	11.24	12.57	14.51
05	608	602	652	481	482	483	484	1.55	7.21	8.83	10.20	11.40	12.49	13.96	16.12
055	608	602	652	501	502	503	504	1.60	7.93	9.71	11.22	12.54	13.74	15.36	17.73
06	608	602	652	521	522	523	524	1.72	8.65	10.60	12.24	13.68	14.99	16.75	19.35
065	608	602	652	531	532	533	534	1.75	9.37	11.48	13.26	14.82	16.23	18.15	20.96
07	608	602	652	541	542	543	544	1.80	10.09	12.36	14.28	15.96	17.48	19.55	22.57
075	608	602	652	551	552	553	554	1.90	10.81	13.25	15.29	17.10	18.73	20.94	24.18
08	608	602	652	571	572	573	574	2.05	11.54	14.13	16.31	18.24	19.98	22.34	25.80
087	608	602	652	581	582	583	584	2.06	12.54	15.36	17.74	19.83	21.72	24.29	28.04
09	608	602	652	591	592	593	594	2.10	12.98	15.89	18.35	20.52	22.48	25.13	29.02
10	608	602	652	601	602	603	604	2.30	14.41	17.65	20.38	22.79	24.97	27.91	32.23
11	-	602	652	621	622	623	624	2.40	15.86	19.42	22.42	25.07	27.46	30.70	35.45
125	-	602	652	641	642	643	644	2.50	18.02	22.07	25.48	28.49	31.21	34.89	40.29
131	-	602	652	651	652	653	654	2.55	18.89	23.13	26.71	29.86	32.71	36.57	42.23
139	-	602	652	661	662	663	664	2.65	20.04	24.54	28.34	31.68	34.70	38.80	44.80
15	-	602	652	671	672	673	674	2.70	21.62	26.48	30.58	34.19	37.45	41.87	48.35
175	-	602	652	701	702	703	704	3.00	25.23	30.90	35.68	39.89	43.70	48.86	56.41
20	-	602	652	-	-	723	724	3.05	28.83	35.31	40.78	45.59	49.94	55.84	64.47
25	-	602	652	-	-	763	764	3.50	36.04	44.14	50.97	56.99	62.43	69.80	80.60
30	-	602	652	-	-	793	-	3.90	43.25	52.97	61.16	68.38	74.91	83.75	96.70

A = equivalent bore diameter

Connection Code	Connection	p _{max} * [bar]
A3.00	BSPT	ca. 700
A3.07	NPT	ca. 700
A3.29	Lock nut	ca. 300

* Only valid for operation at constant pressure

Example for ordering: Nozzle code **602** + Flow rate code **361** + Connection code **A3.07** = Ordering no. **602.361.A3.07**
 (Flat fan 20°; 4.52 l/min. at 100 bar; 1/4 NPT)

Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \sqrt{\frac{p_2}{p_1}}$





High pressure flat fan nozzles Series 6FH



With spray stabilizer.
Sharp uniform flat fan with an extremely narrow jet depth.

Applications:

High pressure cleaning.

Materials:

Nozzle body:

303 SS

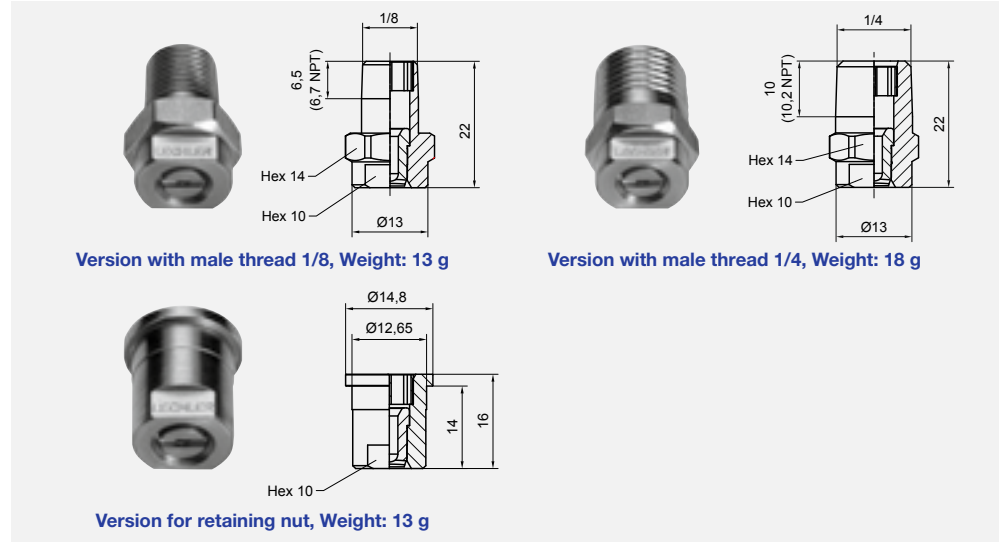
Insert:

hardened stainless steel

420F SS

Spray Stabilizer:

301 SS



US gal/min. at 40 psi	Nozzle code	Flow rate code				Material no. A3	A Ø [mm]	\dot{V} [l/min]							
		Spray angle						p [bar]							
		20°	30°	45°	60°			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	
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	
08	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	30.90	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	

A = equivalent bore diameter * Only available with connection code CC, BC or 29.

Connection code	Connection	p_{max} [bar]
CA	1/8 BSPT	approx. 700
BA	1/8 NPT	approx. 700
CC	1/4 BSPT	approx. 700
BC	1/4 NPT	approx. 700
29	Retaining nut	approx. 300

* Only valid for operation at constant pressure

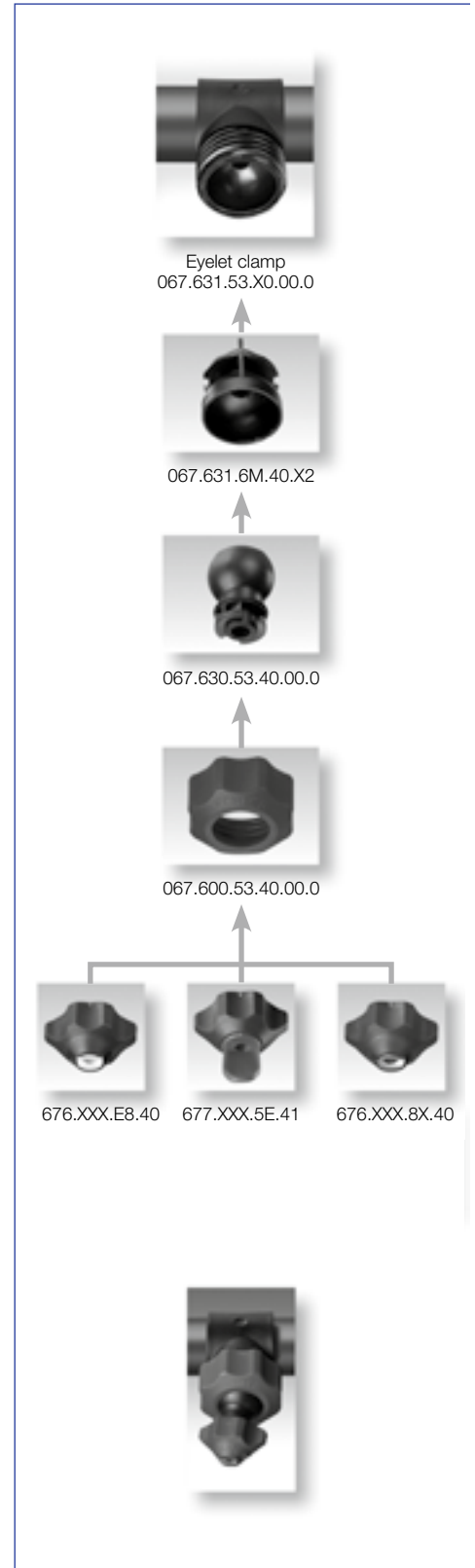
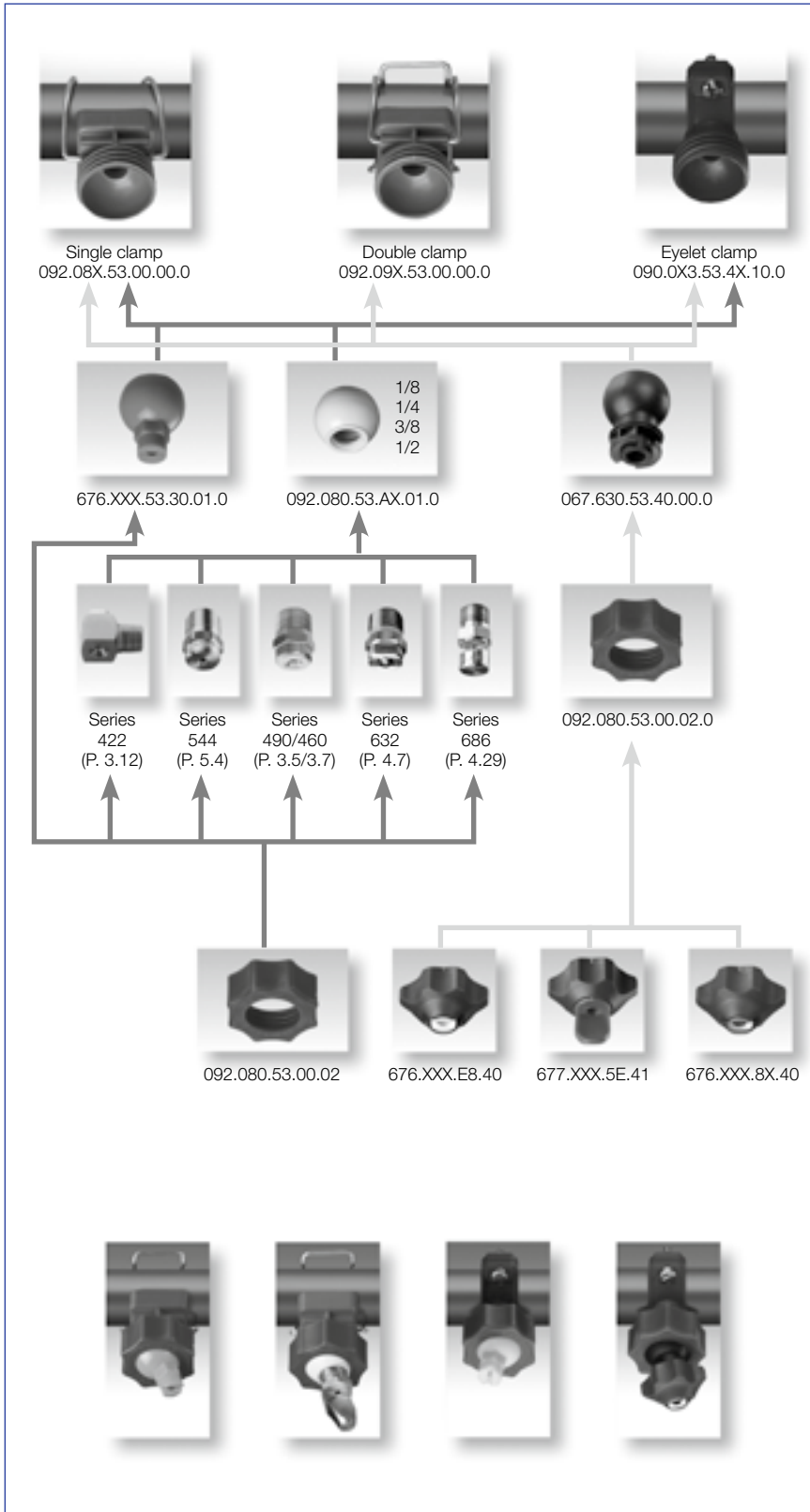
Example for ordering:

Nozzle code + Flow rate code + Material no. + Connection code = Ordering no.
6FH + 361 + A3 + CA = 6FH.361.A3.CA
 (Flat fan 20°; 4.56 l/min. at 100 bar; 1/8 BSPT)





MEMOSPRAY®/Easy-Clip combination



Flat fan nozzles



Nozzle systems for surface technology

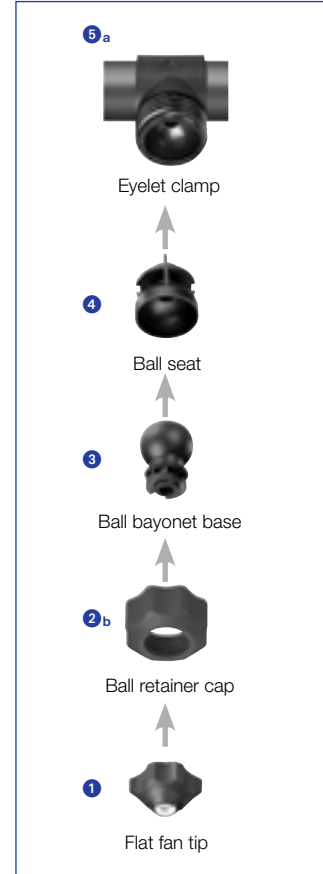
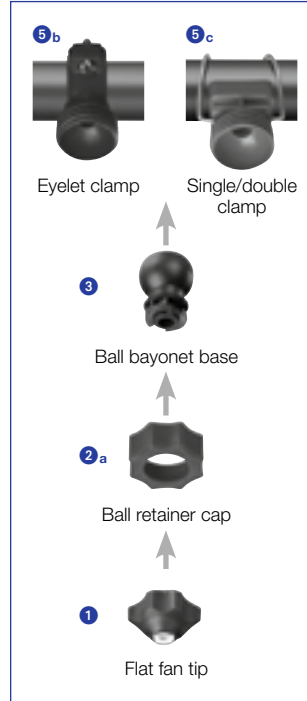
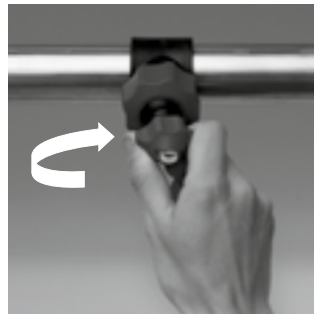
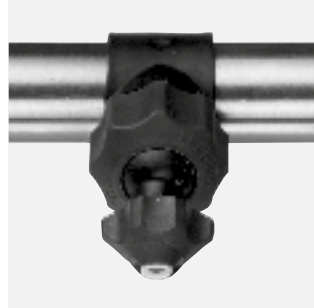
MEMOSPRAY® nozzle system



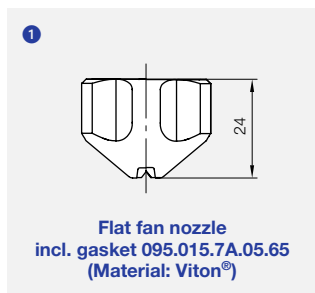
Maintaining of the adjusted spray direction by the »memory effect«.
Very easy handling without the need for special tools.
Especially pressure resistant pipe connector.

Application:

Degreasing, phosphating in surface treatment, cleaning.



Type	Ordering no.	Material no.				E Ø [mm]	Flow rate [l/min] at p [bar]					Weight [g]				
		8F Housing: PP Insert: 303 SS	8R Housing: PP Insert: 316L SS	E8 Housing: PP Insert: ceramic	53 Polypropylene (PP)		1.0	1.5	2.0	2.5	5.0	PP/3016Ti SS	PP/316L SS	PP/Ceramic	PP	
1 Flat fan nozzle	30°	676.642.xx.40	○	○	-	-	1.6	2.83	3.46	4.00	4.47	6.33	15	15	-	-
	30°	676.722.xx.40	○	○	-	-	2.1	4.46	5.46	6.30	7.04	9.96	15	15	-	-
	30°	676.762.xx.40	○	○	-	-	2.3	5.66	6.93	8.00	8.94	12.65	15	15	-	-
	30°	676.802.xx.40	○	○	-	-	2.6	7.07	8.66	10.00	11.18	15.81	15	15	-	-
	30°	676.842.xx.40	○	○	-	-	3.0	8.84	10.82	12.50	13.97	19.76	15	15	-	-
	30°	676.882.xx.40	○	○	-	-	3.4	11.31	13.86	16.00	17.89	25.30	15	15	10	8
	30°	676.922.xx.40	○	○	-	-	4.1	14.14	17.32	20.00	22.36	31.62	15	15	10	8
	30°	676.962.xx.40	○	○	-	-	4.2	17.68	21.65	25.00	27.95	39.53	15	15	10	8
	30°	677.002.xx.40	○	○	-	-	4.7	22.27	27.28	31.50	35.22	49.81	15	-	-	-
1 Flat fan nozzle	60°	676.644.xx.40	○	○	-	-	1.6	2.83	3.46	4.00	4.47	6.33	15	15	-	-
	60°	676.724.xx.40	○	○	-	-	2.1	4.46	5.46	6.30	7.04	9.96	15	15	-	-
	60°	676.764.xx.40	○	○	-	-	2.3	5.66	6.93	8.00	8.94	12.65	15	15	-	-
	60°	676.804.xx.40	○	○	-	-	2.6	7.07	8.66	10.00	11.18	15.81	15	15	-	-
	60°	676.844.xx.40	○	○	-	-	3.0	8.84	10.82	12.50	13.97	19.76	15	15	-	-
	60°	676.884.xx.40	○	○	○	○	3.4	11.31	13.86	16.00	17.89	25.30	15	15	10	8
	60°	676.924.xx.40	○	○	○	○	4.1	14.14	17.32	20.00	22.36	31.62	15	15	10	8
	60°	676.964.xx.40	○	○	○	○	4.2	17.68	21.65	25.00	27.95	39.53	15	15	10	8
	60°	677.004.xx.40	○	○	○	○	4.7	22.27	27.28	31.50	35.22	49.81	15	15	10	8
	60°	677.044.xx.40	○	○	-	-	5.5	28.28	34.64	40.00	44.72	63.25	15	15	-	-
	60°	677.084.xx.40	○	○	-	-	6.2	35.36	43.30	50.00	55.90	79.06	15	15	-	-




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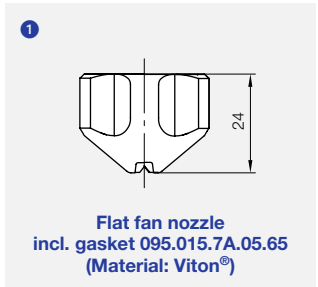


Nozzle systems for surface technology


MEMOSPRAY® nozzle system

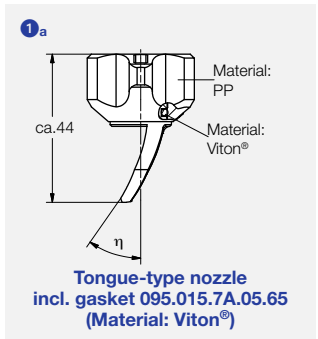


Type		Ordering no.	Material no.				E Ø [mm]	Flow rate [l/min] at p [bar]					Weight [g]			
			8F	8R	E8	53		1.0	1.5	2.0	2.5	5.0	PP/316Ti SS	PP/316L SS	PP/Ceramic	PP
1 Flat fan nozzle	90°	676.646.xx.40	○	○	-	-	1.6	2.83	3.46	4.00	4.47	6.33	15	15	-	-
	90°	676.726.xx.40	○	○	-	-	2.1	4.46	5.46	6.30	7.04	9.96	15	15	-	-
	90°	676.766.xx.40	○	○	-	-	2.3	5.66	6.93	8.00	8.94	12.65	15	15	-	-
	90°	676.806.xx.40	○	○	-	-	2.6	7.07	8.66	10.00	11.18	15.81	15	15	-	-
	90°	676.846.xx.40	○	○	-	-	3.0	8.84	10.82	12.50	13.97	19.76	15	15	-	-
	90°	676.886.xx.40	○	○	-	-	3.4	11.31	13.86	16.00	17.89	25.30	15	15	-	-
	90°	676.926.xx.40	○	○	-	-	4.1	14.14	17.32	20.00	22.36	31.62	15	15	-	-
1 Flat fan nozzle	120°	676.647.xx.40	○	○	-	-	1.6	2.83	3.46	4.00	4.47	6.33	15	15	-	-
	120°	676.727.xx.40	○	○	-	-	2.1	4.46	5.46	6.30	7.04	9.96	15	15	-	-
	120°	676.767.xx.40	○	○	-	-	2.3	5.66	6.93	8.00	8.94	12.65	15	15	-	-
	120°	676.807.xx.40	○	○	-	-	2.6	7.07	8.66	10.00	11.18	15.81	15	15	-	-
	120°	676.847.xx.40	○	○	-	-	3.0	8.84	10.82	12.50	13.97	19.76	15	15	-	-
	120°	676.887.xx.40	○	○	-	-	3.4	11.31	13.86	16.00	17.89	25.30	15	15	-	-
1 Flat fan nozzle	120°	676.927.xx.40	○	○	-	-	4.1	14.14	17.32	20.00	22.36	31.62	15	15	-	-
	Blind nozzle	067.630.8F.40.01	○	-	-	-	-	-	-	-	-	-	15	-	-	-



Flat fan nozzles

Type		η	Ordering no.	Material no.		E Ø [mm]	Flow rate [l/min] at p [bar]					Weight [g]	
				8R	5E		1.0	1.5	2.0	2.5	5.0	PP/316L SS	PVDF
1a Tongue-type nozzle	90°	35°	676.803.xx.41	○	-	3.4	7.07	8.66	10.00	11.18	15.81	25	-
	60°	35°	676.874.xx.41	○	-	4.2	10.61	12.99	15.00	16.77	23.72	25	-
	90°	35°	676.924.xx.41	○	-	4.7	14.14	17.32	20.00	22.36	31.62	25	-
	90°	40°	677.005.xx.41	○	○	6.0	22.27	27.28	31.50	35.22	49.81	25	11



E = narrowest free cross section

Example of ordering: Type 676.646.xx.40 + Material no. 8R = Ordering no. 676.646.8R.40

Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \sqrt{\frac{p_2}{p_1}}$



Nozzle systems for surface technology

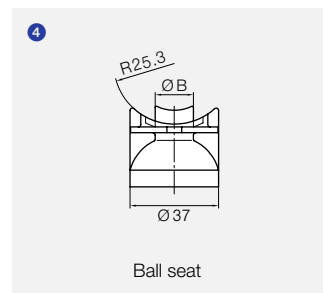
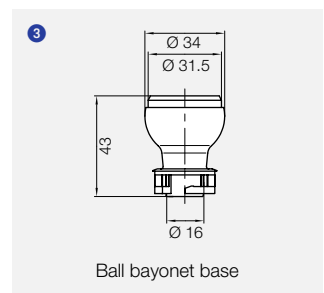
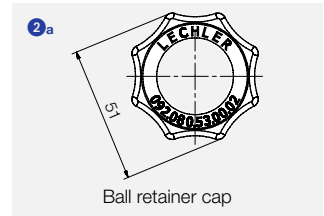
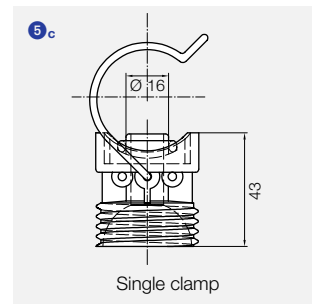
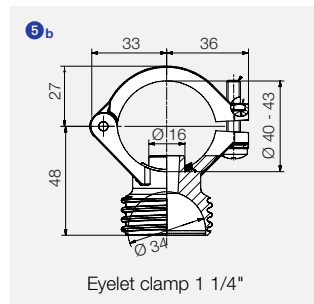
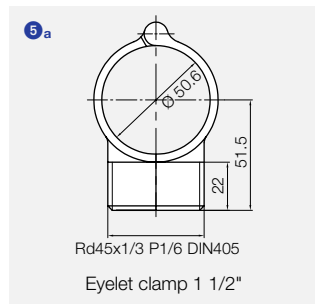
MEMOSPRAY® nozzle system



Type	Ordering no.	Material no.		Spigot- Ø B _R	Recommended bore-Ø	For pipe-Ø	Weight [g]
		53 Polypropylene (PP)	6M PP reinforced				
2 ^a Ball retainer cap	092.080.xx.00.02	○	-				18
2 ^b Ball retainer cap	067.600.xx.40	○	-				18
3 Ball bayonet base	067.630.xx.40	○	-				12
4 Ball seat for Ball eyelet clamp no.	067.631.xx.40.22	-	○	13.8 mm	14.0-14.3 mm	1 1/4" (40.0-43.0 mm)	9
	067.631.xx.40.02	-	○	16.0 mm	16.5-17.0 mm	1 1/4" (40.0-43.0 mm)	11
	067.631.xx.50.00.0	-	○	19.8 mm	20.3-20.8 mm	1 1/4" (40.0-43.0 mm)	13
	067.631.xx.50.22	-	○	13.8 mm	14.0-14.3 mm	1 1/2" (46.0-49.0 mm)	9
	067.631.xx.50.02	-	○	16.0 mm	16.5-17.0 mm	1 1/2" (46.0-49.0 mm)	11
	067.631.xx.50.12	-	○	19.8 mm	20.3-20.8 mm	1 1/2" (46.0-49.0 mm)	13
5 ^a Eyelet clamp	067.631.xx.40.00	○	-	-	-	1 1/4" (40.0-43.0 mm)	31
	067.631.xx.50.00	○	-	-	-	1 1/2" (46.0-49.0 mm)	33
5 ^b Eyelet clamp	090.023.xx.44.10	○	-	13.8 mm	14.0-14.3 mm	1" (32.0-34.5 mm)	48
	090.023.xx.43.10	○	-	16.0 mm	16.5-17.0 mm	1" (32.0-34.5 mm)	48
	090.033.xx.44.10	○	-	13.8 mm	14.0-14.3 mm	1 1/4" (40.0-43.0 mm)	50
	090.033.xx.43.10	○	-	16.0 mm	16.5-17.0 mm	1 1/4" (40.0-43.0 mm)	50
	090.033.xx.40.10	○	-	20.0 mm	20.5-21.0 mm	1 1/4" (40.0-43.0 mm)	50
	090.043.xx.44.10	○	-	13.8 mm	14.0-14.3 mm	1 1/2" (46.0-49.0 mm)	52
	090.043.xx.43.10	○	-	16.0 mm	16.5-17.0 mm	1 1/2" (46.0-49.0 mm)	52
	090.043.xx.40.10	○	-	20.0 mm	20.5-21.0 mm	1 1/2" (46.0-49.0 mm)	52
5 ^c Single clamp*	092.080.xx.00	○	-	16.3 mm	16.5-17.0 mm	1" (32.0-34.5 mm)	36
	092.081.xx.00	○	-	16.3 mm	16.5-17.0 mm	1 1/4" (40.0-43.0 mm)	38
	092.082.xx.00	○	-	16.3 mm	16.5-17.0 mm	1 1/2" (46.0-49.0 mm)	40
	092.083.xx.00	○	-	16.3 mm	16.5-17.0 mm	2" (58.0-62.0 mm)	42

* other bore diameter on request
E = narrowest free cross section

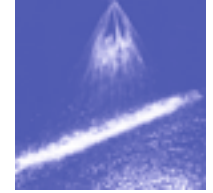
Example **Type** + **Material no.** = **Ordering no.**
for ordering: 092.080.xx.00.02 + 53 = 092.080.53.00.02





Nozzle systems for surface treatment

Easy-Clip nozzle system



Quick and easy assembly with clamp. No tools required. Allround swivelling by 30°. Easy adjustment and cleaning.

Applications:

Degreasing, phosphating in surface treatment.

Materials:

Clamp: Stainless steel 301 SS
 Sealing: EPDM
 Cylinder pin, screw and screw unit: 316 SS.
 Body, ball retainer cap: PP, reinforced.
 Nozzle, ball joint: PP



Sets

existing of

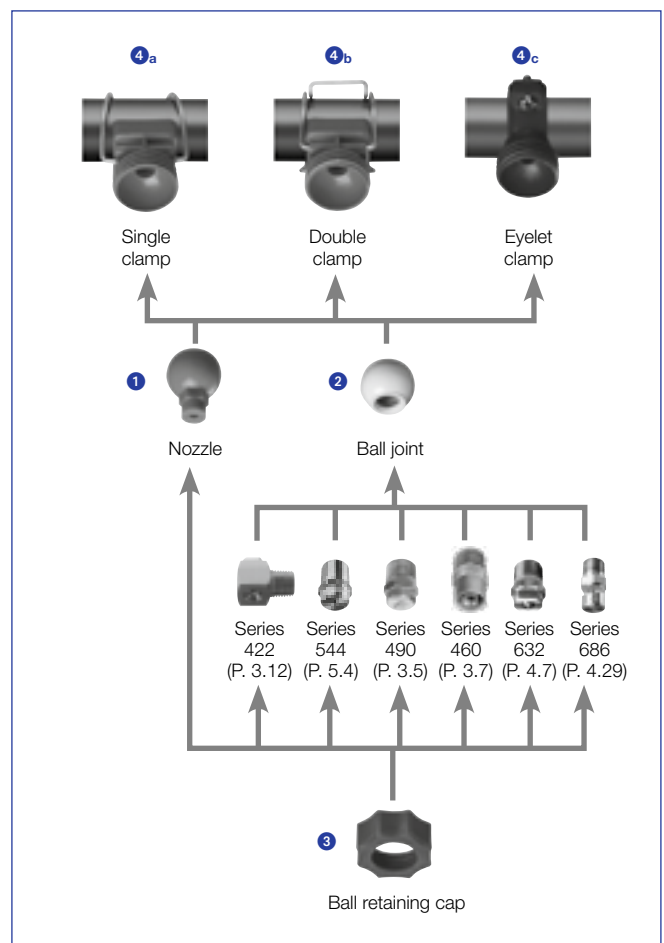
- Nozzle
- Single clamp for 1 1/4" pipe
- Ball retainer cap

Ordering no.	Nozzle colour		V̇ [l/min]				
			p [bar]				
			0.5	1.0	1.5	2.0	2.5
676.724.53.31	grey	60°	3.15	4.45	5.45	6.30	7.04
676.764.53.31	brown	60°	4.00	5.66	6.93	8.00	8.94
676.804.53.31	lilac	60°	5.00	7.07	8.66	10.00	11.18
676.844.53.31	yellow	60°	6.25	8.84	10.83	12.50	13.98
676.884.53.31	red	60°	8.00	11.31	13.85	16.00	17.89
676.904.53.31	blue	60°	9.10	12.87	15.76	18.20	20.35
676.924.53.31	green	60°	10.00	14.14	17.32	20.00	22.36

existing of

- Ball joint
- Single clamp for 1 1/4" pipe
- Ball retainer cap

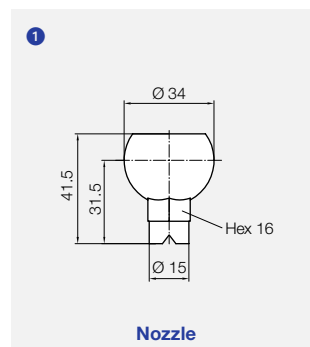
Ordering no.	Ball colour	Nozzle connection	For nozzle series
092.081.53.AB	beige	1/8 BSPP	460, 490, 632, 686, 610, 544
092.081.53.AD	beige	1/4 BSPP	422, 460, 490, 544, 612, 632, 686
092.081.53.AF	beige	3/8 BSPP	422, 460, 490, 632, 686, 688
092.081.53.AH	beige	1/2 BSPP	422, 460, 490, 632, 686



Components

1 Nozzle

Ordering no.	Nozzle colour		V̇ [l/min]				
			p [bar]				
			0.5	1.0	1.5	2.0	2.5
676.724.53.30.01	grey	60°	3.15	4.45	5.45	6.30	7.04
676.764.53.30.01	brown	60°	4.00	5.66	6.93	8.00	8.94
676.804.53.30.01	lilac	60°	5.00	7.07	8.66	10.00	11.18
676.844.53.30.01	yellow	60°	6.25	8.84	10.83	12.50	13.98
676.884.53.30.01	red	60°	8.00	11.31	13.85	16.00	17.89
676.904.53.30.01	blue	60°	9.10	12.87	15.67	18.20	20.35
676.924.53.30.01	green	60°	10.00	14.14	17.32	20.00	22.36
092.080.53.00.01	grey		Blind nozzle				

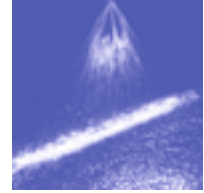


Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$



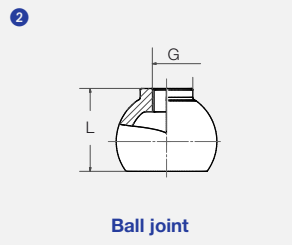
Nozzle systems for surface treatment

Easy-Clip nozzle system



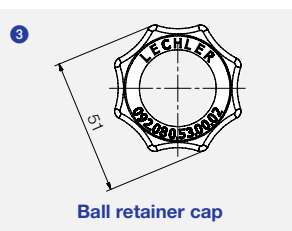
2 Ball joint

Ordering no.	Colour	Nozzle connection	L [mm]	For nozzle series
092.080.53.AB.01	beige	1/8 BSPP	28.4	460, 490, 544, 632, 686
092.080.53.AD.01	beige	1/4 BSPP	32.4	422, 460, 490, 544, 612, 632, 686
092.080.53.AF.01	beige	3/8 BSPP	31.4	422, 460, 490, 632, 686, 688
092.080.53.AH.01	beige	1/2 BSPP	33.0	422, 460, 490, 632, 686



3 Ball retainer cap

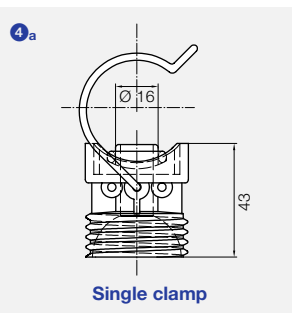
Ordering no.
092.080.53.00.02



4a Single clamp

Ordering no.	Spigot-Ø Br	Recommended bore-Ø	For Pipe-Ø
092.080.53.00	16.3 mm	16.5-17.0 mm	1" (32.0-34.5 mm)
092.081.53.00	16.3 mm	16.5-17.0 mm	1 1/4" (40.0-43.0 mm)
092.082.53.00	16.3 mm	16.5-17.0 mm	1 1/2" (46.0-49.0 mm)
092.083.53.00	16.3 mm	16.5-17.0 mm	2" (58.0-62.0 mm)

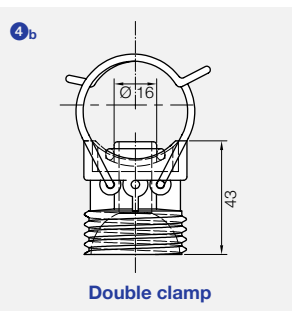
Other spigot-Ø (13.8/19.0 mm) on request.



4b Double clamp

Ordering no.	Spigot-Ø Br	Recommended bore-Ø	For Pipe-Ø
092.090.53.00	16.3 mm	16.5-17.0 mm	1" (32.0-34.5 mm)
092.091.53.00	16.3 mm	16.5-17.0 mm	1 1/4" (40.0-43.0 mm)
092.092.53.00	16.3 mm	16.5-17.0 mm	1 1/2" (46.0-49.0 mm)
092.093.53.00	16.3 mm	16.5-17.0 mm	2" (58.0-62.0 mm)

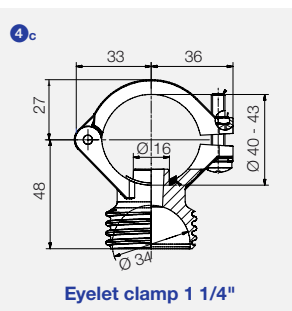
Other spigot-Ø (13.8/19.0 mm) on request.



4c Eyelet clamp

Ordering no.	Spigot-Ø Br	Recommended bore-Ø	For Pipe-Ø
090.023.53.43.10	16 mm	16.5-17.0 mm	1" (32.0-34.5 mm)
090.033.53.43.10	16 mm	16.5-17.0 mm	1 1/4" (40.0-43.0 mm)
090.043.53.43.10	16 mm	16.5-17.0 mm	1 1/2" (46.0-49.0 mm)

Other spigot-Ø (13.8/20.0 mm) on request.





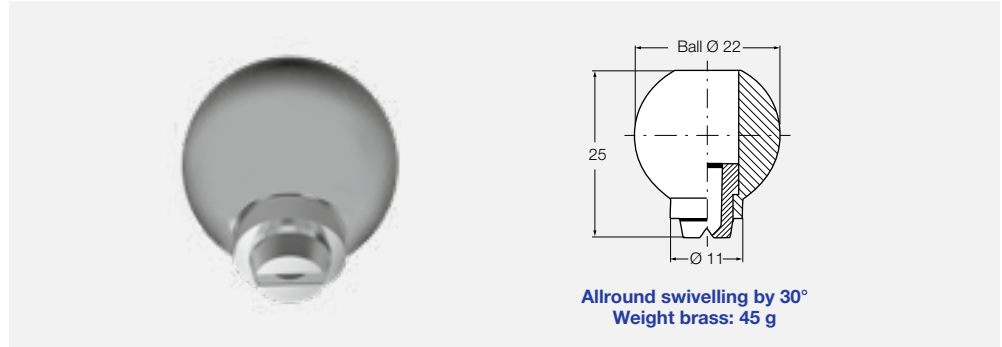
Flat fan nozzles with ball joint Series 676





Swivelling nozzle for precise adjusting of jet direction. No gaskets necessary. Long, unproblematic service life.

Applications:

Cleaning, cooling, lubricating.



Spray angle 	Ordering no.		A Ø [mm]	E Ø [mm]	V̇ [l/min]						Spray width B at p=2 bar 		
	Type	Mat. no.			p [bar] (p _{max} = 30 bar)						H = 250 mm	H = 500 mm	
		16			30	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	0.39	0.51	0.72	65	120
	676.361	○	○	1.00	0.80	0.31*	0.44*	0.63	0.77	1.00	1.40	70	130
	676.441	○	○	1.35	1.10	0.62*	0.88	1.25	1.53	1.98	2.80	75	145
	676.481	○	○	1.50	1.20	0.80*	1.13	1.60	1.96	2.53	3.58	75	150
30°	676.302	○	○	0.70	0.50	0.16*	0.23*	0.32	0.39	0.51	0.72	120	235
	676.362	○	○	1.00	0.70	0.31*	0.44*	0.63	0.77	1.00	1.40	120	235
	676.402	○	○	1.20	0.90	0.50*	0.71	1.00	1.23	1.58	2.24	120	235
	676.482	○	○	1.50	1.10	0.80*	1.13	1.60	1.96	2.53	3.58	120	235
	676.562	○	○	2.00	1.50	1.25	1.77	2.50	3.06	3.95	5.59	120	235
	676.642	○	○	2.50	1.80	2.00	2.83	4.00	4.90	6.33	8.94	120	240
	676.722	○	○	3.00	2.40	3.15	4.46	6.30	7.72	9.96	14.09	125	240
	676.762	○	○	3.50	2.70	4.00	5.66	8.00	9.80	12.65	17.89	125	245
676.802	○	○	4.00	3.10	5.00	7.07	10.00	12.25	15.81	22.36	130	250	
45°	676.303	○	○	0.70	0.50	0.16*	0.23*	0.32	0.39	0.51	0.72	150	270
	676.363	○	○	1.00	0.60	0.31*	0.44*	0.63	0.77	1.00	1.40	155	280
	676.403	○	○	1.20	0.90	0.50*	0.71	1.00	1.23	1.58	2.24	175	320
	676.483	○	○	1.50	1.10	0.80	1.13	1.60	1.96	2.53	3.58	180	340
	676.563	○	○	2.00	1.40	1.25	1.77	2.50	3.06	3.95	5.59	185	355
	676.643	○	○	2.50	1.80	2.00	2.83	4.00	4.90	6.33	8.94	195	370
	676.723	○	○	3.00	2.40	3.15	4.46	6.30	7.72	9.96	14.09	200	375
	676.763	○	○	3.50	2.60	4.00	5.66	8.00	9.80	12.65	17.89	200	380
676.803	○	○	4.00	3.00	5.00	7.07	10.00	12.25	15.81	22.36	205	385	
60°	676.304	○	○	0.70	0.40	0.16*	0.23*	0.32	0.39	0.51	0.72	215	425
	676.334	○	○	0.90	0.50	0.22*	0.32*	0.45	0.55	0.71	1.01	220	440
	676.364	○	○	1.00	0.60	0.31*	0.44*	0.63	0.77	1.00	1.40	230	460
	676.404	○	○	1.20	0.80	0.50*	0.71	1.00	1.23	1.58	2.24	245	485
	676.444	○	○	1.35	0.90	0.62*	0.88	1.25	1.53	1.98	2.80	255	495
	676.484	○	○	1.50	1.00	0.80*	1.13	1.60	1.96	2.53	3.58	260	510
	676.514	○	○	1.65	1.10	0.95*	1.34	1.90	2.33	3.00	4.25	270	520
	676.564	○	○	2.00	1.30	1.25	1.77	2.50	3.06	3.95	5.59	280	535
	676.604	○	○	2.20	1.50	1.58	2.23	3.15	3.86	4.98	7.04	290	550
	676.644	○	○	2.50	1.60	2.00	2.83	4.00	4.90	6.33	8.94	295	565
	676.674	○	○	2.70	1.80	2.38	3.36	4.75	5.82	7.51	10.62	300	575
	676.724	○	○	3.00	2.10	3.15	4.46	6.30	7.72	9.96	14.09	305	590
676.764	○	○	3.50	2.30	4.00	5.66	8.00	9.80	12.65	17.89	310	595	

A = equivalent bore diameter · E = narrowest free cross section
* Differing spray pattern

Continued on next page.



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





Flat fan nozzles with ball joint Series 676



Spray angle 	Ordering no.		A Ø [mm]	E Ø [mm]	V [l/min]						Spray width B at p=2 bar 		
	Type	Mat. no.			p [bar] (p _{max} = 30 bar)						H = 250 mm	H = 500 mm	
		16			30	0.5	1.0	2.0	3.0	5.0			10.0
75°	676.145	○	○	0.20	0.12	-	0.04*	0.05	0.06	0.08	0.11	280	550
	676.165	○	○	0.20	0.08	-	0.05*	0.07	0.08	0.10	0.15	290	560
	676.185	○	○	0.20	0.15	-	0.06*	0.08	0.10	0.13	0.18	300	575
	676.215	○	○	0.40	0.20	-	0.08*	0.11	0.14	0.18	0.25	300	580
	676.245	○	○	0.50	0.30	-	0.12*	0.16	0.20	0.26	0.30	310	585
	676.275	○	○	0.60	0.30	0.11*	0.16*	0.22	0.27	0.35	0.49	310	590
90°	676.216	○	○	0.40	0.20	-	0.08*	0.11	0.14	0.18	0.25	370	700
	676.276	○	○	0.60	0.30	0.11*	0.16*	0.22	0.27	0.35	0.49	375	720
	676.306	○	○	0.70	0.40	0.16*	0.23*	0.32	0.39	0.51	0.72	380	740
	676.336	○	○	0.90	0.50	0.22*	0.32*	0.45	0.55	0.71	1.01	415	800
	676.366	○	○	1.00	0.50	0.31*	0.44*	0.63	0.77	1.00	1.40	420	810
	676.406	○	○	1.20	0.70	0.50*	0.71	1.00	1.23	1.58	2.24	430	820
	676.446	○	○	1.35	0.80	0.62*	0.88	1.25	1.53	1.98	2.80	435	830
	676.486	○	○	1.50	0.80	0.80*	1.13	1.60	1.96	2.53	3.58	440	835
	676.516	○	○	1.65	0.90	0.95*	1.34	1.90	2.33	3.00	4.25	440	840
	676.566	○	○	2.00	1.10	1.25	1.77	2.50	3.06	3.95	5.59	445	850
	676.606	○	○	2.20	1.20	1.58	2.23	3.15	3.86	4.98	7.04	450	860
	676.646	○	○	2.50	1.30	2.00	2.83	4.00	4.90	6.33	8.94	455	865
	676.676	○	○	2.70	1.40	2.38	3.36	4.75	5.82	7.51	10.62	465	875
676.726	○	○	3.00	1.70	3.15	4.46	6.30	7.72	9.96	14.09	470	885	
120°	676.187	○	○	0.35	0.20	-	0.06*	0.08	0.10	0.13	0.18	630	1,200
	676.217	○	○	0.40	0.20	-	0.08*	0.11	0.14	0.18	0.25	640	1,210
	676.247	○	○	0.50	0.20	-	0.12*	0.16	0.20	0.26	0.36	650	1,230
	676.277	○	○	0.60	0.30	-	0.16*	0.22	0.27	0.35	0.49	660	1,250
	676.307	○	○	0.70	0.30	0.16*	0.23*	0.32	0.39	0.51	0.72	660	1,250
	676.337	○	○	0.90	0.40	0.22*	0.32*	0.45	0.55	0.71	1.01	670	1,270
	676.367	○	○	1.00	0.50	0.31*	0.44*	0.63	0.77	1.00	1.40	670	1,270
	676.407	○	○	1.20	0.60	0.50*	0.71	1.00	1.23	1.58	2.24	670	1,270
	676.447	○	○	1.35	0.60	0.62*	0.88	1.25	1.53	1.98	2.80	675	1,270
	676.487	○	○	1.50	0.60	0.80*	1.13	1.60	1.96	2.53	3.58	680	1,275
	676.517	○	○	1.65	0.90	0.95*	1.34	1.90	2.33	3.00	4.25	685	1,280
	676.567	○	○	2.00	0.90	1.25	1.77	2.50	3.06	3.95	5.59	690	1,285
	676.607	○	○	2.20	1.10	1.58	2.23	3.15	3.86	4.98	7.04	700	1,300
	676.647	○	○	2.50	1.30	2.00	2.83	4.00	4.90	6.33	8.94	700	1,300
	676.677	○	○	2.70	1.40	2.38	3.36	4.75	5.82	7.51	10.62	720	1,330
	676.727	○	○	3.00	1.60	3.15	4.46	6.30	7.72	9.96	14.09	740	1,360
	676.767	○	○	3.50	1.70	4.00	5.66	8.00	9.80	12.65	17.89	760	1,400

A = equivalent bore diameter · E = narrowest free cross section

* Differing spray pattern

Accessories see next page.

Example Type + Material-no. = Ordering no.
for ordering: 676.145 + 16 = 676.145.16



Flat fan nozzles with ball joint

Series 676

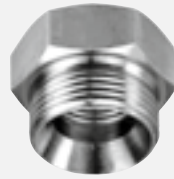


Accessories

Retaining nut
092.020.16.00.02
 Material: 303 SS
092.020.30.00.02
 Material: Brass



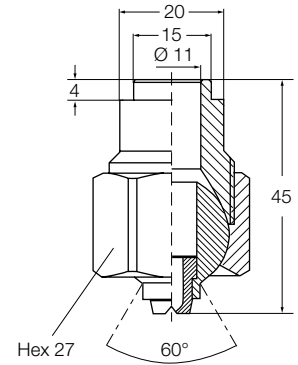
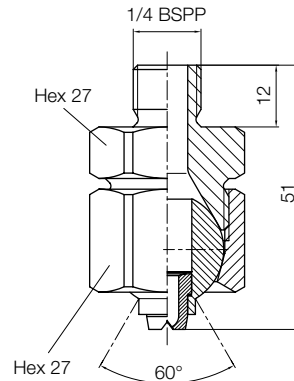
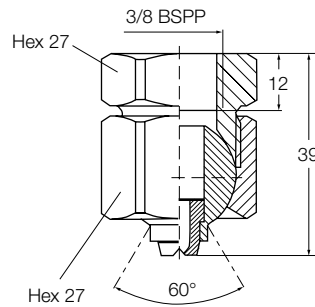
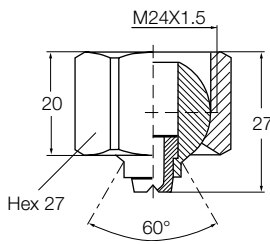
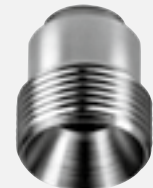
Socket
092.020.16.AF.03
 Material: 303 SS
092.020.30.AF.03
 Material: Brass



Retaining nipple
092.024.16.AC.03
 Material: 303 SS
092.024.30.AC.03
 Material: Brass

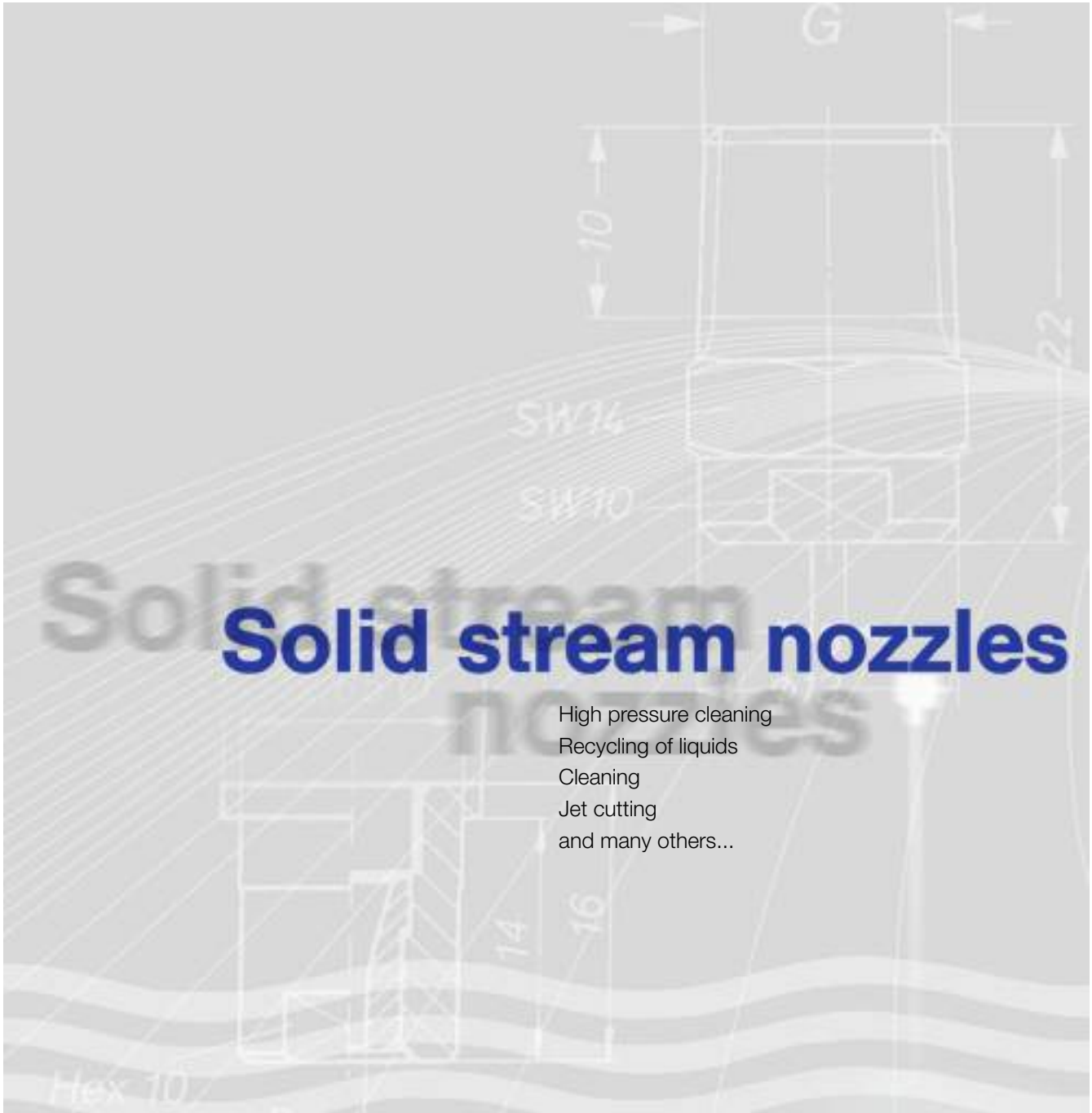


Welding nipple
092.020.17.00.04
 Material: 316Ti SS



Flat fan nozzles

ENGINEERING
YOUR SPRAY SOLUTION



Solid stream nozzles

High pressure cleaning
Recycling of liquids
Cleaning
Jet cutting
and many others...

Solid stream
nozzles



Solid stream nozzles

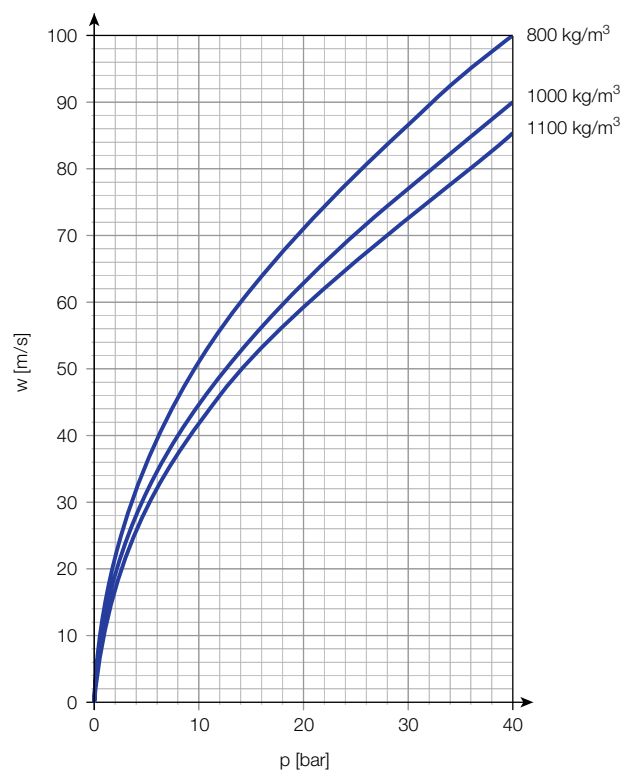
Thanks to optimum flow geometries, **Lechler solid stream nozzles** produce compact, transparent solid stream jets of defined lengths. The almost turbulence-free liquid inflow achieves excellent efficiency, even without jet stabilizer inserts. For all cleaning processes, cutting operations and applications requiring perfect, punctiform jet impacts, i.e. whenever the point is to generate concentrated jet power, the precision of Lechler solid stream nozzles enhances productivity and performance of your plant.

There is a comprehensive range of solid stream nozzles in stainless steel with special hardening or with TC inserts for high-pressure use.

Lechler high-pressure solid stream nozzles excel in closed, stable and powerful solid jets, not even breaking at very high pressures.






Typical exit speed of solid stream nozzles



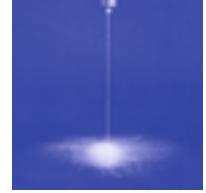


Solid stream nozzles

Low-pressure nozzles		Series	\dot{V} [l/min] at p = 2 bar	Connection	Application/ Design	Page
	544		0.04 – 10.00	1/8 BSPT 1/4 BSPT	Cleaning installations. Optimized flow technology. Extreme jet power. Concentrated solid stream jet.	5.4
	540 541		18.00 – 118.00	1/2 BSPP	Storage tank cleaning, aerating of bulk goods, recycling of liquids, as well as for accelerating chemical process reactions. Cluster solid stream nozzle.	5.6
High-pressure nozzles		Series	\dot{V} [l/min] at p = 80 bar	Connection	Application/ Design	Page
	546 548 550		2.04 – 63.20	1/8 BSPT 1/4 BSPT NPT 1/8 NPT 1/4 Assembly with lock nut	High-pressure cleaning	5.5



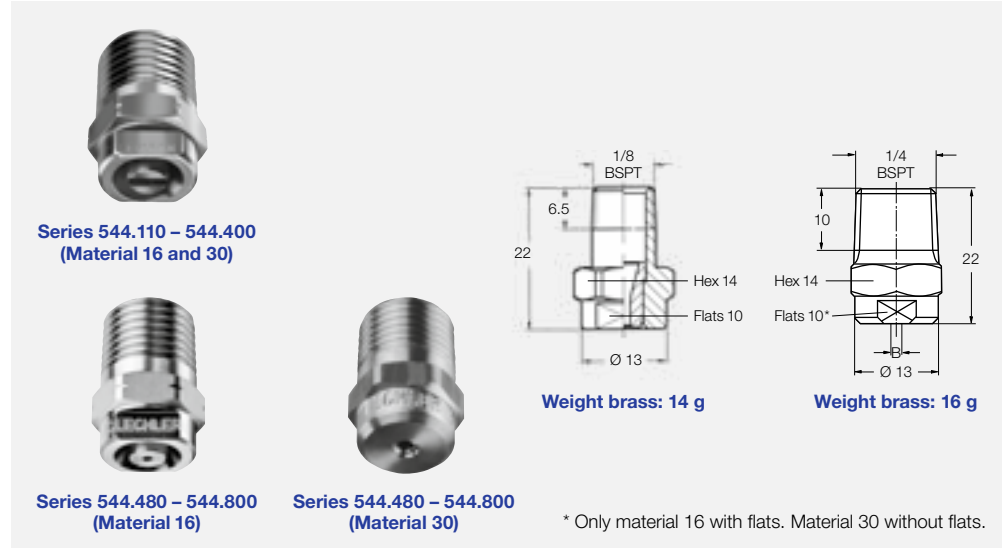
Solid stream nozzles Series 544



Long, closed jet with punctiform impact pattern. Optimized flow conditions. Highest jet power. Concentrated solid stream jet.

Applications:

Cleaning installations.



Ordering no.					B Ø [mm]	V̇ [l/min]									
Type	Mat. no.		Code			p [bar]									
	16	30	1/8 BSPT	1/4 BSPT		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	0.09	0.11	0.13	0.15	
544.160	○	-	CA	CC	0.33	0.03	0.04	0.06	0.07	0.09	0.13	0.16	0.19	0.23	
544.200	○	○	CA	CC	0.39	0.05	0.07	0.10	0.12	0.16	0.22	0.27	0.32	0.39	
544.240	○	-	CA	CC	0.50	0.08	0.11	0.16	0.20	0.25	0.36	0.44	0.51	0.62	
544.280	○	-	CA	CC	0.63	0.13	0.18	0.25	0.31	0.40	0.56	0.68	0.79	0.97	
544.320	○	○	CA	CC	0.80	0.20	0.28	0.40	0.49	0.63	0.89	1.10	1.26	1.55	
544.360	○	○	CA	CC	1.05	0.32	0.45	0.63	0.77	1.00	1.41	1.73	1.99	2.44	
544.400	○	○	CA	CC	1.30	0.50	0.71	1.00	1.22	1.58	2.24	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	6.85	7.91	9.68	
544.640	○	○	CA	CC	2.09	2.00	2.83	4.00	4.90	6.32	8.94	10.95	12.65	15.49	
544.720	○	○	CA	CC	2.66	3.15	4.45	6.30	7.72	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	27.39	31.62	38.73	

B = bore diameter

Can also be used for air or steam (see page 6.10).

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to "Accessories".

Example for ordering: Type 544.110 + Material no. 16 + Code CC = Ordering no. 544.110.16.CC



High-pressure solid stream nozzles

Series 546/548/550



Punctiform, extremely tight, non-dispersing solid stream. Highest impact.

Applications:

High-pressure cleaning, cutting and separating.

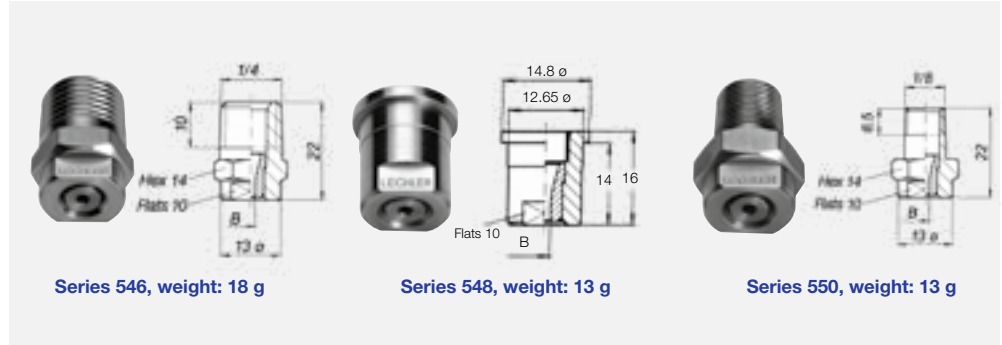
Materials:

Nozzle body:

303 SS

Insert:

Hardened steel 420F SS



Series 546, weight: 18 g

Series 548, weight: 13 g

Series 550, weight: 13 g

US gal/min. at 40 psi	Nozzle-Code			Flow rate code	B Ø [mm]	V̇ [l/min]							
	Connection					p [bar]							
	1/8	1/4	Retaining nut			40	60	80	100	120	150	200	300
01	550	546	548	300	0.60	1.44	1.77	2.04	2.28	2.50	2.79	3.22	3.95
02	550	546	548	360	0.84	2.88	3.53	4.08	4.56	5.00	5.58	6.45	7.90
025	550	546	548	380	0.94	3.60	4.42	5.10	5.70	6.24	6.98	8.06	9.87
027	550	546	548	390	0.99	3.89	4.76	5.50	6.15	6.74	7.53	8.70	10.65
03	550	546	548	400	1.03	4.33	5.30	6.12	6.84	7.49	8.38	9.67	11.85
034	550	546	548	410	1.07	4.90	6.00	6.93	7.75	8.49	9.49	10.96	13.42
035	550	546	548	420	1.11	5.05	6.18	7.14	7.98	8.74	9.77	11.29	13.82
038	550	546	548	440	1.15	5.48	6.71	7.75	8.66	9.49	10.61	12.25	15.00
04	550	546	548	450	1.19	5.77	7.06	8.16	9.12	9.99	11.17	12.90	15.80
045	550	546	548	470	1.26	6.49	7.95	9.18	10.26	11.24	12.57	14.51	17.77
05	550	546	548	480	1.33	7.21	8.83	10.20	11.40	12.49	13.96	16.12	19.75
055	550	546	548	500	1.39	7.93	9.71	11.22	12.54	13.74	15.36	17.73	21.72
06	550	546	548	520	1.46	8.65	10.60	12.24	13.68	14.99	16.75	19.35	23.69
065	550	546	548	530	1.51	9.37	11.48	13.26	14.82	16.23	18.15	20.96	25.67
070	550	546	548	540	1.58	10.09	12.36	14.28	15.96	17.48	19.55	22.57	27.64
074	550	546	548	550	1.62	10.67	13.07	15.09	16.87	18.48	20.66	23.86	29.22
08	550	546	548	570	1.69	11.54	14.13	16.31	18.24	19.98	22.34	25.80	31.59
087	550	546	548	580	1.76	12.54	15.36	17.74	19.83	21.72	24.29	28.04	34.35
089	550	546	548	590	1.78	12.83	15.72	18.15	20.29	22.23	24.85	28.69	35.14
10	550	546	548	600	1.88	14.41	17.65	20.38	22.79	24.97	27.91	32.23	39.47
11	550	546	548	620	1.97	15.86	19.42	22.42	25.07	27.46	30.70	35.45	43.42
124	550	546	548	640	2.09	17.87	21.89	25.28	28.26	30.96	34.61	39.97	48.95
131	550	546	548	650	2.15	18.89	23.13	26.71	29.86	32.71	36.57	42.23	51.72
139	550	546	548	660	2.22	20.04	24.54	28.34	31.68	34.70	38.80	44.80	54.87
15	550	546	548	670	2.30	21.62	26.48	30.58	34.19	37.45	41.87	48.35	59.22
165	550	546	548	690	2.41	23.79	29.13	33.64	37.61	41.20	46.06	53.19	65.14
174	550	546	548	700	2.48	25.08	30.72	35.47	39.66	43.45	48.57	56.09	68.69
183	550	546	548	710	2.55	26.38	32.31	37.31	41.71	45.69	51.08	58.99	72.24
20	550	546	548	720	2.66	28.83	35.31	40.78	45.59	49.94	55.84	64.47	78.96
218	550	546	548	740	2.77	31.43	38.49	44.44	49.69	54.43	60.86	70.27	86.07
25	550	546	548	760	2.96	36.04	44.14	50.97	56.99	62.43	69.80	80.60	98.71
294	550	546	548	790	3.22	42.38	51.91	59.94	67.01	73.41	82.07	94.77	116.06
310	550	546	548	800	3.30	44.69	54.73	63.20	70.66	77.40	86.54	99.93	122.39

B = bore diameter

Connection code	Connection	p _{max} * [bar]
A3.00	BSPT	ca. 700
A3.07	NPT	ca. 700
A3.29	Lock nut	ca. 300

* Only valid for operation at constant pressure

Example for ordering: Nozzle code 550 + Flow rate code 300 + Connection code A3.07 = Ordering no. 550.300.A3.07 (Solid stream; 2.28 l/min. at 100 bar; 1/8 NPT)

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

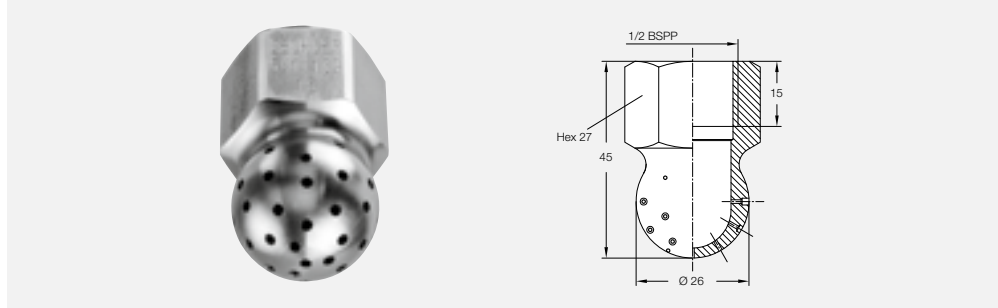



Cluster solid stream nozzle Series 540/541

**Several sharp solid jets.
Also to use with air or saturated steam (see chapter "Air nozzles").**

Applications:

Storage tank cleaning, aerating of bulk goods, recycling of liquids, as well as for accelerating chemical process reactions.



Spray angle 	Ordering no.		E Ø [mm]	V̇ [l/min]			
	Type	Mat no.		p [bar]			
		16		0.5	2	5	40 psi [US gal./min]
approx. 240°	540.909	○	0.8	9.0	18.0	28.5	5.6
	540.989	○	1.0	14.0	28.0	44.3	8.7
	541.109	○	1.5	28.5	57.0	90.1	17.7
	541.189	○	2.0	45.0	90.0	142.3	27.9
	541.239	○	2.3	59.0	118.0	186.6	36.6

E = narrowest free cross section

Example	Type	+	Material-no.	=	Ordering no.
for ordering:	540.909	+	16	=	540.909.16

**ENGINEERING
YOUR SPRAY SOLUTION**



Air nozzles

Air curtains
Blowing off and out
Cleaning
Cooling
Drying
Reheating
Transporting
and many others...



Air nozzles

As a rule, any flat fan or solid stream nozzle can be operated with air instead of liquid.

However, you'll obtain the best results using the nozzle designs we specially engineered for applications of compressed air or saturated steam. For further details, please refer to the next pages.

In addition to air, various nozzle types are also suited for injecting saturated steam. Typical applications of Lechler air nozzles are, for instance, efficient blowing off and blowing out, cooling, drying or cleaning.

Multi-channel air nozzles

In many industries and workshops compressed air has become an indispensable tool.

Compressed air is needed for cleaning, blowing off, drying, conveying and for numerous other applications.

Where uncontrolled compressed air is applied, very often annoying, high-frequency hiss noises arise, which may cause serious harm to hearing. These »noises« are produced by turbulences generated at the air outlet. Their intensity depends on the shape of the nozzle orifice and on the air pressure. This means: the better and stronger the air jet is supposed to be, the higher the health-injuring noise level and the higher the air consumption and its cost.

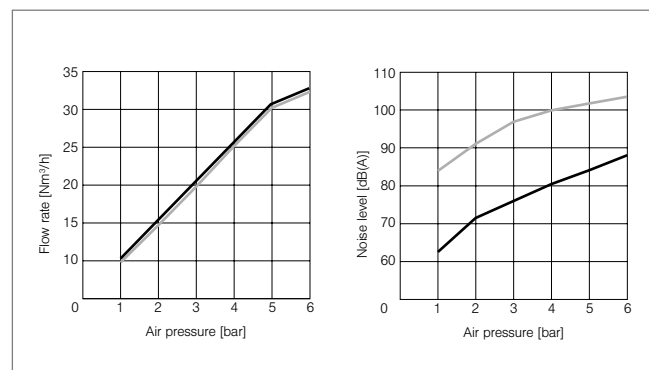
The solution: Lechler multi-channel air nozzles, featuring a significantly reduced sound level, high blowing power and low air consumption.

The performance of multi-channel air nozzles is based on partitioning the air inflow into single air jets. 16 air channels, arranged to ensure optimum flow conditions, provide for a particularly uniform, straight and powerful overall air jet.



In comparison to single-hole air nozzles the advantages are as follows:

- Reduction of the noise level of up to 12 dB
- Low service air pressure with the same blowing power
- Lower air consumption
- Better blowing effect over a longer reach
- Lower operating costs



Comparison of a conventional, single-hole nozzle with the Lechler multi-channel round jet nozzle type 600.326

- Lechler multi-channel round jet nozzle
- Conventional single-hole nozzle

Note for calculation of measuring values:

Blowing power: Blowing distance vertical 50 mm on a scale, area 400 x 500 mm.



Air nozzles

Flat fan nozzles for air	Series		Air consumption [m³/h] at p = 2 bar	Connection	Application/Design	Page
	600.130 600.484	Particularly silent!	8.00 - 18.00	1/4 BSPP 1/4 BSPP NPT 1/4 M 12 x 1.25 Quick release cuppling NW5	Blowing off and blowing out, cleaning, drying, cooling, conveying with air. Multi-channel flat fan nozzle. Plastic versions.	6.5
	600.283 600.493 600.562		7.50 – 30.00	1/8 BSPP 1/4 BSPP 1/4 NPT	Blowing off and blowing out, cleaning, drying, cooling, conveying with air. Multi-channel flat fan nozzle. Metallic versions.	6.6
	679		2.60 – 32.80	Assembly with 3/8 lock nut	Blowing off liquids, cooling, reheating, drying. Easy nozzle changing. Simple jet alignment.	6.7
	686		1.00 – 16.00	1/8 BSPT	Blowing off liquids, cooling, reheating, drying. Tongue-type nozzle.	6.8





Air nozzles

For more information please ask for our special brochure "Nozzles and Accessories for Compressed Air".





Air nozzles

Solid stream nozzles for air	Series		Air consumption [m ³ /h] at p = 2 bar	Connection	Application/ Design	Page
	600.326	Particularly silent!	15.00	1/4 BSPP M 12 x 1.25	Targeted blowing out and blowing off with the aid of air guns. Multi-channel round jet nozzle, producing a powerful air jet with punctiform impact pattern.	6.9
	600.388		8.60	1/8 BSPP M 12 x 1.25	Targeted blowing out and blowing off with the aid of air guns. Multi-channel round jet nozzle. Compact design. Especially for blowing out of pocket holes.	6.9
	544		1.00 – 16.00	1/8 BSPT 1/4 BSPT	Targeted blowing out and blowing off. Powerful air jet with punctiform impact pattern.	6.10
	540 541	240°	39.30 – 325.00	1/2 BSPP	Injection of steam into liquids, injection of compressed air into bulk goods, gas injection. Multi-channel solid stream nozzle.	6.11

For more information please ask for our special brochure »Nozzles and Accessories for Compressed Air«.





Multi-channel flat fan nozzles for air Whisperblast®, Plastic versions Series 600.130/600.484

Particularly
silent!

**Highly efficient air stream,
acting upon areas.
Reduced noise levels.
Low air consumption.**

Applications:

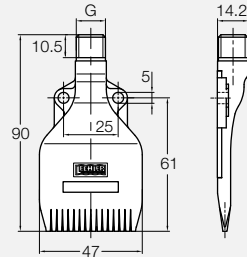
Blowing off and blowing out,
cleaning, drying, cooling,
conveying with air.



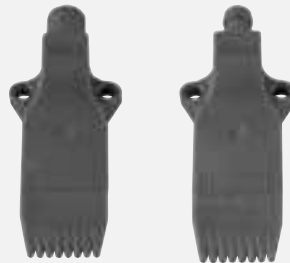
* Complies with OSHA requirements on noise level



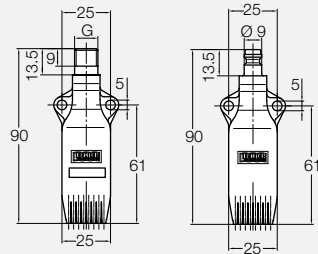
600.130 (POM or PP)



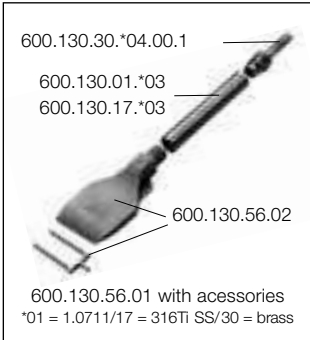
Weight: 23 g · T_{max} POM: 50 °C
Weight: 15 g · T_{max} PP: 60 °C



600.484.56 (POM)

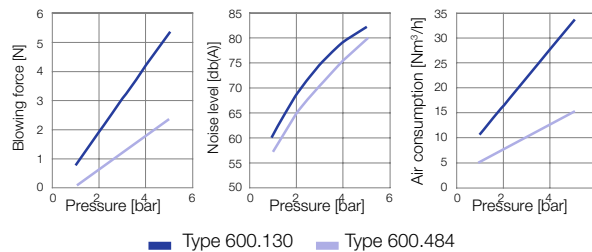


Weight: 16 g · T_{max}: 50 °C



Item 600.130.56.01 does not meet FDA/(EC) No. 1935/2004 requirements.

Technical Data



Socket
Ordering no.
095.016.30.14.23.0

Material: Brass

For connection of series 600.130 with compressed air guns.



Ball joints see page 9.8

Type	Ordering no.					
	Mat. no.		Code			
	S2	56				Quick connection
	PP	POM	1/4 BSPP	1/4 NPT	M12 x 1.25	NW 5
600.130	○	○	AC	BC	-	-
600.130 with plug	-	○	02	-	-	-
600.130 with plug, Hose barb (D = 8 mm) and Extension tube, steel (L = 85 mm)	-	○	01	-	-	-
600.484	-	○	AC	BC	HG	00

Example of ordering: Type 600.130. + Mat. no. 56. + Code AC = Ordering no. 600.130.56.AC





Multi-channel flat fan nozzles for air Whisperblast®, metallic versions Series 600.283/600.493/600.562

Particularly
silent!

Metalic versions for higher temperatures. Highly efficient air stream, acting upon areas. Reduced noise levels. Low air consumption.

Applications:


Blowing off and blowing out, cleaning, drying, cooling, conveying with air.



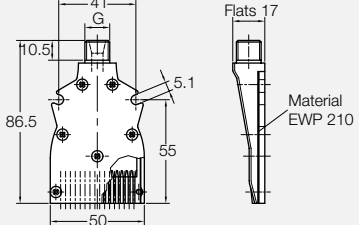
Socket
Ordering no.
095.016.30.14.23.0

Material: Brass


For connection with compressed air guns for the following series:
– 600.283
– 600.493



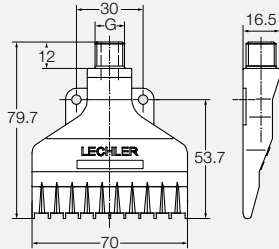
600.283.42 (Aluminum)




Weight: 60 g · T_{max}: 200 °C



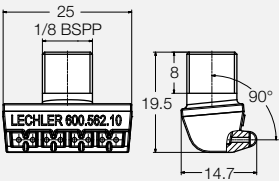
600.493.1Y (Stainless steel 316L SS)



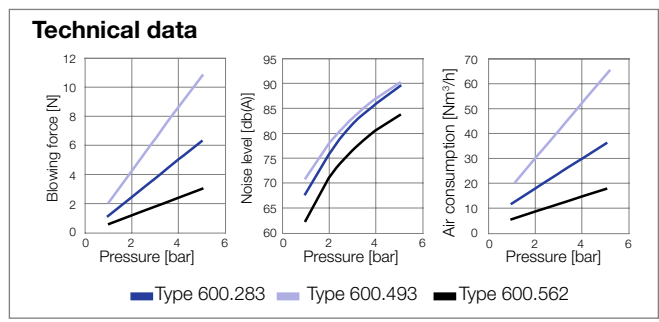
Weight: 126 g · T_{max}: 550 °C



600.562.1Y.10 (Stainless steel 316L SS)



Weight: 17 g · T_{max}: 550 °C



Ball joints see page 9.8

For more information please ask for our special brochure »Nozzles and Accessories for Compressed Air«.



Type	Ordering no.				
	Mat. no.		Code		
	42	1Y			
	Aluminum	Stainless steel	1/8 BSPP	1/4 BSPP	1/4 NPT
600.283	○	-	-	AC	BC
600.493	-	○	-	AC	BC
600.562.1Y.10	-	○	○	-	-

Example of ordering: Type 600.283. + Mat. no. 42 + Code AC = Ordering no. 600.283.42.AC



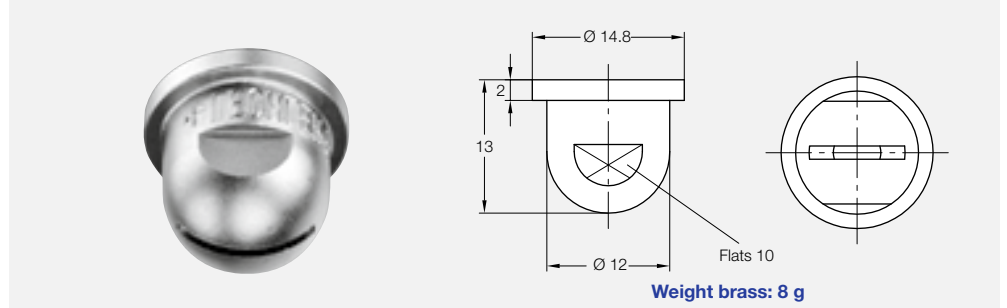
Flat fan nozzles for air or saturated steam


Series 679

**Particularly wide-angle,
powerful air jet.
Assembling with retaining
nut. Easy nozzle changing.
Simple jet alignment.**

Applications:

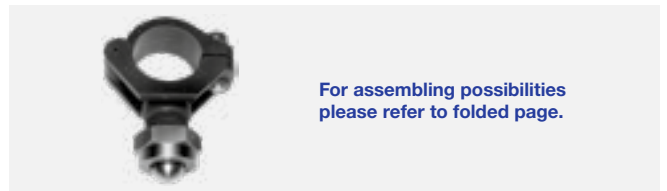
Blowing off liquids, cooling,
reheating, drying.



Spray angle 	Ordering no.		A Ø [mm]	\dot{V}_n Air [m³/h]				\dot{M} Saturated steam [kg/h]				
	Type	Mat. no.		p [bar]				p [bar]				
		17 316Ti SS		30 Brass	0.5	2.0	5.0	10.0	0.5	2.0	5.0	10.0
approx. 70°–90°	679.037	-	○	1.2	1.50	3.00	6.00	11.00	1.20	2.30	4.60	8.30
	679.085	○	○	1.3	2.00	4.00	8.00	14.70	1.60	3.10	6.10	11.10
	679.117	○	○	1.5	2.10	4.20	8.40	15.40	1.70	3.30	6.50	11.70
	679.165	○	○	1.8	2.60	5.10	10.30	18.80	2.00	4.10	8.00	14.30
	679.255	○	○	2.1	3.60	7.30	14.50	26.60	2.80	5.70	11.20	20.20
	679.365	○	○	2.8	6.30	12.70	25.40	46.50	5.00	10.00	19.60	35.30
	679.415	○	○	3.6	10.20	20.30	40.70	74.60	8.00	16.00	31.40	56.70
679.495	○	○	4.3	15.60	31.10	62.20	114.00	12.40	24.80	48.50	87.60	

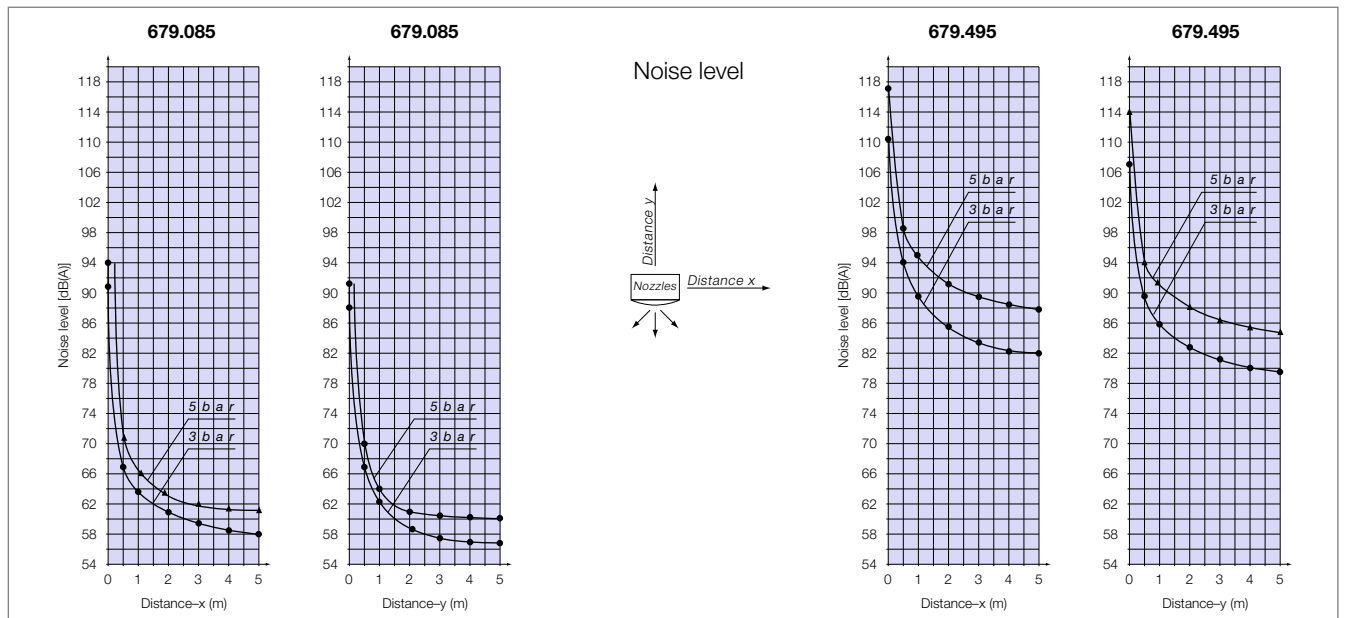
A = equivalent bore diameter

Example	Type	+	Mat. no.	=	Ordering no.
of ordering:	679.037.	+	30	=	679.037.30



For assembling possibilities
please refer to folded page.

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to »Accessories«.





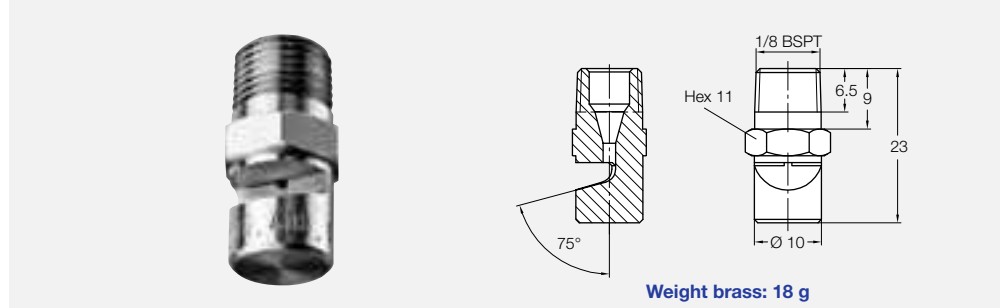
Tongue-type nozzles for air or saturated steam


Series 686

**Wide-angle,
powerful air jet.**

Applications:

Blowing off liquids, cooling,
reheating, drying.



Spray angle 	Ordering no.				B Ø [mm]	η	\dot{V}_n Air [m³/h]				\dot{M} Saturated steam [kg/h]			
	Type	Mat. no.		Code			p [bar]				p [bar]			
		16 303 SS	30 Brass				1/8 BSPT	1.0	2.0	5.0	10.0	1.0	2.0	5.0
approx. 27-47°	686.408	○	○	CA	1.0	75°	1.07	1.60	3.20	5.86	0.88	1.31	2.57	4.64
	686.488	○	○	CA	1.3	75°	1.76	2.64	5.29	9.69	1.46	2.17	4.25	7.67
approx. 70°	686.528	○	○	CA	1.5	75°	2.20	3.31	6.61	12.13	1.83	2.71	5.31	9.59
	686.568	○	○	CA	1.7	75°	2.73	4.09	8.19	15.01	2.27	3.36	6.57	11.87
	686.608	○	○	CA	1.9	75°	3.35	5.02	10.04	18.40	2.78	4.11	8.06	14.55
	686.688	○	○	CA	2.4	75°	5.45	8.18	16.36	30.00	4.53	6.71	13.14	23.72
	686.728	○	○	CA	2.7	75°	6.88	10.33	20.65	37.86	5.71	8.46	16.58	29.94
	686.808	○	○	CA	3.4	75°	10.89	16.33	32.66	59.87	9.04	13.28	26.22	47.35

B = bore diameter

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to »Accessories«.

Example of ordering:	Type	+	Mat. no.	+	Code	=	Ordering no.
	686.408	+	16	+	CA	=	686.408.16.CA



Ball joints see page 9.8



Multi-channel round jet nozzles for air Series 600.326/600.388

**Particularly
silent!**

Powerful air jet, producing punctiform impact patterns. Low noise level. Low air consumption.

Applications:

Targeted blowing out and blowing off with compressed air guns.

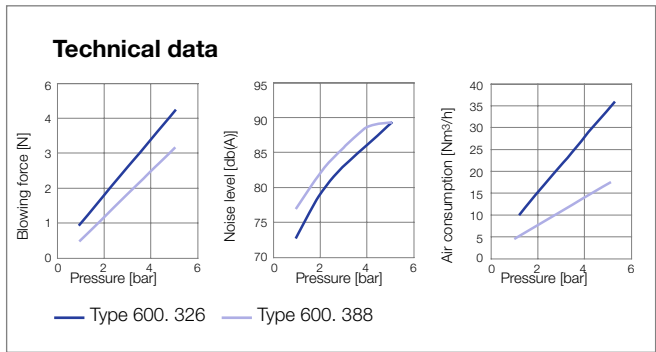
Reduction of noise level of up to 12 dB (A).

600.326.5K (ABS) $T_{max}: 50\text{ }^{\circ}\text{C}$ **600.326.3W (Zinc)** $T_{max}: 90\text{ }^{\circ}\text{C}$

600.388.30 (Brass, POM) $T_{max}: 50\text{ }^{\circ}\text{C}$

Mini-round jet nozzle. Compact design.

Applications:
Especially for blowing out pocket holes.



Ball joints see page 9.8

Ordering no.		Connection thread G	Weight
Type	Code		
600.326.5K (Material: ABS)	AC	1/4 BSPP	9 g
	HG	M 12 x 1.25	
600.326.3W (Material: Zinc)	AC	1/4 BSPP	47 g
	HG	M 12 x 1.25	
600.388.30 (Material: Brass/POM)	AA	1/8 BSPP	12 g
	HG	M 12 x 1.25	

Example of ordering: Type + Code = Ordering no.
600.326.5K + AC = 600.326.5K.AC



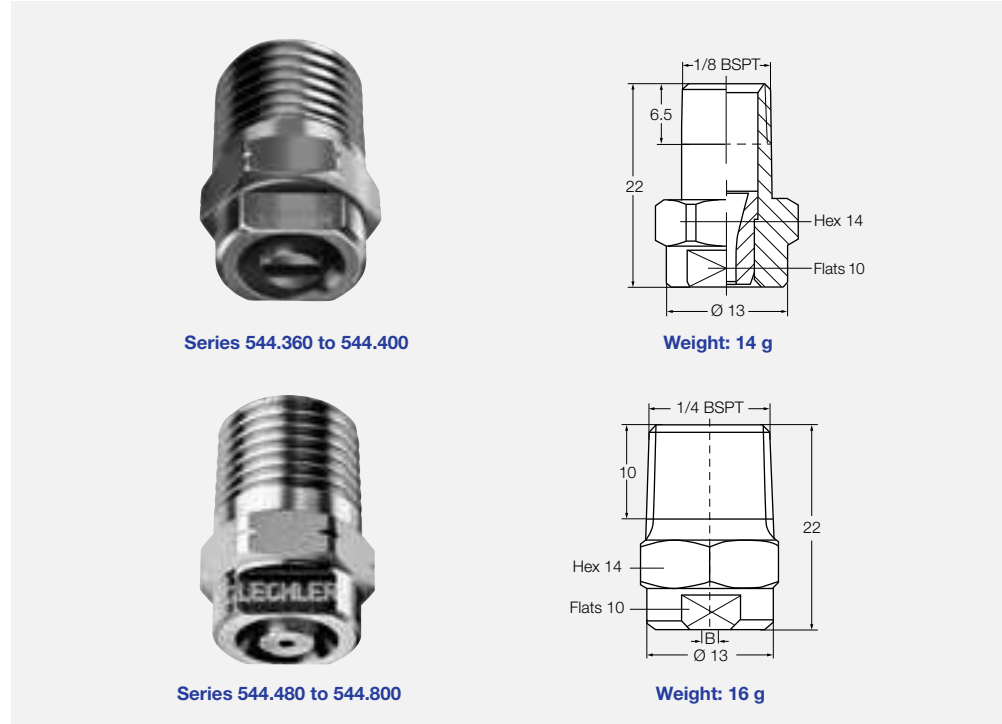
Solid stream nozzles for air or saturated steam

Series 544

**Powerful air jet,
producing punctiform
impact patterns.**

Applications:

Targeted blowing out and blowing off.



Type	Ordering no.			B Ø [mm]	\dot{V}_n Air [m³/h]				\dot{M} Saturated steam [kg/h]			
	Mat. no.	Code			p [bar]				p [bar]			
		16	303 SS		1/8 BSPT	1/4 BSPT	1.0	2.0	3.0	5.0	1.0	2.0
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

B = bore diameter

Example of ordering: Type + Mat. no. + Code = Ordering no.
544.360 + 16 + CA = 544.360.16.CA



Ball joints see page 9.8



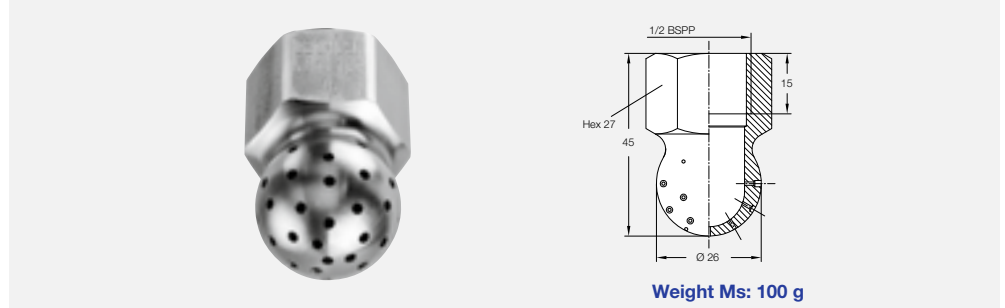
Cluster solid stream nozzles for air or saturated steam


Series 540/541

Powerful air jet with 40 individual bore holes.

Applications:

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



 Spray angle	Ordering no.		B Ø [mm]	\dot{V}_n Air [m ³ /h]				\dot{M} Saturated steam [kg/h]			
	Type	Mat. no.		p [bar]				p [bar]			
		16		1.0	2.0	3.0	5.0	1.0	2.0	3.0	5.0
approx. 240°	540.909	○	0.8	22.80	34.20	45.50	68.30	18.10	26.90	35.50	52.70
	540.989	○	1.0	35.50	53.30	71.00	106.50	28.20	41.70	55.10	81.70
	541.109	○	1.5	83.30	124.90	166.50	249.80	66.00	97.70	129.20	191.60
	541.189	○	2.0	129.70	194.50	259.30	389.00	103.00	152.60	201.70	299.10
	541.239	○	2.3	167.20	250.80	334.30	501.50	133.20	197.30	260.80	386.60

B = bore diameter

Example of ordering:	Type	+	Mat. no.	=	Ordering no.
	540.909	+	16	=	540.909.16

**ENGINEERING
YOUR SPRAY SOLUTION**



Tank cleaning nozzles

Beverage industry
Bioengineering
Chemical industry
Cosmetic industry
Food industry
Pharmaceutical industry
Tank building
and many others ...



Tank cleaning nozzles

Operating principles

Static



Static spray balls do not rotate and therefore require considerably more fluid.

They are used primarily for rinsing tanks. They are inexpensive to purchase and are very robust (trouble-free).

Free-spinning



The cleaning fluid drives the spray head by means of specially positioned nozzles. The rapidly repeated impacts removes the soil and rinses 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 droplets produced are larger and strike the tank wall at higher speed. These rotating cleaning nozzles thus achieve an even higher impact which is especially for large tanks important.

Gear-controlled



The cleaning fluid drives an internal gear by means of a turbine wheel so that the spray head rotates by two axes. The solid jet nozzles mounted on the spray head produce powerful jets. These 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 therefore ideal for very large tanks and the toughest cleaning tasks.

Materials



Lechler tank cleaning nozzles are made of highest-quality materials, such as stainless steel 316L, PVDF, PEEK, or PTFE.



In addition to meeting the requirements for resistance and wear, materials used in the beverage, food and pharmaceutical industries must also be food-grade.

Many of the materials used for Lechler tank cleaning nozzles fully comply with FDA requirements and conform to (EC) 1935/2004.

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

Hygiene 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 3A® or EHEDG.

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

ATEX








Lechler offers several nozzle series designed especially for use in explosive atmospheres. For more detailed information, please request our brochure "Precision nozzles for tank and equipment cleaning".

For detailed information and planning resources, please request our brochure "Precision nozzles for tank and equipment cleaning".













Tank cleaning nozzles

Free-spinning tank cleaning nozzles	Series		\dot{V} [l/min] at recommended operating pressure	Recommended operating pressure	Max. Temperature	Connection	Page			
	500.234 PicoWhirly	300°	9.8	3 bar	200 °C	M6	7.6			
	Max. tank diameter [m]	0	1	2	3	4	5	6	7	8
	566 MicroWhirly	180° 360°	15 – 21	2 bar	130 °C	3/8 BSPP male 3/8 BSPP female	7.6			
	Max. tank diameter [m]	0	1	2	3	4	5	6	7	8
	500.186 MiniWhirly	300°	18	2 bar	50 °C	1/2 BSPP	7.7			
	Max. tank diameter [m]	0	1	2	3	4	5	6	7	8
	500.191 PVDF MicroWhirly	180° 360°	13 – 20	2 bar	90 °C	1/2 BSPP	7.7			
	Max. tank diameter [m]	0	1	2	3	4	5	6	7	8
	5MC MicroSpinner	60° 180° 360°	32 – 40	2 bar	140 °C	3/8 BSPP 1/2" Slip-on	7.8			
	Max. tank diameter [m]	0	1	2	3	4	5	6	7	8
	5MI MiniSpinner	60° 180° 360°	30 – 100	2 bar	140 °C	3/4 BSPP 1/2 BSPP 3/4" Slip-on	7.9			
	Max. tank diameter [m]	0	1	2	3	4	5	6	7	8










Tank cleaning nozzles

Free-spinning tank cleaning nozzles		Series		\dot{V} [l/min] at recommended operating pressure	Recommended operating pressure	Max. Temperature	Connection	Page		
	594/595 Hygienic Whirly	360°		14 – 82	3 bar	100 °C	3/8 BSPP 3/4 BSPP 3/4" Slip-on	7.10		
	Max. tank diameter [m]	0	1	2	3	4	5	6	7	8
	569 Whirly	270° 360°		48 – 145	2 bar	140 °C	3/4 BSPP 3/4" Slip-on	7.11		
	Max. tank diameter [m]	0	1	2	3	4	5	6	7	8
	573/583 PTFE Whirly	270° 360°		67 – 225	2 bar	140 °C	3/4 BSPP 1 BSPP 3/4" Slip-on	7.12		
	Max. tank diameter [m]	0	1	2	3	4	5	6	7	8
	577 Gyro	360°		200 – 659	3 bar	90 °C	1 BSPP 2 BSPP	7.13		
	Max. tank diameter [m]	0	1	2	3	4	5	6	7	8
Controlled rotating tank cleaning nozzles		Series		\dot{V} [l/min] at recommended operating pressure	Recommended operating pressure	Max. Temperature	Connection	Page		
	5S2/5S3 XactClean® HP	180° 270° 360°		40 – 213	5 bar	95 °C	3/8 BSPP 1/2 BSPP 3/4 BSPP 1 BSPP 1/2" Slip-on 3/4" Slip-on	7.14		
	Max. tank diameter [m]	0	1	2	3	4	5	6	7	8
	5S5 XactClean® HP+	180° 270° 360°		202 – 367	3 bar	95 °C	1 BSPP 1 1/4 BSPP 1 1/2 BSPP 1 1/2" Slip-on	7.15		
	Max. tank diameter [m]	0	1	2	3	4	5	6	7	8



Tank cleaning nozzles

Gear-controlled tank cleaning nozzles		Series		\dot{V} [l/min] at recommended operating pressure	Recommended operating pressure	Max. Temperature	Connection	Page			
	5TA IntenseClean Hygienic	360°		40 – 79	5 bar	95 °C	3/4 BSPP	7.16			
	Max. tank diameter [m]	0	3	6	9	12	15	18	21	24	27
	5TB IntenseClean Hygienic	360°		169 – 261	5 bar	95 °C	1 1/2 BSPP	7.16			
	Max. tank diameter [m]	0	3	6	9	12	15	18	21	24	27
	5TM IntenseClean	360°		198 – 411	5 bar	60 °C	1 1/2 BSPP	7.17			
	Max. tank diameter [m]	0	3	6	9	12	15	18	21	24	27
Static spray balls		Series		\dot{V} [l/min] at recommended operating pressure	Recommended operating pressure	Max. Temperature	Connection	Page			
	540/541	240°		22 – 145	3 bar	200 °C	1/2 BSPP	7.18			
	Max. tank diameter [m]	0	1	2	3	4	5	6	7	8	9
	5B2/5B3 RinseClean	180° 360°		15 – 670	2 bar	200 °C	Slip-on connection	7.19			
	Max. tank diameter [m]	0	1	2	3	4	5	6	7	8	9

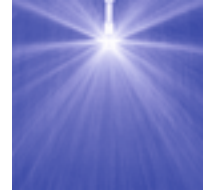
Tank cleaning nozzles



Rotating cleaning nozzle

»PicoWhirly«/»MicroWhirly«

Series 500.234/566



PicoWhirly Series 500.234

- Very compact design
- Self rotating
- Rotating solid jets
- Completely made of stainless steel

Materials:
316L SS

Max. temperature:
200 °C

Recommended operating pressure:
3 bar

Installation:
Operation in every direction is possible

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

Bearing:
Kolsterised slide bearing

MicroWhirly Series 566

- Compact design
- Self rotating
- Effective flat jet nozzles

Materials:
316L SS and PEEK

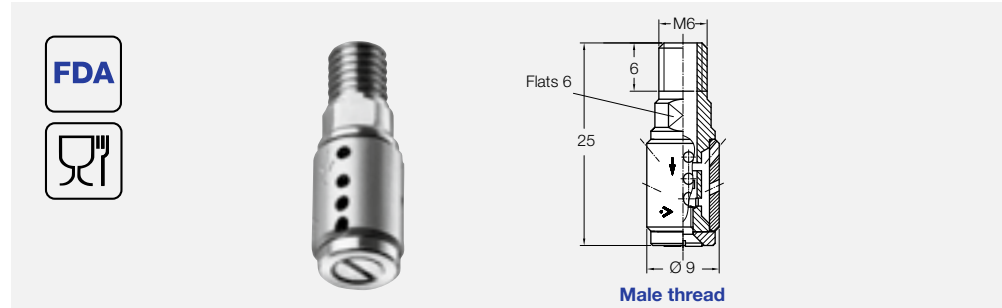
Max. temperature:
130 °C

Recommended operating pressure:
2 bar

Installation:
Operation in every direction is possible

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

Bearing:
Slide bearing made of PEEK

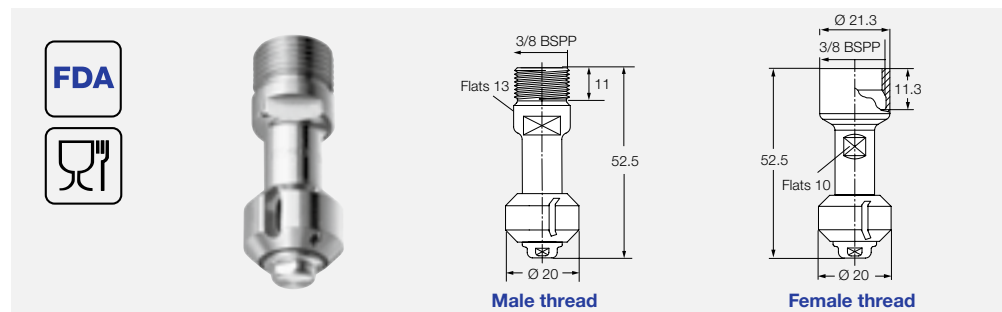


Spray angle	Ordering number Type	E Ø [mm]	V̇ [l/min]				Max. tank diameter [m]
			p [bar] (p _{max} = 5 bar)				
300°	500.234.G9.00	1.8	1	2	3	at 40 psi [US gal./ min]	0.9
			5.7	8.0	9.8		

E = narrowest free cross-section

The maximum tank diameter shown above applies for the recommended operating pressure and is indicative only. The cleaning result is also affected by the type of soiling.

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



Spray angle	Ordering number			E Ø [mm]	V̇ [l/min]				Max. tank diameter [m]
	Type	Connection			p [bar] (p _{max} = 6 bar)				
180°	566.873.1Y	AE	AF	1.0	1	2	3	at 40 psi [US gal./ min]	1.6
					12	15	18		
180°	566.933.1Y	AE	AF	2.4	1	2	3	at 40 psi [US gal./ min]	1.7
					15	21	26		
180°	566.874.1Y	AE	AF	1.0	1	2	3	at 40 psi [US gal./ min]	1.6
					12	15	18		
180°	566.934.1Y	AE	AF	2.4	1	2	3	at 40 psi [US gal./ min]	1.7
					15	21	26		
360°	566.879.1Y	AE	AF	1.0	1	2	3	at 40 psi [US gal./ min]	1.6
					12	15	18		
360°	566.939.1Y	AE	AF	2.4	1	2	3	at 40 psi [US gal./ min]	1.7
					15	21	26		

E = narrowest free cross-section · NPT and weld-on version on request

The maximum tank diameter shown above applies for the recommended operating pressure and is indicative only. The cleaning result is also affected by the type of soiling.

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

Slip-on information: – R-clip made of stainless steel 316L SS is included (Ordering number: 095.022.1Y.50.94.E)
– Depending on diameter of the adapter the flow rate can increase due to leakage between connecting pipe and rotating cleaning nozzle.



**ATEX version
on request**





Rotating cleaning nozzles

»MiniWhirly«/»PVDF MicroWhirly«

Series 500.186/500.191



MiniWhirly Series 500.186

- Effective flat jet nozzles
- For applications in barrel and canister cleaning

Materials:
POM, 316 SS

Max. temperature:
50 °C

Recommended operating pressure:
2 bar

Installation:
Vertically facing downward

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

Bearing:
Ball bearing made of stainless steel

PVDF MicroWhirly Series 500.191

- Very inexpensive
- Self rotating
- Effective flat jet nozzles
- Completely made of PVDF

Material:
PVDF

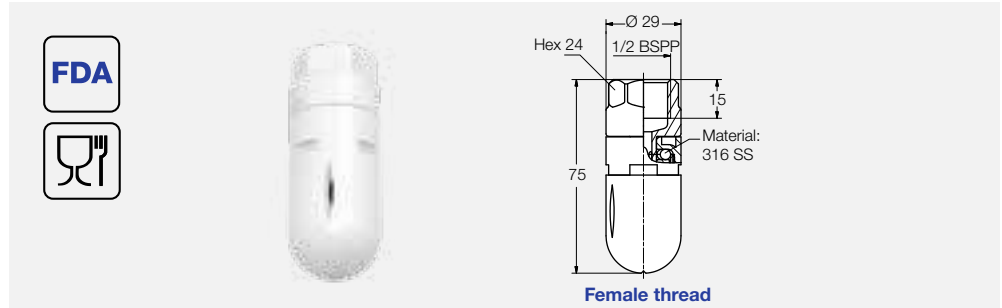
Max. Temperature:
90 °C

Recommended operating pressure:
2 bar

Installation:
Operation in every direction is possible

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

Bearing:
Slide bearing made of PVDF

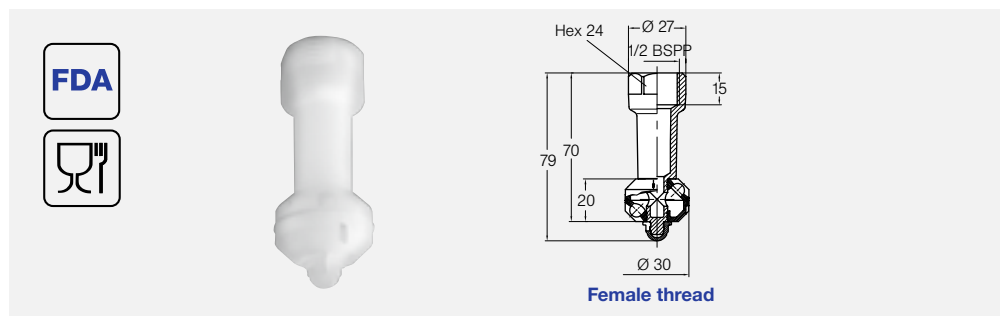


Spray angle	Ordering number Type	E Ø [mm]	V̇ [l/min]				Max. tank diameter [m]
			p [bar] (p _{max} = 5 bar)				
			1	2	3	at 40 psi [US gal./ min]	
300°	500.186.56.AH	1.9	13	18	22	6	1.3

E = narrowest free cross-section

The maximum tank diameter shown above applies for the recommended operating pressure and is indicative only. The cleaning result is also affected by the type of soiling.

Operation with compressed air only for short-term usage. The PVDF MicroWhirly is not suitable for operation with compressed air or any other gas. Operation above the recommended operating pressure has negative effects on the cleaning result and wear.



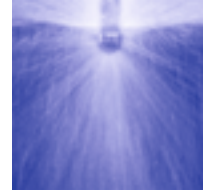
Spray angle	Ordering number Type	E Ø [mm]	Con-nection BSPP female	V̇ [l/min]				Max. tank diameter [m]
				p [bar] (p _{max} = 5 bar)				
				1	2	3	at 40 psi [US gal./ min]	
180°	500.191.5E.02	2.2	1/2	9	13	16	4	0.8
180°	500.191.5E.01	2.2	1/2	9	13	16	4	0.8
270°	500.191.5E.31	2.2	1/2	14	20	24	6	1.1
360°	500.191.5E.00	2.2	1/2	14	20	24	6	1.1

E = narrowest free cross-section · NPT and weld-on version on request

The maximum tank diameter shown above applies for the recommended operating pressure and is indicative only. The cleaning result is also affected by the type of soiling.



Rotating cleaning nozzle »MicroSpinner« Series 5MC



- Completely made of stainless steel
- Self-rotating
- Efficient slot design
- Modern bearing construction

Materials:
316L SS,
440C SS

Max. temperature:
140 °C

Recommended operating pressure:
2 bar

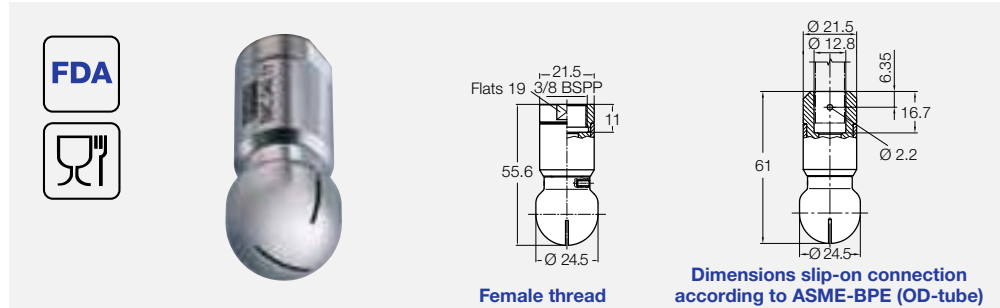
Installation:
Operation in every direction is possible

Filtration:
Line strainer with a mesh size of 0.1 mm/170 mesh

Bearing:
Double ball bearing made of 440C SS



ATEX version on request



Spray angle	Ordering number				E Ø [mm]	V [l/min]				Max. tank diameter [m]
	Type	Mat. no.	Connection			p [bar] (p _{max} = 5 bar)				
			1Y	3/8 BSPP		1/2" Slip-on	1	2	3	
60°	5MC.022	○	AF	TF05	1.0	16	23	28	7	-
	5MC.042	○	AF	TF05	3.0	28	40	49	12	-
180°	5MC.004	○	AF	TF05	0.8	22	32	39	10	1.8
360°	5MC.049	○	AF	TF05	0.9	28	39	48	12	1.8

E = narrowest free cross-section · NPT, more slip-on sizes and weld-on versions on request

The maximum tank diameter shown above applies for the recommended operating pressure and is indicative only. The cleaning result is also affected by the type of soiling.

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

Slip-on information: – R-clip made of stainless steel 316L SS is included (Ordering no.: 095.013.1E.05.59).
– Depending on diameter of the adapter the flow rate can increase due to leakage between connecting pipe and rotating cleaning nozzle.

Example of ordering: Type + Connection = Ordering no.
5MC.042.1Y + AF = 5MC.042.1Y.AF



Rotating cleaning nozzle »MiniSpinner« Series 5MI



- Completely made of stainless steel
- Self-rotating
- Efficient slot design
- Modern bearing construction

Materials:
316L SS,
440C SS

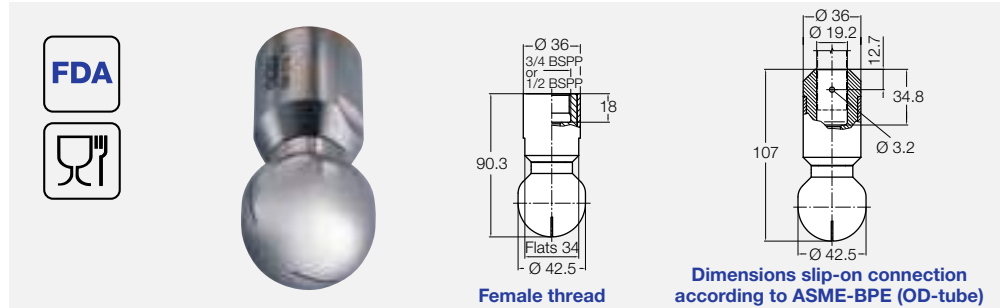
Max. temperature:
140 °C

Recommended operating pressure:
2 bar

Installation:
Operation in every direction is possible

Filtration:
Line strainer with a mesh size of 0.1 mm/170 mesh

Bearing:
Double ball bearing made of 440C SS



Spray angle	Ordering no.					E Ø [mm]	V [l/min]				Max. tank diameter [m]
	Type	Mat. no. 1Y 316L SS	Connection				p [bar] (p _{max} = 5 bar)				
			1/2 BSPP	3/4 BSPP	3/4" Slip-on		1	2	3	at 40 psi [US gal./min]	
60°	5MI.162	○	AH	-	TF07	2.6	45	63	77	20	-
180°	5MI.113	○	-	AL	TF07	1.0	47	67	82	21	2.6
180°	5MI.114	○	-	AL	TF07	1.0	47	67	82	21	2.6
360°	5MI.054	○	-	AL	TF07	0.5	21	30	37	9	1.8
	5MI.074	○	-	AL	TF07	0.6	35	49	60	15	2.1
	5MI.014	○	-	AL	TF07	0.9	49	69	85	21	2.3
	5MI.209	○	-	AL	TF07	1.5	71	100	122	31	2.6

E = narrowest free cross-section · NPT, more slip-on sizes and weld-on versions on request

The maximum tank diameter shown above applies for the recommended operating pressure and is indicative only. The cleaning result is also affected by the type of soiling.

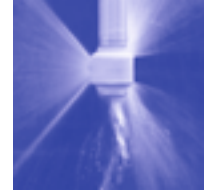
Operation with compressed air only for short-term usage. Operation above the recommended operating pressure has negative effects on the cleaning result and wear.

Slip-on information: – R-clip made of stainless steel 316L SS is included(Ordering no.: 095.022.1Y.50.60).
– Depending on diameter of the adapter the flow rate can increase due to leakage between connecting pipe and rotating cleaning nozzle.

Example of ordering: Type + Material no. + Connection = Ordering no.
5MI.162. + 1Y + AH = 5MI.162.1Y.AH



Rotating cleaning nozzle »HygienicWhirly« Series 594/595



- EHEDG version available
- Self rotating
- Effective flat jet nozzles
- Also suited for the application of foam

Materials:

316L SS, PEEK,
EHEDG version:
O-ring made of EPDM

Max. temperature:

100 °C,
short-term up to 140 °C

Recommended operating pressure:

3 bar

Installation:

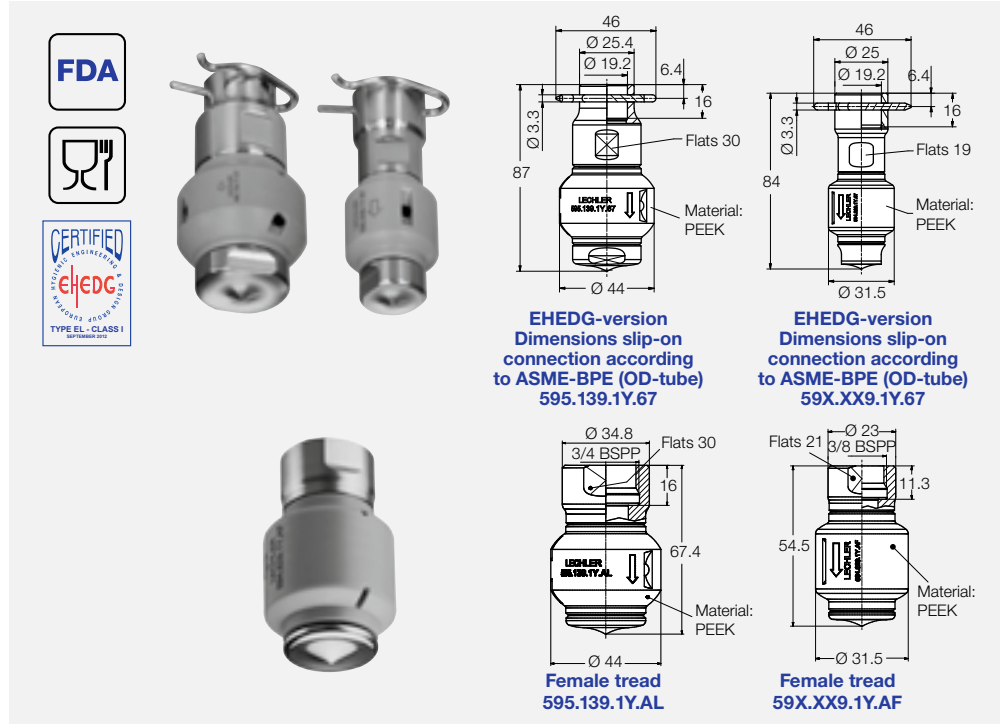
Operation in every direction is possible



Filtration:

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

Bearing:

Slide bearing made of PEEK



Spray angle 	Ordering no.				E Ø [mm]	V [l/min]					Max. tank diameter [m]
	Type	Connection				p [bar] (p _{max} = 5 bar)					
		3/8 BSPP female	3/4 BSPP female	3/4" Slip-on EHEDG version		0.5	1	2	3	at 40 psi [US gal./min]	
360° 	594.829.1Y	AF	-	67	1.7	6	8	11	14	3	0.8
	594.879.1Y	AF	-	67	2.5	8	11	15	18	5	1.2
	595.009.1Y	AF	-	67	4.0	16	22	32	39	10	1.5
	595.049.1Y	AF	-	67	4.2	20	28	40	49	12	2.0
	595.139.1Y	-	AL	67	5.0	34	47	67	82	21	2.7

E = narrowest free cross-section · NPT on request

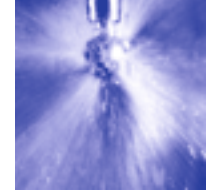
The maximum tank diameter shown above applies for the recommended operating pressure and is indicative only. The cleaning result is also affected by the type of soiling.

Slip-on information: – R-clip made of stainless steel 316L SS is included (Ordering number: 095.022.1Y.50.94.E).
– Depending on diameter of the adapter the flow rate can increase due to leakage between connecting pipe and rotating cleaning nozzle.

Example of ordering: Type + Connection = Ordering no.
594.829.1Y + AF = 594.829.1Y.AF



Rotating cleaning nozzle »Whirly« Series 569



- Popular and proven design
- Powerful flat jets
- Wide range of flow rates

Materials:

316L SS, PEEK,
Rulon 641

Max. temperature:

140 °C

Recommended

operating pressure:

2 bar

Installation:

Operation in every direction is possible; in horizontal installation position no rotating until 2 bar

Filtration:

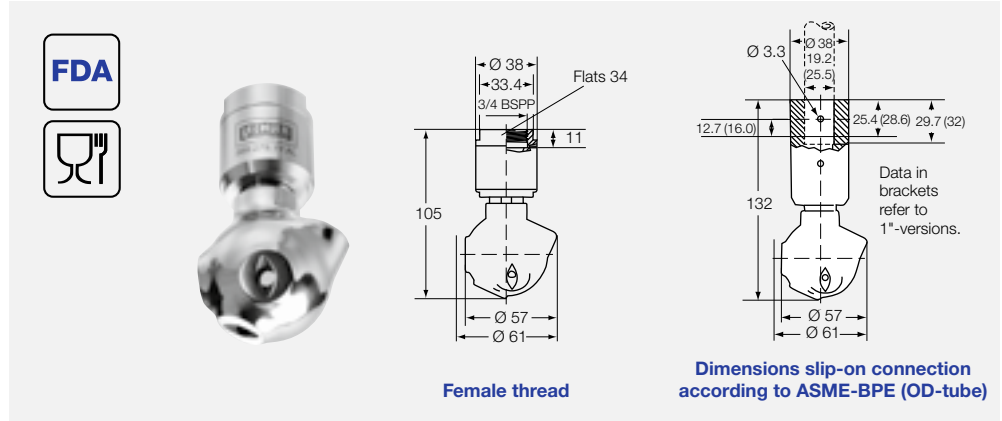
Line strainer with a mesh size of 0.1 mm/170 mesh

Bearing:

Double ball bearing made of stainless steel



**ATEX version
on request**



Spray angle	Ordering no.			E Ø [mm]	V [l/min]				Max. tank diameter [m]
	Type	Connection			p [bar] (p _{max} = 6 bar)				
		3/4 BSPP female	3/4" Slip-on		1	2	3	at 40 psi [US gal./min]	
270°	569.055.1Y	AL	TF07	3.6	36	48	62	15	1.8
	569.135.1Y	AL	TF07	4.8	52	71	87	22	2.1
	569.195.1Y	AL	TF07	5.6	69	97	119	30	2.6
270°	569.056.1Y	AL	TF07	3.6	36	48	62	15	1.8
	569.106.1Y	AL	TF07	4.8	41	58	71	18	2.1
	569.196.1Y	AL	TF07	5.6	69	97	119	30	2.6
360°	569.059.1Y	AL	TF07	3.2	36	48	62	15	1.8
	569.139.1Y	AL	TF07	3.6	52	71	87	22	2.1
	569.199.1Y	AL	TF07	4.8	69	97	119	30	2.6
	569.279.1Y	AL	TF07	7.1	103	145	178	45	3.0

E = narrowest free cross-section · NPT on request

The maximum tank diameter shown above applies for the recommended operating pressure and is indicative only. The cleaning result is also affected by the type of soiling.

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

Slip-on information: – R-clip made of stainless steel 316L SS is included (Ordering no.: 095.022.1Y.50.60.E).
– Depending on diameter of the adapter the flow rate can increase due to leakage between connecting pipe and rotating cleaning nozzle.

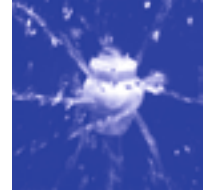
Example **Type** + **Connection** = **Ordering no.**
of ordering: **569.055.1Y.** + **AL** = **569.055.1Y.AL**

For additional connection options please refer to our brochure "Precision Spray Nozzles for Tank and Equipment Cleaning"





Rotating cleaning nozzle »PTFE Whirly« Series 573/583



- Self rotating
- Rotating solid jets
- Recommended for tanks made of glass and enamel
- 3A® version available

Materials:
PTFE

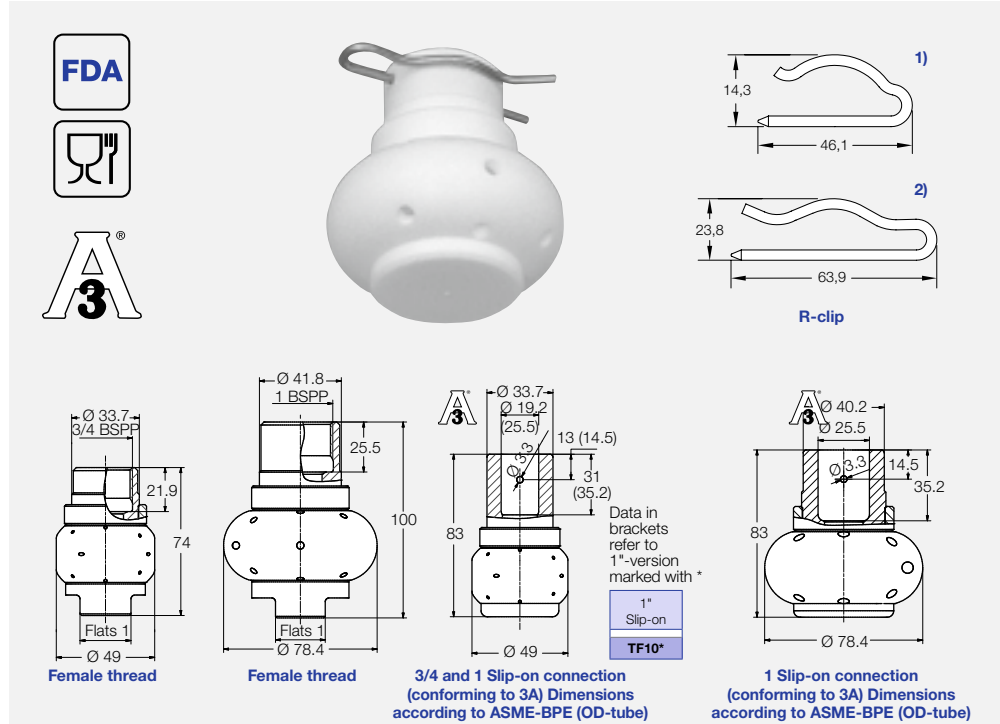
Max. temperature:
95 °C
(Versions for use with higher temperature (130 °C) on request)

Recommended operating pressure:
2 bar

Installation:
Operation in every direction is possible

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

Bearing:
Slide bearing made of PTFE



For additional spray angles, nozzle sizes and connection options please refer to our brochure "Precision Spray Nozzles for Tank and Equipment Cleaning"



Spray angle	R-clip	Ordering no.	Connection				E Ø [mm]	V [l/min]				Max. tank diameter [m]	
			Type	3/4 BSPP	1 BSPP	3/4" Slip-on		1" Slip-on	p [bar] (p _{max} = 6 bar)				
									1	2	3		at 40 psi [US gal./min]
270°	1)	583.266.55	AL	-	TF07	TF10*	3.4	103	145	178	45	2.8	
270°	1)	573.266.55	AL	-	TF07	TF10*	3.4	103	145	178	45	2.8	
360°	1)	583.119.55	AL	-	TF07	TF10*	1.8	41	58	71	18	2.4	
	1)	583.209.55	AL	-	TF07	TF10*	3.5	71	100	122	31	2.5	
	1)	583.269.55	AL	-	TF07	TF10*	4.8	103	145	178	45	2.8	
	2)	583.279.55	-	AN	-	TF10	3.7	106	150	184	47	3.0	
	2)	583.349.55	-	AN	-	TF10	5.6	159	225	276	70	3.2	

E = narrowest free cross-section · NPT on request
* see drawing 3 for details

The maximum tank diameter shown above applies for the recommended operating pressure and is indicative only. The cleaning result is also affected by the type of soiling.

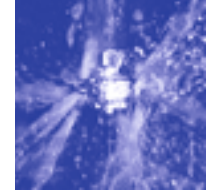
Operation with compressed air only for short-term usage. Operation above the recommended operating pressure has negative effects on the cleaning result and wear.

Slip-on information: – R-clip made of stainless steel 316L SS is included
(Ordering number: R-clip 1: 095.022.1Y.50.88.E, R-clip 2: 095.022.1Y.50.60.E)
– Depending on diameter of the adapter the flow rate can increase due to leakage between connecting pipe and rotating cleaning nozzle.

Example of ordering:	Type	+	Connection	=	Ordering no.
	583.266.55	+	AL	=	583.266.55.AL



Rotating cleaning nozzle »Gyro« Series 577



- Self rotating
- Effective flat jet nozzles
- Large free cross sections, less prone to clogging

Max. tank diameter:
5.5 m

Materials:
316L SS, PTFE

Max. temperature:
90 °C

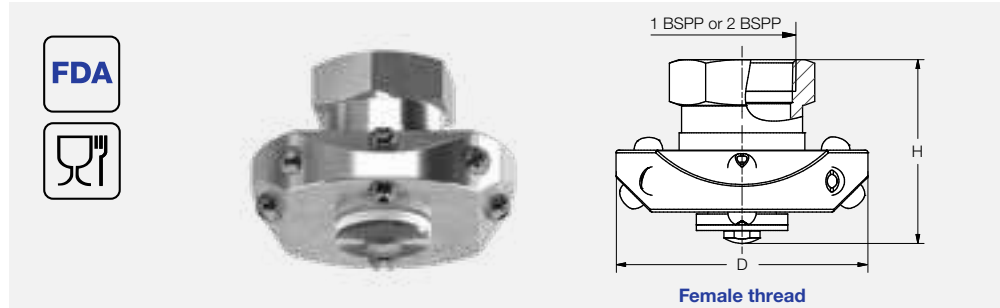
Recommended operating pressure:
3 bar

Installation:
Vertically facing downward

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

Bearing:
Slide bearing made of PTFE

Accessories:
Spare parts set consisting of: top seal, bottom seal, bolt, nut, sleeve, instructions for use



Spray angle	Ordering no.			V [l/min]					Dimensions	
	Type	Connection		p [bar] (p _{max} = 5 bar)					Height H [mm]	Diameter D [mm]
		1 BSPP	2 BSPP	1	2	3	5	at 40 psi [US gal./min]		
360°	577.289.1Y	AN	-	115	163	200	258	50	72	118
	577.369.1Y	AN	-	182	258	316	408	80	72	118
	577.409.1Y	-	AW	228	322	394	509	100	103	156
	577.439.1Y	-	AW	273	386	473	610	120	103	156
	577.499.1Y	-	AW	380	538	659	851	170	103	156

NPT on request

The maximum tank diameter shown above applies for the recommended operating pressure and is indicative only. The cleaning result is also affected by the type of soiling.

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

Example	Type	+	Connection	=	Ordering no.
for Ordering:	577.289.1Y.	+	AN	=	577.289.1Y.AN



Rotating cleaning nozzle »XactClean® HP« Series 5S2/5S3



- Controlled rotation
- Powerful flat fan nozzles
- Very efficient tank cleaning nozzle

Materials:

316L SS,
316 SS,
632 SS,
PEEK, PTFE,
Zirconium oxide, EPDM

Max. temperature:

95 °C

Recommended operating pressure:

5 bar

Installation:

Operation in every direction is possible

Filtration:

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

Bearing:

Double ball bearing

Rotation monitoring sensor:



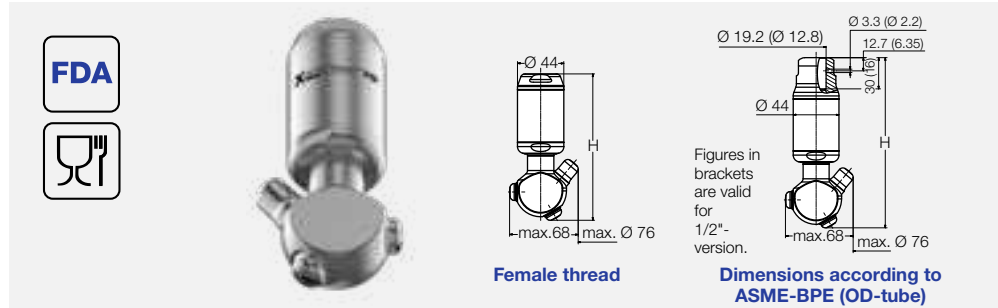
Sensor compatible, please ask for more information.

The maximum tank diameter shown above applies for the recommended operating pressure and is indicative only. The cleaning result is also affected by the type of soiling.

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

Slip-on information:

- R-clip made of stainless steel
- 316L SS is included (Ordering number: 095.022.1Y.50.60.E (TF07), 095.013.1E.05.59.0 (TF05)).
- Depending on diameter of the adapter the flow rate can increase due to leakage between connecting pipe and rotating cleaning nozzle.



Nozzle dimensions [mm]

Connection	Max. Height H
AF	146
AH	149
AL	139
AN	139
TF05	148
TF07	164



Spray angle	Ordering no.							E Ø [mm]	V [l/min]				Max. tank diameter [m]
	Type	Connection							p [bar] (p _{max} = 15 bar)				
		3/8 BSPP female	1/2 BSPP female	3/4 BSPP female	1 BSPP female	1/2" Slip-on	3/4" Slip-on		2	5	10	at 40 psi [US gal./min]	
180°	5S2.953.1Y	AF	AH	-	-	TF05	-	2.0	25	40	57	7.8	3.5
	5S3.053.1Y	-	AH	-	-	-	TF07	2.0	41	65	92	12.8	4.0
	5S3.113.1Y	-	AH	AL	-	-	TF07	2.0	60	94	133	18.4	6.0
	5S3.183.1Y	-	-	AL	-	-	TF07	2.0	89	141	199	27.7	7.0
	5S3.233.1Y	-	-	AL	-	-	TF07	2.0	111	175	248	34.3	7.5
	5S3.263.1Y	-	-	AL	AN	-	TF07	2.0	135	213	301	41.8	8.0
180°	5S2.954.1Y	AF	AH	-	-	TF05	-	2.0	25	40	57	7.8	3.5
	5S3.054.1Y	-	AH	-	-	-	TF07	2.0	41	65	92	12.8	4.0
	5S3.114.1Y	-	AH	AL	-	-	TF07	2.0	60	94	133	18.4	6.0
	5S3.184.1Y	-	-	AL	-	-	TF07	2.0	89	141	199	27.7	7.0
	5S3.234.1Y	-	-	AL	-	-	TF07	2.0	111	175	248	34.3	7.5
	5S3.264.1Y	-	-	AL	AN	-	TF07	2.0	135	213	301	41.8	8.0
270°	5S2.955.1Y	AF	AH	-	-	TF05	-	2.0	25	40	57	7.8	3.5
	5S3.055.1Y	-	AH	-	-	-	TF07	2.0	41	65	92	12.8	4.0
	5S3.115.1Y	-	AH	AL	-	-	TF07	2.0	60	94	133	18.4	6.0
	5S3.185.1Y	-	-	AL	-	-	TF07	2.0	89	141	199	27.7	7.0
	5S3.235.1Y	-	-	AL	-	-	TF07	2.0	111	175	248	34.3	7.5
	5S3.265.1Y	-	-	AL	AN	-	TF07	2.0	135	213	301	41.8	8.0
270°	5S2.956.1Y	AF	AH	-	-	TF05	-	2.0	25	40	57	7.8	3.5
	5S3.056.1Y	-	AH	-	-	-	TF07	2.0	41	65	92	12.8	4.0
	5S3.116.1Y	-	AH	AL	-	-	TF07	2.0	60	94	133	18.4	6.0
	5S3.186.1Y	-	-	AL	-	-	TF07	2.0	89	141	199	27.7	7.0
	5S3.236.1Y	-	-	AL	-	-	TF07	2.0	111	175	248	34.3	7.5
	5S3.266.1Y	-	-	AL	AN	-	TF07	2.0	135	213	301	41.8	8.0
360°	5S2.959.1Y	AF	AH	-	-	TF05	-	1.7	25	40	57	7.8	3.5
	5S3.059.1Y	-	AH	-	-	-	TF07	2.0	41	65	92	12.8	4.0
	5S3.119.1Y	-	AH	AL	-	-	TF07	2.0	60	94	133	18.4	6.0
	5S3.189.1Y	-	-	AL	-	-	TF07	2.0	89	141	199	27.7	7.0
	5S3.239.1Y	-	-	AL	-	-	TF07	2.0	111	175	248	34.3	7.5
	5S3.269.1Y	-	-	AL	AN	-	TF07	2.0	135	213	301	41.8	8.0



Rotating cleaning nozzle »XactClean® HP+« Series 5S5



- Controlled rotation
- Powerful flat fan nozzles
- Very efficient tank cleaning nozzle, especially for larger tanks

Materials:

316L SS,
316 SS, PEEK, EPDM

Max. temperature:

95 °C

Recommended operating pressure:

3 bar

Installation:

Operation in every direction is possible

Filtration:

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

Bearing:

Double ball bearing

Rotation monitoring sensor:



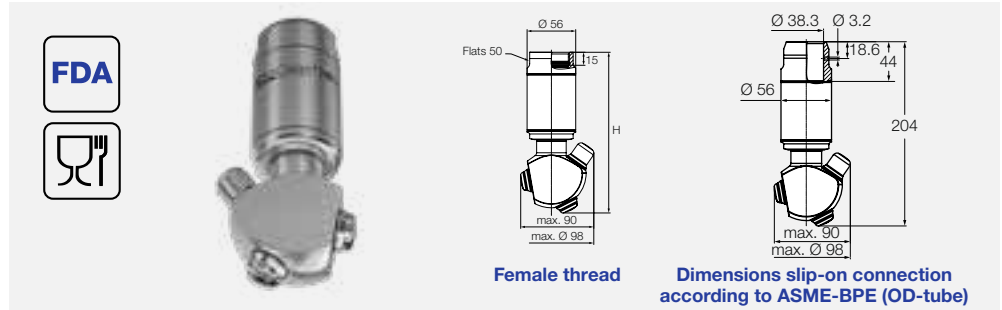
Sensor compatible, please ask for more information.

The maximum tank diameter shown above applies for the recommended operating pressure and is indicative only. The cleaning result is also affected by the type of soiling.

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







Slip-on information:

- R-clip made of stainless steel
- 316L SS is included (Ordering number: 095.013.1Y.06.45.0).
- Depending on diameter of the adapter the flow rate can increase due to leakage between connecting pipe and rotating cleaning nozzle.



Nozzle dimensions [mm]

Connection	Max. Height [H]
AN	185
AQ	185
AS	187

Spray angle 	Ordering no.					E Ø [mm]	V̇ [l/min]				Max. tank diameter [m]
	Type	Connection					p [bar] (p _{max} = 10 bar)				
		1 BSPP	1 1/4 BSPP	1 1/2 BSPP	1 1/2" Slip-on		2	3	5	at 40 psi [US gal./min]	
180° 	5S5.293.1Y	AN	-	-	TF15	3.0	165	202	261	51.2	9.0
	5S5.323.1Y	AN	AQ	-	TF15	3.0	200	245	316	62.0	9.2
	5S5.363.1Y	-	AQ	AS	TF15	3.0	250	306	395	77.6	9.4
180° 	5S5.294.1Y	AN	-	-	TF15	3.0	165	202	261	51.2	9.0
	5S5.324.1Y	AN	AQ	-	TF15	3.0	200	245	316	62.0	9.2
	5S5.364.1Y	-	AQ	AS	TF15	3.0	250	306	395	77.6	9.4
270° 	5S5.295.1Y	AN	-	-	TF15	3.0	165	202	261	51.2	9.0
	5S5.325.1Y	AN	AQ	-	TF15	3.0	200	245	316	62.0	9.2
	5S5.365.1Y	-	AQ	AS	TF15	3.0	250	306	395	77.6	9.4
270° 	5S5.296.1Y	AN	-	-	TF15	3.0	165	202	261	51.2	9.0
	5S5.326.1Y	AN	AQ	-	TF15	3.0	200	245	316	62.0	9.2
	5S5.366.1Y	-	AQ	AS	TF15	3.0	250	306	395	77.6	9.4
360° 	5S5.299.1Y	AN	-	-	TF15	3.0	165	202	261	51.2	9.0
	5S5.329.1Y	AN	AQ	-	TF15	3.0	200	245	316	62.0	9.2
	5S5.369.1Y	-	AQ	AS	TF15	3.0	250	306	395	77.6	9.4
	5S5.399.1Y	-	AQ	AS	TF15	3.0	300	367	474	93.1	9.6

E = narrowest free cross-section · NPT on request



High impact tank cleaning machine

»IntenseClean Hygienic«

Series 5TA/5TB



- Gear-controlled
- Particularly powerful solid jets
- Operating pressures up to 15 and 25 bar possible

Materials:

316L SS,
632 SS,
PEEK, PTFE,
Zirconium oxide, EPDM

Max. temperature:

95 °C

Recommended operating pressure:

5 bar

Installation:

Operation in every direction possible

Filtration:

Line strainer with a mesh size of 0.2 mm/80 mesh

Bearing:

Ball bearing

Weight:

5TA: 0.9 kg
5TB: 4.0 kg

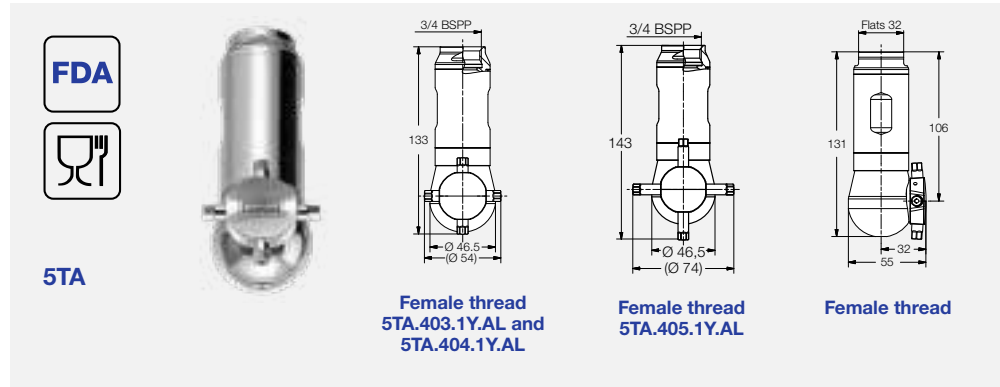
Rotation monitoring sensor:





Sensor compatible, please ask for more information.



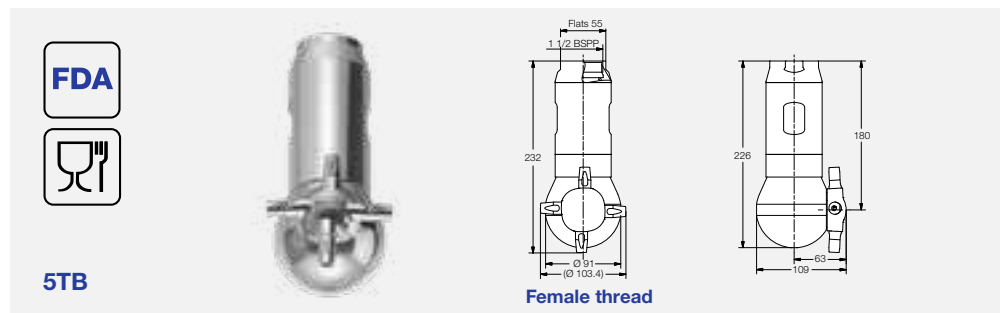
ATEX version on request





Spray angle 	Ordering no. Type	E Ø [mm]	Number, Ø Nozzles [mm]	V' [l/min]				Max. tank diameter [m]
				p [bar] (p _{max} = 15 bar)				
				2	5	10	at 40 psi [US gal./ min]	
360° 	5TA.403.1Y.AL	1.5	4 x 3.0	25	40	56	7.8	12.0
	5TA.404.1Y.AL	1.5	4 x 4.0	35	55	78	10.9	12.5
	5TA.405.1Y.AL	1.5	4 x 5.0	50	79	112	15.5	13.0

E = narrowest free cross-section · Slip-on connection on request

The maximum tank diameter shown above applies for the recommended operating pressure and is indicative only. The cleaning result is also affected by the type of soiling.



Spray angle 	Ordering no. Type	E Ø [mm]	Number, Ø Nozzles [mm]	V' [l/min]				Max. tank diameter [m]
				p [bar] (p _{max} = 25 bar)				
				2	5	10	at 40 psi [US gal./ min]	
360° 	5TB.406.1Y.AS	6.0	4 x 6.0	107	169	239	33.1	14.0
	5TB.407.1Y.AS	6.0	4 x 7.0	135	213	302	41.9	14.0
	5TB.408.1Y.AS	6.0	4 x 8.0	165	261	369	51.2	15.0

E = narrowest free cross-section

The maximum tank diameter shown above applies for the recommended operating pressure and is indicative only. The cleaning result is also affected by the type of soiling.



High impact tank cleaning machine

»IntenseClean«

Series 5TM



- Gear driven
- Very powerful solid jets
- Popular and proven design

Materials:

316L SS, 304 SS, 302 SS, PTFE, PEEK

Max. temperature:

95 °C

Recommended operating pressure:

5 bar

Installation:

Operation in every direction possible

Filtration:

Line strainer with a mesh size of 0.2 mm/80 mesh

Bearing:

Ball bearing

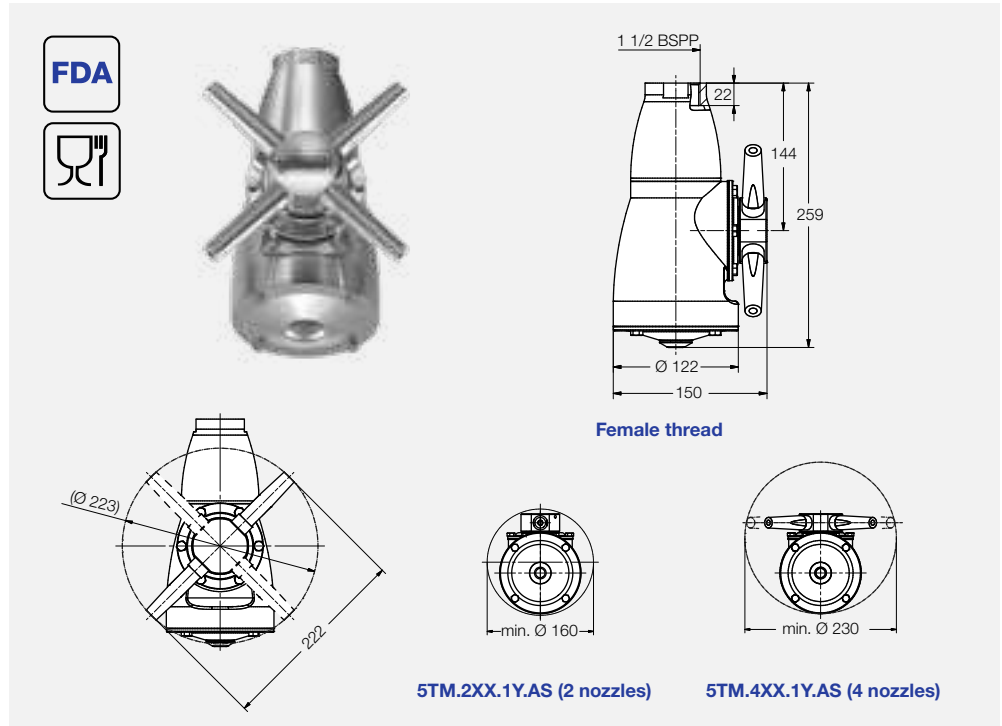
Weight:

7.5 kg

Rotation monitoring sensor:



Sensor compatible, please ask for more information.



Spray angle	Ordering no.	E Ø [mm]	Number, Ø Nozzles [mm]	V̇ [l/min]				Max. tank diameter [m]
				p [bar] (p _{max} = 7 bar)				
				2	3	5	at 40 psi [US gal./ min]	
360°	5TM.208.1Y.AS	8	2 x 8.0	125	153	198	39	24.0
	5TM.210.1Y.AS	10	2 x 10.0	160	196	253	50	24.0
	5TM.406.1Y.AS	6	4 x 6.0	140	171	221	43	18.0
	5TM.407.1Y.AS	7	4 x 7.0	170	208	269	53	20.0
	5TM.408.1Y.AS	8	4 x 8.0	200	245	316	62	22.0
	5TM.410.1Y.AS	10	4 x 10.0	260	318	411	81	23.0

E = narrowest free cross-section

The maximum tank diameter shown above applies for the recommended operating pressure and is indicative only. The cleaning result is also affected by the type of soiling.



Static spray balls Series 540/541



- Compact design
- Effective solid jets
- Also to use with saturated steam

Materials:
303 SS



Max. temperature:
200 °C

Recommended operating pressure:
3 bar

Installation:
Operation in every direction possible

For additional spray balls please refer to our brochure "Precision Spray Nozzles for Tank and Equipment Cleaning"



Spray angle 	Ordering number Type	E ∅ [mm]	V [l/min]					Max. tank diameter [m]
			p [bar] (p _{max} = 10 bar)					
			0.5	1	2	3	at 40 psi [US gal./ min]	
240° 	540.909.16	0.8	9	13	18	22	6	6.5
	540.989.16	1.0	14	20	28	34	9	7.0
	541.109.16	1.5	29	40	57	70	18	7.5
	541.189.16	2.0	45	64	90	110	28	8.3
	541.239.16	2.3	59	83	118	145	37	9.5

E = narrowest free cross-section

The maximum tank diameter shown above applies for the recommended operating pressure and is indicative only. The cleaning result is also affected by the type of soiling.

In most applications, static spray balls do not deliver the same cleaning power as rotating nozzles, anyway they do have advantages that make them indispensable for certain tasks:

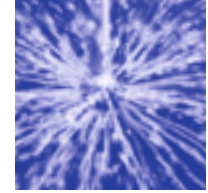
- No moving parts
- Self-draining
- Easy to inspect
- Proven use in hygienically sensitive environments

Should a rotating nozzle stop turning for some reason, parts of the tank may remain uncleaned. This cannot happen with spray balls. However, gaps can occur in the spray pattern if individual openings are blocked with soil.

Compared to rotating nozzles, static spray balls usually need two to three times the amount of liquid.



Static spray balls »RinseClean« Series 5B2/5B3



- Popular spray ball design
- Powerful solid jets

Materials:

316L SS
R-clip: 316L SS

Max. temperature:
200 °C

Recommended operating pressure:
2 bar

Installation:

Operation in every direction possible

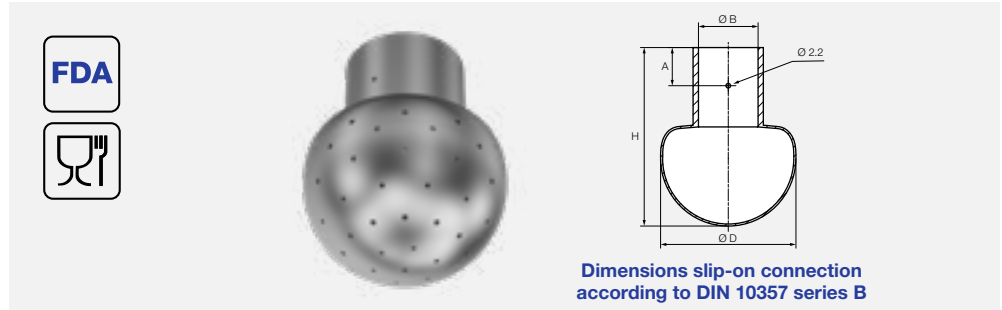
For additional spray balls please refer to our brochure "Precision Spray Nozzles for Tank and Equipment Cleaning"



The maximum tank diameter shown above applies for the recommended operating pressure and is indicative only. The cleaning result is also affected by the type of soiling.

Slip-on information:

- R-clip made of stainless steel 316L SS is included.
- Depending on diameter of the adapter the flow rate can increase due to leakage between connecting pipe and static spray ball.



Dimensions slip-on connection according to DIN 10357 series B

Spray angle	Ordering no. Type	E Ø [mm]	V̇ [l/min]				Dimensions [mm]					Max. tank diameter [m]
			p [bar] (p _{max} = 5 bar)				Ø D	Height H	Con- nec- tion B	Distance to bore hole A	R-clip	
			1	2	3	at 40 psi [US gal./ min]						
360° 	5B2.879.1Y.D0.80.0	0.8	11	15	18	4.7	20	37	8.2	9	1	2.0
	5B3.089.1Y.D1.20.0	1.0	35	50	61	15.5	28	42	12.2	9	1	2.2
	5B3.139.1Y.D1.20.0	1.6	46	65	80	20.2	28	42	12.2	9	1	2.3
	5B3.209.1Y.D1.80.0	1.5	71	100	123	31.0	28	42	18.2	9	2	2.5
	5B3.309.1Y.D2.20.0	1.7	127	180	221	55.8	64	84	22.2	18	2	3.5
	5B3.379.1Y.D2.80.0	2.1	184	260	318	80.7	64	84	28.2	18	3	5.2
	5B3.389.1Y.D4.00.0	2.1	198	280	343	86.9	64	84	40.3	18	4	5.2
	5B3.409.1Y.D3.40.0	2.3	226	320	392	99.3	64	84	34.2	18	4	5.2
	5B3.449.1Y.D2.80.0	3.0	290	410	502	127.2	64	84	28.2	18	3	5.4
	5B3.489.1Y.D3.40.0	2.9	361	510	625	158.2	64	84	34.2	18	4	5.5
5B3.499.1Y.D4.00.0	2.8	382	540	661	167.5	64	84	40.3	18	4	5.5	
5B3.539.1Y.D5.20.0	3.2	474	670	821	207.8	90	111	52.3	25	5	5.6	
180° 	5B3.083.1Y.D1.80.0	1.2	35	50	61	15.5	28	42	18.2	9	2	2.2
	5B3.253.1Y.D2.20.0	1.8	92	130	159	40.3	64	84	22.2	18	2	3.0
	5B3.323.1Y.D2.80.0	2.3	141	200	245	62.0	64	84	28.2	18	3	3.5
	5B3.463.1Y.D5.20.0	3.3	325	460	563	142.7	90	111	52.3	25	5	5.4
180° 	5B3.114.1Y.D1.80.0	1.4	42	60	74	18.6	28	42	18.2	9	2	2.2
	5B3.274.1Y.D2.20.0	2.3	106	150	184	46.5	64	84	22.2	18	2	3.0
	5B3.394.1Y.D2.80.0	3.0	205	290	355	90.0	64	84	28.2	18	3	5.0
	5B3.444.1Y.D5.20.0	3.2	283	400	490	124.1	90	111	52.3	25	5	5.2

E = narrowest free cross-section

In most applications, static spray balls do not deliver the same cleaning power as rotating nozzles, anyway they do have advantages that make them indispensable for certain tasks:

- No moving parts
- Self-draining
- Proven use in hygienically sensitive environments

Should a rotating nozzle stop turning for some reason, parts of the tank may remain uncleaned. This cannot happen with spray balls. However, gaps can occur in the spray pattern if individual openings are blocked with soil.

Compared to rotating nozzles, static spray balls usually need two to three times the amount of liquid.

ENGINEERING
YOUR SPRAY SOLUTION



Strainers

G3A ISO 228

G3A
ISO
228A

358

450



Strainers

Strainers	Design	Connection	Nominal pressure at 20 °C	Material of housing	Page
	Strainer	1/2 BSPP 3/4 BSPP 1 BSPP 1 1/4 BSPP 1 1/2 BSPP	12 bar	Polypropylene	8.3
	Basket strainer	3 BSPP	8 bar	Polypropylene	8.4



Strainer, max. pressure 12 bar

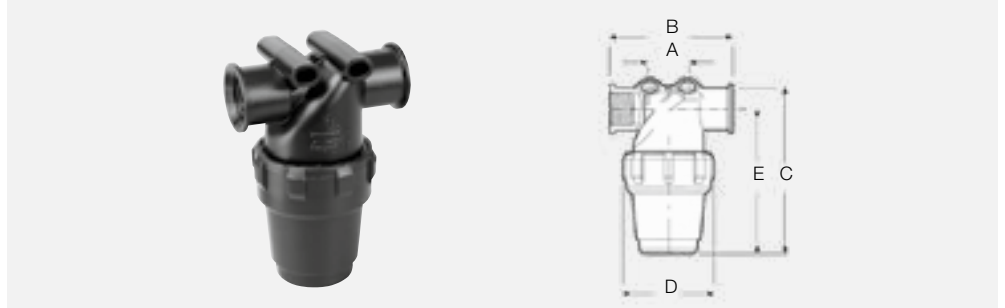
Standard strainer for industrial applications.

For service pressures up to 12 bar. With large screening surfaces.

Screening fineness is colour-marked:

(0.6 mm = red,
0.3 mm = blue,
0.2 mm = green).

Easy handling. Robust construction. Slim design.



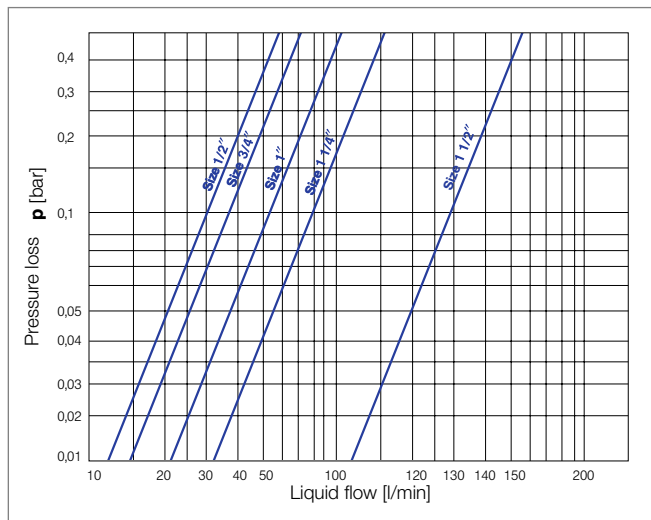
Type		Dimensions [mm]						Weight [g]
		Connection	A	B	C	D	E	
S. GA 2.	S. GI 2.	1/2 BSPP	27	97	140	74	118	200
S. GA 3.	S. GI 3.	3/4 BSPP	27	97	140	74	118	200
S. GA 4.	S. GI 4.	1 BSPP	40	112	175	86	143	300
S. GA 5.	S. GI 5.	1 1/4 BSPP	39	146	280	116	239	630
S. GA 6.	S. GI 6.	1 1/2 BSPP	39	146	280	116	239	630

Pressure/ temperature range

T	P _{max}
20 °C	12 bar
60 °C	7 bar

	Ordering no.			Standard screen Standard strainer		Further screens			
	Type	Size	Mat. hous. Code*	[mm]	Type (blue)	[mm]	Type (red)	[mm]	Type (green)
Male thread	S. GA 2.	012.	53	0.3	S. 000. 012. 00. 26. 03	0.6	S. 000. 012. 00. 26. 06	0.2	S. 000. 012. 00. 26. 02
	S. GA 3.	034.	53	0.3	S. 000. 012. 00. 26. 03	0.6	S. 000. 012. 00. 26. 06	0.2	S. 000. 012. 00. 26. 02
	S. GA 4.	100.	53	0.3	S. 000. 100. 00. 26. 03	0.6	S. 000. 100. 00. 26. 06	0.2	S. 000. 100. 00. 26. 02
	S. GA 5.	114.	53	0.3	S. 000. 114. 00. 26. 03	0.6	S. 000. 114. 00. 26. 06	0.2	S. 000. 114. 00. 26. 02
	S. GA 6.	112.	53	0.3	S. 000. 114. 00. 26. 03	0.6	S. 000. 114. 00. 26. 06	0.2	S. 000. 114. 00. 26. 02
Female thread	S. GI 2.	012.	53	0.3	S. 000. 012. 00. 26. 03	0.6	S. 000. 012. 00. 26. 06	0.2	S. 000. 012. 00. 26. 02
	S. GI 3.	034.	53	0.3	S. 000. 012. 00. 26. 03	0.6	S. 000. 012. 00. 26. 06	0.2	S. 000. 012. 00. 26. 02
	S. GI 4.	100.	53	0.3	S. 000. 100. 00. 26. 03	0.6	S. 000. 100. 00. 26. 06	0.2	S. 000. 100. 00. 26. 02
	S. GI 5.	114.	53	0.3	S. 000. 114. 00. 26. 03	0.6	S. 000. 114. 00. 26. 06	0.2	S. 000. 114. 00. 26. 02
	S. GI 6.	112.	53	0.3	S. 000. 114. 00. 26. 03	0.6	S. 000. 114. 00. 26. 06	0.2	S. 000. 114. 00. 26. 02

* Code 53 = Polypropylen



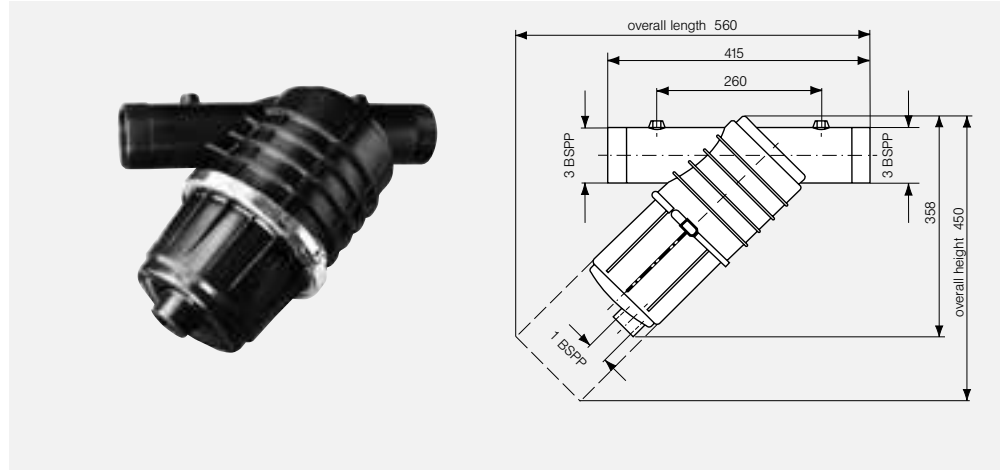
Correction factors for Δp

Viscosity m Pa s	Mesh size of screen basket [mm]		
	0.6	0.3	0.2
1 (Water)	1.0	1.2	1.4
100	1.6	1.9	2.0
200	1.7	2.2	2.3



Basket strainer, max. pressure 8 bar

Strainers, designed for high flow volumes and low pressure loss. The strainer is fitted with a flow deflector, avoiding obstruction of the screen insert in front of the outlet and allowing the dirt particles to settle on the filter bottom. From there they can easily be removed from below through an offset discharge port. The strainer is prepared for the connection of 2 pressure gauges, allowing to control the pressure loss occurring on the screen insert. The strainer is available with various screen insert types.



Strainer with screen

Type			Screen mesh size
Type	Size	Material	
SGA.2	300	53 (Polypropylen)	594 µm/32 mesh
SGA.3	300	53 (Polypropylen)	365 µm/50 mesh
SGA.4	300	53 (Polypropylen)	173 µm/100 mesh
SGA.5	300	53 (Polypropylen)	144 µm/120 mesh

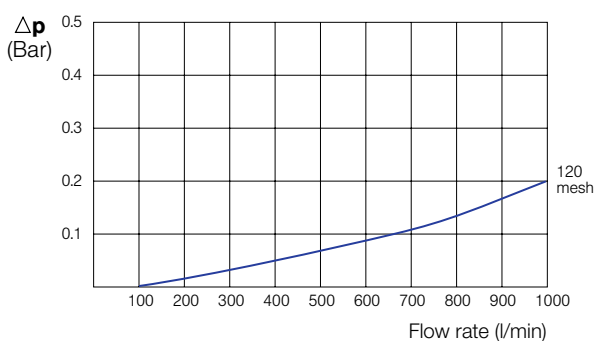
Example for ordering: Type **SGA.2** + Size **300** + Material **53** = Ordering no. **SGA.2.300.53**

Screen

Type			Screen mesh size
Type	Size	Material	
S.002	300.00	26 (304 SS)	594 µm/32 mesh
S.003	300.00	26 (304 SS)	365 µm/50 mesh
S.004	300.00	26 (304 SS)	173 µm/100 mesh
S.005	300.00	5A (Polyester/304 SS)	144 µm/120 mesh

Example for ordering: Type **S.002** + Size **300.00** + Material **26** = Ordering no. **S.002.300.00.26**

Pressure loss chart



Technical data

Screening surface	860 cm ²
Screening insert ø	145 mm
Height of screening insert	320 mm
Inflow and outflow port dia. Ø	3
Pressure gauge connection dia. Ø	1/4 BSPP
Maximum service pressure	8 bar

ENGINEERING
YOUR SPRAY SOLUTION





Solenoid Valve Series 166H

The stainless steel body attached to an electrically actuated solenoid valve offers the possibility to clock the spray application flexibly.

Advantages:

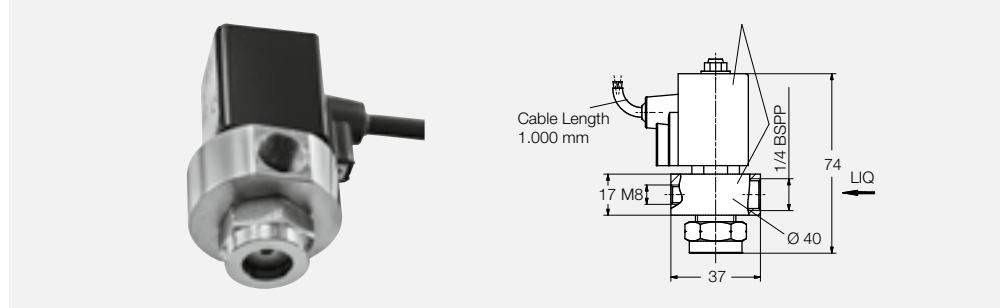
- Assembly with retaining nut – easy nozzle changing
- Simple jet alignment
- For flat fan and full cone nozzles

Applications:

Cleaning and coating, moistening, lubrication.

Scope of supply:

Nozzle valve with body and retaining nut. Nozzle has to be ordered separately.



Materials:

303 SS
Stainless steel combined with solenoid valve

Power:

8 Watt

Voltage:

24 V DC

Protection:

IP 67

Flow rate water V_w :





Max. 3 l/min at 4 bar

Max. frequency:

500/min

Max. operating pressure:

5 bar (valve closed)

	Type	Up to size	Spray Pattern	Spray angle	Material
	652 (See page 4.16)	51X	flat fan	See page 4.16	See page 4.16
	684 (See page 4.30)	528	flat fan (tongue-type nozzle)	140°	See page 4.30
	468 (See page 3.12)	52X	full cone	See page 3.12	See page 3.12
	226 (See page 2.6)	285	hollow cone	See page 2.6	See page 2.6

Ordering number:

166.000.16.H0.00.0 (Nozzle valve with body and retaining nut)



TWISTLOC

Quick-change nozzle system

Lechler TWISTLOC-nozzle changing in less than no time.

The quick-change nozzle system makes you save time and money.

Quick:

For putting in or taking out a nozzle, just give it a twist.

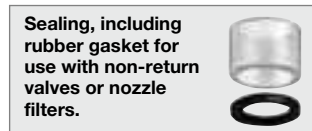
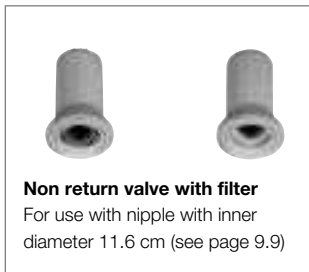
Easy:

Without tool, just with one hand, even at locations hard to get at and under bad lighting conditions.

Safe:

Constant pre-setting of the nozzle to the correct direction prevents any assembling errors.

Max. pressure: 15 bar.



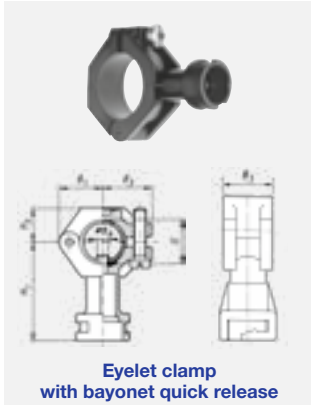
Type	Ordering no.							Inside-Ø D [mm]	
	Material no.				Code				
	1C	16	5E	7A	1/4 BSPT	3/8 BSPT	Welding connection		
092.102	304 SS	303 SS	PVDF	Viton®	1/4 BSPT	3/8 BSPT	Welding connection	8.0	
	-	○	-	-	CC	-	-		11.6
	-	-	○	-	-	CE	-		8.0
092.104	○	-	-	-	-	-	00	11.6	
092.113	-	-	-	○	-	-	-	-	
092.116	-	-	-	○	-	-	-	-	
092.106	-	○	○	-	-	-	-	-	
092.108	-	○	○	-	-	-	-	-	

Example for ordering: Type + Material no. + Code = Ordering no.
092.102 + 16 + CC = 092.102.16.CC



Accessories

Bayonet quick release system



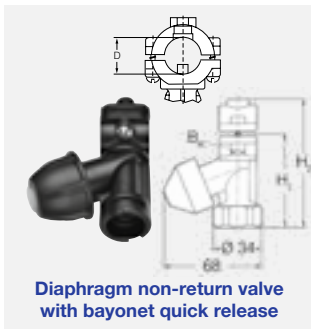
Eyelet clamp with bayonet quick release

For series	Ordering no.					Screw (Material)	Pipe Ø	D Ø [mm]	Opening pressure [bar]	Closing pressure [bar]	Dimensions [mm]						Weight		
	Type	Material no.									Code	H ₁	H ₂	B _{RO} *	B** _Ø	B ₁		B ₂	B ₃
		51	53	5E	56														
302 Bajonett/ 422 Bajonett/ 226/2TR/468/548/ 646/652/679/684	090.003	○	○	○	-	KA	304 SS	1/2"	20-22.0	-	-	49.5	16.5	6.0	6.2-6.4	21.2	23.8	18.5	22 g
	090.013	○	○	○	-	KA	304 SS	3/4"	25-27.5	-	-	52.5	17.5	7.6	7.8-8.0	24.5	26.5	22.0	26 g
	090.023	○	○	○	-	KA	304 SS	1"	32-34.5	-	-	57.0	21.0	10.6	10.8-11.0	30.0	31.0	22.0	32 g
302 Bajonett/ 422 Bajonett/ 226/2TR/468/548/ 646/652/679/684	065.272	-	-	-	○	KH	304 SS	1/2"	20-22.0	0.8	0.6	59	84	6.0	6.2-6.4	-	-	-	48 g
	065.272	-	-	-	○	KL	304 SS	3/4"	25-27.5	0.8	0.6	66	90	9.6	9.8-10.0	-	-	-	53 g

*B_Ø = spigot diameter

**B = recommended bore diameter

Information: Please consider the material combination if you use bayonet quick release eyelet clamps in combination with bayonet quick release retainer caps. When different materials are used, the cap may become difficult to turn.

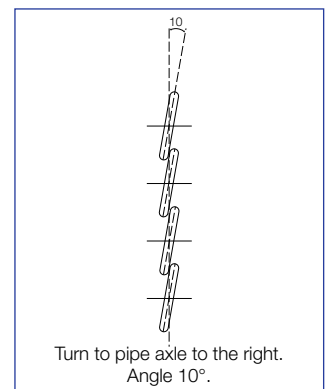


Diaphragm non-return valve with bayonet quick release



Bayonet welding nipple
Turn to pipe axle:
Direction: right, angle: 10°

For series	Ordering no.	Material	Dimensions [mm]	
			L	R
302 Bajonett/ 422 Bajonett/ 226/2TR/468/548/ 646/652/679/684	095.016.50.08.05	PVC	25	16
	095.016.53.08.05	PP	25	16



Filter with gasket, for bayonet retainer cap 065.202

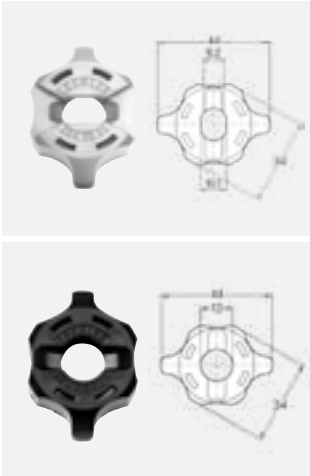
For series	Ordering no.		Mesh width [mm]	Colour	Dimensions [mm]				Weight
	Type	Mat. no.			H ₁	H ₂	D ₁	D ₂	
		7J							
xxx.32x-xxx.44x	065.268	○	0.25	blue	21.5	2.5	18.0	11.0	2 g
xxx.48x-xxx.56x	065.269	○	0.65	red	21.5	2.5	18.0	11.0	2 g

Example Type + Material no. + Code = Ordering no.
for ordering: 090.003 + 51 + KA = 090.003.51.KA



Bayonet quick release system

Bayonet quick-release retainer caps
incl. gasket 065.242.73
(Material: rubber)

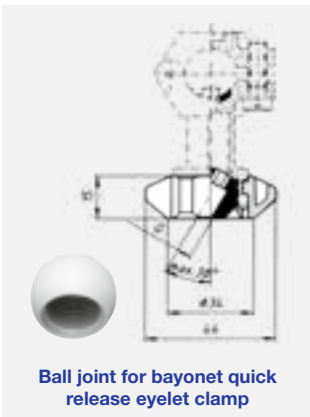


For series	Ordering no.	Material	Colour
652/679	065.202.56.00	POM	red
	065.202.53.00	Polypropylene	grey
	065.202.5E.00	PVDF	blue
226/2TR/468/ 548/684	065.202.56.11	POM	black
	065.202.53.11	Polypropylene	grey

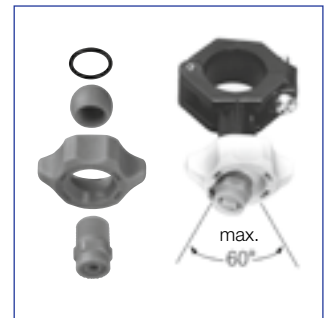
Information: Please consider the material combination if you use bayonet quick release eyelet clamps in combination with bayonet quick release retainer caps. When different materials are used, the cap may become difficult to turn.

Ball joint for bayonet quick release system

Inexpensive ball joint system for nozzles with 1/8 and 1/4 male thread.



For series	Ordering no.			Colour
	Type	Mat. no.	Code	
		5E		
	PVDF	1/8 BSPP	1/4 BSPP	
For all nozzles with 1/8" - or 1/4"-male thread.	092.150	○	AB AD	blue



Pressure/Temperature

T	P _{max}
65 °C	10 bar
80 °C	8 bar
100 °C	4 bar

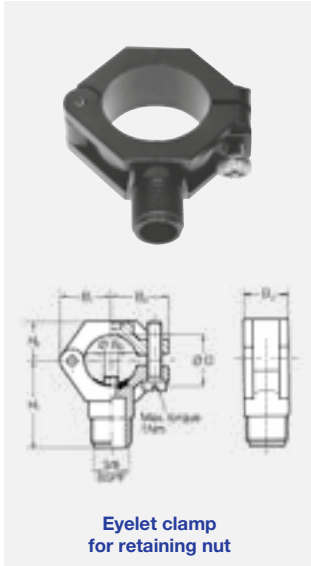


For series	Ordering no.	Material	Colour
For ball joint	092.150.5E.00	PVDF	blue



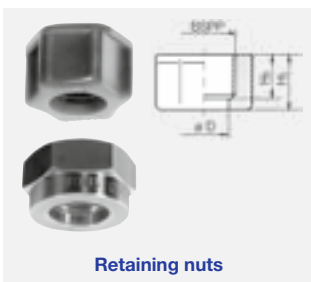
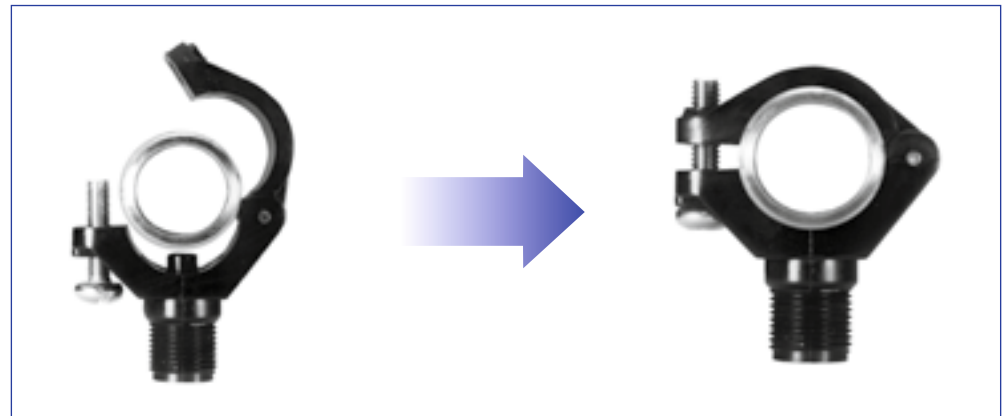
Accessories

Eyelet clamps/Retaining nuts



For Series	Ordering no.				Screw	Dimensions [mm]										Weight (Polyamid)
	Type	Material no.				BSPP	Pipe Ø	D Ø	B _s * Ø	B _r ** Ø	B ₁	B ₂	B ₃	H ₁	H ₂	
		51	53	5E												
226/2TR/216/302/308/350 468/ 548/ 679/684/652	090.053	○	○	○	Material 304 SS	3/8	3/8"	16.5-18.0	6.0	6.2-6.4	19.0	22.0	18.5	34.5	14.5	20 g
	090.003	○	○	○		3/8	1/2"	20-22.0	6.0	6.2-6.4	21.2	23.8	18.5	36.5	16.5	20 g
	090.013	○	○	○		3/8	3/4"	25-27.5	7.6	7.8-8.0	24.5	26.5	22.0	39.5	17.5	25 g
	090.023	○	○	○		3/8	1"	32-34.5	10.6	10.8-11.0	30.0	31.0	22.0	44.0	21.0	32 g
	090.033	○	○	○		3/8	1 1/4"	40-43.0	12.6	12.8-13.0	34.0	35.5	25.0	48.0	25.0	38 g

*B_s Ø = spigot diameter
**B_r Ø = recommended bore diameter



For Series	Ordering no.						Dimensions [mm]					Weight (Brass)
	Type	Material no.					BSPP	H ₁	H ₂	D Ø	Hex	
		16	17 ¹	1Y	30	56						
226/2TR/468 548/652/660 679/684	065.200	○	○	-	○	-	3/8	13.0	10.0	12.8	22	25 g
	065.200	-	-	-	-	○	3/8	14.5	11.5	12.8	22	25 g
	069.000	○	-	○	○	-	UNF 11/16-16	14.3	8.7	13.1	21	25 g
656/657 664/665	065.600	○	○	-	○	-	3/4	16.0	13.0	20.1	32	60 g

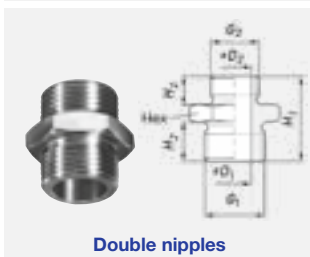
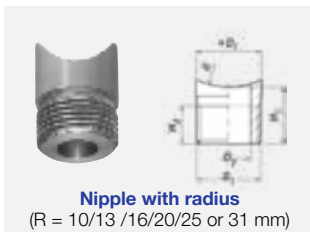
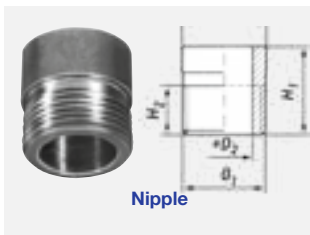
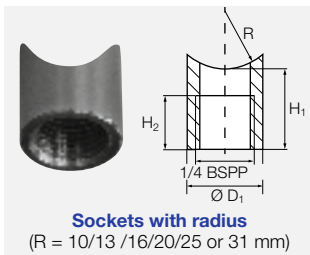
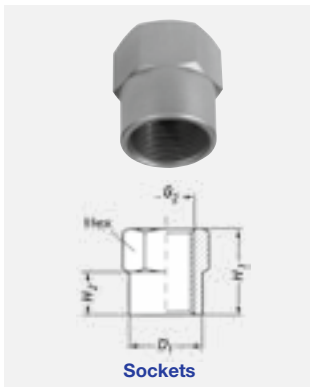
¹ We reserve the right to deliver 316Ti SS or 316L SS under the material no. 17.

Example	Type	+	Material no.	=	Ordering no.
for ordering:	090.053	+	51	=	090.053.51

For filters and non-return valves please refer to page 9.9.



Accessories Sockets/Nipples



For Series	Ordering no.					Dimensions [mm]							Weight (Brass)		
	Type	Material no.					G ₁	G ₂	H ₁	H ₂	D ₁	D ₂		Hex	
		02	1Y	17	30	53									
		Steel	316L SS	316TI SS	Brass	Polypropylene									
For all nozzles with 1/8 male thread.	040.270	-	○	-	○	-	-	1/8 BSPP	20	10	13.8	-	14	20 g	
For all nozzles with 1/4 male thread.	061.220	-	○	-	○	-	-	1/4 BSPP	20	10	16.8	-	17	25 g	
For all nozzles with 3/8 male thread.	040.271	-	-	○	○	-	-	3/8 BSPP	20	10	21.5	-	22	25 g	
	040.271	-	-	-	-	○	-	3/8 BSPP	20	10	24.5	-	22	25 g	
For all nozzles with 1/4 male thread.	040.228.xx.yy*	-	○	-	-	-	-	1/4 BSPP	-	18	2	17	-	16 g	
306/307 502/503 656/657	065.210	○	-	○	○	○	-	3/8 BSPP	-	18	10	17.2	11.5	-	20 g
	065.610	○	-	○	-	○	-	3/4 BSPP	-	27	14	28	18	-	61 g
226/2TR/216/302/308/350 548/468/679/684/652	065.217.xx.yy*	-	-	○	-	-	-	3/8 BSPP	-	15	10	17.2	11.5	-	20 g
226/2TR/216/302 308/350/548/468 679/684/652	065.215¹	-	-	○	○	-	-	3/8 BSPP	1/4 BSPP	25	10	10	7	22	30 g
	065.211	-	-	○	○	-	-	3/8 BSPP	3/8 BSPP	25	10	11.5	-	22	25 g
656/657	065.611	-	-	○	○	-	-	3/4 BSPP	3/4 BSPP	35	14	18	-	32	90 g

* Replace **xx** by material no. and **yy** by radius R

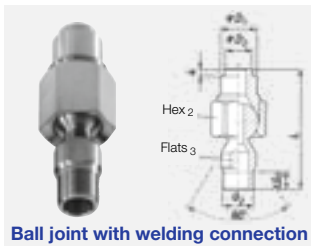
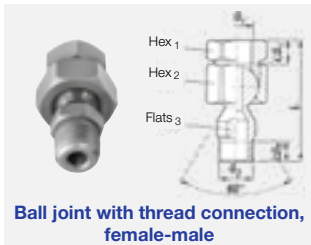
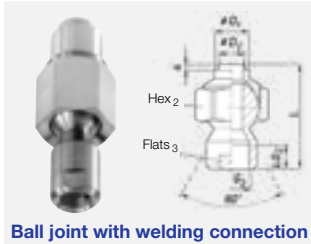
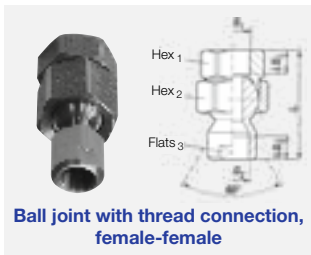
¹ Not to be used with non-return valve or filter.

Example **Type** + **Material no.** = **Ordering no.**
for ordering: **040.270** + **1Y** = **040.270.1Y**



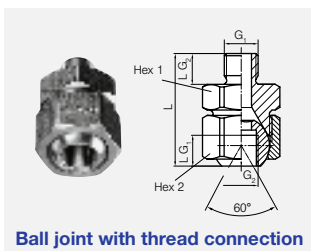
Accessories Ball joints

Allround swivelling action of 30°.
No sealings, no wear.
Long service life even after many adjustments.
 P_{max} : 25 bar.



For Series	Ordering no.				Dimensions [mm]											Weight (Brass)
	Type	Material no.			Code	D ₁	D ₂	G ₁ BSPP	G ₂ BSPP	L _{G1}	L _{G2}	L	Hex ₁	Hex ₂	Hex ₃	
		16 303 SS/ 316Ti SS	16 303 SS	30 Brass												
For all nozzles with 1/4 male thread.	092.020	-	○	○	AD	-	-	1/4	1/4	12.0	11.5	60.3	27	27	17	190 g
	092.021	-	○	○	AF	-	-	3/8	1/4	12.0	11.5	58.3	27	27	17	170 g
For all nozzles with 3/8 male thread.	092.030	-	○	○	AF	-	-	3/8	3/8	12.0	12.0	56.7	27	30	19	160 g
For all nozzles with 1/4 male thread.	092.020	○	-	-	SD	20.0	15.0	-	1/4	-	11.5	64.3	-	27	17	150 g
	092.030	○	-	-	SF	22.0	15.0	-	3/8	-	12.0	58.7	-	30	19	150 g
226/2TR/216/302/308/350 548/468/679/684/652	092.022	-	○	○	AD	-	-	1/4	3/8	12.0	10.0	63.8	27	27	17	135 g
	092.022	-	○	○	AF	-	-	3/8	3/8	12.0	10.0	61.8	27	27	17	165 g
226/2TR/216/302/308/350 548/468/679/684/652	092.022	○	-	-	SE	20.0	15.0	-	3/8	-	10.0	67.8	-	27	17	155 g

Compact ball joints for narrow installation conditions

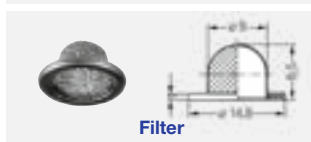
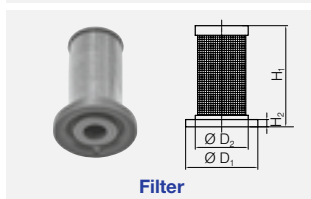
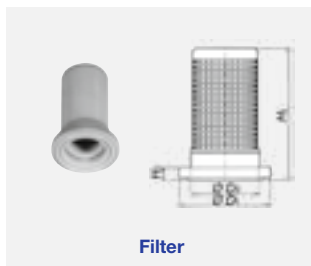
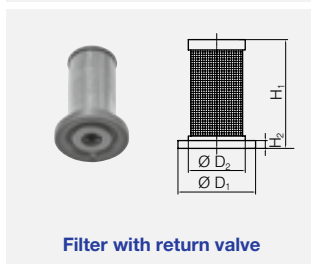


For all nozzles with 1/8 male thread	092.010	-	○	○	AA	-	-	1/8	1/8	8.0	8.0	29.3	22	24	-	70 g
For all nozzles with 1/4 male thread	092.024	-	○	○	AC	-	-	1/4	1/4	12.0	12.0	44	27	27	-	140 g
For all nozzles with 3/8 male thread	092.030	-	○	○	AE	-	-	3/8	3/8	12.0	12.0	44	27	30	-	160 g



Accessories

Non-return valves/filters



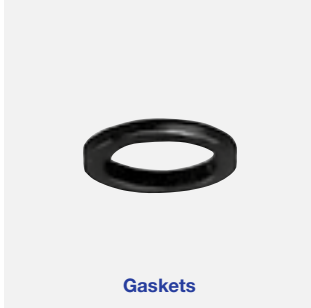
For nozzle size	Ordering no.				Colour	Opening pressure [bar]	Closing pressure [bar]	Mesh size [mm]	Dimensions [mm]				Weight
	Type	Material no.											
		56 POM	53 Polypropylen	26 Monel/ Copper					H ₁	H ₂	D ₁	D ₂	
xxx.32x-xxx.44x	065.265 Ball 420 SS Spring 301 SS	○	-	-	blue	0.5-1.0	0.4-0.9	0.25	21.5	2.0	14.8	11.0	2 g
xxx.48x-xxx.56x	065.266 Ball 420 SS Spring 301 SS	○	-	-	red	0.4-0.5	0.35-0.45	0.65	21.5	2.0	14.8	11.0	2 g
xxx.14x-xxx.36x	095.016.53.11.00 Ball 304 SS Spring 301 SS	-	○	-	blue	approx. 0.5	approx. 0.3	0.08	21.0	1.6	15.0	11.0	2 g
xxx.14x-xxx.36x	095.016.53.14.63 Ball 304 SS Spring 301 SS	-	○	-	green	approx. 2.8	approx. 1.6	0.08	21.0	1.6	15.0	11.0	2 g
xxx.32x-xxx.44x	065.257	○	-	-	blue	-	-	0.25	21.5	2.0	14.8	11.0	2 g
xxx.48x-xxx.56x	065.256	○	-	-	red	-	-	0.65	21.5	2.0	14.8	11.0	2 g
xxx.14x-xxx.36x	095.016.53.15.62	-	○	-	light pink	-	-	0.08	21.0	1.6	15.0	11.0	1 g
xxx.32x-xxx.44x	065.252	-	-	○	-	-	-	0.50	8.5	1.0	14.8	9.0	1 g

Example for ordering: Type **065.265** + Material no. **56** = Ordering no. **065.265.56**



Accessories

Gaskets/Teflon sealing tape



For Series	For nozzle Series	Ordering no.				Dimensions [mm]	Weight ca.	
		Type	Material no.					
			55	71	72			73
		PTFE	Cu. ISOPL. 750	EWP 210 (asbestos free)	Soft rubber			
610	1/8 BSPP	061.040	-	-	○	-	Ø 10 x Ø 14 x 1	0.13 g
220/612	1/4 BSPP	061.240	○	○*	○	-	Ø 13.2 x Ø 17 x 1(*2)	0.20 g
460/461/ 490/491/ 616/617/ 689	3/4 BSPP	061.640	-	○*	○	-	Ø 26.5 x Ø 32 x 1(*2.5)	0.50 g
405	1 1/4 BSPP	062.140	-	-	○	-	Ø 42 x Ø 50 x 1	1.20 g
405	2 BSPP	062.540	-	-	○	-	Ø 60 x Ø 70 x 2	3.92 g
226/468/ 652/679/ 684	retaining nut 3/8	065.240	○	-	○	○	Ø 11 x Ø 15 x 1	0.14 g
656/657	retaining nut 3/4	065.640	-	-	○	-	Ø 18 x Ø 24 x 1	0.50 g

Teflon sealing tape for connecting cylindrical female threads and conical male threads.	Ordering no. 095.009.55.09.30.0	Dimensions: 12 mm x 0.1 mm x 12 m
---	--	--------------------------------------

Example	Type	+	Material no.	=	Ordering no.
for ordering:	061.040	+	72	=	061.040.72

1.6 Other applications

2. Kind of distribution

- 1.) Full cone _____
- 2.) Hollow cone _____
- 3.) Flat jet _____
- 4.) Solid jet _____
- Spray angle 0° 15° 30° 45° 60° 90° 120°

3. Liquid to atomize _____

Volume of liquid _____

Ingredients _____

Density _____ Viscosity: _____

Solid material content _____ in %

Liquid temperature _____ °C

4. Further plant equipment

4.1 Liquid

Pump _____ bar _____

Volume of flow _____ m³/h

4.2 Possibility of twin fluid atomization

Assisting agent

Compressed air Pressure/Volume _____

Steam Pressure/Volume _____

Others _____

Temperature of assisting agent: _____ °C

ON THE INTERNET, YOU CAN FIND EVEN MORE INFORMATION AND SUPPORT FOR YOUR WORK AT www.lechler.com

This catalogue gives you an overview of our wide product range.

On the Internet you can also find additional information about our entire range of services, work aids, our global presence and much more besides – we are looking forward to your visit.



NEW



Android (Google)



iOS (Apple)

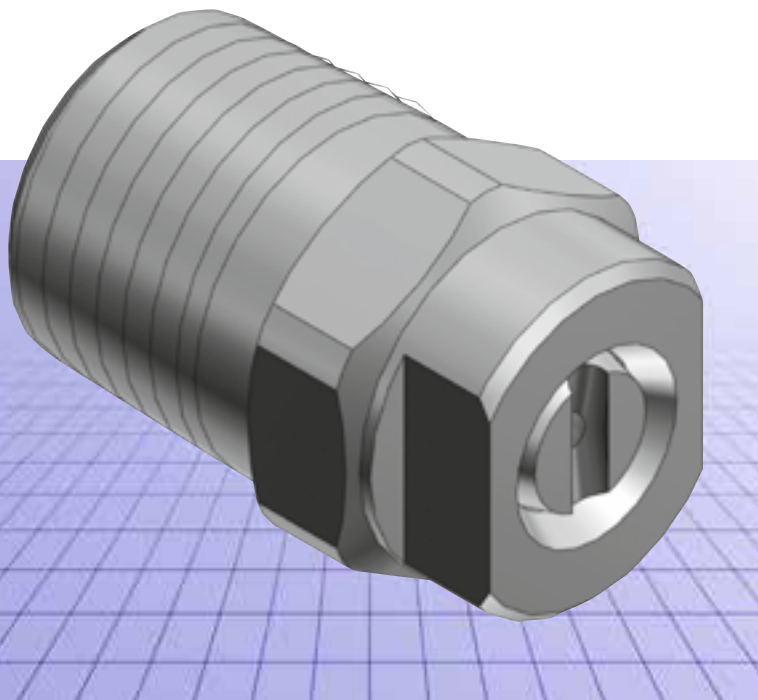
Online nozzle calculator

Lechler Industry App:

All important calculation and conversion programs for nozzle technology combined in one App.

- Unit converter for pressure, volume and flow rate
- Pressure/flow rate calculator for single-fluid nozzles incl. axial-flow full cone nozzles
- Calculation of pipe diameters

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2. Top left click on "Register".
3. Enter registration data, confirm license agreement, send e-mail.
4. A confirmation e-mail will be sent to you.
5. Follow the instructions in the confirmation e-mail.
6. Top right click on "Log in".
7. Login: User name + password.
8. Setting the CAD file format:
 - a) "Select CAD formats" (left column).
 - b) "CAD MODEL for download" (left column).
 - c) Select 3D format.
 - d) Save.

Download

1. File download: Select nozzle chapter, nozzle design, nozzle series.
2. Select series, click on "Generate CAD MODEL".
3. Click on "Download" in pop-up window.
4. Pop-up window: Click on "Save", select destination folder, "Save" again.

EXPERT KNOWLEDGE FROM THE RELEVANT FIELD IS ALSO ALWAYS A NECESSITY FOR PERFECT USE OF THE NOZZLE TECHNOLOGY

We have detailed information for you in special brochures.

Yes, I want to know more!

Please, send me special information:

- Precision spray nozzles for Tank and Equipment Cleaning
- Precision spray nozzles for the food and beverage industry
- Precision spray nozzles for the chemical industry
- Precision spray nozzles for surface technology
- Nozzles and accessories for Compressed air
- VarioSpray — Nozzle valve systems for the variable atomization of very small liquid volumes
- SCALEMASTER® HP SUPERIOR Descaling nozzles
- SCALEMASTER® HP »High Performance«
- MiniSCALEMASTER®
- SELECTOSPRAY® Roll cooling systems
- Pollution control from Lechler
- VarioCool® Gas conditioning systems
- VarioClean - NO_x Nozzle lances and systems for gaz denitrification
- Droplet separators
- Agricultural nozzles and accessories

Please call me

My telephone number is:

We want to use nozzles from Lechler for the following application:

We belong to the following industry:

Our address

Name _____

Company/Department _____

Postcode/City _____

P.O. Box/Street _____

Telephone _____

Telefax _____

Email _____



FOR YOUR NOTES



FOR YOUR NOTES



FOR YOUR NOTES



FOR YOUR NOTES



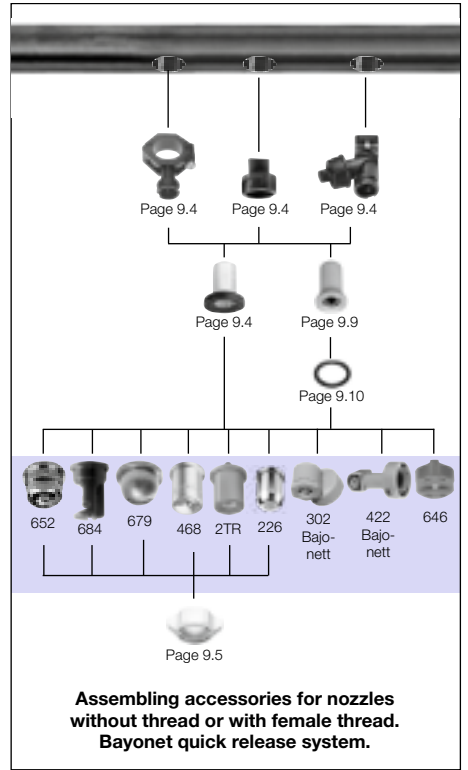
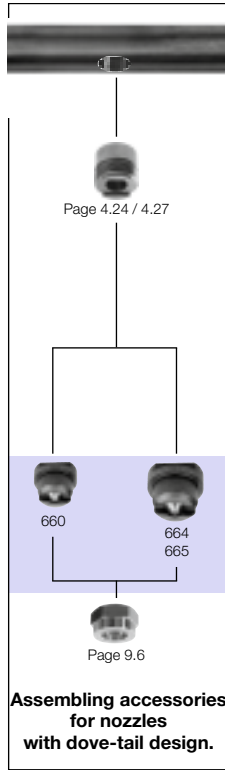
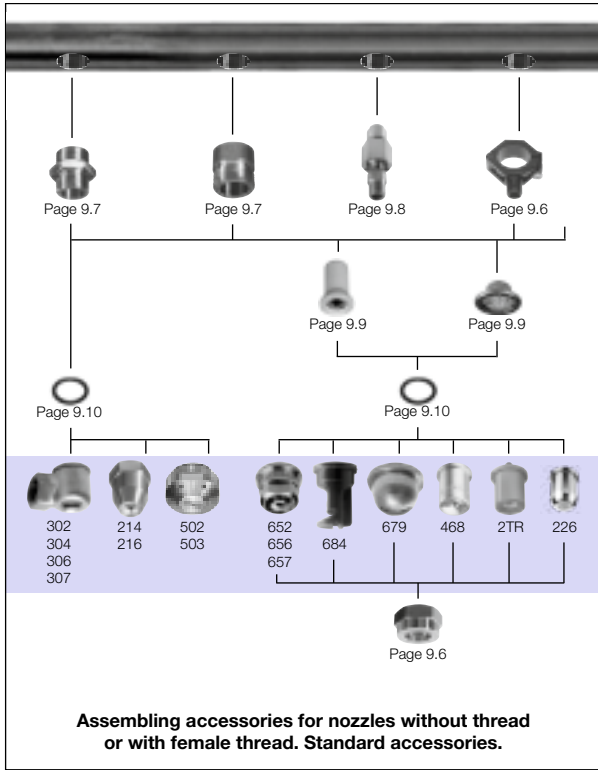
THE RIGHT INFORMATION IS HALF A PROBLEM SOLUTION

Our experts have documented their knowledge in a professional practice-related language, leaving out all unnecessary theoretical considerations. Background knowledge, technical data and a lot of practical examples show how Lechler spray technologies can simplify work processes, cut down costs, improve on product quality or just enhance productivity the easy way. Success starts with deciding on something that needs to be done. So, just fill in the form opposite and let us know which information you require on Lechler quality spray nozzles and equipment. We'll reply immediately.

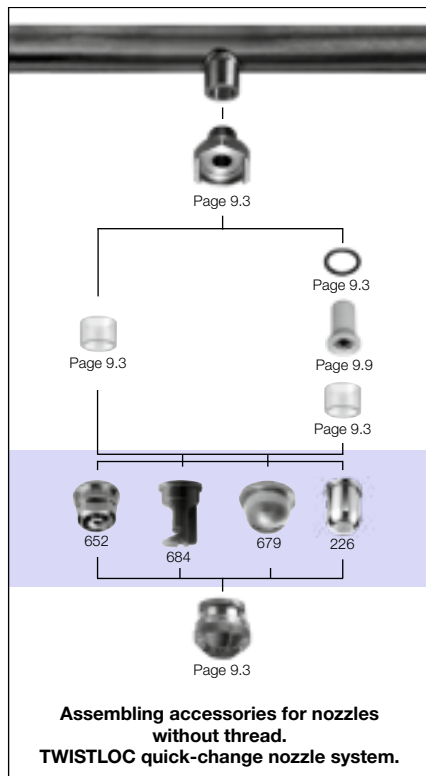


IN THIS WAY YOU CAN MATCH NOZZLE ASSEMBLING TO YOUR VERY SPECIAL REQUIREMENTS

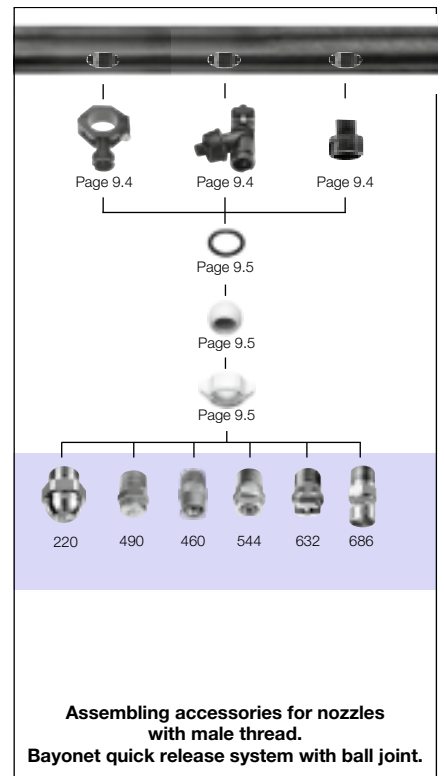
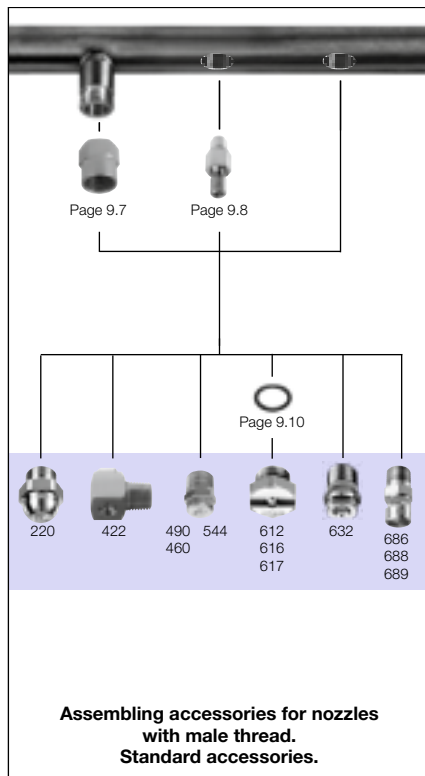
Assembling accessories for nozzles without thread or with female thread.



TWISTLOC



Assembling accessories for nozzles with male thread.



Profit from our experts' broad knowledge of nozzles and applications, and from their experience in the industry.

There are **special brochures** for many applications, containing useful tips that you can request simply by using the fax form below, or via e-mail.

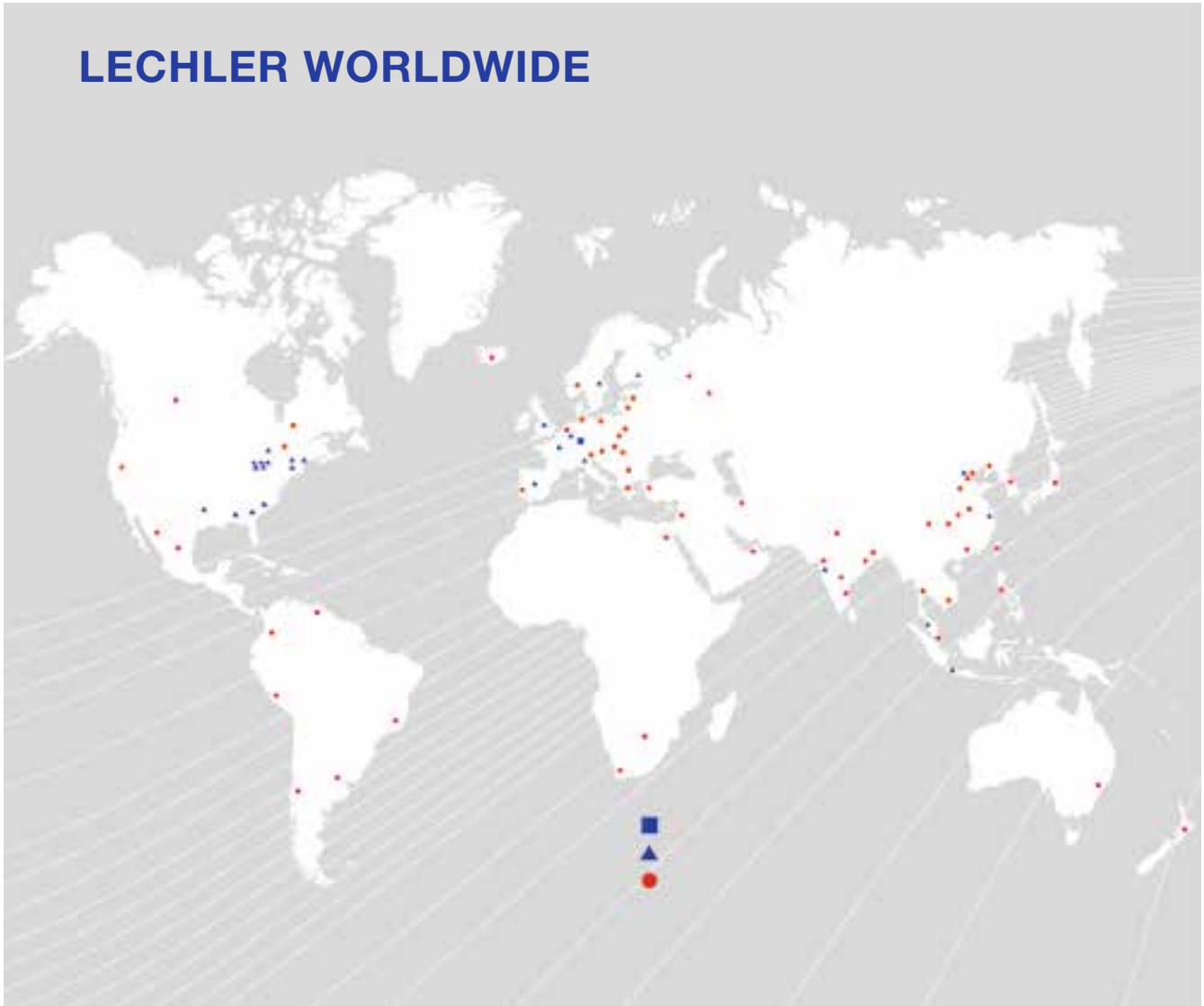
On the fold-out page, we have put together for you a whole host of **assembling possibilities** for Lechler nozzles.



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