*ENGINEERING*
*YOUR SPRAY SOLUTION*

# TANK AND EQUIPMENT CLEANING

## Cleaning diversity of the highest quality

GENERAL INDUSTRY

# A CLEAN SOLUTION
# 140 YEARS OF HYGIENE COMPETENCE

**For over 140 years, we at Lechler have been researching drops and their applications. Our nozzles ensure optimum cleanliness particularly in locations that are difficult to access, where it is dangerous or where things have to be especially clean.**

**With more than 700 employees, we work worldwide to provide the right nozzle for every application. With our own Development and Technology Center in Metzingen we simulate complex spray characteristics, check nozzles in endurance tests and optimize cleaning patterns so that the ideal relationship between flow rate, range and spray force is achieved.**

**Over the course of all these years, we have developed a deep understanding of the processes in a large number of different industries. That is why we do not just support our customers with high-performance precision nozzles for tank and equipment cleaning, but also help them to optimize their processes.**

**1879**
Company founded by Paul Lechler

**1893**
Patent for liquid atomization

**1967**
Relocation of production to Metzingen

**1978**
Expansion to the USA and then to other countries

**1995**
Production, sales and administration are concentrated in Metzingen

# CONTENTS



140
1879 - 2019

**2010**
Expansion of production with a new, 13,000 m² production hall

**2016**
Opening of the state-of-the-art Development and Technology Center in Metzingen

**2019**
Lechler celebrates 140th anniversary

**2021**
New factory in China

**2022**
New logistics center in Metzingen

# EVERY DROP ON TARGET
# HOW WE HELP TO CLEAN UP AGAIN

An excellent understanding of cleaning processes, tank geometries and nozzle design is required in order to achieve optimum cleaning of tanks and equipment. We have been at home in all three fields for a long time now. But there are still always new challenges for us. Thanks to state-of-the-art CFD analysis and highly precise measuring instruments for drop sizes and speeds, we are quickly able to develop suitable solutions in these cases.

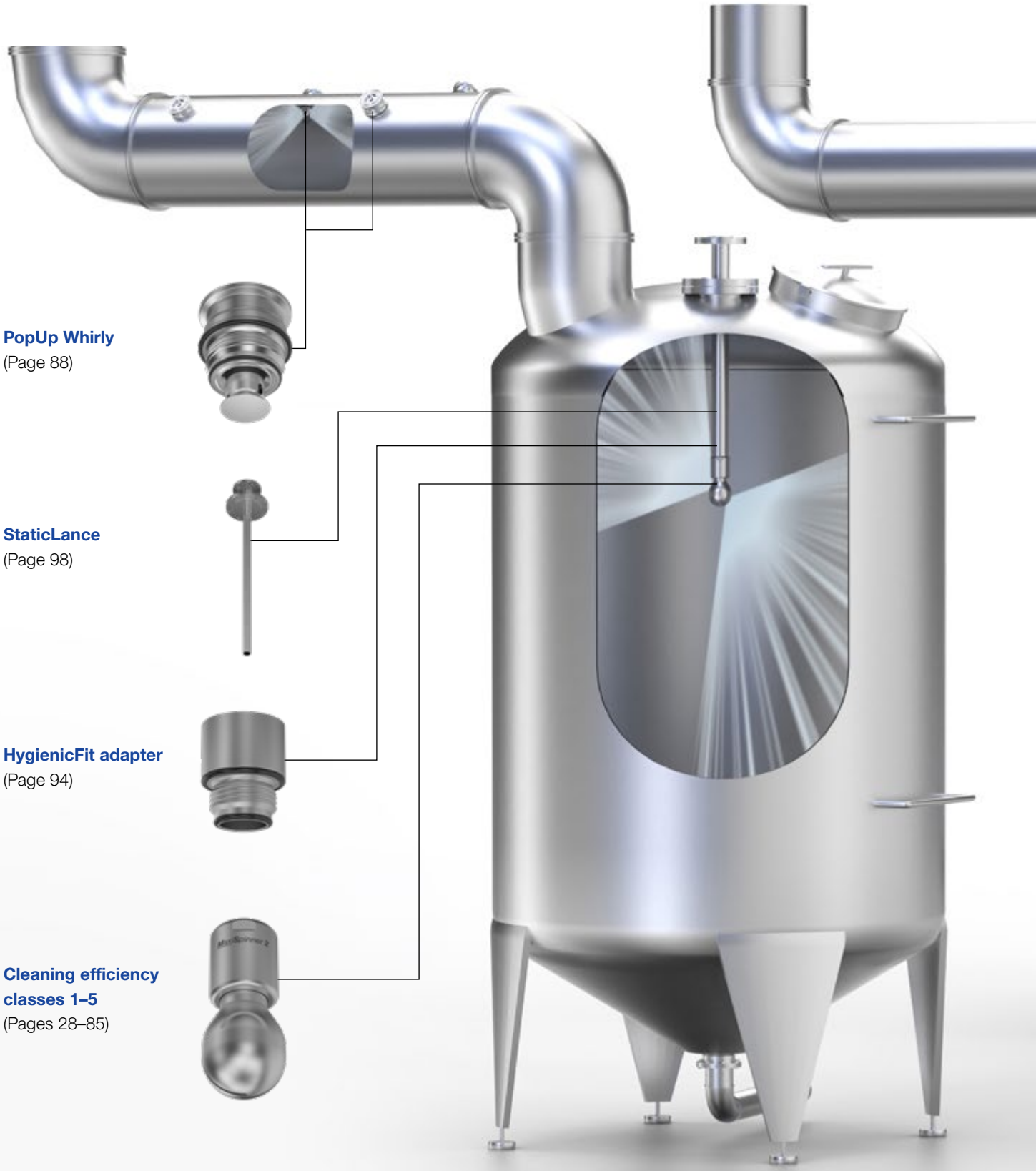
With our proprietary Tank*Clean* software, we are also able to simulate complex tank geometries and spray processes with different nozzles. Together with our extensive range of cleaning nozzles, we can develop tailor-made solutions for your tank and equipment cleaning requirements – particularly if complex applications are involved.

## Why Lechler?

- **Unique product variety of the market leader**
- **Cleaning efficiency classes – for easy nozzle selection**
- **Planning security thanks to Tank*Clean* simulation software**
- **Solutions for agitator, filler neck and line cleaning**
- **Extensive accessories for complete solutions**
- **Individual advice – on-the-spot worldwide**
- **Short delivery times thanks to high stock availability**

# MORE THAN JUST NOZZLES
# OUR COMMITMENT TO TANK AND EQUIPMENT CLEANING

Effective tank and equipment cleaning cannot just be limited to the tanks. Lechler therefore offers a comprehensive and coordinated product range to allow fast, efficient and thorough cleaning from the feed lines through to the discharge lines.



**PopUp Whirly**
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**StaticLance**
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**HygienicFit adapter**
(Page 94)

**Cleaning efficiency classes 1–5**
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**FlexLance**
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**Rotation monitoring sensor**
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**Cleaning efficiency classes 1–5**
(Pages 28–85)

**PopUp Clean**
(Page 92)

# GIVE DIRT NO CHANCE
# TIME TO GET CLEANING

**Nobody likes dirt or contaminations: they impair product quality. But removal takes time – and causes costs.**

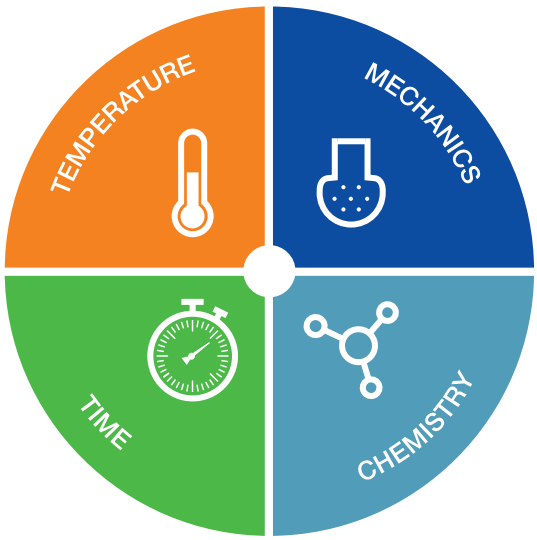
**As your partner, we help to minimize these costs as much as possible.**

## This is how efficient cleaning works – Sinner's circle

Every cleaning process is based on four main factors:

- Chemical (choice and concentration of the cleaning agents)
- Mechanical (detachment of dirt by impact or shear stress)
- Temperature (at which cleaning takes place)
- Time (duration of the overall cleaning process)

The four cleaning factors can be clearly demonstrated by Sinner's circle. Together, they always result in 100 % of the cleaning effort. Depending on the cleaning process, the individual factors may be of different magnitudes and they mutually influence each other. The cleaning nozzle directly influences the mechanical factor.



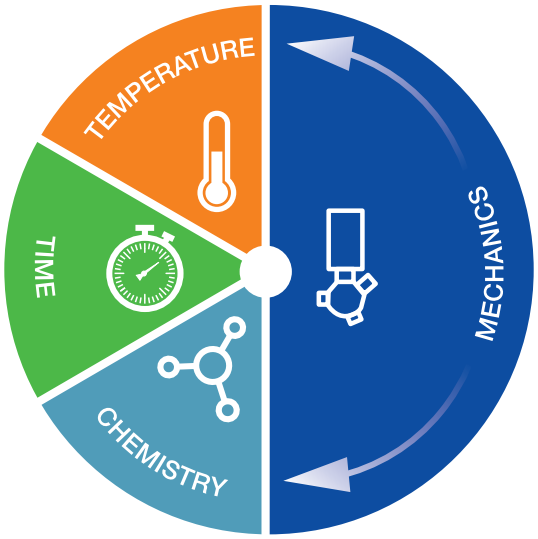




Fig. 1

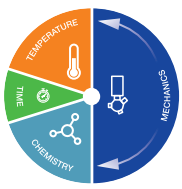


Fig. 2

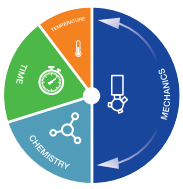
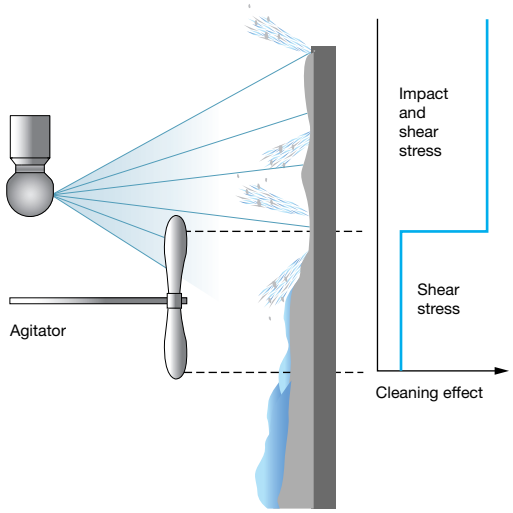


Fig. 3

**Example**

Assumption: A given tank can be successfully cleaned with equal shares for the time, temperature, chemical and mechanical factors (Fig. 1). Choosing a different nozzle with more powerful cleaning force results in additional freedom for cleaning faster (Fig. 2) or with a lower temperature (Fig. 3) and thus more energy-efficiently, for example.




Cleaning by impact only occurs
if it takes place directly

If a jet is sprayed on to a surface, this generates an impact. This direct impact leads to a better cleaning effect. As a result of shear forces or shear stresses produced by the cleaning fluid as it runs down, areas that are not impacted directly are also rinsed. However, the cleaning effect there is much weaker in comparison with direct impact.

**Important:** The best cleaning effect is obtained by high impact at the location to be cleaned.

Cleaning in the low-pressure range (2 bar to 5 bar) is normally most effective and efficient. This is because normally larger tanks are cleaned and higher pressures would lead there to a high level of atomization with a reduced cleaning effect.

## Good to know

The impact is sufficient for a rough assessment of the cleaning force. However, things are often much more complex in practice. In specific applications, it is sometimes possible to realize additional savings by conducting a more detailed analysis. Talk to us. We will gladly advise you: by phone on +49 7123 962-0 or by email at info@lechler.de.

# QUICK DECISION-MAKING AID
# LECHLER CLEANING EFFICIENCY CLASSES

Our promise: Lechler has the right cleaning nozzle for every application. We have separated our extensive range of nozzles into five different cleaning efficiency classes so that you can easily find the product that is right for your application. Below you will find the typical soiling types for the respective efficiency class. Here, the higher the efficiency class, the more powerful and efficient the mechanical cleaning effect (see page 8, Sinner's circle).

## 1

Possible soiling type

| | |
|---|---|
| **Type** | Spray ball, static |
| **Cleaning effect** | |
| **Drive** | No drive, no rotating parts |
| **Typical soiling** | Light soiling such as non-adhering powder or liquids |
| **Nozzle design** | Static spray pattern with punctiform impact |

## 2

Possible soiling type

| | |
|---|---|
| **Type** | Rotating cleaner, free-spinning |
| **Cleaning effect** | |
| **Drive** | By the medium |
| **Typical soiling** | Low-viscosity to slightly viscous substances such as fresh ketchup |
| **Nozzle design** | Slot design or bore layout with direct impact on the entire tank surface |

## 3

Possible soiling type

| | |
|---|---|
| **Type** | Rotating cleaner, free-spinning |
| **Cleaning effect** | |
| **Drive** | By the medium |
| **Typical soiling** | More viscous substances such as chocolate sauce |
| **Nozzle design** | Special flat fan geometry with direct impact on the entire tank surface |

# 4

Possible soiling type

| | |
|---|---|
| **Type** | Rotating cleaner, controlled rotation |
| **Cleaning effect** | |
| **Drive** | By the medium, drive unit with turbine and gear unit |
| **Typical soiling** | Medium soiling such as high-viscosity creams |
| **Nozzle design** | Special flat fan nozzle inserts with direct impact on the entire tank surface |

# 5

Possible soiling type

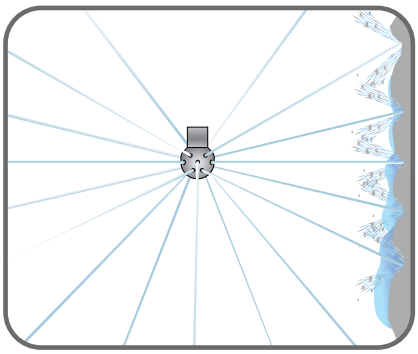
| | |
|---|---|
| **Type** | High impact tank cleaning machine, controlled rotation about two axes |
| **Cleaning effect** | |
| **Drive** | By the medium, drive unit with turbine and gear unit |
| **Typical soiling** | Persistent soiling such as make-up |
| **Nozzle design** | Solid stream nozzles with controlled rotation about two axes, direct impact on the entire tank surface during a cleaning cycle |

**Good to know**

The individual cleaning efficiency classes are not sharply defined. Depending on application, nozzles from the next-higher or next-lower cleaning efficiency class may be suitable. Please ask us in case of doubt. We will gladly advise you: by phone on +49 7123 962-0 or by email at info@lechler.de.

# OPERATING PRINCIPLES
# DESIGN AND CLEANING CAPACITY

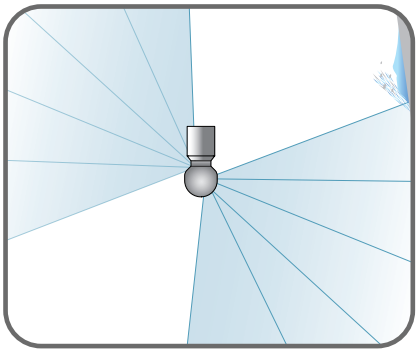
Different operating principles influence the impact and the cleaning effect. The cleaning efficiency can also be influenced by choosing the appropriate nozzle.



## Spray ball, static

Static spray balls do not have any moving parts and are largely maintenance-free.

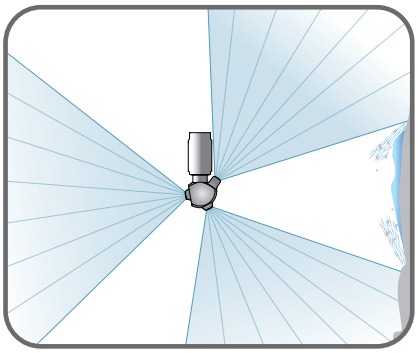
- The impact of the spray jets is punctiform and the surfaces are cleaned by the shear stress of the liquid running down the surface.
- The water consumption is comparatively high
- Increasing soiling results in a significantly longer cleaning time, and cleaning may not be complete
- Simple, inexpensive solution



## Rotating cleaner, free-spinning

Thanks to their special nozzle geometry, free-spinning rotating cleaners permit area impact on the tank walls. They are particularly suitable for small to medium-sized tanks.

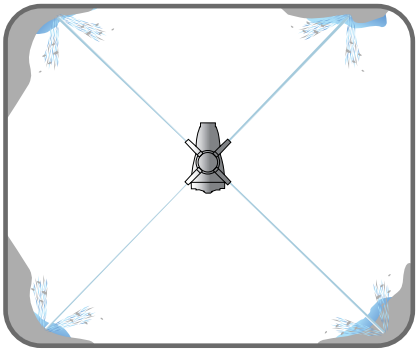
- Drive by cleaning fluid
- Fast impact repetition
- Optimum cleaning performance in the low pressure range



## Rotating cleaner, controlled rotation

These rotating cleaners are characterized by their controlled rotation and a stronger cleaning effect thanks to special flat fan geometries. They are particularly suitable for medium-sized to large tanks.

- Increased impact thanks to low rotation speed and resultant larger drops
- Optimum cleaning performance in medium pressure ranges



## High impact tank cleaning machines, controlled rotation about two axes

High impact tank cleaning machines operate with few solid streams for maximum impact. The rotation of the nozzles about two axes means that every point on the tank wall is hit by the streams during the cleaning cycle.

- Punctiform impact over the entire tank surface
- Maximum impact
- Highest cleaning power

## A few rules of thumb

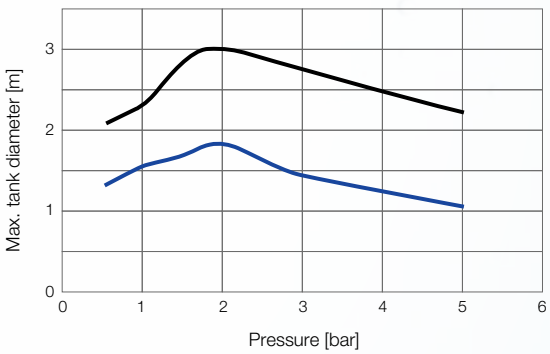
### Flow rate and impact

The higher the flow rate, the greater the impact and the more intensive the cleaning effect. For the best possible results, the nozzles with the highest flow rate should be chosen from the suitable nozzles within a series.

### Operating pressure

The best results can be achieved with the recommended operating pressure of the respective nozzle. An excessively high pressure leads to greater atomization and reduces the spraying range.

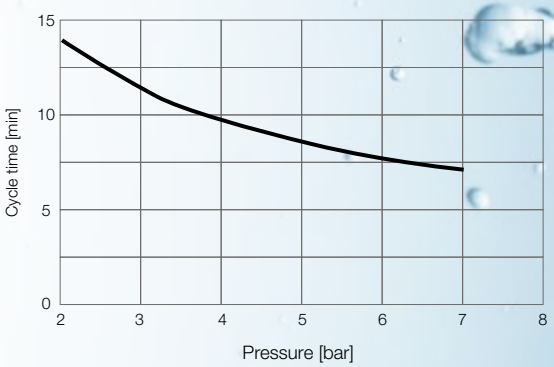
If there is more than one flow rate size within a series, the types with the largest and smallest spraying range are shown. If other flow rate sizes are available, their comparable curves run between the shown upper and lower limits. Information on the maximum tank diameter is provided in the table on the respective product page.




### Cleaning cycle time

Rotating cleaners of cleaning efficiency classes 2 to 4 achieve fast, full-area impact in one revolution.

In contrast, high impact tank cleaning machines need several revolutions to complete a cleaning cycle. High impact tank cleaning machines of cleaning efficiency class 5 spray the tank wall in a defined pattern with their powerful solid jets. A certain number of revolutions of the high impact tank cleaning machine is needed to cover every point in the tank. The time required for this is referred to as “Cleaning cycle duration”.

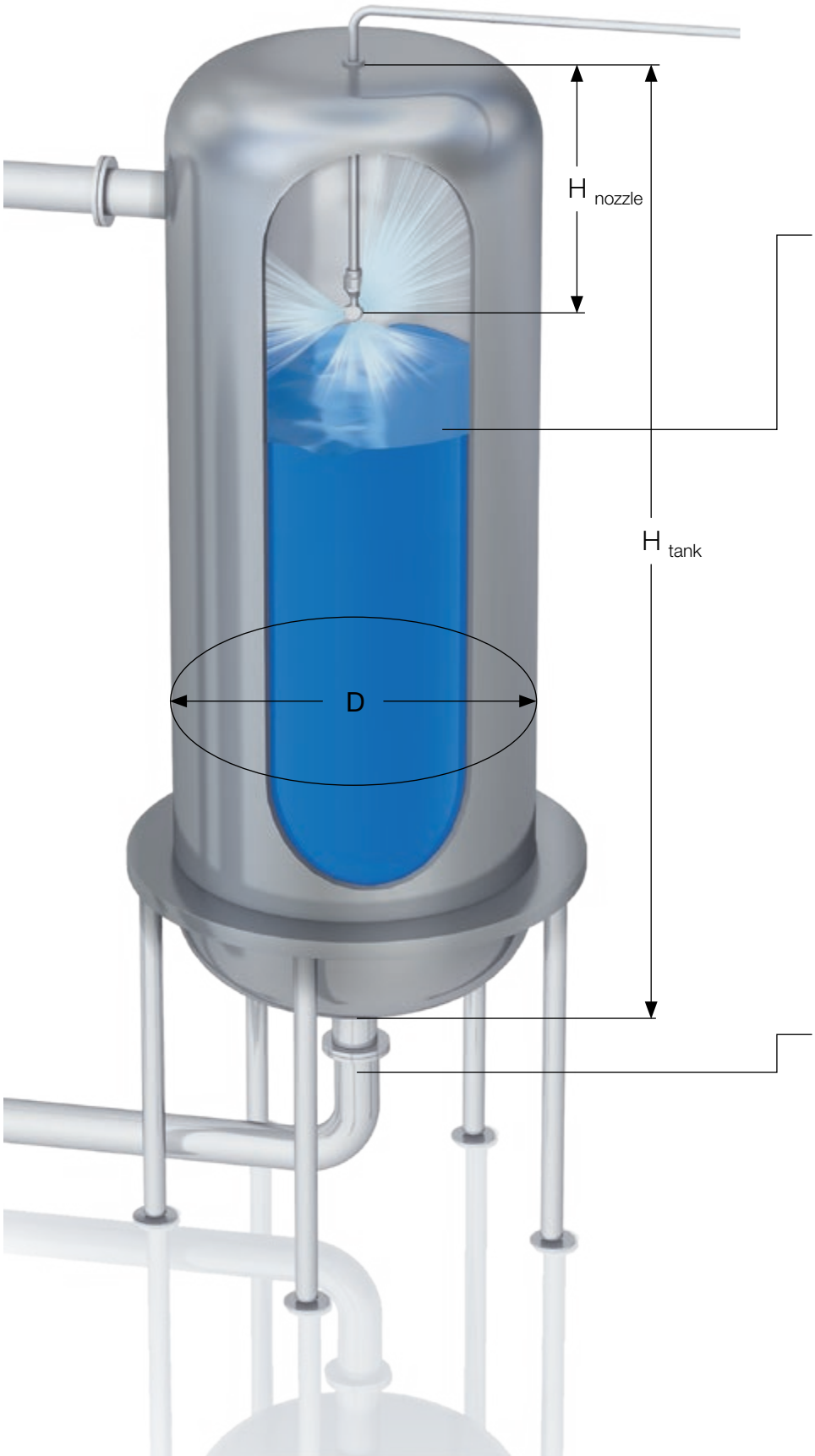



## Good to know

There is at least one exception to every rule of thumb. If you are unsure or need further support, make life easier for yourself and just ask us. You can contact us by phone on +49 7123 962-0 or by email at info@lechler.de.

# FOR YOUR PLANNING
# CRITERIA FOR NOZZLE SELECTION

The size of the tank, its shape and possible fittings are important factors for selection of the right cleaning nozzle. Fittings in particular determine the number of nozzles required for optimum cleaning.




### Tank size

The diameter of the tank to be cleaned should be smaller than the maximum tank diameter recommended in the product tables. You can find the necessary information on the product pages.

### Fill level

If possible, the nozzle should not come into contact with the product during production. It is therefore recommended to install nozzles above the maximum tank fill level.

### Arrangement

The nozzle must be positioned in the upper part of the tank if possible. The following recommendation applies:

$$H_{nozzle} = \frac{1}{3} \cdot H_{tank}$$

Make sure that sufficient cleaning fluid strikes the tank ceiling.

$$H_{nozzle} < \frac{1}{3} \cdot D_{max.\ nozzle}$$

### Conversion

Flow rate according to density:
If the density of the cleaning agent (R) differs from that of water (W), the flow rate is calculated as follows:

$$\dot{V}_R = \dot{V}_W \sqrt{\frac{\rho_W}{\rho_R}}$$

Flow rate according to differential pressure:
If the tank cleaning nozzle is operated with a deviating differential pressure, the flow rate is calculated as follows:

$$\dot{V}_2 = \sqrt{\frac{p_2}{p_1}} \cdot \dot{V}_1$$

Differential pressure according to volume flow:

$$p_2 = \left(\frac{\dot{V}_2}{\dot{V}_1}\right)^2 \cdot p_1$$

### Tank drainage rate

The tank drainage rate must be chosen so that the liquid level does not rise during the cleaning process. The following values are recommended.

| Drain ["] | Drainage rate [l/min] |
|---|---|
| 1 | 23 |
| 1 1/2 | 50 |
| 2 | 87 |
| 2 1/2 | 132 |
| 3 | 190 |
| 4 | 330 |

### Number of nozzles

When cleaning large tanks or complex installations, it is often necessary to install several nozzles. They must be positioned so that their spray jets overlap and that the jets strike every surface that is to be cleaned if possible.

### Avoidance of spray shadows

Obstacles such as agitators, baffle plates or pipes can prevent the areas behind them from being reached directly by the spray jet. Impact cleaning is not possible there. In such cases, it is necessary to install several nozzles so that the spray shadows of the individual nozzles are eliminated. In addition, static spray nozzles can also be used for targeted removal of deposits left as a result of spray shadows or in areas that are difficult to clean.

### Pump and pipes

The pipe dimensions depend on the flow rate to be delivered. The size should be chosen so that the pressure losses in the feed pipe system are kept as low as possible. The required static operating pressure must be present directly at the nozzle. The pump power must be matched to this.

# FOR YOUR PLANNING
# PROFESSIONAL SUPPORT

## TankClean

On the previous pages we provided you with the most important information for planning efficient tank and equipment cleaning. In many cases, this will already allow you to find the optimum solution for your requirements.

However, what if the situation is more complex? For example, due to fitting-related spray shadows – or if you want to be absolutely sure that every area in the tank has been fully cleaned? The solution here is simple: we will gladly support you with our Tank*Clean* simulation software.

**With Tank*Clean* we can ...**

- simulate tank geometries with a large number of fittings precisely and realistically
- select the right number of optimum nozzles and position them freely
- simulate the cleaning process and thus show spray shadows or other problematic areas
- record the simulation as a PDF and video

# YOUR ADVANTAGES

**PLANNING RELIABILITY**
We assist you in planning your tank cleaning solution to ensure cleaning without any gaps.

**PROCESS OPTIMIZATION**
By simulating the existing cleaning processes, we show you the optimization potentials for these processes.

**PROCESS RELIABILITY**
Thanks to realistic and individually customizable process simulation, we can offer you individual solution concepts.

**COST AND TIME SAVINGS**
Simulation makes it possible to detect any potential problem areas before final definition of the cleaning concept. This makes it possible to significantly reduce the number of time- and cost-intensive practical cleaning tests.

**See and understand Tank*Clean***

Discover the possibilities of Tank*Clean:* Visit **www.lechler.com/tankclean** or scan the QR code.

# FOR YOUR PLANNING
# CERTIFICATES AND DECLARATIONS

We can issue various certificates and declarations for our products. It must be checked in advance whether the desired document can be issued for a certain product. We will gladly inform you about the conditions for the documents on request.

## Declaration of compliance EN 10204 - 2.1

This declaration confirms that the products have been manufactured and tested in accordance with the specifications.

## Test report EN 10204 - 2.2

The report can be issued for the material (including the non-specific material certificate of the supplier), surface quality or spray parameters (spray angle and flow rate, without additional document).

## Inspection certificate EN 10204 - 3.1

The inspection certificate is usually issued for the material. It can be issued for selected tank cleaning nozzles on request. In this case, production of the parts takes place on an order-specific basis with restamping.

However, a specific certificate can also be issued for the flow rate, spray angle nozzle dimensions, surface quality, etc.

## FDA declaration of conformity

Confirmation that the material used complies with the specifications of the FDA.

## 3-A declaration of conformity

Confirmation that the product complies with the requirements of 3-A Sanitary Standards No. 78-03.

## Declaration of conformity according to regulations (EC) No. 1935/2004 and (EC) No. 10/2011

Confirmation that the supplied product is suitable for use in contact with food and that the material complies with the above regulations.

## ATEX type examination certificate

The ATEX type examination certificate certifies approval of the tank cleaning nozzle for corresponding ATEX environments.

## Supplier declaration

Declaration on certificates of origin of the European Union, issued by Lechler. A supplier declaration can be issued for a specific order (individual supplier declaration) or as a long-term supplier declaration with a validity of two years.

## Certificate of origin

Official confirmation of the origin of a product, certified by the Chamber of Commerce and Industry.

# FOR YOUR PLANNING
# LECHLER ONLINE-SERVICES

## 3D design data

We can support you in your design work with the freely available 3D design data of Lechler nozzles and accessories.

After free registration, you can download the required data packages in all common CAD formats from **www.lechler.com/de-en/service/cad**.

- Time-saving, immediate download of 3D drawings and technical data
- Simple product selection like in Lechler print catalog
- Preview function with product photo and 3D graphics
- Available in all common 3D file formats

## Ready at all times – the Lechler Industry app

The Lechler Industry app offers all important calculation and conversion functions in one place:

- Units converter for pressure, volume and flow rate
- Pressure/flow rate calculator for single fluid nozzles including axial-flow full cone nozzles
- Determination of the pipe diameter

Available free of charge in the Apple App Store and Google Play Store.

iOS (Apple)

Android (Google)

## Current brochure

We are continuously developing our product range. You can always access the latest version of this brochure at **www.lechler.com/de-en/catalogues**.

## Good to know

You can find current information about Lechler and our products and services online at **www.lechler.com/de-en**.

# THE PRODUCT RANGE
# A BRIEF INTRODUCTION

Cleaning efficiency class 1

Cleaning efficiency class 2

Cleaning efficiency class 3

Cleaning efficiency class 4

Cleaning efficiency class 5

Perfect add

# FOR YOUR PLANNING
# OPTIMUM PREPARATION

Every industry and every process has its own requirements. We know them all and supply the optimum cleaning nozzles for an extremely wide range of ambient conditions.

### FOOD CONFORMITY

Many of the materials used for Lechler tank cleaning nozzles comply with the requirements of the FDA and conform to the regulation EU1935/2004.

### HYGIENE REQUIREMENTS

Lechler cleaning nozzles meet the strictest hygiene requirements. Selected series are available as specially certified 3-A-compliant nozzles.

### ATEX

Lechler offers specially approved nozzle series for use in explosive atmospheres.

### MAXIMUM OPERATING TEMPERATURE

Maximum permitted temperature of the cleaning medium during operation.

### MAXIMUM AMBIENT TEMPERATURE

Maximum permitted ambient temperature within the tank.

### INSTALLATION

The installation symbol describes the position in which the nozzle must be installed so that it functions properly.

### BEARING

The primary bearing used is described here.

### MATERIAL

Here you can find all materials that are used in the nozzle. This list permits a simple check of the chemical resistance.

### WEIGHT

The weight is specified from the lightest to the heaviest nozzle within a series.

### SURFACE QUALITY

Ra

INSIDE AND OUTSIDE

We distinguish between surfaces inside the cleaning nozzle and outside surfaces. Excepted from this are threads, weld seams and gear wheels as well as areas in which the cleaning medium flows very quickly.

### STEAM SUITABILITY

If the SIP process is realized by the cleaning nozzle, the suitability for hot water or even steam operation is decisive. Our products have been tested in vertically downwards-facing installation position at a temperature of 150 °C and a pressure of 2.5 bar(g) specifically for the extreme conditions in steam operation. The wear behavior differs depending on the design and materials used. We therefore categorize the steam suitability of our products as follows:

- Suitable (only slight wear evident after test duration of 50 h)
- Conditionally suitable (clear wear already evident after test duration of 25 h)
- Not suitable (the tested type was worn so that is was no longer capable of operation within a very short time)

It must be noted that operation with steam means increased wear irrespective of suitability. The following rule of thumb therefore applies: The lower the pressure, the lower the rotation speed and load and also the lower the wear of the cleaning nozzle.

### INSERTION DIAMETER

This is the minimum diameter of the opening that is required to insert the cleaning nozzle in the tank. Since the exact insertion diameter depends on the selected type, a range is specified for some series. If the size of the insertion opening is within the specified range, the exact insertion diameter must be requested from Lechler.

### RECOMMENDED OPERATING PRESSURE

The recommended operating pressure is the optimum pressure at which the nozzle cleans most efficiently. The recommended operating pressure must be determined directly in front of the nozzle.

### ADAPTER

The HygienicFit adapter guarantees hygienic connection of the supply line. Compatible products are identified by this pictogram.

### ROTATION MONITORING

These nozzles are compatible with the Lechler rotation monitoring sensor.

### MAINTENANCE

All nozzles with the maintenance symbol can be maintained. You can find further information on pages 100–101.

### RECOMMENDED FILTER

We recommend a filter with the specified mesh size in order to prevent clogging and excessive wear of the cleaning nozzle.


Prüfstand 305

# TANK CLEANING NOZZLES
## SERIES OVERVIEW

| | | Cleaning efficiency class 1 | | | | | |
|---|---|---|---|---|---|---|---|
| **Series** | | **Spray ball 527** | **Spray ball 540/541** | **RinseClean 5B2/5B3** | **PicoWhirly 500.234** | **MicroWhirly 566** | **MiniWhirly 500.186** |
| **Information on Page** | | 30 | 32 | 34 | 40 | 42 | 44 |
| | |  |  |  |  |  |  |
| | **Operating principle** | |  | | | | |
| | **Max. tank diameter [m]** | 5.2–8.2 | 6.5–9.5 | 2.2–5.6 | 0.9 | 1.6–1.7 | 1.3 |
| | **Insertion diameter [mm]** | 35.0–102.0 | 31.0 | 20.0–90.0 | 9.0 | 20.0–48.0 | 29.0 |
| | **Recommended operating pressure [bar]** | 1.5 | 3.0 | 2.0 | 3.0 | 2.0 | 2.0 |
| | **Flow rate at recommended operating pressure [l/min]** | 52.0–364.0 | 22.0–145.0 | 15.0–1,000.0 | 9.8 | 15.0–21.0 | 18.0 |
| | **Food-compliant** | ● | ● | ● | ● | ● | |
| | **ATEX available** | | | | | ● | |
| | **Surface quality (outside) [µm]** | ≤ 0.8 µm | ≤ 6.3 µm | ≤ 0.8 | ≤ 1.6 | ≤ 1.6 | ≤ 1.6 |
| | **Steam suitability** | suitable | suitable | suitable | suitable | suitable | not suitable |
| | **Max. operating temperature [°C]** | 200 | 200 | 200 | 200 | 150 | 50 |
| | **Max. ambient temperature [°C]** | 250 | 250 | 250 | 200 | 200 | 100 |
| | **Compatible with HygienicFit** | | | | | | |
| | **Rotation monitoring** | | | | | | |
| | **Weight [g]** | 50–660 | 90–100 | 10–300 | 10 | 50–200 | 40 |
| | **Maintainable** | | | | | | |

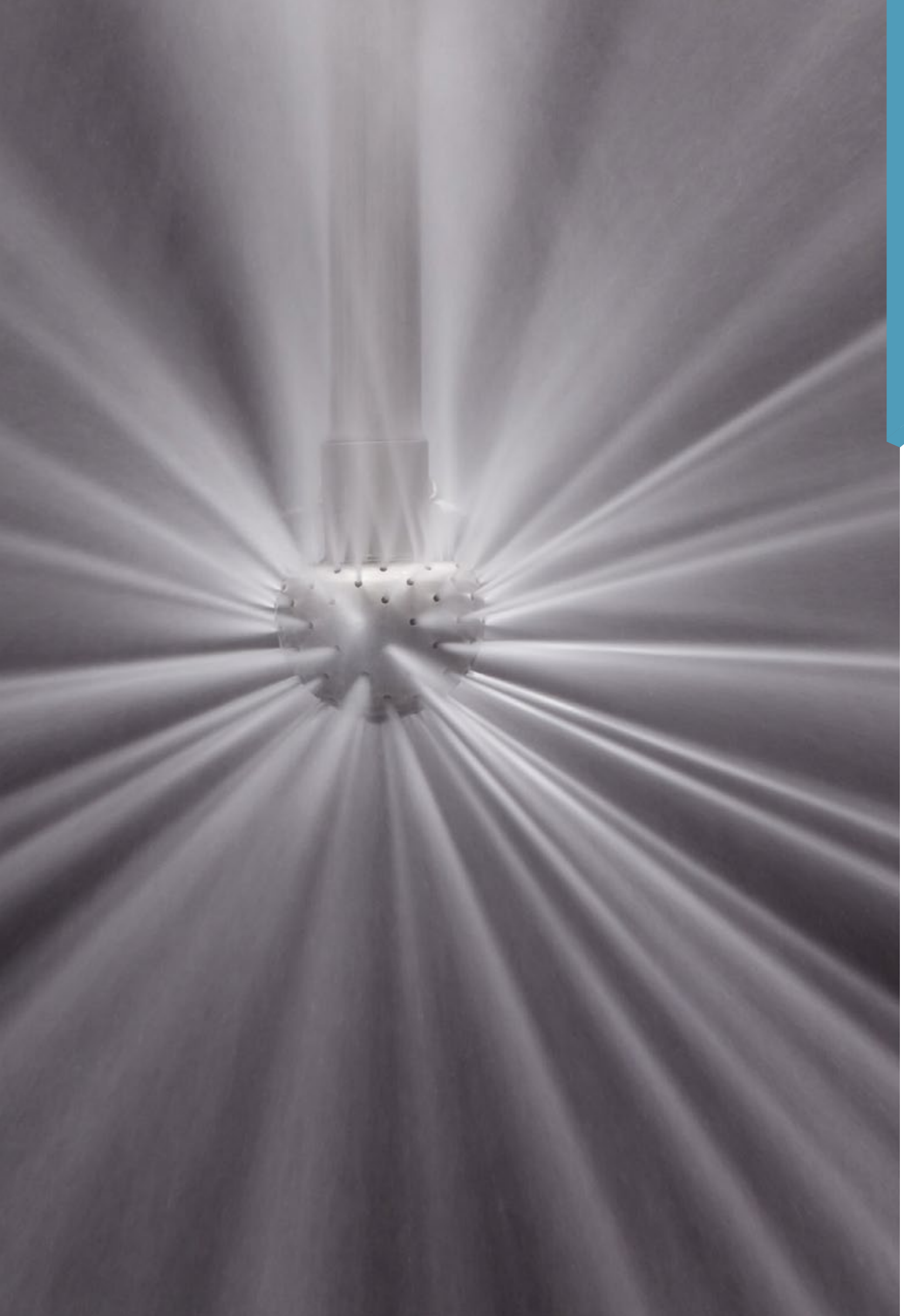
| Cleaning efficiency class 2 | | | | | |
|---|---|---|---|---|---|
| **PVDF MicroWhirly 500.191** | **NanoSpinner 2 5M1** | **MicroSpinner 2 5M2** | **MiniSpinner 2 5M3** | **MaxiSpinner 2 5M4** | **PTFE Whirly 573/583** |
| 46 | 48 | 50 | 52 | 56 | 58 |
|  |  |  |  |  |  |
| |  | | | | |
| 0.8–1.1 | 1.4–1.6 | 1.7–1.8 | 1.8–2.6 | 4.0–5.0 | 2.4–3.2 |
| 30.0 | 17.0–34.0 | 28.0–48.0 | 39.0–58.0 | 69.0 | 49.0–78.4 |
| 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| 13.0–20.0 | 15.0–20.0 | 23.0–40.0 | 30.0–100.0 | 135.0–250.0 | 58.0–225.0 |
| ● | ● | ● | ● | ● | ● |
| | ● | ● | ● | ● | |
| ≤ 1.6 | ≤ 0.4 | ≤ 0.4 | ≤ 0.4 | ≤ 0.4 | ≤ 0.8 |
| not suitable | not suitable | conditionally suitable | conditionally suitable | conditionally suitable | not suitable |
| 95 | 200 | 200 | 200 | 200 | 95 |
| 150 | 250 | 250 | 250 | 250 | 200 |
| | | ● | ● | ● | |
| | | | | | |
| 12–30 | 20 | 80–100 | 230–340 | 1,100–1,500 | 140–300 |
| | | | | | |

| | | Cleaning efficiency class 3 | | |
|---|---|---|---|---|
| **Series** | | **HygienicWhirly 594/595** | **Whirly 2 5W9** | **Gyro 577** |
| **Information on Page** | | 64 | 66 | 68 |
| | |  |  |  |
| | **Operating principle** |  | | |
| | **Max. tank diameter [m]** | 0.8–2.7 | 1.8–3.0 | 3.4–5.4 |
| | **Insertion diameter [mm]** | 31.5–48.0 | 69.5 | 110.0–156.0 |
| | **Recommended operating pressure [bar]** | 3.0 | 2.0 | 3.0 |
| | **Flow rate at recommended operating pressure [l/min]** | 14.0–82.0 | 48.0–145.0 | 200.0–659.0 |
| | **Food-compliant** | ● | ● | ● |
| | **ATEX available** | | ● | |
| | **Surface quality (outside) [µm]** | ≤ 0.8 | ≤ 0.4 | ≤ 0.8 |
| | **Steam suitability** | suitable | not suitable | conditionally suitable |
| | **Max. operating temperature [°C]** | 150 | 150 | 95 |
| | **Max. ambient temperature [°C]** | 150 | 200 | 200 |
| | **Compatible with HygienicFit** | | ● | |
| | **Rotation monitoring** | | | |
| | **Weight [g]** | 90–290 | 360–500 | 640–1,920 |
| | **Maintainable** | | | |

| Cleaning efficiency class 4 | | Cleaning efficiency class 5 | | |
|---|---|---|---|---|
| **XactClean HP 2 5S6/5S7** | **XactClean HP+ 5S5** | **MeshClean 5T2/5T3** | **IntenseClean Hygienic 5TB** | **IntenseClean 5TM** |
| 72 | 76 | 80 | 82 | 84 |
|  |  |  |  |  |
|  | | |  | |
| 3.5–8.0 | 9.0–9.6 | 11.5–13.0 | 14.0–15.0 | 18.0–24.0 |
| 50.0–79.0 | 81.0–140.0 | 68.0–82.0 | 130.0 | 160.0–230.0 |
| 5.0 | 3.0 | 5.0 | 5.0 | 5.0 |
| 40.0–213.0 | 202.0–367.0 | 20.0–79.0 | 169.0–238.0 | 198.0–411.0 |
| ● | ● | ● | ● | ● |
| ● | | ● | ● | ● |
| ≤ 1.6 | ≤ 0.8 | ≤ 0.8 | ≤ 0.8 | ≤ 0.8 |
| suitable | suitable | suitable | suitable | not suitable |
| 150 | 150 | 150 | 150 | 95 |
| 150 | 150 | 150 | 150 | 140 |
| | ● | ● | | |
| ● | ● | ● | ● | ● |
| 650–900 | 1,120–1,930 | 1,000 | 4,000 | 7,400–7,880 |
| ● | ● | ● | ● | ● |

# CLEANING EFFICIENCY CLASS 1
# **RINSE EFFICIENTLY AND RELIABLY**

| | |
|---|---|
| **Type** | Spray ball, static |
| **Cleaning effect** |  |
| **Drive** | No drive, no rotating parts |
| **Typical soiling** | Light soiling such as non-adhering powder or liquids |
| **Nozzle design** | Static spray pattern with punctiform impact |



# Static spray balls
## Series 527

**Features:**
- Suitable for the highest hygiene requirements due to 3-A certification
- High surface quality
- Suitable for very high temperatures

FDA

**Function video**
**www.lechler.com/de-en/medialibrary/videos-general-industry**
Or scan the QR code.

**Series 527**

**Technical data:**

**Maximum operating temperature**
200 °C

**Maximum ambient temperature**
250 °C

**Installation**
Operation in every installation position

**Bearing**
Static – no bearing

**Material**
Stainless steel 1.4404 (316L)

**Weight**
50–660 g

**Surface quality**
≤ 0.8 µm
OUTSIDE

**Surface quality**
≤ 0.8 µm
INSIDE

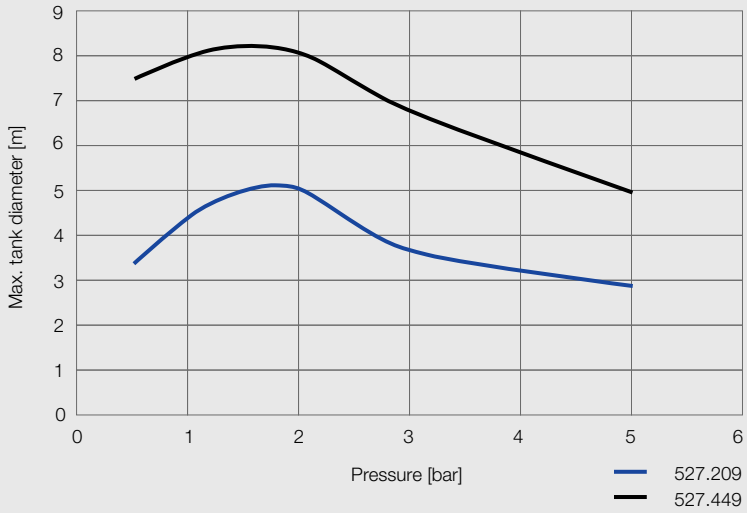
**Steam suitability**
Suitable

**Insertion diameter**
35–102 mm

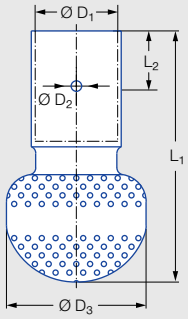
**Recommended filter**
Smaller than the narrowest cross-section

**Recommended operating pressure**
1.5 bar

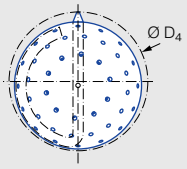
**Max. tank diameter**
The specified maximum tank diameter applies to the recommended operating pressure and is indicative only. The type of soiling is also decisive for the cleaning result.




**Overview of maximum tank diameter depending on pressure**




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




**Insertion diameter $D_4$ of slip-on connection**

With the slip-on connection, the spray ball is pushed onto the customer connecting pipe and secured with the supplied cotter pin.

| Spray angle | Order no. Type | Narrowest cross-section Ø [mm] | V̇ water [l/min] p [bar] ($p_{max}$ = 5 bar) | | | | V̇ water | | Dimensions [mm] | | | | | | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1.0 | **1.5** | 2.0 | 3.0 | at 1.5 bar [$m^3$/h] | at 2 bar [$m^3$/h] | $L_1$ | $L_2$ | Ø $D_1$ | Ø $D_2$ | Ø $D_3$ | Ø $D_4$ | |
| 360° | **527.209.1Y.00.75** | 0.8 | 42 | **52** | 60 | 73 | 3.1 | 3.6 | 68.0 | 12.7 | 19.0 | 3.3 | 32.0 | 35.0 | 5.2 |
| | **527.289.1Y.01.50** | 1.1 | 120 | **147** | 170 | 208 | 8.8 | 10.2 | 116.0 | 25.4 | 38.3 | 4.9 | 65.0 | 71.0 | 6.0 |
| | **527.449.1Y.02.00** | 1.7 | 297 | **364** | 420 | 514 | 21.8 | 25.2 | 152.0 | 25.4 | 51.0 | 4.9 | 102.0 | 102.0 | 8.2 |

**Information on slip-on connection**
- Cotter pin made of stainless steel 1.4404 (316L) included.
- Depending on the adapter diameter, the flow rate may increase due to the leakage between the adapter and spray ball.

**Information on operation**
Use above the recommended pressure will have a negative effect on the cleaning result and wear.

# Static spray balls
## Series 540/541

**Features:**
- Robust and especially compact design
- Threaded connection
- Suitable for very high temperatures
- Also suitable for steam and air operation

FDA

**Function video**
**www.lechler.com/de-en/medialibrary/videos-general-industry**
Or scan the QR code.

**Series 540/541**

**Technical data:**

**Maximum operating temperature**
200 °C

**Maximum ambient temperature**
250 °C

**Installation**
Operation in every installation position

**Bearing**
Static – no bearing

**Material**
Stainless steel 1.4305 (303)

**Weight**
90–100 g

**Surface quality**
≤ 6.3 µm
OUTSIDE

**Surface quality**
≤ 6.3 µm
INSIDE

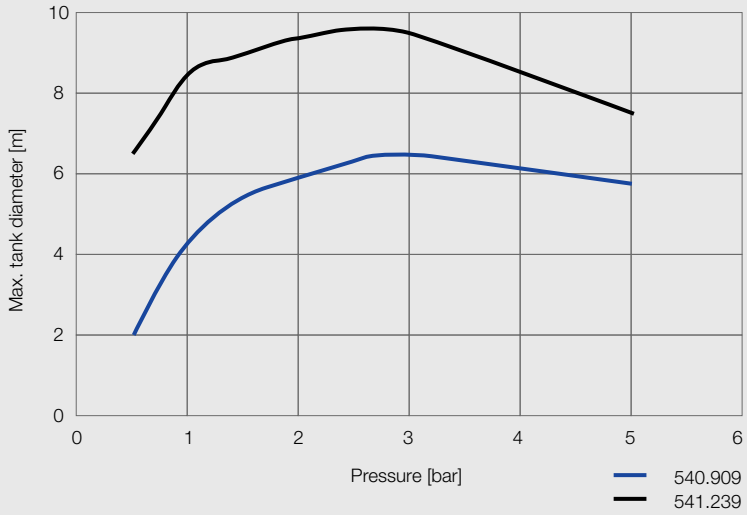
**Steam suitability**
Suitable

**Insertion diameter**
31 mm

**Recommended filter**
Smaller than the narrowest cross-section

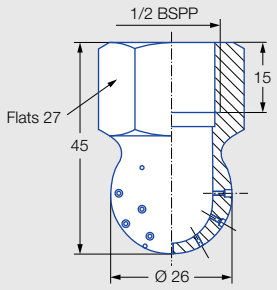
**Recommended operating pressure**
3 bar

**Max. tank diameter**
The specified maximum tank diameter applies to the recommended operating pressure and is indicative only. The type of soiling is also decisive for the cleaning result.

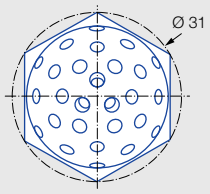



**Overview of maximum tank diameter depending on pressure**

Dimensions in mm.




**Female thread**




**Insertion diameter**

| Spray angle | Order no. / Type | Narrowest cross-section Ø [mm] | V̇ water [l/min] p [bar] ($p_{max}$ = 10 bar) 0.5 | 1.0 | 2.0 | **3.0** | 5.0 | V̇ water at 3 bar [m³/h] | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|---|---|
| 240° | **540.909.16** | 0.8 | 9 | 13 | 18 | **22** | 28 | 1.3 | 6.5 |
| | **540.989.16** | 1.0 | 14 | 20 | 28 | **34** | 44 | 2.0 | 7.0 |
| | **541.109.16** | 1.5 | 29 | 40 | 57 | **70** | 90 | 4.2 | 7.5 |
| | **541.189.16** | 2.0 | 45 | 64 | 90 | **110** | 142 | 6.6 | 8.3 |
| | **541.239.16** | 2.3 | 59 | 83 | 118 | **145** | 187 | 8.7 | 9.5 |

NPT threads on request.

**Information on operation**
Use above the recommended pressure will have a negative effect on the cleaning result and wear.

# Static spray balls RinseClean
## Series 5B2/5B3

**Features:**
- No moving parts
- Self-draining
- Proven in numerous applications
- Suitable for very high temperatures and high hygiene requirements
- Also available in 2.4602 (Alloy 22)

FDA

**Function video**
www.lechler.com/de-en/medialibrary/videos-general-industry
Or scan the QR code.

**Series 5B2/5B3**

**Technical data:**

**Maximum operating temperature**
200 °C

**Maximum ambient temperature**
250 °C

**Installation**
Operation in every installation position

**Bearing**
Static – no bearing

**Material**
Stainless steel 1.4404 (316L), cotter pin made of stainless steel 1.4404 (316L) or 2.4602 (Alloy 22), cotter pin made of 2.4602 (Alloy 22)

**Weight**
10–300 g

**Surface quality**
Ra ≤ 0.8 µm
polished Ra ≤ 0.5 µm
OUTSIDE

**Surface quality**
Ra ≤ 0.8 µm
INSIDE

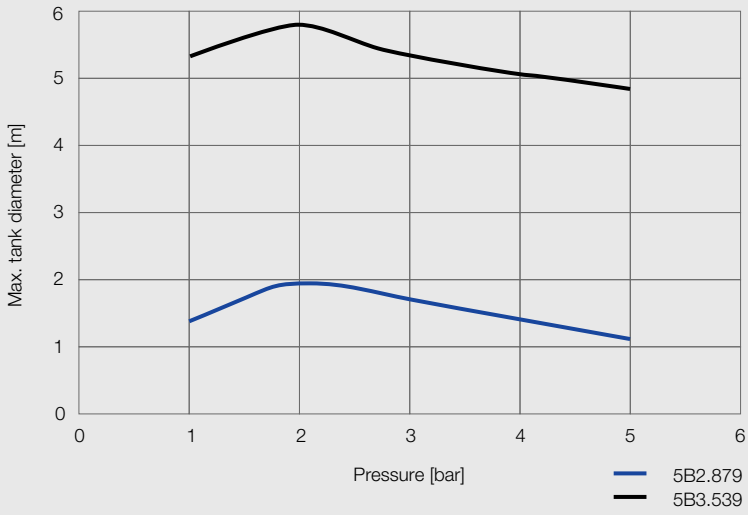
**Steam suitability**
Suitable

**Insertion diameter**
20–90 mm

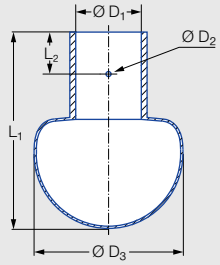
**Recommended filter**
Smaller than the narrowest cross-section

**Recommended operating pressure**
2 bar

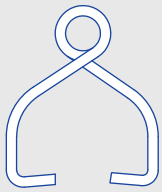
**Max. tank diameter**
The specified maximum tank diameter applies to the recommended operating pressure and is indicative only. The type of soiling is also decisive for the cleaning result.



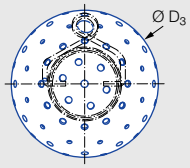

**Overview of maximum tank diameter depending on pressure**




Pin 1



Pin 2–5




Insertion diameter $D_3$ of slip-on connection

With the slip-on connection, the spray ball is pushed onto the customer connecting pipe and secured with the supplied cotter pin.

## Slip-on connection according to DIN 10357, series B (replaces DIN 11850, series 1)

| Spray angle | Order no. Type | Mat. no. 1Y 1.4404 (316L) | Mat. no. 21 2.4602 (Alloy 22) | Connection | Narrowest cross-section Ø [mm] | V̇ water [l/min] p [bar] ($p_{max}$ = 5 bar) 0.5 | 1.0 | 2.0 | 3.0 | V̇ water at 2 bar [m³/h] | Dimensions [mm] $L_1$ | $L_2$ | Ø $D_1$ | Ø $D_2$ | Ø $D_3$ | Pin | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 180° | 5B3.083 | ● | ● | D1.80 | 1.2 | 25 | 35 | **50** | 61 | 3.0 | 42.0 | 9.0 | 18.2 | 2.2 | 28.0 | 1 | 2.2 |
| | 5B3.253 | ● | ● | D2.20 | 1.8 | 65 | 92 | **130** | 159 | 7.8 | 84.0 | 18.0 | 22.2 | 2.2 | 64.0 | 2 | 3.0 |
| | 5B3.323 | ● | ● | D2.80 | 2.3 | 100 | 141 | **200** | 245 | 12.0 | 84.0 | 18.0 | 28.2 | 2.2 | 64.0 | 3 | 3.5 |
| | 5B3.463 | ● | | D5.20 | 3.3 | 230 | 325 | **460** | 563 | 27.6 | 111.0 | 25.0 | 52.3 | 3.0 | 90.0 | 5 | 5.4 |
| 180° | 5B3.114 | ● | ● | D1.80 | 1.4 | 30 | 42 | **60** | 74 | 3.6 | 42.0 | 9.0 | 18.2 | 2.2 | 28.0 | 1 | 2.2 |
| | 5B3.274 | ● | ● | D2.20 | 2.3 | 75 | 106 | **150** | 184 | 9.0 | 84.0 | 18.0 | 22.2 | 2.2 | 64.0 | 2 | 3.0 |
| | 5B3.394 | ● | ● | D2.80 | 3.0 | 145 | 205 | **290** | 355 | 17.4 | 84.0 | 18.0 | 28.2 | 2.2 | 64.0 | 3 | 5.0 |
| | 5B3.444 | ● | | D5.20 | 3.2 | 200 | 283 | **400** | 490 | 24.0 | 111.0 | 25.0 | 52.3 | 3.0 | 90.0 | 5 | 5.2 |
| 270° | 5B3.305 | ● | ● | D2.20 | 1.9 | 90 | 127 | **180** | 221 | 10.8 | 84.0 | 18.0 | 22.2 | 2.2 | 64.0 | 2 | 3.5 |
| | 5B3.345 | ● | ● | D2.80 | 2.1 | 115 | 163 | **230** | 282 | 13.8 | 84.0 | 18.0 | 28.2 | 2.2 | 64.0 | 3 | 5.0 |
| | 5B3.385 | ● | ● | D3.40 | 2.2 | 140 | 198 | **280** | 343 | 16.8 | 84.0 | 18.0 | 34.3 | 2.2 | 64.0 | 4 | 5.2 |
| | 5B3.405 | ● | ● | D3.40 | 2.4 | 160 | 226 | **320** | 392 | 19.2 | 84.0 | 18.0 | 34.3 | 2.2 | 64.0 | 4 | 5.2 |
| | 5B3.425 | ● | ● | D2.80 | 2.8 | 180 | 255 | **360** | 441 | 21.6 | 84.0 | 18.0 | 28.2 | 2.2 | 64.0 | 3 | 5.2 |
| | 5B3.445 | ● | ● | D4.00 | 2.7 | 205 | 290 | **410** | 502 | 24.6 | 84.0 | 18.0 | 40.3 | 2.2 | 64.0 | 4 | 5.4 |
| | 5B3.475 | ● | ● | D3.40 | 3.1 | 235 | 332 | **470** | 576 | 28.2 | 84.0 | 18.0 | 34.3 | 2.2 | 64.0 | 4 | 5.4 |
| | 5B3.535 | ● | | D5.20 | 3.6 | 335 | 474 | **670** | 821 | 40.2 | 111.0 | 25.0 | 52.3 | 3.0 | 90.0 | 5 | 5.6 |
| | 5B3.605 | ● | | D5.20 | 4.5 | 500 | 707 | **1,000** | 1,225 | 60.0 | 111.0 | 25.0 | 52.3 | 3.0 | 90.0 | 5 | 5.6 |
| 360° | 5B2.879 | ● | ● | D0.80 | 0.8 | 8 | 11 | **15** | 18 | 0.9 | 37.0 | 9.0 | 8.2 | 2.2 | 20.0 | 1 | 2.0 |
| | 5B3.089 | ● | ● | D1.20 | 1.0 | 25 | 35 | **50** | 61 | 3.0 | 42.0 | 9.0 | 12.2 | 2.2 | 28.0 | 1 | 2.2 |
| | 5B3.139 | ● | ● | D1.20 | 1.6 | 33 | 46 | **65** | 80 | 3.9 | 42.0 | 9.0 | 12.2 | 2.2 | 28.0 | 1 | 2.3 |
| | 5B3.209 | ● | ● | D1.80 | 1.5 | 50 | 71 | **100** | 123 | 6.0 | 42.0 | 9.0 | 18.2 | 2.2 | 28.0 | 1 | 2.5 |
| | 5B3.309 | ● | ● | D2.20 | 1.7 | 90 | 127 | **180** | 221 | 10.8 | 84.0 | 18.0 | 22.2 | 2.2 | 64.0 | 2 | 3.5 |
| | 5B3.379 | ● | ● | D2.80 | 2.1 | 130 | 184 | **260** | 318 | 15.6 | 84.0 | 18.0 | 28.2 | 2.2 | 64.0 | 3 | 5.2 |
| | 5B3.389 | ● | ● | D4.00 | 2.1 | 140 | 198 | **280** | 343 | 16.8 | 84.0 | 18.0 | 40.3 | 2.2 | 64.0 | 4 | 5.2 |
| | 5B3.409 | ● | ● | D3.40 | 2.3 | 160 | 226 | **320** | 392 | 19.2 | 84.0 | 18.0 | 34.2 | 2.2 | 64.0 | 4 | 5.2 |
| | 5B3.449 | ● | ● | D2.80 | 3.0 | 205 | 290 | **410** | 502 | 24.6 | 84.0 | 18.0 | 28.2 | 2.2 | 64.0 | 3 | 5.4 |
| | 5B3.489 | ● | ● | D3.40 | 2.9 | 255 | 361 | **510** | 625 | 30.6 | 84.0 | 18.0 | 34.2 | 2.2 | 64.0 | 4 | 5.5 |
| | 5B3.499 | ● | ● | D4.00 | 2.8 | 270 | 382 | **540** | 661 | 32.4 | 84.0 | 18.0 | 40.3 | 2.2 | 64.0 | 4 | 5.5 |
| | 5B3.539 | ● | | D5.20 | 3.2 | 335 | 474 | **670** | 821 | 40.2 | 111.0 | 25.0 | 52.3 | 3.0 | 90.0 | 5 | 5.6 |

| Pin | Order no. 1Y Stainless steel 1.4404 (316L) | 21 2.4602 (Alloy 22) |
|---|---|---|
| 1 | 095.013.1Y.06.55 | 095.013.21.06.55 |
| 2 | 095.013.1Y.06.58 | 095.013.21.06.58 |
| 3 | 095.013.1Y.06.56 | 095.013.21.06.56 |
| 4 | 095.013.1Y.06.59 | 095.013.21.06.59 |
| 5 | 095.013.1Y.06.57 | |

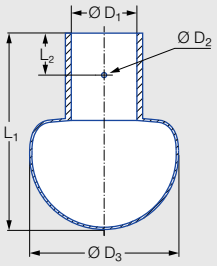
| Ordering example: | Type | + | Material no. | + | Connection | = | Order no. |
|---|---|---|---|---|---|---|---|
| | 5B3.083 | + | 1Y | + | D1.80 | = | 5B3.083.1Y.D1.80 |

**Note**
Available in polished version on request.

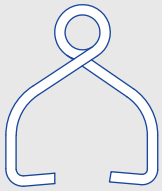
**Information on slip-on connection**
- Cotter pin made of stainless steel 1.4404 (316L) or 2.4602 (Alloy 22) included.
- Depending on the adapter diameter, the flow rate may increase due to the leakage between the adapter and spray ball.

**Information on operation**
Use above the recommended pressure will have a negative effect on the cleaning result and wear.

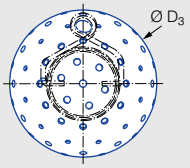
**Slip-on connection**




Pin 1



Pin 2–5




Insertion diameter $D_3$ of slip-on connection

## Slip-on connection according to DIN EN 10357 series A (replaces DIN 11850, series 2)

| Spray angle | Order no. | | | | Narrowest cross-section Ø [mm] | V̇ water [l/min] | | | | V̇ water | Dimensions [mm] | | | | | Pin | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Type | Mat. no. 1Y 1.4404 (316L) | Mat. no. 21 2.4602 (Alloy 22) | Connection | | p [bar] ($p_{max}$ = 5 bar) 0.5 | 1.0 | **2.0** | 3.0 | at 2 bar [m³/h] | $L_1$ | $L_2$ | Ø $D_1$ | Ø $D_2$ | Ø $D_3$ | | |
| 360° | **5B3.149** | ● | ● | **D2.90** | 0.9 | 35 | 50 | **70** | 86 | 4.2 | 84.0 | 18.0 | 29.2 | 2.2 | 64.0 | 3 | 2.3 |
| | **5B3.299** | ● | ● | **D2.90** | 1.5 | 83 | 117 | **165** | 202 | 9.9 | 84.0 | 18.0 | 29.2 | 2.2 | 64.0 | 3 | 3.2 |
| | **5B3.359** | ● | ● | **D2.90** | 1.9 | 115 | 163 | **230** | 282 | 13.8 | 84.0 | 18.0 | 29.2 | 2.2 | 64.0 | 3 | 5.0 |
| | **5B3.399** | ● | ● | **D2.90** | 2.2 | 150 | 212 | **300** | 367 | 18.0 | 84.0 | 18.0 | 29.2 | 2.2 | 64.0 | 3 | 5.2 |
| | **5B3.429** | ● | ● | **D2.90** | 2.6 | 180 | 255 | **360** | 441 | 21.6 | 84.0 | 18.0 | 29.2 | 2.2 | 64.0 | 3 | 5.2 |
| | **5B3.539** | ● | | **D5.30** | 3.2 | 335 | 474 | **670** | 821 | 40.2 | 111.0 | 25.0 | 53.3 | 3.0 | 90.0 | 5 | 5.6 |

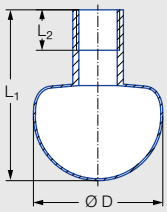
## Slip-on connection according to DIN EN 10357 series D (ASME BPE 1997, OD-tube compatible)

| Spray angle | Order no. | | | | Narrowest cross-section Ø [mm] | V̇ water [l/min] | | | | V̇ water | Dimensions [mm] | | | | | Pin | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Type | Mat. no. 1Y 1.4404 (316L) | Mat. no. 21 2.4602 (Alloy 22) | Connection | | p [bar] ($p_{max}$ = 5 bar) 0.5 | 1.0 | **2.0** | 3.0 | at 2 bar [m³/h] | $L_1$ | $L_2$ | Ø $D_1$ | Ø $D_2$ | Ø $D_3$ | | |
| 360° | **5B3.089** | ● | ● | **A1.00** | 1.0 | 25 | 35 | **50** | 61 | 3.0 | 42.0 | 9.0 | 28.0 | 2.2 | 9.8 | 1 | 2.2 |
| | **5B3.209** | ● | ● | **A1.90** | 1.5 | 50 | 71 | **100** | 123 | 6.0 | 42.0 | 9.0 | 28.0 | 2.2 | 19.3 | 1 | 2.5 |
| | **5B3.309** | ● | ● | **A1.90** | 1.7 | 90 | 127 | **180** | 221 | 10.8 | 84.0 | 18.0 | 64.0 | 2.2 | 19.3 | 1 | 3.5 |
| | **5B3.379** | ● | ● | **A2.60** | 2.1 | 130 | 184 | **260** | 318 | 15.6 | 84.0 | 18.0 | 64.0 | 2.2 | 25.6 | 3 | 5.2 |
| | **5B3.449** | ● | ● | **A3.80** | 3.0 | 205 | 290 | **410** | 502 | 24.6 | 84.0 | 18.0 | 64.0 | 2.2 | 38.3 | 4 | 5.4 |
| | **5B3.539** | ● | | **A5.10** | 3.2 | 335 | 474 | **670** | 821 | 40.2 | 111.0 | 25.0 | 90.0 | 3.0 | 51.1 | 5 | 5.6 |

**Information on slip-on connection**

- Cotter pin made of stainless steel 1.4404 (316L) or 2.4602 (Alloy 22) included.
- Depending on the adapter diameter, the flow rate may increase due to the leakage between the adapter and spray ball.

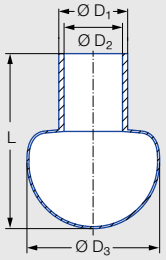
**Threaded connection**




## Threaded connection

| Spray angle | Order no. | | | | | | | Narrowest cross-section Ø [mm] | V̇ water [l/min] | | | | V̇ water | Dimensions [mm] | | | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Type | Mat. no. | | Connection | | | | | p [bar] ($p_{max}$ = 5 bar) | | | | | | | | |
| | | 1Y | 21 | 1/8 BSPP male | 1/2 BSPP | 1 BSPP | 2 BSPP | | | | | | | | | | |
| | | 1.4404 (316L) | 2.4602 (Alloy 22) | | | | | | 0.5 | 1.0 | **2.0** | 3.0 | at 2 bar [m³/h] | $L_1$ | $L_2$ | Ø D | |
| 360° | **5B2.879** | ● | ● | **AA** | | | | 0.8 | 8 | 11 | **15** | 18 | 0.9 | 37 | 8 | 20 | 2.0 |
| | **5B3.309** | ● | ● | | **AH** | | | 1.9 | 90 | 127 | **180** | 221 | 10.8 | 84 | 14 | 64 | 3.5 |
| | **5B3.379** | ● | ● | | | **AN** | | 2.1 | 130 | 184 | **260** | 318 | 15.6 | 84 | 18 | 64 | 5.2 |
| | **5B3.539** | ● | | | | | **AW** | 3.1 | 335 | 474 | **670** | 821 | 40.2 | 111 | 24 | 90 | 5.6 |

**Welded connection**




## Welded connection according to ISO 2037

| Spray angle | Order no. | | | | Narrowest cross-section Ø [mm] | V̇ water [l/min] | | | | V̇ water | Dimensions [mm] | | | | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Type | Mat. no. | | Connection | | p [bar] ($p_{max}$ = 5 bar) | | | | | | Adapter | | | |
| | | 1Y | 21 | | | | | | | | | | | | |
| | | 1.4404 (316L) | 2.4602 (Alloy 22) | | | 0.5 | 1.0 | **2.0** | 3.0 | at 2 bar [m³/h] | L | Ø $D_1$ | Ø $D_2$ | Ø $D_3$ | |
| 360° | **5B2.879** | ● | ● | **W1.20** | 0.8 | 8 | 11 | **15** | 18 | 0.9 | 37.0 | 12.0 | 10.0 | 20.0 | 2.0 |
| | **5B3.089** | ● | ● | **W1.20** | 1.0 | 25 | 35 | **50** | 61 | 3.0 | 42.0 | 12.0 | 10.0 | 28.0 | 2.2 |
| | **5B3.209** | ● | ● | **W1.70** | 1.5 | 50 | 71 | **100** | 123 | 6.0 | 42.0 | 17.2 | 15.2 | 28.0 | 2.5 |
| | **5B3.309** | ● | ● | **W2.50** | 1.7 | 90 | 127 | **180** | 221 | 10.8 | 84.0 | 25.0 | 22.6 | 64.0 | 3.5 |
| | **5B3.379** | ● | ● | **W2.50** | 2.1 | 130 | 184 | **260** | 318 | 15.6 | 84.0 | 25.0 | 22.6 | 64.0 | 5.2 |
| | **5B3.449** | ● | ● | **W3.80** | 3.0 | 205 | 290 | **410** | 502 | 24.6 | 84.0 | 38.0 | 35.6 | 64.0 | 5.4 |

**Information on operation**
Use above the recommended pressure will have a negative effect on the cleaning result and wear.

# CLEANING EFFICIENCY CLASS 2
# **RINSING AND LIGHT CLEANING**

| | |
|---|---|
| **Type** | Rotating cleaner, free-spinning |
| **Cleaning effect** |  |
| **Drive** | By the medium |
| **Typical soiling** | Low-viscosity to slightly viscous substances such as fresh ketchup |
| **Nozzle design** | Slot design or bore layout with direct impact on the entire tank surface |


MiniSpinner 2

# Rotating cleaning nozzle PicoWhirly
## Series 500.234

**Features:**
- Cleaning with rotating solid jets
- Compact design for confined spaces
- Suitable for very high temperatures
- Made completely of stainless steel

FDA

**Function video**
**www.lechler.com/de-en/medialibrary/videos-general-industry**
Or scan the QR code.

**Series 500.234**

**Technical data:**

**Maximum operating temperature**
200 °C

**Maximum ambient temperature**
200 °C

**Installation**
Operation in every installation position

**Bearing**
Kolsterised slide bearing

**Material**
Stainless steel 1.4404 (316L)

**Weight**
10 g

**Surface quality**
Ra ≤ 1.6 µm
OUTSIDE

**Surface quality**
Ra ≤ 1.6 µm
INSIDE

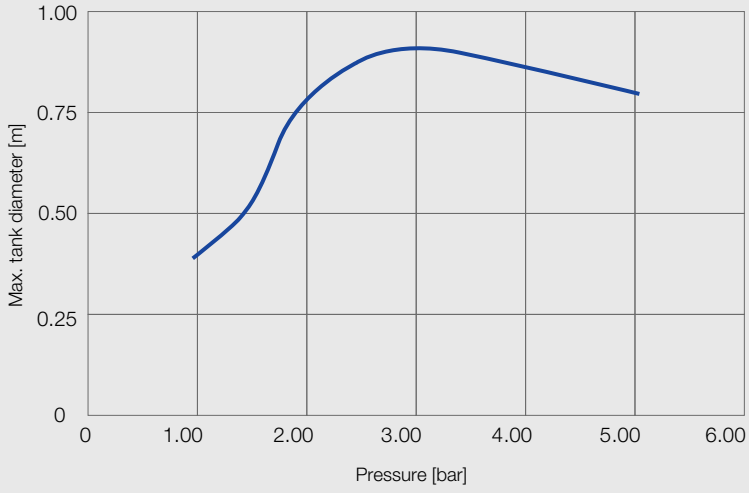
**Steam suitability**
Suitable

**Insertion diameter**
9 mm

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

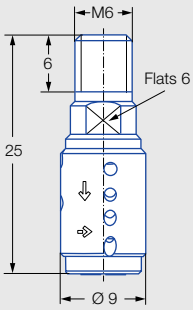
**Recommended operating pressure**
3 bar

**Max. tank diameter**
The specified maximum tank diameter applies to the recommended operating pressure and is indicative only. The type of soiling is also decisive for the cleaning result.




**Overview of maximum tank diameter depending on pressure**

Dimensions in mm.




**Male thread**

| Spray angle | Order no. / Type | Narrowest cross-section Ø [mm] | V̇ water [l/min] p [bar] ($p_{max}$ = 5 bar) | | | | V̇ water | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|---|
| | | | 1.0 | 2.0 | **3.0** | 5.0 | at 3 bar [$m^3$/h] | |
| 300° | **500.234.G9.00** | 1.8 | 5.7 | 8.0 | **9.8** | 12.7 | 0.6 | 0.9 |

**Information on operation**

Compressed air can be used only for a short time for blowing dry. Use above the recommended pressure will have a negative effect on the cleaning result and wear.

# Rotating cleaning nozzle MicroWhirly
## Series 566

**Features:**
- Cleaning with effective flat fan jets
- Robust slide bearing made of PEEK
- Connection via thread or slip-on connection

FDA

**Series 566**

**Function video**
**www.lechler.com/de-en/medialibrary/videos-general-industry**
Or scan the QR code.

**Technical data:**

**Maximum operating temperature**
150 °C
90 °C (ATEX)

**Maximum ambient temperature**
200 °C
120 °C (ATEX)

**Installation**
Operation in every installation position

**Bearing**
Slide bearing made of PEEK

**Material**
Stainless steel 1.4404 (316L), PEEK ESD (only ATEX version)

**Weight**
50–200 g

**Surface quality**
Ra ≤ 1.6 µm
OUTSIDE

**Surface quality**
Ra ≤ 1.6 µm
INSIDE

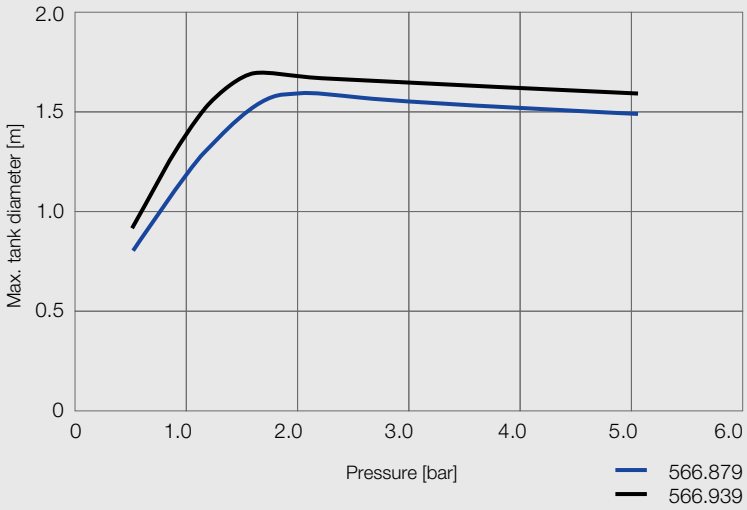
**Steam suitability**
Suitable

**Insertion diameter**
20–48 mm

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

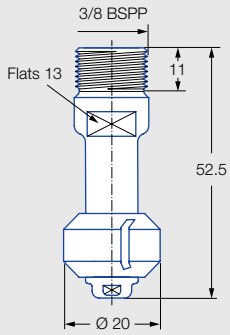
**Recommended operating pressure**
2 bar

**Max. tank diameter**
The specified maximum tank diameter applies to the recommended operating pressure and is indicative only. The type of soiling is also decisive for the cleaning result.

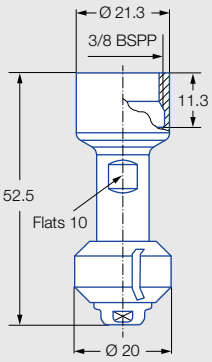



**Overview of maximum tank diameter depending on pressure**

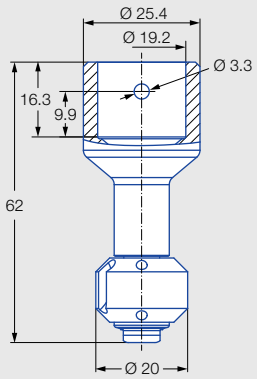
Dimensions in mm.



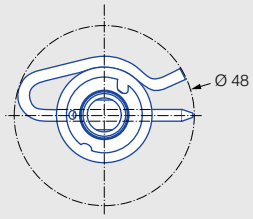

**Male thread**




**Female thread**




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




**Insertion diameter of slip-on connection ASME-BPE (OD tube)**

| Spray angle | Order no. | | | | Narrowest cross-section Ø [mm] | V̇ water [l/min] p [bar] ($p_{max}$ = 6 bar) | | | V̇ water | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|---|---|---|
| | Type | Connection | | | | | | | | |
| | | 3/8 BSPP male | 3/8 BSPP female | 3/4" slip-on connection | | 1.0 | **2.0** | 3.0 | at 2 bar [m³/h] | |
| 180° | **566.873.1Y** | **AE** | **AF** | **TF07** | 1.0 | 12 | **15** | 18 | 0.9 | 1.6 |
| | **566.933.1Y** | **AE** | **AF** | **TF07** | 2.4 | 15 | **21** | 26 | 1.3 | 1.7 |
| 180° | **566.874.1Y** | **AE** | **AF** | **TF07** | 1.0 | 12 | **15** | 18 | 0.9 | 1.6 |
| | **566.934.1Y** | **AE** | **AF** | **TF07** | 2.4 | 15 | **21** | 26 | 1.3 | 1.7 |
| 360° | **566.879.1Y** | **AE** | **AF** | **TF07** | 1.0 | 12 | **15** | 18 | 0.9 | 1.6 |
| | **566.939.1Y** | **AE** | **AF** | **TF07** | 2.4 | 15 | **21** | 26 | 1.3 | 1.7 |

NPT threads and weld-on version on request.

**Information on operation**

Compressed air can be used only for a short time for blowing dry. Use above the recommended pressure will have a negative effect on the cleaning result and wear.

**Information on slip-on connection**

- Cotter pin made of stainless steel 1.4404 (316L) included.
- Depending on the adapter diameter, the flow rate may increase due to the leakage between the adapter and rotating cleaning nozzle.

## Ordering example with FDA and (EC) 1935/2004 conformity.

**All materials are suitable for contact with food.**

FDA

| Type | + | Connection | = | Order no. |
|---|---|---|---|---|
| 566.873.1Y | + | AE | = | 566.873.1Y.AE |

## Ordering example with ATEX approval. No FDA and (EC) 1935/2004 conformity.

**Unit group/Category/Zones:**

Ⓔx II 1G Ex h IIB T6…T3 Ga

Ⓔx II 1D Ex h IIIC T85 °C...T150 °C Da

**Important**

The code for the connection changes for the ATEX version with slip-on connection.
Ordering example for slip-on connection: 566.873.1Y.TF.EX

| Type | + | Connection | + | ATEX | = | Order no. |
|---|---|---|---|---|---|---|
| 566.873.1Y | + | AE | + | EX | = | 566.873.1Y.AE.EX |

# Rotating cleaning nozzle MiniWhirly
## Series 500.186

**Features:**
- Economical entry-level model
- Cleaning with effective flat fan jets
- Specially designed for barrel and canister cleaning

Series 500.186

**Function video**
www.lechler.com/de-en/medialibrary/videos-general-industry
Or scan the QR code.

**Technical data:**

**Maximum operating temperature**
50 °C

**Maximum ambient temperature**
100 °C

**Installation**
Vertically downwards

**Bearing**
Ball bearing made of stainless steel 1.4401 (316)

**Material**
POM, stainless steel 316

**Weight**
40 g

**Surface quality**
Ra ≤ 1.6 µm
OUTSIDE

**Surface quality**
Ra ≤ 1.6 µm
INSIDE

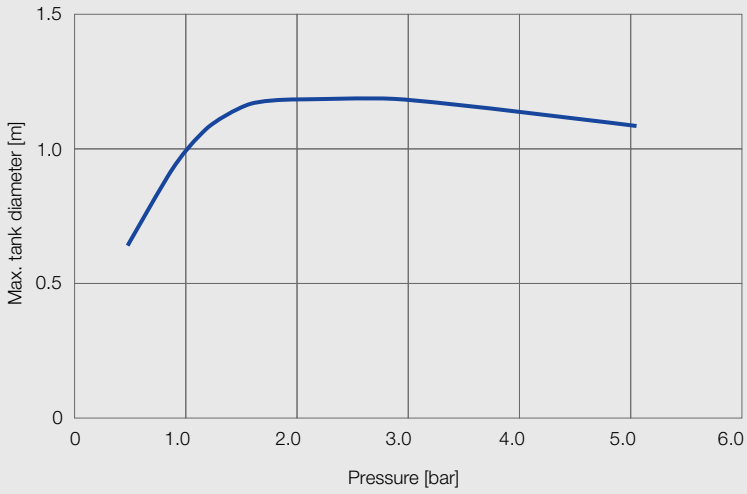
**Steam suitability**
Not suitable

**Insertion diameter**
29 mm

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

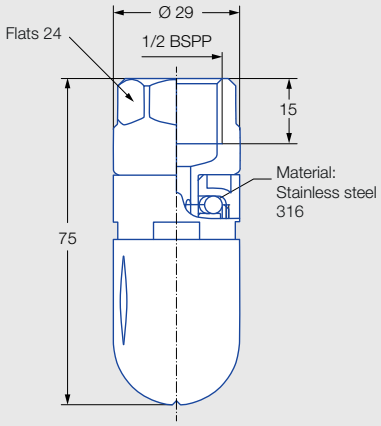
**Recommended operating pressure**
2 bar

**Max. tank diameter**
The specified maximum tank diameter applies to the recommended operating pressure and is indicative only. The type of soiling is also decisive for the cleaning result.




Overview of maximum tank diameter depending on pressure

Dimensions in mm.




**Female thread**

| Spray angle | Order no. / Type | Narrowest cross-section Ø [mm] | V̇ water [l/min] p [bar] ($p_{max}$ = 5 bar) | | | V̇ water | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|
| | | | 1.0 | **2.0** | 3.0 | at 2 bar [$m^3$/h] | |
| 300° | **500.186.56.AH** | 1.9 | 13 | **18** | 22 | 1.1 | 1.3 |

**Information on operation**

Compressed air can be used only for a short time for blowing dry. Use above the recommended pressure will have a negative effect on the cleaning result and wear.

# Rotating cleaning nozzle PVDF MicroWhirly
## Series 500.191

**Features:**
- Developed for work in corrosive environments
- Good suitability for food contact and foam delivery
- Made completely of PVDF

FDA

**Function video**
**www.lechler.com/de-en/medialibrary/videos-general-industry**
Or scan the QR code.

**Series 500.191**

**Technical data:**

**Maximum operating temperature**
95 °C

**Maximum ambient temperature**
150 °C

**Installation**
Operation in every installation position

**Bearing**
Slide bearing made of PVDF

**Material**
PVDF

**Weight**
12–30 g

**Surface quality**
Ra ≤ 1.6 µm
OUTSIDE

**Surface quality**
Ra ≤ 1.6 µm
INSIDE

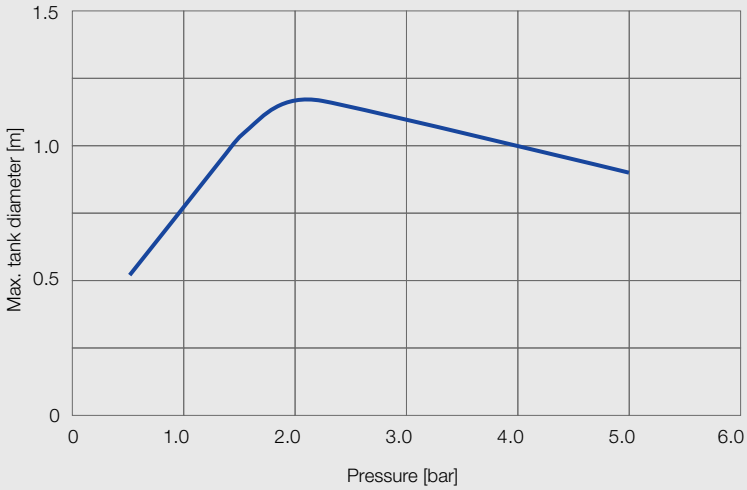
**Steam suitability**
Not suitable

**Insertion diameter**
30 mm

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

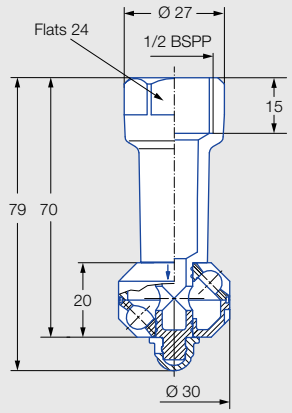
**Recommended operating pressure**
2 bar

**Max. tank diameter**
The specified maximum tank diameter applies to the recommended operating pressure and is indicative only. The type of soiling is also decisive for the cleaning result.

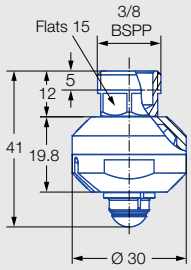



**Overview of maximum tank diameter depending on pressure**

Dimensions in mm.




**Standard version**
**Female thread**




**Compact version**
**Male thread**

### Standard version with female thread

| Spray angle | Order no. / Type | Narrowest cross-section Ø [mm] | V̇ water [l/min] p [bar] ($p_{max}$ = 5 bar) 1.0 | **2.0** | 3.0 | V̇ water at 2 bar [m³/h] | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|
| 180° | **500.191.5E.02** | 2.2 | 9 | **13** | 16 | 0.8 | 0.8 |
| 180° | **500.191.5E.01** | 2.2 | 9 | **13** | 16 | 0.8 | 0.8 |
| 270° | **500.191.5E.31** | 2.2 | 14 | **20** | 25 | 1.2 | 1.1 |
| 360° | **500.191.5E.00** | 2.2 | 14 | **20** | 25 | 1.2 | 1.1 |

### Compact version with male thread

| Spray angle | Order no. / Type | Narrowest cross-section Ø [mm] | V̇ water [l/min] p [bar] ($p_{max}$ = 5 bar) 1.0 | **2.0** | 3.0 | V̇ water at 2 bar [m³/h] | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|
| 180° | **500.191.5E.21** | 2.2 | 9 | **13** | 16 | 0.8 | 0.8 |
| 360° | **500.191.5E.22** | 2.2 | 14 | **20** | 25 | 1.2 | 1.1 |

### Information on operation

The PVDF MicroWhirly is not suitable for operation with compressed air or another gas. Use above the recommended pressure will have a negative effect on the cleaning result and wear.

# Rotating cleaning nozzle NanoSpinner 2
## Series 5M1

**Features:**
- Compact design for confined spaces
- Hygienic design
- Suitable for high temperatures
- Completely made of stainless steel 1.4404 (316L) or 2.4602 (Alloy 22)

FDA

**Series 5M1**

**Function video**
www.lechler.com/de-en/medialibrary/videos-general-industry
Or scan the QR code.

**Technical data:**

**Maximum operating temperature**
200 °C
95 °C (ATEX)

**Maximum ambient temperature**
250 °C
200 °C (ATEX)

**Installation**
Operation in every installation position

**Bearing**
Double ball bearing made of stainless steel 1.4404 (316L) or 2.4602 (Alloy 22)

**Material**
Stainless steel 1.4404 (316L) or 2.4602 (Alloy 22)

**Weight**
20 g

**Surface quality**
Ra ≤ 0.4 µm
OUTSIDE

**Surface quality**
Ra ≤ 0.8 µm
INSIDE

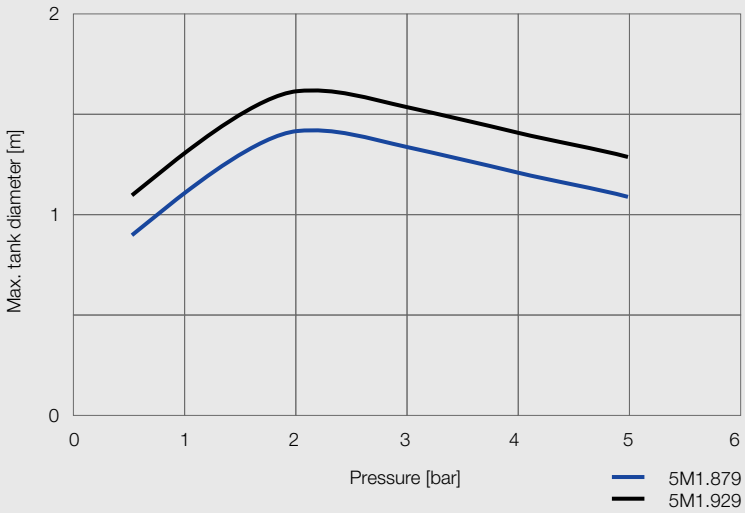
**Steam suitability**
Not suitable

**Insertion diameter**
17–34 mm

**Recommended filter**
Line strainer with a mesh size of 0.1 mm/170 mesh

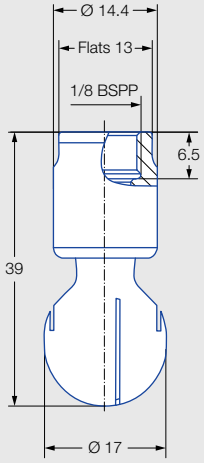
**Recommended operating pressure**
2 bar

**Max. tank diameter**
The specified maximum tank diameter applies to the recommended operating pressure and is indicative only. The type of soiling is also decisive for the cleaning result.

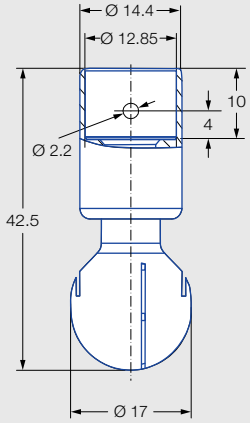



**Overview of maximum tank diameter depending on pressure**

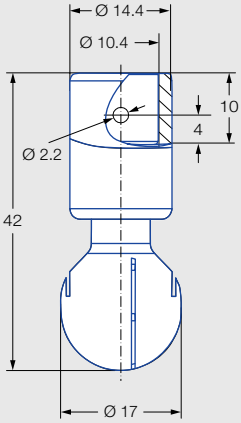
Dimensions in mm.



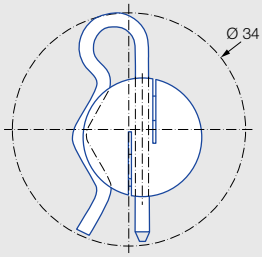

**Female thread**



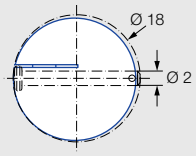

**Dimensions of slip-on connection according to ASME-BPE (OD tube)**




**Dimensions of slip-on connection according to DIN 11866 series B**




**Insertion diameter of slip-on connection 1.4404 (316L)**




**Insertion diameter of slip-on connection 2.4602 (Alloy 22)**

| Spray angle | Order no. | | | | | | Narrowest cross-section Ø [mm] | V̇ water [l/min] | | | V̇ water | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Type | Mat. no. | | Connection | | | | p [bar] ($p_{max}$ = 7 bar) | | | | |
| | | 1Y | 21 | | | | | | | | | |
| | | Stainless steel 1.4404 (316L) | 2.4602 (Alloy 22) | 1/8 BSPP | Ø 10.2 mm in accordance with DIN 11866 Series B | 1/2" slip-on connection | | 1.0 | **2.0** | 3.0 | at 2 bar [m³/h] | |
| 360° | **5M1.879** | ● | ● | **AB** | **TF04** | **TF05**[1] | 0.4 | 11 | **15** | 18 | 0.9 | 1.4 |
| | **5M1.929** | ● | ● | **AB** | **TF04** | **TF05**[1] | 0.5 | 14 | **20** | 25 | 1.2 | 1.6 |

[1] The connection variant TF05 is not available as an ATEX variant.

NPT threads and weld-on version on request.

**Information on operation**

Compressed air can be used only for a short time for blowing dry. Use above the recommended pressure will have a negative effect on the cleaning result and wear.

**Information on slip-on connection**

- Cotter pin made of stainless steel 1.4404 (316L) included (Order no. 05M.130.1Y.00.00). For version made of 2.4602 (Alloy 22), bolt with head incl. cotter pin included (Order no. 05M.131.21.00.00).
- Depending on the adapter diameter, the flow rate may increase due to the leakage between the adapter and rotating cleaning nozzle.

## Ordering example with FDA and (EC) 1935/2004 conformity.

**All materials are suitable for contact with food.**

| Type | + | Material no. | + | Connection | = | Order no. |
|---|---|---|---|---|---|---|
| 5M1.879 | + | 1Y | + | AB | = | 5M1.879.1Y.AB |

## Ordering example with ATEX approval. FDA and (EC) 1935/2004 conformity.

**Unit group/Category/Zones:**

Ⓔx II 1G Ex h IIB T6…T2 Ga

Ⓔx II 1D Ex h IIIC T85 °C...T250 °C Da

**Important**

The code for the connection changes for the ATEX version with slip-on connection.
Ordering example for slip-on connection: 5M1.879.1Y.T0.EX

| Type | + | Material no. | + | Connection | + | ATEX | = | Order no. |
|---|---|---|---|---|---|---|---|---|
| 5M1.879 | + | 1Y | + | AB | + | EX | = | 5M1.879.1Y.AB.EX |

# Rotating cleaning nozzle MicroSpinner 2
## Series 5M2

**Features:**
- Hygienic design
- Suitable for high temperatures
- Completely made of stainless steel 1.4404 (316L) or 2.4602 (Alloy 22)

FDA

**Function video**
www.lechler.com/de-en/medialibrary/videos-general-industry
Or scan the QR code.

**Series 5M2**

**Technical data:**

**Maximum operating temperature**
200 °C
95 °C (ATEX)

**Maximum ambient temperature**
250 °C
200 °C (ATEX)

**Installation**
Operation in every installation position

**Bearing**
Double ball bearing made of stainless steel 1.4404 (316L) or 2.4602 (Alloy 22)

**Material**
Stainless steel 1.4404 (316L) or 2.4602 (Alloy 22)

**Weight**
80–100 g

**Surface quality**
Ra ≤ 0.4 µm

**Surface quality**
Ra ≤ 0.8 µm

**Steam suitability**
Conditionally suitable

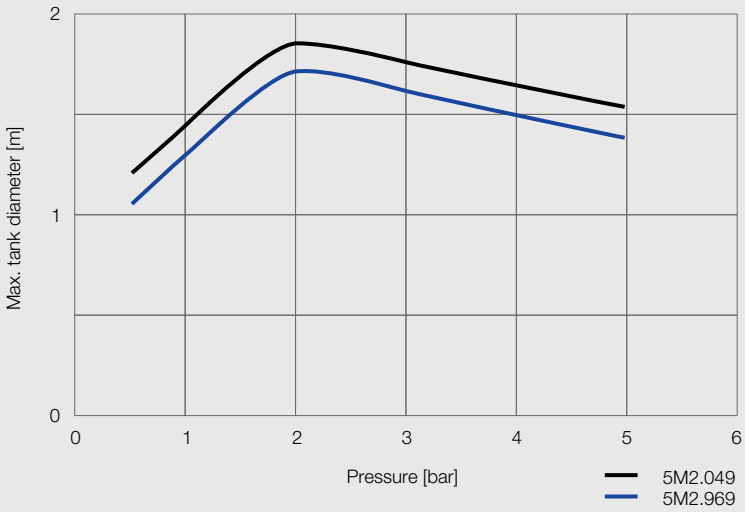
**Insertion diameter**
28–48 mm

**Recommended filter**
Line strainer with a mesh size of 0.1 mm/170 mesh

**Recommended operating pressure**
2 bar

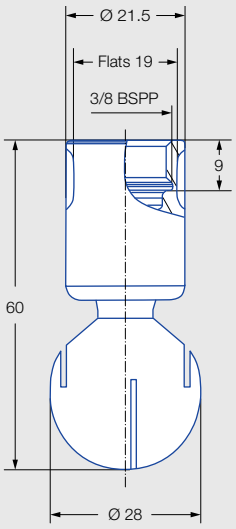
**Adapter**
3/8 BSPP is compatible with HygienicFit

**Max. tank diameter**
The specified maximum tank diameter applies to the recommended operating pressure and is indicative only. The type of soiling is also decisive for the cleaning result.

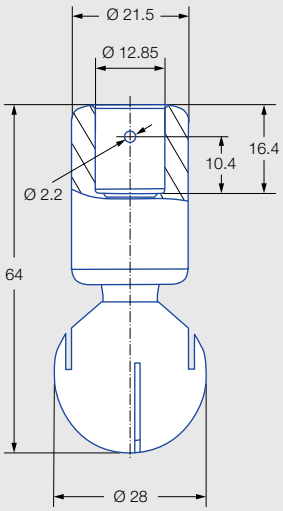



**Overview of maximum tank diameter depending on pressure**

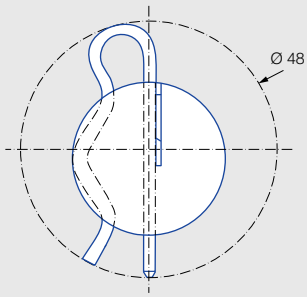
Dimensions in mm.



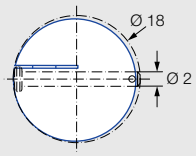

**Female thread**




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




**Insertion diameter of slip-on connection Stainless steel 1.4404 (316L)**




**Insertion diameter of slip-on connection 2.4602 (Alloy 22)**

| Spray angle | Order no. | | | | | Narrowest cross-section Ø [mm] | V̇ water [l/min] | | | V̇ water | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Type | Mat. no. | | Connection | | | p [bar] ($p_{max}$ = 7 bar) | | | | |
| | | 1Y | 21 | | | | | | | | |
| | | Stainless steel 1.4404 (316L) | 2.4602 (Alloy 22) | 3/8 BSPP | 1/2" slip-on connection | | 1.0 | **2.0** | 3.0 | at 2 bar [m³/h] | |
| 60° | **5M2.952** | ● | ● | **AF** | **TF05** | 1.5 | 16 | **23** | 28 | 1.4 | – |
| | **5M2.042** | ● | ● | **AF** | **TF05** | 3.0 | 28 | **40** | 49 | 2.4 | – |
| 180° | **5M2.004** | ● | ● | **AF** | **TF05** | 0.9 | 22 | **32** | 39 | 1.9 | 1.8 |
| 360° | **5M2.969** | ● | ● | **AF** | **TF05** | 0.8 | 18 | **25** | 31 | 1.5 | 1.7 |
| | **5M2.049** | ● | ● | **AF** | **TF05** | 0.9 | 28 | **39** | 48 | 2.3 | 1.8 |

NPT threads, other slip-on connections and weld-on versions on request.

**Information on operation**

Compressed air can be used only for a short time for blowing dry. Use above the recommended pressure will have a negative effect on the cleaning result and wear.

**Information on slip-on connection**

- Cotter pin made of stainless steel 1.4404 (316L) included (Order no. 05M.230.1Y.00.00). For version made of 2.4602 (Alloy 22), bolt with head incl. cotter pin included (Order no. 05M.231.21.00.00).
- Depending on the adapter diameter, the flow rate may increase due to the leakage between the adapter and rotating cleaning nozzle.

## Ordering example with FDA and (EC) 1935/2004 conformity.

**All materials are suitable for contact with food.**

| Type | + | Material no. | + | Connection | = | Order no. |
|---|---|---|---|---|---|---|
| 5M2.952 | + | 1Y | + | AF | = | 5M2.952.1Y.AF |

## Ordering example with ATEX approval. FDA and (EC) 1935/2004 conformity.

**Unit group/Category/Zones:**

Ⓔx II 1G Ex h IIB T6…T2 Ga

Ⓔx II 1D Ex h IIIC T85 °C...T250 °C Da

**Important**

The code for the connection changes for the ATEX version with slip-on connection.
Ordering example for slip-on connection: 5M2.952.1Y.T1.EX

| Type | + | Material no. | + | Connection | + | ATEX | = | Order no. |
|---|---|---|---|---|---|---|---|---|
| 5M2.952 | + | 1Y | + | AF | + | EX | = | 5M2.952.1Y.AF.EX |

# Rotating cleaning nozzle MiniSpinner 2
## Series 5M3

**Features:**
- Hygienic design
- Suitable for high temperatures
- Completely made of stainless steel 1.4404 (316L) or 2.4602 (Alloy 22)


FDA

**Function video**
**www.lechler.com/de-en/medialibrary/videos-general-industry**
Or scan the QR code.

**Series 5M3**

**Technical data:**

**Maximum operating temperature**
200 °C
95 °C (ATEX)

**Maximum ambient temperature**
250 °C
200 °C (ATEX)

**Installation**
Operation in every installation position

**Bearing**
Double ball bearing made of stainless steel 1.4404 (316L) or 2.4602 (Alloy 22)

**Material**
Stainless steel 1.4404 (316L) or 2.4602 (Alloy 22)

**Weight**
230–340 g

**Surface quality**
Ra ≤ 0.4 µm

**Surface quality**
Ra ≤ 0.8 µm

**Steam suitability**
Conditionally suitable

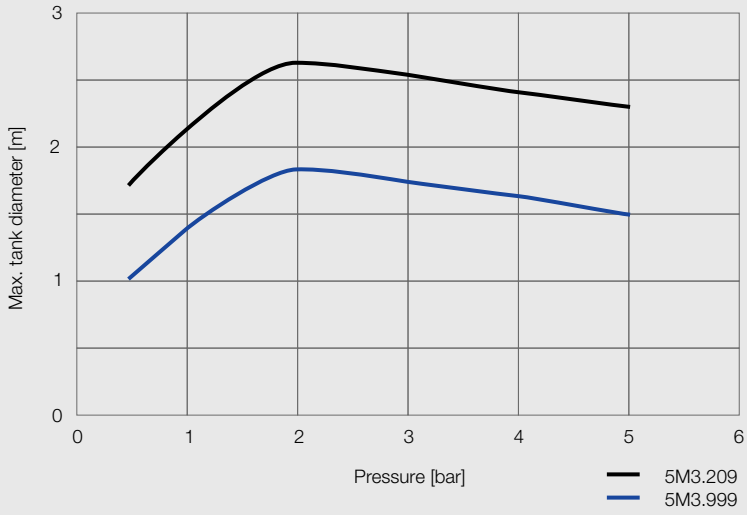
**Insertion diameter**
39–58 mm

**Recommended filter**
Line strainer with a mesh size of 0.1 mm/170 mesh

**Recommended operating pressure**
2 bar

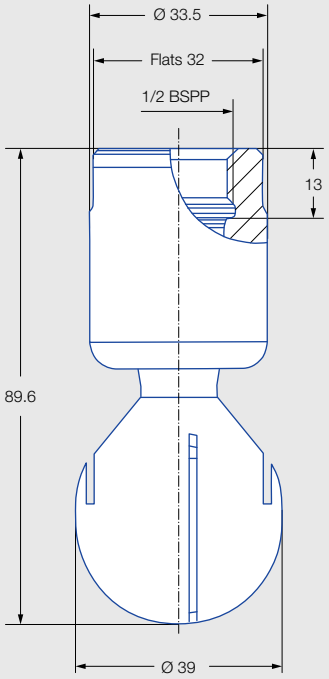
**Adapter**
1/2 BSPP and 3/4 BSPP are compatible with HygienicFit

**Max. tank diameter**
The specified maximum tank diameter applies to the recommended operating pressure and is indicative only. The type of soiling is also decisive for the cleaning result.

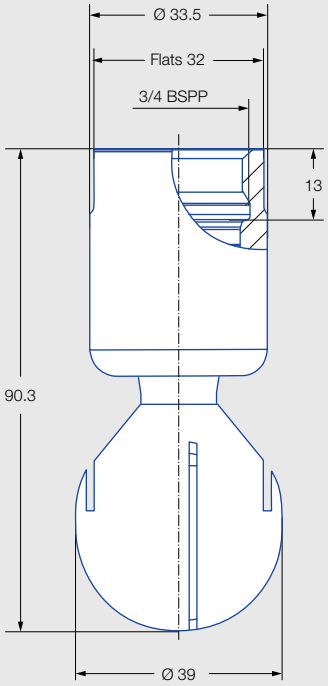



**Overview of maximum tank diameter depending on pressure**

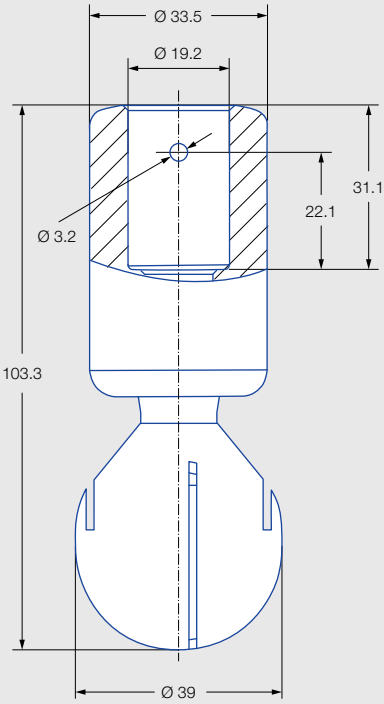
Dimensions in mm.



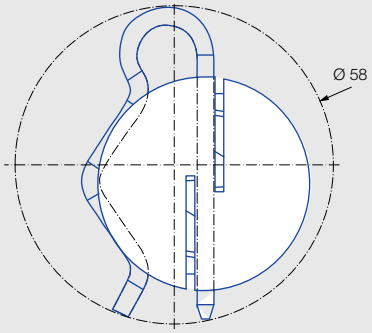

**Female thread**



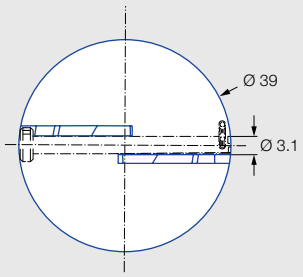

**Female thread**




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




**Insertion diameter of slip-on connection stainless steel 1.4404 (316L)**




**Insertion diameter of slip-on connection 2.4602 (Alloy 22)**

| Spray angle | Order no. | | | | | | Narrowest cross-section Ø [mm] | V̇ water [l/min] | | | V̇ water | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Type | Mat. no. | | Connection | | | | p [bar] ($p_{max}$ = 7 bar) | | | | |
| | | 1Y | 21 | | | | | | | | | |
| | | Stainless steel 1.4404 (316L) | 2.4602 (Alloy 22) | 1/2 BSPP | 3/4 BSPP | 3/4" slip-on connection | | 1.0 | **2.0** | 3.0 | at 2 bar [m³/h] | |
| 60° | **5M3.122** | ● | ● | **AH** | | **TF07** | 2.6 | 45 | **63** | 77 | 3.8 | – |
| 180° | **5M3.133** | ● | ● | | **AL** | **TF07** | 1.2 | 47 | **67** | 82 | 4.0 | 2.6 |
| 180° | **5M3.134** | ● | ● | | **AL** | **TF07** | 1.3 | 47 | **67** | 82 | 4.0 | 2.6 |
| 360° | **5M3.999** | ● | ● | | **AL** | **TF07** | 0.4 | 21 | **30** | 37 | 1.8 | 1.8 |
| | **5M3.089** | ● | ● | | **AL** | **TF07** | 0.7 | 35 | **49** | 60 | 2.9 | 2.1 |
| | **5M3.139** | ● | ● | | **AL** | **TF07** | 0.8 | 49 | **69** | 85 | 4.1 | 2.3 |
| | **5M3.209** | ● | ● | | **AL** | **TF07** | 1.5 | 71 | **100** | 122 | 6.0 | 2.6 |

NPT threads, other plug connections and weld-on versions on request.

**Information on operation**
Compressed air can be used only for a short time for blowing dry. Use above the recommended pressure will have a negative effect on the cleaning result and wear.

**Information on slip-on connection**
- Cotter pin made of stainless steel 1.4404 (316L) included (05M.330.1Y.00.00). For version made of 2.4602 (Alloy 22), bolt with head incl. cotter pin included (Order no. 05M.332.21.00.00).
- Depending on the adapter diameter, the flow rate may increase due to the leakage between the adapter and rotating cleaning nozzle.

## Ordering example with FDA and (EC) 1935/2004 conformity.

**All materials are suitable for contact with food.**

| Type | + | Material no. | + | Connection | = | Order no. |
|---|---|---|---|---|---|---|
| 5M3.122 | + | 1Y | + | AH | = | 5M3.122.1Y.AH |

## Ordering example with ATEX approval. FDA and (EC) 1935/2004 conformity.

**Unit group/Category/Zones:**
Ex II 1G Ex h IIB T6…T2 Ga
Ex II 1D Ex h IIIC T85 °C...T250 °C Da

**Important**
The code for the connection changes for the ATEX version with slip-on connection.
Ordering example for slip-on connection: 5M3.122.1Y.T2.EX

| Type | + | Material no. | + | Connection | + | ATEX | = | Order no. |
|---|---|---|---|---|---|---|---|---|
| 5M3.122 | + | 1Y | + | AH | + | EX | = | 5M3.122.1Y.AH.EX |

# Rotating cleaning nozzle MaxiSpinner 2
## Series 5M4

**Features:**
- Hygienic design
- Suitable for high temperatures
- Completely made of stainless steel 1.4404 (316L) or 2.4602 (Alloy 22)

FDA

**Function video**
**www.lechler.com/de-en/medialibrary/videos-general-industry**
Or scan the QR code.

**Series 5M4**

**Technical data:**

**Maximum operating temperature**
200 °C
95 °C (ATEX)

**Maximum ambient temperature**
250 °C
200 °C (ATEX)

**Installation**
Operation in every installation position

**Bearing**
Double ball bearing made of stainless steel 1.4404 (316L) or 2.4602 (Alloy 22)

**Material**
Stainless steel 1.4404 (316L) or 2.4602 (Alloy 22)

**Weight**
1.1–1.5 kg

**Surface quality**
Ra ≤ 0.4 µm

**Surface quality**
Ra ≤ 0.8 µm

**Steam suitability**
Conditionally suitable

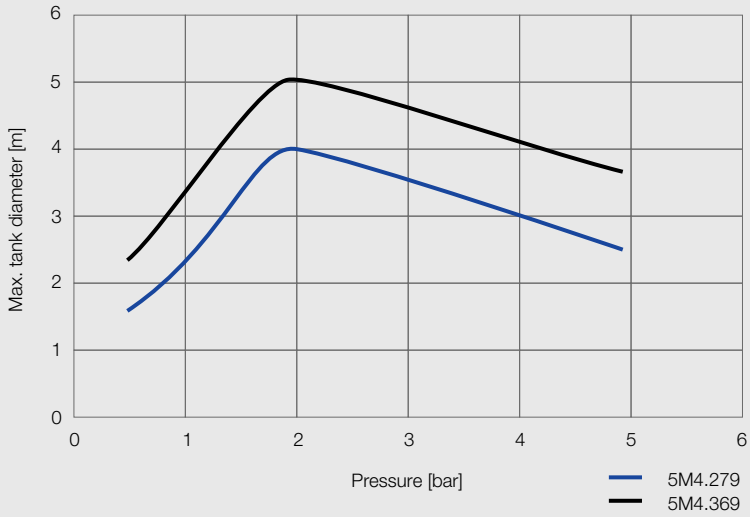
**Insertion diameter**
69 mm

**Recommended filter**
Line strainer with a mesh size of 0.1 mm/170 mesh

**Recommended operating pressure**
2 bar

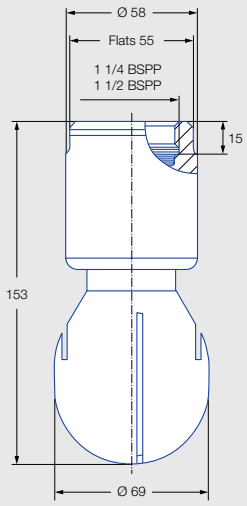
**Adapter**
1 1/4 BSPP and 1 1/2 BSPP are compatible with HygienicFit

**Max. tank diameter**
The specified maximum tank diameter applies to the recommended operating pressure and is indicative only. The type of soiling is also decisive for the cleaning result.

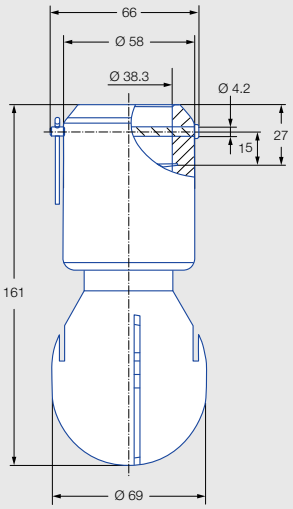



**Overview of maximum tank diameter depending on pressure**

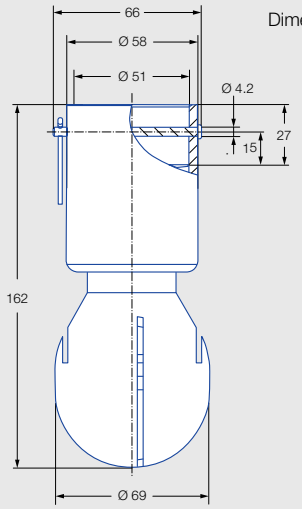
Dimensions in mm.




**Female thread**




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




**Dimensions of 2" slip-on connection according to ASME-BPE (OD tube)**

| Spray angle | Order no. | | | | | | | Narrowest cross-section Ø [mm] | V̇ water [l/min] | | | V̇ water | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Type | Mat. no. | | Connection | | | | | p [bar] ($p_{max}$ = 7 bar)[1] | | | | |
| | | 1Y | 21 | | | | | | | | | | |
| | | 1.4404 (316L) | 2.4602 (Alloy 22) | 1 1/4 BSPP | 1 1/2 BSPP | 1 1/2" slip-on connection | 2" slip-on connection | | 1.0 | **2.0** | 3.0 | at 2 bar [m³/h] | |
| 180° | **5M4.253** | ● | ● | **AQ** | **AS** | **TF15** | **TF20** | 1.8 | 95 | **135** | 165 | 8.1 | 4.0 |
| 180° | **5M4.254** | ● | ● | **AQ** | **AS** | **TF15** | **TF20** | 2.1 | 95 | **135** | 165 | 8.1 | 4.0 |
| 270° | **5M4.365** | ● | ● | **AQ** | **AS** | **TF15** | **TF20** | 2.5 | 177 | **250** | 306 | 15.0 | 5.0 |
| 360° | **5M4.279** | ● | ● | **AQ** | **AS** | **TF15** | **TF20** | 1.7 | 107 | **150** | 184 | 9.0 | 4.0 |
| | **5M4.329** | ● | ● | **AQ** | **AS** | **TF15** | **TF20** | 2.0 | 141 | **200** | 245 | 12.0 | 4.5 |
| | **5M4.369** | ● | ● | **AQ** | **AS** | **TF15** | **TF20** | 2.3 | 177 | **250** | 306 | 15.0 | 5.0 |

[1] Please note the maximum operating pressure of 4 for the 2" slip-on connection variant. NPT threads and weld-on version on request.

### Information on operation

Compressed air can be used only for a short time for blowing dry. Use above the recommended pressure will have a negative effect on the cleaning result and wear.

### Information on slip-on connection

- Bolt with head incl. cotter pin made of 1.4404 (316L) included (Order no. 05M.431.1Y.00.00). For version made of 2.4602 (Alloy 22), bolt with head incl. cotter pin included (05M.431.21.00.00).
- Depending on the adapter diameter, the flow rate may increase due to the leakage between the adapter and rotating cleaning nozzle.

## Ordering example with FDA and (EC) 1935/2004 conformity.

**All materials are suitable for contact with food.**

| Type | + | Material no. | + | Connection | = | Order no. |
|---|---|---|---|---|---|---|
| 5M4.253 | + | 1Y | + | AQ | = | 5M4.253.1Y.AQ |

## Ordering example with ATEX approval. FDA and (EC) 1935/2004 conformity.

**Unit group/Category/Zones:**
Ex II 1G Ex h IIB T6…T2 Ga
Ex II 1D Ex h IIIC T85 °C...T250 °C Da

**Important**
The code for the connection changes for the ATEX version with slip-on connection.
Ordering example for 1 1/2" slip-on connection: 5M4.253.1Y.T5.EX
Ordering example for 2" slip-on connection: 5M4.253.1Y.T6.EX

| Type | + | Material no. | + | Connection | + | ATEX | = | Order no. |
|---|---|---|---|---|---|---|---|---|
| 5M4.253 | + | 1Y | + | AQ | + | EX | = | 5M4.253.1Y.AQ.EX |

# Rotating cleaning nozzle PTFE Whirly
## Series 573/583

**Features:**
- Entirely made of PTFE
- 3-A-compliant slip-on connection
- Suitable for corrosive environments
- Suitable for particularly high hygiene requirements (e.g. milk industry)

FDA

**Function video**
www.lechler.com/de-en/medialibrary/videos-general-industry
Or scan the QR code.

**Series 573/583**

**Technical data:**

**Maximum operating temperature**
95 °C

**Maximum ambient temperature**
200 °C

**Installation**
Operation in every installation position

**Bearing**
Slide bearing made of PTFE

**Material**
PTFE

**Weight**
140–300 g

**Surface quality**
Ra ≤ 0.8 µm
OUTSIDE

**Surface quality**
Ra ≤ 0.8 µm
INSIDE

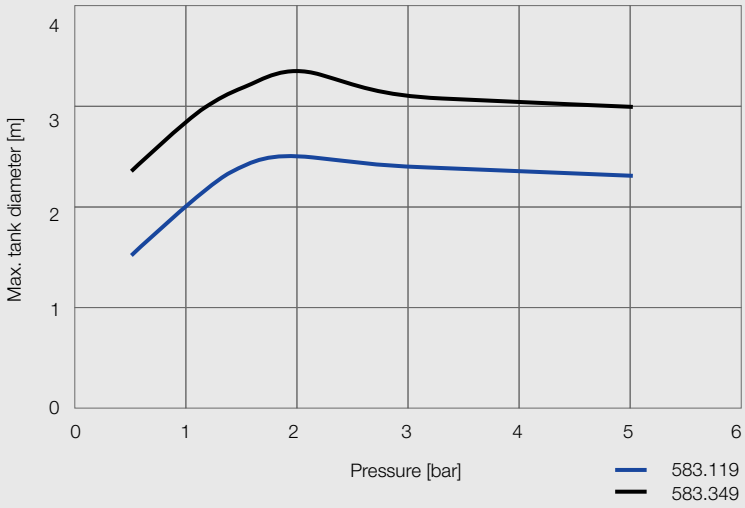
**Steam suitability**
Not suitable

**Insertion diameter**
49.0–78.4 mm

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

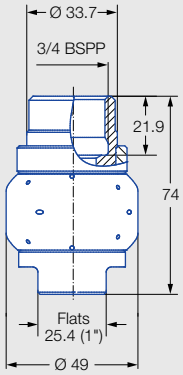
**Recommended operating pressure**
2 bar

**Max. tank diameter**
The specified maximum tank diameter applies to the recommended operating pressure and is indicative only. The type of soiling is also decisive for the cleaning result.

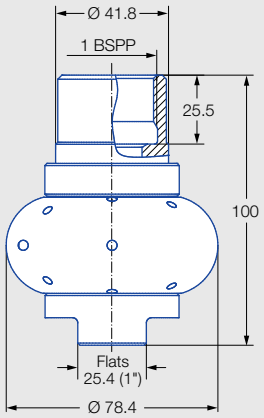



**Overview of maximum tank diameter depending on pressure**

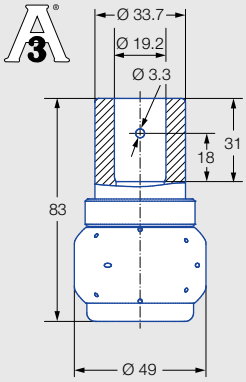
Dimensions in mm.



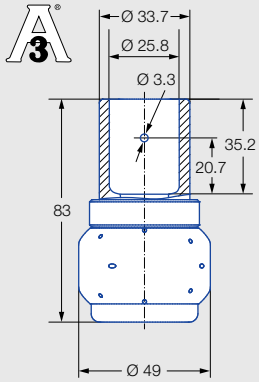

**Female thread**



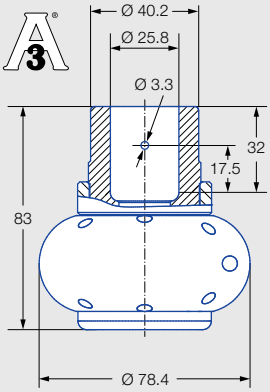

**Female thread**



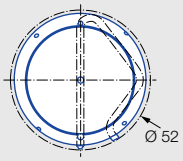

**3/4" slip-on connection (3-A-compliant) Dimensions of slip-on connection according to ASME-BPE (OD tube)**



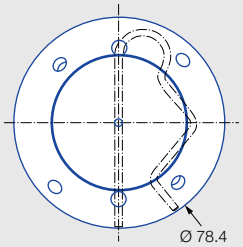

**1" slip-on connection pin 1 (3-A-compliant) Dimensions of slip-on connection according to ASME-BPE (OD tube)**




**1" slip-on connection pin 2 (3-A-compliant) Dimensions of slip-on connection according to ASME-BPE (OD tube)**




**Insertion diameter of slip-on connection according to ASME-BPE (OD tube)**




**Insertion diameter of slip-on connection according to ASME-BPE (OD tube)**

| Spray angle | Order no. | | | | | Narrowest cross-section Ø [mm] | V̇ water [l/min] | | | V̇ water | Pin | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Type | Connection | | | | | p [bar] ($p_{max}$ = 6 bar) | | | | | |
| | | 3/4 BSPP | 1 BSPP | 3/4" slip-on connection | 1" slip-on connection | | 1.0 | **2.0** | 3.0 | at 2 bar [m³/h] | | |
| 270°  | **583.116.55** | **AL** | | **TF07** | | 2.4 | 47 | **67** | 82 | 4.0 | 1 | 2.5 |
| | **583.346.55** | | | | **TF10** | 5.9 | 159 | **225** | 276 | 13.5 | 2 | 3.2 |
| 270°  | **573.116.55** | **AL** | | **TF07** | | 2.4 | 47 | **67** | 82 | 4.0 | 1 | 2.5 |
| 360°  | **583.119.55** | **AL** | | **TF07** | **TF10** | 1.8 | 41 | **58** | 71 | 3.5 | 1 | 2.4 |
| | **583.209.55** | **AL** | | **TF07** | **TF10** | 3.5 | 71 | **100** | 122 | 6.0 | 1 | 2.5 |
| | **583.269.55** | **AL** | | **TF07** | | 4.8 | 103 | **145** | 178 | 8.7 | 1 | 2.8 |
| | **583.279.55** | | **AN** | | **TF10** | 3.7 | 106 | **150** | 184 | 9.0 | 2 | 3.0 |
| | **583.349.55** | | **AN** | | **TF10** | 5.6 | 159 | **225** | 276 | 13.5 | 2 | 3.2 |

NPT threads on request.

### Information on operation

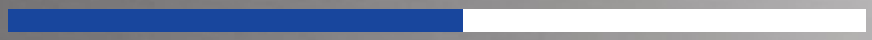
Compressed air can be used only for a short time for blowing dry. Use above the recommended pressure will have a negative effect on the cleaning result and wear.

### Information on slip-on connection

- Cotter pin made of stainless steel 1.4401 (316) included (Order no. for pin 1: 095.013.17.06.60, pin 2: 095.013.17.06.61).
- Depending on the adapter diameter, the flow rate may increase due to the leakage between the adapter and rotating cleaning nozzle.

| Ordering example: | Type | + | Connection | = | Order no. |
|---|---|---|---|---|---|
| | 583.116.55 | + | AL | = | 583.116.55.AL |

# CLEANING EFFICIENCY CLASS 3
# LIGHT TO MEDIUM SOILING

| | |
|---|---|
| **Type** | Rotating cleaner, free-spinning |
| **Cleaning effect** |  |
| **Drive** | By the medium |
| **Typical soiling** | More viscous substances such as chocolate sauce |
| **Nozzle design** | Special flat fan geometry with direct impact on the entire tank surface |


Whirly 2

# Rotating cleaning nozzle HygienicWhirly
## Series 594/595

**Features:**
- Cleaning with effective flat fan jets
- Effective cleaning even at low pressure
- Suitable for foam delivery

FDA

**Function video**
**www.lechler.com/de-en/medialibrary/videos-general-industry**
Or scan the QR code.

**Series 594/595**

**Technical data:**

**Maximum operating temperature**
150 °C

**Maximum ambient temperature**
150 °C

**Installation**
Operation in every installation position

**Bearing**
Slide bearing made of PEEK

**Material**
Stainless steel 1.4404 (316L), PEEK, version with slip-on connection: O-ring made of EPDM

**Weight**
90–290 g

**Surface quality**
Ra ≤ 0.8 µm
OUTSIDE

**Surface quality**
Ra ≤ 0.8 µm
INSIDE

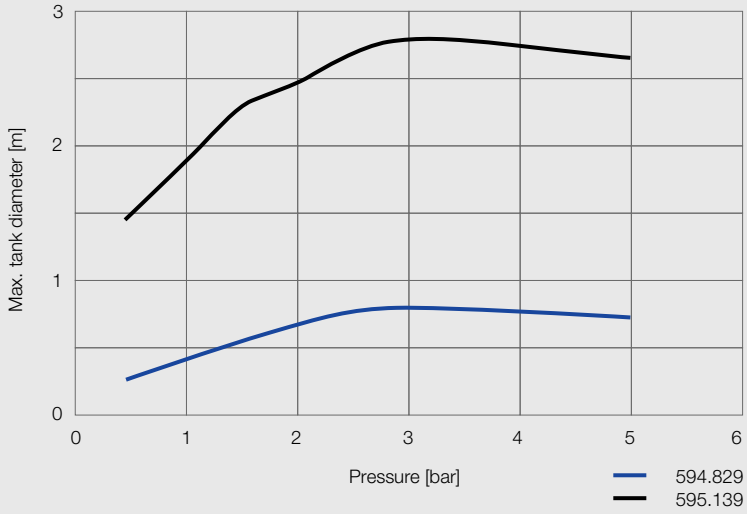
**Steam suitability**
Suitable

**Insertion diameter**
31.5–48.0 mm

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

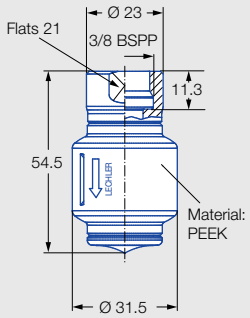
**Recommended operating pressure**
3 bar

**Max. tank diameter**
The specified maximum tank diameter applies to the recommended operating pressure and is indicative only. The type of soiling is also decisive for the cleaning result.

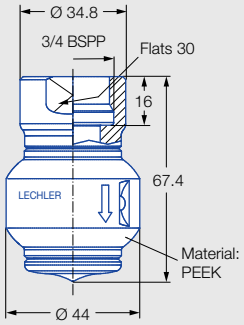



**Overview of maximum tank diameter depending on pressure**

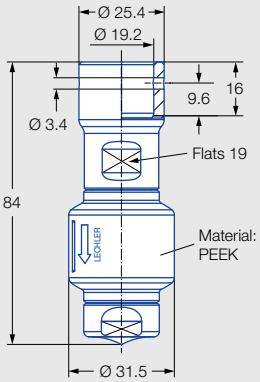
Dimensions in mm.



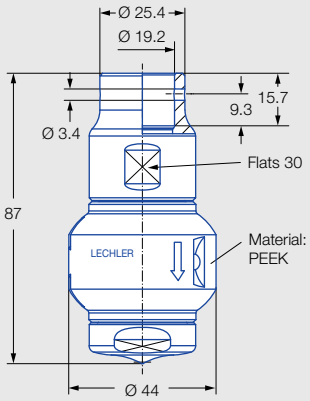

**Standard version**
**Female thread**
**59x.xx9.1Y.AF**



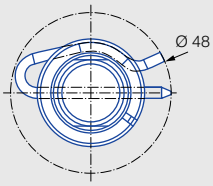

**Standard version**
**Female thread**
**595.139.1Y.AL**



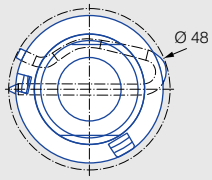

**Dimensions of slip-on connection according to ASME-BPE (OD tube)**
**59x.xx9.1Y.67**




**Dimensions of slip-on connection according to ASME-BPE (OD tube)**
**595.139.1Y.67**




**Insertion diameter of slip-on connection**
**59x.xx9.1Y.67**




**Insertion diameter of slip-on connection**
**595.139.1Y.67**

| Spray angle | Order no. | | | | Narrowest cross-section Ø [mm] | V̇ water [l/min] | | | | | V̇ water | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Type | Connection | | | | p [bar] ($p_{max}$ = 5 bar) | | | | | | |
| | | 3/8 BSPP | 3/4 BSPP | 3/4" slip-on connection | | 0.5 | 1.0 | 2.0 | **3.0** | 5.0 | at 3 bar [m³/h] | |
| 360° | **594.829.1Y** | **AF** | | **67** | 1.7 | 6 | 8 | 11 | **14** | 18 | 0.8 | 0.8 |
| | **594.879.1Y** | **AF** | | **67** | 2.5 | 8 | 11 | 15 | **18** | 23 | 1.1 | 1.2 |
| | **595.009.1Y** | **AF** | | **67** | 4.0 | 16 | 22 | 32 | **39** | 50 | 2.3 | 1.5 |
| | **595.049.1Y** | **AF** | | **67** | 4.2 | 20 | 28 | 40 | **49** | 63 | 2.9 | 2.0 |
| | **595.139.1Y** | | **AL** | **67** | 5.0 | 34 | 47 | 67 | **82** | 106 | 4.9 | 2.7 |

NPT threads on request.

**Information on operation**
Compressed air can be used only for a short time for blowing dry. Use above the recommended pressure will have a negative effect on the cleaning result and wear.

**Information on slip-on connection**
- Cotter pin made of stainless steel 1.4404 (316L) included (Order no. 095.022.1Y.50.94.E).
- Depending on the adapter diameter, the flow rate may increase due to the leakage between the adapter and rotating cleaning nozzle.

| Ordering example: | Type | + | Connection | = | Order no. |
|---|---|---|---|---|---|
| | **594.829.1Y** | + | **AF** | = | **594.829.1Y.AF** |

# Rotating cleaning nozzle Whirly 2
## Series 5W9

**Features:**
- Popular hygienic design
- Cleaning with effective flat fan jets
- Flexible connection options
- Available with many different flow rates and spray angles


FDA

Series 5W9

**Function video**
**www.lechler.com/de-en/medialibrary/videos-general-industry**
Or scan the QR code.

**Technical data:**

**Maximum operating temperature**
150 °C
95 °C (ATEX)

**Maximum ambient temperature**
200 °C
140 °C (ATEX)

**Installation**
Operation in every installation position

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

**Material**
Stainless steel 1.4404 (316L), PEEK

**Weight**
360–500 g

**Surface quality**
Ra ≤ 0.4 µm

**Surface quality**
Ra ≤ 0.8 µm

**Steam suitability**
Not suitable

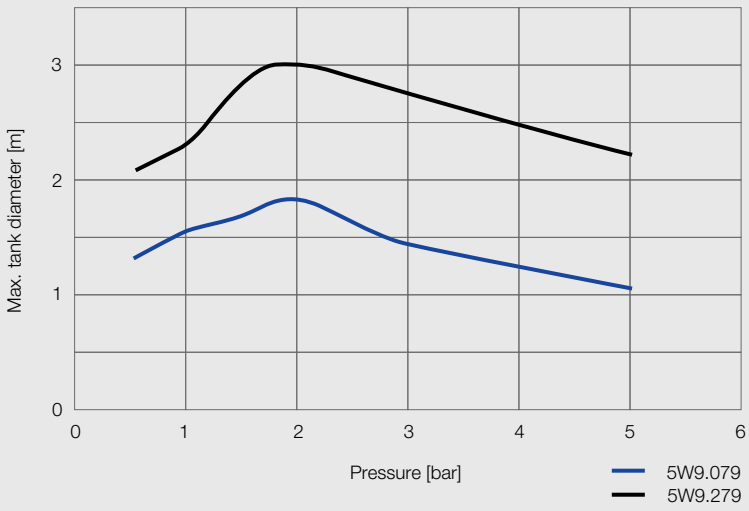
**Insertion diameter**
69.5 mm

**Recommended filter**
Line strainer with a mesh size of 0.1 mm/170 mesh

**Recommended operating pressure**
2 bar

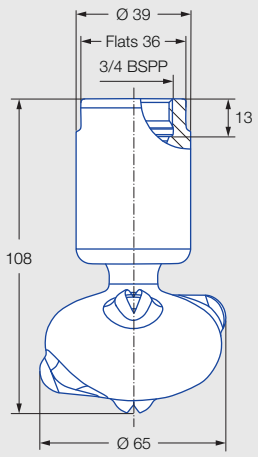
**Adapter**
3/4 BSPP is compatible with HygienicFit

**Max. tank diameter**
The specified maximum tank diameter applies to the recommended operating pressure and is indicative only. The type of soiling is also decisive for the cleaning result.

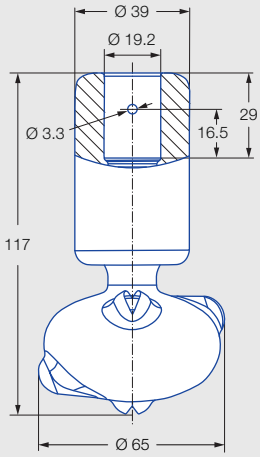



**Overview of maximum tank diameter depending on pressure**

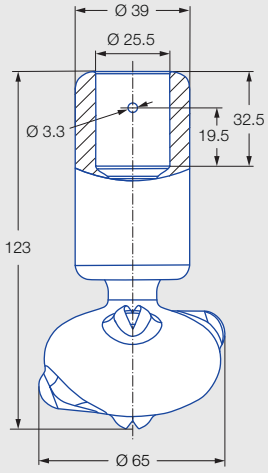
Dimensions in mm.



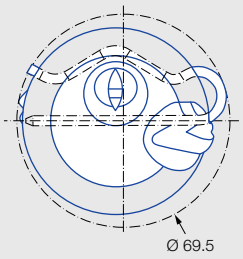

**Female thread**




**Dimensions of 3/4" slip-on connection according to ASME-BPE (OD tube)**




**Dimensions of 1" slip-on connection according to ASME-BPE (OD tube)**




**Insertion diameter of slip-on connection Stainless steel 1.4404 (316L)**

| Spray angle | Order no. | | | | Narrowest cross-section Ø [mm] | V̇ water [l/min] p [bar] ($p_{max}$ = 6 bar) | | | V̇ water | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|---|---|---|
| | Type | Connection | | | | | | | | |
| | | 3/4 BSPP | 3/4" slip-on connection | 1" slip-on connection | | 1.0 | **2.0** | 3.0 | at 2 bar [m³/h] | |
| 270° | **5W9.075.1Y** | **AL** | **TF07** | **TF10** | 2.0 | 34 | **48** | 59 | 2.9 | 1.8 |
| | **5W9.145.1Y** | **AL** | **TF07** | **TF10** | 2.8 | 50 | **71** | 87 | 4.3 | 2.1 |
| | **5W9.195.1Y** | **AL** | **TF07** | **TF10** | 3.3 | 69 | **97** | 119 | 5.8 | 2.6 |
| 270° | **5W9.076.1Y** | **AL** | **TF07** | **TF10** | 2.0 | 34 | **48** | 59 | 2.9 | 1.8 |
| | **5W9.106.1Y** | **AL** | **TF07** | **TF10** | 2.5 | 41 | **58** | 71 | 3.5 | 2.1 |
| | **5W9.196.1Y** | **AL** | **TF07** | **TF10** | 3.4 | 69 | **97** | 119 | 5.8 | 2.6 |
| 360° | **5W9.079.1Y** | **AL** | **TF07** | **TF10** | 1.6 | 34 | **48** | 59 | 2.9 | 1.8 |
| | **5W9.149.1Y** | **AL** | **TF07** | **TF10** | 2.4 | 50 | **71** | 87 | 4.3 | 2.1 |
| | **5W9.199.1Y** | **AL** | **TF07** | **TF10** | 3.0 | 69 | **97** | 119 | 5.8 | 2.6 |
| | **5W9.279.1Y** | **AL** | **TF07** | **TF10** | 3.5 | 103 | **145** | 178 | 8.7 | 3.0 |

NPT threads on request.

**Information on operation**

Compressed air can be used only for a short time for blowing dry. Use above the recommended pressure will have a negative effect on the cleaning result and wear.

**Information on slip-on connection**

- Cotter pin made of stainless steel 1.4404 (316L) included (Order no. 095.013.1Y.06.72).
- Depending on the adapter diameter, the flow rate may increase due to the leakage between the adapter and rotating cleaning nozzle.

## Ordering example with FDA and (EC) 1935/2004 conformity.

**All materials are suitable for contact with food.**

| Type | + | Connection | = | Order no. |
|---|---|---|---|---|
| 5W9.075.1Y | + | AL | = | 5W9.075.1Y.AL |

## Ordering example with ATEX approval. FDA and (EC) 1935/2004 conformity.

**Unit group/Category/Zones:**

Ⓔx II 1G Ex h IIB T6…T3 Ga
Ⓔx II 1D Ex h IIIC T85 °C...T170 °C Da

**Important**

The code for the connection changes for the ATEX version with slip-on connection.
Ordering example for 3/4" slip-on connection: 5W9.075.1Y.T2.EX
Ordering example for 1" slip-on connection: 5W9.075.1Y.T3.EX

| Type | + | Connection | + | ATEX | = | Order no. |
|---|---|---|---|---|---|---|
| 5W9.075.1Y | + | AL | + | EX | = | 5W9.075.1Y.AL.EX |

# Rotating cleaning nozzle Gyro
## Series 577

**Features:**
- Cleaning with powerful nozzle inserts
- Suitable for very large tanks
- Available with many different flow rates
- Clogging-resistant and large clear cross-sections

Series 577

**Function video**
www.lechler.com/de-en/medialibrary/videos-general-industry
Or scan the QR code.

**Technical data:**

**Maximum operating temperature**
95 °C

**Maximum ambient temperature**
200 °C

**Installation**
Vertically downwards

**Bearing**
Slide bearing made of PTFE

**Material**
Stainless steel 1.4404 (316L), PTFE

**Weight**
0.64–1.92 kg

**Surface quality**
Ra ≤ 0.8 µm
OUTSIDE

**Surface quality**
Ra ≤ 4.0 µm
INSIDE

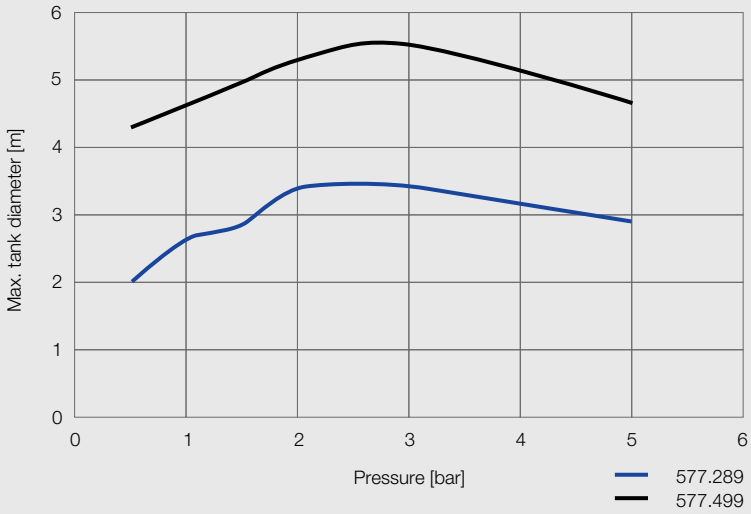
**Steam suitability**
Conditionally suitable

**Insertion diameter**
110–156 mm

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

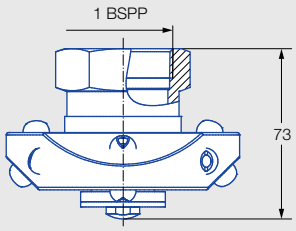
**Recommended operating pressure**
3 bar

**Max. tank diameter**
The specified maximum tank diameter applies to the recommended operating pressure and is indicative only. The type of soiling is also decisive for the cleaning result.

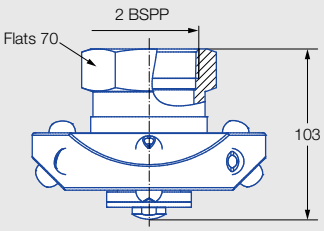



Overview of maximum tank diameter depending on pressure

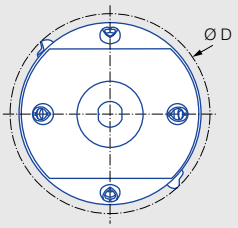
Dimensions in mm.




Female thread




Female thread




Insertion diameter

| Spray angle | Order no. | | | V̇ water [l/min] | | | | V̇ water | Dimensions [mm] | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|---|---|---|
| | Type | Connection | | p [bar] ($p_{max}$ = 5 bar) | | | | | | |
| | | 1 BSPP | 2 BSPP | 1.0 | 2.0 | **3.0** | 5.0 | at 3 bar [m³/h] | Ø D | |
| 180° | **577.283.1Y** | **AN** | | 115 | 163 | **200** | 258 | 12.0 | 118 | 3.4 |
| | **577.363.1Y** | **AN** | | 182 | 258 | **316** | 408 | 19.0 | 118 | 3.9 |
| | **577.403.1Y** | | **AW** | 228 | 322 | **394** | 509 | 23.6 | 156 | 4.2 |
| | **577.433.1Y** | | **AW** | 273 | 386 | **473** | 610 | 28.4 | 156 | 4.6 |
| | **577.523.1Y** | | **AW** | 452 | 639 | **783** | 1,010 | 39.5 | 156 | 5.4 |
| 180° | **577.284.1Y** | **AN** | | 115 | 163 | **200** | 258 | 12.0 | 118 | 3.4 |
| | **577.364.1Y** | **AN** | | 182 | 258 | **316** | 408 | 19.0 | 118 | 3.9 |
| | **577.404.1Y** | | **AW** | 228 | 322 | **394** | 509 | 23.6 | 156 | 4.2 |
| | **577.434.1Y** | | **AW** | 273 | 386 | **473** | 610 | 28.4 | 156 | 4.6 |
| | **577.494.1Y** | | **AW** | 380 | 538 | **659** | 851 | 39.5 | 156 | 5.4 |
| 270° | **577.285.1Y** | **AN** | | 115 | 163 | **200** | 258 | 12.0 | 118 | 3.4 |
| | **577.365.1Y** | **AN** | | 182 | 258 | **316** | 408 | 19.0 | 118 | 3.9 |
| | **577.405.1Y** | | **AW** | 228 | 322 | **394** | 509 | 23.6 | 156 | 4.2 |
| | **577.435.1Y** | | **AW** | 273 | 386 | **473** | 610 | 28.4 | 156 | 4.6 |
| | **577.495.1Y** | | **AW** | 380 | 538 | **659** | 851 | 39.5 | 156 | 5.4 |
| 360° | **577.289.1Y** | **AN** | | 115 | 163 | **200** | 258 | 12.0 | 110 | 3.4 |
| | **577.369.1Y** | **AN** | | 182 | 258 | **316** | 408 | 19.0 | 110 | 3.9 |
| | **577.409.1Y** | | **AW** | 228 | 322 | **394** | 509 | 23.6 | 156 | 4.2 |
| | **577.439.1Y** | | **AW** | 273 | 386 | **473** | 610 | 28.4 | 156 | 4.6 |
| | **577.499.1Y** | | **AW** | 380 | 538 | **659** | 851 | 39.5 | 156 | 5.4 |

NPT threads on request.

**Information on operation**
Compressed air can be used only for a short time for blowing dry. Use above the recommended pressure will have a negative effect on the cleaning result and wear.

| Ordering | Type | + | Connection | = | Order no. |
|---|---|---|---|---|---|
| example: | 577.283.1Y | + | AN | = | 577.283.1Y.AN |

# CLEANING EFFICIENCY CLASS 4
# **MEDIUM TO HEAVY SOILING**

| | |
|---|---|
| **Type** | Rotating cleaner, controlled rotation |
| **Cleaning effect** | |
| **Drive** | By the medium, drive unit with turbine and gear unit |
| **Typical soiling** | Medium soiling such as high-viscosity creams |
| **Nozzle design** | Special flat fan nozzle inserts with direct impact on the entire tank surface |


To prevent
product damage
do not rotate by hand!

# Rotating cleaning nozzle XactClean HP 2
## Series 5S6/5S7

**Features:**
- Flat fan nozzle with high impact
- Uniform cleaning
- High efficiency due to controlled rotation
- High operating reliability thanks to robust drive unit

FDA

Series 5S6/5S7

**Function video**
**www.lechler.com/de-en/medialibrary/videos-general-industry**
Or scan the QR code.

**Technical data:**

**Maximum operating temperature**
150 °C

**Maximum ambient temperature**
150 °C

**Installation**
Operation in every installation position

**Bearing**
Double ball bearing

**Material**
Stainless steel 1.4404 (316L), PEEK, EPDM

**Weight**
650–900 g

**Surface quality**
Ra ≤ 0.8 µm
OUTSIDE

**Surface quality**
Ra ≤ 1.6 µm
INSIDE

**Steam suitability**
Suitable

**Insertion diameter**
50–79 mm

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

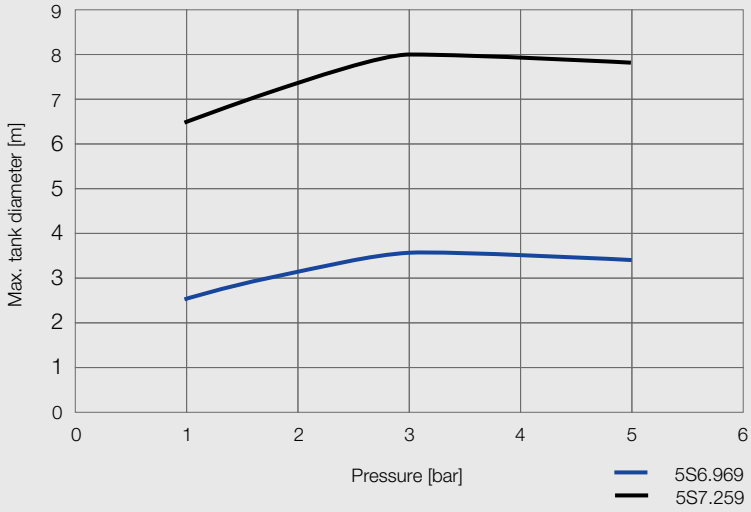
**Recommended operating pressure**
3 bar

**Rotation monitoring**
Sensor-compatible, information:
see pages 96–97

**Maintainable**

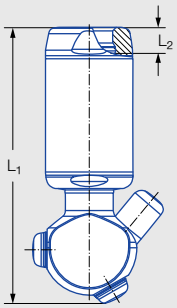
**Adapter**
3/8 BSPP, 1/2 BSPP, 3/4 BSPP and 1 BSPP are compatible with HygienicFit

**Max. tank diameter**
The specified maximum tank diameter applies to the recommended operating pressure and is indicative only. The type of soiling is also decisive for the cleaning result.

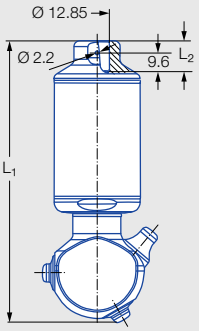



**Overview of maximum tank diameter depending on pressure**

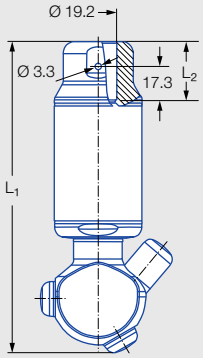
Dimensions in mm.



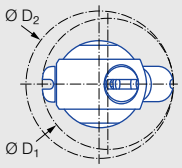

Female thread



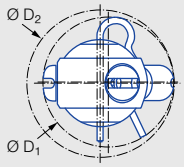

Dimensions of 1/2" slip-on connection according to ASME-BPE (OD tube)




Dimensions of 3/4" slip-on connection according to ASME-BPE (OD tube)




Insertion diameter $D_1$ and interference circle diameter $D_2$ of the threaded connection




Insertion diameter $D_1$ and interference circle diameter $D_2$ of the slip-on connection

| Connection | | Dimensions [mm] | | | |
|---|---|---|---|---|---|
| | | $L_1$ | $L_2$ | Insertion diameter $D_1$ | Interference circle diameter $D_2$ |
| **AF** | 3/8 BSPP | 141.0 | 9.0 | 50.0–66.0 | 50.0–67.0 |
| **AH** | 1/2 BSPP | 143.0 | 13.0 | 50.0–74.0 | 50.0–76.0 |
| **AL** | 3/4 BSPP | 143.0 | 13.2 | 50.0–79.0 | 50.0–81.0 |
| **AN** | 1 BSPP | 140.0 | 16.5 | 51.0–79.0 | 53.0–80.0 |
| **TF05** | 1/2" slip-on connection | 150.0 | 16.0 | 52.0–66.0 | 50.0–67.0 |
| **TF07** | 3/4" slip-on connection | 160.0 | 30.0 | 66.0–79.0 | 50.0–81.0 |

| **Spray angle** | **Order no.** | | | | | | | Narrowest cross-section Ø [mm] | **V̇ water [l/min]** | | | | **V̇ water** | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Type | Connection | | | | | | | **p [bar] ($p_{max}$ = 15 bar)** | | | | | |
| | | 3/8 BSPP | 1/2 BSPP | 3/4 BSPP | 1 BSPP | 1/2" slip-on connection | 3/4" slip-on connection | | 2.0 | **3.0** | 5.0 | 10.0 | at 5 bar [m³/h] | |
| 180° | **5S6.963.1Y** | **AF** | **AH** | | | **TF05** | | 1.7 | 25 | **31** | 40 | 57 | 1.9 | 3.5 |
| | **5S7.043.1Y** | | **AH** | | | | **TF07** | 2.0 | 41 | **50** | 65 | 92 | 3.0 | 4.0 |
| | **5S7.113.1Y** | | **AH** | **AL** | | | **TF07** | 2.0 | 60 | **73** | 94 | 133 | 4.4 | 6.0 |
| | **5S7.183.1Y** | | | **AL** | | | **TF07** | 2.0 | 89 | **109** | 141 | 199 | 6.5 | 7.0 |
| | **5S7.223.1Y** | | | **AL** | | | **TF07** | 2.0 | 111 | **136** | 175 | 248 | 8.2 | 7.5 |
| | **5S7.253.1Y** | | | **AL** | **AN** | | **TF07** | 2.0 | 135 | **165** | 213 | 301 | 9.9 | 8.0 |
| 180° | **5S6.964.1Y** | **AF** | **AH** | | | **TF05** | | 1.7 | 25 | **31** | 40 | 57 | 1.9 | 3.5 |
| | **5S7.044.1Y** | | **AH** | | | | **TF07** | 2.0 | 41 | **50** | 65 | 92 | 3.0 | 4.0 |
| | **5S7.114.1Y** | | **AH** | **AL** | | | **TF07** | 2.0 | 60 | **73** | 94 | 133 | 4.4 | 6.0 |
| | **5S7.184.1Y** | | | **AL** | | | **TF07** | 2.0 | 89 | **109** | 141 | 199 | 6.5 | 7.0 |
| | **5S7.224.1Y** | | | **AL** | | | **TF07** | 2.0 | 111 | **136** | 175 | 248 | 8.2 | 7.5 |
| | **5S7.254.1Y** | | | **AL** | **AN** | | **TF07** | 2.0 | 135 | **165** | 213 | 301 | 9.9 | 8.0 |

| Spray angle | Order no. | | | | | | | Narrowest cross-section Ø [mm] | V̇ water [l/min] | | | | V̇ water | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Type | Connection | | | | | | | p [bar] ($p_{max}$ = 15 bar) | | | | | |
| | | 3/8 BSPP | 1/2 BSPP | 3/4 BSPP | 1 BSPP | 1/2" slip-on connection | 3/4" slip-on connection | | 2.0 | **3.0** | 5.0 | 10.0 | at 5 bar [m³/h] | |
| 270° | **5S6.965.1Y** | **AF** | **AH** | | | **TF05** | | 1.7 | 25 | **31** | 40 | 57 | 1.9 | 3.5 |
| | **5S7.045.1Y** | | **AH** | | | | **TF07** | 2.0 | 41 | **50** | 65 | 92 | 3.0 | 4.0 |
| | **5S7.115.1Y** | | **AH** | **AL** | | | **TF07** | 2.0 | 60 | **73** | 94 | 133 | 4.4 | 6.0 |
| | **5S7.185.1Y** | | | **AL** | | | **TF07** | 2.0 | 89 | **109** | 141 | 199 | 6.5 | 7.0 |
| | **5S7.225.1Y** | | | **AL** | | | **TF07** | 2.0 | 111 | **136** | 175 | 248 | 8.2 | 7.5 |
| | **5S7.255.1Y** | | | **AL** | **AN** | | **TF07** | 2.0 | 135 | **165** | 213 | 301 | 9.9 | 8.0 |
| 270° | **5S6.966.1Y** | **AF** | **AH** | | | **TF05** | | 1.7 | 25 | **31** | 40 | 57 | 1.9 | 3.5 |
| | **5S7.046.1Y** | | **AH** | | | | **TF07** | 2.0 | 41 | **50** | 65 | 92 | 3.0 | 4.0 |
| | **5S7.116.1Y** | | **AH** | **AL** | | | **TF07** | 2.0 | 60 | **73** | 94 | 133 | 4.4 | 6.0 |
| | **5S7.186.1Y** | | | **AL** | | | **TF07** | 2.0 | 89 | **109** | 141 | 199 | 6.5 | 7.0 |
| | **5S7.226.1Y** | | | **AL** | | | **TF07** | 2.0 | 111 | **136** | 175 | 248 | 8.2 | 7.5 |
| | **5S7.256.1Y** | | | **AL** | **AN** | | **TF07** | 2.0 | 135 | **165** | 213 | 301 | 9.9 | 8.0 |
| 360° | **5S6.969.1Y** | **AF** | **AH** | | | **TF05** | | 1.5 | 25 | **31** | 40 | 57 | 1.9 | 3.5 |
| | **5S7.049.1Y** | | **AH** | | | | **TF07** | 2.0 | 41 | **50** | 65 | 92 | 3.0 | 4.0 |
| | **5S7.119.1Y** | | **AH** | **AL** | | | **TF07** | 2.0 | 60 | **73** | 94 | 133 | 4.4 | 6.0 |
| | **5S7.189.1Y** | | | **AL** | | | **TF07** | 2.0 | 89 | **109** | 141 | 199 | 6.5 | 7.0 |
| | **5S7.229.1Y** | | | **AL** | | | **TF07** | 2.0 | 111 | **136** | 175 | 248 | 8.2 | 7.5 |
| | **5S7.259.1Y** | | | **AL** | **AN** | | **TF07** | 2.0 | 135 | **165** | 213 | 301 | 9.9 | 8.0 |

NPT threads on request.

**Information on operation**

Compressed air can be used only for a short time for blowing dry. Use above the recommended pressure will have a negative effect on the cleaning result and wear.

**Information on slip-on connection**

- Cotter pin made of stainless steel 316L included (Order no. 095.022.1Y.50.60.E [TF07], 095.013.1E.05.59 [TF05]).
- Depending on the adapter diameter, the flow rate may increase due to the leakage between the adapter and rotating cleaning nozzle.

## Ordering example with FDA and (EC) 1935/2004 conformity.

**All materials are suitable for contact with food.**

| Type | + | Connection | = | Order no. |
|---|---|---|---|---|
| 5S6.965.1Y | + | AF | = | 5S6.965.1Y.AF |

## Ordering example with ATEX approval. FDA and (EC) 1935/2004 conformity.

**Unit group/Category/Zones:**

Ⓔx II 1G Ex h IIB T6…T3 Ga
Ⓔx II 1D Ex h IIIC T85 °C...T190 °C Da

**Important**

The code for the connection changes for the ATEX version with slip-on connection.
Ordering example for 1/2" slip-on connection: 5S6.963.1Y.T1.EX
Ordering example for 3/4" slip-on connection: 5S7.043.1Y.T2.EX

| Type | + | Connection | + | ATEX | = | Order no. |
|---|---|---|---|---|---|---|
| 5S6.965.1Y | + | AF | + | EX | = | 5S6.965.1Y.AF.EX |

# Rotating cleaning nozzle XactClean HP+
## Series 5S5

**Features:**
- High impact and uniform cleaning thanks to specially developed flat fan nozzles
- Effective cleaning of larger tanks through higher flow rates
- High operating reliability due to robust drive unit

FDA

**Series 5S5**

**Function video**
**www.lechler.com/de-en/medialibrary/videos-general-industry**
Or scan the QR code.

**Technical data:**

**Maximum operating temperature**
150 °C

**Maximum ambient temperature**
150 °C

**Installation**
Operation in every installation position

**Bearing**
Double ball bearing

**Material**
Stainless steel 1.4404 (316L), stainless steel 1.4401 (316), PEEK, EPDM

**Weight**
1.12–1.93 kg

**Surface quality Outside**
Ra ≤ 0.8 µm

**Surface quality Inside**
Ra ≤ 1.6 µm

**Steam suitability**
Suitable

**Insertion diameter**
81–140 mm

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

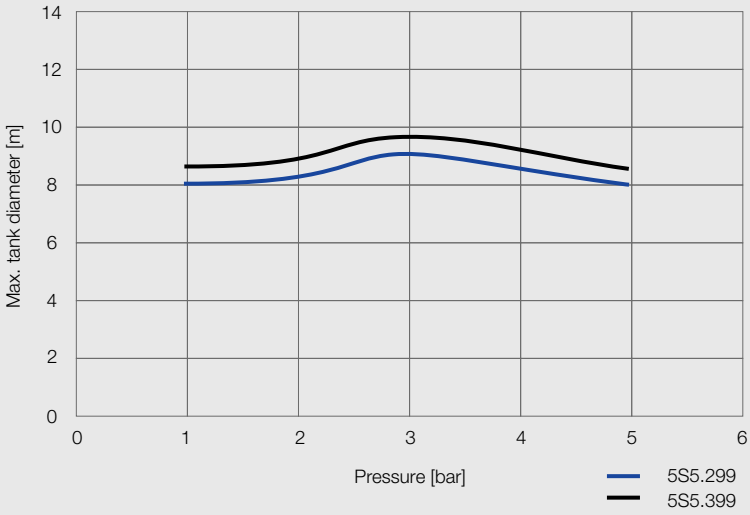
**Recommended operating pressure**
3 bar

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

**Rotation monitoring**
Sensor-compatible, information: see pages 96–97

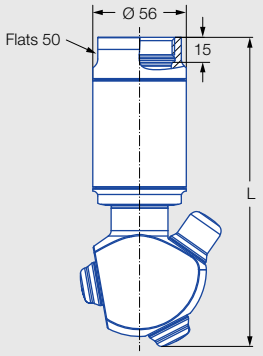
**Maintainable**

**Max. tank diameter**
The specified maximum tank diameter applies to the recommended operating pressure and is indicative only. The type of soiling is also decisive for the cleaning result.

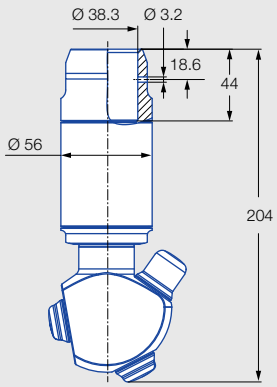



**Overview of maximum tank diameter depending on pressure**

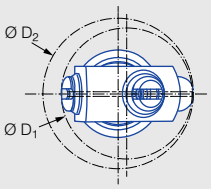
Dimensions in mm.



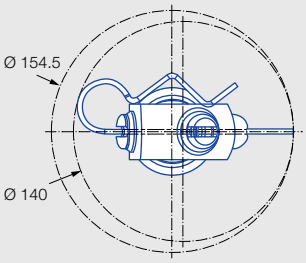

Female thread




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




Insertion diameter $D_1$ and interference circle diameter $D_2$ of the threaded connection




Insertion diameter and interference circle diameter of the slip-on connection

| Connection | | Dimensions [mm] | | |
|---|---|---|---|---|
| | | L | Insertion diameter $D_1$ | Interference circle diameter $D_2$ |
| **AN** | 1 BSPP | 185 | 81–92 | 82–98 |
| **AQ** | 1 1/4 BSPP | 185 | 81–92 | 82–98 |
| **AS** | 1 1/2 BSPP | 187 | 81–92 | 82–98 |

| Spray angle | Order no. | | | | | Narrowest cross-section Ø [mm] | V̇ water [l/min] | | | V̇ water | 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 connection | | 2.0 | **3.0** | 5.0 | at 3 bar [m³/h] | |
| 180° | **5S5.293.1Y** | **AN** | | | **TF15** | 3.0 | 165 | **202** | 261 | 12.1 | 9.0 |
| | **5S5.323.1Y** | **AN** | **AQ** | | **TF15** | 3.0 | 200 | **245** | 316 | 14.7 | 9.2 |
| | **5S5.363.1Y** | | **AQ** | **AS** | **TF15** | 3.0 | 250 | **306** | 395 | 18.4 | 9.4 |
| 180° | **5S5.294.1Y** | **AN** | | | **TF15** | 3.0 | 165 | **202** | 261 | 12.1 | 9.0 |
| | **5S5.324.1Y** | **AN** | **AQ** | | **TF15** | 3.0 | 200 | **245** | 316 | 14.7 | 9.2 |
| | **5S5.364.1Y** | | **AQ** | **AS** | **TF15** | 3.0 | 250 | **306** | 395 | 18.4 | 9.4 |
| 270° | **5S5.295.1Y** | **AN** | | | **TF15** | 3.0 | 165 | **202** | 261 | 12.1 | 9.0 |
| | **5S5.325.1Y** | **AN** | **AQ** | | **TF15** | 3.0 | 200 | **245** | 316 | 14.7 | 9.2 |
| | **5S5.365.1Y** | | **AQ** | **AS** | **TF15** | 3.0 | 250 | **306** | 395 | 18.4 | 9.4 |
| 270° | **5S5.296.1Y** | **AN** | | | **TF15** | 3.0 | 165 | **202** | 261 | 12.1 | 9.0 |
| | **5S5.326.1Y** | **AN** | **AQ** | | **TF15** | 3.0 | 200 | **245** | 316 | 14.7 | 9.2 |
| | **5S5.366.1Y** | | **AQ** | **AS** | **TF15** | 3.0 | 250 | **306** | 395 | 18.4 | 9.4 |
| 360° | **5S5.299.1Y** | **AN** | | | **TF15** | 3.0 | 165 | **202** | 261 | 12.1 | 9.0 |
| | **5S5.329.1Y** | **AN** | **AQ** | | **TF15** | 3.0 | 200 | **245** | 316 | 14.7 | 9.2 |
| | **5S5.369.1Y** | | **AQ** | **AS** | **TF15** | 3.0 | 250 | **306** | 395 | 18.4 | 9.4 |
| | **5S5.399.1Y** | | **AQ** | **AS** | **TF15** | 3.0 | 300 | **367** | 474 | 22.0 | 9.6 |

NPT threads on request.

### Information on operation

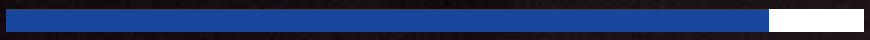
Compressed air can be used only for a short time for blowing dry. Use above the recommended pressure will have a negative effect on the cleaning result and wear.

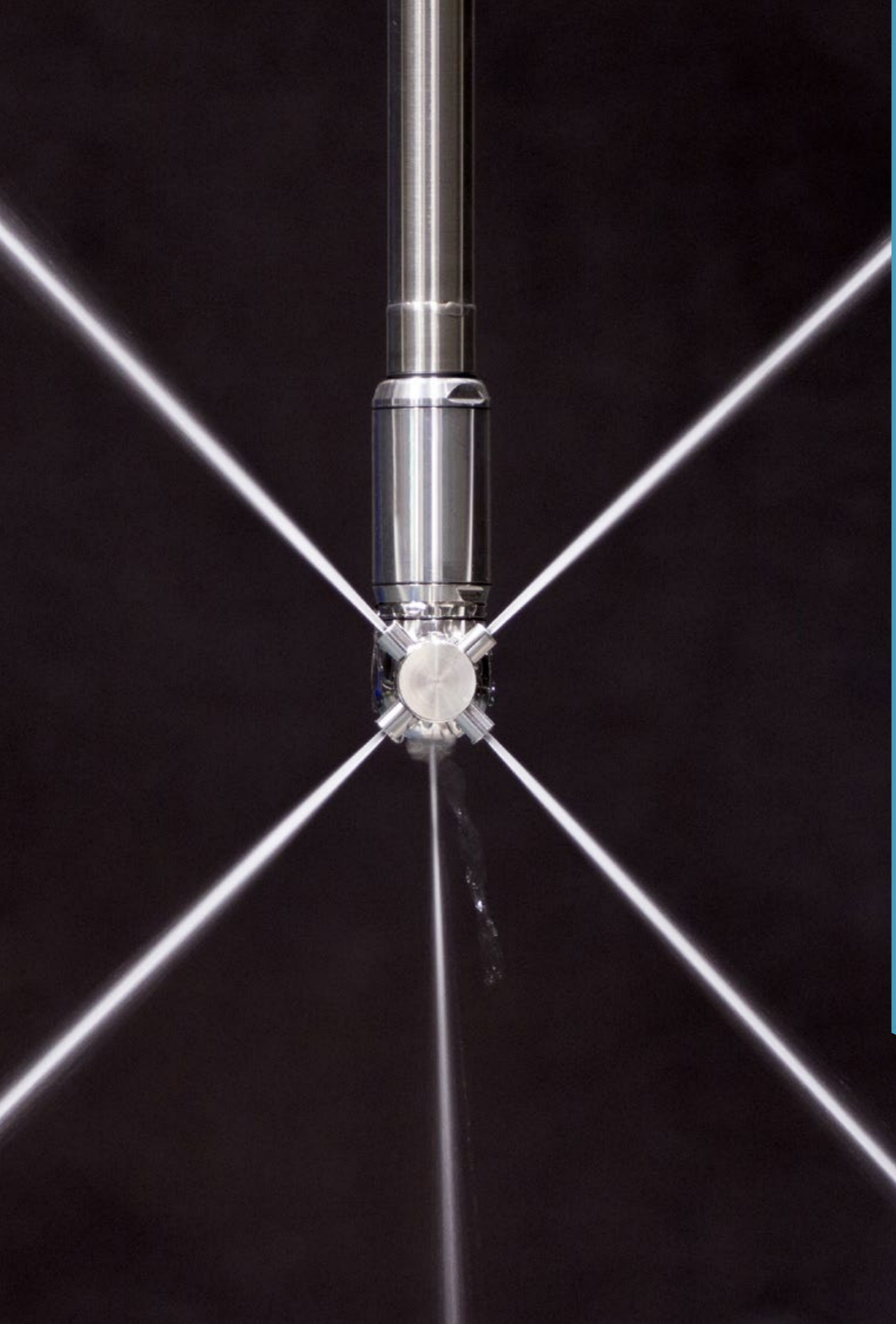
| Ordering example: | Type | + | Connection | = | Order no. |
|---|---|---|---|---|---|
| | **5S5.293.1Y** | + | **AN** | = | **5S5.293.1Y.AN** |

### Information on slip-on connection

- Cotter pin made of stainless steel 1.4404 (316L) included (Order no. 095.013.1Y.06.45).
- Depending on the adapter diameter, the flow rate may increase due to the leakage between the adapter and rotating cleaning nozzle.

# CLEANING EFFICIENCY CLASS 5
# **PERSISTENT SOILING**

| | |
|---|---|
| **Type** | High impact tank cleaning machine, controlled rotation about two axes |
| **Cleaning effect** |  |
| **Drive** | By the medium, drive unit with turbine and gear unit |
| **Typical soiling** | Persistent soiling such as make-up |
| **Nozzle design** | Solid stream nozzles with controlled rotation about two axes, direct impact on the entire tank surface during a cleaning cycle |



Efficiency class 5

# High impact tank cleaning machine MeshClean
## Series 5T2/5T3

**Features:**
- High efficiency thanks to especially powerful solid jet nozzles
- Also suitable for smaller tanks with stubborn soiling
- Active self-cleaning through special nozzle geometry
- Particularly low-maintenance

FDA

**Function video**
www.lechler.com/de-en/medialibrary/videos-general-industry
Or scan the QR code.

**Series 5T2/5T3**

**Technical data:**

**Maximum operating temperature**
150 °C
150 °C (ATEX)

**Maximum ambient temperature**
150 °C
150 °C (ATEX)

**Installation**
Operation in every installation position

**Bearing**
Ball bearing

**Material**
Stainless steel 1.4404 (316L), PTFE, PEEK, EPDM

**Weight**
1.0 kg

**Surface quality**
Ra ≤ 0.8 µm
OUTSIDE

**Surface quality**
Ra ≤ 1.6 µm
INSIDE

**Steam suitability**
Suitable

**Insertion diameter**
68–82 mm

**Recommended filter**
Line strainer with a mesh size of 0.2 mm/80 mesh

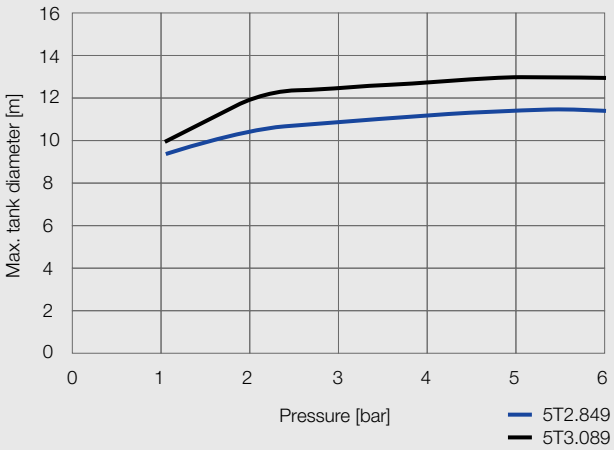
**Recommended operating pressure**
5 bar

**Adapter**
3/4 BSPP is compatible with HygienicFit

**Rotation monitoring**
Sensor-compatible, information:
see pages 96–97

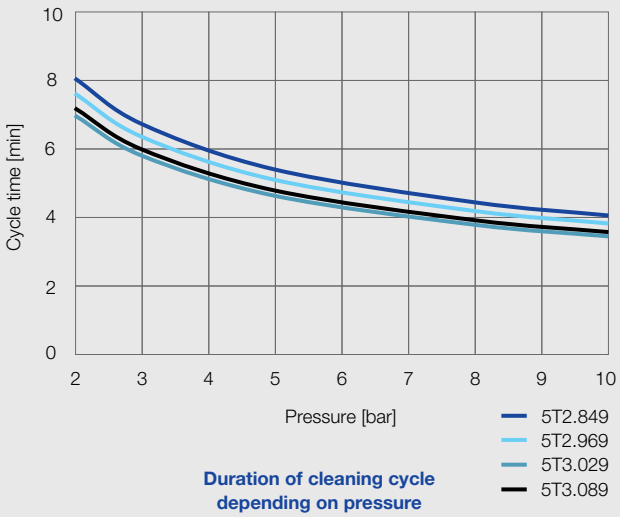
**Maintainable**

**Max. tank diameter**
The specified maximum tank diameter applies to the recommended operating pressure and is indicative only. The type of soiling is also decisive for the cleaning result.



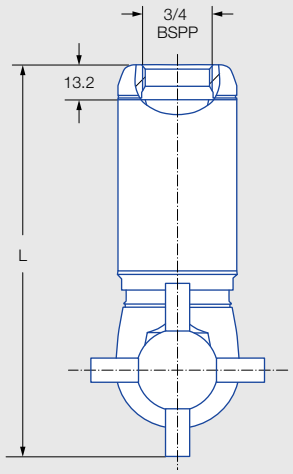

**Overview of maximum tank diameter depending on pressure**

**Duration of cleaning cycle**

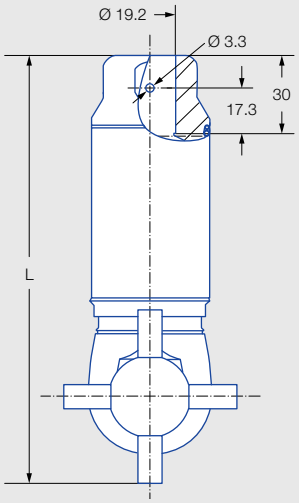



**Duration of cleaning cycle depending on pressure**

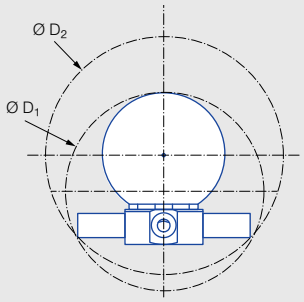
Dimensions in mm.



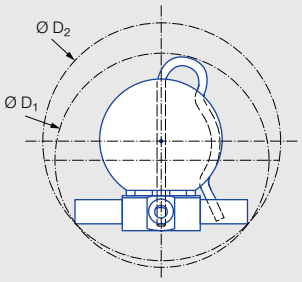

**Female thread**




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




**Insertion diameter $D_1$ and interference circle diameter $D_2$ of the threaded connection**




**Insertion diameter $D_1$ and interference circle diameter $D_2$ of the slip-on connection**

| Spray angle | Order no. | | | V̇ water [l/min] | | V̇ water | Dimensions [mm] | | | | | | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Type | Connection | | p [bar] ($p_{max}$ = 15 bar) | | at 5 bar [$m^3$/h] | Female thread | | | Slip-on connection | | | |
| | | 3/4 BSPP | 3/4" slip-on connection | 2.0 | **5.0** | | L | Ø $D_1$ | Ø $D_2$ | L | Ø $D_1$ | Ø $D_2$ | |
| 360° | **5T2.849.1Y** | **AL** | **TF07** | 13 | **20** | 1.2 | 142 | 68 | 82 | 157 | 77 | 82 | 11.5 |
| | **5T2.969.1Y** | **AL** | **TF07** | 25 | **40** | 2.4 | 142 | 68 | 82 | 157 | 77 | 82 | 12.0 |
| | **5T3.029.1Y** | **AL** | **TF07** | 35 | **55** | 3.3 | 142 | 68 | 82 | 157 | 77 | 82 | 12.5 |
| | **5T3.089.1Y** | **AL** | **TF07** | 50 | **79** | 4.7 | 148 | 74 | 91 | 163 | 82 | 91 | 13.0 |

**Information on operation**

Compressed air can be used only for a short time for blowing dry. Use above the recommended pressure will have a negative effect on the cleaning result and wear.

## Ordering example with FDA and (EC) 1935/2004 conformity.

**All materials are suitable for contact with food.**

| Type | + | Connection | = | Order no. |
|---|---|---|---|---|
| 5T2.849.1Y | + | AL | = | 5T2.849.1Y.AL |

## Ordering example with ATEX approval. FDA and (EC) 1935/2004 conformity.

**Unit group/Category/Zones:**

Ex II 1G Ex h IIB T6...T3 Ga

Ex II 1D Ex h IIIC T85 °C...T190 °C Da

**Important**

The code for the connection changes for the ATEX version with slip-on connection.

Ordering example for 3/4" slip-on connection: 5T2.849.1Y.T2.EX

| Type | + | Connection | + | ATEX | = | Order no. |
|---|---|---|---|---|---|---|
| 5T2.849.1Y | + | AL | + | EX | = | 5T2.849.1Y.AL.EX |

# High impact tank cleaning machine IntenseClean Hygienic
## Series 5TB

**Features:**
- Proven in the pharmaceutical, food and beverage industries
- High surface quality

Series 5TB

**Function video**
www.lechler.com/de-en/medialibrary/videos-general-industry
Or scan the QR code.

**Technical data:**

**Maximum operating temperature**
150 °C
97 °C (ATEX)

**Maximum ambient temperature**
150 °C
135 °C (ATEX)

**Installation**
Operation in every installation position

**Bearing**
Ball bearing

**Material**
Stainless steel 1.4404 (316L), stainless steel 1.4532 (632), PTFE, PEEK, zirconium oxide, EPDM

**Weight**
4.0 kg

**Surface quality**
Ra ≤ 0.8 µm
OUTSIDE

**Surface quality**
Ra ≤ 0.8 µm
INSIDE

**Steam suitability**
Suitable

**Insertion diameter**
130 mm

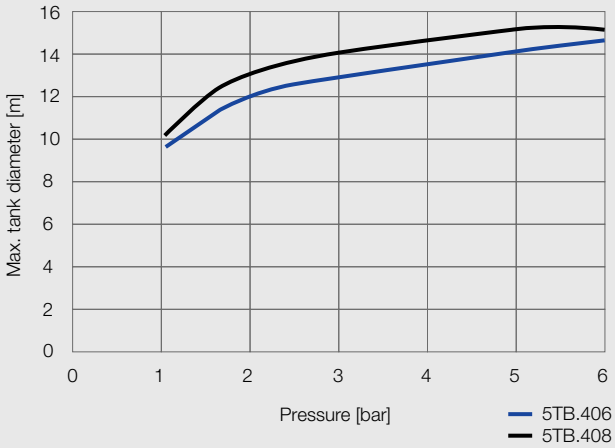
**Recommended filter**
Line strainer with a mesh size of 0.2 mm/80 mesh

**Recommended operating pressure**
5 bar

**Rotation monitoring**
Sensor-compatible, information: see pages 96–97

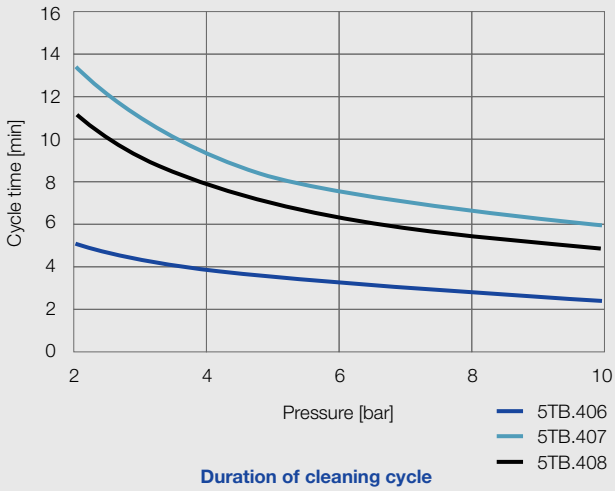
**Maintainable**

**Max. tank diameter**
The specified maximum tank diameter applies to the recommended operating pressure and is indicative only. The type of soiling is also decisive for the cleaning result.



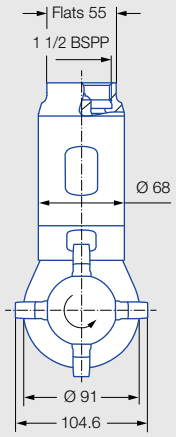

Overview of maximum tank diameter depending on pressure

**Duration of cleaning cycle**

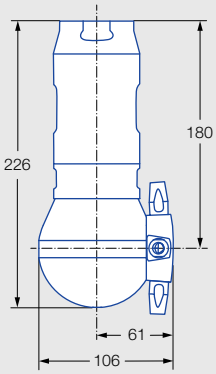



Duration of cleaning cycle depending on pressure

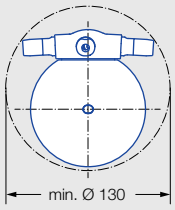
Dimensions in mm.




**Female thread**




**Female thread**




**Insertion diameter**

| Spray angle | Order no. / Type | Narrowest cross-section Ø [mm] | Quantity x nozzle Ø [mm] | V̇ water [l/min] p [bar] ($p_{max}$ = 25 bar) 2.0 | 5.0 | 10.0 | V̇ water at 5 bar [m³/h] | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|---|
| 360° | **5TB.406.1Y.AS** | 6.0 | 4 × 6.0 | 107 | **169** | 239 | 10.1 | 14.0 |
| | **5TB.407.1Y.AS** | 6.0 | 4 × 7.0 | 132 | **209** | 296 | 12.5 | 14.0 |
| | **5TB.408.1Y.AS** | 6.0 | 4 × 8.0 | 150 | **238** | 336 | 14.3 | 15.0 |

NPT threads on request.

**Information on operation**
Compressed air can be used only for a short time for blowing dry. Use above the recommended pressure will have a negative effect on the cleaning result and wear.

**Ordering example with FDA and (EC) 1935/2004 conformity.**

**All materials are suitable for contact with food.**

| Type | + | Connection | = | Order no. |
|---|---|---|---|---|
| 5TB.406.1Y. | + | AS | = | 5TB.406.1Y.AS |

**Ordering example with ATEX approval. FDA and (EC) 1935/2004 conformity.**

**Unit group/Category/Zones:**
II 1G Ex h IIB T6…T4 Ga
II 1D Ex h IIIC T85 °C…T135 °C Da

| Type | + | ATEX | = | Order no. |
|---|---|---|---|---|
| 5TB.406.1Y.AS | + | EX | = | 5TB.406.1Y.AS.EX |

# High impact tank cleaning machine IntenseClean
## Series 5TM

**Features:**
- Very robust design
- High efficiency thanks to especially powerful solid jet nozzles
- High efficiency due to gear-controlled rotation
- Proven in the petrochemical industry

FDA

**Function video**
www.lechler.com/de-en/medialibrary/videos-general-industry
Or scan the QR code.

**Series 5TM**

**Technical data:**

**Maximum operating temperature**
95 °C
95 °C (ATEX)

**Maximum ambient temperature**
140 °C
120 °C (ATEX)

**Installation**
Operation in every installation position

**Bearing**
Ball bearing

**Material**
Stainless steel 1.4404 (316L), stainless steel 1.4301 (304), stainless steel 1.4310 (302), PTFE, PEEK

**Weight**
7.40–7.88 kg

**Surface quality**
Ra ≤ 0.8 µm
OUTSIDE

**Surface quality**
Ra ≤ 4.5 µm
INSIDE

**Steam suitability**
Not suitable

**Insertion diameter**
160–230 mm

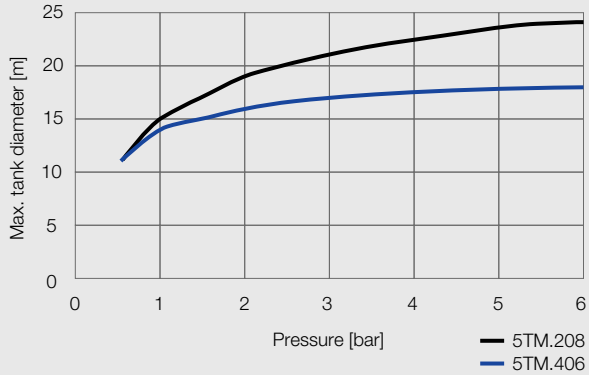
**Recommended filter**
Line strainer with a mesh size of 0.2 mm/80 mesh

**Recommended operating pressure**
5 bar

**Rotation monitoring**
Sensor-compatible, information: see pages 96–97

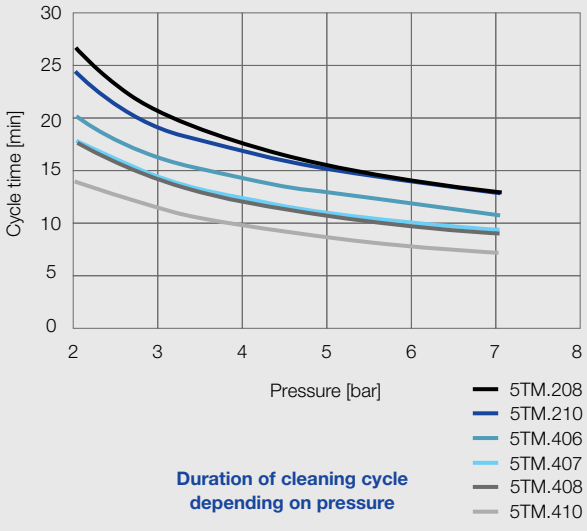
**Maintainable**

**Max. tank diameter**
The specified maximum tank diameter applies to the recommended operating pressure and is indicative only. The type of soiling is also decisive for the cleaning result.



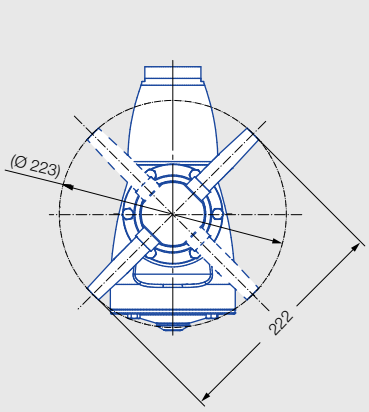

Overview of maximum tank diameter depending on pressure

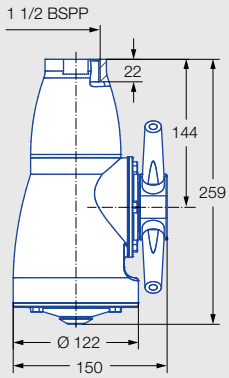
**Duration of cleaning cycle**



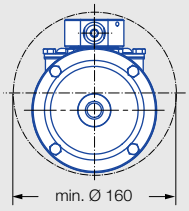

Duration of cleaning cycle depending on pressure

Dimensions in mm.

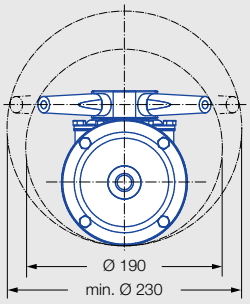



Female thread




Insertion diameter
5TM.2xx




Insertion diameter
5TM.4xx

| Spray angle | Order no. / Type | Narrowest cross-section Ø [mm] | Quantity x nozzle Ø [mm] | V̇ water [l/min] p [bar] ($p_{max}$ = 7 bar) 2.0 | 3.0 | **5.0** | 7.0 | V̇ water at 5 bar [m³/h] | Max. tank diameter [m] |
|---|---|---|---|---|---|---|---|---|---|
| 360° | **5TM.208.1Y.AS** | 8.0 | 2 × 8.0 | 125 | 153 | **198** | 234 | 11.9 | 24.0 |
| | **5TM.210.1Y.AS** | 10.0 | 2 × 10.0 | 160 | 196 | **253** | 299 | 15.2 | 24.0 |
| | **5TM.406.1Y.AS** | 6.0 | 4 × 6.0 | 140 | 171 | **221** | 261 | 13.3 | 18.0 |
| | **5TM.407.1Y.AS** | 7.0 | 4 × 7.0 | 170 | 208 | **269** | 318 | 16.1 | 20.0 |
| | **5TM.408.1Y.AS** | 8.0 | 4 × 8.0 | 200 | 245 | **316** | 374 | 19.0 | 22.0 |
| | **5TM.410.1Y.AS** | 10.0 | 4 × 10.0 | 260 | 318 | **411** | 486 | 24.7 | 23.0 |

NPT threads on request.

**Information on operation**
Compressed air can be used only for a short time for blowing dry. Use above the recommended pressure will have a negative effect on the cleaning result and wear.

## Ordering example with FDA and (EC) 1935/2004 conformity.

**All materials are suitable for contact with food.**

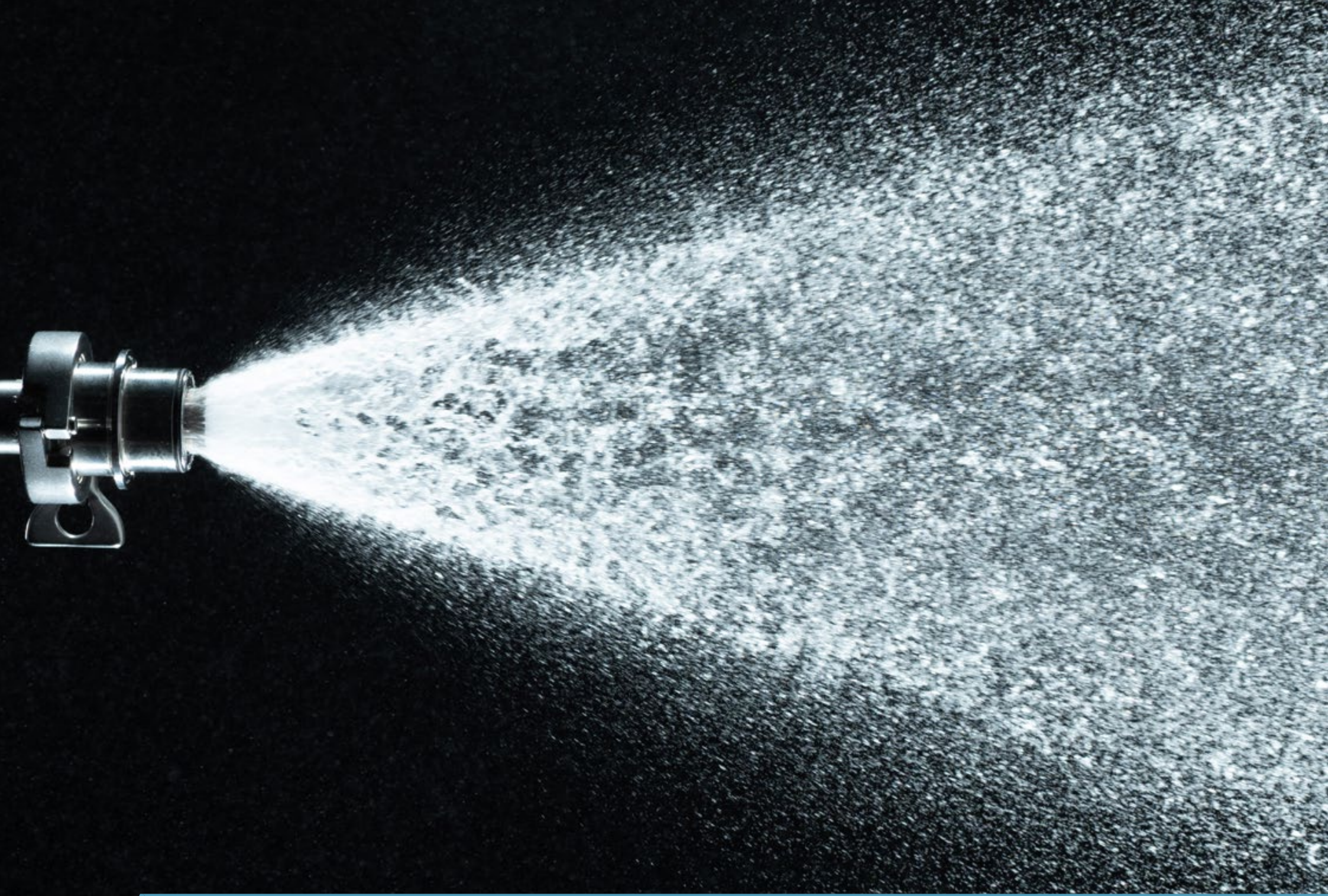
| Type | + | Connection | = | Order no. |
|---|---|---|---|---|
| 5TM.208.1Y | + | AS | = | 5TM.208.1Y.AS |

## Ordering example with ATEX approval. FDA and (EC) 1935/2004 conformity.

**Unit group/Category/Zones:**
Ⓔx II 1G Ex h IIB T6…T3 Ga
Ⓔx II 1D Ex h IIIC T85 °C…T150 °C Da

| Type | + | ATEX | = | Order no. |
|---|---|---|---|---|
| 5TM.208.1Y.AS | + | EX | = | 5TM.208.1Y.AS.EX |

# TANK CLEANING
# **PERFECT ADD**



# Extendable rotating cleaning nozzle PopUp Whirly
## Series 5P2

**Features:**
- Rotating cleaning nozzle extends automatically depending on pressure
- Flush wall installation possible
- Good suitability for cleaning pipes
- Particularly suitable for applications in the pharmaceutical, chemical and food industries

FDA

Series 5P2

**Function video**
www.lechler.com/de-en/medialibrary/videos-general-industry
Or scan the QR code.

**Technical data:**

**Maximum operating temperature**
140 °C
140 °C (ATEX)

**Maximum ambient temperature**
150 °C
140 °C (ATEX)

**Installation**
Operation in every installation position

**Bearing**
Slide bearing

**Material**
Stainless steel 1.4404 (316L), stainless steel 1.4571 (316Ti), stainless steel 1.4401 (316), FKM

**Weight**
500 g

**Surface quality**
Ra ≤ 0.8 µm on process side, remaining housing Ra ≤ 1.6 µm

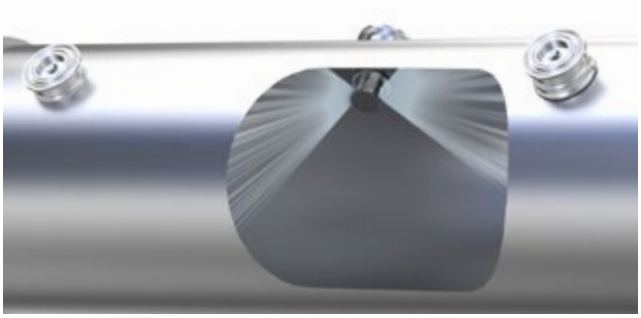
**Surface quality**
Ra ≤ 1.6 µm

**Steam suitability**
Not suitable

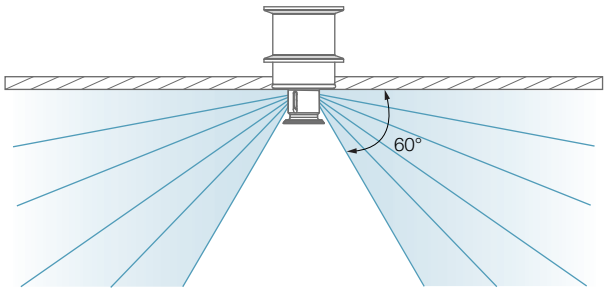
**Recommended filter**
Line strainer with mesh size of 0.3 mm/50 mesh

**Recommended operating pressure**
2 bar
Opening pressure approx. 1.0 bar, closing pressure approx. 0.5 bar

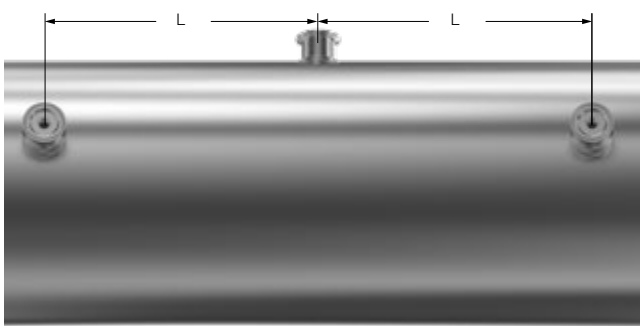
### Installation example

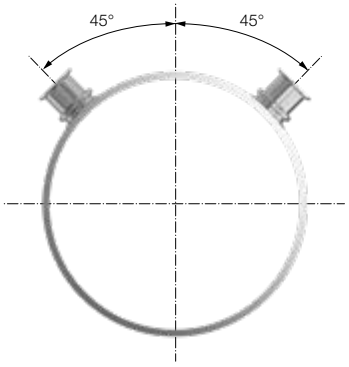


### Spray distribution



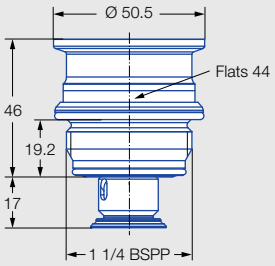

### Recommendation for nozzle positioning



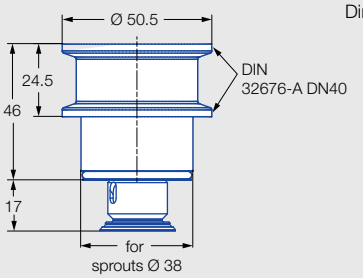




| Type | Nozzle spacing L [m] |
|---|---|
| 5P2.873 | 0.8 |
| 5P2.923 | 1.0 |

Dimensions in mm.

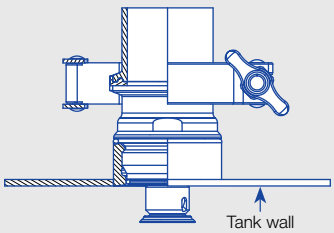



**Male thread**

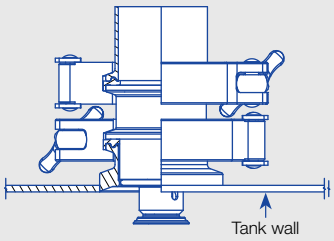



**Tri-Clamp connection**

## Installation situation



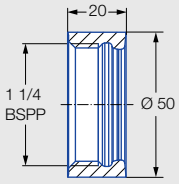

**Male thread**




**Tri-Clamp connection**

## Weld-in socket for threaded connection

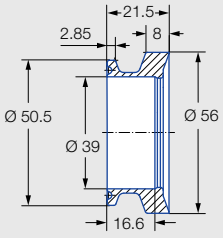
The thread is hygienically encapsulated with two O-rings (included in the scope of delivery of the PopUp Whirly).




**Order no.:** 050.020.1Y.AQ.00
**Material:** Stainless steel 1.4404 (316L)

## Weld-in flange for Tri-Clamp connection

A joint clamp in accordance with DIN 32676-A DN50 with a connection diameter of 50.5 mm is required for connection of the nozzle at the weld-in flange. A gasket with a thickness of 2 mm is required if the flange is used in combination with the PopUp Whirly.




**Order no.:** 050.020.1Y.01.00
**Material:** Stainless steel 1.4404 (316L)

| Spray angle | Order no. | | | Narrowest cross-section Ø [mm] | V̇ water [l/min] | | | V̇ water |
|---|---|---|---|---|---|---|---|---|
| | Type | Connection on tank wall | | | p [bar] ($p_{max}$ = 6 bar) | | | |
| | | 1 1/4 BSPP male | Tri-Clamp | | 1.0 | **2.0** | 3.0 | at 2 bar [m³/h] |
| 60° | **5P2.873.1Y** | **AP** | **00** | 2.5 | 11 | **15** | 18 | 0.9 |
| | **5P2.923.1Y** | **AP** | **00** | 3.5 | 14 | **20** | 25 | 1.2 |

**Information on operation**
The PopUp Whirly is not suitable for operation with compressed air or another gas. Use above the recommended pressure will have a negative influence on the cleaning result and wear.

### Ordering example with FDA and (EC) 1935/2004 conformity.

**All materials are suitable for contact with food.**

| Type | + | Connection | = | Order no. |
|---|---|---|---|---|
| 5P2.873.1Y | + | AP | = | 5P2.873.1Y.AP |

### Ordering example with ATEX approval. FDA and (EC) 1935/2004 conformity.

**Unit group/Category/Zones:**
Ex II 1G Ex h IIB T6…T3 Ga
Ex II 1D Ex h IIIC T85 °C…T170 °C Da

| Type | + | Connection | + | ATEX | = | Order no. |
|---|---|---|---|---|---|---|
| 5P2.873.1Y | + | AP | + | EX | = | 5P2.873.1Y.AP.EX |

# Extendable rotating cleaning nozzle PopUp Whirly
## Series 5P3

**Features:**
- Rotating cleaning nozzle extends automatically depending on pressure
- Flush wall installation possible
- Good suitability for cleaning pipes
- Particularly suitable for applications in the pharmaceutical, chemical, food and beverage industries

FDA

Series 5P3

**Function video**
www.lechler.com/de-en/medialibrary/videos-general-industry
Or scan the QR code.

**Technical data:**

**Maximum operating temperature**
140 °C
140 °C (ATEX)

**Maximum ambient temperature**
150 °C
140 °C (ATEX)

**Installation**
Operation in every installation position

**Bearing**
Slide bearing

**Material**
Stainless steel 1.4404 (316L), stainless steel 1.4571 (316Ti), stainless steel 1.4401 (316), FKM

**Weight**
660 g

**Surface quality**
Ra ≤ 0.8 µm on process side, remaining housing Ra ≤ 1.6 µm
OUTSIDE

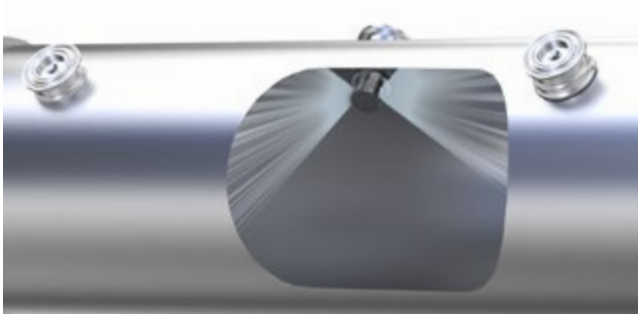
**Surface quality**
Ra ≤ 1.6 µm
INSIDE

**Steam suitability**
Not suitable

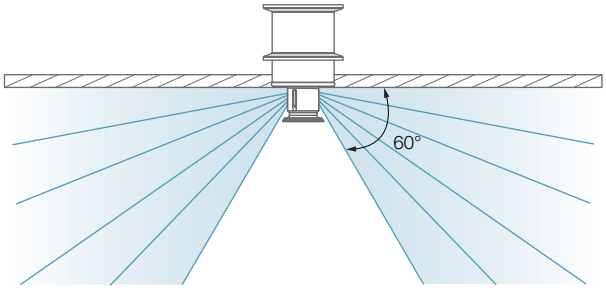
**Recommended filter**
Line strainer with mesh size of 0.3 mm/50 mesh

**Recommended operating pressure**
2 bar
Opening pressure approx. 0.9 bar, closing pressure approx. 0.5 bar

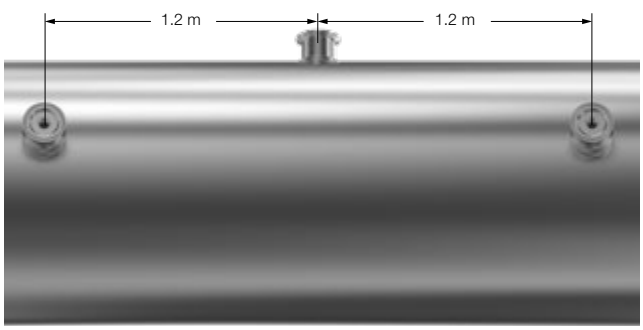
### Installation example

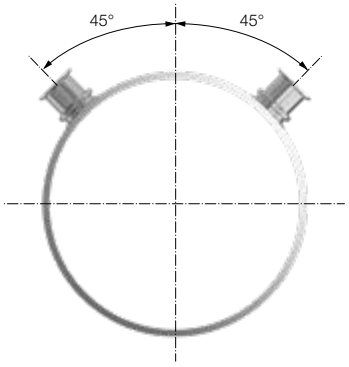


### Spray distribution

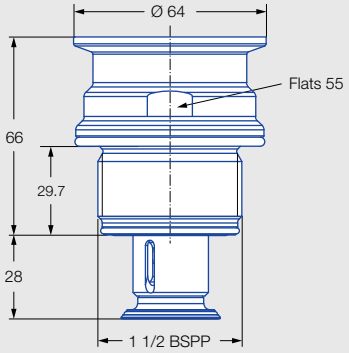



### Recommendation for nozzle positioning

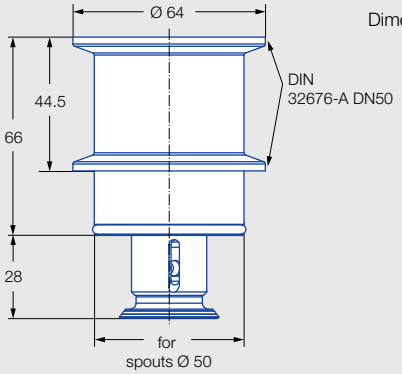


Dimensions in mm.

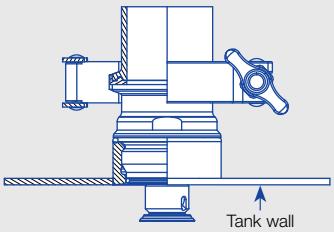



**Male thread**

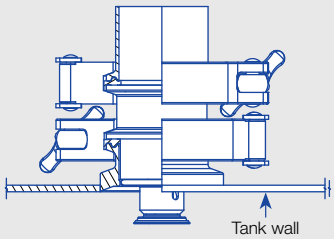



**Tri-Clamp connection**

## Installation situation



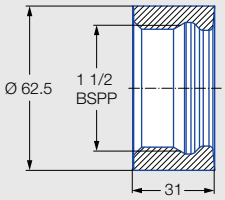

**Male thread**




**Tri-Clamp connection**

## Weld-in socket for threaded connection

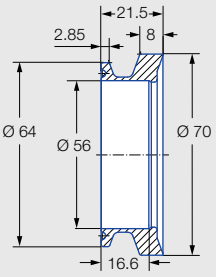
The thread is hygienically encapsulated with two O-rings (included in the scope of delivery of the PopUp Whirly).




**Order no.:** 050.020.1Y.AS.00
**Material:** Stainless steel 1.4404 (316L)

## Weld-in flange for Tri-Clamp connection

A joint clamp in accordance with DIN 32676-A DN50 with a connection diameter of 64.0 mm is required for connection of the nozzle at the weld-in flange. A gasket with a thickness of 2 mm is required if the flange is used in combination with the PopUp Whirly.




**Order no.:** 050.020.1Y.01.01
**Material:** Stainless steel 1.4404 (316L)

| Spray angle | Order no. | | | Narrowest cross-section Ø [mm] | V̇ water [l/min] | | | V̇ water |
|---|---|---|---|---|---|---|---|---|
| | Type | Connection | | | p [bar] ($p_{max}$ = 6 bar) | | | |
| | | 1 1/2 BSPP male | Tri-Clamp | | 1.0 | **2.0** | 3.0 | at 2 bar [m³/h] |
| 60° | **5P3.043.1Y** | **AR** | **00** | 3.3 | 28 | **40** | 49 | 2.4 |

**Information on operation**
The PopUp Whirly is not suitable for operation with compressed air or another gas. Use above the recommended pressure will have a negative influence on the cleaning result and wear.

### Ordering example with FDA and (EC) 1935/2004 conformity.

**All materials are suitable for contact with food.**

| Type | + | Connection | = | Order no. |
|---|---|---|---|---|
| 5P3.043.1Y | + | AR | = | 5P3.043.1Y.AR |

### Ordering example with ATEX approval. FDA and (EC) 1935/2004 conformity.

**Unit group/Category/Zones:**
Ex II 1G Ex h IIB T6…T3 Ga
Ex II 1D Ex h IIIC T85 °C…T170 °C Da

| Type | + | Connection | + | ATEX | = | Order no. |
|---|---|---|---|---|---|---|
| 5P3.043.1Y | + | AR | + | EX | = | 5P3.043.1Y.AR.EX |

# Extendable cleaning nozzle PopUp Clean
## Series 5P5

**Features:**
- Cleaning nozzle extends automatically depending on pressure
- Flush wall installation possible
- For cleaning agitators and other spray shadow areas
- Compact, robust design

FDA

Series 5P5

**Function video**
www.lechler.com/de-en/medialibrary/videos-general-industry
Or scan the QR code.

**Technical data:**

**Maximum operating temperature**
95 °C
95 °C (ATEX)

**Maximum ambient temperature**
150 °C
140 °C (ATEX)

**Installation**
Operation in every installation position

**Bearing**
Slide bearing

**Material**
Stainless steel 1.4404 (316L), stainless steel 1.4571 (316Ti), FKM or 2.4602 (Alloy 22), 2.4610 (Alloy 4), FKM

**Weight**
340 g

**Surface quality**
Ra ≤ 0.8 µm on process side, remaining housing Ra ≤ 1.6 µm

**Surface quality**
Ra ≤ 1.6 µm

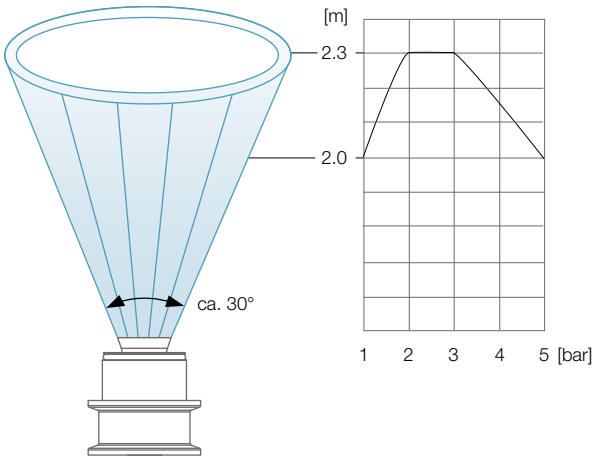
**Steam suitability**
Not suitable

**Recommended filter**
Line strainer with mesh size of 0.3 mm/50 mesh

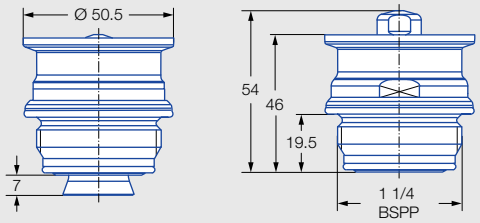
**Recommended operating pressure**
2 bar
Opening pressure: approx. 0.3 bar, closing pressure: approx. 0.3 bar

### Installation example

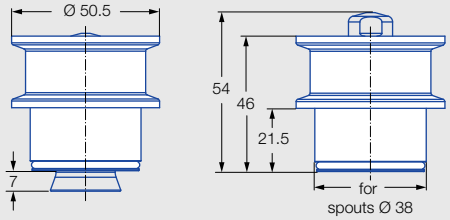
### Spray height
Sprays upwards in vertical installation position.



Dimensions in mm.

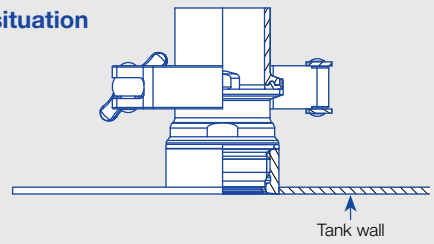



**Male threaded connection**

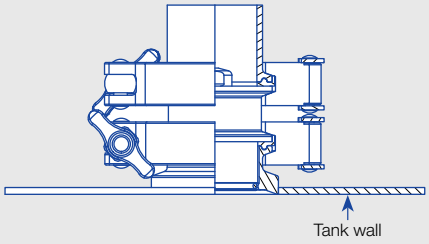



**Tri-Clamp connection**

## Installation situation



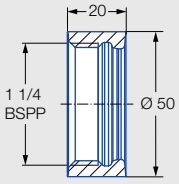

**Threaded connection**




**Tri-Clamp connection**

## Weld-in socket for threaded connection

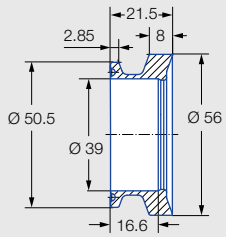
The thread is hygienically encapsulated with two O-rings (included in the scope of delivery of the PopUp Clean).




**Order no.:** 050.020.1Y.AQ.00
**Material:** Stainless steel 1.4404 (316L)

## Weld-in flange for Tri-Clamp connection

A joint clamp in accordance with DIN 32676-A DN50 with a connection diameter of 50.5 mm is required for connection of the nozzle at the weld-in flange. A gasket with a thickness of 2 mm is required if the flange is used in combination with the PopUp Clean.




**Order no.:** 050.020.1Y.01.00
**Material:** Stainless steel 1.4404 (316L)

| Spray angle | Order no. | | | | | V̇ water [l/min] | | | | V̇ water | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Type | Material no. | | Connection | | p [bar] ($p_{max}$ = 5 bar) | | | | | |
| | | 1Y | 21 | | | | | | | | |
| | | 1.4404 (316L) | 2.4602 (Alloy 22) | 1 1/4 BSPP male | Tri-Clamp | 1.0 | **2.0** | 3.0 | 5.0 | at 2 bar [m³/h] | at 5 bar [m³/h] |
| 30° | **5P5.081** | ● | ● | **AP** | **00** | 35 | **50** | 61 | 79 | 3.0 | 4.7 |

**Information on operation**
The PopUp Clean is not suitable for operation with compressed air or another gas. Use above the recommended pressure will have a negative influence on the cleaning result and wear.

### Ordering example with FDA and (EC) 1935/2004 conformity.

**All materials are suitable for contact with food.**

| Type | + | Material | + | Connection | = | Order no. |
|---|---|---|---|---|---|---|
| 5P5.081 | + | 1Y | + | AP | = | 5P5.081.1Y.AP |

### Ordering example with ATEX approval. FDA and (EC) 1935/2004 conformity.

**Unit group/Category/Zones:**
Ex II 1G Ex h IIB T6…T3 Ga
Ex II 1D Ex h IIIC T85 °C…T170 °C Da

| Type | + | Material | + | Connection | + | ATEX | = | Order no. |
|---|---|---|---|---|---|---|---|---|
| 5P5.081 | + | 1Y | + | AP | + | EX | = | 5P5.081.1Y.AP.EX |

# Adapter HygienicFit
## Series 05C

**Features:**

- Hygienic threaded connection between equipment and nozzle
- Available for many thread sizes
- Weld-on side suitable for common pipe standards
- O-rings ensure a leak-tight connection
- O-rings fully encapsulate the thread

FDA

Series 05C

**Function video**
**www.lechler.com/de-en/medialibrary/videos-general-industry**
Or scan the QR code.

**Technical data:**

**Maximum operating temperature**
150 °C

**Maximum ambient temperature**
150 °C

**Installation**
Operation in every installation position

**Material**
1.4404 (316L), EPDM (O-ring)

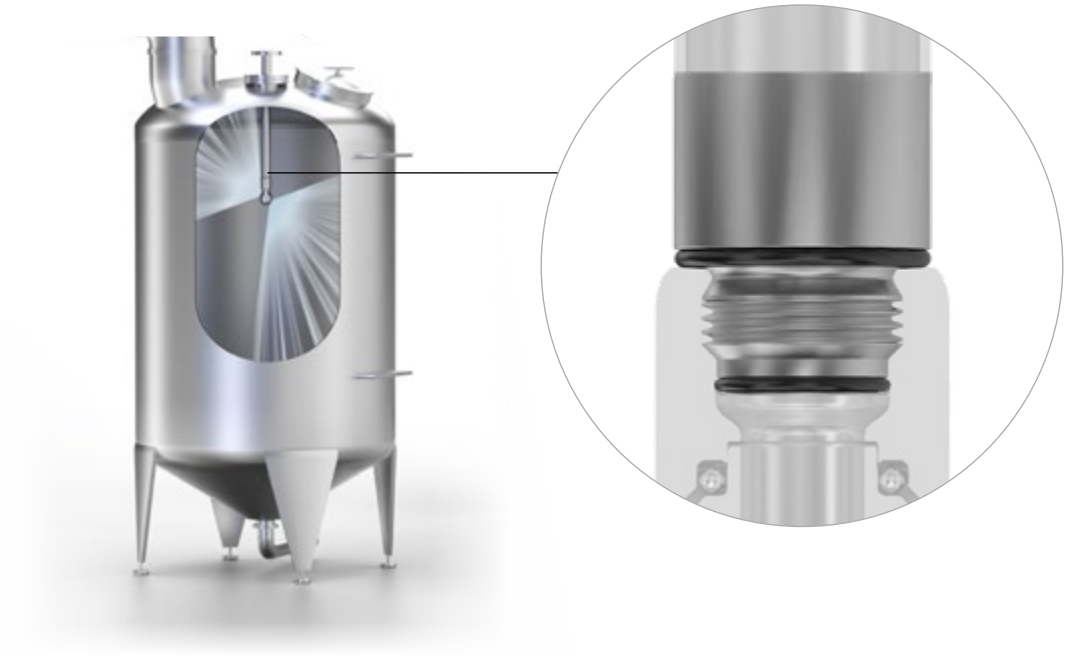
**Weight**
70–300 g

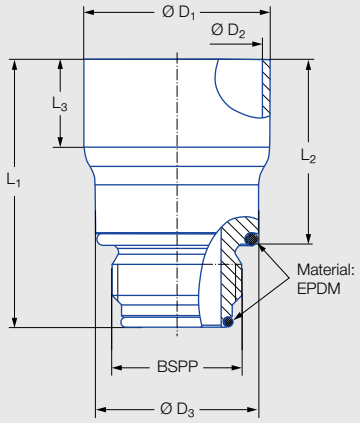
**Surface quality**
Ra ≤ 0.8 µm
OUTSIDE

**Surface quality**
Ra ≤ 0.8 µm
INSIDE

**Steam suitability**
Suitable

**If you find this icon on our product pages, this means that the nozzle is compatible with the HygienicFit adapter.**






| Order no. | | Dimensions [mm] | | | | | | Pipe standard |
|---|---|---|---|---|---|---|---|---|
| Type | Connection thread BSPP male | $L_1$ | $L_2$ | $L_3$ | Ø $D_1$ | Ø $D_2$ | Ø $D_3$ | |
| **05C.190.1Y.AE.16** | 3/8 | 48.00 | 35.70 | 18.00 | 19.05 | 15.80 | 21.50 | DIN EN 10357 series D |
| **05C.230.1Y.AE.15** | 3/8 | 48.00 | 35.70 | 18.00 | 23.00 | 20.00 | 21.50 | DIN EN 10357 series A |
| **05C.250.1Y.AE.12** | 3/8 | 48.00 | 35.70 | 17.00 | 25.00 | 22.60 | 21.50 | DIN EN 10357 series D |
| **05C.250.1Y.AG.12** | 1/2 | 56.00 | 39.00 | 18.00 | 25.00 | 22.60 | 31.00 | DIN EN 10357 series D |
| **05C.350.1Y.AK.15** | 3/4 | 55.00 | 37.80 | 21.00 | 35.00 | 32.00 | 33.50 | DIN EN 10357 series A |
| **05C.380.1Y.AK.12** | 3/4 | 55.00 | 37.80 | 18.00 | 38.00 | 35.60 | 33.50 | ISO 2037 |
| **05C.381.1Y.AK.15** | 3/4 | 55.00 | 37.80 | 18.00 | 38.10 | 35.10 | 33.50 | DIN EN 10357 series D |
| **05C.381.1Y.AM.16** | 1 | 59.00 | 39.00 | 23.00 | 38.10 | 34.90 | 40.50 | DIN EN 10357 series D |
| **05C.508.1Y.AP.15** | 1 1/4 | 57.00 | 38.00 | 22.00 | 50.80 | 47.80 | 49.40 | DIN EN 10357 series D |
| **05C.635.1Y.AR.16** | 1 1/2 | 63.00 | 44.00 | 22.00 | 63.50 | 60.30 | 56.00 | DIN EN 10357 series D |

## Spare parts set of O-rings, EPDM

| Thread type BSPP | Order no. |
|---|---|
| 3/8 | **05C.000.E9.AE.00** |
| 1/2 | **05C.000.E9.AG.00** |
| 3/4 | **05C.000.E9.AK.00** |
| 1 | **05C.000.E9.AM.00** |
| 1 1/4 | **05C.000.E9.AP.00** |
| 1 1/2 | **05C.000.E9.AR.00** |

O-ring set also available in FKM on request.

# Rotation monitoring sensor

**Features:**

- Reliable monitoring of cleaning processes
- Process connection EHEDG-compliant
- Simple operation and PLC connection possible
- Can be individually adapted to each cleaning task
- Operating principle: capacitive

FDA

**Technical data:**

**Maximum operating temperature**
0–100 °C

**Maximum ambient temperature**
–10 °C to +60 °C

**Installation**
Operation in every installation position

**Material**
Sleeve (1/2 BSPP):
Stainless steel 1.4404 (316L)
Probe tip: PEEK
Housing: 1.4305 (303)

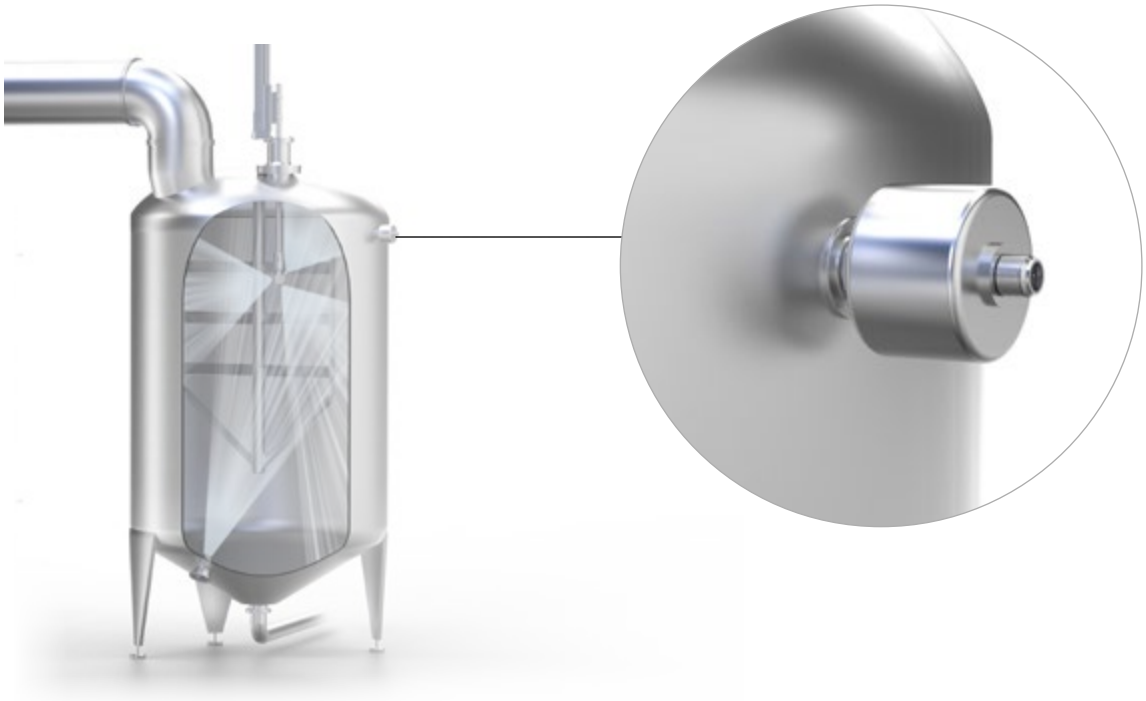
**Weight**
350 g

**Surface quality**
Ra ≤ 0.8 µm weld-in flange,
Ra ≤ 1.6 µm PEEK tip

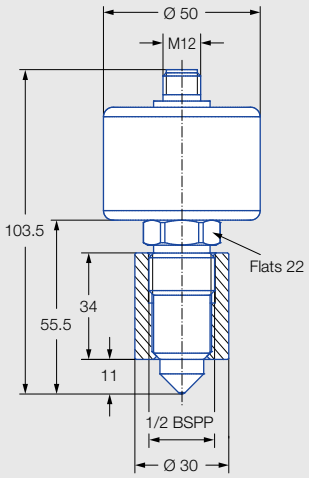
**Steam suitability**
Max. 125 °C for max. 30 min. at ambient temperature ≤ 35 °C

**Electrical data**
Supply voltage:
Ub = 24 V +/–20 %
(18 to 32 VDC)
Power requirement: < 20 mA
Output signal: PNP, 50 mA, short circuit protected, active

**If you find this icon on our product pages, this means that the nozzle is compatible with the rotation monitoring sensor.**



Dimensions in mm.




## Rotation monitoring sensor with weld-in sleeve

## Cable set for commissioning

Power adapter

USB adapter with cable

Programming adapter Y-piece

Weld-in mandrel

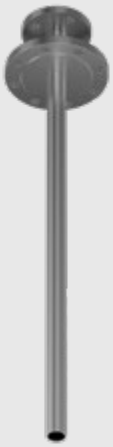
| Ordering data | Order no. |
|---|---|
| Rotation monitoring sensor with weld-in sleeve | **050.040.00.00.00** |
| Cable set for commissioning | **050.040.00.00.01** |

Software download (free): **www.lechler.com/de-en/software/rotatingcontrolsystem**

# Cleaning lance StaticLance

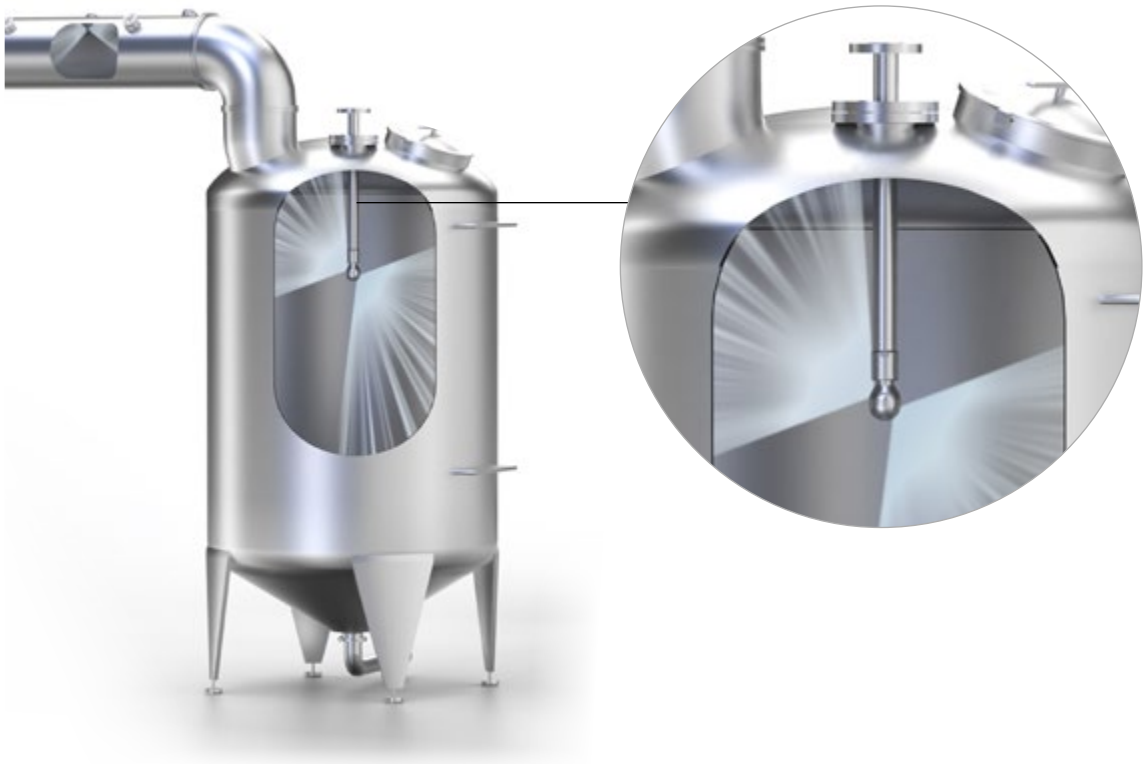
**Features:**

- Optimum nozzle positioning and alignment in the tank
- Individual design possible depending on existing conditions
- Standard material 1.4404 (316L)
- Different material versions optionally available



FDA

Static lance



**Good to know**

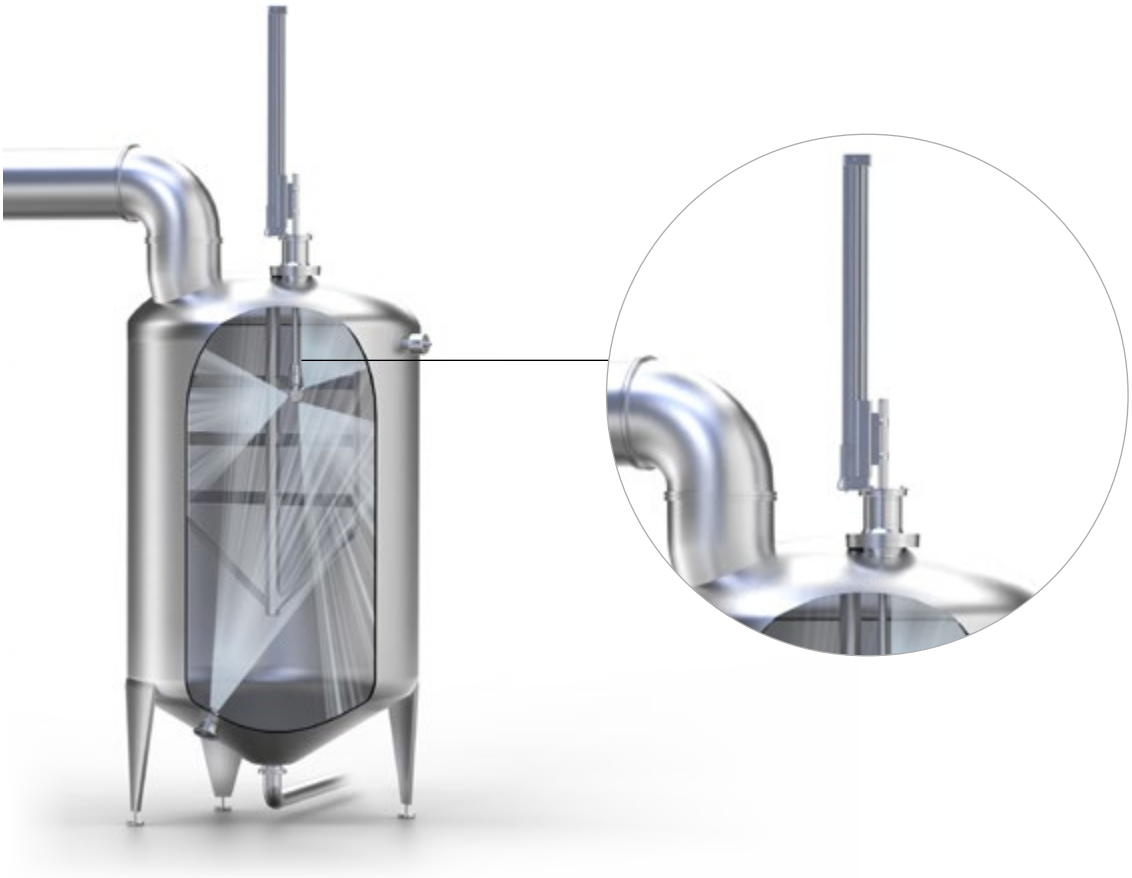
If you would like further information on our static lances, please contact us: by phone on +49 7123 962-0 or by email at info@lechler.de.

# Cleaning lance FlexLance

**Features:**

- Stroke length: 1 mm to 2,700 mm
- Material: contact with process 1.4404 (316L)
- Tank cleaning nozzle connection by means of EN 10226 R 3/4 thread
- Driven pneumatic rodless cylinder
- Position monitoring possible (optional)
- Sealed by rod seal on process side
- Process-side flange EN 1092-1 DN 100 PN 16
- Process-side components are food-compliant

Extendable cleaning lance



## Good to know

In some processes, the tank cleaning nozzle must not remain in the tank during the process. Lechler offers pneumatically extendable cleaning lances so that the tank cleaning nozzle is only in the tank when it is used for cleaning. We will be pleased to discuss your requirements. By phone on +49 7123 962-0 or by email at info@lechler.de.

# STAY CLEAN
# THE LECHLER MAINTENANCE SERVICES

Your systems should operate reliably and efficiently in the long term. That is why we recommend regular maintenance. Lechler offers two options to ensure the shortest possible downtimes of your system and to guarantee prompt recommissioning of your tank cleaning products. We will gladly advise you in person on the best solution for your needs.

**Two maintenance options for maximum uptime**

## ZERO DOWNTIME SERVICE

**Maintenance:** on-the-spot by the customer.

You independently maintain your cleaning system with the genuine Lechler spare parts on the basis of detailed maintenance instructions and can reduce possible downtimes to zero in an ideal case.

### YOUR ADVANTAGES

- Zero downtime possible
- Simply perform maintenance yourself on the basis of detailed instructions
- Use of Lechler genuine parts
- No complex import and export processes
- Cost-efficient maintenance

## LECHLER FULL SERVICE

**Maintenance:** at Lechler by Lechler.

You send in your cleaning equipment and our experts will take care of everything else.

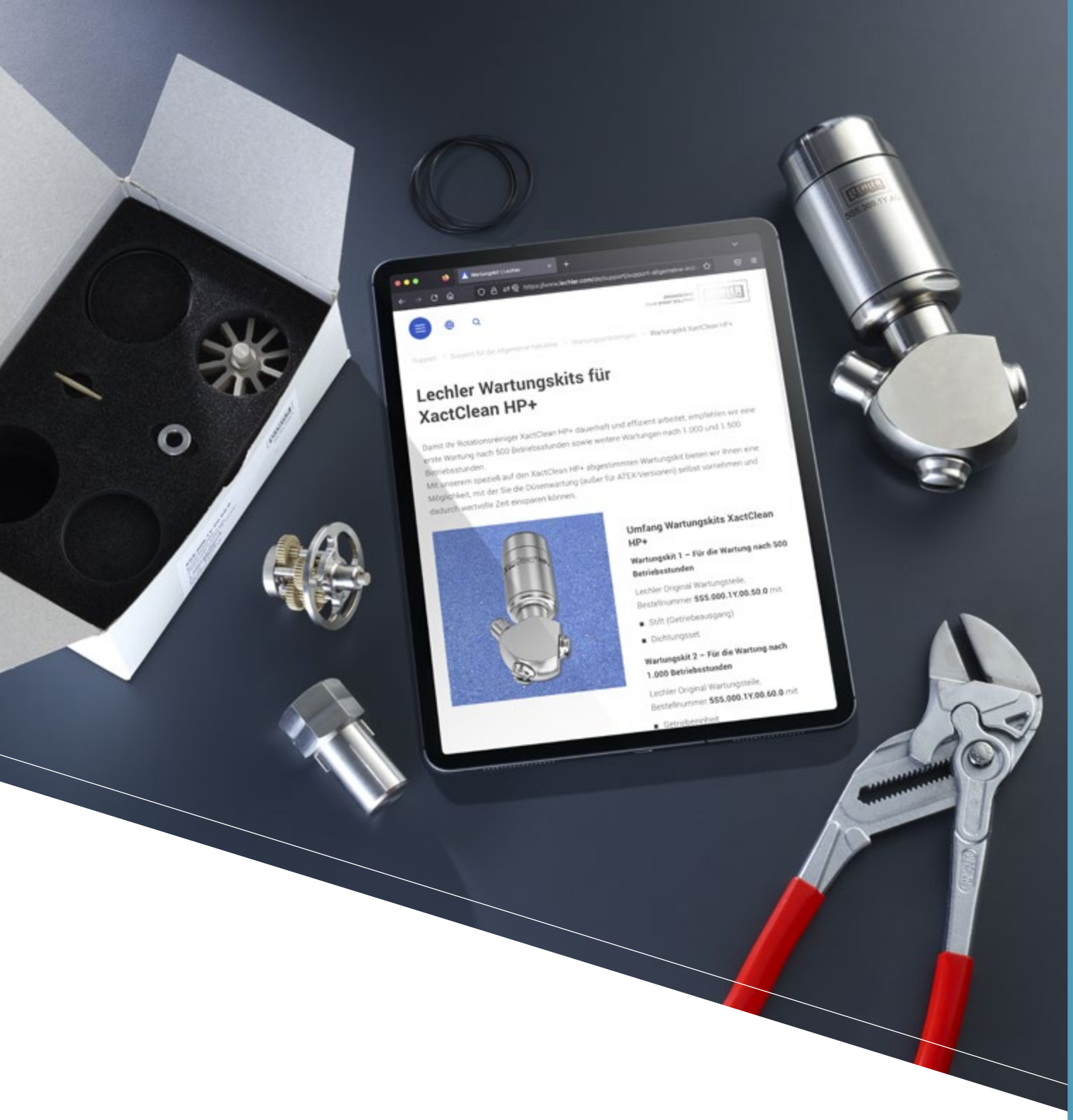
### YOUR ADVANTAGES

- Immediate feedback if there are any issues
- Use of Lechler genuine parts
- Lechler Service Points also in your vicinity

Please note that maintenance of ATEX-certified products is possible only within the scope of Lechler Full Service for safety reasons.

**If you find this icon on our product pages, this means that maintenance is possible.**

**Lechler Service**
You can find detailed information on the Lechler maintenance concept at
**www.lechler.com/de-en/service/service-offers**
Or scan the QR code.




**Good to know**

Do you have any questions about maintenance? Talk to us. We will gladly advise you. By phone on +49 7123 962-0 or by email at service@lechler.de.

# EVERYTHING COVERED
# CLEAN ALL OVER THE WORLD



Subsidiary

Sales office/sales agent

Headquarters

Production

Sales

Service Points

## Full range from one source

Efficient cleaning requires controlled generation and distribution of every single drop.

With over 140 years of nozzle expertise and over 45,000 immediately available nozzles, spray systems and accessories, we can realize every spray jet application in a short time. The wide range of proven solid jet, flat fan and solid cone nozzles allows us to offer optimized cleaning solutions for every application.

## Global representation

We are at home right at the heart of Europe. In Metzingen we develop highly-efficient cleaning nozzles and test them under practically-based conditions.

We do not just see ourselves as a supplier and manufacturer, however. Because we also support you in optimization of your cleaning processes on-site. Thanks to our international network of production locations, subsidiaries and sales offices/sales representatives, we can always guarantee fast part availability and short distances for service work. Contact us and experience this for yourself.
**We look forward to hearing from you.**

**Germany**
Lechler GmbH
Ulmer Strasse 128
72555 Metzingen, Germany
Phone +49 7123 962-0
info@lechler.de

**China**
Lechler Nozzle Systems
(Changzhou) Co., Ltd.
No.99 Decheng Rd, Jintan
Changzhou, JS 213200, P.R.C
Phone +86 400-004-1879
info@lechler.com.cn

**India**
Lechler (India) Pvt. Ltd.
Plot B-2
Main Road
Wagle Industrial Estate Thane
400604 Maharashtra
Phone +91 22 40634444
lechler@lechlerindia.com

**USA**
Lechler Inc.
445 Kautz Road
St. Charles, IL 60174
Phone +1 630 3776611
info@lechlerusa.com

**ASEAN**
Lechler Spray Technology
Sdn. Bhd.
No. 22, Jalan Astaka 4B/KU2
Bandar Bukit Raja
41050 Klang, Selangor
Malaysia
Phone +603 3359 1118
info@lechler.com.my

**Belgium**
Lechler S.A./N.V.
Avenue Newton 4
1300 Wavre
Phone +32 10 225022
info@lechler.be

**Finland**
Lechler Oy
Ansatie 6 a C 3 krs
01740 Vantaa
Phone +358 207 856880
info@lechler.fi

**France**
Lechler France SAS
Parc de la Haute Maison
6, Allée Képler, Bâtiment C2
Phone +33 1 49882600
info@lechler.fr

**Great Britain**
Lechler Ltd.
1 Fell Street, Newhall
Sheffield, S9 2TP
Phone +44 114 2492020
info@lechler.com

**Italy**
Lechler Spray Technology S.r.l.
Via Don Dossetti, 2
20080 Carpiano (Mi)
Phone +39 2 98859027
info@lechleritalia.com

**Sweden**
Lechler AB
Hävertgatan 29
254 42 Helsingborg
Phone +46 18 167030
info@lechler.se

**Spain**
Lechler, S.A.
C / Isla de Hierro, 7 – Oficina 1.3
28703 San Sebastián de
los Reyes (Madrid)
Phone +34 91 6586346
info@lechler.es

*ENGINEERING*
*YOUR SPRAY SOLUTION*


**Lechler GmbH · Precision Nozzles · Nozzle Systems**
**Ulmer Strasse 128 · 72555 Metzingen, Germany · Phone +49 7123 962-0 · info@lechler.de · www.lechler.com**

**ASEAN:** Lechler Spray Technology Sdn. Bhd. • 22, Jln. Astaka 4B/KU2 • Bdr. Bukit Raja • 41050 Klang • Malaysia • Phone +603 3359 1118 • info@lechler.com.my
**Belgium:** Lechler S.A./N.V. • Avenue Newton 4 • 1300 Wavre • Phone +32 10 225022 • info@lechler.be
**China:** Lechler Nozzle Systems (Changzhou) Co., Ltd. • No.99 Decheng Rd, Jintan, Changzhou, JS 213200, P.R.C • Phone +86 400-004-1879 • info@lechler.com.cn
**Finland:** Lechler Oy • Ansatie 6 a C 3 krs • 01740 Vantaa • Phone +358 207 856880 • info@lechler.fi
**France:** Lechler France SAS • Parc de la Haute Maison • 6, Allée Képler, Bâtiment C2 • 77420 Champs-sur-Marne • Phone +33 1 49882600 • info@lechler.fr
**Great Britain:** Lechler Ltd. • 1 Fell Street, Newhall • Sheffield, S9 2TP • Phone +44 114 2492020 • info@lechler.com
**India:** Lechler (India) Pvt. Ltd. • Plot B-2 • Main Road • Wagle Industrial Estate Thane • 400604 Maharashtra • Phone +91 22 40634444 • lechler@lechlerindia.com
**Italy:** Lechler Spray Technology S.r.l. • Via Don Dossetti, 2 • 20080 Carpiano (Mi) • Phone +39 2 98859027 • info@lechleritalia.com
**Sweden:** Lechler AB • Hävertgatan 29 • 254 42 Helsingborg • Phone +46 18 167030 • info@lechler.se
**Spain:** Lechler, S.A. • C / Isla de Hierro, 7 – Oficina 1.3 • 28703 San Sebastián de los Reyes (Madrid) • Phone +34 91 6586346 • info@lechler.es
**USA:** Lechler Inc. • 445 Kautz Road • St. Charles, IL 60174 • Phone +1 630 3776611 • info@lechlerusa.com



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