

Operating Instructions

5TA/5TB

ATEX





These operating instructions are part of the EX jet cleaner and must be at the user's disposal during all times.

All safety instructions should be made known and observed. If the unit is sold, the operating instructions must be included as well

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1 General Information

1.1 Function

5TA / 5TB Ex jet cleaners are orbital spraying units. They are driven by the cleaning medium. The machines are designed with minimal clearance volume and made with certified materials in Germany. The surface finish is constantly controlled during production.

The filtered cleaning medium is fed into the jet cleaner. The jet cleaner is either mounted directly at the flange or lowered into the vessel on a feed pipe or a lance. The connections are both adjustable and, standard and further described in the chapter "Technical data". The medium flowing in is directed onto a turbine that creates an output speed of 10 to 14 min⁻¹ with the downstream gear drive. The jet cleaner is driven by a drive shaft. Due to the design of the orbital driven jet cleaner, the exiting cleaning agent jet is thrown to the vessel wall with a maximum impingement impact for complete 360° spherical cleaning by rotating around the vertical and horizontal axes of the jet cleaner to systematically clean via a preprogrammed defined path. Depending on the type of soiling the user has to decide whether to add a suitable amount of cleaning agent:

Important: Only part of the cleaning medium is directed through the transmission. The main flow of volume is directed to the spraying head with the nozzles via a by-pass. As a result, the pressure loss is minimized and the maximum flow rate for the nozzles is guaranteed.

The jet cleaners can be operated with a wide range of nozzle diameters resulting in a perfect adaptation of the units to the cleaning task.

1.2 Intended use



The jet cleaners must be used only inside closed vessels. Any operation outside a vessel may lead to injuries due to the high impact forces. Furthermore, the cleaning medium would be sprayed into the environment.

1.2.1 ATEX area

In potentially explosive atmospheres of Zone 0, 1, 2 & 20, 21, 22 only equipment may be used which is designed, certified and marked according to ATEX.

The jet cleaners 5TA-Ex and 5TB-Ex are designed to be used in the described areas and are suited for use in dust and gas environments.

The personnel which carry out the commissioning and inspection must have the qualifications for working in potentially explosive atmospheres. The operating company must ensure that all personnel that have to do with commissioning and inspection of the described jet cleaners have read and fully understood the operating instructions.



Modifications of the jet cleaners are prohibited and will void the warranty.

Any other use is regarded as incorrect. The operator alone shall be liable for any damages arising from such misuse.



The Ex jet cleaners are state of the art and reliable in operation. Misuse and improper installation can lead to endangering the life or limb of the operator and damage to the jet cleaner itself.

1.2.2 Component marking

EX jet cleaners are material marked according to:



The marking is engraved on the housing of the jet cleaner. The number of the EC-type examination is:

TPS 15 ATEX 20455 008

1.2.3 Operating conditions



The following conditions must be observed for the intended use

- The operator is responsible to avoid ignitable sources caused by the cleaning process (according to TRBS 2153).
- The Ex jet cleaners must be connected to equal potential bonding. All conductive components must be grounded or connected to other conductive components. The leakage resistance must be smaller than $10^6 \,\Omega$.
- After changing the Ex jet cleaner or mounting on a lance (feed pipe), the leakage resistance must be measured. It must be less than $<10^6 \Omega$.
- The instructions for Installation and commissioning point 4 must be observed!
- Use structural measures, e.g. a fixed mounting, to ensure that enough clearance is allowed from the container wall or container fittings.
- The cleaning medium used with the Ex jet cleaner must not exceed 80% of its ignitable temperature.
- If the Ex jet cleaner is used in a dust environment, it must not exceed 2/3 of the ignitable temperature of the dust cloud.
- The minimum conductivity of the cleaning medium must exceed 1000 pS/m.
- Jet cleaner mustn't be driven by gas or vapour, because there is the risk of a electrostatic charge inside the jet celaner. To exclude a rotation when pump is starting up there should be a shut-off device directly before the jet cleaner. The volume of the pipeline between shut-off device and jet cleaner should be as low as possible. All pipelines have to be vented.
- Ex jet cleaners must be operated with a line strainer mesh with a maximum width of 500µm.
- The maximum allowed temperature range for the operation of the Ex jet cleaner is 4 to 120°C.

The operator is responsible for keeping the operating conditions.

1.2.4 Hazards



The specified jet cleaners are exposed to high pressures. Therefore, it is imperative that the operating instructions be observed. Damages which may result from non- compliance will be rejected by the manufacturer.



The jet cleaner must be operated only in the environment for which it is intended. Operation is allowed only in closed vessels / rooms. Close attention should be paid to rotating parts.



The jet cleaner should not be forced by rotation at the machine head. This may result in the destruction of the drive.



When working with the jet cleaner, ensure that your hands are properly positioned in an area where they will not be trapped between the nozzles and body of the unit.



Assembly and operation of the specified jet cleaners must be carried out only by instructed and authorized-personnel.

2 Technical data

	5TA.XXX.1Y.AL.EX	5TB.XXX.1Y.AS.EX
Length:	131 mm	226 mm
Built-in diameter:	65 mm	125 mm
Medium connection:	G¾"	G1½"
Number of nozzles:	2 – 4	2 – 4
Nozzle diameter:	2,0 – 5,0 mm	5,0 – 8,0 mm
Work pressure:	3 – 12 bar	3 – 15 bar
Cleaning diameter:	2,5 – 4,5 m	4,0 – 9,0 m
Rinsing diameter:	3,5 – 6,0 m	4,0 – 11,0 m
Weight:	0.8 kg	4.0 kg
Temperature range:	4 – 120 °C	4 – 120 °C
Prefilter:	500 µm	500 µm
Conductivity medium:	>1000 pS/m	>1000 pS/m

Materials:	Stainless steel 1.4404 (316L)
	PEEK TF 10
	EPDM
	Zirconia ZrO ₂

Accessories (optional):	Rotation control
	Connecting parts
	Special nozzles

2.1 Dimensions 5TA



The dimensions can vary depending on the type of medium connection and nozzle diameter

2.2 Dimensions 5TB



The dimensions can vary depending on the type of medium connection and nozzle diameter

3 Maintenance



Depending on the operating conditions the ex jet cleaner has to face a regular visual control of external damage, function of rotation and spraying pattern.

Maintenance from the manufacturer is recommended after a maximum of 300 operating hours. Depending on the prevalent operating conditions for example pressure, temperature, and properties of the medium or impact of the operator on the plant it could be necessary to do the maintenance earlier.

Maintenance and assembly of the Ex jet cleaners can only be affected in the building stages because after assembly, welding seams need to be put on.

If the Ex jet cleaners are disassembled by the operator or by a third party, the ATEX certification is no longer valid.

4 Installation and commissioning

4.1 Installation of the Ex jet cleaner



The operating conditions (Point 1.2.3) must be observed.

When the Ex jet cleaner is mounted to a lance (feed pipe) the connection between the jet cleaner and the pipe should be secured with a welding seam.

The welding seam is to be applied in such a way that the O-ring used for sealing is not damaged.



1. Screw together the feed pipe

2. Weld the connection

4.2 Assembly and operating personnel

The operator of the jet cleaner is responsible for training the assembly and operating personnel. Everybody who works at rotating and spraying machines must be informed about the hazards that these machines may cause.

Persons not listed as operating personnel are not allowed to stay in the working range of the machine. The operator must ensure that the necessary safety measures are taken.

4.3 Mounting



The operating conditions (Point 1.2.3) must be observed

As soon as all pipe systems and feeding pipes fastening the jet cleaner are firmly connected and the valves are closed, the jet cleaner is ready to be placed into operation for the first time.

The function of the pre-filter/strainer in the feeding pipe to the jet cleaner must be checked and the filter element must be inserted.

Prior to commissioning, the feeding pipe to the jet cleaner must be rinsed. Metallic impurities and welding residues may destroy the jet cleaner.

During commissioning, make sure that the feeding pipe to the jet cleaner has been deaerated, especially in the case of long feeding pipes, to avoid the water hammer effects of pressure impacts, which may damage the jet cleaner.

To avoid pressure impacts when hand-operated valves are used, do not open valves abruptly.



In the case of automatically programmed cleaning systems, the operators must be familiarized with cutoff and/or emergency stop procedures.

5 Integration into a system

5.1 Automatic control

If the Ex jet cleaners are integrated into an automated working system, it must be made clear that the function of the jet cleaner can be monitored. This can be done by means of a rotational control or by visual inspection. The function control must be documented in case of visual inspection.

5.2 Manual control

If the Ex jet cleaners are controlled via hand control elements, make sure that water hammer impacts are avoided. Therefore, the operating elements must be slowly opened and closed. If the operating elements are exposed to steam, ensure that the temperature does not exceed the limits specified. This guarantees the performance of the jet cleaner.

5.3 Emergency stop of the system



The operators of the system must be familiar with the plant design in order to be able to force an emergency stop of the jet cleaner. It is essential to provide training and inform personnel about the necessary elements regarding an emergency stop. The training of the people, who were in charge of the cleaning, must be documented. Any damages to any person and/or property, which result from faulty operation or application, are the responsibility of the plant operator.

6 Transport

6.1 Delivery scope



The Ex jet cleaner and the current operating instructions are included with the delivery. You can learn about the delivery options for the Ex jet cleaners from the shipping documents.

6.2 Transport and packaging



Our products produced, assembled and tested very carefully. If there is any reason for complaint, we will provide you complete satisfaction within the scope of our warranty. We will also be pleased to assist you after the expiration of the warranty.

Upon receipt of delivery, always check the packing list with the delivery scope. Once delivery is complete, the goods must be checked for damage.

If there are damages, it is essential to note them on the shipping documents. In the case of damage, the forwarder must countersign the documents.

If parts are returned due to damage, use the outer packaging or the packaging from the devices that are not damaged.

7 Quality control

We are serious about quality in design, production, assembly, final inspection and control. It is essential that high-quality production of our products remain consistent. In order to guarantee our high quality standards, we use a computer-assisted quality assurance system, which is certified according to ISO 9001:2008. Beyond this, all of our products are subjected to a final function test (100% control). As a result, we assure that only properly functioning products leave our company.

8 Disposal

All materials used for the production of the jet cleaner are not harmful to the environment. The most commonly used materials are stainless steel, EPDM, Zirconia and PEEK. You can dispose of the materials using the-proper methods.



ATTENTION!! Make sure that there are no remaining contaminants of materials from previous uses and operation. If there are contaminants, the corresponding material must be used to rinse the parts to be disposed.

9 Annex

9.1 Symbols

Notes regarding protection against explosionImage: Constant of the second s

Observe operating instructions

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9.2 Flow data 5TA-Ex

-			
Pressure	Flow rate		
[bar]	[m ³ /h]	[l/min]	Connection ³ / ₄ "
3.0	0.9	15.0	Number of nozzels 4
4.0	1.0	16.7	
5.0	1.1	18.3	Nozzle diameter 2.0
6.0	1.2	20.0	
7.0	1.3	21.7	
8.0	1.4	23.3	

Pressure	Flow rate		
[bar]	[m³/h]	[l/min]	Connection ³ /4"
3.0	1.5	25.3	Number of nozzles 4
4.0	1.7	28.3	
5.0	1.9	32.0	Nozzle diameter 2.5
6.0	2.0	33.8	
7.0	2.2	37.2	
8.0	2.4	40.0	

Pressure	Flow rate		
[bar]	[m ³ /h]	[l/min]	Connection ³ / ₄ "
3.0	1.6	26.7	Number of nozzles 4
4.0	1.9	31.7	
5.0	2.1	35.0	Nozzle diameter 3.0
6.0	2.3	38.3	
7.0	2.4	40.0	
8.0	2.5	41.7	

Pressure	Flow rate		
[bar]	[m³/h]	[l/min]	Connection ³ /4"
3.0	3.1	51.7	Number of nozzles 4
4.0	3.5	58.3	
5.0	3.8	63.3	Nozzle diameter 4.0
6.0	4.1	68.3	
7.0	4.4	73.3	
8.0	4.7	78.3	

Pressure	Flow rate		
[bar]	[m ³ /h]	[l/min]	Connection ¾"
3.0	3.7	61.7	Number of nozzles 4
4.0	4.3	71.7	
5.0	4.8	80.0	Nozzle diameter 5.0
6.0	5.2	86.7	
7.0	5.5	91.7	
8.0	5.9	98.3	

9.3 Flow data 5TB-Ex

Pressure	Flow rate		
[bar]	[m ³ /h]	[l/min]	Connection 1 1/2"
3.0	3.9	65.0	Number of nozzles 4
4.0	4.4	73.3	Nozzle diameter 4 0
5.0	4.9	81.7	
6.0	5.3	88.3	
7.0	5.7	95.0	
8.0	6.1	101.7	

Pressure	Flow rate		
[bar]	[m³/h]	[l/min]	Connection 1 $\frac{1}{6}$
3.0	5.8	96.7	
4.0	6.7	111.7	Number of nozzles 4
5.0	7.4	123.3	Nozzla diamator E O
6.0	8.0	133.3	Nozzie diameter 5.0
7.0	8.5	141.7	
8.0	9.0	150.0	

Pressure	Flow	v rate	
[bar]	[m³/h]	[l/min]	Connection 1 1/4"
3.0	7.8	130.0	
4.0	8.8	146.7	Number of nozzles 4
5.0	9.5	158.3	Nozzla diamatar 6.0
6.0	10.3	171.7	
7.0	11.0	183.3	
8.0	11.6	193.3	

Pressure	Flow rate		
[bar]	[m³/h]	[l/min]	Connection 1 1/3"
3.0	9.7	161.7	
4.0	11.1	185.0	Number of nozzles 4
5.0	12.3	205.0	Nozzla diamator 7.0
6.0	13.4	223.3	Nozzie diameter 7.0
7.0	14.3	238.3	
8.0	15.1	251.7	

Pressure	Flow rate		
[bar]	[m³/h]	[l/min]	Connection 1 ¹ / ₄ "
3.0	11.9	198.3	
4.0	13.6	226.7	Number of nozzles 4
5.0	15.1	251.7	Nozzla diamator 8 0
6.0	16.4	273.3	
7.0	17.5	291.7	
8.0	18.5	308.3	

10 Imprint

Original instruction manual

5TA/5TB

June 2015

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11 EC-Declaration of Conformity

EC-Declaration of Conformity

in accordance with EU Directive 94/9/EC (ATEX)

We,

Lechler GmbH, Ulmer Strasse 128, 72555 Metzingen / Germany

hereby declare that the

Unit: Intense Clean Hygienic Series: 5TA / 5TB

conforms to the stipulations of the Directive 94/9/EC (ATEX) for units and protective systems for correct use in areas in which an explosion hazard is present.

II 1GD c IIB TX

Ta 4°C up to 120°C

The EC-Type Examination was carried out by the Notified Body TÜV Product Service GmbH 0123, branch office Stuttgart, Gottlieb-Daimler-Str. 7, 70794 Filderstadt, with the EC-Type Examination Number TPS 15 ATEX 20455 008. The following harmonised standards were applied:

EN 1127-1:2011

EN 13463-1:2009

EN 13463-5:2011

The associated operating instructions contain important safety-related instructions and stipulations for putting the named mechanical units into operation in accordance with Directive 94/9/EC (ATEX).

Modifications and repairs to the named units are not permitted without the manufacturer's express written agreement.

If the named units are installed in a higher-level machine, the new risks arising from the installation must be assessed by the manufacturer of the new machine.

Lechler GmbH, June 2015

Walter H. Lechler President

Suido Kunzmann Managing Director