

OPERATING INSTRUCTIONS

Original instructions



GEA Reinigungstechnologie

Orbital cleaner JU6

GEA Tuchenhausen GmbH
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1 General

This chapter contains basic instructions for using the cleaner and explanations of illustration conventions. It also contains information about the design and structure.

The term cleaner in these Operating Instructions refers to GEA Reinigungstechnologie.

1.1 Information about the document

The present instruction manual are part of the user information for the component. The instruction manual contains all the information you need to transport, install, commission, operate and carry out maintenance for the component.

1.1.1 Binding character of this instruction manual

This instruction manual contains the manufacturer's instructions to the operator of the component and to all persons who work on or use the component regarding the procedures to follow.

Carefully read this instruction manual before starting any work on or using the component. Your personal safety and the safety of the component can only be ensured if you act as described in the instruction manual.

Store the instruction manual in such a way that it is accessible to the operator and the operating staff during the entire service life of the component. When the location is changed or the component is sold make sure you also provide the instruction manual.

1.1.2 Note regarding the illustrations

The illustrations in this instruction manual shows the component in a simplified form. The actual design of the component can differ from the illustration. For detailed views and dimensions of the component please refer to the design documents.

1.1.3 Symbols and highlighting

In this instruction manual, important information is highlighted by symbols or special formatting. The following examples illustrate the most important types of highlighting.

⚠ DANGER
Warning: fatal injuries Failure to observe the warning can result in serious damage to health, or even death. • The arrow identifies a precautionary measure you have to take to avoid the hazard.

⚠ WARNING
Warning: serious injuries Failure to observe the warning can result in serious damage to health. • The arrow identifies a precautionary measure you have to take to avoid the hazard.

⚠ CAUTION

Warning: injuries

Failure to observe the warning can result in minor or moderate damage to health.

- The arrow identifies a precautionary measure you have to take to avoid the hazard.

ATTENTION

Warning: damage to property

Failure to observe the warning can result in serious damage to the component or in the vicinity of the component.

- The arrow identifies a precautionary measure you have to take to avoid the hazard.

Carry out the following steps: = start of an action

Carry out the following steps: = Start of a work step

1. First step in a sequence of operations.
 2. Second step in a sequence of operations.
→ Result of the previous operation.
- ⇒ The operation is complete, the goal has been achieved.
INFO Further useful information.

1.2 Manufacturer address

GEA Tuchenhausen GmbH
Am Industriepark 2-10
Germany
21514 Büchen

1.3 Customer service

Phone: +49 4155 49-0
Fax: +49 4155 49-2035
flowcomponents@gea.com
www.gea.com

1.4 EC Declaration of Conformity for Partially Completed Machines



Einbauerklärung Declaration of Incorporation

im Sinne der EG-Maschinenrichtlinie 2006/42/EG
as defined by Machinery Directive 2006/42/EC

Hersteller: **GEA Tuchenhausen GmbH**
Manufacturer: **Am Industriepark 2-10**
21514 Büchen, Germany

Hiermit erklären wir, dass es sich bei dieser Lieferung um die nachfolgend bezeichnete - jedoch unvollständige - Maschine handelt und dass ihre Inbetriebnahme solange untersagt ist, bis festgestellt wurde, dass die Maschine, in die diese Maschine eingebaut werden soll, den Bestimmungen der EG-Maschinenrichtlinie entspricht.

We herewith declare that this consignment contains the subsequently described - but incomplete - machine and that commissioning is suspended until it is established that the machine in which the machine concerned will be installed conforms to the regulations of the EC-Machine Directive

Wir erklären, dass die hier beschriebene unvollständige Maschine den "grundlegenden Sicherheits- und Gesundheitsschutzanforderungen" aus Anhang I, Abschnitt 1. und Abschnitt 2.1 erfüllt. Die technischen Unterlagen wurden gemäß Anhang VII, Teil B erstellt. Auf begründetes Verlangen werden die Unterlagen einzelstaatlichen Stellen zur Verfügung gestellt.

We declare that the subsequently described incomplete machine fulfills the "Essential Health and Safety Requirements" from Annex I part 1. and part 2.1. The technical documentation is compiled in accordance to part B of Annex VII. In response to reasoned request the relevant information will be transmitted to the national authorities.

Bei einer nicht mit uns abgestimmten Änderung an der Maschine verliert diese Erklärung ihre Gültigkeit.

This declaration becomes invalid in case of alterations at the machine which have not been agreed with us.

Bezeichnung der Maschine: <i>Machine's designation:</i>	JU6 JU6
Maschinentyp: <i>Machine type:</i>	GEA Orbitalreiniger GEA orbital cleaner
Einschlägige EG-Richtlinien: <i>Relevant EC-Directives:</i>	2006/42/EG 2006/42/EC
Angewendete harmonisierte Normen: <i>Applicable, harmonized standards:</i>	DIN EN ISO 12100 DIN EN ISO 12100

Büchen, 30 October 2025


Sören de Boon
Senior Vice President
CEO BU Valves & Pumps


i.V. Stephan Dirks
Senior Director Product Engineering & Development
Business Line Hygienic Valves / BU Valves & Pumps

Figure 1-1 - EU Declaration of Incorporation in accordance with the EC Machinery Directive 2006/42/EC

Translated copy of the EU - Declaration of Integration in accordance with the EC Machinery Directive 2006/42/EC

Manufacturer:	GEA Tuchenhausen GmbH Am Industriepark 2-10 21514 Büchen
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We herewith declare that this consignment contains the subsequently identified – but incomplete – machine and that putting into service is not permitted until it has been established that the machinery into which this machine is to be incorporated is in conformity with the provisions of the EC Machinery Directive.

We declare that the incomplete machine identified here complies with the "Essential Health and Safety Requirements" defined in Annex I, section 1 and section 2.1. The technical documentation is compiled in accordance with Annex VII, part B. In response to a reasoned request the relevant information will be transmitted to the appropriate national authorities.

This declaration will become invalid if any alterations are made to the machine which have not been agreed with us.

Designation of the machine:	JU6
Machine type:	GEA Orbital cleaner
Relevant EC directives:	2006/42/EC EC Machinery Directive
Applicable harmonized standards:	DIN EN ISO 12100

Büchen, 30/10/2025

Sören de Boon Senior Vice President CEO BU Valves & Pumps	Signed by Stephan Dirks Senior Director Product Engineering & Development Business Line Hygienic Valves / BU Valves & Pumps
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2 Safety

This chapter describes the minimum requirements for the intended use of the cleaner. It forms the basis for safe operation of the cleaner.

2.1 Intended use

The GEA orbital cleaner JU6 orbital cleaner is designed for cleaning tanks and vessels. This cleaner is designed for the operation in a vertical installation position. The inlet faces upwards. If the cleaner is used in a different position, its performance may be impaired. All information contained in this document refers to a cleaner in the normal fitting position.

INFO The manufacturer will not accept any liability for damage resulting from any use of the cleaner which is not in accordance with its designated use. The risk is borne solely by the operating company.

2.1.1 Requirements for the operation

The prerequisite for the reliable and safe operation of the cleaner is proper transportation and storage as well as professional installation and assembly. Operating the unit within the limits of its designated use also involves adhering to the operating, maintenance and servicing instructions.

2.1.2 Improper operating conditions

The operational reliability of the cleaner cannot be ensured under improper operating conditions. Therefore avoid improper operating conditions.

Operating the cleaner is not permitted if

- Persons or objects are in the danger zone.
- Safety devices are not working or were removed.
- Malfunctions have been detected on the cleaner.
- Damage or a leak has been detected on the cleaner.
- Maintenance intervals have been exceeded.

2.2 Operator's duty of care

In your capacity as operator of the facility you bear a particular responsibility for the proper and safe handling of the cleaner in your facility. Only use the cleaner when it is in perfect condition to prevent danger to persons and property.

These Operating Instructions contain the information you and your staff need for the safe and reliable operation during the entire service life of the cleaner. Be sure to read this instruction manual carefully and ensure that the measures described here are observed.

The operator's duty of care includes planning the necessary safety measures and monitoring that these measures are observed. The following principles apply:

- Only allow qualified staff to work on the cleaner.
- The operating company must authorize personnel to carry out the relevant tasks.
- Working areas and the entire environment of the cleaner must be neat and clean.
- Personnel must wear suitable work clothing and personal protective equipment. As the operating company must ensure that work clothing and personal protective equipment are used.
- Inform personnel regarding any properties of the product which might pose a health risk and the preventative measures to be taken.
- Have a qualified first-aid representative on call during the operation. This person must be able to initiate any necessary first-aid measures in case of an emergency.
- Clearly define processes, lines of authority and responsibilities associated with the cleaner. Everybody must know what to do in case of an emergency. Instruct the staff in this respect at regular intervals.
- The signs relating to the cleaner must always be complete and legible. Check, clean and replace the signs as necessary at regular intervals.
- Observe the technical data specified and the limits of use!

INFO Carry out regular checks. This way you can ensure that these measures are actually observed.

2.3 Subsequent changes

Subsequent changes to the cleaner are not permitted. Otherwise you will have to undergo a new conformity process in accordance with the EC Machinery Directive on your own.

In general, only original spare parts supplied by GEA Tuchenhausen GmbH should be installed. This ensures the reliable and economical operation of the cleaner.

2.4 General safety precautions and dangers

The cleaner was built in accordance with the state of the art and recognised safety regulations at the time of its launch.

Nevertheless, the cleaner can pose dangers, especially if

- the cleaner is not used in accordance with its intended use,
- the cleaner is not used correctly,
- the cleaner is operated under impermissible operating conditions.

The safety measures stipulated by the operator and listed below must still be adhered to in order to ensure safety.

2.4.1 Principles for safe operation

Dangerous situations during operation can be avoided by safety-conscious and proactive behaviour of the personnel.

To ensure the safe operation of the cleaner the following principles apply:

- The Operating Instructions must be kept ready to hand and accessible for everyone at the cleaner's place of use. They must be complete and in clearly legible form.
- Only use the cleaner for its intended use.
- The cleaner must be functional and in good working order. Check the condition of the cleaner before starting work and at regular intervals.
- Wear tight-fitting work clothing for all work on the cleaner.
- Ensure that nobody can get hurt on the parts of the cleaner.
- Immediately report any faults or noticeable changes on the cleaner to the person responsible.
- Never touch the pipes and the cleaner when these components are hot! Avoid opening the cleaner, unless the process units have been emptied and depressurised.
- Observe the accident prevention regulations and all local regulations.

2.4.2 Environmental protection

Harm to the environment can be avoided by safety-conscious and proactive behaviour of the staff.

For environmental protection the following principles apply:

- Substances harmful to the environment must not be discharged into the ground or the sewage system.
- Always observe the pertinent regulations relating to waste avoidance, disposal and utilization.
- Substances harmful to the environment must be collected and stored in suitable containers. Clearly mark the containers.
- Dispose of lubricants as hazardous waste.

2.4.3 Electrical equipment

For all work on electrical equipment, the following principles apply:

- Access to electrical equipment should only be allowed to qualified electricians. Always keep unattended control cabinets locked.
- Modifications of the controller can affect the safe and reliable operation. Modifications are only permitted with the express permission of the manufacturer.
- After completion of all work, check that the protective devices are fully functional.

2.5 Supplementary regulations

In addition to the instructions in this documentation the following also has to be observed:

- pertinent accident prevention regulations,
- generally accepted safety rules,
- national regulations applicable in the country of use,
- work and safety instructions applicable in the facility,
- installation and operating regulations for use in potentially explosive areas.
- For use in Ex-protected areas, special safety and operating instructions apply. For this purpose, GEA supplies a separate ATEX supplementary operating manual, which must be observed.

2.6 Qualification of personnel

This section contains information about the qualifications that staff working on the cleaner must have.

Operating and maintenance personnel must

- have the necessary qualification to carry out their tasks.
- be instructed with regard to possible dangers.
- know and observe the safety precautions given in the documentation.

Only allow qualified electricians to carry out work on the electrical equipment or have a qualified electrician supervise the work. Only allow specially trained personnel to carry out work on an explosion-protected installation. When working on explosion-protected installation observe the standards DIN EN 60079-14 for gases and DIN EN 50281-1-2 for dusts.

The following minimum qualifications are required:

- Vocational training as a skilled worker who can work on the cleaner independently.
- Sufficient instruction to work on the cleaner under the supervision and direction of a qualified specialist.

Each member of staff must meet the following requirements to be allowed to work on the cleaner:

- Personal suitability for the respective task.
- Sufficient professional qualification for the respective task.
- Instructed with regard to the function of the cleaner.
- Instructed with regard to the operating sequences of the cleaner.
- Familiar with the safety devices and their function.
- Familiarity with this instruction manual, especially with the safety precautions and the information which is relevant for the task on hand.
- Familiar with the basic regulations with regard to occupational health and safety and accident prevention.

For work to be carried out on the cleaner the following user groups are distinguished:

User groups

Staff	Qualifications
Operating personnel	Adequate instruction and sound knowledge in the following areas: • Function of the cleaner • Operating sequences of the cleaner • What to do in case of an emergency • Lines of authority and responsibilities with respect to the task
Maintenance personnel	Adequate instruction as well as sound knowledge of the design and function of the cleaner. Sound knowledge in the following areas: • Mechanical equipment • Electrical equipment • Pneumatic system Authorization with regard to safety engineering standards to carry out the following tasks: • Setting devices into operation • Earthing of devices • Marking of devices The relevant certificates of qualification must be submitted before work can be carried out on ATEX certified machines.

Table 1: User groups

2.7 Residual dangers

Dangerous situations can be avoided by safety-conscious and proactive behaviour of the personnel and by wearing personal protective equipment.

Residual dangers on the cleaner and measures

Danger	Cause	Measure
Danger to life	Inadvertent switch-on of the cleaner	Effectively disconnect all components, effectively prevent switch-on.
	Electric power	Observe the following safety rules: • Isolate from the power supply. • Take appropriate measures to prevent switch on. • Test absence of voltage. • Earthing and short-circuiting. • Cover or safeguard any adjacent live parts.
Risk of injury	Danger presented by moving or sharp-edged parts	The operator must exercise caution and prudence. For all work: • Wear suitable work clothing. • Never operate the machine if the cover panels are not correctly fitted. • Never open the cover panels during the operation. • Never reach into openings. As a precautionary measure, wear personal protective equipment in the vicinity of the valve: • Protective gloves • Safety shoes

Table 2: Residual dangers

2.8 Safety instructions

Please observe the following information:

- Conformity applies only to cleaners without electrical components.
- Before putting the cleaner into operation, make sure that nobody can be endangered by the cleaner's running.
- Never operate the cleaner outside the object to be cleaned.
- Rotating parts and spilled cleaning fluid can endanger people and cause property damage.
- The cleaners may only be operated if cleaning fluid is supplied. For the safe operation of the rotating cleaners it must be ensured that the cleaner is operated only with a supply of liquids, see .
- The cleaner must not be exposed to gas and vapour instead of liquid, not even briefly when starting the cleaning process and emptying pipes. High speeds and increased friction could cause damage and ignition hazards.
- The cleaners must be filled with cleaning fluid without pressure and then started gently. Filling under pressure would amount to a short-term operation with gas or vapour, which can lead to ignition hazards. A sudden start can lead to damage and thus to an ignition source. Pressure surges are to be avoided.
- In the event of malfunctions, shut down the cleaner (disconnect from the power, air and fluids supplies) and secure it against further use. Defects are to be rectified immediately.
- The maximum operating conditions must be observed and monitored, see . There is the risk of excessive charge formation, increased wear and leakages, see.
- Observe the safety data sheets supplied by the detergent manufacturers. The cleaner must only be operated with such cleaning detergents and used in such mediums against which all materials used are sufficiently resistant. The sealing materials must always be matched to the type and temperature of the cleaning medium.
- During cleaning, liquids must be discharged from the tank so that no electrostatic charges form in the liquid which could potentially accumulate. During cleaning, do not add any liquids in the container.
- At the start of vessel or container cleaning, atmospheric conditions must be present inside, see table "Conditions for starting tank cleaning" (page 13).
- The cleaning medium must be removed after spraying and must not be pumped through the cleaner again.
- The cleaner must be regularly checked for damage and function, taking into account the operating conditions. GEA recommends a visual inspection at every cleaning process.
- Maintenance of the ATEX cleaner is mandatory after a maximum of 150 operating hours. Maintenance-free cleaners (usually rotating cleaners) must be inspected after a maximum of 150 operating hours and after a maximum of 3 years or 2500 hours of operation. Depending on the operating conditions, the operator must specify shorter maintenance intervals or inspection intervals.

- The performed maintenance must be logged.
- The user must ensure a loss-proof lead connection into the tank. For this, GEA offers, among other things, suitable components and a mounting system.

Conditions when starting the tank cleaning

Designation	Size
Absolute pressure	0.8...1.1 bar
Ambient temperature	See the instruction manual of the cleaner
Operating temperature	See the instruction manual of the cleaner
Temperature in the tank	See the instruction manual of the cleaner
Acidity content	Maximum of 21% by volume
Relative ambient humidity	until saturation

Table 3: Conditions when starting the tank cleaning

3 Transport and storage

This chapter contains information about transporting the cleaner. It also describes the minimum requirements for storage after delivery and for any necessary intermediate storage.

The target group of this chapter is all persons who carry out actions related to the transport or storage of the cleaner.

3.1 Storage conditions

Store the cleaner in a dry place and ensure it is not subjected to vibration and is protected from external influence.

Storage temperature +5...+40 °C

3.2 Transport

For transport, the following principles apply:

- Hold the cleaner by the lifting eye in the T-piece under the cylinder housing. Never grab the cleaner by the cylinder housing or the nozzles, as fingers can become trapped between the moving, interlocking gears in such cases. There is a risk of injury.
- Only use suitable lifting gear and slings for transporting package units/cleaners.
- Observe the pictograms on the package.
- Handle the cleaner with care to avoid damage caused by impact or careless loading and unloading. The outside synthetic materials are susceptible to breaking.
- Only allow qualified staff to transport the cleaner.
- Movable parts must be properly secured.
- Only use approved, fully functional load lifting devices and lifting accessories which are suitable for the intended purpose. Observe the maximum load-bearing capacities.
- Under no circumstances should anyone stand under a suspended load.

3.3 Scope of supply

On receipt of the cleaner, check whether

- the details on the type plate correspond to the data in the order and delivery documents,
- the equipment is complete and all components are in good order.

4 Technical data

4.1 Technical data

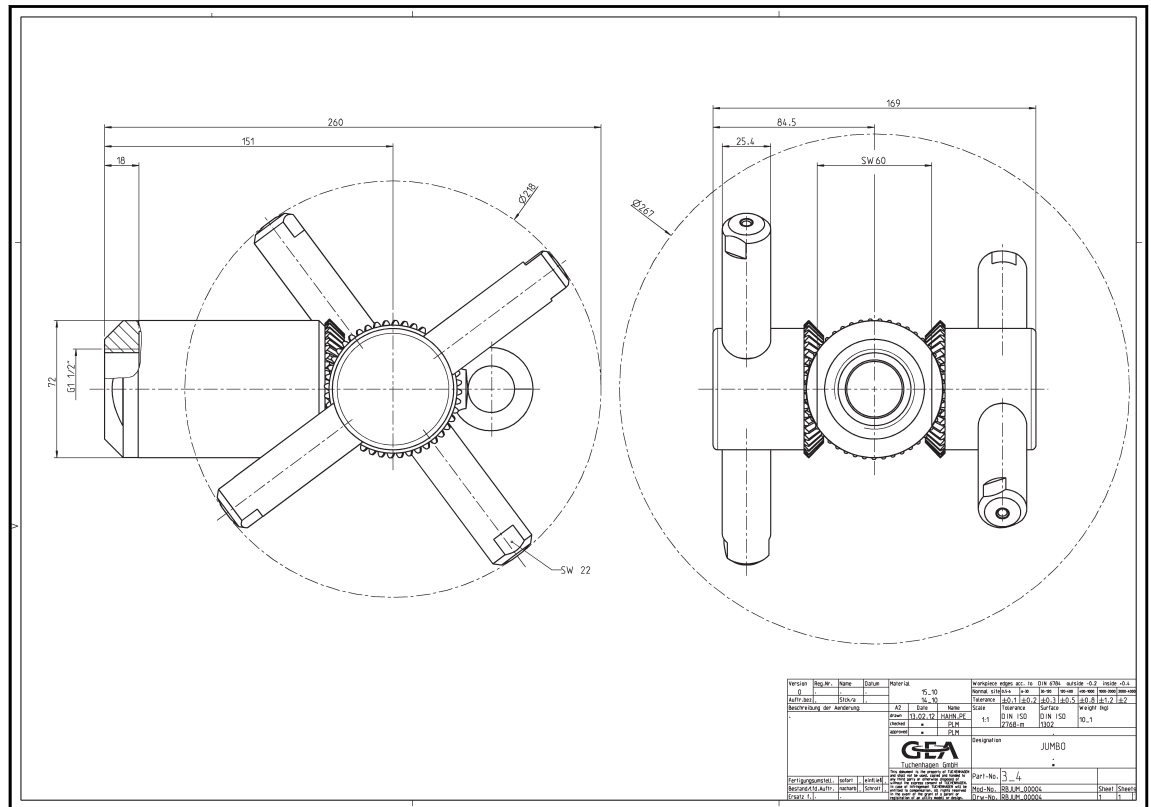


Figure 4-1 - Dimension sheet

Technical data: JU6

Characteristics	Description
Weight	4.4 kg
Inlet	1 ½" BSPT (IG) or 1 ½" NPT (IG)
Nozzle size	¼" or 3/8"
Material	Stainless steel AISI 316L, P.PTFE
Total length	260 mm, approx. 10"
Operating temperature	Max.: 95 °C, 140 °F
Working pressure	Min.: 4 bar Max.: 14 bar

Table 4: Technical data of the cleaner

4.2 Operating pressure and nozzle size

For the GEA Orbital Cleaner JU6, an operating pressure between 5 and 10 bar is recommended, with 4 bar as the minimum and 14 bar as the maximum allowable pressure.

The cleaner can be equipped with nozzles in sizes 1/4" and 3/8".

The nozzle opening and pump pressure determine the jet length and flow rate. The tank cleaner should be equipped with nozzles with the appropriate nozzle opening.

5 Assembly and installation

This chapter contains information and instructions about the assembly and installation of the cleaner.

The target group of this chapter is all persons who carry out actions related to the cleaner.

5.1 Safety precautions

Hazardous situations during installation can be avoided by safety-conscious and proactive behaviour of the personnel.

For installation, the following principles apply:

- Only properly qualified staff is allowed to install, assemble and set the cleaner into operation.
- Ensure that adequate working and traffic areas are available at the place of installation.
- Observe the maximum load-bearing capacity of the installation surface.
- Observe the transport instructions and markings on the part(s) to be transported.
- Remove any nails protruding from transport crates immediately after opening the crate.
- Under no circumstances should anyone stand under a suspended load.
- During assembly, the cleaner's safety devices might not be working effectively.
- Reliably secure sections of the plant which have already been connected against inadvertently being switched on.

5.2 Notes on installation

Observe the following points before installing the cleaner:

- Switch off the power circuit and protect it from unauthorized switch-on.
- Protect the supply pump for CIP medium against unauthorized switch-on.
- Shut off the cleaning medium supply line and secure the line against being opened. There must not be any chemical cleaning medium in the supply line.
- Make sure that there are no foreign objects in the system.
- Clean (rinse) the cleaning medium supply line before connecting the cleaner.
- The electrical installation must be in accordance with the requirements of EN 60079-14 in areas with explosive gas atmosphere and in accordance with the requirements of EN 61241-4 in areas with explosive dust atmosphere.

5.3 Installation

Installation dimensions

Cleaner	Smallest manhole diameter
JU6	280 mm, 11"

Table 5: Installation dimensions

Fitting position

The cleaner is intended for operation in a vertical position, with the inlet facing up and the ball facing down.

Sieve

It is recommended to install a filter/sieve (mesh size 0.5 mm) in the CIP supply line near the cleaning head to protect the cleaner from blockages due to particles or damage.

⚠ CAUTION

CAUTION - Sharp moving parts

Fingers can become trapped between the moving, interlocking gears.

- Hold the cleaner by the lifting eye in the T-piece under the cylinder housing.

ATTENTION

CAUTION - Incorrect installation and improper tools

Damage/deformation to the housing.

- When screwing in and tightening the cleaner, be sure to hold it on the wrench surfaces of the inlet cap.
- Never use a chain or a tool with serrated clamping to turn the housing.

Perform the following steps:

1. Hold the cleaner at the inlet and screw it onto the threaded connection by hand until it is firmly seated.
 2. Connect all media supply lines.
- ⇒ Done.

6 Commissioning

This chapter contains information for the initial and any subsequent commissioning of the cleaner. It also describes the necessary checks and tests.

The target group of this chapter is all persons who carry out actions related to the cleaner.

6.1 Safety precautions

Initial commissioning

For initial commissioning, the following principles apply:

- Carry out protective measures against dangerous contact voltages in accordance with the applicable regulations.
- The cleaner must be completely assembled and correctly adjusted. All screw connections must be securely tightened.
- Reliably secure machine parts which have already been connected against inadvertently being switched on.
- Relubricate all lubricating points.
- Make sure lubricants are used properly.
- After conversion of the cleaner, residual risks must be reassessed.

Commissioning

For commissioning, the following principles apply:

- Only allow properly qualified staff to set the cleaner into operation.
- Make sure all connections are properly established.
- When installing the cleaner, secure it against tipping and secure all fixing points correctly.
- Only set the cleaner into operation in closed vessels.
- When the cleaner is switched on, the danger zones must be free.
- Remove any liquids that have escaped without leaving residues.

6.2 Commissioning

Prerequisites

- Before commissioning, check the voltage specifications, the fuse rating and the supply cable.
- Avoid water hammers in the supply pipe.

⚠ CAUTION

Hot and aggressive liquids are discharged from the cleaner!

Danger of injury.

- Make sure nobody stands in the area of action of the nozzles.
- The cleaner may only be operated in a container intended for this purpose.

ATTENTION

The cleaner is a sensitive component.

Excessive pressure of the cleaning fluid can damage the cleaner.

- Do not exceed the maximum allowable pressure of 14 bar.

ATTENTION

The seals in the cleaner are sensitive components.

Steam can damage the seals.

- Do not operate the cleaner with steam.

Perform the following steps:

1. Connect the cleaner and set it into operation.
2. During commissioning, check regularly that all seals are free of leakage. Replace defective seals.

⇒ Done.

7 Operation and control

This chapter contains information on starting up and shutting down the cleaner.

The target group of this chapter is the operators of the cleaner.

7.1 Safety precautions

Dangerous situations during operation can be avoided by safety-conscious and proactive behaviour of the personnel.

For operation, the following principles apply:

- Monitor the cleaner during the operation.
- Check all safety devices at regular intervals.
- All guards and hoods must be mounted as intended.
- The place of installation of the cleaner must be adequately ventilated at all times.
- Structural alterations of the cleaner are not permitted. Immediately report any changes on the cleaner to the person responsible.
- Always keep danger zones clear. Do not leave any objects in the danger zone. Only allow persons to enter the danger zone when the machine is de-energized.
- Regularly check that all emergency stop devices are working correctly.

7.2 Operating conditions

The cleaner is driven by the cleaning liquid flowing through it at a suitable pressure and flow rate. It is essential that the cleaner is supplied with cleaning liquid at the correct pressure and flow rate for effective operation. The requirements are specified in the tables below.

Operating flow rate and pressure requirements for cleaner JU6 – ¼" nozzles

Required flow rate [m³/h]	10.8	13.2	15	16.8	18	19.2
Required pressure [bar]	4	6	8	10	12	14

Table 6: Operating flow rate and pressure requirements for cleaner JU6 – ¼" nozzles

Operating flow rate and pressure requirements for cleaner JU6 – ⅜" nozzles

Required flow rate [m³/h]	18.6	22.8	27	29.4	32.4	34.8
Required pressure [bar]	4	6	8	10	12	14

Table 7: Operating flow rate and pressure requirements for cleaner JU6 – ⅜" nozzles

ATTENTION

The cleaner may only be operated at a maximum pressure of 14 bar. Higher pressures can destroy the cleaner.

- The specified pressure is the pressure required at the cleaning head and not at the pump.

8 Maintenance

8.1 Safety precautions

Maintenance and repair

Before carrying out maintenance and repair work on the component's electrical equipment, perform the following steps in accordance with the "5 safety rules":

- Isolate from the power supply
- Take appropriate measures to prevent switch on
- Test absence of voltage
- Earthing and short-circuiting
- Cover or safeguard any adjacent live parts.

For maintenance and repair, the following principles apply:

- Observe the intervals specified in the maintenance schedule.
- Only allow qualified staff to carry out maintenance or repair work on the cleaner.
- Before starting any maintenance or repair work, the cleaner must be switched off and secured against being switched back on. Work may only be started once any residual energy has been discharged.
- Block access for unauthorized persons. Put up notice signs which draw attention to the maintenance or repair work going on.
- Do not climb on the cleaner. Use suitable access aids and working platforms.
- Wear suitable protective clothing.
- Only use suitable and undamaged tools to carry out maintenance work.
- When replacing parts only use approved, fully functional load suspension devices and lifting accessories which are suitable for the intended purpose.
- Before setting the unit back into operation refit all safety devices as originally provided in the factory. Then check that all safety devices are working correctly.
- Make sure lubricants are used properly.
- Check pipes are firmly secured, also check for leaks and damage.
- Check that all emergency stop devices are working correctly.

Disassembly

For removal, the following principles apply:

- Only allow qualified staff to disassemble the cleaner.
- Before starting disassembly, the cleaner must be switched off and secured against being switched back on. Work may only be started once any residual energy has been discharged.
- Disconnect all power and utility lines.
- Markings, e.g. on lines, must not be removed.
- Do not climb on the cleaner. Use suitable access aids and working platforms.
- Mark the lines (if unmarked) prior to disassembly to ensure they are not confused when re-assembling.
- Protect open line ends with blind plugs against ingress of dirt.
- Pack sensitive parts separately.
- Observe storage conditions for longer periods of standstill.

8.2 Inspections

GEA Tuchenhausen GmbH recommends inspections after 175 operating hours to check:

- The tightness of the cleaner.
- The functionality of the cleaner.

8.3 Servicing intervals

To ensure the highest operational reliability of the cleaner, all wearing parts should be replaced at longer intervals.

The practical servicing intervals can only be determined by the user since they depend on the operating conditions. For example:

- type and temperature of the cleaning solution,
- ambient conditions.

As a guideline it is recommended to carry out a check at the latest every 350 operating hours.

8.4 Prior to removal

Prerequisites

- Ensure that no active processes are running in the relevant area during maintenance and servicing work .
- The vessel must be pressure/vacuum free.

Perform the following steps:

1. Drain all pipe system elements that lead to the cleaner and, if necessary, clean or rinse them.
 2. Allow the cleaner to cool down.
 3. Loosen the terminals from the initiator cable.
 4. Remove the cleaner from the tank.
- ⇒ Done.

8.5 Dismantling

Tools

- Use a rod of size 3/4" with a slot width of 3/4" x length of 7/8" to remove the lower vertical shaft.

Remove motor

1. Carefully clamp the wrench surfaces of the inlet flap (29) in a vice with padded jaws.
2. Hold the housing (18) with a strap wrench and unscrew it from the inlet cap.
3. Remove the motor (1) from the housing.

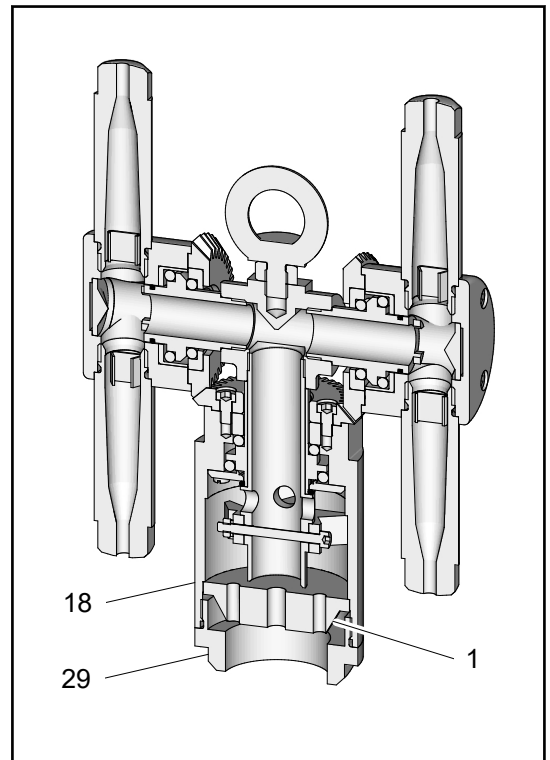


Figure 8-1 - Disassembly - Motor removal

Remove the housing.

1. Unscrew the three set screws M5 x 5 (28) from the T-piece (10) of the nozzle head.
2. Insert the tool – a rod of size 3/4" with a slot: width 3/4" x length 7/8" – into the lower vertical shaft (2) and loosen the shaft.
→ The entire shaft (2) with the rotor (4) can then be pulled out.
3. Loosen four cylinder screws M5 x 10 (26) and remove the bevel gear (8) from the housing (18).

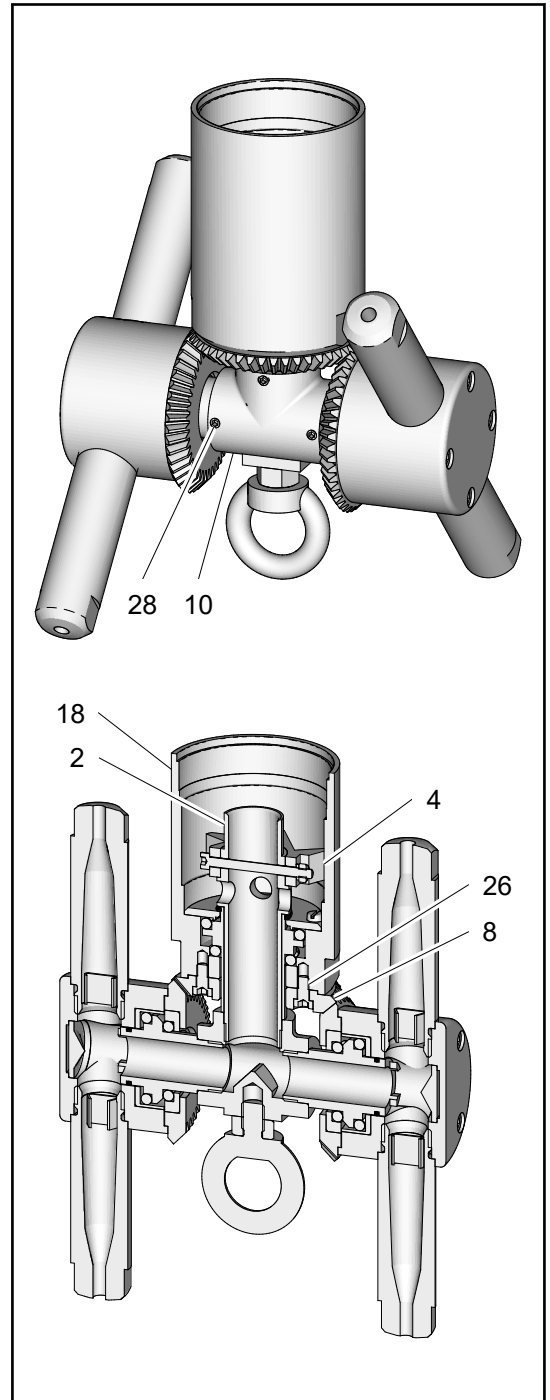


Figure 8-2 - Disassembly - Housing removal

Disassemble the housing.

1. Unscrew three pan-head screws M4 x 10 (32) from the housing (18).
2. Remove the bearing support plate (6) and the O-ring (23).

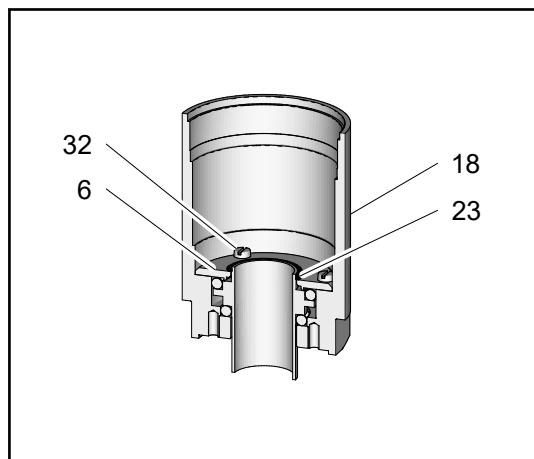


Figure 8-3 - Disassembly - Housing disassembly

Disassemble and remove the nozzle head.

1. Unscrew the nozzles (15) along with the flow straighteners (16).
→ Make sure the three set screws M5 x 5 (28) have been removed from the vertical and horizontal T-pieces (10).
2. Clamp the T-piece (10) in a vice with padded jaws and insert the tool into the nozzle housing (13).
3. Loosen the ring with guide elements at the end of the nozzle body shaft (12).
4. Carefully hold the bevel gear (9) and nozzle body (13) and unscrew four cylinder screws M5 x 45 (27).
5. Carefully place the nozzle body (13) on a flat work surface, with the bevel gear facing upward.
6. Hold the nozzle body (13), and gently lift the entire nozzle body shaft (12) with bevel wheel (9) out of the threaded end of the shaft, taking care not to change the position of the left ball bearing unit in the nozzle body (13).

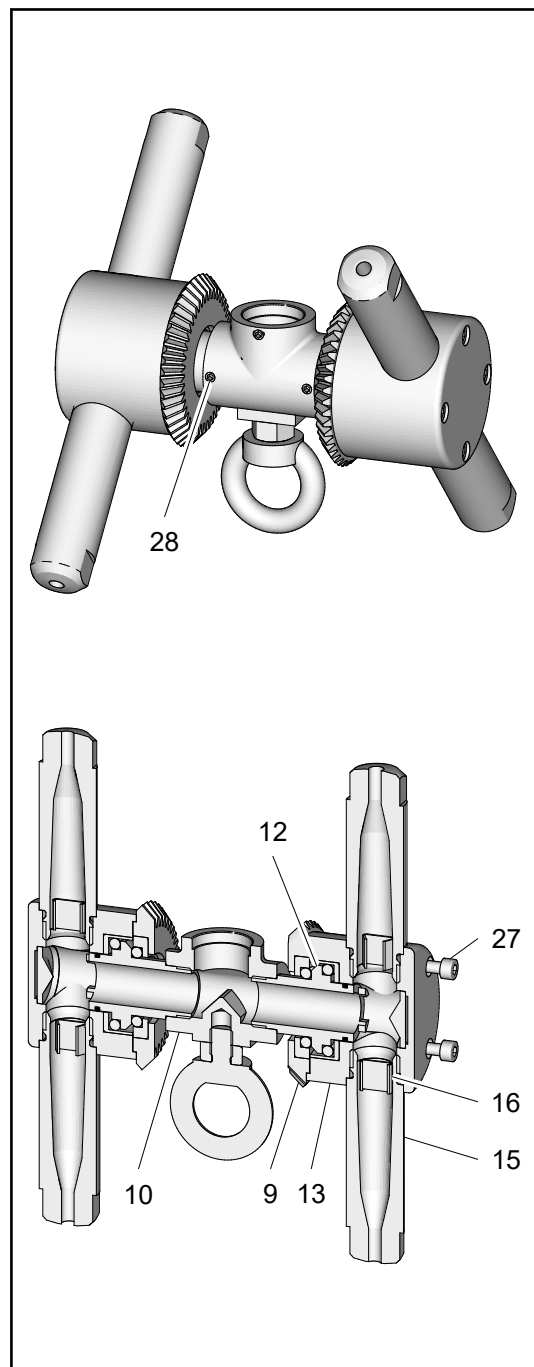


Figure 8-4 - Disassembly - Remove and disassemble the nozzle head

⇒ Done.

8.6 Maintenance

This cleaner is designed for easy maintenance and has few mechanical/wear parts that are easy to replace. No special tools are required. This cleaner should be visually inspected/maintained regularly.

Carry out the following steps:

1. Check the parts for wear and damage and replace if necessary.
2. Check whether the 14 stainless steel balls (24) and 14 PTFE balls (33) were alternately inserted.
3. Carefully remove and inspect the vertical shaft bushing (7).
4. Check whether 11 stainless steel balls (24) and 11 PTFE balls (33) are alternately arranged.
5. Inspect the running surfaces of the bearing insert ring (34) for wear and chatter marks.
6. Inspect the bevel gear insert (35) for damage or chatter marks.
7. Check the nozzle body shaft (12) for wear, chatter marks on the running surfaces, and alignment.
8. Inspect the O-ring (25) for damage and deformation.
9. Check the nozzle body (13) for damage.
10. Replace all wearing parts marked in the spare parts list.

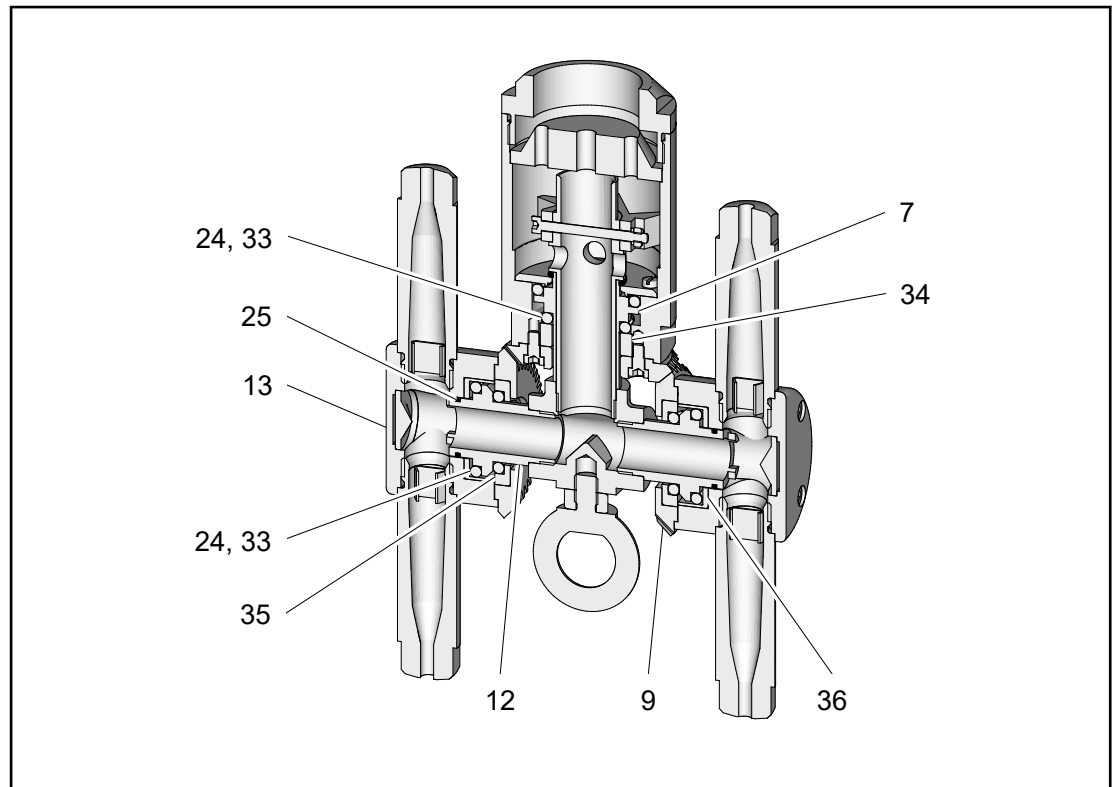


Figure 8-5 - Maintenance

⇒ Done.
INFO

The bevel gear insert rings (35) in the bevel gears (9) are replaceable. The two nozzle bodies (13) are equipped with replaceable nozzle body insert rings (36). These easy-to-install replacement parts significantly reduce maintenance time and costs.

8.7 Assembly

Assemble the housing

1. Place a replacement vertical shaft bearing bushing (7) on a flat work surface.
→ Alternatively, you can use a rod (28 mm, 35 mm long).
2. Slide the housing (18) over the replacement vertical shaft bearing bushing or the rod (28 mm).
→ This keeps the balls in position during assembly.
3. Alternately place 11 stainless steel balls (24) and 11 PTFE balls (33) on the lower raceway.
4. Place the vertical shaft bearing bushing (7) on top of the replacement vertical shaft bearing bushing (7) or the rod (28 mm) and carefully lift the housing (18) so that the vertical shaft bearing bushing (7) holds the balls in place.
5. Place this unit on the inlet cap (29), taking care not to change the position of the balls.
6. Alternately place 14 stainless steel balls (24) and 14 PTFE balls (33) on the upper raceway of the vertical shaft bearing bushing (7).
7. Assemble and tighten the bearing support plate (6) with three pan-head screws M4 x 10 (32).
8. Mounting the O-ring (23).
9. Screw the bevel gear (8) to the housing with four cylinder screws M5 x 10 (26).

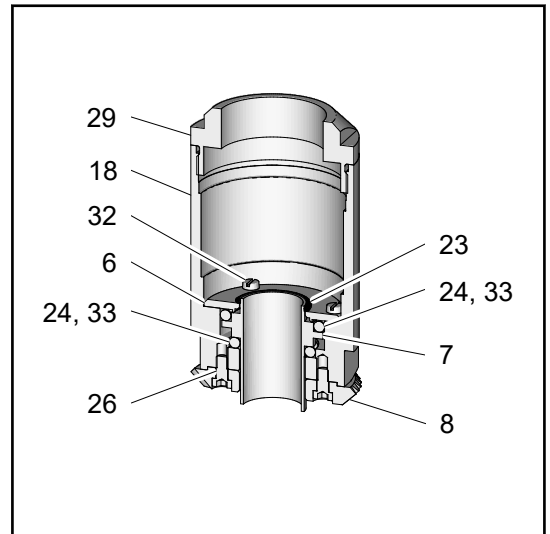


Figure 8-6 - Installation - Assembly of the housing

Installing the nozzle bodies

1. Place the nozzle body (13) with the four holes facing downward on a flat work surface. Moisten the raceway of the nozzle body insert (36).
2. Alternately place 12 stainless steel balls (24) and 12 PTFE balls (33) on this raceway.
3. Cut the PTFE O-ring (25) as shown in the spare parts drawing and insert it into the groove of the nozzle body shaft (12).
4. Insert the shaft into the nozzle body (13) without changing the position of the balls.
5. Slightly moisten the raceway of the nozzle body shaft (12) with water and alternately place 10 stainless steel balls (24) and 10 PTFE balls (33) on this raceway.
6. Carefully slide the bevel gear (9) onto the nozzle body (13) and tighten with four cylinder screws M5 x 45 (27).
7. Hold the nozzle body shaft (12) at the protruding threaded end and check that it rotates freely.

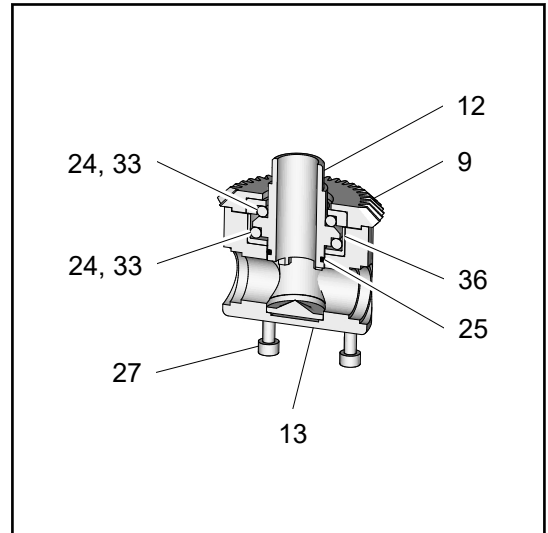


Figure 8-7 - Installation - Install nozzle body

Final assembly

1. To assemble a nozzle body (13), insert the threaded end of the nozzle body shaft (12) into the T-piece (10). Insert the end of the nozzle body shaft (12) with the guide elements through the opening and tighten.
→ Repeat this process for the other nozzle body (13).
2. Insert the lower vertical shaft (2) complete with 6-tooth rotor (4) through the housing (18), screw it into the vertical and horizontal T-piece (10), and tighten.
3. Screw the lifting eye (21) back on. Align with the vertical and horizontal T-piece (10) and tighten the set screw with hexagon socket M5 x 5 (28).
4. Insert and tighten three set screws with hexagon socket M5 x 5 (28).
5. Insert the motor (1) from the top into the housing (18), with the conical side facing upward, and ensure that it rests against the housing shoulder (18).
6. Screw the inlet cap (29) into the housing (18) and tighten with a strap wrench.
7. Install and tighten the nozzles (15) with the flow straighteners (16) in the nozzle bodies (13). Proceed with caution, as failure to do so may result in deformation of the nozzle body shaft (12) or chatter marks.
8. Finally, hold the cleaner by the lifting eye (21) and check that the housing (18) and both nozzle bodies (13) rotate freely in both directions.

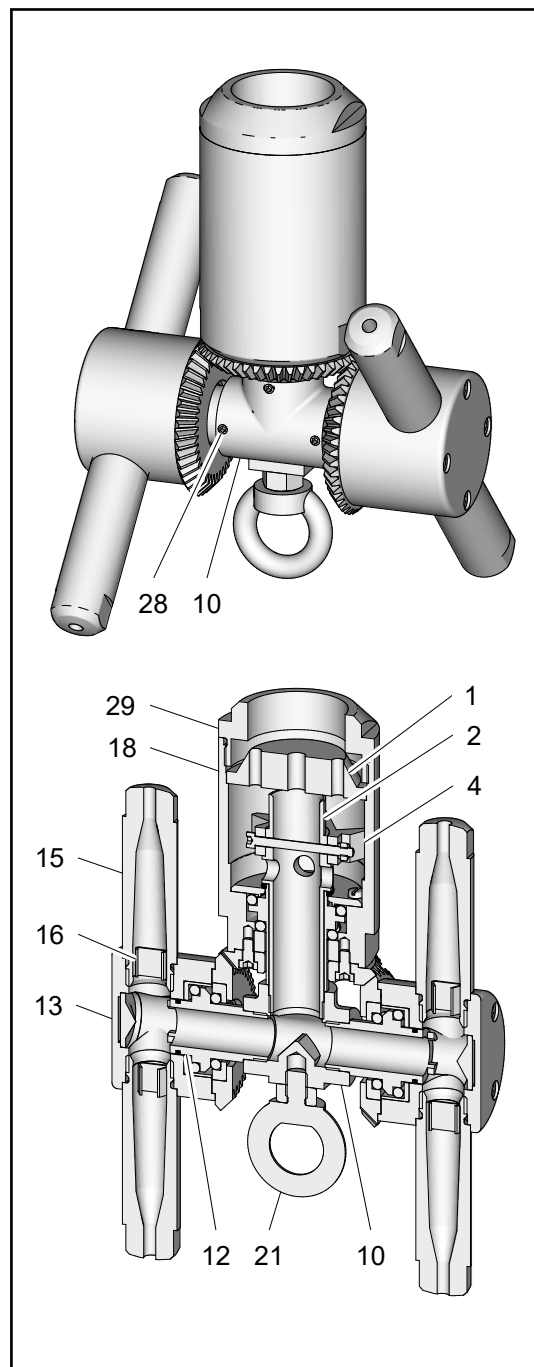


Figure 8-8 - Assembly - final installation

⇒ Done.

INFO

The nozzle bodies (13) must be mounted so that the nozzle openings in one nozzle body are on the horizontal plane, and the nozzle openings in the other nozzle body are on the vertical plane. Only in this way can the correct spray pattern be ensured.

9 Malfunctions

9.1 Faults and remedies

In the event of malfunctions immediately deactivate the cleaner and secure it against inadvertent reactivation. Malfunctions may only be remedied by qualified staff, who must observe the safety precautions. For malfunctions not listed in the table below, contact the manufacturer.

Malfunction	Cause	Remedy
Cleaner does not rotate and/or no liquid flows through the cleaner.	Incorrect pressure or flow rate at the cleaner.	Correct the pressure and flow rate at the cleaner.
	Sieve pipe clogged.	Clean or replace the sieve pipe.
	Blocked nozzle and flow straightener	Remove and inspect the nozzle and flow straightener for blockages. Allow cleaner to run without nozzles. The blockages are flushed out if necessary.
	Motor blocked.	Remove the cleaner from the CIP line and remove the inlet cap. Check that the motor boreholes are free. Disassemble the motor and check that the vertical shaft and rotor are not obstructed from moving.
	Bevel wheels are damaged or blocked.	Turn the cleaner upside down on a firm, flat work surface and slowly rotate the cleaning head by the lifting eye. Watch for any stiff areas while turning. If stiffness is detected, check the bevel gears at that point for damage or blockages. If stiffness is detected, check the bevel gears at this point for damage and blockages.

Table 8: Malfunctions and remedies

10 Shutting down

10.1 Safety precautions

The following principles apply for decommissioning:

- Switch the cleaner off via the main switch.
- Padlock the main switch (if fitted) in the off position to prevent it from being switched back on. The key to the padlock must be deposited with the person responsible until the machine is restarted.
- For longer periods of standstill, observe the storage conditions, see chapter 3.1 *Storage conditions*.

10.2 Disposal

10.2.1 General notes

Dispose of the cleaner in an environmentally friendly manner. Observe the statutory waste disposal regulations applicable at the place of installation.

The cleaner is made of the following materials:

- Metals
- Synthetic materials

Separate the different materials and dispose of them correctly sorted. Always observe the applicable statutory regulations in your country.

11 Annex

11.1 Lists

11.1.1 Abbreviations and terms

Abbreviation	Explanation
ATEX	ATEX is a widely used synonym for the European Union ATEX directives. The designation ATEX is derived from the abbreviation of the French ATmosphère EX-plosive.
BS	British Standard
bar	Unit of measurement of pressure [bar] All pressure data expressed in [bar/psi] is assumed to be gauge pressure [barg/psig] unless explicitly specified otherwise.
BSP	British Standard Pipe Thread
BSPT	British Standard Pipe Tapered Tread
approx.	approximately
°C	Unit of measurement of temperature [degree Celsius]
DN	DIN nominal width
DIN	German standard issued by DIN (Deutsches Institut für Normung e.V., German Institute for Standardization)
EN	European Standard
GEA	Company group GEA AG GEA stands for Global Engineering Alliance
h	Unit of measurement of time [hour]
ISO	International Standard of the International Organization for Standardization
kg	Unit of measurement of weight [kilogram]
l	Unit of measurement of volume [litre]
min.	minimum
max.	maximum
mm	Unit of measurement of length [millimetre]
µm	Unit of measurement of length [micrometre]
M	Metric
NPT	National Pipe Thread

Abbreviation	Explanation
Nm	Unit of measurement of work [newton metre] SPECIFICATION FOR THE TORQUE: 1 Nm = 0.737 lbft Pound-Force (lb) + Feet (ft)
PA	Polyamide
PEEK	Polyether ether ketone
C-PEEK	Polyether ether ketone containing carbon
PTFE	Polytetrafluoroethylene
C-PTFE	Carbonated polytetrafluoroethylene
AF	Indicates the size of spanners [width across flats]
Inch OD	Pipe dimension acc. to British standard (BS) Outside diameter
Inch IPS	US pipe dimension Iron Pipe Size

Table 9: Abbreviations and terms

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GEA Tuchenhausen GmbH
Am Industriepark 2-10
21514 Büchen , Germany

Phone +49 4155 49-0