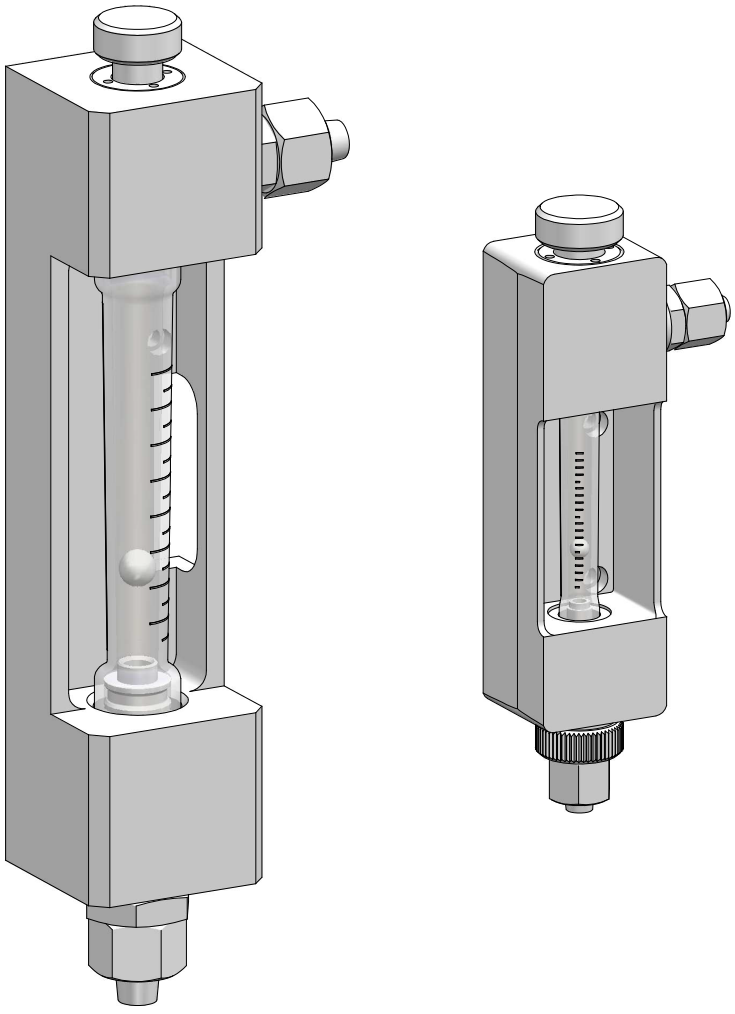
Flow meter

Operating instructions



Read the operating manual!

The user is responsible for installation and operation related mistakes!

Original operating instructions

BA-25110-02-V01

Dosing Conveying Control | Liquids Gases Systems

Table of Contents

1 Notes for the Reader

This operating manual contains information and behaviour rules for the safe and designated operation of the device.

Observe the following principles:

- read the entire operating instructions prior to inaugurating the device.
- ensure that everyone who works with or on the device has read the operating manual and follows it.
- Maintain the operating manual throughout the service life of the device.
- Pass the operating manual on to any subsequent owner of the device.

1.1 General non-discrimination

In this operating manual, only the male gender is used where grammar allows gender allocation. The purpose of this is to make the text easy to read. Men and women are always referred to equally. We would like to ask female readers for understanding of this text simplification.

1.2 Explanation of the signal words

Different signal words in combination with warning signs are used in this operating manual. Signal words illustrate the gravity of possible injuries if the risk is ignored:

Signal word	Meaning
DANGER!	Refers to imminent danger. Ignoring this sign may lead to death or the most serious injuries.
WARNING!!	Refers to a potentially hazardous situation. Failure to follow this instruction may lead to death or severe injuries.
CAUTION	Refers to a potentially hazardous situation. Failure to follow this instruction may lead to minor injury or damage to property.
Note	Refers to a danger which, if ignored, may lead to risk to the machine and its function.

Table 1: Explanation of the signal words

1.3 Explanation of the warning signs

Warning signs represent the type and source of a danger:

Warning sign	Type of danger
	Danger to life from chlorine poisoning
	Danger to life due to electric shock
	General danger zone
	Danger of damage to machine or functional influences

Table 2: Explanation of the warning signs

1.4 Identification of warnings

Warnings are intended to help you recognise risks and avoid negative consequences.

This is how warnings are identified:

Warning sign	SIGNAL WORD
Description of danger. Consequences if ignored. ⇨ The arrow signals a safety precaution to be taken to eliminate the danger.	

1.5 Instruction for action identification

This is how pre-conditions for action are identified:

✓ Pre-condition for action which must be met before taking action.

🛠 A resource such as a tool or auxiliary materials required to perform the operating instructions.

This is how instructions for action are identified:

➔ Separate step with no follow-up action.

1. First step in a series of steps.
2. Second step in a series of steps.
   ▸ Result of the above action.

✓ **Action completed, aim achieved.**

2 Safety

2.1 General warnings

The following warnings are intended to help you eliminate the dangers that can arise while handling the device. Risk prevention measures always apply regardless of any specific action.

Safety instructions warning against risks arising from specific activities or situations can be found in the respective sub-chapters.

DANGER!

Danger to life from chlorine poisoning!

Chlorine is poisonous. In severe cases, breathing in chlorine may lead to death. It irritates the eyes, the respiratory system and the skin.

- ⇨ Use sufficient personal protective equipment.
- ⇨ When carrying out any work on the system, use a respirator mask with a Type B gas filter that complies with EN 14387.
- ⇨ Always comply with the accident prevention regulations that apply at the place of use.
- ⇨ Get rid of leaks without delay. You must get rid of even very minor leaks without delay. Together with the humidity, chlorine forms hydrochloric acid and corrosion results in rapidly increasing leakage.
- ⇨ Use only chlorine-resistant seals.
- ⇨ Only use seals once. Reusing them leads to leaks.

DANGER!

Danger to life from chlorine poisoning!

Chlorinators without gas warning devices are an increased safety risk, since it is not possible to detect escaping chlorine gas in good time or at all.

- ⇨ Install a gas warning device.

WARNING!!

Increased risk of accidents due to insufficient qualification of personnel!

Chlorinators and their accessories must only be installed, operated and maintained by personnel with sufficient qualifications. Insufficient qualification will increase the risk of accidents.

- ⇨ Ensure that all action is taken only by personnel with sufficient and corresponding qualifications.
- ⇨ Prevent access to the system for unauthorised persons.

Note

Damage to the plant due to the formation of hydrochloric acid

Chlorine gas is highly hygroscopic. This means that humidity enters the system at any open connection on devices or pipes, which results in the formation of hydrochloric acid and contamination. thus inevitably causing damage to the units.

- ⇨ Keep all connections (including in the vacuum system and on all devices not currently in use) closed at all times.

2.2 Information about chlorine

Chlorine is a hazardous substance. The chemical element chlorine is a greenish-yellow, toxic gas with a pungent odour, which can be detected in the air at concentrations below 1 ppm (= 1 ml/m³).

Chlorine is 2.5 times heavier than air and accumulates at ground level.

Chlorine is extremely toxic for water organisms. The reason for the toxicity of chlorine is its extraordinary reactivity. It reacts with animal and vegetable tissue and thus destroys it.

Air with a chlorine gas content of 0.51% leads to a quick death in mammals and humans, as it attacks the respiratory tract and the pulmonary alveolus (formation of hydrogen chloride or hydrochloride acid).

Note

Faults due to insufficient chlorine quality

Impurities in the chlorine gas form deposits in devices and valves and can attack the components chemically. This can lead to malfunctions.

- ⇨ Only use technically pure chlorine that meets the following requirements:
  - Mass content of chlorine at least 99.5%
  - Water content max. 20 mg/kg

  Chlorine that complies with EN 937 meets these requirements

2.3 Hazards due to non-compliance with the safety instructions

Failure to follow the safety instructions may endanger not only persons, but also the environment and the device.

The specific consequences can be:

- Failure of important functions of the device and of the corresponding system,
- failure of required maintenance and repair methods,
- danger to persons,
- danger to the environment caused by substances leaking from the system.

2.4 Working in a safety-conscious manner

Besides the safety instructions specified in this operating manual, further safety rules apply and must be followed:

- Accident prevention regulations,
- safety and operating provisions,
- safety regulations on handling hazardous substances,
- environmental protection provisions,
- applicable standards and legislation.

2.5 Personal protective equipment

Based on the degree of risk posed by the dosing medium and the type of work you are carrying out, you must use corresponding protective equipment. Read the Accident Prevention Regulations and the Safety Data Sheets to the dosing media find out what protective equipment you need.

As a minimum, the following protective equipment is recommended:


Protective mask


protective clothing


Protective gloves


safety shoes

Corresponding protective equipment must be used during these tasks:

- Commissioning,
- all work on gas-bearing sections of the plant,
- changing the chlorine gas containers,
- shutdown,
- maintenance work,
- disposal.

DANGER!

Danger to life from chlorine poisoning!

If chlorine gas escapes, a filter mask is ineffective, since it is not a self-contained breathing apparatus.

⇨ If chlorine gas escapes, wear a Type 2 self-contained breathing apparatus that complies with EN 137.

2.6 Personnel qualification

Any personnel who work on the device must have appropriate special knowledge and skills.

Anybody who works on the device must meet the conditions below:

- Attendance at all the training courses offered by the owner,
- personal suitability for the respective activity,
- sufficient qualification for the respective activity,
- training in how to handle the device,
- knowledge of safety equipment and the way this equipment functions,
- knowledge of this operating manual, particularly of safety instructions and sections relevant for the activity,
- knowledge of fundamental regulations regarding health and safety and accident prevention.

All persons must generally have the following minimum qualification:

- Training as specialists to carry out work on the device unsupervised,
- sufficient training that they can work on the device under the supervision and guidance of a trained specialist.

These operating instructions differentiate between these user groups:

2.6.1 Specialist staff

Thanks to their professional training, knowledge, experience and knowledge of the relevant specifications, specialist staff are able to perform the job allocated to them and recognise and/or eliminate any possible dangers by themselves.

2.6.2 Trained electricians

Due to their professional training, knowledge and experience as well as knowledge of specific standards and provisions, trained electricians are able to do the electrical work assigned to them and to recognise and avoid any potential dangers by themselves.

They are specially trained for their specific working environment and are familiar with relevant standards and provisions.

They must comply with the legally binding regulations on accident prevention.

2.6.3 Trained persons

Trained persons have received training from the operator about the tasks they are to perform and about the dangers stemming from improper behaviour.

Trained persons have attended all trainings offered by the operator.

2.6.4 Personnel tasks

In the table below you can check what qualifications are the pre-condition for the respective tasks. Only people with appropriate qualifications are allowed to perform these tasks!

Qualification	Activities
Specialist staff	■ Transportation ■ Assembly ■ Hydraulic installations ■ Commissioning ■ Control ■ Taking out of operation ■ Fault rectification ■ Maintenance ■ Repairs ■ Disposal
Trained electricians	■ Electrical installation ■ Rectifying electrical faults ■ Electrical repairs
Trained persons	■ Storage

Table 3: Personnel qualification

3 Intended use

3.1 Notes on product warranty

Any non-designated use of the device can impair its function and the protection provided. This leads to invalidation of any warranty claims!

Please note that liability is on the side of the user in the following cases:

- the device is operated in a manner which is not consistent with these operating instructions, particularly safety instructions, handling instructions and the section "Intended Use".
- Information on usage and environment (see section 5 „Technical data“ on page 11) is not adhered to.
- if people operate the device who are not adequately qualified to carry out their respective activities.
- No original spare parts or accessories of Lutz-Jesco GmbH are used.
- Unauthorised changes are made to the device.
- The user uses different dosing media than those indicated in the order.
- Maintenance and inspection intervals are not adhered to as required or not adhered to at all.
- The device is commissioned before it or the corresponding system has been correctly and completely installed.
- Safety equipment has been bridged, removed or made inoperative in any other way.

3.2 Intended purpose

The flow meter effects the display of and dosing of chlorine gas in chlorine gas piping. The use of the flow meter for other gases is only permissible with the express permission of the manufacturer.

3.3 Device revision

This operating manual applies to the following devices:

Device	Month / year of manufacture
Flow meter for wall mounting	03/2015 onwards

Table 4: Device revision

The production date is indicated on the rating plate.

3.4 Prohibited dosing media

The device must not be used for the following media and substances:

- all media apart from gaseous chlorine
- not technically pure chlorine with a mass content of less than 99.5%

4 Product description

4.1 Scope of delivery

Please compare the delivery note with the scope of delivery. The following items are part of the scope of delivery:

- Flow meter
- Mounting material
- Operating instructions

4.2 Design and function

Float flow meters are used to determine and perform manual dosing of the quantity of chlorine gas. The float flow meter consists of the following components:

- Measuring glass ① with flow scale and float ② stops for limiting the movement of the float.
- Housing ③ for holding the measuring glass ①,
- Valve screw ④ for setting the dosing quantity.
- Screw connection (⑤, ⑥) for fastening hoses.
- Seals (⑦, ⑧, ⑨, ⑩) for preventing chlorine gas contamination of the surrounding air.

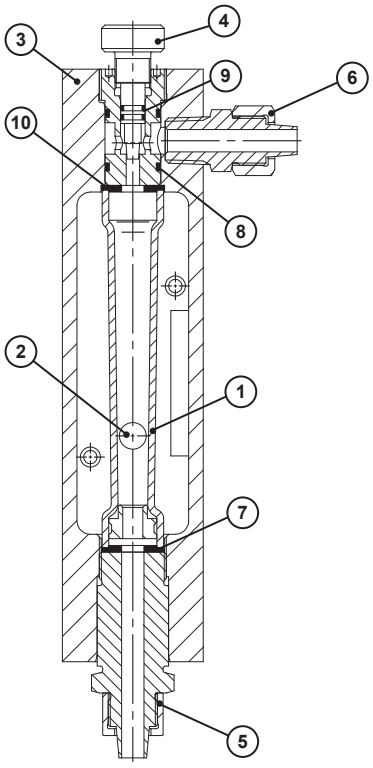


Fig. 1: Sectional view

The float in the measuring tube is moved vertically by the upwards flowing chlorine gas, thus effecting the measurement Different forces impinge on the float: flow resistance, lifting force and the weight of the float. Given a constant flow, the position of the float stabilises and the height adjustment of the float is the measure for the flow.

4.3 Rating plate

The rating plate contains information on the safety and functional method of the product. The rating plate must be kept legible for the duration of the service life of the product.

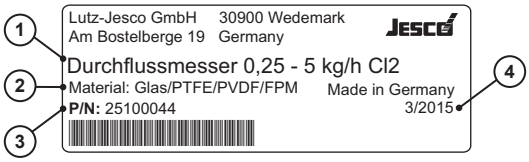


Fig. 2: Flow meter rating plate

No.	Description
1	Product name
2	Materials coming into contact with chlorine gas
3	Part number
4	Month / year of manufacture

Table 5: Rating plate

5 Technical data

Flow meter		
Flow (end area)	25 - 4000 g/h Cl_2	0,25 – 10 kg/h Cl_2
Tube length	80 mm	160 mm
Material of the housing	ABS+GF	PVC
Connections	PE hose Ø 8/12	PE hose Ø 12/16
Weight	0.2 kg	0.9 kg
Accuracy	± 2%	
Turn down ratio	1:20	
Operating pressure	0.9 bar (at 20°C)	
Permissible ambient temperature	10 – 50°C (no direct sunlight)	
Components coming into contact with the media	Glass, PTFE, PVDF, FPM	

Table 6: Technical data

Note

Influence of the operating conditions

The flow meter is designed for use with chlorine gas at 0.9 bar absolute and 20°C. Should the process data change, the flow meter is unable to display correct values. In such a case, it is necessary to establish a conversion factor for the scale.

⇨ Should you make alterations to the operating conditions, please contact the manufacturer.

6 Dimensions

All dimensions in mm.

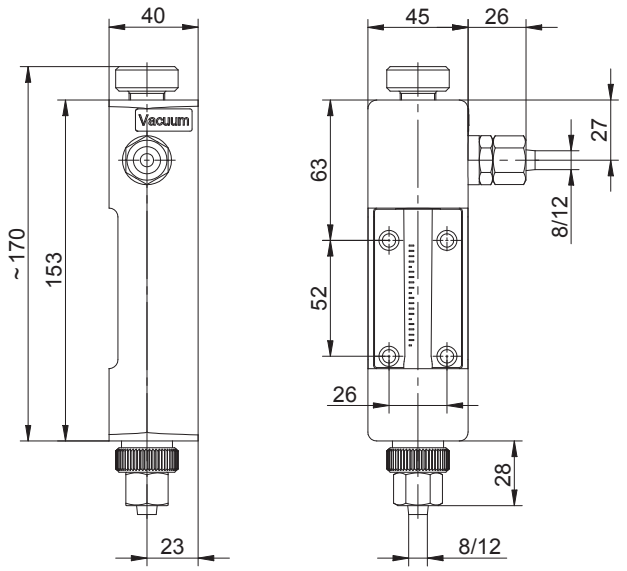


Fig. 3: Dimensions flow meter 25 - 4000 g/h

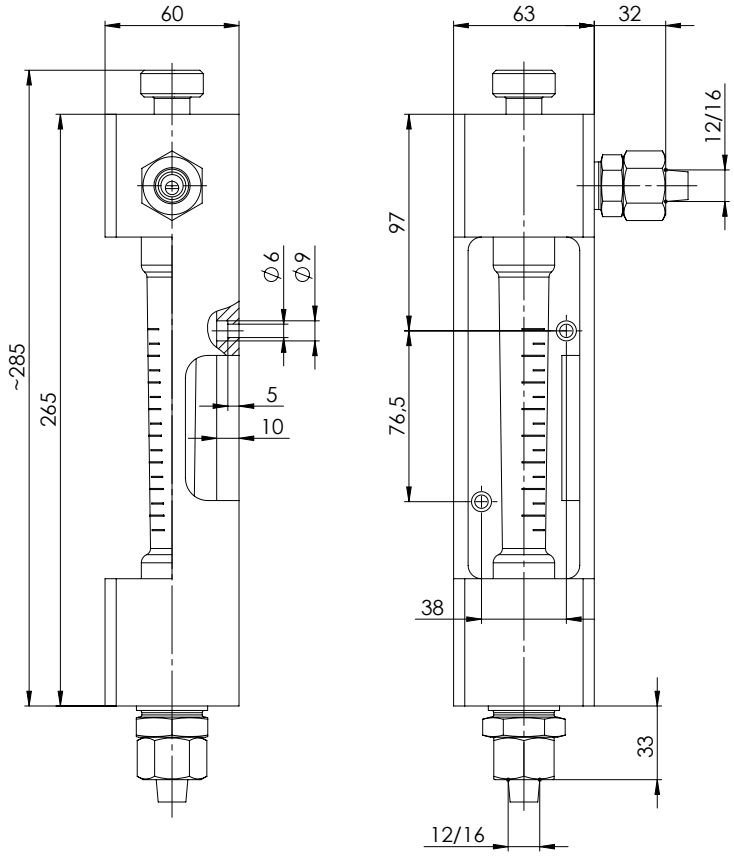


Fig. 4: Dimensions flow meter 0,25 - 10 kg/h

7 Installation

DANGER!

Danger to life from chlorine poisoning!

Chlorinators without gas warning devices are an increased safety risk, since it is not possible to detect escaping chlorine gas in good time or at all.

⇨ Install a gas warning device.

WARNING!!

Increased risk of accidents due to insufficient qualification of personnel!

Chlorinators and their accessories must only be installed, operated and maintained by personnel with sufficient qualifications. Insufficient qualification will increase the risk of accidents.

⇨ Ensure that all action is taken only by personnel with sufficient and corresponding qualifications.

⇨ Prevent access to the system for unauthorised persons.

Note

Damage to the system due to incorrect installation

The failure to observe installation instructions (e.g. use of unsuitable tools, incorrect torque) can damage the system parts.

⇨ Use suitable tools.

⇨ Note the specified torque.

7.1 Installation location

The flow meter can be fitted in both the room of the chlorine supply and dosage.

The room must fulfil the following requirements:

- secured against access by unauthorised persons,
- protected against weather conditions,
- frost-free,
- room of sufficient size to allow trouble-free assembly as well as inspection and maintenance of the device at all times,
- good ventilation of the room
- the room must comply with the locally valid prescriptions

7.2 Mounting position

The chlorine input must point downwards.

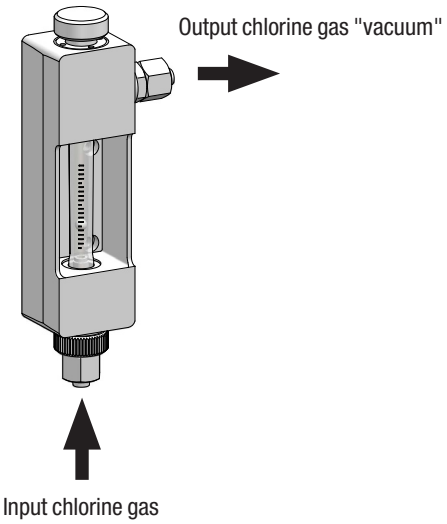


Fig. 5: Mounting position

7.3 Installing the device

The flow meter is fitted directly to the wall using the mounting equipment. The expedient installation locations are depicted in chapter 7.5 "Example installation".

Fitting the PE hose line

After fitting the flow meter to the wall, a PE hose is connected to the hose connections of the flow meter.

Precondition for action:

✓ The device is fitted on the wall.

✓ The protective caps on the hose connections were removed.

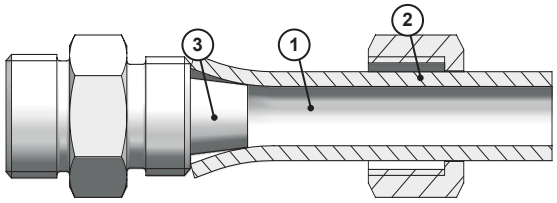


Fig. 6: Fitting the hose connection

Perform the following working steps:

1. Cut the hose ① at right angles.
2. Slide the union nut ② onto the hose.
3. Slide the hose end onto the cone of the hose connection ③.

4. Tighten the union nut by hand.

✓ **PE hose fitted.**

7.4 Completing the installation

After completing installation, you must check that all the connections are leak-proof (see 8.1 „Check the vacuum system“ on page 15).

7.5 Installation examples

Fig. 7: Installation example flow meter 1 - 4000 g/h

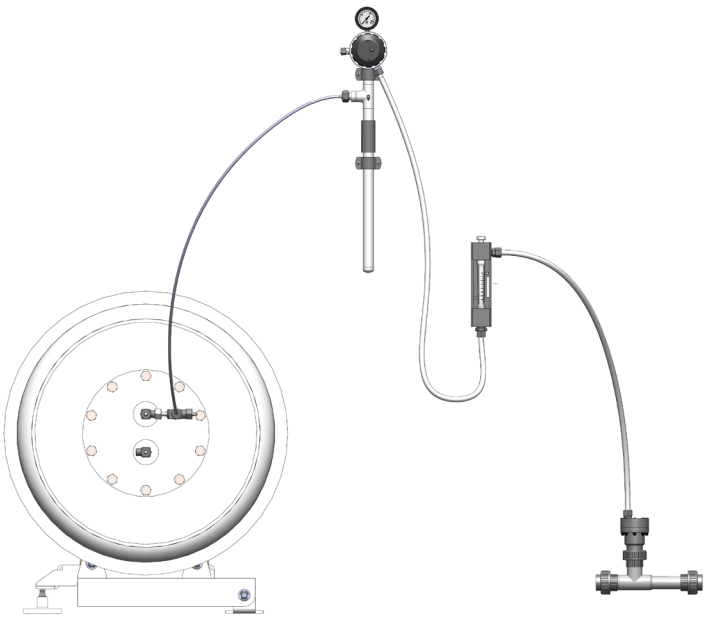


Fig. 8: Example installation flow meter 0.25 - 10 kg/h

8 Start-up

DANGER!

Chlorine gas can escape due to systems that are leaky or not installed correctly!

Chlorinators constitute an increased safety risk if they have not been properly installed, if an adequate leak test has not been performed or if the devices are not in good condition.

⇨ Before placing the system into operation, have it checked by technical personnel to ensure that it is in the proper condition and leaktight.

⇨ The condition of the installation must be checked for adequate tightness on a regular basis.

⇨ Get rid of leaks without delay. You must get rid of even very minor leaks without delay. Together with the humidity, chlorine forms hydrochloric acid and corrosion results in rapidly increasing leakage.

8.1 Check the vacuum system

Note

Operating faults through leakages in the vacuum system

Small leaks in the vacuum system will not be recognised in normal operation, since no chlorine escapes. Air will enter the system with moisture. The moisture can combine with the chlorine to create deposits and operating malfunctions. With the injector switched off, there may be a slight chlorine smell.

⇨ Check the vacuum system.

⇨ Ensure that all action is taken only by personnel with sufficient and corresponding qualifications.

8.1.1 Carry out the leak test on the vacuum system

Precondition for action:

✓ The vacuum system is fully assembled.

✓ All the open connections of the vacuum system were closed.

✓ The injector is ready for operation.

Perform the following working steps:

1. Connect the chlorine supply e.g. to the chlorine tank valves or a valve in the vacuum regulator supply line.
2. Open the valve screw for controlling the dosing quantity on the flow meter.
3. Switch the injector on

▶ The ball in the flow meter must stop moving after a short time.

4. If the ball does not come to a standstill, clamp the measuring glass more tightly. If this does not end the leaks, conduct a leakage test of all components including the vacuum regulator to remove the leaking point.
5. Switch off the injector.
6. Repair the leak. If joints are made, make sure that they harden sufficiently.
7. Repeat the leak test of the vacuum system.

✓ **A leak test was performed in the vacuum system**

8.1.2 Localising leakages in the vacuum system

Note

Damage to the plant due to excessive pressure

When using positive pressure to localise leaks, components in the vacuum system, e.g. membranes or springs, may be mechanically overloaded.

⇨ Use a maximum positive pressure of 0.5 bar.

Precondition for action:

✓ When checking the tightness of the vacuum system, a leak was detected.

✓ The vacuum system is fully assembled.

✓ All the open connections of the vacuum system were closed correctly.

✓ The valves on the chlorine supply have been closed.

✓ If the system was previously operated with chlorine, the residual chlorine has been extracted with the injector and the system operated for approx. 5 minutes using nitrogen or dry compressed air.

✓ The injector was switched off.

Perform the following working steps:

1. Close the water valves upstream and downstream of the injector.
2. Connect the supply of nitrogen or dry compressed air to the vacuum system.
3. Slowly increase the system pressure to approx. 0.2 – 0.4 bar (at significantly higher positive pressures, the safety valve will open).
4. Apply soap solution to all the potential leaks. Bubbles form at leak locations (with a possible time delay).

✓ **Leakage in the vacuum system localised**

8.2 Commissioning the device

Precondition for action:

- ✓ The leak test of the vacuum system was performed successfully.
- ✓ The chlorination installation has been fitted completely.
- ✓ The injector is ready for operation.

Perform the following working steps:

1. Open the valves in sequence starting from the chlorine tank proceeding towards the injection nozzle.
2. Switch the injector on.
3. Open the valve screw on the flow meter.

✓ **The device is commissioned.**

9 Operation

Note

Reading off the chlorine gas flow

Spherical floats are used in this version of the flow meter to display the flow quantity of the flow medium.

⇨ The measured value is read off via the level of the ball on the measuring tube scale.

During normal operation of the plant the chlorine gas flow is either adjusted automatically using the regulating valve or manually using the adjusting valve of the flow meter. With automatic control systems, the chlorine contents of the treated water should be subject to checks at regular intervals using independent comparison measurements; the measuring equipment must then be calibrated if necessary.

9.1 Shutting down in an emergency

DANGER!

Danger to life from chlorine poisoning!

Chlorine is poisonous. In severe cases, breathing in chlorine may lead to death. It irritates the eyes, the respiratory system and the skin.

⇨ If chlorine escapes, leave the room immediately.

⇨ Use sufficient personal protective equipment.

⇨ If chlorine gas escapes, wear a Type 2 self-contained breathing apparatus that complies with EN 137.

⇨ Only initiate counter measures after putting on the protective equipment.

The chlorine tank valves must be closed.

The further procedure depends on the type of accident and should be planned and executed by professional personnel.

9.2 Test intervals

You must check the components of the chlorinator for leaks on a daily basis and after maintenance or commissioning work.

10 Shutdown

10.1 Short-term shutdown

Perform the following working steps:

1. Close the chlorine tank valves.
2. Use the injector to suck off the remaining chlorine until the flow meter displays 0 bar.
3. Switch off the injector.

✓ **Chlorinator shut down for the short term.**

10.2 Long-term shutdown

Perform the following working steps:

1. Close the chlorine tank valves.
2. Use the injector to suck off the remaining chlorine until the flow meter displays 0 bar.
3. Operate the chlorination installation for approx. 5 minutes with nitrogen or dry compressed air at 5 bar.
4. Close all the connections to protect the lines and devices from humidity and dirt.
5. Switch off the injector.

✓ **Device shut down for the long term.**

10.3 Storage

Note

Damage to the plant due to the formation of hydrochloric acid

Chlorine gas is highly hygroscopic. This means that humidity enters the system at any open connection on devices or pipes, which results in the formation of hydrochloric acid and contamination. thus inevitably causing damage to the units.

⇨ Keep all connections (including in the vacuum system and on all devices not currently in use) closed at all times.

Required actions:

✓ The device has been shut down in accordance with the section 10.2 “Long-term shutdown”.

Storing the device correctly will extend its service life. You should avoid negative influences such as extreme temperatures, high humidity, dust, chemicals, etc.

Ensure ideal storage conditions where possible:

- the storage place must be cold, dry, dust-free and generously ventilated,
- temperatures between + 2 °C and + 40 °C,
- Relative air humidity must not exceed 90 %.

10.4 Transportation

10.4.1 Packing the device

Required actions:

✓ The device has been shut down in accordance with the section 10.2 “Long-term shutdown”.

Perform the following working steps:

1. Dismantle all the pipe connections.
2. Unscrew the device from the wall
3. Seal all open connections airtight.

✓ **Device prepared for transport.**

If the device is sent back to the manufacturer, please follow sections “Declaration of no objection” on page 29 and section “Warranty Application” on page 30.

10.5 Disposal of old equipment

- Before disposing of the old equipment, you must clean off the remaining chlorine by rinsing it with nitrogen or air.
- The device must be disposed of in accordance with applicable local laws and regulations. It should not be disposed of as domestic waste!
- As the disposal regulations may differ from country to country, please consult your supplier if necessary.
- In Germany, the manufacturer must provide free-of-charge disposal, provided the device has been safely returned along with a declaration of no objection (see page 29).

11 Maintenance

Products by Lutz-Jesco are manufactured to the highest quality standards and have a long service life. However, some parts are subject to operational wear. This means that regular visual inspections are necessary to ensure a long operating life. Regular maintenance will protect the device from operation interruptions.

DANGER!

Danger to life from chlorine poisoning!

Do not carry out maintenance or any other work on the chlorinator until the system has been decommissioned and all of the chlorine gas has been removed from the lines. The failure to follow this instruction presents a significant risk of injury.

⇨ Prior to any maintenance work, prepare the system in accordance with section 11.3 „Prepare system for maintenance“ on page 20.

WARNING!!

Increased risk of accidents due to insufficient qualification of personnel!

Chlorinators and their accessories must only be installed, operated and maintained by personnel with sufficient qualifications. Insufficient qualification will increase the risk of accidents.

⇨ Ensure that all action is taken only by personnel with sufficient and corresponding qualifications.

Note

Damage to the system due to corrosion

Water in chlorine carrying system components combines with chlorine to form hydrochloric acid and leads to corrosion

⇨ After maintenance work is complete, remove all water residues from the system before placing it into operation.

11.1 Maintenance intervals

To avoid hazardous incidents, chlorinators must be regularly maintained. This table gives you an overview of maintenance work and the intervals at which you must carry it out. The next few sections contain instructions for carrying out this work.

Interval	Maintenance
Daily or after maintenance or repair work	■ Check that the system is leaktight
After 1 year	Minor maintenance: ■ Clean the measuring glass ■ Renew the seals for the measuring glass
After 3 years	Major maintenance: ■ Minor maintenance: ■ Replace all seals ■ Clean the valve screw and valve bushing

Table 7: Maintenance intervals

In some cases, regional regulations may require shorter maintenance intervals. Maintenance intervals depend only on how frequently the equipment is used. Chemical wear of rubber parts, for example, begins with the initial medium contact and continues irrespective of the usage.

11.2 Maintenance accessories

Description	Part number
Silicone grease For greasing the seals	35537
Plastic tools For dismantling the seals	W00133
Face spanner size 11-60 (Ø3) For fitting the valve bushing	35279
Replacement gaskets for measuring glass (2 pieces) For flow monitors with 80 mm measuring glass	81901
Replacement gaskets for measuring glass (2 pieces) For flow monitors with 160 mm measuring glass	81900
Replacement O-ring for adjusting screw (2 pieces)	80006
Spare parts set For flow monitors with a 80 mm measuring glass	29717
Spare parts set for flow meter 160 mm measuring glass	41176

Table 8: Accessories for maintenance intervals

11.3 Prepare system for maintenance

DANGER!

Danger to life from chlorine poisoning!

Do not carry out maintenance or any other work on the chlorinator until the system has been decommissioned and all of the chlorine gas has been removed from the lines. The failure to follow this instruction presents a significant risk of injury.

⇨ Proceed in accordance with the following instructions.

Perform the following working steps:

1. Close the chlorine tank valves.
2. Use the injector to suck off the remaining chlorine.
3. Run the chlorinator for approximately five minutes with nitrogen or dry compressed air.
4. Switch off the injector.
5. Close all connections in order to protect the lines and equipment against humidity.

✓ **The system is prepared for maintenance.**

11.4 Maintenance of the components

The following components are to be serviced within the scope of the maintenance of the flow meter: The components can partially be serviced independently of each other.

1. The measuring glass and measuring glass bracket
2. The valve screw and
3. Valve bushing (only together with 1) and 2))

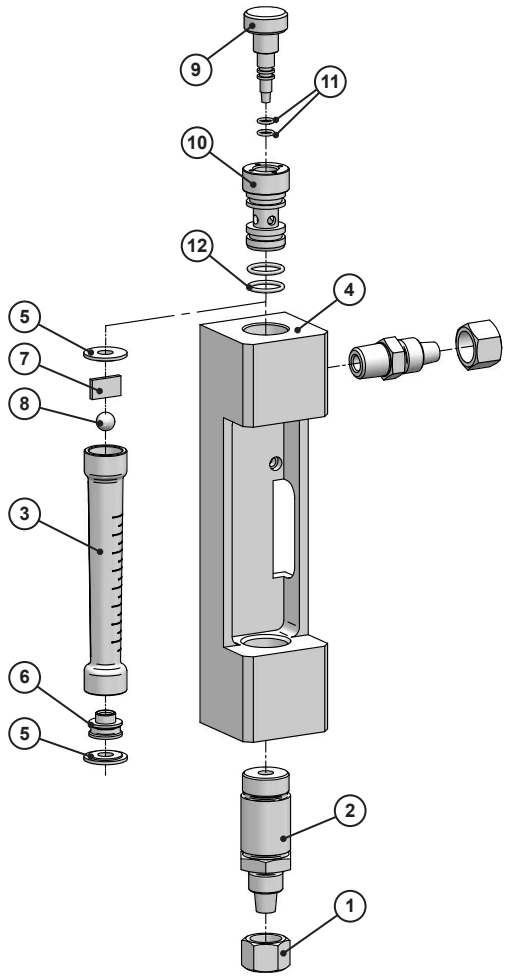


Fig. 9: Maintenance of the components

11.4.1 Maintenance of the measuring glass and the measuring glass bracket

The measuring glass has a long durability and need only be changed when necessary. Inspect and clean the measuring glass within the scope of the maintenance; change both the gaskets in the measuring glass.

Precondition for action:

✓ The system was prepared for maintenance within the scope of the provisions of Chapter 11.3 "Preparing the system for maintenance"

✓ 2 replacement gaskets are available for the measuring glass

Perform the following working steps:

1. Unscrew the union nut ① on the clamping screw ② and remove the hose.

2. Unscrew the clamping screw ② below the measuring glass ③ and remove the clamping screw downwards from the measuring glass ④.
3. Remove the measuring glass ③ downwards from the measuring glass bracket ④.
4. Remove the two gaskets ⑤.
5. Remove the plastic end stops (⑥,⑦) and the float ⑧ in the measuring glass ③. When removing the lower end stop, ⑥ ensure that the bearing surface of the float is not damaged.
6. Clean the measuring glass ③, the plastic end stops (⑥,⑦) and the float ⑧ with warm water or isopropyl alcohol. Allow all components to dry well.

Note

Damage to the measuring glass due to the formation of hydrochloric acid

Chlorine gas is highly hygroscopic. Residual moisture in the measuring glass can result in the development of hydrochloric acid and soiling.

⇨ Ensure that the measuring glass is dry before returning it to the measuring glass bracket.

7. Screw in the clamping screw ② c. 2-3 threads into the measuring glass bracket ④.
8. Place a new gasket ⑤ on the clamping screw② (with a flow meter with an 80 mm measuring glass, the seal is inserted in the clamping screw).
9. Place a new gasket ⑤ on the measuring glass ③. Ensure that the gasket is centred in the measuring glass.
10. Insert the measuring glass ③ laterally into the measuring glass bracket ④ and remove the measuring glass on the clamping screw gasket ②. Ensure that the gasket is centred in the measuring glass.
11. Screw the clamping screw ② upwards and proceeding sensitively, secure the measuring glass ③ in the measuring glass bracket ④.

✓ **Maintenance of the measuring glass and the measuring glass bracket performed.**

Note

Damage to the system due to incorrect installation

Failure to comply with fitting specifications (e.g. the use of unsuitable tools, incorrect torque).

⇨ Only apply the appropriate amount of force to the plastic parts. Plastic threads (especially PVC threads) can be tightened and loosened more easily by applying only a conservative amount of silicone grease or PRFE grease.

11.4.2 Maintenance of the valve screw

The O-rings are to be replaced and the threads cleaned within the scope of the maintenance of the valve screws.

Precondition for action:

✓ The system was prepared for maintenance within the scope of the provisions of Chapter 11.3 "Preparing the system for maintenance"

✓ 2 replacement O-rings for the valve screws are available

✓ A suitable tool for removing the O-rings e.g. article W00133, is available

Perform the following working steps:

1. Unscrew the valve screw ⑨ from the valve bushing ⑩.
2. Remove the two O-rings ⑪ from the valve screw using a suitable tool, e.g. article W00133 ⑨.
3. Free the thread of the valve screw from encrusted grease ⑨ using a brush.
4. Rub the new O-rings ⑪ with a light coating of silicone grease and fit them on the valve screw ⑨.
5. Brush the valve screw thread ⑧ with a light coat of silicone grease and fit the valve screw carefully into the valve bushing ⑩.

✓ **Maintenance of the valve screws performed.**

11.4.3 Maintenance of the valve bushing

The maintenance of the valve bushing is only to be performed within the scope of a complete maintenance of the flow meter, as the valve bushing is both the guide for the valve screw and the upper end stop for the measuring glass. The O-rings are to be replaced and the threads cleaned within the scope of the maintenance of the valve bushing.

Precondition for action:

✓ The system was prepared for maintenance in accordance with Chapter 11.3 "Preparing the system for maintenance".

✓ The maintenance of the measuring glass was performed in accordance with chapter 11.4.1. "Maintenance of the measuring glass and the measuring glass bracket"

✓ The valve screw ⑨ was unscrewed from the valve bushing in accordance with chapter 11.4.2 "Maintenance of the valve screw" ⑩.

✓ A suitable tool for removing the O-rings e.g. article W00133, is available.

✓ The key for fitting the valve bushing is available.

✓ The spare parts set for the flow meter is available.

Perform the following working steps:

1. Replace the O-rings ⑫ for the valve bushing ⑩. Grease the new O-rings with a light covering of silicone grease before fitting
2. Clean the thread of the valve bushing ⑩ with a brush and cover the thread lightly with silicone grease before fitting the valve bushing ⑩ in the measuring glass bracket ④.

3. Conclude the maintenance of the valve screw ⑨ in accordance with chapter 11.4.2 "Maintenance of the valve screw". To do so, use the O-rings ⑪ from the spare parts set for the flow meter.
4. Conclude the maintenance of the measuring glass ③ and the measuring glass bracket ④ in accordance with chapter 11.4.1 "Maintenance of the measuring glass and the measuring glass bracket". Use the gaskets ⑤ from the spare parts set for the flow meter.

✓ **Maintenance of the valve bushing performed.**

11.5 Finishing maintenance

Perform the following working steps:

1. Make a note of the date and scope of the maintenance performed.
2. Attach a sticker displaying the maintenance date to the device.
3. To restart the system, proceed in accordance with the instructions in chapter "Start-up" on page 15.

✓ **Maintenance completed.**

12 Troubleshooting

See below for information about how to rectify faults on the device or the system. If you cannot eliminate the fault, please consult with the manufacturer on further measures or return the device for repair.

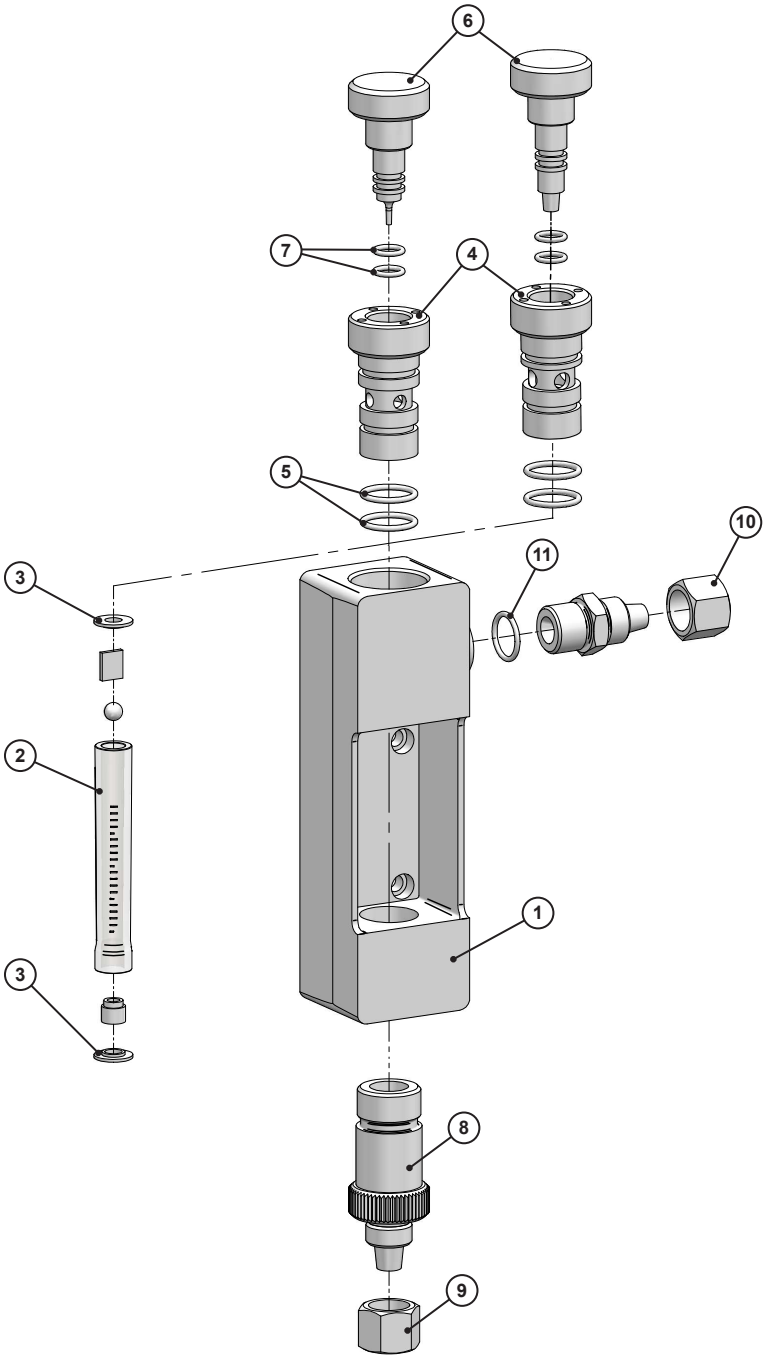
Problem	Possible cause	Remedy
Flow meter shows nothing or insufficient flow	The chlorine tank is empty	Connect a new cylinder
	The tank valve or a valve in the chlorine supply is closed or not fully open	Open valves.
	The connection line on the chlorine tank is buckled or blocked	Clean or replace the line.
	The supply pressure for the vacuum regulator is too low.	Increase the outlet pressure of the pressure reducing valve
	The filter in the chlorine gas is blocked (recognisable via the low pressure on the vacuum regulator input).	Clean or replace the filter. Use a better quality of chlorine gas.
	Float in flow meter clogged	Perform the maintenance of the measuring glass in accordance with chapter 11.4.1. "Maintenance of the measuring glass and the measuring glass bracket"
	Insufficient vacuum due to...	
	...a leak in the vacuum system	Locate and remedy leaks in accordance with Chapter 8.1.2 "Localising leakages in the vacuum system"
	A reduced performance of the injector	Consult the troubleshooting in the operating instructions of the injector
	...a leak in the vacuum regulator	Consult the troubleshooting in the operating instructions of the vacuum regulator
Liquid chlorine in the measuring glass	Chlorine gas condenses to liquid chlorine because the temperature in the flow meter is lower than that in the chlorine drum	Fit the pressure reducing valve, fit the moisture eliminator with heating collar
White deposits in measuring glass	Vacuum system is leaky and air humidity condenses forming white fog.	Locate and remedy leaks in accordance with Chapter 8.1.2 "Localising leakages in the vacuum system"

Table 9: Troubleshooting

13 Spare parts

Items included in the maintenance set (see Table 8 „Accessories for maintenance intervals“ on page 20) are marked with *.

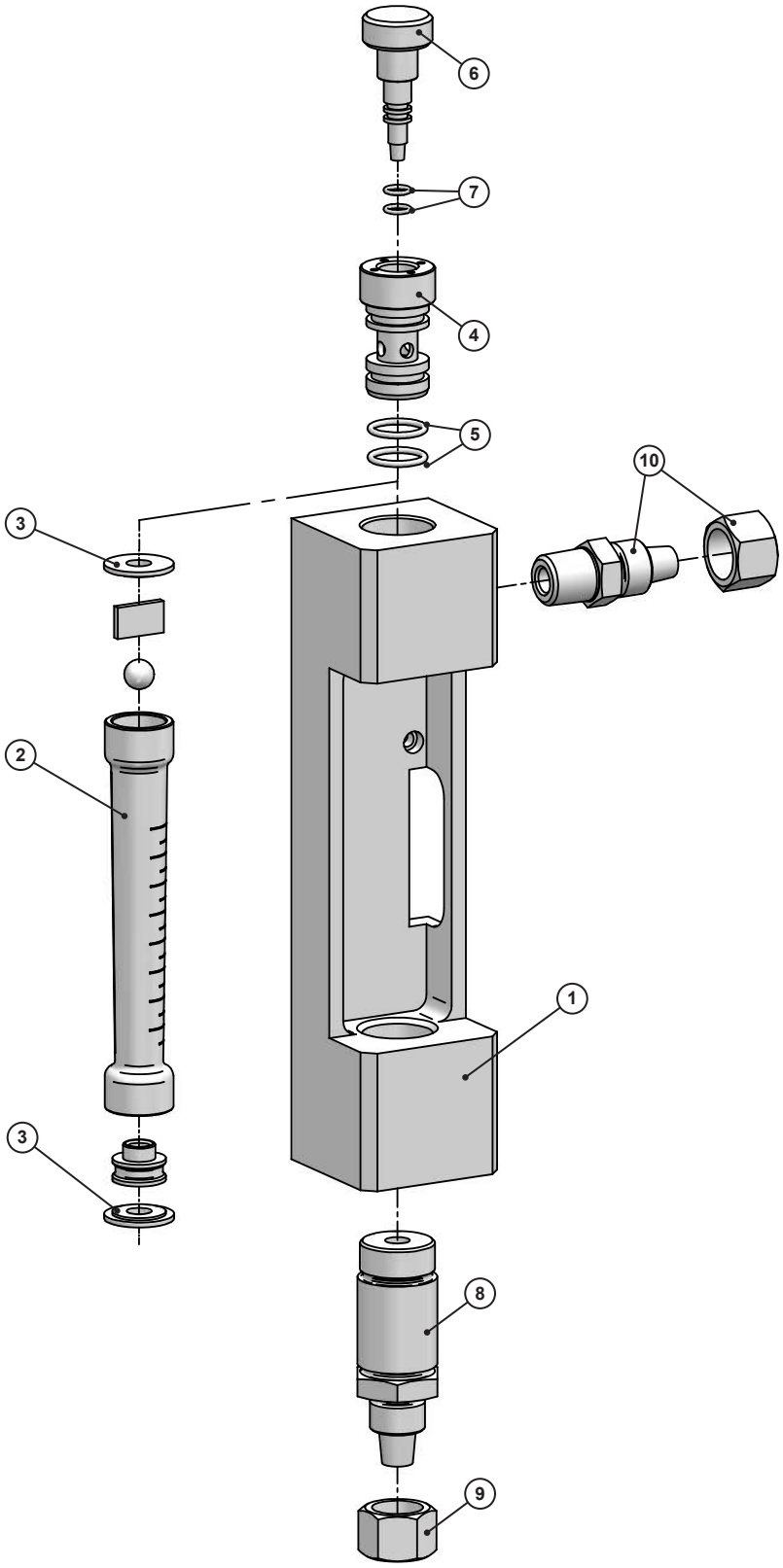
13.1 Flow meter 4 kg/h Cl_2



Position	Quantity	Description	Info
1	1	Measuring glass bracket 80 mm measuring glass	ABS-GF
2	1	Measuring glass 80 mm	Glass
3*	2	Gasket Ø13.5	FPM
4	1	Valve bushing M28x1.5 (up to 500 g/h)	PVC
	1	Valve bushing M28x1.5 (up to 4 kg/h)	PVC
5*	2	O-ring Ø 16	FPM
6	1	Valve screw M16x1 (up to 500 g/h)	PVDF
	1	Valve screw M16x1 (up to 4 kg/h)	PVDF
7*	2	O-ring Ø 7.65	FPM
8	1	Clamping screw 8/12	PVCn
9	1	Union nut M16x1.5	PVC
10	1	Hose clamp connection 8/12	PVC
11*	1	O-ring Ø 14	FPM

Table 10: Replacement parts flow meter 4 kg/h Cl_2

13.2 Flow meter 10 kg/h Cl_2



Position	Quantity	Description	Info
1	1	Measuring glass bracket 160 mm measuring glass	ABS-GF
2	1	Measuring glass 160 mm	Glass
3*	2	Gasket Ø28	FPM
4	1	Valve bushing M30x1.5	PVC
5*	2	O-ring Ø 19	FPM
6	1	Valve screw M16x1	PVDF
7*	2	O-ring Ø 7.65	FPM
8	1	Clamping screw 12/16	PVCn
9	1	Union nut M22x1.5	PVC
10	1	Hose clamp connection 12/16	PVC

Table 11: Replacement parts flow meter 10 kg/h Cl_2

14 EC Declaration of Incorporation

(DE) Einbauerklärung im Sinne der EG-Richtlinie 2006/42/EG über Maschinen (Anhang II B)
Hiermit erklären wir, dass die nachstehend beschriebene unvollständige Maschine alle grundlegenden Anforderungen der Maschinenrichtlinie 2006/42/EG erfüllt, soweit es im Rahmen des Lieferumfangs möglich ist. Ferner erklären wir, dass die speziellen technischen Unterlagen gemäß Anhang VII Teil B dieser Richtlinie erstellt wurden. Wir verpflichten uns, den Marktaufsichtsbehörden auf begründetes Verlangen die speziellen Unterlagen zu der unvollständigen Maschine über unsere Dokumentationsabteilung zu übermitteln. Die unvollständige Maschine darf erst dann in Betrieb genommen werden, wenn ggf. festgestellt wurde, dass die Maschine oder Anlage, in welche die unvollständige Maschine eingebaut werden soll, den Bestimmungen der Richtlinie 2006/42/EG über Maschinen entspricht und die EG-Konformitätserklärung gemäß Anhang II A ausgestellt ist.

(EN) Declaration of Incorporation according to EC directive 2006/42/EC on machinery (Annex II B)
Herewith we declare, that the partly completed machinery described below is complying with all essential requirements of the Machinery Directive2006/42/EC, as far as the scope of delivery allows. Additional we declare that the relevant technical documentation is compiled in accordance with part B of Annex VII. We commit to transmit, in response to a reasoned request by the market surveillance authorities, relevant documents on the partly completed machinery by our documentation department.The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of Directive 2006/42/EC on Machinery, where appropriate, and until the EC Declaration of Conformity according to Annex II A is issued.

(FR) Notice de montage dans le cadre de la directive européenne 2006/42/CE relative aux machines (annexe II B)
Nous expliquons ici que la machine incomplète décrite ci-après répond à toutes les exigences fondamentales de la directive relative aux machines 2006/42/CE, pour autant que cela soit possible dans le cadre du volume de livraison. Plus loin nous expliquons que les documents techniques spéciaũx sont établis conformément à l'annexe VII partie B de cette directive. Pour ce qui est de notre service de documentation, nous nous engageons à communiquer aux autorités de surveillance du marché les explications fondées des documents spéciaux pour la machine incomplète. La machine incomplète doit d'abord être mise en service, quand il est constaté que la machine ou l'installation dans laquelle la machine incomplète doit être montée répond aux dispositions de la directive 2006/42/CE relative aux machines, et que la notice de conformité européenne est présentée conformément à l'annexe II A.

(ES) Declaración de incorporación según la Directiva 2006/42/CE sobre máquinas (Anexo II B)
Por la presente declaramos que la siguiente cuasi máquina cumple con todas las disposiciones pertinentes de la Directiva 2006/42/CE de máquinas, siempre y cuando lo permita el volumen de suministro. También declaramos que la documentación técnica descrita en el anexo VII parte B se ha elaborado conforme a la presente Directiva. Nos comprometemos a enviar los documentos de la cuasi máquina a las autoridades de vigilancia del mercado a través de nuestro departamento de documentación en respuesta a una previa solicitud motivada. La cuasi máquina no puede ponerse en servicio sin antes verificar que la máquina o el sistema en el que se instale la cuasi máquina, cumpla con las disposiciones de la Directiva 2006/42/CE de máquinas y con la declaración CE de conformidad según el anexo II A.

(PT) Declaração de Construção de acordo com a Directiva-CE 2006/42/CE de máquinas (Anexo II B)
Esclarecemos por meio deste que a máquina incompleta descrita a seguir segue os requerimentos da directiva de máquinas 2006/42/CE, contanto que sua utilização seja mantida dentro do escopo original. Esclarecemos ainda que a documentação técnica especial segue o disposto no Anexo VII Parte B de tal directiva. Comprometemo-nos a a cumprir com as exigências das autoridades de fiscalização que forem feitas a nosso departamento de documentação que estejam relacionadas a qualquer documentação da máquina incompleta. A máquina poderá ser colocada em operação, se necessário for, desde que seja verificado que o sistema ou a máquina na qual a máquina incompleta será instalada foi montada, em conformidade com a directiva 2006/42/CE de máquinas e com à declaração de conformidade 2006/42/CE.

Bezeichnung des Gerätes:	**Durchflussmesser**	Descripción de la mercancía:	**Caudalímetros**
Description of the unit:	**Flow meter**	Designação do aparelho:	**Medidor de vazão**
Désignation du matériel:	**Débitmètre**		
Typ / Type:	**25 - 4000g / 0,25 - 10kg**		

Die unvollständige Maschine entspricht allen Bestimmungen der Richtlinie(n):
The partly completed machine is in conformity with all requirements of the directive(s):

2006/42/EG	**Maschinenrichtlinie**	**Machinery Directive**

Folgende harmonisierte Normen wurden angewandt:
The following harmonised standards were applied:

DIN 19606	**Chlorgasdosieranlagen zur Wasseraufbereitung - Anlagenaufbau und Betrieb**
DIN 19606	**Chlorinators for water treatment - Equipment, installation and operation**

Heinz Lutz
Geschäftsführer / Chief Executive Officer
Lutz-Jesco GmbH
Wedemark, 01.03.2015

Lutz-Jesco GmbH
Am Bostelberge 19
30900 Wedemark
Germany

15 Declaration of no objection

Please copy the declaration, stick it to the outside of the packaging and return it with the device.

Declaration of no objection

Please fill out a separate form for each appliance!

We forward the following device for repairs:

Device and device type: ..... Part-no.: .....

Order No.: ..... Date of delivery: .....

Reason for repair: .....

.....

.....

Dosing medium

Description: ..... Irritating: ☐ Yes ☐ No

Properties: ..... Corrosive: ☐ Yes ☐ No

We hereby certify, that the product has been cleaned thoroughly inside and outside before returning, that it is free from hazardous material (i.e. chemical, biological, toxic, flammable, and radioactive material) and that the lubricant has been drained.

If the manufacturer finds it necessary to carry out further cleaning work, we accept the charge will be made to us.

We assure that the aforementioned information is correct and complete and that the unit is dispatched according to the legal requirements.

Company / address: ..... Phone: .....

..... Fax: .....

..... Email: .....

Customer No.: ..... Contact person: .....

Date, Signature: .....

16 Warranty Application

Warranty Application

Please copy and send it back with the unit!

If the device breaks down within the period of warranty, please return it in a cleaned condition with the complete warranty application, filled out.

Sender

Company: ..... Phone: ..... Date: .....

Address: .....

Contact person: .....

Manufacturer order no.: ..... Date of delivery: .....

Device type: ..... Serial number: .....

Nominal capacity / nominal pressure: .....

Description of fault: .....

.....

.....

.....

.....

.....

.....

.....

Service conditions of the device

Point of use / system designation: .....

.....

.....

Accessories used (suction line etc.): .....

.....

.....

.....

.....

Commissioning (date): .....

Duty period (approx. operating hours): .....

Please describe the specific installation and enclose a simple drawing or picture of the chemical feed system, showing materials of construction, diameters, lengths and heights of suction and discharge lines.

17 Index