
Operating instructions

Chlorine gas filter

60K
200K

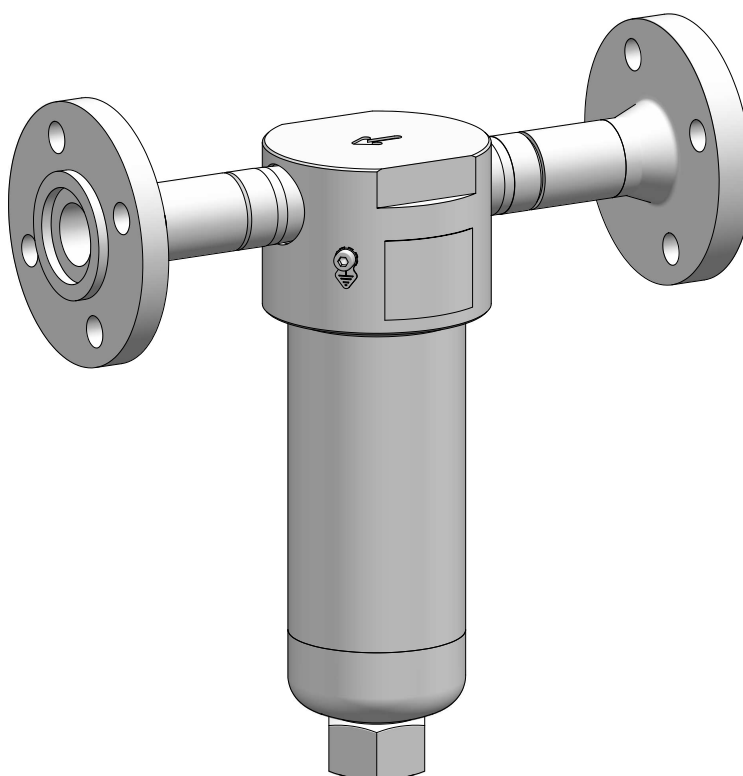


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1 About these operating instructions

This document:

- Is part of the product.
- Describes the safe and correct use of the product in all operating phases.
- Must be read completely before the product is commissioned.
- Must be read and applied by every person tasked with working on the product.
- Must be kept for the duration of the service life of the product.
- Must be passed on to any subsequent owner of the product.

1.1 Target groups

Target group	Task
Operator	1. Keep these operating instructions available at the place of use of the product, including for later use. 2. Instruct employees to read and comply with these instructions, especially the safety instructions and warnings. 3. Comply with additional system-related specifications and regulations.
Qualified personnel Trained persons	► Read, observe and follow these operating instructions, in particular the safety instructions and warnings.

Table 1: Target groups and their tasks

1.2 General non-discrimination

For better readability, these operating instructions always use the masculine form when referring to persons. However, all genders are addressed equally.

1.3 Warnings

Warnings are intended to help you recognise risks and avoid negative consequences. They are structured as follows in these operating instructions:

Warning sign

SIGNAL WORD

Type and source of danger

Consequences of non-compliance

► A safety precaution to be taken to eliminate the hazard.

Fig. 1: Design of warnings

Signal words

These operating instructions use the following signal words to emphasise the severity of possible injuries if the danger is ignored:

DANGER

Imminent danger

Non-compliance can result in death or serious injury.

WARNING

Possible danger

Non-compliance can lead to death or severe injuries.

CAUTION

Potentially hazardous situation

Non-compliance can result in minor injuries.

NOTE

Potentially hazardous situation

Non-compliance can result in damage to property or malfunctions.

INFORMATION

Information or recommendation

Simplifies handling or extends the service life of the product or system.

Warning signs used

These operating instructions use the following warning signs to indicate the type and source of danger:

Danger to life from chlorine poisoning

General hazard

Risk of machine damage or malfunction

1.4 Action steps

Action steps are structured as follows:

- ✓ This prerequisite must be met before you can start with the action steps.

- ▶ Single step

Multiple steps in sequence are structured as follows:

1. First step
 2. Second step
 - ↳ Intermediate result of a step
- 📌 Overall result

1.5 Cross-references

Cross-references are marked with an arrow.

Example: (→ Fig. 5)

1.6 Latest version

Please find the latest version of these operating instructions at www.lutz-jesco.com.

1.7 Copyright

The content of these operating instructions and the images contained in them are subject to the copyright protection of Lutz-Jesco GmbH.

2 Safety

2.1 Dangers when handling chlorine

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-sections.



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 eliminate 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

A filter mask is ineffective in the event of a chlorine gas leak. 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.



DANGER

Danger to life from chlorine poisoning

Chlorine gas systems without gas warning devices constitute an increased safety risk. Chlorine gas leaks cannot be detected in time or at all.

- ▶ Install a gas warning device.



WARNING

Increased risk of accidents due to insufficient qualification of personnel!

Only sufficiently qualified personnel may install, operate and maintain this product and its accessories. 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.
- ▶ Wear personal protective equipment when performing any work on the system.



NOTE

System damage due to 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 the connections (also in the vacuum system) 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 that 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 0.5–1 % leads to a quick death in mammals and humans, as it attacks the respiratory tract and the pulmonary alveolus (formation of hydrogen chloride or hydrochloric 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 fulfils the following requirements:
 - Chlorine mass content at least 99.5%
 - Water content max. 20 mg/kg
 - Chlorine in accordance with EN 937 fulfils these requirements.

2.3 Product safety

The device is constructed in accordance with the state of the art and recognised safety regulations. Nevertheless, their use may pose a risk to the life and limb of the user or third parties or cause damage to the product and other property. Therefore:

- The product may only be operated if it is in a technically flawless state, in accordance with its intended purpose, in a safety and danger-conscious fashion and in compliance with these operating instructions.
- Keep these operating instructions and all other applicable documents complete, legible and accessible to personnel at all times.
- Refrain from working in any way that could endanger personnel or uninvolved third parties.
- In the event of a safety-relevant fault, take the product out of operation immediately and have the fault rectified by the responsible person.
- In addition to the overall documentation, comply with the statutory or other safety and accident prevention regulations and the applicable standards and directives of the country of operation.

2.4 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 equipment.

The specific consequences can be:

- Failure of important functions of the product and the associated system
- Failure of required maintenance and repair methods
- Danger to persons
- Danger to the environment caused by leaking substances

2.5 Working in a safety-conscious manner

In addition to the safety instructions specified in these operating instructions, you must comply with additional safety regulations:

- Accident prevention regulations
- Safety and operating provisions
- Safety provisions for handling dangerous substances (particularly the safety data sheets of the dosing media)
- Environmental protection provisions
- Applicable standards and legislation

2.6 Modifications

Modifications to the product (such as alterations, changes and structural redesign) are not permitted without the express written consent of the manufacturer. Otherwise, the operating company is liable for the modifications that it makes. Modifications not agreed with the manufacturer may have the following effects, among others:

- Functional impairments of the product
- Damage to the product and other damage to property

- Environmental damage
- Personal injuries right through to death

2.7 Warranty

The following applies within the scope of the warranty:

- During the warranty period, obtain the manufacturer's approval before carrying out any modifications, repair work or alterations.
- Only use original parts.

2.8 Obligations of the operating company

The operator of the product is obligated to:

- Operate the product only in a technically flawless state, in accordance with its intended purpose, in a safety and danger-conscious fashion and in compliance with these operating instructions
- Ensure and monitor intended use
- Comply with and monitor legal and other safety and accident prevention regulations
- Comply with and monitor safety regulations when handling hazardous substances
- Comply with and monitor the applicable standards and directives of the country of operation
- Provide personal protective equipment

2.9 Personal protective equipment

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

The following protective equipment is recommended as a minimum:



Respirator mask



Protective clothing



Protective gloves



Safety shoes

Fig. 2: Protective equipment required

Wear the protective equipment when performing the following tasks:

- Commissioning
- All work on gas-bearing system parts
- Replacing the supply tanks
- Shut-down
- Maintenance work
- Disposal

2.10 Personnel qualification

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

Anybody who works with the product must meet the conditions below:

- Personal suitability for the respective activity
- Sufficient qualification for the respective activity
- Training into the handling of the device
- Knowledge of safety equipment and the way this equipment functions
- Knowledge of these operating instructions, particularly the safety instructions and sections relevant for the activity
- Knowledge of fundamental regulations regarding health and safety and accident prevention

All persons must have one of the following minimum qualifications:

- Trained as a specialist to work independently with the product
- Sufficient training to work on the product under the supervision and guidance of a qualified specialist

These operating instructions differentiate between the following user groups:

Qualified personnel

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

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.

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.

2.10.1 Personnel tasks

Incorrect handling of the product can cause severe personal injury and damage to property. Therefore, ensure that all work is carried out by qualified personnel only.

The following table shows which qualifications are required for the corresponding activities.

Qualification	Activities
Qualified personnel	• Installation • Hydraulic installation • Maintenance • Repairs • Commissioning • Shut-down • Disposal • Troubleshooting
Trained electricians	• Electrical installation of the heating sleeve • Elimination of electrical faults
Trained persons	• Transportation • Storage • Operation

Table 2: Personnel tasks

3 Intended use

3.1 Notes on product warranty

Any non-designated use of the product can compromise its function or intended protection. This leads to invalidation of any warranty claims!

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

- The product is operated in a manner that is not consistent with these operating instructions, particularly the safety information, action steps and the intended use.
- Information on usage and environment is not adhered to.
- People operate the product 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 product by the user.
- 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 chlorine gas filter is used in chlorine gas dosing systems for separating reliquefied chlorine gas and filtering the contaminants and solid matter that the chlorine gas contains.

Using the heating sleeve that is available as an accessory, it is possible to evaporate the separated liquid chlorine in the chlorine gas filter.

3.3 Prohibited operating conditions

Compliance with the operating conditions ensures the operational safety of the product. Prohibited operating conditions must therefore be avoided.

Operation of the product is not permitted under the following conditions:

- The product is used in a way that does not correspond to the defined intended purpose.
- The specified operating and environmental conditions are not adhered to.
- The product is used for outdoor applications.
- The product is operated without proper protective equipment, e.g. this equipment has been removed, is not properly installed or is not fully functional.

3.4 Prohibited dosing media

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

- Any gases except chlorine gas
- Liquids
- Solid substances

4 Product description

4.1 Scope of delivery

Carefully check the delivery prior to installation and refer to the delivery note to ensure that the delivery is complete and to check for any transport damage. Contact the supplier and/or carrier regarding any questions concerning the delivery and/or transport damage. Do not operate defective products.

The version without counterflanges includes the following scope of delivery:

- Chlorine gas filter
- Flange seals DN 25 (2 pcs)
- Operating instructions

Versions with counterflanges include the scope of delivery stated above as well as the following:

- Counterflange DN 25 – 1" NPT female thread with tongue and groove (2 pcs) or
- Counterflange DN 25 – welding neck flange with tongue and groove (2 pcs)
- Mounting material for flanges (screws, washers, nuts and gas-kets)

The filter is assembled ready-to-install. All the flange openings are closed by transportation locks.

4.2 Structure of the device

The chlorine gas filter consists of a ceramic filter element (8) that is located in a filter pipe (7) and a flanged filter head (3) for installing the chlorine gas filter into the pipeline.

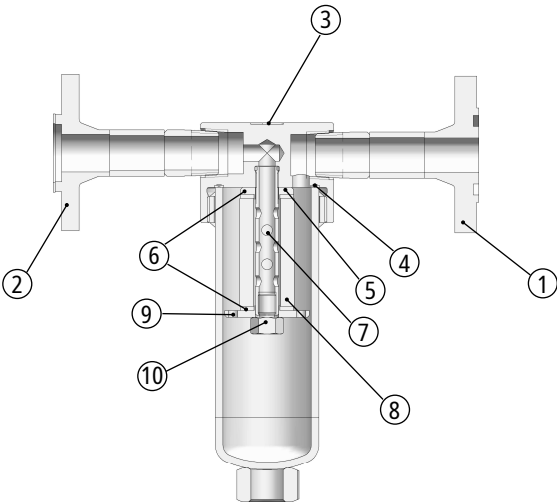


Fig. 3: Structure of the chlorine gas filter

1 Connecting flange with groove (inlet)	2 Connecting flange with spring (outlet)
3 Filter head	4 Flat gasket
5 Filter support	6 Flat gaskets
7 Filter pipe	8 Filter element
9 Filter support with drillholes	10 Base screw

4.2.1 Rating plate

The rating plate clearly identifies the product and provides important information such as the manufacturer, product designation, year of manufacture and technical and safety-relevant data. The rating plate must be kept legible for the duration of the service life of the product.

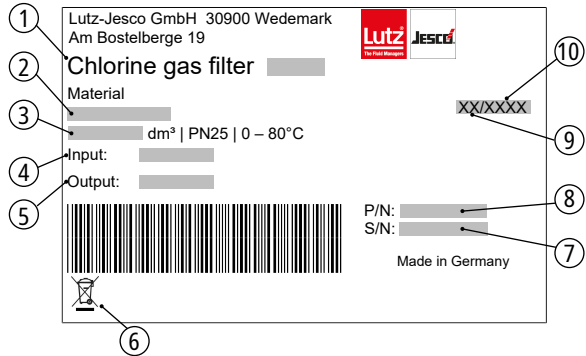


Fig. 4: Rating plate

1 Product name	2 Capacity
3 Contents, pressure class and operating temperature	4 Specification of the input
5 Specification of the output	6 WEEE label
7 Serial number	8 Part number
9 Month of manufacture	10 Year of manufacture

5 Technical data

Description	Value
Throughput	60 kg Cl ₂ /h, 200 kg Cl ₂ /h
Max. operating pressure	PS 25
Weight	9 kg (60 kg/h), 10 kg (200 kg/h)
Max. operating temperature	80 °C
Connection of pipework	DN 25
Material of the housing	Carbon steel, brass (nickel-plated)
Material of seals	FPM, Klingsil
Filter material	Ceramic
Connections	DN 25 / PN 40 with groove (inlet) and tongue (outlet) according to EN 1092-1

Table 3: Technical data

6 Dimensions

All dimensions in millimetres (mm).

6.1 Chlorine gas filter 60K

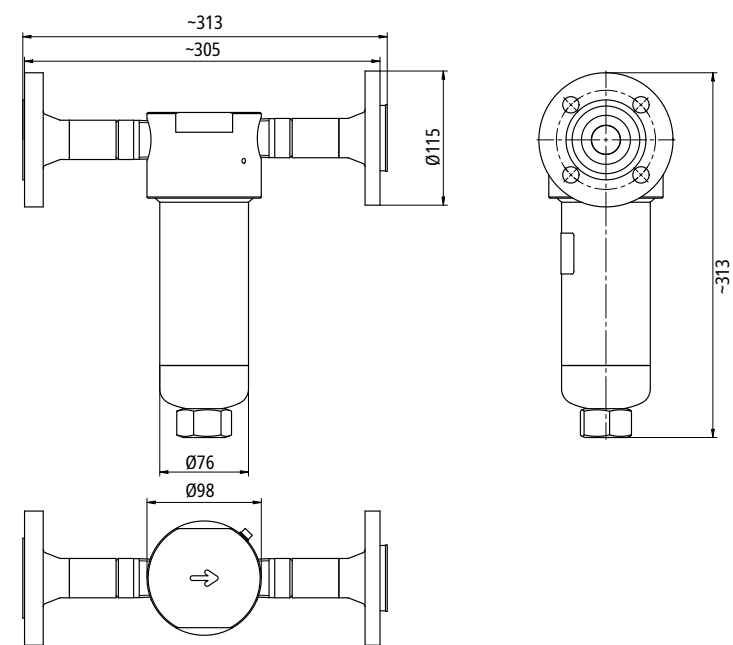


Fig. 5: Dimensions of the chlorine gas filter (60K)

6.2 Chlorine gas filter 200K

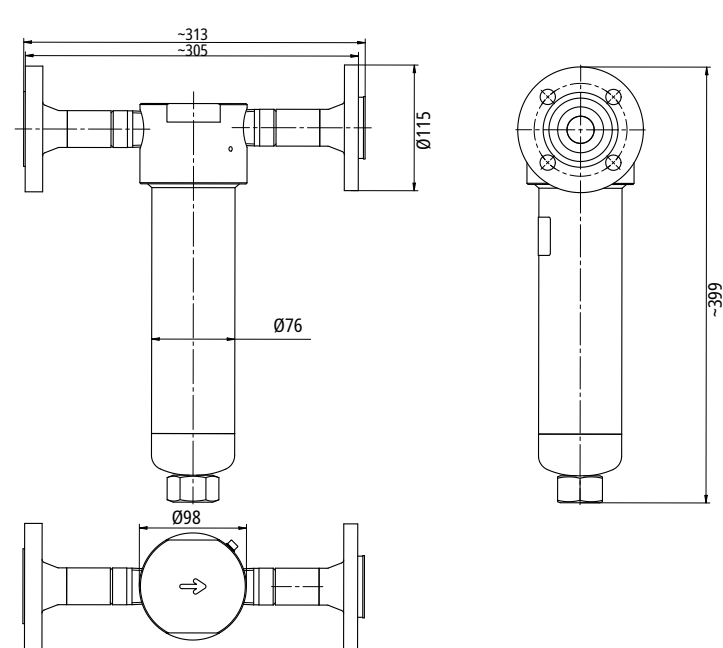


Fig. 6: Dimensions of the chlorine gas filter (200K)

7 Installation

7.1 Installation location

The chlorine gas filter is to be mounted as follows:

- In overpressure lines: before the pressure reducing valve
- In systems with chlorine vaporisers: between the chlorine vaporiser and pressure reducing valve

Leave at least 400 mm space below the flange to allow access for maintenance.

7.2 Mounting the chlorine gas filter

- ✓ The flanges are free from temporary coatings, e.g. to protect from corrosion.
- ✓ The sealing surfaces of the flanges are free of contamination and damage.
- ✓ Bolts, nuts and washers are clean and undamaged. In this connection, pay particular attention to the thread and the supporting surfaces.
- ✓ Seals must be clean, undamaged and dry. You are not allowed to use adhesive paste and fitting lubricant.



INFORMATION

If any bolts, nuts and washers are removed during assembly work, you need to replace them with new ones according to a risk assessment or after inspection if they are damaged. You may only install used bolts, nuts and washers if they are at least as good as new.

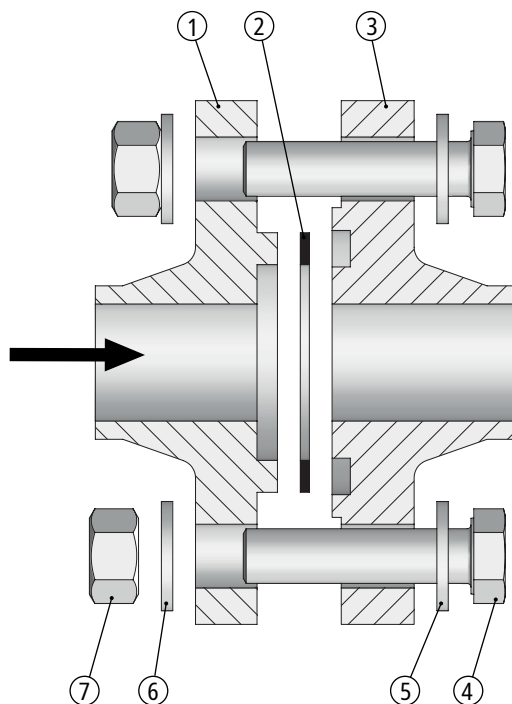


Fig. 7: Installing the flange connection

1. Lubricate the sliding faces and thread of bolts, nuts and washers e.g. using fitting grease or PTFE grease.

2. Place the flat gasket (2) into the groove of the connection flange (3). Assemble the seal in dry condition.
3. Mount the tongue flange (1). Make sure that the flat gasket (2) does not slip.
4. Fit the bolts (4), washers (5, 6) and nuts (7) by hand.
5. Tighten the bolts evenly alternately crosswise in three stages: 20 Nm, 35 Nm, 50 Nm. After this, retighten all the bolts to the full target tightening torque (50 Nm).
6. Setting the seal (adapting to the flange seal surface) can make it necessary to retighten the bolts. For this reason, retighten the bolts to 50 Nm after a few hours.



INFORMATION

When mounting, ensure that the installation method is correct. There is an arrow on the end face of the chlorine gas filter's filter head that shows the specified direction of throughflow of the chlorine gas filter.

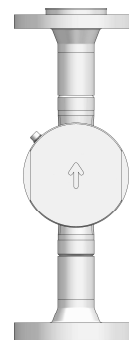


Fig. 8: Top view of chlorine gas filter with arrow showing direction of throughflow

☞ Chlorine gas filter mounted.

7.3 Installing a heating sleeve (optional)

1. Push the heating sleeve over the housing pipe so that it is located approximately in the middle of the housing pipe.
2. A qualified electrician must connect the prefabricated open ends of the heating sleeve to an existing junction box on site and observe the voltage specification on the heating sleeve.
3. Attach the ground loop of the heating sleeve to the filter head of the chlorine gas filter using the eyelet. There is a corresponding threaded hole on the filter head for this purpose.

☞ Heating sleeve mounted.

7.4 Completing the installation

After completing the installation, you need to check that all connections are tight and leak-proof (→ Commissioning [► 14]).

8 Commissioning



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 components are not in good condition.

- ▶ Before you put the system into operation, have it checked by technical personnel to ensure that it is in proper condition and leak tight.
- ▶ Inspect the chlorine gas filter, connecting flanges and all the other system components on a regular basis.



WARNING

Danger of personal injury and material damage!

The housing seal may have loosened during transportation of the product.

- ▶ Tighten the housing pipe on the nut before commissioning the product. Do not exceed the maximum tightening torque of 100 Nm.

8.1 Inspecting the pressure system

To inspect the tightness of the pressure system from the chlorine tank to the chlorine gas filter, first perform a leak test with nitrogen and then a leak test with chlorine.

8.1.1 Performing a leak test with nitrogen



INFORMATION

You are strongly recommended to carry out this inspection before carrying out the leak test with chlorine, since it shows leaks in the pressure system without the risk of chlorine escaping.

As an alternative, you can perform the inspection using dry compressed air.

- ✓ All the open connections of the pressure system were closed correctly.
 - ✓ All the shut-off valves in the pipe system were opened.
 - ✓ A nitrogen cylinder was connected.
1. Slowly raise the system pressure at the nitrogen cylinder's pressure reducer to 10 bar.
 2. Close the nitrogen cylinder's valve.
 3. Apply soap solution to all the potential leaks. Bubbles will appear at leak locations.
 4. Close the outlet on the nitrogen cylinder's pressure reducer and observe the pressure gauge in the installation. The pressure must not drop within one hour.

5. If necessary, repair leaks and repeat the leak test.
- 🔧 Leak test with nitrogen carried out.

8.1.2 Performing a leak test with chlorine



DANGER

Danger to life from chlorine poisoning!

If you start the leak test with chlorine before the entire system has been installed and the ejectors are ready for operation, chlorine cannot be extracted immediately in the case of a leakage.

- ▶ Make sure that all system components have been installed correctly and the ejectors are ready for operation before starting the leak test with chlorine.
- ▶ Put on protective clothing before carrying out the leak test with chlorine.

- ✓ The leak test with nitrogen has been carried out successfully.
 - ✓ All the open connections of the pressure system were closed correctly.
 - ✓ A chlorine container was connected.
 - ✓ The ejector is ready for operation.
1. Briefly open the chlorine container valve and close it again.
 2. Carry out the ammonia test on the entire pressure system: Ammonia steam with chlorine forms a white vapour and makes even very small leaks visible. Hold an open bottle containing the ammonia solution close to the pipe and make slight pumping motions with the plastic bottle.

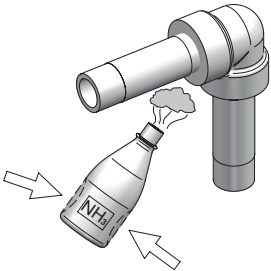


Fig. 9: Leak test with ammonia



NOTE

Damage to the system from ammonia solution

If the ammonia solution comes into contact with the system, this leads to corrosion on the equipment.

- ▶ Make sure that you do not spill any ammonia.
3. If you find leaks: Use the ejector to extract the chlorine immediately. Eliminate the leak and repeat the leak test.
 4. If you do not find any leaks: Briefly open the chlorine container valve and leave it open.
- 🔧 Leak test with chlorine carried out.

9 Operation



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 you put the system into operation, have it checked by technical personnel to ensure that it is in proper condition and leak tight.
- ▶ The condition of the installation must be checked for adequate tightness on a regular basis.
- ▶ Ensure that all action is taken only by personnel with sufficient and corresponding qualifications.

The chlorine gas filter does not require any special operation. It is used in chlorine gas dosing systems for separating reliquefied chlorine gas and filtering the contaminants and solid matter that the chlorine gas contains.

10 Maintenance

Products from Lutz-Jesco GmbH 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 inspections are necessary to ensure a long operating life of the product. Regular maintenance protects the product against operational disruptions.

Observe the following information regarding maintenance:

- Maintain chlorinators at least once a year to prevent malfunctions.
- In some cases, regional regulations may require shorter maintenance intervals. Working on the system requires special safety precautions and may only be carried out by instructed technical personnel.
- If the device has been out of operation for a longer period of time, carry out maintenance before recommissioning.
- If there is a significant pressure drop above the chlorine gas filter, the filter is very dirty and needs to be replaced.
- Regardless of the contamination level, you must change the filter element and all the seals at the latest at the end of each year of operation.



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. Otherwise, chlorine gas may escape.

- Close the chlorine container valves before carrying out any work.
- Use the injector to suck out all the chlorine-bearing pipes.



WARNING

Increased risk of accidents due to insufficient qualification of personnel!

Only sufficiently qualified personnel may install, operate and maintain the product and the system in which it is used. Insufficient qualification will increase the risk of accidents.

- Ensure that all action is taken only by personnel with sufficient and corresponding qualifications.
- Ensure that maintenance is carried out with the appropriate personal protective equipment.

10.1 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. Instructions for carrying out this work are provided in the subsections.

Interval	Maintenance
In case of heavy contamination of the filter element	• Replace the filter and seals
After 1 year	• Clean the device • Replace filter element • Replace all seals

Table 4: Maintenance intervals



INFORMATION

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.

10.2 Maintenance accessories

Maintenance kit	Content
	1 x filter element
Spare parts kit for chlorine gas filter	1 x housing seal 2 x flat gaskets for the filter element 2 x flat gaskets for the flanges

Table 5: Maintenance accessories

10.3 Preparing the system for maintenance

1. Close the chlorine tank valves.
 2. Use the ejector to suck off the remaining chlorine.
 3. Run the chlorine gas system for approx. 5 minutes with nitrogen or dry compressed air.
 4. Switch off the ejector.
 5. Remove the device from the pipeline.
 6. Close all the connections to protect the lines and devices from humidity and dirt.
- 🔒 The system is prepared for maintenance.

10.4 Maintenance of the chlorine gas filter

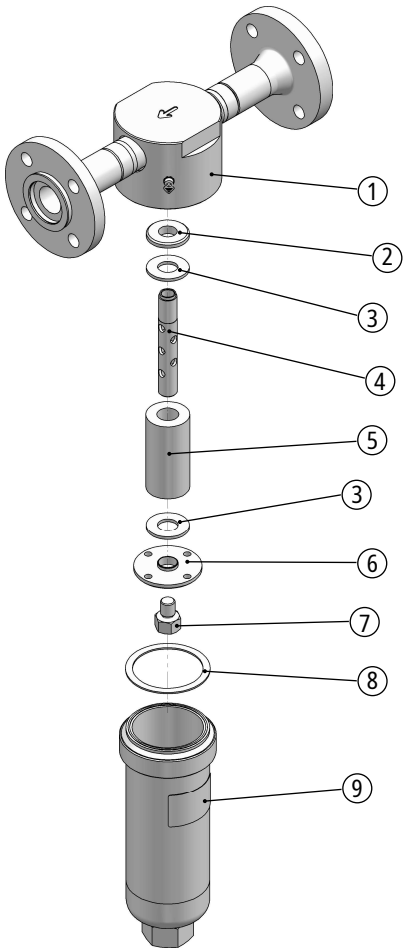


Fig. 10: Exploded view of the chlorine gas filter

10.4.1 Removing the filter element

- ✓ The system has been prepared for maintenance (→ Preparing the system for maintenance [► 16]).
 - ✓ All feed and discharge lines have been depressurised.
 - ✓ The maintenance set is available.
 - ✓ Required equipment ⚠ is to hand: open-end spanner SW 21 and SW 41, vice and cleaning alcohol.
1. Clamp the device into the vice with the filter head (1) facing downwards.
 2. Take the open-end spanner SW 41 and unscrew the housing pipe (9) from the filter head.
 3. Remove the flat gasket (8).
 4. Take the open-end spanner SW 21 and unscrew the base screw (7) from the filter bolt (4).
 5. Remove the filter element (5) with the two seals (3) and the filter supports (2, 6). The filter bolt (4) remains fitted in the filter head (1).
- 🔧 Filter element removed.

10.4.2 Fitting the filter element

- ✓ The filter element has been removed.
 - ✓ Required equipment ⚠ is to hand: open-end spanner SW 21, SW 41, vice and cleaning alcohol.
1. Check the state of all sealing surfaces. They must be clean and undamaged.
 2. Clean all threads.
 3. Rub some silicone grease onto the flat gasket (8). Place the flat gasket into the groove of the filter head (1).
 4. Place a flat gasket (3) and the filter support (2) onto the new filter element (5). The filter support reaches into the flat gasket and filter element.
 5. Slide this group onto the filter bolt (4).
 6. Place another flat gasket and filter support (6) onto the filter element one after each other.
 7. Screw on the base screw (7) loosely by hand. Make sure that positions 3 to 6 are concentric to each other. Tighten the base screw approx. 1/4 turn using an open-end spanner SW 21.
 8. Rub some silicone grease onto the external thread on the housing pipe (1). Screw the housing pipe into the filter head. Tighten the housing pipe on the nut with an open-end spanner SW 41. The tightening torque is approx. 100 Nm.
- 🔧 Filter element installed.

10.5 Completing the maintenance

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. Put the device into operation again (→ Commissioning [► 14]).
- 🔧 Maintenance completed.

11 Troubleshooting

Problem	Possible Cause	Corrective actions
Serious drop in pressure after the chlorine gas filter	Filter blocked	Carry out maintenance
Chlorine gas filter blocked from the inside	Direction of flow is not correct	Clean and replace the connection sides of the connecting piece. Perfuse the chlorine gas filter from the outside to the inside.
Ice, frost or condensed humidity on the filter hood to a specific height.	Liquid chlorine in the filter hood	Reduce the extraction quantity or attach a heating sleeve and heat the chlorine gas filter.

Table 6: Troubleshooting

12 Shutdown and disposal

12.1 Shutting down the system temporarily

1. Close the chlorine gas container valves.
 2. Use the ejector to extract the remaining chlorine.
 3. Switch off the ejector.
- ☞ Chlorine gas system shut down temporarily.

12.2 Shutting down the system for a longer period of time

1. Close the chlorine tank valves.
 2. Use the ejector to extract the remaining chlorine.
 3. Run the chlorinator for approximately five minutes with nitrogen.
 4. Close all the connections to protect the lines and devices from humidity and dirt.
 5. Switch off the ejector.
- ☞ Chlorine gas system shut down for a longer period of time.

12.3 Disposal of old equipment

Comply with the following instructions when disposing of an old device:

- Before disposing of the device, you must remove any residual chlorine by flushing it with nitrogen or air.
- You must dispose of the device in accordance with 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. However, this requires the device to have been safely returned along with a decontamination declaration.

13 Note on EU conformity

The devices fall under the purview of the pressure equipment directive 2014/68/EU.

The values stated below do not exceed the limit values in according to article 4, paragraph 3. Therefore, it is designed and manufactured in accordance with valid good engineering practice These pressure devices must not carry a CE marking and an EU declaration of conformity must not be issued.

Designation of the device: Chlorine gas filter

Type: 60K, 200K

Volume: 0,6 l (type 60K), 1 l (type 200K)

Pressure: PN25

Medium: Chlorine, fluid group 1

The devices fulfil all the demands made by the directive(s):

2014/68/EU Pressure equipment directive

14 Decontamination declaration

Due to legal regulations for the protection of our employees and operating facilities, we need the completed and signed declaration of decontamination in order to process your return.

1. Copy this page and complete it **for each device separately!**
2. Attach the declaration to the outside of the packaging.
3. Return the device.

Decontamination declaration

We forward the following device for repairs:

Device designation:

Part no.:

Order no.:

Date of delivery:

Reason for repair:

Medium dosed

Description:

Irritant:

☐ Yes
 ☐ No

Properties:

Corrosive:

☐ Yes
 ☐ No

We hereby certify that the device has been thoroughly cleaned inside and out before being returned, contains no hazardous chemical, biological and radioactive agents and has been drained of oil.

If the manufacturer has to perform additional cleaning, we shall be invoiced the costs incurred.

We certify that the aforementioned information is correct and complete and that the device will be returned in accordance with legal requirements.

Company / Address:

Phone:

Fax:

E-mail:

Customer no.:

Contact person:

Date, Signature:

15 Warranty claim

If the device breaks down within the period of warranty, please return it in a cleaned condition with the fully completed warranty claim.

1. Copy this page and fill in all fields.
2. Pack the device together with the completed warranty claim.
3. Return the device.

Warranty claim		Date:
Sender		
Company:	Phone:	
Address:	Fax:	
.....	E-mail:	
.....	Contact person:	
Manufacturer order no.:	Delivery date:	
Device type:	Serial number:	
Nominal power / nominal pressure:		
Fault details:		
.....		
.....		
.....		
.....		
.....		
Operating conditions of the device		
Application site / site description:		
.....		
.....		
Accessories used:		
.....		
.....		
Commissioning (date):		Operating hours (approx.):
Please state the specific characteristics of the installation and enclose a basic sketch or photograph of the installation, indicating the materials, diameters, lengths and heights.		
.....		

Notes



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