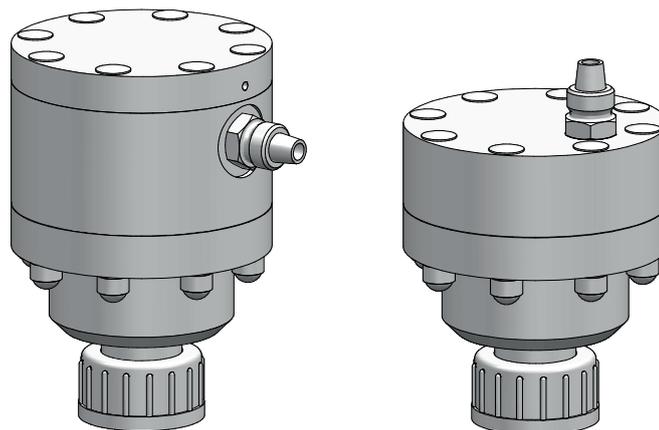


Injector non-return valves

Up to 25 kg/h chlorine gas

Operating instructions



Read the operating manual!

The user is responsible for installation and operation related mistakes!

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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 manual prior to starting-up 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.
PLEASE NOTE	Refers to a danger which, if ignored, may lead to risk to the machine and its function.

Tab. 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
	General danger
	Danger from poisonous substances
	Danger from electrical voltage
	Danger of damage to machine or functional influences

Tab. 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!
<p>Danger to life from chlorine poisoning!</p> <p>Chlorine is poisonous. In severe cases, breathing in chlorine may lead to death. It irritates the eyes, the respiratory system and the skin.</p> <ul style="list-style-type: none"> ⇒ 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!
<p>Danger to life from missing safety device.</p> <p>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.</p> <ul style="list-style-type: none"> ⇒ Install a gas warning device. 	

	WARNING
<p>Increased risk of accidents due to insufficient qualification of personnel!</p> <p>Chlorinators and their accessories must only be installed, operated and maintained by personnel with sufficient qualifications. Insufficient qualification will increase the risk of accidents.</p> <ul style="list-style-type: none"> ⇒ Ensure that all action is taken only by personnel with sufficient and corresponding qualifications. ⇒ Prevent access to the system for unauthorised persons. 	

	PLEASE NOTE
<p>Damage to the plant due to the formation of hydrochloric acid</p> <p>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.</p> <ul style="list-style-type: none"> ⇒ 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 0.5 -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).

	PLEASE NOTE
<p>Faults due to insufficient chlorine quality</p> <p>Impurities in the chlorine gas form deposits in devices and valves and can attack the components chemically. This can lead to malfunctions.</p> <ul style="list-style-type: none"> ⇒ Only use technically pure chlorine that meets the following requirements: <ul style="list-style-type: none"> - 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.

You will require the minimum of the following personal protective equipment:

Personal protective equipment required	
	Respirator mask
	Protective clothing
	Safety shoes
	Protective gloves

Tab. 3: Personal protective equipment required

Wear the following personal protective equipment when performing the following tasks:

- Commissioning
- All work on gas-bearing sections of the plant
- Changing the chlorine tank
- Shut-down
- Maintenance work
- Disposal

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
- Sufficient qualification for the respective activity
- Training in how to handle the device
- Knowledge of safety equipment and the way this equipment functions
- Familiar with this operating manual
- 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 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.

2.7 Personnel tasks

In the table below, you can check what personnel qualifications are required for the respective tasks. Only people with appropriate qualifications are allowed to perform these tasks!

Qualification	Activities
Specialist staff	<ul style="list-style-type: none"> ■ Transportation ■ Assembly ■ Hydraulic installations ■ Commissioning ■ Taking out of operation ■ Fault rectification ■ Maintenance ■ Repairs ■ Disposal
Trained persons	<ul style="list-style-type: none"> ■ Storage ■ Control

Tab. 4: 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 9) 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.
- 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 injector non-return valve stops the return water. This keeps the system dry. It may only be used with technically pure chlorine with a minimum mass content of 99.5 %

3.3 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:

- Injector non-return valve
- Operating instructions

4.2 Design and function

4.2.1 Device design

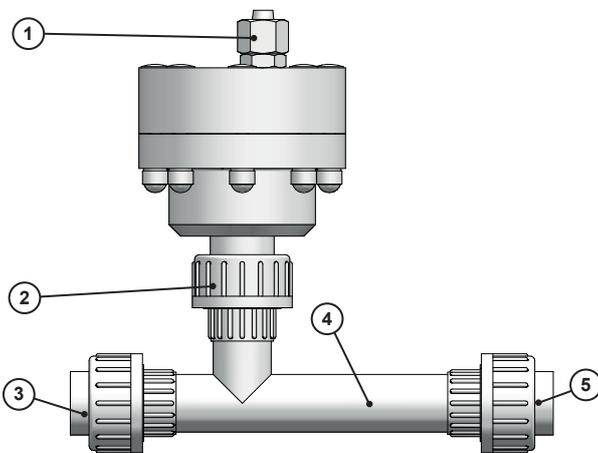


Fig. 1: Injector with injector non-return valve

Item	Description
1	Chlorine gas input
2	Chlorine gas output
3	Water inlet
4	Mixing zone
5	Finished mixture

Tab. 5: Components

4.2.2 Function description

Injectors use the principle of water-jet pumps to create the vacuum required to suck in gas. If the water flow is disturbed or interrupted by the injector, the water pressure is also present on the injector suction connection. A non-return valve must be installed on the injector suction connection to prevent water penetration of the gas line and to protect the chlorinators against damage.

The injector non-return valve is realized as a spring-loaded diaphragm valve. As long as a vacuum is applied to the suction connection, the spring is compressed and the valve is open. If the vacuum collapses, the spring will relax and closes the valve. The water pressure on the diaphragm supports the valve seal.

A version with an integrated back-pressure regulator in accordance with DIN19606 is available for dosing capacities of up to max. 6 kg/h. The device keeps the vacuum in the line to the dosing device at a constant level and prevents dosing errors resulting from suction pressure variations.

4.3 Rating plate

There is information on the equipment about safety or the product's way of functioning. The information must stay legible for the duration of the service life of the product.

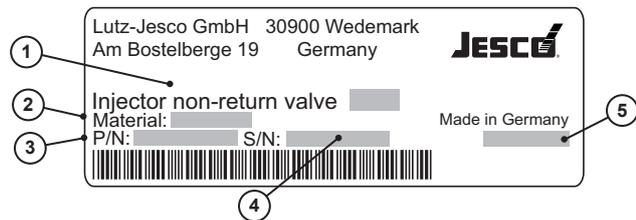


Fig. 2: Rating plate

No.	Description
1	Product name
2	Material
3	Part number
4	Serial number
5	Month/year of manufacture

Tab. 6: Rating plate

5 Technical data

Information			Value
Capacity range	without back pressure regulator	kg Cl ₂ /h	6, 10, 15 and 25
	with back-pressure regulator	kg Cl ₂ /h	6
Gas connection	6 kg Cl ₂ /h		8/12 PE hose*, 12/16 PE hose, PVC threaded connection DN10/Ø16, PVC threaded connection DN15/Ø20
	10, 15 kg/h Cl ₂ /h		12/16 PE hose
	25 kg/h Cl ₂ /h		PVC threaded connection DN15/Ø20
Injector connection	6 kg Cl ₂ /h		PVC union nut G1
	to 25 kg/h Cl ₂ /h		PVC union nut G2
Opening pressure	without back pressure regulator	bar t	> -0.1
	with back-pressure regulator	bar t	> -0.3
Maximum operating pressure		bar	16
Material in contact with the media			PVC, PVDF, FPM, Hastelloy
Weight		kg	0.8 approx.
Max. ambient temperature		°C	55

Tab. 7: Technical data

 * to 4 kg Cl₂/h

6 Dimensions

All dimensions in mm

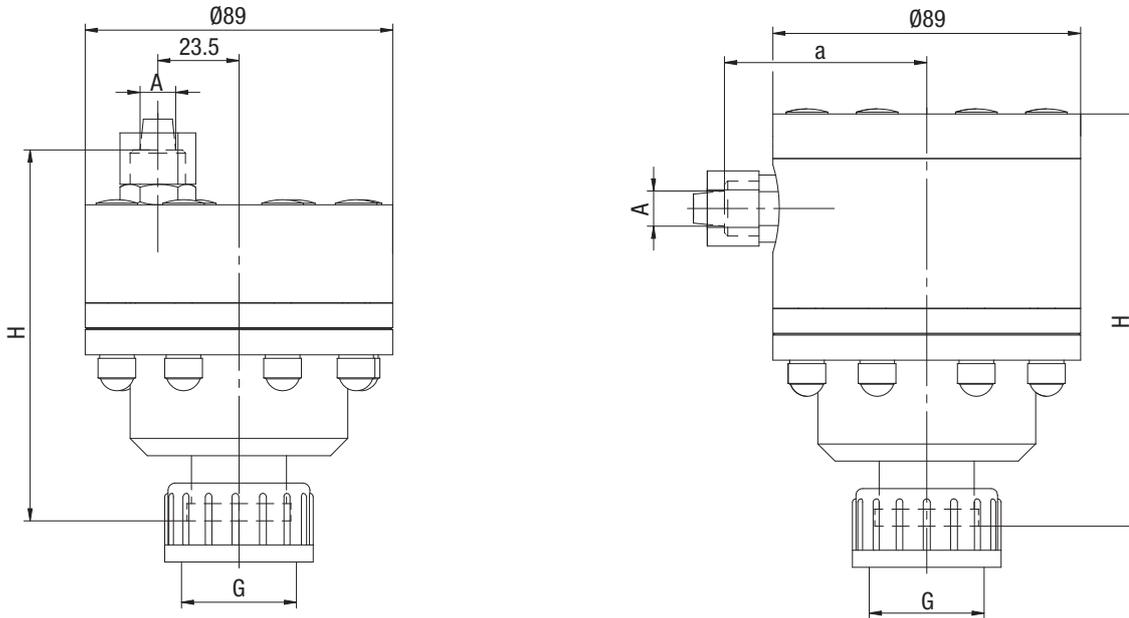


Fig. 3: Dimensional drawing ejector non-return valve without back pressure regulator (left) and ejector non-return valve with back pressure regulator (right)

Version	Max. performance chlorine gas	Input A	Height H	Clearance c
Without back pressure regulator	6 kg/hr	8/12 PE hose	112 mm	-
		12/16 PE hose	110 mm	-
		PVC screw connection DN15	117 mm	-
	10 kg/h, 15 kg/h	12/16 PE hose	136 mm	-
	25 kg/hr	PVC screw connection DN15	142 mm	-
With back-pressure regulator	6 kg/hr	8/12 PE hose	120 mm	60 mm
		12/16 PE hose	120 mm	65 mm

Tab. 8: Dimensions

7 Installation

PLEASE 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

Install the non-return valve directly on the injector or close to it. The following chapters provide further information.

The room must fulfil the following minimum requirements:

- Secured against access by unauthorised persons
- Protected against weather conditions
- Permissible ambient temperature adhered to (see Section 5 "Technical data" on page 9)
- Room complies with the locally valid prescriptions

7.2 Connection the non-return valve to the ejector

Non-return valves must be fitted vertically and only work correctly if their output points downwards. If the injector was fitted vertically, an elbow connector must be placed between the injector and non-return valve to permit the inlet.

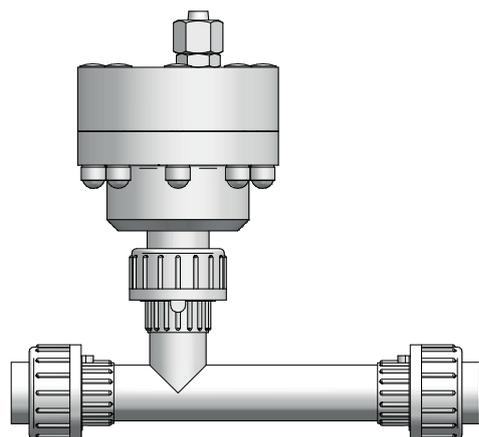


Fig. 4: Horizontal installation position of the injector

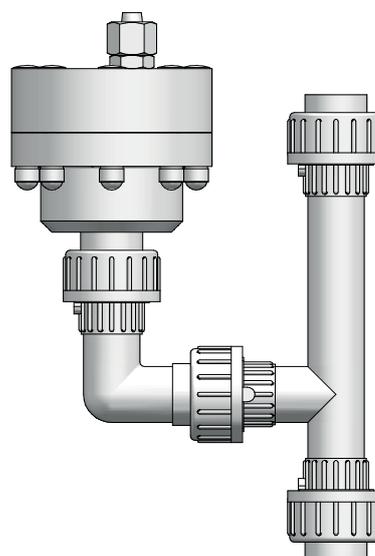


Fig. 5: Vertical installation position of the injector

Precondition for action:

- ✓ The sealing surfaces of the injector non-return valve and the injector are free of soiling and damage.

Perform the following working step:

- ➔ Screw the union nut of the injector non-return valve onto the gas connection of the injector and tighten the union nut hand tight.
- ✓ **Connection to the injector has been completed.**

7.3 Connecting the injector non-return valve to the chlorine supply

For instance, PVC-U pipes or PE hoses are used as vacuum lines.

The following nominal widths are recommended for the vacuum lines between dosing device and ejector non-return valve (max. pressure decrease: 25 mbar, calculated at 750 mbar a).

Mass flow of chlorine	Length of vacuum line			
	5 m	10 m	20 m	50 m
4 kg/hr	DN8	DN12	DN12	DN15
6 kg/hr	DN12	DN12	DN12	DN15
10 kg/hr	DN12	DN15	DN15	DN20
15 kg/hr	DN12	DN15	DN20	DN20
25 kg/hr	DN20	DN20	DN20	DN25

Tab. 9: Recommended nominal width between the dosing device and ejector non-return valve

If the recommended nominal width for the vacuum line is larger than the connection of the device, fit a c. 0.5 m line with the same connection size as the device directly to the device. Use the recommended nominal width for the long distance.

7.3.1 Establish the hose connection

Precondition for action:

- ✓ The device is fitted on the wall.
- ✓ The transport protection on the connection has been removed.

Resources required:

- ✂ Sharp knife

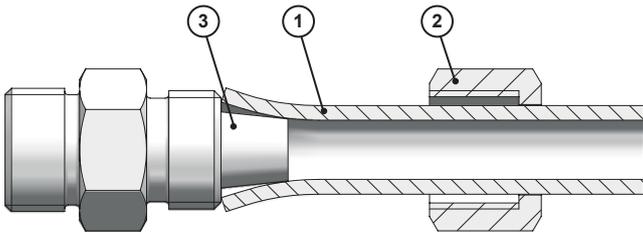


Fig. 6: Establish the hose connection

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.
5. Fix the hose to the wall.

- ✓ **Hose connected fitted.**

7.3.2 Make the PVC seal connection.

Precondition for action:

- ✓ The device is fitted on the wall.
- ✓ The vacuum line is fixed with sufficient pipe clamps and meets the connection in an un-tensioned state.
- ✓ All parts are clean and dry.
- ✓ The transport protection on the connection has been removed.

Resources required:

- ✂ Pipe cutter
- ✂ File or chamfer tool
- ✂ PVC adhesive and cleaning agent
- ✂ Non-fuzzing paper towels

Perform the following working steps:

1. Cut the PVC pipe at right angles.
2. Make a chamfer on the pipe exterior (approx. 3mmx20°).
3. Clean the pipe and the bushing with the cleaning agent recommended by the manufacturer of the adhesive.

4. Glue the pipe in the connection. Follow the instructions on the PVC adhesive.

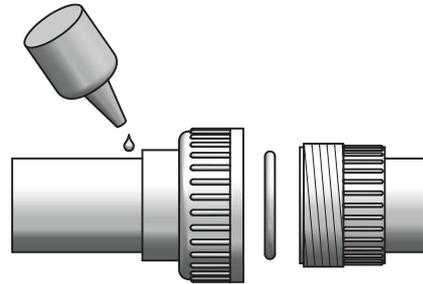


Fig. 7: Making the PVC seal connection

5. Mount the connection on the device. Ensure that the O-ring is fitted.
6. Tighten the union nut by hand.
7. Allow the bond to harden for at least 3 hours prior to the leak test.

- ✓ **PVC seal connection made.**

8 Operation

During operation the ejector non-return valve starts and stops automatically.

Ensure ideal storage conditions where possible:

- The storage place must be cold, dry, dust-free and moderately ventilated.
- Climactic conditions: see chapter 5 “Technical data” on page 9

8.1 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.	
⇒ Given a serious escape and insufficient equipment or qualifications, leave the work to professional emergency services personnel. Do not take any unnecessary risks.	

8.3 Disposal

	PLEASE NOTE
Do not dispose of the device in the domestic waste!	
Do not dispose of electric devices via the domestic waste.	
⇒ Before disposing of the old equipment, you must clean off the remaining chlorine by rinsing it with nitrogen or air.	
⇒ The device and its packaging must be disposed of in accordance with locally-valid laws and regulations.	
⇒ Dispose of different materials separately and ensure that they are recycled.	
⇒ When returning the device to the manufacturer, it must be sent safely and together with a declaration of safety (see page 20).	

The measures depend on the type of accident and should be planned and executed by professional personnel.

8.2 Shut-down

8.2.1 Short-term shut-down

Perform the following working steps:

1. Close the chlorine tank valves.
2. Use the injector to suck off the remaining chlorine.
3. Switch off the injector.

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

8.2.2 Long-term shutdown

Perform the following working steps:

1. Close the chlorine tank valves.
2. Use the injector to suck off the remaining chlorine.
3. If possible, operate the chlorine gas system for approximately five minutes with nitrogen or dry compressed air.
4. Switch off the injector.
5. Close all the connections to protect the lines and devices from humidity and dirt.

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

The device remains in the installation location during the operating pause. All connections remain closed. The voltage supply should remain active so that condensate is unable to gather in the electrical devices.

9 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.

- ⇒ Prior to any maintenance work, prepare the system in accordance with section 9.2 "Preparing the system for maintenance" on page 14.
- ⇒ When dismantling the device, always use breathing apparatus with a Type B gas filter that complies with EN 14387.

PLEASE 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.

9.1 Maintenance intervals

i In some cases, regional regulations may require shorter maintenance intervals. Carry out maintenance before recommissioning the system after a long period out of service.

Maintenance intervals not 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.

Subject the chlorinator to regular maintenance, to prevent malfunctions. Perform the maintenance in the following intervals:

Interval	With back-pressure regulator	Without back pressure regulator
After 1 year	<ul style="list-style-type: none"> ■ Replace the O-rings ■ Change the membranes 	<ul style="list-style-type: none"> ■ Replace the packing washer ■ Change the membrane
After 3 years	<ul style="list-style-type: none"> ■ Replace the O-ring ■ Change the membranes ■ Replace the spring 	<ul style="list-style-type: none"> ■ Replace the packing washer ■ Change the membrane ■ Replace the spring

Tab. 10: Maintenance intervals

9.2 Preparing the system for maintenance

Perform the following working steps:

1. Close the valves of the chlorine tanks.
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. Stop the injector water e.g. by closing the ball valves.

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

9.3 Device Maintenance

Precondition for action:

- ✓ Section "9.2 Preparing the system for maintenance" was performed.
- ✓ The spare parts are free of damage.

Resources required:

- ✘ Maintenance kit
- ✘ PTFE grease

9.3.1 Dismantle the ejector non-return valve

Please note the exploded diagrams from page 17.

Devices without back-pressure regulator

Perform the following working steps:

1. Dismantle the injector non-return valve from the injector.
2. Remove all safety and cover caps from the device.
3. Loosen all 8 screws on the housing.
 - ▶ The spring presses the housing sections apart.
4. Remove the packing washer from the front casing.
5. Remove the diaphragm and all the parts connected to it.
6. Remove the spring after 3 years within the scope of maintenance.
7. Remove the diaphragm mount and the threaded ring from the diaphragm and then remove the diaphragm.
8. Clean the rest of the parts thoroughly (e.g. with warm water or isopropyl alcohol) and check for visible damage.

✓ **The non-return valve has been dismantled.**

Devices with back-pressure regulator

Perform the following working steps:

1. Dismantle the injector non-return valve from the injector.
2. Remove all safety and cover caps.
3. Loosen all 8 screws on the housing.
 - ▶ The springs press the housing sections apart.
4. Remove the diaphragm of the back-pressure regulator.

5. Remove the spring of the back-pressure regulator.
6. Remove the injector non-return valve diaphragm and the parts connected to it.
7. Remove the injector non-return valve spring after 3 years within the scope of maintenance.
8. Remove the diaphragm mount and the threaded ring from the diaphragm and then remove the diaphragm.
9. Clean the rest of the parts thoroughly (e.g. with warm water or isopropyl alcohol) and check for visible damage.

✓ **The non-return valve has been dismantled.**

9.3.2 Fitting the injector non-return valve

Devices without back-pressure regulator

Perform the following working steps:

1. Fit a new sealing disc in the upper section of the housing. Make sure that the shiny side of the sealing disc points towards the diaphragm mount. Cover the visible side with a small amount of PTFE grease.
2. Place a new diaphragm on the threaded ring. Cover the diaphragm on the outer and inner ring with a light covering of PTFE grease.
3. Cover the thread of the diaphragm mount with a light covering of PTFE grease and screw the diaphragm mount into the threaded ring. Make sure that the diaphragm remains in position in the groove of the threaded ring.
4. Position the spring in the lower section of the housing.
5. Guide the diaphragm mount into the spring.
6. Screw the upper and lower section of the housing together. Ensure distortion-free installation.
7. Tighten the screws clockwise with 1 Nm.
8. Re-fit all safety and cover caps.

✓ **The non-return valve has been fitted.**

Devices with back-pressure regulator

Perform the following working steps:

1. Insert the screws into the drillholes of the cover and place the cover onto a level surface with the inside pointing upwards.
2. Insert a new diaphragm into the groove in the cover intended for this purpose.
3. Place the spring plate with the flat side on the centre of the diaphragm.
4. Place the spring on the spring plate.
5. Take the controller housing and insert the screws through its drillholes.
6. Fit a new O-ring in the diaphragm mount and cover a light covering of PTFE grease.
7. Place a new diaphragm on the threaded ring.
8. Cover the diaphragm on the outer and inner ring with a light covering of PTFE grease.

9. Cover the thread of the diaphragm mount with a light covering of PTFE grease and screw the diaphragm mount into the threaded ring. Make sure that the diaphragm remains in position in the groove of the threaded ring.
10. Place the module in the controller housing with the O-ring side on the spherical curve.
11. Guide the spring over the diaphragm mount.
12. Position the spring in the lower section of the housing.
13. Guide the diaphragm mount through the spring.
14. Take the lower section of the housing and guide the screws (pointing out of the controller housing) through the drillholes of the lower section of the housing.
15. Screw the housing sections together. Ensure distortion-free installation.
16. Tighten the screws clockwise with 1 Nm.
17. Re-fit all safety and cover caps.

✓ **The non-return valve has been fitted.**

9.4 Functional control

Perform a functional check after maintenance by increasing the pressure in the piping system slowly until the setpoint has been reached. If no leak develops within 5 minutes, the injector non-return valve is sealed.

10 Troubleshooting

All possible errors are listed in this table.

Problem	Symptom	Possible cause
System does not produce	Water flows without noise	Ball valves closed
	Water flows with a loud noise	The injector has been fitted the wrong way round
	The water flows with a loud noise but without an effect	The injector has been mounted correctly but aligned incorrectly
System produces too little	The water flows with a loud noise but with an insufficient effect	The injector has been fitted correctly but aligned incorrectly. It may still be possible to control the flow via the pressure-relief valve (choking or opening). If necessary, consult the manufacturer.

Tab. 11: Troubleshooting

11 Spare parts

11.1 Devices without back-pressure regulator

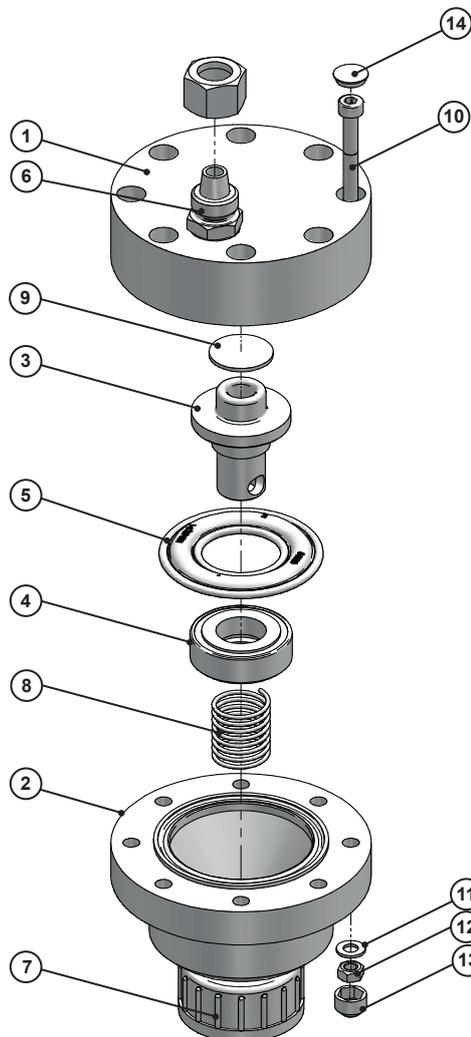


Fig. 8: Exploded view devices without back-pressure regulator

Item	No.	Description
1	1	Front casing
2	1	Rear casing
3	1	Diaphragm mount
4	1	Threaded ring
5**	1	Diaphragm Ø56.4
6	1	Hose clamp connection 8/12 or 12/16 or PVC screw connection DN15
7	1	PVC screw connection G1 or G2
8*	1	Pressure spring Ø20 or Ø19
9**	1	Sealing disc
10	8	Cylinder head screw M5

Tab. 12: Single parts for devices without back-pressure regulator

Item	No.	Description
11	8	Washer Ø5.3
12	8	Hexagon nut M5
13	8	End cap
14	8	Protective cap

Tab. 12: Single parts for devices without back-pressure regulator

* Included in the maintenance set after 3 years operation

** Included in the maintenance sets after 1 year and 3 years operation.

11.2 Devices with back-pressure regulator

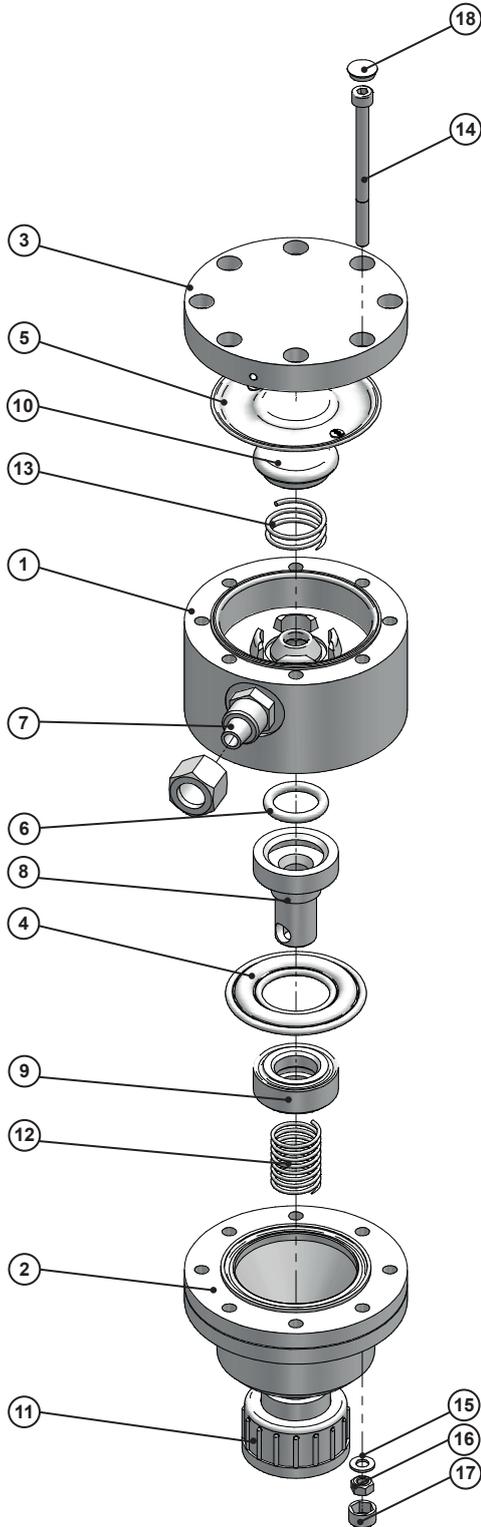


Fig. 9: Exploded view devices with back-pressure regulator

Item	No.	Description
1	1	Controller housing
2	1	Rear casing
3	1	Cover
4**	1	Diaphragm Ø56.4
5**	1	Diaphragm Ø68
6**	1	O-Ring Ø18
7	1	Hose clamp connection 8/12 or 12/16 or PVC screw connection DN15/Ø16 or DN15/Ø20
8	1	Diaphragm mount
9	1	Threaded ring
10	1	Spring plate Ø34x9.5 PMMA-GS
11	1	Cemented connection with union nut
12*	1	Pressure spring Ø20
13	1	Pressure spring Ø24
14	8	Cylinder head screw M5
15	8	Washer Ø5.3
16	8	Hexagon nut M5
17	8	End cap
18	8	Protective cap

Tab. 13: Single parts for devices with back-pressure regulator

* Included in the maintenance set after 3 years operation

** Included in the maintenance sets after 1 year and 3 years operation.

12 Spare parts set

Maintenance kit	Without back pressure regulator	With back-pressure regulator
After 1 year	<ul style="list-style-type: none"> ■ Diaphragms ■ Sealing disc 	<ul style="list-style-type: none"> ■ Diaphragms ■ O-ring
After 3 years	<ul style="list-style-type: none"> ■ Diaphragms ■ Sealing disc ■ Spring 	<ul style="list-style-type: none"> ■ Diaphragms ■ O-ring ■ Spring

Tab. 14: Single parts for devices without back-pressure regulator

13 Notes to EU conformity

The ejector non-return valves do not fall under the purview of the Machinery directive 2006/42/EG.

The ejector non-return valves do not fall under the purview of the Pressure equipment directive 2014/68/EU.

The values stated below do not exceed the limit values according to article 4, paragraph 1. As such, the ejector non-return valves are designed and manufactured in accordance with valid good engineering practice. In accordance with article 4 section 3, as a pressure device, the ejector non-return valves do not carry CE marking and cannot be issued with a EU declaration of conformity.

Device designation: Injector non-return valve

Pressure stage: PN16

Nominal diameter: DN8, DN12, DN15

Max. temperature: 55 °C

Medium: Water (H₂O)

The manufacturer and distributor of the ejector non-return valves is:

Lutz-Jesco GmbH / Am Bostelberge 19 / 30900 Wedemark / Germany

14 Declaration of no objection

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:

15 Warranty claim

Warranty claim

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 claim.

Sender

Company: Phone: Date:

Address:

Contact person:

Manufacturer order no.: Date of delivery:

Device type: Serial number:

Nominal capacity / nominal pressure:

Description of fault:

.....

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.....

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.....

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.

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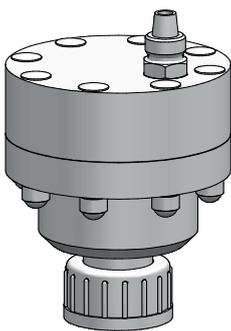
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Operating instructions
Injector non-return valves