

XOMOX[®]

OPERATION MANUAL

XOMOX[®] XLC FULLY LINED INSTALLATION AND OPERATION MANUAL

XOMOX[®]
XLC Fully Lined



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CAUTION

READ INSTRUCTIONS BEFORE INSTALLATION or valve service. Failure to follow instructions could result in death or serious injury. If there are any question, contact the factory at 513-745-6000.

WARNING

Proper installation plays an important role in valves performance. Installation must be performed by qualified technicians only. Customer assumes all responsibility for valve performance on valves installed in the field by non-Crane ChemPharma, Tuflin personnel. Improper installation will result in damage to the valve.

Once installed in the pipe work, the purpose of the XLC fully lined one-way ball check valve is to either allow flow through the valve or shut-off the flow.

WARNING

If the subsequent caution- and warning comments are not adhered to, danger can result and the guarantee of the manufacturer becomes null and void. The manufacturer is at your disposal for further requests. For addresses see last page.

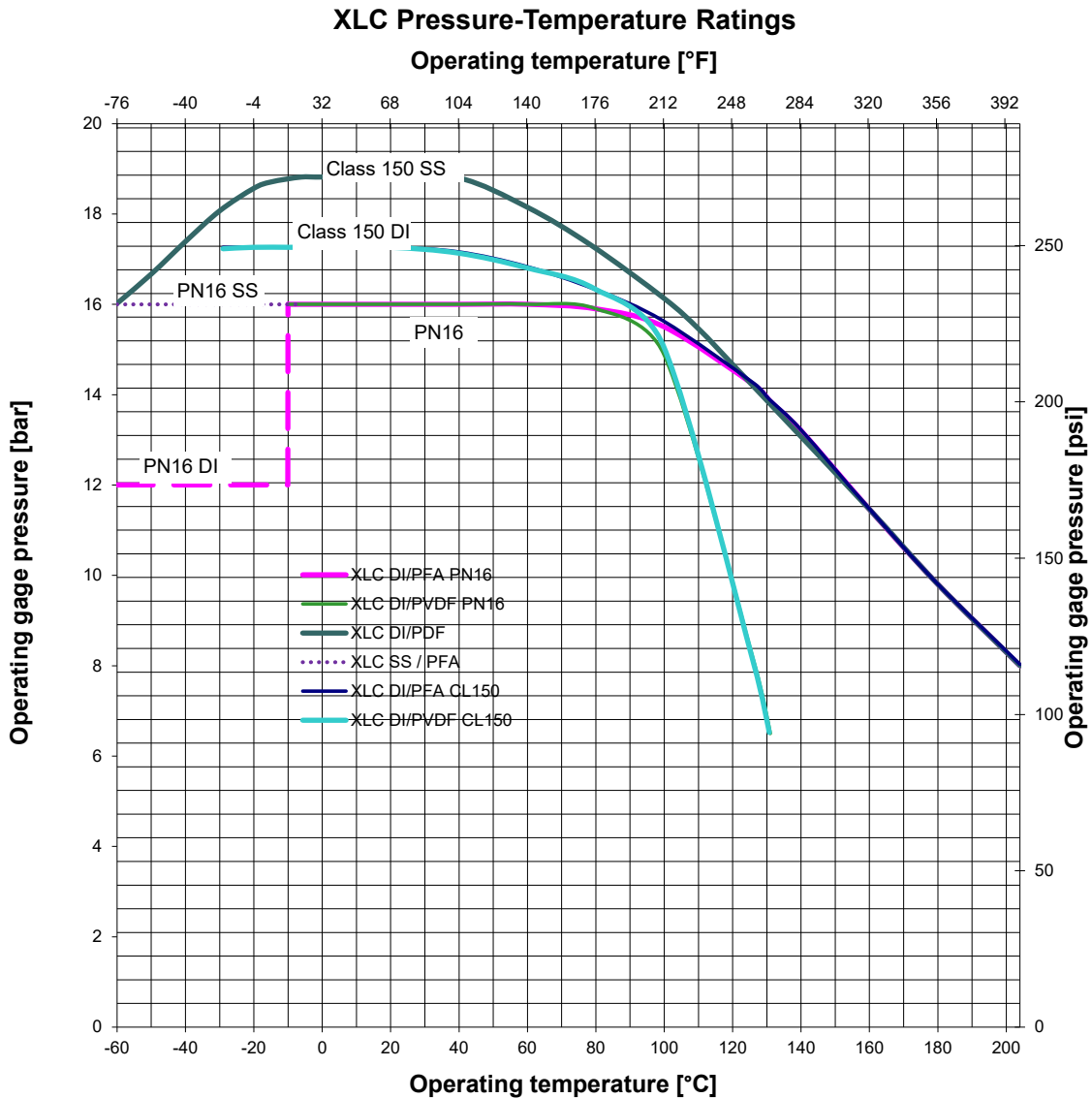
1. Intended use

Improper installation, improper use or improper maintenance may result in material damage and / or operator injury.

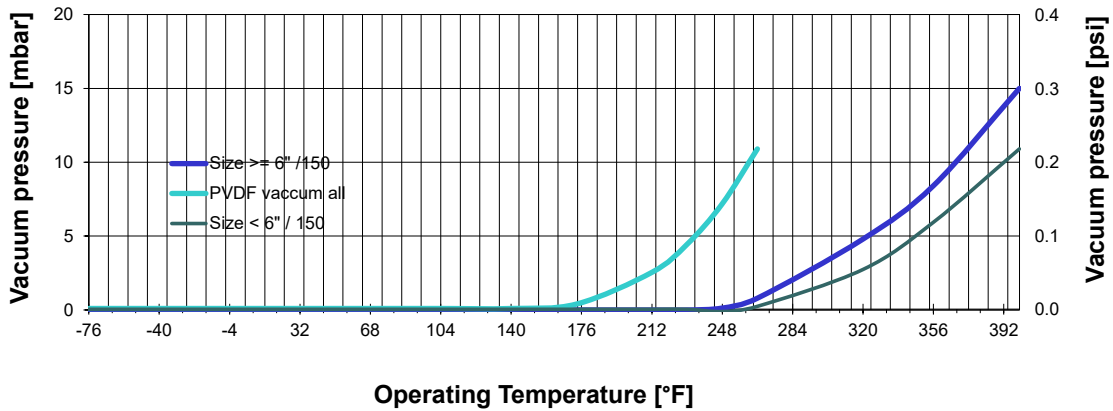
Do not operate XLC- Ball check valve beyond stated pressure/temperature ratings described below

This operating manual must be strictly observed in order to avoid personal injuries and/or property damage.

Installation and maintenance must be performed by qualified employees.



Installation & Operation



2. Technical data

Wear parts: Ball (see section 7.1)

Materials, dimensions, weights, options according to XLC series product brochure

Notes

- 1) Body material (EN-JS 1049 / ASTM A395 60-40-18) meets the requirements of both EN 1563 and ASTM A395
- 2) Minimum temperature for ductile iron material (60-40-18) according to ASME B16.42 is -20° F (-29° C)
- 3) Minimum temperature for EN-JS 1049 is -10° C (-14° F)
- 4) For valves with ductile iron bodies maximum cold working gauge pressure for JIS 10Kg is 10 bar (145 psig) for EN PN16 is 16 bar (232 psig) and ASME Class 150 is 250 psig (17.2 bar). For valves with stainless steel bodies, ASME Class 150 is 278 psig (19.2 bar).
- 5) Contact your CRANE ChemPharma Flow Solutions™ sales office for applications outside the relevant pressure and temperature limits of the design code in question (dash line)

3. Safety notes

3.1 General safety notes

The same safety regulations apply for valves as for the piping system in which they are installed. The instructions available provide only such safety notes which are to be observed additionally for valves.

3.2 Safety notes for the operator

It is not within the responsibility of the manufacturer, and thus when using the valve, to ensure that the valve is used as intended in such a way as described in the section -1.

 **WARNING**

Safeguard against improper use of the valve:

It must be particularly ensured that the selected materials of the wetted parts of the valve are suitable for the used media.

Ignorance of these precautionary measures can mean danger for life and limb and cause damage in the piping system.

1. The piping system (and the control system) was assembled professionally and are checked regularly. The wall thickness of the body of the valve is dimensioned in such a way that in such professionally assembled lines an additional load in the usual size ($= \pi/4 \cdot DN^2 \cdot PS$) is taken into account (PS = maximal permissible design pressure at ambient temperature).
2. The valve is connected professionally to these systems. These non-return valves are not installed in drop lines (flow from bottom to down).
3. In this piping system the usual flow speeds (e.g. 4 m/s for liquids) are not exceeded during continuous operation, and abnormal operation conditions such as oscillations, water shocks/hammer, cavitations and larger portions of solid materials in the medium – in particular abrasive – are to be agreed upon with the manufacturer.
4. These systems which are operated at operating temperatures $>50^\circ\text{C}$ or $< -10^\circ\text{C}$ are protected together with the piping connections from being touched.
5. For pressure-containing pipelines, only qualified employees can operate, service and repair the valve.
6. No marking according to directive 94/9/EG (ATEX) is required. XOMOX valves were examined in the

Installation & Operation

scope of the directive 94/9/EG regarding an assessment of danger of ignition in accordance with DIN EN 13463-1 2002.

7. The valves exhibits no known ignition sources and thus do not fall under the requirements of the directive. A CE marking following this directive is not permissible. The valves can be used in a potentially explosive area.

8. Valves with fluoroplastic lining (Teflon®, PFA etc..) that are handling chargeable media, must be provided with an electrostatic derivable synthetic lining, (that means the surface resistance of the lining material is less than or equal to 1 Giga Ohm, according to DIN EN 13463-1, paragraph 7,4).

9. The valve has to be included into the electric potential analysis of the plant with regard to all metal parts in potentially explosive atmospheres independently of the guideline.

3.3 Special types of danger

WARNING

Before removing the valve from the pipeline, the pipeline must be completely de-pressurized so that the media does not escape unchecked from the line.

Because backflow preventers must not be 100% leak-proof:
these back-pressure valves may not be used as end valves.

If a valve must be disassembled from a pipeline, media can escape from the line or from the valve. With unhealthy or dangerous media the pipeline must be completely drained before the valve is removed.

CAUTION

Caution with residues which escape from the pipeline or which have remained in body cavities of the valve (potentially under pressure).

3.4 Name Plate and Body Tail identification

Stainless steel plate is permanently riveted to the body. Do not remove it. Marking is according to EN 19 or on customer request. Markings may not be damaged, so that the valve can be identified.

4. Transport and storage

Valves must be treated, transported and stored carefully:

1. The valve is to be stored in its protective package and/or with the protective caps at the connection ends. Valves which are heavier than approx. 10 kg should be stored and transported on a pallet (or similar) (also to the installation place). While transport & storage the storage systems should be capable of carrying the weight of the components to avoid the damages of components.
2. With storage before installation, valves are to be protected from damaging influences such as dirt or humidity and are to be stored at ambient temperature.
3. Particularly the lining of the flange sealing surfaces may not be damaged during transport and storage. Do not stack valves!
4. The SS & DI material valves should be stored separately to avoid the surface corrosion -issues.
5. Report immediately in case of transport damage to respective carrier.

5. Installation into the piping

1. Examine valve for in-transit damage, damaged check valves must not be installed.
2. If pipe flange metallic or glass lined then PTFE-lined gasket must be used.
3. Valve must be grounded.
4. The flow direction arrow should be upward & easily visible for XLC ball check valve in vertical application
5. The flow direction arrow should be in line with the flow & in horizontal application the arrow must be placed in top (Preferred rotation for arrow visibility position within $\pm 15^\circ$) for XLC ball check valve.
6. The XLC valves are not suitable for drop lines.
7. Check valves should not be located close to upstream flow disturbances such as control valves, elbows and tees. Turbulence in the flowing fluid entering the valve may cause closing elements motion and excessive wear. It is recommended that check valves be located at least five pipe diameters downstream from elbows and ten diameters downstream from tees and control valves; even greater distance is recommended in the case of control valves that operate with high pressure drop or severe cavitations. (Reference:- MSS SP-92 "Valve Users Guide," published by the Manufacturers Standardization Society.)

5.1 General instructions

For the installation of valves into piping systems, the same instructions apply as for the connection of pipes and similar piping elements. For valves, the subsequent instructions apply additionally.

Installation & Operation

CAUTION

For the transport to the installation place also refer to Section 4 (above).

The valve is fully lined:

Handle the valve particularly carefully and observe the instructions for the flange connection.

The flow direction is marked with an arrow outside on the body:

The valve opens in the direction of the arrow and closes with flow reversal.

False installation could mean danger for life and limb
and cause damage to the piping system.

5.2 Working steps

CAUTION

No valve may be installed whose approved pressure/temperature range (Rating) is not sufficient for the operating condition.

Ignoring these regulations could mean danger for life and limb and cause damage to the piping system. If in doubt consult the manufacturer.

1. The counter flanges of the piping must align and be parallel to the plane. Make sure that during the installation that piping stresses are not applied to the valve.

CAUTION

Connection flanges which do not align / which are not parallel could damage the lining of the valve.

2. Before the installation, the valve and the relevant piping must be carefully cleared of dirt, in particular from hard foreign substances.

3. All sealing surfaces, particularly the sealing surfaces at the flange connection must be free of any contamination when installing.

4. The valve can be installed in Horizontal position - The flow direction arrow should be in line with the flow & the arrow must be placed on top (Preferred rotation for arrow visibility position within $\pm 15^\circ$) for XLC ball check valve.

5. The valve can be installed in Vertical position – only when the flow direction arrow pointing towards upward direction & clearly visible after installation.

6. When installing the valve (and gaskets, when applicable) in an existing pipe- line the distance between the piping ends must be dimensioned in such a way that all connection- and/or sealing surfaces and gaskets remain undamaged.

7. Tightening of the flange bolts:

CAUTION

The lining at the flange raised face may not be overloaded:
 The tightening torque of the flange bolts is to be limited in each case to the value which is determined for the Teflon®- flat gaskets at flange connections according to the relevant regulations (e.g. EN 1591 or AD-2000-B07). In limited cases 10% higher tightening torques are permitted. See sect. 5.3 Otherwise the lining at the flange can be damaged and the valve becomes useless.

8. Check the function of the valve before the installation: The ball of the ball check valves must be freely mobile and in shut-off position (fully fit on the body sealing). Recognizable malfunctions before start-up need to be repaired See also Section 8 – Troubleshooting.

5.3 Recommended tightening torques

1. These torque values are valid for lightly lubricated bolts and nuts.
2. Tighten flange bolts with a torque wrench, using a "crisscross" pattern that alternately tightens the bolts located 180° apart.
3. Using this pattern, tighten the bolts in 20% increments of the final bolt torque until 80% of the final bolt torque has been achieved or tightening to the final torque values, tighten bolts sequentially clockwise once around the flange. This will help ensure that the bolts are evenly stressed.
4. A re-torque should be applied a minimum 24h after the initial torque or after the first thermal cycle. This allow for setting of the plastic and for relaxation of the bolts.
5. Torquing should only be done on the system in the ambient, cooled state, never while the process it at elevated temperature or excessive force could be applied to the plastic faces.
6. Re-torque should be done annually thereafter especially if the process line experiences elevated temperatures or external ambient temperatures.
7. Frequency of re-torque depends on applications. Vibration, bolt strength or number of thermal cycles is important. Continuous process needs less re-torque.

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Flange Bolting torques

Normal Size	ANSI B16.5 Class 150		
	no. bolts x Thread	bolt torque +/-25% ft-lbs.	+/-25% Nm.
½"	4x½"	10	14
¾"	4x½"	10	14
1"	4x½"	11	15
1½"	4x½"	25	35
2"	4x5/8"	52	73
3"	4x5/8"	82	115
4"	8x5/8"	55	77
6"	8x¾"	100	140

Normal Size	PN10		PN16	
	no. bolts x Thread	bolt torque +/-25% Nm.	no. bolts x Thread	bolt torque +/-25% Nm.
15	4xM12	25	4xM12	25
20	4xM12	25	4xM12	25
25	4xM12	25	4xM12	25
30	4xM16	25	4xM16	25
40	4xM16	25	4xM16	25
50	4xM16	45	4xM16	45
65	4xM16	46	4xM16	46
80	6xM16	48	6xM16	48
100	8xM16	50	8xM16	50
150	8xM20	90	8xM20	90

Housing bolting (Body-Tail joint) torques

Normal Size	Body Joint			
	no. bolts x Thread	bolt torque 0/+30% Nm.	0/+30% ft-lbs	
25	1"	4xM12	15	11
40	1½"	4xM16	44	32
50	2"	4xM16	49	36
80	3"	6xM16	53	39
100	4"	8xM16	104	77
150	6"	8xM20	137	101

6. Pressure test of the piping section

For the pressure test of the valves the same instructions apply as for the piping. Additionally applies:

1. Check and make sure that no check valve leaves a piping section pressure free.
2. Rinse new installed line systems carefully in order to wash out foreign substances.
3. The pressure test of an open valve may not exceed the value $PT=1.5 \times PN$ or PS . A closed valve may be tested under pressure only with $PT=1.1 \times PN$ or PS (according to marking)
4. Shell test & leakage test should be carried out in accordance to the ASME B 16.34 / EN12266-1 for respective class / PN rating.

CAUTION

If a flange connection with lining is leaking:

First re-tighten of all the flange bolts with the torque according to Section 5.3 - Working steps.

If necessary, this torque can be increased by 10% - as described.

If the flange connection continues to leak:

Loosen flange connection, observe thereby Section 3.3 - Special types of danger, check plane parallelism of the flange connection and modify if not sufficient.

Check the gasket surfaces at all flanges: If the lining is damaged, the valve and/or counter-flange must be exchanged.

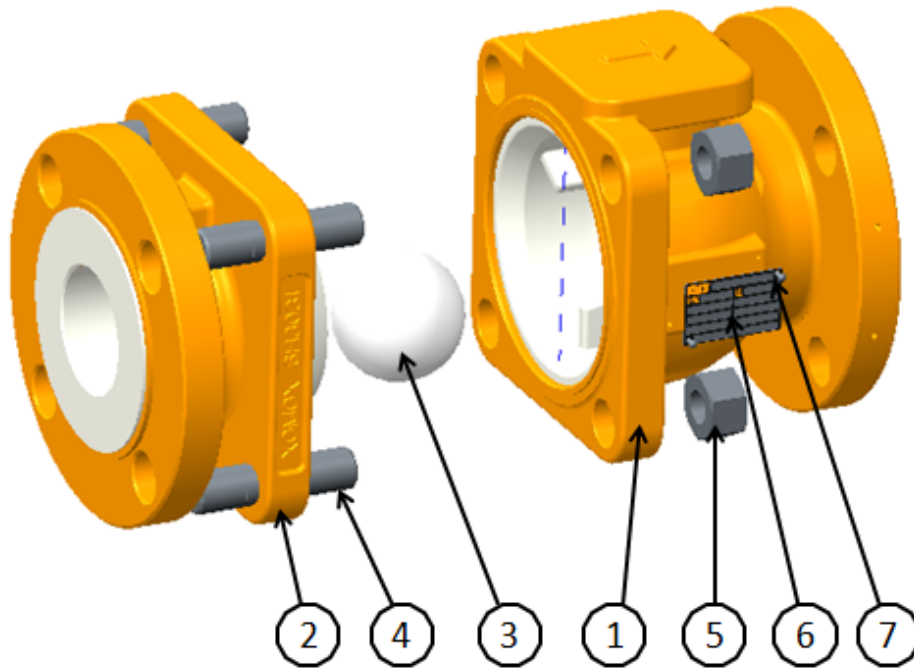
7. Normal operation and maintenance:

The valves have been tested for tightness with water & air. While doing initial loading of the valve with operating pressure and temperature, the torques of all connecting bolts must be checked.

Regular maintenance work is not necessary for the valves, but when checking the line section there should be no leakage at the flange connections and body joint side connection. For leakage and repairs see Section 3.2 - Safety notes and Section 8 – Troubleshooting

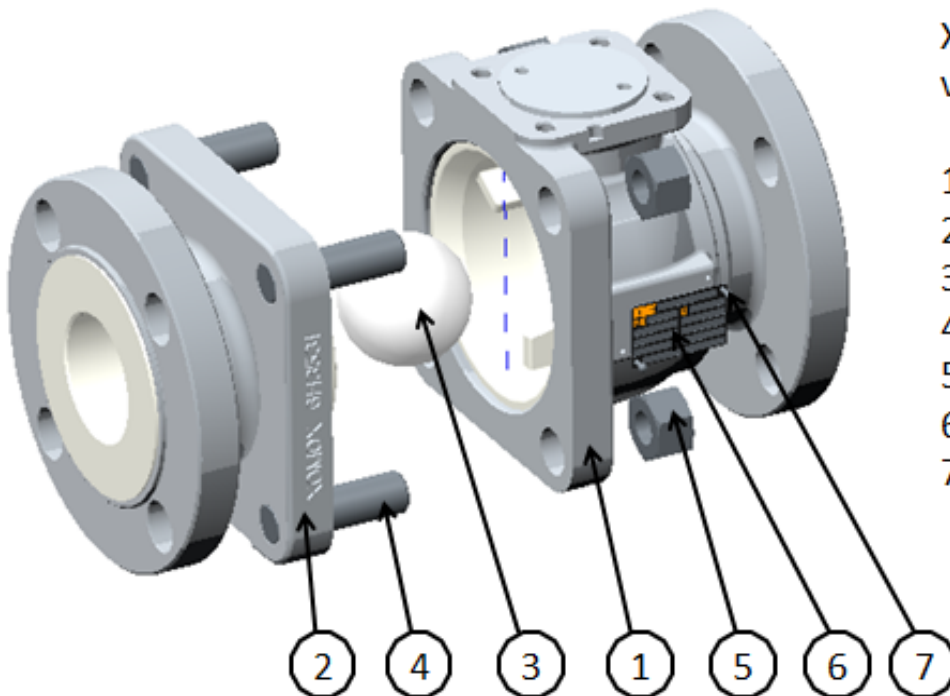
Installation & Operation

Wear parts: Ball see XLC exploded view



XLC DI Ball check valve:-

1. BODY LINED
2. TAIL LINED
3. BALL
4. STUD
5. NUT
6. LABEL TAG
7. TAG PIN



XLC SS Ball check valve:-

1. BODY LINED
2. TAIL LINED
3. BALL
4. STUD
5. NUT
6. LABEL TAG
7. TAG PIN

CAUTION

If a valve must be disassembled from a pipeline, media can escape from the line or from the valve. With unhealthy or dangerous media the pipeline must be completely drained before the valve is removed. Caution with residues which escape from the pipeline or which have remained in body cavities of the valve (potentially under pressure).

Before removing the valve from the pipeline, the pipeline must be completely depressurized so that the media does not escape unchecked from the line.

In case of cover closed top design, do not unscrew the cover, (No detachable part-locked internally by lining) it may damage the internal lining and media may escape.

Before dismantling the tail of the valve, the valve must be depressurized so that the media does not escape unchecked from the valve and does not cause any damage.

Before dismantling the tail, the valve must be cleaned and decontaminated so that the media does not escape unchecked from the valve.

- 7.1.1 Remove body tail joint side nuts.
- 7.1.2 Open body tail.
- 7.1.3 Remove Ball.
- 7.1.4 Clean Body and Tail

CAUTION

The valve is fully lined:

Handle the valve and components particularly carefully and protect the body/tail surface connection while disassembly & reassembly. In case of any welding process while installing protect the lined surfaces from damage.

- 7.1.5 Introduce new ball.
- 7.1.6 Set up tail on the body with press.
- 7.1.7 Set up lubricated bolting.
- 7.1.8 Tighten the body joint nuts. (See the reference torque from section 5.3)
- 7.1.9 Pressure and sealing test in accordance to section 5

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8. Troubleshooting:

While remedying faults, Section 3 -Safety notes, must be adhered to.

CAUTION

If a valve is removed from line containing dangerous media and is to be removed from the plant:
Follow decontamination instructions – see XOMOX<Disposal sheets>...

Type of Fault	Measurement	Note
Leakage at the body bolt connection or a flange connection to the pipeline	<p>Retighten connection.</p> <p>The permissible torque for the flange screw is limited. See warning note in Section 5.2 and 5.3: Working steps. If the leakage cannot be remedied: Remove valve (see warnings from Section 3.3 -Special types of danger) and inspect.</p>	<p>Note 1: Only original XOMOX-spare parts may be installed.</p> <p>Note 2: If it is detected after the disassembly that the wetted inner parts are not sufficiently resistant towards the media, parts of suitable material are to be selected.</p>
In-line leakage	<p>Disassemble valve (observing the notes of Section 3.3 & 7.1 - Special types of danger) and 7.1.1 to 7.1.4 and inspect.</p> <p>If the valve is damaged: Repair is necessary: Spare parts and necessary instructions are to be requested from the manufacturer.</p>	



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