

# XOMOX<sup>®</sup>

brands you trust.

## Installation, Operation and Maintenance Manual **XLB - Lined Ball Valves**

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**CRANE**<sup>®</sup>

Crane ChemPharma & Energy

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# XLB Lined Ball Valve Installation, Operation & Maintenance

XOMOX® XLB fully lined ball valve to EN, ASME, JIS10K including one piece ball/stem, SX seal and adjustable wedge ring packing.

Once installed in the pipework with the relevant manual operator or actuator, the purpose of the XLB fully lined two-way ball valve is used to either allow flow through the valve or shut-off or control the flow.



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 contact information 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 XLB 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.

## 2. Technical data

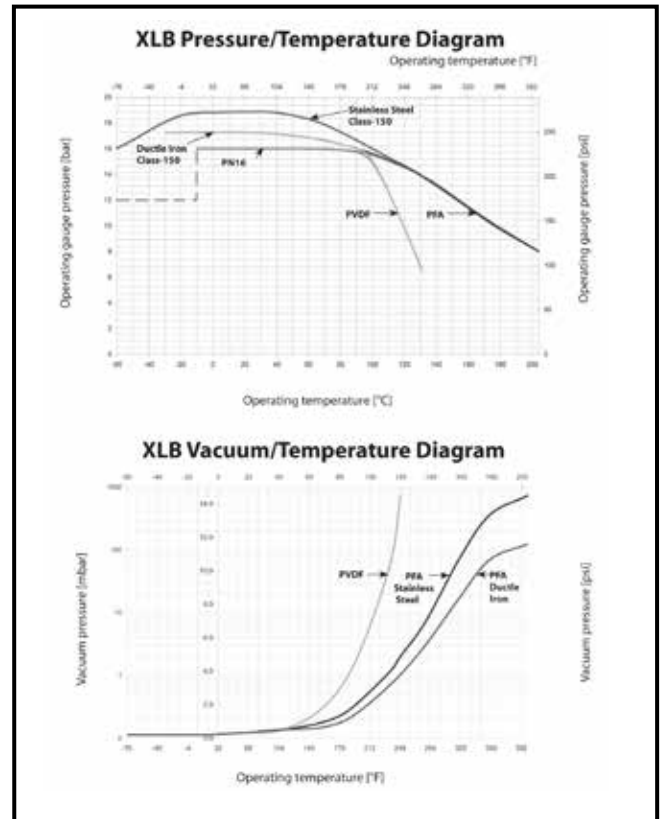
Wear parts: see 6.1

Breakaway torque, table obtained with water at 20°C (70°F). Higher breakaway torque may occur with other media.

Ball Size *		Max Breakaway Torque					
		5 bars	70 psi	10 bars	145 psi	17.6 bars	250 psi
DN mm	NPS in	Nm	in/lb	Nm	in/lb	Nm	in/lb
25	1"	8	71	8	71	9	80
40	1 1/2"	12	106	13	115	20	177
50	2"	19	168	20	177	25	221
80	3"	35	310	55	487	70	620
100	4"	77	682	90	797	100	885
150	6"	154	1363	190	1682	260	2301

\*XLB 42 standard port valves 1 1/2" through 8" size use 1" through 6" ball size respectively, DN15 and DN20 1/2" and 3/4" use DN25 1" ball size. DN32 1 1/4" uses DN40 1 1/2" ball size.

Materials, dimensions, weights, options according to XLB series technical data sheet CP-XOMOX-XLB-TB-EN-TO-2/11.



## Notes

- 1) Body material (EN-JS 1049 / 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) 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 relevant design code.

# XLB Lined Ball Valve Installation, Operation & Maintenance

## 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 and as for the control system to which the actuator is connected. The instructions available provide only such safety notes which are to be observed additionally for valves.

For actuator units additional safety notes are contained in the respective operating instructions.

### 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.

#### DANGER

##### 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. An actuator or a manual operating device that has been installed subsequently onto the valve and adapted to the valve is adjusted correctly in both end positions of the valve.
2. The piping system (and the control system) was assembled professionally and 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 ( $= \pi/4 \text{ DN}^2 \text{ PS}$ ) is taken into account (PS = maximal permissible design pressure at ambient temperature).
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, cavitation 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 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 exhibit no potential 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 (PFA, PVDF, 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

#### DANGER TO LIFE

The shaft is sealed by a packing, which is pretension with wedge ring and three screws through the cover. **Never remove this cover under pressure in the pipeline.**

#### DANGER TO LIFE

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

#### DANGER

*For valves, which are used as end valve:*

During normal use, in particular with gas-like, hot and/or dangerous media a **blind flange** must be mounted **at the free connecting pieces** or the valve must be securely locked in "CLOSE"-position.

#### DANGER

If a valve has to be opened as end valve in a pressure containing line, this may take place with all caution only in such a way that **the escaping media** does not cause any damage.

#### DANGER

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).**

# XLB Lined Ball Valve Installation, Operation & Maintenance

### 3.4 Name Plate and Body Tail identification

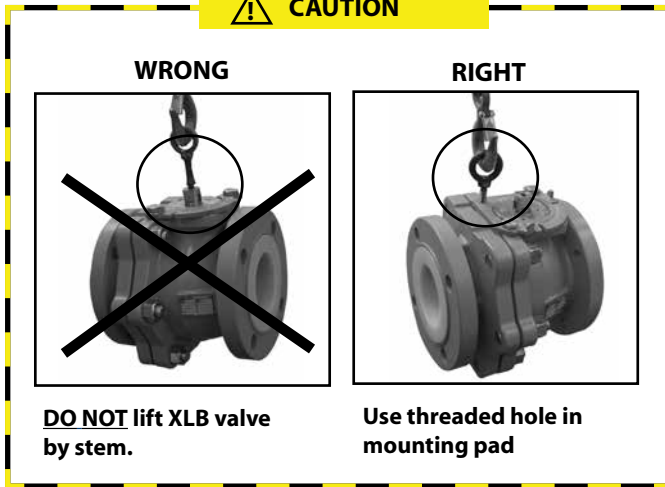
Stainless steel plate is permanently riveted to the body. Do not remove it. Marking is according to EN 19 or on customer request. Markings may not be damaged, so that the valve can be identified.

### 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).
2. With storage before installation, valve, gear and actuator 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. Valves must be stored in such a way as they were supplied. The operating device may not be activated.

#### CAUTION



### 5. Installation into the piping

1. If pipe flange is metallic or glass-lined then PTFE-lined gasket must be used.
2. Valve must be grounded.
3. In case of balls with vent hole, valve must be oriented accordingly (relief hole against the flow direction).

#### 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. For the transport to the installation place also refer to Section 3 (above).

#### CAUTION

*The valve is fully lined:*

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

#### DANGER TO LIFE

**If – in special circumstances – a valve must be mounted without operating possibility, it is to be ensured that such a valve is not pressurized.**

If a manual operator or an actuator is retrofitted, torque, rotation direction, operating angle and the adjustment of the final positions "OPEN" and "CLOSE" must be adapted to the valve. **Ignoring these regulations could mean danger for life and limb and cause damage to the piping system.**

#### DANGER

*The actuator is adjusted for the operating data indicated in the order:*

**The adjustment of the final positions "OPEN" and "CLOSE" may not be changed without agreement of the manufacturer.**

#### CAUTION

*Only for valves with electric drive: It must be ensured that the actuator in the end positions is switched off **by the signal of the limit switch**. If the shut-off **takes place** with the **signal of the torque switch**, this signal should be additionally used for an alarm.*

**For further information, see the operating instructions of the electric drive.**

### 5.2 Working steps

#### CAUTION

*Since fully lined surfaces of the valves before/with the installation have to be particularly protected:*

The valve must be transported in the protective package to the installation place and may be only removed there. In each case the flange coverings may and must only be removed immediately before the installation of the valve.

4. Examine valve, gear and actuator for transport damage. Damaged units may not be installed.

5. Ensure that only valves are installed whose pressure class, type of connection and connection dimensions correspond to the application conditions. The connection data for the actuator must correspond with the data of the control. See labeling at the actuator.

# XLB Lined Ball Valve Installation, Operation & Maintenance

## DANGER TO LIFE

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.

6. The counter flanges of the piping must align and be parallel to the plane. Make sure during 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.

7. Before the installation, the valve and the relevant piping must be carefully cleared of dirt, in particular from hard foreign substances.
8. All sealing surfaces, particularly the sealing surfaces at the flange connection must be free of any contamination when installing.
9. The valve can be installed in any orientation. However, if possible, the actuator should not be mounted directly underneath the valve as leakage at the ball stem could lead to damage of the actuator.
10. When installing the valve (and gaskets, when applicable) in an existing pipeline the distance between the piping ends must be dimensioned in such a way that all connection- and/or sealing surfaces and gaskets remain undamaged.
11. 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 PTFE 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 section 4.3). **Otherwise the lining at the flange can be damaged and the valve becomes useless.**

12. For the connection of the actuator unit to the control, the appropriate instructions apply.
13. To complete the installation a functional test with the signals of the control is to be executed with the actuated valves: The valve must close and open correctly according to the control commands. Detectable functioning faults are absolutely to be remedied before the commissioning. See also Section 7 -Troubleshooting.

## DANGER

**Faulty executed control commands could mean danger for life and limb and cause damage to the piping system.**

### 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.

Normal size	ASME 16.5 Class 150		
	No. bolts x thread	bolt torque +/-25% ft-lbs	X/-25% Nm
1/2"	4x 1/2"	10	14
3/4"	4x 1/2"	10	14
1"	4x 1/2"	11	15
1 1/2"	4x 1/2"	25	34
2"	4x 5/8"	52	71
3"	4x 5/8"	82	111
4"	4x 5/8"	55	75
6"	4x 3/4"	100	136
8"	4x 3/4"	135	183

# XLB Lined Ball Valve Installation, Operation & Maintenance

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	35
40	4xM16	25	4xM16	35
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

## 6. Pressure test of the piping section

For the pressure test of the valves the same instructions apply as for the piping. In addition:

1. Rinse new installed line systems carefully in order to wash out foreign substances.
2. 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).

### CAUTION

For the protection of the lining of the body:

The test pressure of fully lined valves is to be limited in each case to **1.5 PS**. The valve may thereby not be closed.

**A higher test pressure could make the valve unusable.**

### CAUTION

If a flange connection with lining is leaking:

First retighten of all the flange bolts with the torque according to Section 4.2 and 4.3 - Working steps. If necessary, this torque can be increased by 10% - as described.

If the flange connection is then continues to leak:

Loosen flange connection, observe thereby Section 2.3 - 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.**

### DANGER

Ball valves usually have cavities between ball and body, in which media can collect in small quantities.

If this cavity must be likewise dried, the ball valve must be in an **intermediate position** ( $\frac{1}{2}$  to  $\frac{3}{4}$ ) during this time.

## 7. Normal operation and maintenance

The valves which were supplied by factory with lever, gear box or actuator are exactly adjusted and may not be adjusted as long as a valve operates perfectly.

For the manual operation or the hand emergency operation at the actuator (if available) normal hand force is sufficient; the usage of extension for the increase of the actuation moment is not permissible.

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 at the valve stem. For leakage and repairs see Section 2 - Safety notes and Section 8 - Troubleshooting.

### CAUTION

*The packing (SX and Wedge ring) is pretension:*

This pretension is set at the factory and is not to be adjusted **as long as no leakage is observed at the ball stem.**

### 7.1 Replacement of wear parts

Wear parts: Seats [4], SX [7], Antistatic spring [9], cover O-Ring [10] and one piece lined ball/stem [3]. See XLB exploded view.

### DANGER TO LIFE

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).**

### DANGER TO LIFE

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

# XLB Lined Ball Valve Installation, Operation & Maintenance

**⚠ DANGER TO LIFE**

Before unscrewing the cover or before dismantling the tail of the valve, **the valve must be depressurized with ball in an intermediate position** so that the media does not escape unchecked from the valve and remaining media does not cause any damage.

**⚠ DANGER**

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

7.1.11 Setup new seats

**⚠ CAUTION**

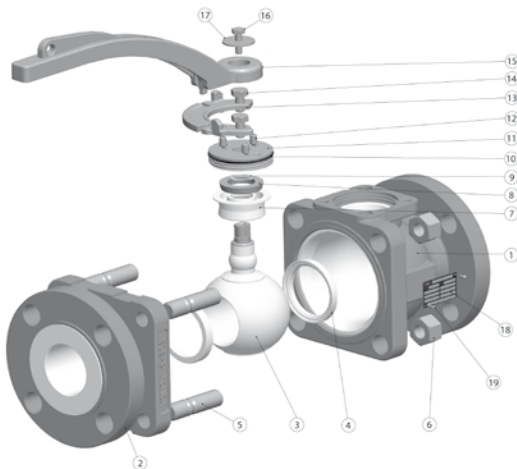
*Orientation of the seats:*  
**chamfer side towards the ball.**

7.1.12 Introduce new lined ball/stem in the body

**⚠ CAUTION**

*The valve is fully lined:*  
Handle ball/stem particularly carefully during introduction in the body do not damage the body or the packing sealing surface with metallic part of the stem.

XLB Component View



- 7.1.13 Position the stem in the axis of packing hole with the cover which will be screwed on the body for this purpose
- 7.1.14 Set up tail on the body with press
- 7.1.15 Set up lubricated bolting
- 7.1.16 Tighten the body joint nuts

Ball size*		BODY JOINT		
		No. bolts x thread	Bolt torque 0/+30% Nm	0/+30 ft-lbs
25	1"	4xM12	15	11
40	1 1/2"	4xM16	44	32
50	2"	4xM16	49	36
80	3"	6x M16	53	39
100	4"	8xM16	104	77
150	6"	8xM20	137	101

- 7.1.1 Move ball in closed position
- 7.1.2 Remove lever, gear box or actuator
- 7.1.3 Unscrew cover [12] with cover key
- 7.1.4 Remove antistatic spring [9] and wedge ring [8]
- 7.1.5 Remove SX with SX-remover tool [7]
- 7.1.6 Remove nuts [6]
- 7.1.7 Open body tail [2]
- 7.1.8 Remove ball/stem [3]
- 7.1.9 Remove seats [4]
- 7.1.10 Clean body and tail

\*XLB 42 standard port valves 1 1/2" through 8" size use 1" through 6" ball size respectively, DN15 and DN20 1/2" and 3/4" use DN25 1" ball size. DN32 1/1/4" uses DN40 1 1/2" ball Size.

**⚠ CAUTION**

*The valve is fully lined:*  
Handle the valve and components particularly carefully and protect the body/tail surface connection.

- 7.1.17 Remove cover and insert SX
- 7.1.18 Insert wedge
- 7.1.19 Move three cover screws to initial position
- 7.1.20 Screw cover with O-ring seal [10] until metal to metal contact with body is achieved
- 7.1.21 Adjust three cover screws [12]
- 7.1.22 Check breakaway torque according section 2
- 7.1.23 Pressure and sealing test according section 5

# XLB Lined Ball Valve Installation, Operation & Maintenance

## 8 Troubleshooting

While remedying faults, Section 2 -Safety notes, absolutely must be observed.

**⚠ DANGER**

*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 the 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 4.2 and 4.3: Working steps.</p> <p><b>⚠ CAUTION</b></p> <p>If the leakage cannot be remedied: Remove valve (see warnings from Section 2.3 -Special types of danger) and inspect.</p>	<p>Note 1: Only original XOMOX- spare parts may be installed.</p>
Stem leakage	<p>Check if the valve closes 100%.</p> <p>If the ball valve is completely closed: Open valve completely. Mark position of the actuator, dismantle actuator. By retightening the three compression screws the pretension of the wedge ring on SX sealing can be increased:</p> <p>Tighten these compression screws alternating in the clockwise direction with a ¼ turn each until the leakage is remedied. Reinstall actuator in the marked position.</p> <p>If the valve torque is too high or when the leakage cannot be remedied and the packing has to be exchanged follow section 6.1:</p> <p><b>⚠ DANGER TO LIFE</b></p> <p>Observe Section 2.3 - Special types of danger.</p> <p>To safeguard operating staff against danger, ensure that the line is completely depressurized before removing the valve.</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 2.3 - Special types of danger) and 6.1.1 to 6.1.10 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>	
Malfunction	<p>Check actuator unit and control commands.</p> <p>If actuator and control are okay: Dismantle valve (observing the notes of Section 2.3 - Special types of danger) 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>	

For problems with the actuator unit, see appropriate instructions.



# XLB Lined Ball Valve Installation, Operation & Maintenance

## Declaration of Conformity According Directive 97/23 EC

The manufacturer XOMOX® International GmbH & Co, D88131 Lindau/Bodensee declares that the valves:

### Ball valves in two-way form with lining, Series XLB

- In accordance with XOMOX® brochure <XLB – Lined ball valves>
- With pneumatic-/ electro-/ hydraulic actuator
- With bare shaft for later installation of other operator possibilities
- With hand lever/worm gear and hand wheel

1. Pressure bearing accessories within the meaning of the EC pressure equipment directive 97/23 EC and which are in conformity with the requirements of this directive.
2. May be operated only in compliance with the appropriate operating instruction.

Applied standards	EN 12569: Valves for chemical and petrochemical process industry
Description of type and technical features	XOMOX® brochure <XLB lined ball valves>
Applied conformity evaluation methods	In accordance with Annex II of the pressure equipment directive 97/23 EC
Name and address of the notified body	Det Norske Veritas Veitasveien 1 1322 Høvik, Oslo Norwegen
Identification number of the notified body	0575
Applied conformity assessment procedure	Module H

If not otherwise required by the customer, XOMOX® classifies all valves as category III.

Modifications to valves and/or units, which have consequences for the technical data of the valve, for the <intentional use> according to Section 1 of the operating instructions, and which modify essentially the valve and/or a supplied unit, make these declarations invalid.

March 2011

Lindau/Bodensee, Date



S. Uebelher, Vice President / General Mgr.

### Further information

This operating manual, the XOMOX®-prospectus stated, XOMOX®-data and safety sheet and further information and details can be obtained – also in other language versions – under [www.cranecempharma.com](http://www.cranecempharma.com) or from the following:

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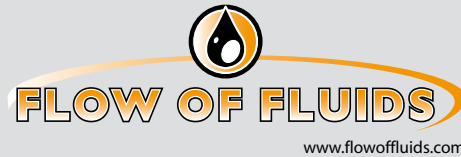
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