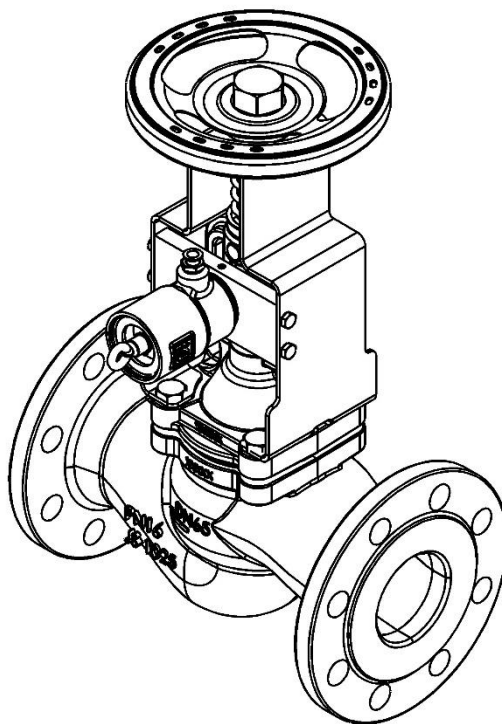


# Installation and operating manual

Quick closing valve (Bellow sealed)

LK product no: 902002



## Contents

<b>1. General information.....</b>	<b>3</b>
<b>2. Safety precautions .....</b>	<b>3</b>
2.1 Significance of symbols .....	3
2.2 Explanatory notes on safety information.....	3
<b>3. Storage and transport .....</b>	<b>4</b>
<b>4. Description.....</b>	<b>4</b>
4.1 Scope of applications .....	4
4.2 Operating principles.....	5
4.3 Technical data.....	9
<b>5. Installation.....</b>	<b>12</b>
5.1 General notes for installation.....	12
5.2 Installing the quick closing valve .....	13
5.3 Installing the mechanical release system.....	14
5.4 Putting the valve into operation.....	14
<b>6. Maintenance instruction .....</b>	<b>15</b>
<b>7. Repair .....</b>	<b>15</b>
7.1 Dismantling of the quick closing valve .....	15
7.2 Putting quick closing valve into operation after repair .....	16
7.3 Repair kit Quick Closing Valve .....	16
7.4 Repair of Release Cylinders (9) .....	17
<b>8. Contacts .....</b>	<b>17</b>

## 1. General information

This manual gives instructions on installation of the Quick Closing Valves together with maintenance instructions and shall be read carefully before installation is started.

It is in the responsibility of the installer to ensure that the work is carried out in a satisfactorily manner, approved materials are used and that the installation meets applicable rules and regulations. Regional safety requirements must be applied and observed both at installation and maintenance as well as in repair work

It is the installer/owners responsibility to define responsibility and competence of personnel for the installation and maintenance of the valves. In case of problems which cannot be solved from information in this manual the supplier of the valves shall be contacted. The notes and warnings defined in following chapters must be followed as this information concerns your safety.

Note! Part numbering (..) in chapter 3.3.2 Part list are maintained and used as references through all chapters.

The manufacturer reserves the right to introduce technical modifications at any time.

## 2. Safety precautions

### 2.1 Significance of symbols



Warning of general danger.

### 2.2 Explanatory notes on safety information

In these Operating and Installation Instructions dangers, risks and items of safety information is highlighted to attract special attention.

Information marked with the above symbol and "*ATTENTION!*" describes practices, a failure to comply with which can result in serious injury or danger of death for users or third parties or in material damage to the system or the environment. It is vital to comply with these practices and to monitor compliance.

All other information not specifically emphasized such as transport, installation, operating and maintenance instructions as well as technical data (in the operating instructions, product documentation and on the device itself) must also be complied with to the fullest extent in order to avoid faults which in turn can cause serious injury to persons or damage to property.

### 3. Storage and transport



#### Attention!

Protect valve and other equipment against external forces.

Valve hand wheels (14) and release cylinders (9) are not designed to take external forces e.g. they must not be used for as climbing aids or as connection of lifting gear.

Lifting to be carried out by using suitable handling equipment.

Weights of valves to be taken from data sheet.

- The valves are delivered with plastic protection covers in both flange ends and in the pipe connection to the release cylinder (9). The covers shall not be removed until the installation.
- If the covers have been removed inspect the internals carefully for dirt before installation.
- The valves must be stored indoors well protected from dust and moisture.
- Long time storing must be done in warm warehouses to avoid corrosion attack on unprotected areas inside the valve.
- Do not damage the external coating during transportation and storing.

### 4. Description

#### 4.1 Scope of applications

The valve is used for shut-off of media from a remote place or to close locally by hand.



#### Attention!

- The applications and limitations given in these documents must be followed.
- Installation in heavy vibrating pipe lines is not recommended.
- The markings of the valves must be taken into account for each application.
- It is in the responsibility of the installer to ensure compliance with local rules and regulations.
- Please contact the supplier or the manufacturer if you have any questions regarding the application.

The valves are designed to work in connection to tanks, not subjected to direct pumping pressure. Maximum designed closing pressure of quick closing function is eight bar for sizes up to and including DN65 and four bar for sizes above DN80.

### 4.2 Operating principles

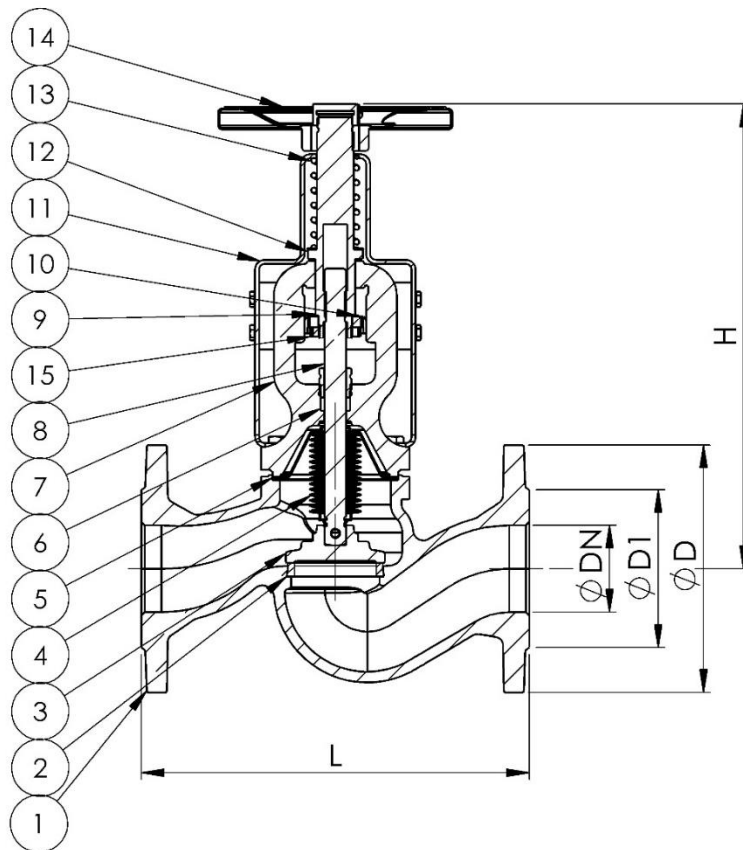
The valve is a stop valve with a remote quick closing function, but can also serve as a conventional stop valve by using the hand wheel (14).

The quick closing action is instantly carried out by a spring (13), pre-compressed by turning the hand wheel.

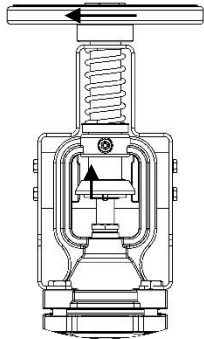
The stem (8) and attached disc (3) is hooked up by means of the setting nut (10).

When the setting nut is released from loaded position - the valve will close.

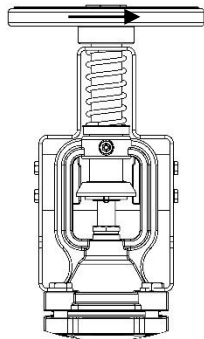
Release from loaded position is done by the release mechanism, see following description of release alternatives. Retracting the piston rod (17) extension in the release cylinder by pulling the eye bolt (16), will also close the valve.



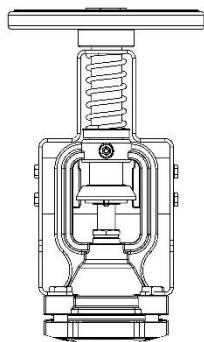
#### 4.2.1 Loading the valve for Quick Closing



Turn the hand wheel (14) in closing direction (clockwise) until the piston rod (17) in the cylinder comes out and holds the setting (10) nut in its upper position.



Turn the hand wheel (14) in opening direction (counter clockwise).



Stop the turning of the hand wheel (14) when the mechanical stop is felt.



### Attention!

It is important that the spring force inside the release cylinder (9) is pushing out the piston rod (17) fully. Do not tighten further when the stop is felt.

#### 4.2.2 Closing of valve by the remote Quick Closing function

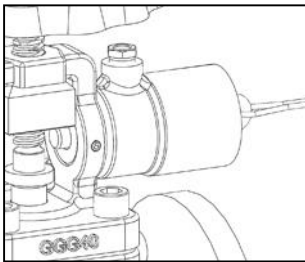
The valve is quick closed by a remote hydraulic or pneumatic signal or by pulling back the piston rod (17) of the universal release cylinder (9) by a wire arrangement. In all systems also the fire release arrangement is operating by the melting ring which in case of contact with fire will close the valve.



Be aware of the fact that the valve stem with related components as hand wheel (14) will fall down very rapidly by spring force at closing of the valve which can cause injury.

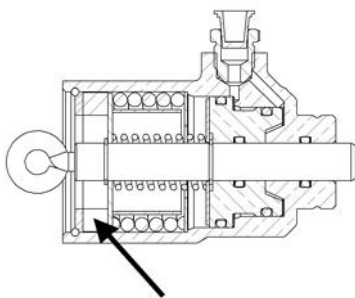
Also avoid injury by always secure the release system when work is carried out on the valve. When testing the remote release system, stay away from moving parts on the valve.

#### 4.2.3 Closing of valve by the remote Mechanic system



The mechanical release system is arranged by connecting a wire to the eye bolt (16). By pulling the wire the piston rod (17) is moved to release position and the valve will close.

#### 4.2.4 Closing of valve by the Automatic fire release

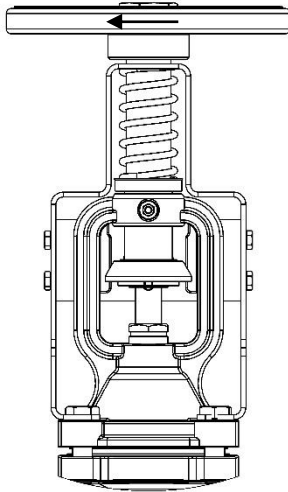


The release cylinder is internally equipped with a melting ring (see arrow) which will melt at temperatures above 178 °C. The strong spring will push the piston rod (17) into the release cylinder (9) allowing the valve to close by spring force.



It is important that the release cylinder (9) is replaced when it has been exposed to excessive heat.

#### 4.2.5 Closing valve by hand wheel (14)



The valve can be closed by the hand wheel (14), when required. Turn the hand wheel (14) in clockwise direction. The setting nut (10) will then be fully pushed up against the top of the bonnet (7), which holds the disc (3) in shut off position.



Do not use tools to increase the torque on the hand wheel (14).

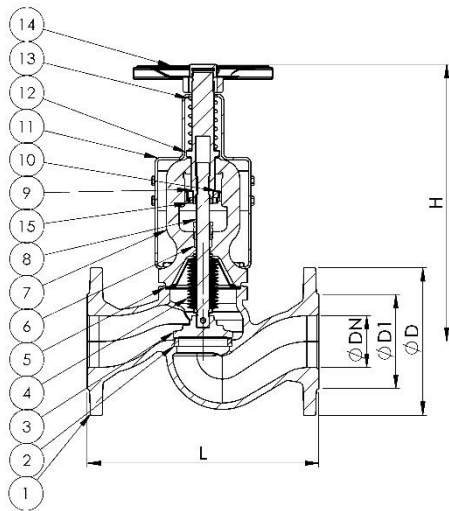


### 4.3 Technical data

#### 4.3.1 Dimensions [mm]

DN	L	D	d1	H	M	Weight (approx.)
40	200	150	84	294	125	16 kg
50	230	165	99	323	150	18 kg
65	290	185	118	387.5	175	24 kg
80	310	200	132	435	200	30 kg
100	350	220	156	491	250	45 kg
125	400	250	184	596	300	62 kg
150	480	285	211	693	400	90 kg
200	600	340	266	895	400	144 kg

#### 4.3.2 Part list

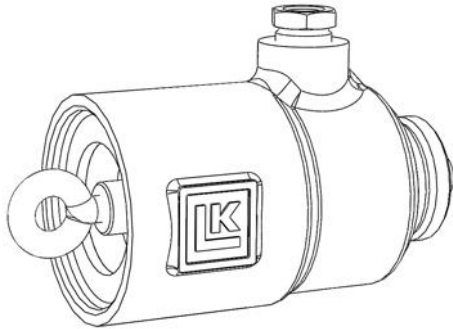


Pos.	Item
1	Body
2	Seat
3	Disc
4	Bellow
5	Gasket
6	Gland packing
7	Bonnet
8	Stem
9	Release cylinder
10	Setting nut
11	Bracket
12	Shaft
13	Spring
14	Handwheel
15	Locking nut
16	Eye bolt
17	Piston rod

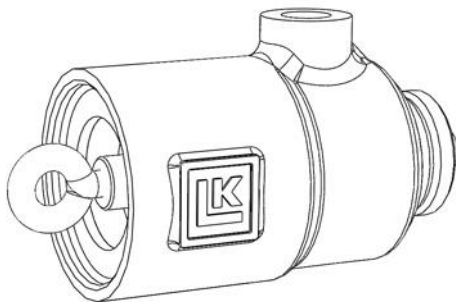


Values (mm & kg) are approximations.

### 4.3.3 Release cylinder (9)



<b>Technical data for the release cylinder (9), hydraulic execution</b>	
Stroke volume	3,8 cm <sup>3</sup>
Max hydraulic static pressure	4,0 bar
Pressure class	PN30
Fire release temperature	178°C
Connecting thread	ISO G1/8"



<b>Technical data for release cylinder (9), pneumatic execution</b>	
Stroke volume	9,9 cm <sup>3</sup>
Recommended working pressure in pneumatic system	7 bar
Pressure class	PN30
Fire release temperature	178°C
Connecting thread	ISO G1/4"



### **Attention!**

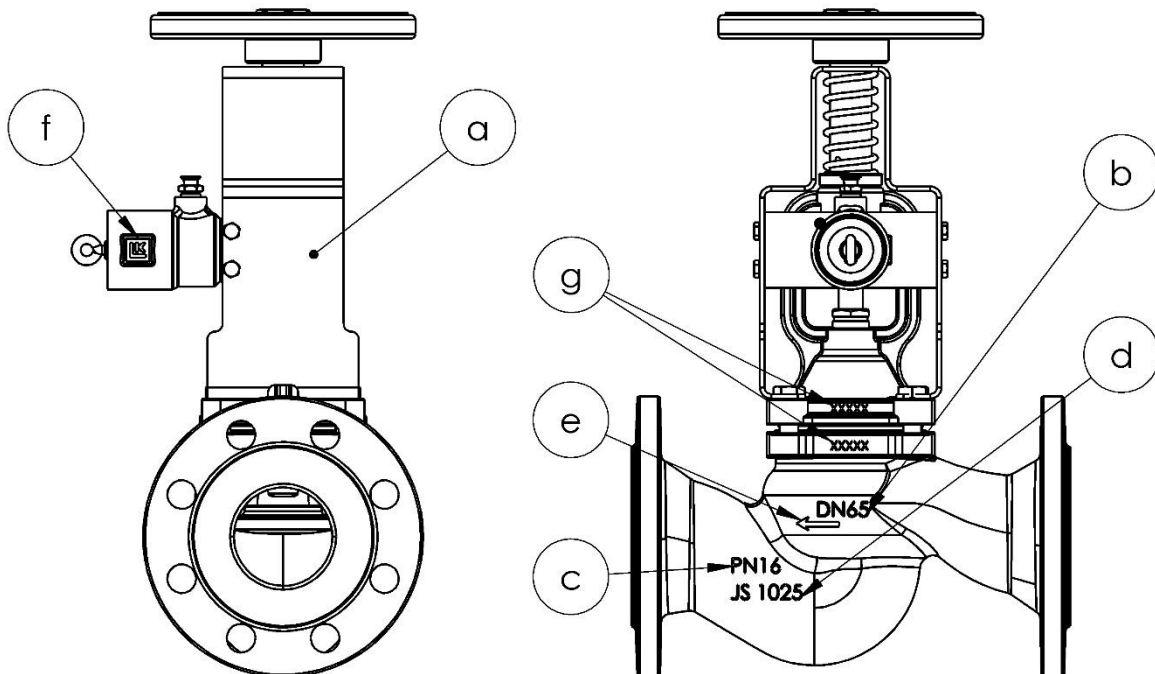
Make sure that the inlet nipple is fitted in hydraulic installation and removed in pneumatic installation.

#### 4.3.4 Marking

The quick closing valve is identified by reading the individual manufacturing number engraved on the valve bracket (11).

All Quick Closing Valves have the following markings:

- Serial number (a) engraved on the valve bracket (11).
- Size (b), pressure class (c) and material (d) on the valve body (1).
- Flow direction (e) on valve body (1).
- Manufacturers logo (f) on release cylinder body (9)
- Manufacturers casting identification (g)



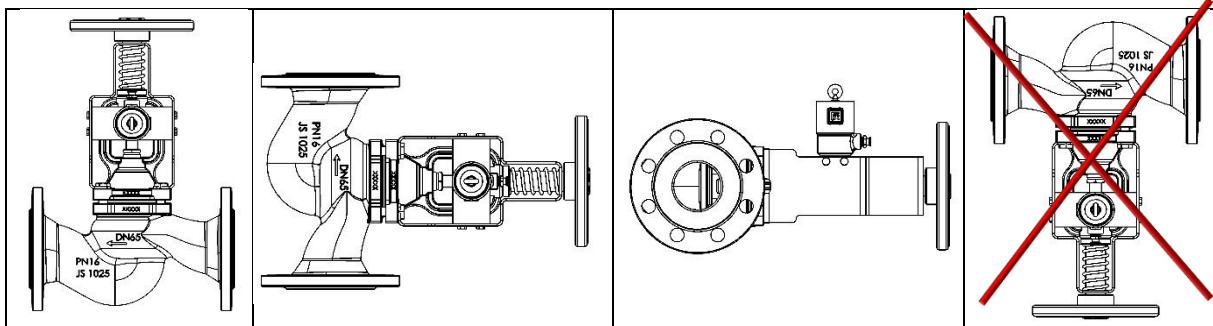
## 5. Installation

### 5.1 General notes for installation

- Installation/construction companies or operators are responsible for positioning and installing the valves and related operating systems.
- Following points shall be taken into account at installation work.



- Remove protecting covers for valve flanges.
- Protect valve from dirt during the whole installation procedure.
- Check for dirt and foreign particles in valves and pipelines.
- Note installation positions with reference to flow and marking arrow (e) on valve.
- Use only counter flanges and screws with correct dimensions.
- Centre gaskets between flanges.
- Avoid damaging forces on valve when pipeline is installed.
- Valve hand wheels and actuators are not designed to take external forces e.g. they must not be used for as climbing aids or as connection of lifting gear.
- Lifting to be carried out by using suitable handling equipment.
- Weights of equipment to be taken from data sheet.
- Installation of the valve with stem vertical is preferred, but all positions indicated below can be used.

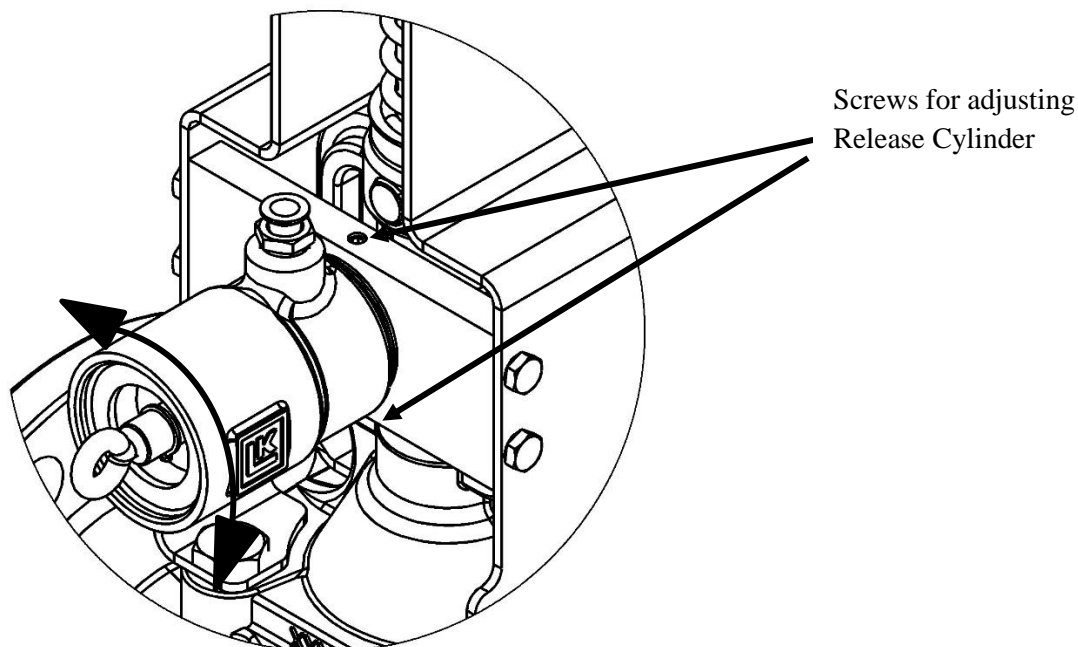


- Keep stem threads and shaft free from paint
- Protect the piston rod in the release cylinder from dirt and paint under the whole installation procedure.
- Do not remove the protecting cap in the threads to the release cylinder until the pipe will be connected.

## 5.2 Installing the quick closing valve

### 5.2.1 Change direction of release cylinder (9) connecting threads

- The release cylinder (9) can be turned to suit direction of the release pipe.
- Loosen the two socket screws and turn the release cylinder (9) in position to suit the direction of the pipe line.
- Be sure that the cylinder (9) is positioned correct in the bonnet (7) and tighten the socket screws.
- To facilitate the air venting of the release cylinder (9) in a hydraulic remote system the cylinder (9) should be kept in delivered position with thread connection at top.



### Attention!

- The valve is not designed for installation in heavy vibrating pipe lines (close to main engines and generator engines). If this must be the case all precautions must be taken to prevent the valve from these vibrations.

### 5.3 Installing the mechanical release system

Connect the wire to the eye bolt (16) in the end of the release cylinder (9).

Note! To avoid an accidental release by ship movements in heavy sea, make sure that there is no tension in the wire.

The return spring inside the cylinder (9) is keeping the piston rod (17) in position. With the setting nut (8) in top position (no force acting on the piston rod (17)) check that the wire arrangement not is moving the piston to release position.



- It is important that the weight of the wire is unloaded all the way down to the release cylinder (9) and that the return spring can hold the piston rod (17) in position.

### 5.4 Putting the valve into operation

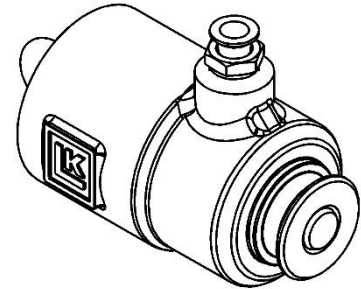


- Before the valve is put into operation check that it is the right valve in its right position (material, pressure, temperature and direction of flow).
- Residues in piping and valves (dirt, weld beads, etc.) inevitable lead to leakage.
- Check remote control system function and operation directly on valve.
- Be aware of the fact that the valve stem (8) with related components as hand wheel (14) will fall down very rapidly by spring force at closing of the valve which can cause injury.
- Also avoid injury by always securing the release system when work is carried out on the valve. When testing the remote release system, stay away from moving parts on the valve.
- Regional safety instruction must be adhered to.
- Touching valves operating at high media temperatures  $>50^{\circ}\text{C}$  can cause injury.
- Affix warning notice or protective insulation as appropriate.
- Before putting a new plant into operation or restarting after repairs or modifications, always make sure that:
  - All works has been completed for the valves and other depending systems.
  - Valve is loaded for remote operation.

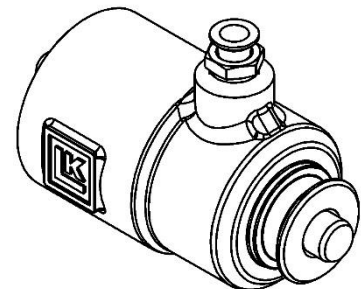
## 6. Maintenance instruction

We recommend following to be checked at regular intervals

- When valves can be closed without disturbing the proper function of the piping system use the remote control system and close the valves.
- Also check operation directly on the valve.
- Clean the area around the stem (8) from dirt coming in contact with the stem and check for leakage between valve bonnet (7) and stem (8) or damage on stem surface.



- Check that the piston rod (17) in release cylinder (9) is kept in outer position.
- If needed, apply suitable lubrication to the stem extender joints, with respect to materials and temperature.



## 7. Repair

### 7.1 Dismantling of the quick closing valve



The following points must be observed before dismantling the valve:

- Pressure less pipe system.
- Medium and valve must cool.
- Plant must be drained.
- Cleansing of the piping system in case of dangerous media.

## 7.2 Putting quick closing valve into operation after repair



### Attention!

- Before the valve is put into operation check that it is the right valve in its right position (material, pressure, temperature and direction of flow).
- Residues in piping and valves (dirt, weld beads, etc.) inevitable lead to leakage.
- Check remote control system function and operation directly on valve.
- Be aware of the fact that the valve stem with related components as hand wheel (14) will fall down very rapidly by spring force at closing of the valve which can cause injury.
- Also avoid injury by always secure the release system when work is carried out on the valve. When testing the remote release system, stay away from moving parts on the valve.
- Regional safety instruction must be adhered to.
- Touching valves operating at high media temperatures  $>50^{\circ}\text{C}$  can cause injury.
- Affix warning notice or protective insulation as appropriate.

*Before putting a new plant into operation or restarting after repairs or modifications, always make sure that:*

- All works has been completed for the valves and other depending systems.
- Valve is loaded for remote operation.

## 7.3 Repair kit Quick Closing Valve

For repair kit contact LK Valves.



### 7.4 Repair of Release Cylinders (9)

Only completely assembled release cylinders (9) can be supplied.



#### **Attention!**

It is important that the release cylinder (9) is replaced when it has been exposed to excessive heat.

Never dismantle the release cylinder (9). It contains strong springs that can cause injury if they are dismantled.

Complete release cylinder LK article number: 76103

*Note: New version is fully compatible with previous versions.*

## 8. Contacts

Your Quick closing valves are designed and manufactured by:

LK Valves AB  
Garnisonsgatan 19  
SE-254 66 Helsingborg  
SWEDEN

Telephone: +46 (0)42 38 38 70

Fax: +46 (0)42 38 38 75

Website: <http://www.lkvalves.com>

E-mail: [sales@lkvalves.com](mailto:sales@lkvalves.com)