Operating and Instruction Manual

Valves and actuators

EN

Version 2.2.6

Translation of the original instructions

Introduction

This operating and installation manual is intended for installation, operation, maintenance and monitoring staff.

The instructions in this manual must be read and understood by all above personnel and must at all times be adhered to.

The manufacturer shall not be liable for damage or loss resulting from non-compliance with the instructions in this installation and operating manual.

Manufacturer details

Manufacturer address:

MARTIN LOHSE GmbH

Unteres Paradies 63

89522 Heidenheim

Germany

Telephone: +49 7321 755-0

sales@lohse-gmbh.de

www.lohse-gmbh.de

Contents

1 About this installation and operating manual

1.1 General notes

This installation and operating manual contains all information necessary for the

- transport
- commissioning and decommissioning
- and operation of the valve or actuator.
- proper disposal

Information regarding the maintenance and repair can be found in the separate service manual for LOHSE valves.

Using this document, familiarise yourself with the valve. The installation and operating manual assists you in the proper and correct operation of the product. Safe operation of the valve is only ensured, if you proceed exactly as described in this manual.

For accessories and attachments, refer to the operating manual of the respective manufacturer.

1.2 Warning signs and symbols

The following symbols and warnings are used to highlight

- dangers
- warnings
- safety measures and precautions

There are three categories of risks:

DANGER

Type and source of danger

Indicates an immediate danger. Non-compliance with the instructions can result in serious or even fatal injury.

- Explanation of the necessary safety measures.

WARNING

Type and source of danger

Indicates a potential risk. Non-compliance with the instructions can result in serious or damage to property.

- Explanation of the necessary safety measures.

CAUTION

Type and source of danger

Indicates a potential risk. Non-compliance with the instructions can result in injury or damage to property.

- Explanation of the necessary safety measures.

1.3 Target group

This installation and operating manual has been compiled for the owner of the product and the qualified technical personnel working with and on the valve who are able to carry out the required tasks and identify potential risks.

Personnel must be qualified for working with

- electrical power
- Control and regulating equipment
- pressurised components

The valve owner must assess the personnel as regards the necessary knowledge and skills.

Qualified technical personnel are in charge of the operation, maintenance and monitoring of the valve.

1.4 Filing of installation and operating manual

Keep this installation and operating manual in a suitable location so that it can be accessed at any time by qualified technical staff.

1.5 Validity

This installation and operating manual is valid for the following series of LOHSE valves and actuators:

1.5.1 Valve types

Series	Description	Valve type
CNA	Compact valve (standard model)	Shut-off valve
CNAA	COMPACT valve with raised seating flange facing	Shut-off valve
CNA-Bi	COMPACT valve, sealing on both sides	Shut-off valve
CGNA	COMPACT valve for powder and granular products	Shut-off valve
CBS	COMPACT regulating valve with orifice	Regulating valve
CBSA	COMPACT regulating valve with orifice and raised seating flange facing	Regulating valve
CGBS	COMPACT regulating valve with orifice for powder and granular products	Regulating valve
CAW	COMPACT valve for liquids (water, wastewater)	Shut-off valve
CDS	COMPACT valve with through-going valve plate	Shut-off valve
CDSV	COMPACT valve with through-going valve plate, with hardened valve plate and flanging rings	Shut-off valve
CDSA	COMPACT valve with through-going valve plate and raised seating flange facing	Shut-off valve
CDSR	COMPACT valve with through-going valve plate for rejects	Reject valve
CGDS	COMPACT valve with through-going valve plate for powder and granular products	Shut-off valve
CDSQ	COMPACT valve with through-going valve plate and square cross-section	Shut-off valve
CPD	COMPACT valve with through-going valve plate for powder and bulk materials	Shut-off valve
NAQ	Reject valve with round inlet and square outlet, with grey cast housing	Reject valve
RQS	Reject valve with round inlet and square outlet, in stainless steel housing	Reject valve
RQSV	Reject valve with round inlet and square outlet, in stainless steel housing, with hardened valve plate and wearing ring	Reject valve
AEQ	Reject valve with square inlet and outlet, with sealing frame in inlet, in grey cast or stainless steel housing	Reject valve
SAQ	Valve with square inlet and outlet, in stainless steel housing	Reject valve
TA	Reject valve with round inlet and outlet, with 2 valve plates, in steel or stainless steel housing	Reject valve
TAQ	Reject valve with square inlet and outlet, with 2 valve plates, in stainless steel housing	Reject valve
TRE	Reject valve with square inlet and outlet, with 2 valve plates, valve plates aligned at angle below 15°, in stainless steel housing	Reject valve

In principle, the instructions in this installation and operating manual also apply to LOHSE valve types other than those listed above. Please contact the manufacturer for additional data sheets.

1.5.2 Actuator types for COMPACT valves and reject valves

Series	Description
H	Handwheel drive with rising stem
Hns	Handwheel drive with non-rising stem
VC	Double-acting pneumatic cylinder, stroke adjustable in opening and closing direction, NAMUR interface, T- and C-slot for solenoid switch
VM	Double-acting pneumatic cylinder, stroke adjustable in opening and closing direction
PZ	Double-acting pneumatic cylinder, stroke adjustable in closing direction only
VMV "CLOSE"	Double-acting pneumatic cylinder, stroke adjustable across entire stroke length in closing direction
VMV "OPEN"	Double-acting pneumatic cylinder, stroke adjustable across entire stroke length in opening direction
VMF "CLOSE"	Single-acting pneumatic cylinder, with spring return mechanism in closing direction
VMF "OPEN"	Single-acting pneumatic cylinder, with spring return mechanism in opening direction
HH	Stroke lever
E	Electrical actuator
K	Chain wheel actuator
GK	Bevel gear actuator
X	Square head actuator
Y	Hydraulic cylinder
Z	prepared for E-actuator / transmission
M	increasing spindle and connecting sleeve
S	quick-acting lever
BG	Handle (only CPD)

2 Safety

2.1 General safety instructions

2.1.1 General risks

Danger sources posing general risks:

- Mechanical danger sources
- Electrical danger sources

2.1.2 Risks in connection with electrical equipment

DANGER

Risk in connection with electrical equipment

As there is a constant humid atmosphere in the production process, electrically operated valves are a source of danger.

Danger: electric shock

- Observe the relevant regulations regarding the use of electrical devices in wet rooms.

2.1.3 Operation in explosive atmosphere

CAUTION

Operation in explosive atmosphere

Risk of explosion of ungrounded valves

- After installation, the valve must be integrated into the general grounding circuit!

2.1.4 Preconditions for operation

The valve must only be operated

- if it is in proper working order
- for the intended purpose
- with awareness of the associated dangers and in accordance with the instructions in this manual
- if all safety and EMERGENCY-STOP devices are in place and working properly

Malfunctions and faults that might impair the safety of the valve must be eliminated without delay.

DANGER

Substantial risk of injury when reaching into by hand

While the valve is in operation, do not attempt to reach into it or clean it by hand and/or with an implement, as this could cause serious injury and/or damage to property.

- Observe safety instruction (see 2.9).

2.1.5 Residual risks

DANGER

Risk of injury from shearing, crushing and snagging

Danger by moving valve parts that might have become accessible when covers are removed for function checks or similar purposes and by automatically actuated valves.

- Do not reach with your hands or fingers into the range of the moving valve parts.

DANGER

Risk of injury from burning and scalding

on machines and systems operated at high temperatures (above 40° C):

operating temperature >= 70° C:
Short-term skin contact (approx. 1 sec.) with the surface of the valve or machine components can result in burns (DIN EN ISO 13732-1)

operating temperature = 65° C:
Longer skin contact (approx. 3 sec.) with the surface of the valve or machine components can result in burns (DIN EN ISO 13732-1).

operating temperature *55° C* - 65° C:
Longer skin contact (approx. 3 to 10 sec.) with the surface of the valve or machine components can result in burns (DIN EN ISO 13732-1).

- Wear personal protective equipment.

2.1.6 State of technology

Valves from MARTIN LOHSE GmbH are designed and manufactured according to the latest state of technology and the relevant technical safety standards. There remains however a residual risk to life and limb of the operator or third parties, and a risk of damage to the valve and other property,

- if the valve operated for a purpose other than that intended
- if the valve is operated by persons who are not suitably qualified (see chapter 1.3)
- if the valve has been modified
- if the safety instructions in this manual are not strictly adhered to

2.2 Proper use

LOHSE valves are shut-off valves or as regulating valves designed for fluid media and for operating conditions as outlined in 2.2.1 and 2.2.2. The properties of the medium must be taken into account when choosing the valve material.

In exceptional cases, certain valve types might be used for gaseous media such as oxygen and compressed air. If you wish to use the valves for such media, you must first contact MARTIN LOHSE GmbH. Valves and connections for gaseous media must be completed free of grease.

The valve is actuated by means of a handwheel, pneumatic cylinder, stroke lever, electrical actuator, chain wheel, quick-release lever, bevel gear mechanism, square head of hydraulic cylinder.

LOHSE valves must be actuated with original LOHSE actuators or actuators approved by MARTIN LOHSE GmbH. LOHSE actuators must only be used in conjunction with LOHSE valves.

2.2.1 Maximum permissible operating temperature

Type designation	Max. operating temperature
CNA, CNAA, CNA-Bi, CBS, CBSA, CDS, CDSV, CDSA, CDSR	120° C
CGNA, CGBS, CGDS, CAW, CDSQ, CPD, NAQ, RQS, RQSV, AEQ, SAQ, TA, TRE, TAQ	80° C
The above temperature values are guide values. Always observe the specifications in the order confirmation or documentation. Valves for higher operating temperatures are available on request!	

2.2.2 Maximum permissible operating pressure p [bar]

Type designation	DN 25 – 300 (nominal Ø in mm)											
	25	32	40	50	65	80	100	125	150	200	250	300
CNA / CNAA / CNA-Bi				10	10	10	10	10	10	10	10	6
CAW				8	8	8	6	6	6	6	4	4
CBS / CBSA				10	10	10	10	10	10	10	10	6
CGNA / CGBS				6	6	6	6	6	6	6	6	4
CDS / CDSV / CDSA / CDSR	10	10	10	10	10	10	10	10	10	10	10	6
CGDS				6	6	6	6	6	6	6	4	4
CDSQ												4
CPD						2	2	2	2	2	2	2
NAQ / RQS / RQSV							8		8	8	8	4
AEQ									8	8	8	4
SAQ												
TA							4	4	4	4	4	2
TRE									4	4	4	2
TAQ									4	4	4	2
Valves for higher operating pressures are available on request! For special valves, observe the maximum operating pressures in the order confirmation or documentation!												

Type designation	DN 350 – 1800 (nominal Ø in mm)												
	350	400	450	500	600	700	800	900	1000	1200	1400	1600	1800
CNA / CNAA / CNA-Bi	6	6	6	6	4	3	3	3	3	3	3	3	3
CAW	2,5	2,5	2,5	2,5	2,5	1,5	1,5	1,5	1,5				
CBS / CBSA	6	6	6	6	4								
CGNA / CGBS	4	4											
CDS / CDSV / CDSA / CDSR	6	6	6	6	4	3	3	3	3	3	3	3	3
CGDS	4	4											
CDSQ		4		2									
CPD	2	2											
NAQ / RQS / RQSV	4	2		2	2								
AEQ	4	2		2	2	1	1						
SAQ		2.5		2	2	2	2						
TA	2	2		2	2	2							
TRE		2		2	2								
TAQ		2		2	2								
Valves for higher operating pressures are available on request! For special valves, observe the maximum operating pressures in the order confirmation or documentation!													

2.3 Improper use

Any use of the valves for purposes other than that intended is deemed improper. MARTIN LOHSE GmbH shall not be liable for damage to persons or property resulting from improper use.

2.4 Modifications

CAUTION

Modifications

Do not make any modifications to the valve that might impair its safety.

It is forbidden to remove type plates and markings!

2.5 Inspections

Regularly instruct the operating personnel in the safe and proper use of the valve, with reference to the installation and operating manual. Carry out regular inspections to ensure that all instructions are adhered to.

2.6 Personal protective equipment

If required, wear personal protective equipment.

The personal protective equipment consists of

- safety footwear
- protective gloves
- safety goggles
- hard hat
- hearing protection

The personal protective equipment must be suitable for the pressurised medium.

2.7 Noise protection

The valve produces noise at a sound pressure level of less than 70 dB(A).
If combined with a control valve, the continuous sound pressure level might be higher, depending on the type of the valve.

2.8 Additional regulations

For the operation of the valve, all internal and statutory safety and accident prevention regulations must be adhered to.

2.9 Safety instructions for valves and actuators

DANGER

Risk of injury from crushing

Single-acting actuators might move the valve to its open and close position when the compressed air supply is closed or disconnected.

- Do not reach with your hands or fingers into the range of the moving valve parts unless the actuator has reached its end position.

Automated actuators that are electrically powered might move the valve to its open or closed position.

- Before carrying out any maintenance or repair work on valves with actuators, and before installing or removing the valve in the pipeline system, disconnect the actuator from the power supply.

WARNING

Risk of injury on hot or cold surfaces, risk to health from hazardous substances

All personnel working with or on the valve, including installation, operation and repair of the valve, must be suitably trained. This helps eliminate the risk of damage to property or injury to persons.

Ensure that all installation and assembly personnel are familiar with

- the installation and removal of the valve in a process line
- special and potential risks associated with the process
- most important safety instructions
- risk in connection with the handling of pressurised equipment as well as hot and cold surfaces
- risk in connection with the handling of hazardous substances

WARNING

Risk of injury from escaping media

If the design limits of the valve are exceeded, there is a risk of damage to the valve and of uncontrolled release of the pressurised medium

- Do not exceed the design limits of the valve!

DANGER

Risk of injury from pressurised valves

The dismantling of pressurised valves can result in uncontrolled depressurisation. Before carrying out any work on the valve, insulate it from the pipeline system, depressurise the valve and remove all medium.

- Do not dismantle the valve or remove it from the pipe unless the valve is fully depressurised.

DANGER

Risk of injury from hazardous substances

- Inform yourself of the properties of the medium and any associated risks. Protect yourself and the environment from hazardous substances.
- Observe the safety instructions in the material safety data sheets of the medium manufacturer.
- Ensure that no medium is discharged into the pipeline during maintenance work.
- Wear personal protective equipment that is suitable to protect you against the pressurised medium.

DANGER

Risk of injury from suspended loads

When transporting the valve, observe its weight.

Never lift the valve by its accessories, attached components or connected pipes. Always use suitable lifting gear, taking into account the centre of gravity of the valve.

- Do not stand under suspended loads.

WARNING

Risk of injury from heavy objects

Observe the weight of the valve.

- Always use suitable transport and lifting gear.

CAUTION

Risk of damage to valve from use of inadmissible actuators

The use of inadmissible actuators can cause damage to the valve.

- Use only original LOHSE actuators or actuators approved by LOHSE.

3 Transport and storage

DANGER

Risk of injury from heavy objects

Observe the weight of the valve.

- Always use suitable transport and lifting gear.

DANGER

Risk of injury from crushing if valve topples over

Observe the size of the valve.

- Always use suitable transport gear and secure the valve against toppling over.

DANGER

Risk of injury from suspended loads

When transporting or otherwise handling the valve, observe its weight.

- Do not stand under suspended loads

Wear personal protective equipment consisting of

- hard hat
- safety footwear
- protective gloves

3.1 Suitable slings and transport means

When transporting the valve, observe its weight. The valve must be transported with suitable transport gear.

Valve [DN]	Slings/transport means with load capacity [kg]
<= 500	1000
<= 800	3000
<= 900	6000
<= 1200	10000
<= 1600	15000
> 1600	25000

For size of valve, see dimension sheet.

3.2 Transport

Upon receipt of the delivery, inspect the LOHSE valve for damage caused during transport.

CAUTION

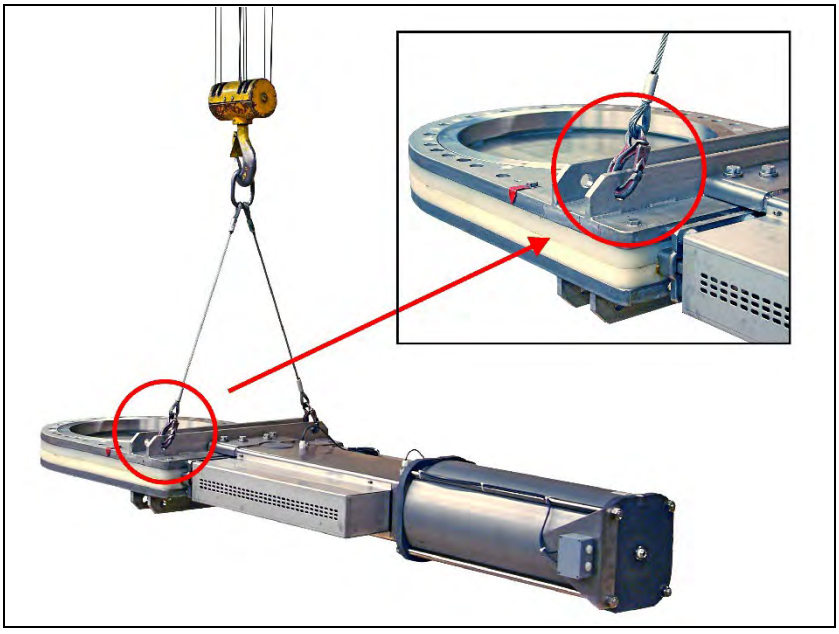
Damage to valve

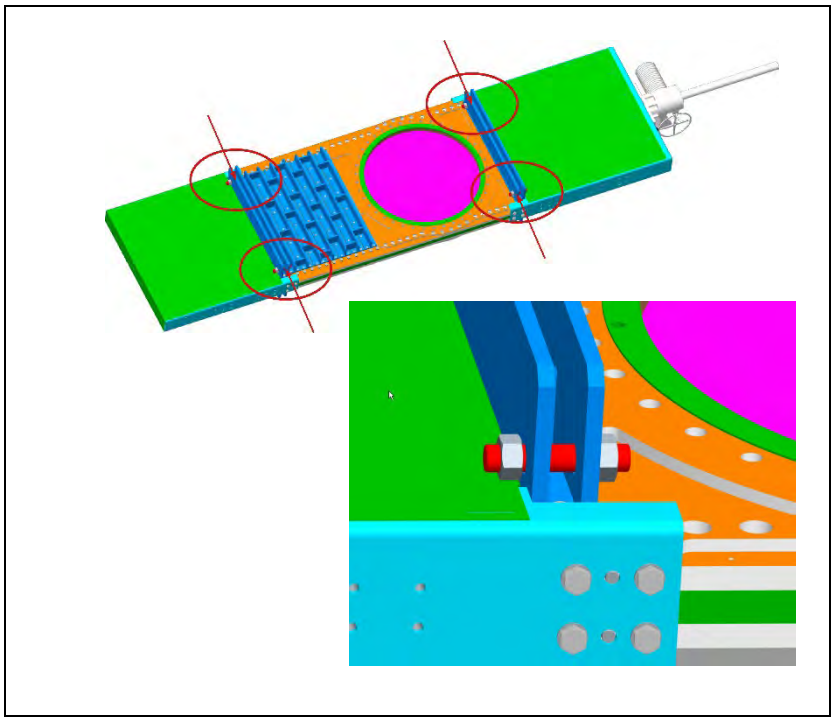
Do not lift the valve by the actuator mechanism.

- To raise the valve, attach suitable slings only at the points provided on the base body (see examples). The valve must be properly balanced when lifted (observe centre of gravity).

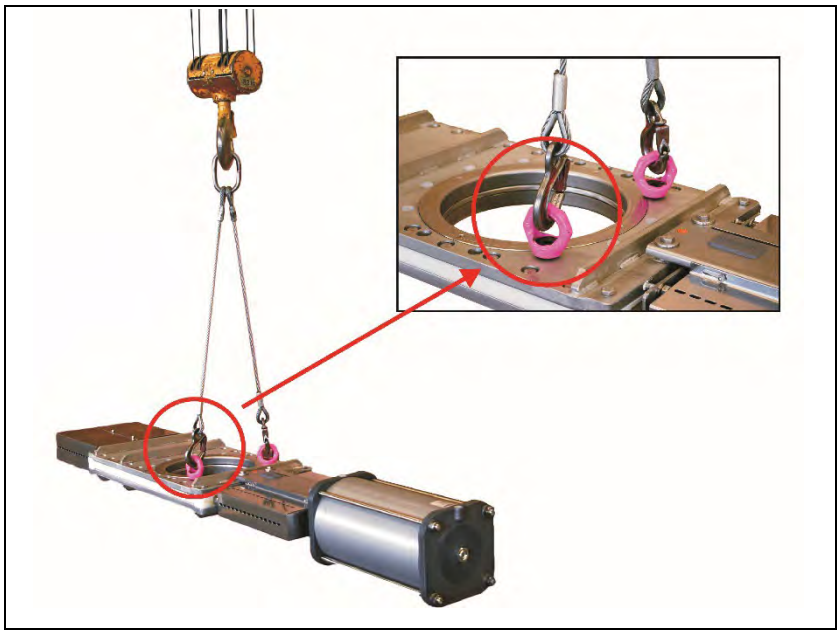
The pictures below show examples of attachment points on the valve body.

Attachment points at the housing





Attachment points with eyelet bolts at the flange



In addition to the attachment points shown here, you can attach the valve at the points described in chapter 4.1.

3.3 Storage

Store the valve on a suitable support in a dry and clean room.

Protect the valve from dirt.

Packing unit must be replaced after storing longer than 12 months.

4 Installation / dismantling

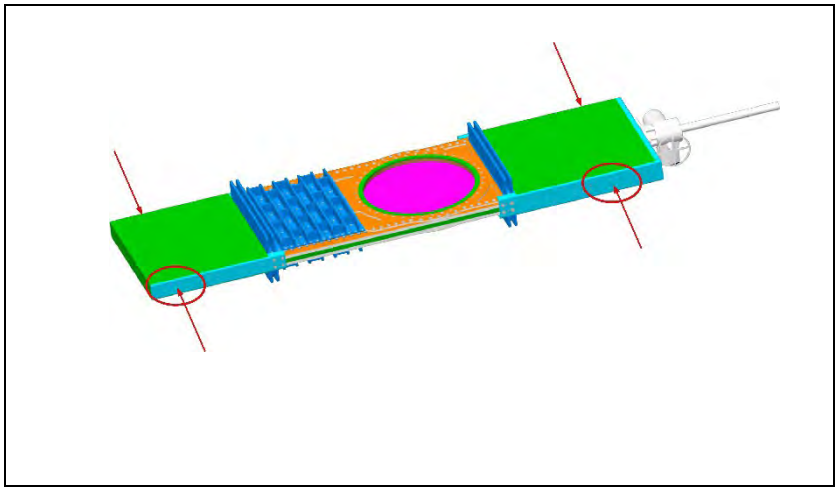
4.1 Installation instructions

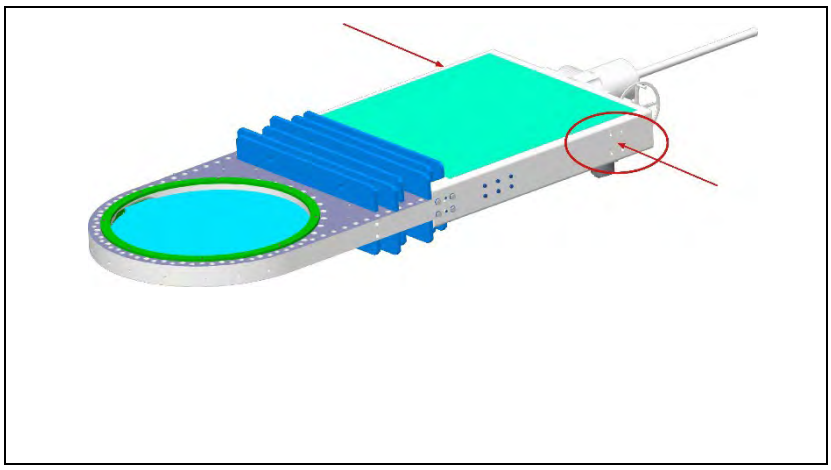
Before installing the valve, remove the transport securing devices (protective plug). The valve is mounted with screws from pipe flange to pipe flange and also with screws in the threaded holes of the housing into the pipe – in compliance with the product specifications listed in 4.1.2- 4.1.6.6.

With a diameter of DN300 or larger, automated actuators require additional support if the mounting position of the valve is more than 30° from vertical.

Avoid vibration. If vibrations cannot be avoided, the actuator of the valve requires additional support. Vibration can loosen bolted connections, even if they are secured!

In the case of valves with a diameter of DN800 or larger it is also absolutely necessary to fasten the valve with suitable mounting material in the holes provided.





The corresponding dimension sheet shows the positions of the mounting holes.

This is necessary to ensure proper operation of the valve.

To seal the flange connections, insert suitable seals between the flange surfaces.

Exception: When installing valve types “AEQ” and “CDSQ”, do not insert a seal on the input side.

DANGER

Risk of damage caused by incorrectly installed valves

Incorrectly installed valves can lead to damage to the pipeline system.

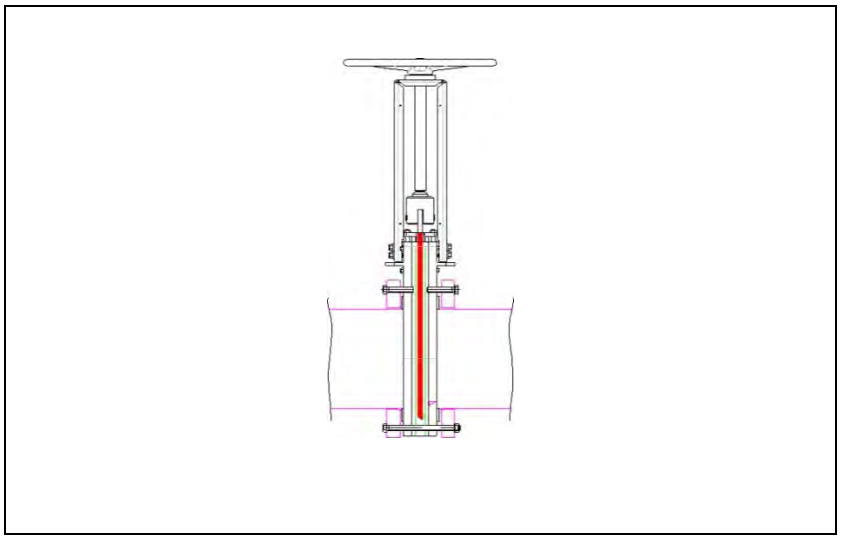
- Ensure that valves are installed correctly.

4.1.1 Installation recommendation

The following installation recommendations are provided to prevent blocking of the valve by material accumulations:

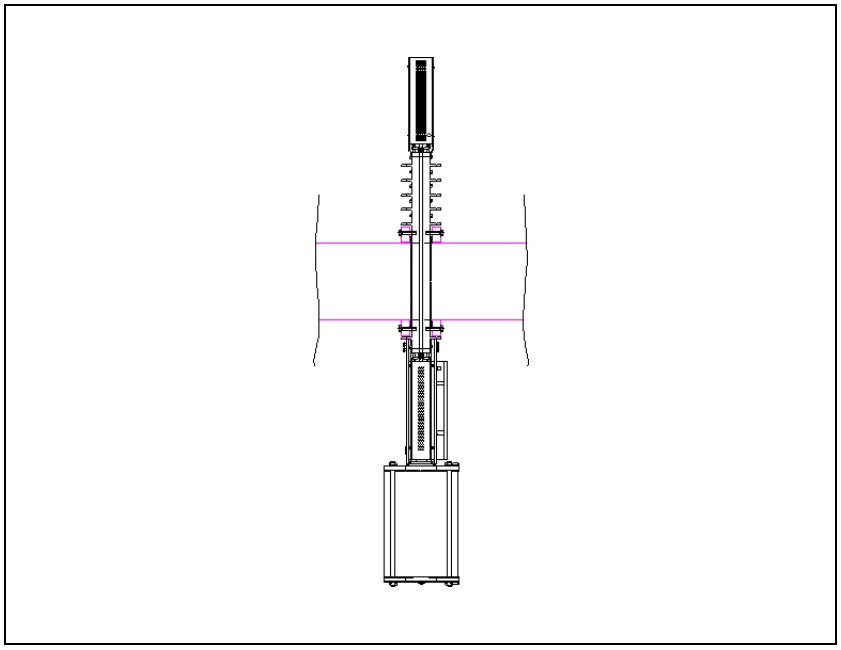
4.1.1.1 LOHSE COMPACT valve

If the mounting position permits, a LOHSE COMPACT valve of the series CNA, CNAA, CNA-Bi, CGNA, CBS, CBSA, CGBS, CAW should be installed with the actuator pointing upward.



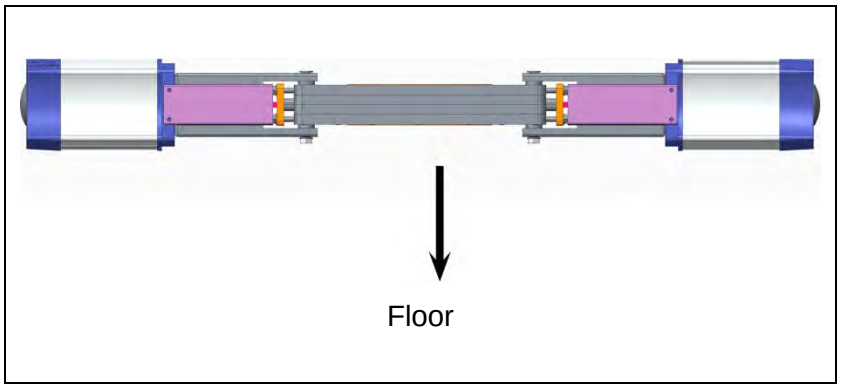
4.1.1.2 LOHSE COMPACT valve with through-going valve plate

If the mounting position permits, a LOHSE COMPACT valve with a continuous valve plate of the series CDS, CDSV, CDSA, CDSR, CGDS, CDSQ should be installed with the actuator pointing downward.



4.1.1.3 LOHSE reject valve

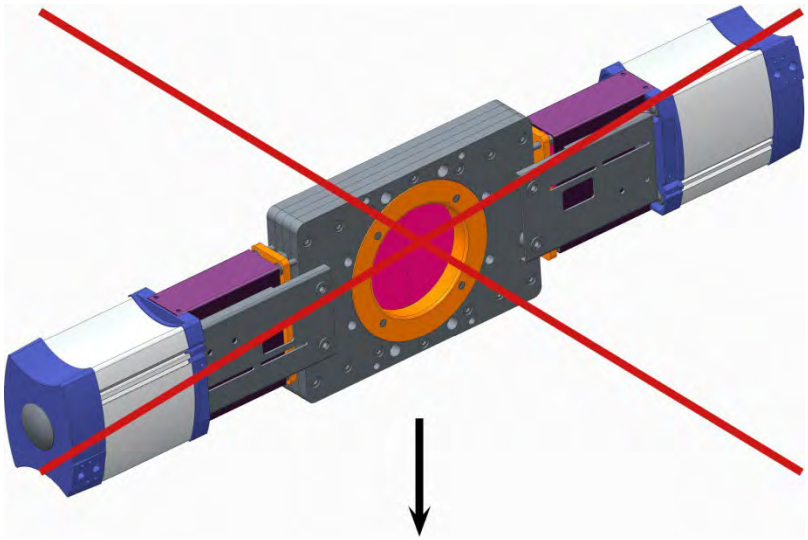
If the mounting position permits, a LOHSE dirt trap of the series NAQ, RQS, RQSV, AEQ, SAQ, TA, TAQ, TRE should be installed horizontally.



If the mounting position does not permit horizontal installation, vertical installation is tolerable.

Floor

Orthogonal installation is NOT RECOMMENDED!



Floor

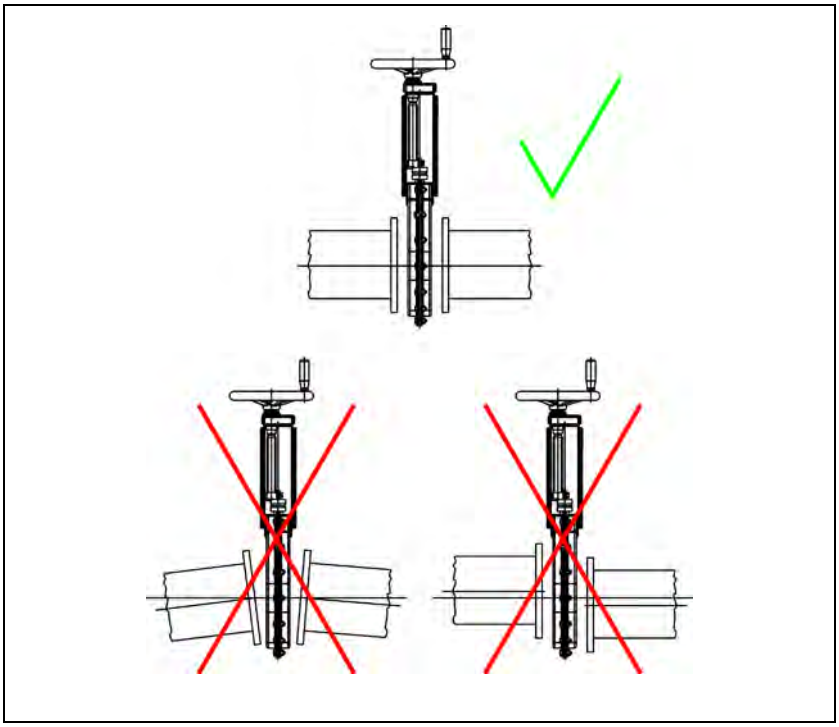
4.1.2 Installation between flanges

Ensure that the sealing surfaces of the flanges are clean and not damaged.

Install the valve without any stress on the valve (do not stress the housing when inserting the bolts in the flange sections).

The flanges of the pipeline must be aligned parallel to the valve.

The flanges of the pipelines must be aligned so that there is no offset.



4.1.3 Installation as end fitting

CAUTION

Risk of damage to property

- When using the valve as an end fitting, you must mount a separate mating flange at the outlet side.

DANGER

Risk of injury from crushing and escaping medium

- The danger area (connecting parts / escaping medium) must be cordoned off with suitable safety equipment.

4.1.4 Tightening torques

For bolts for flange-connected valves

The following values are to be used only as recommendations for non-lubricated threaded connections using materials with a tensile strength of 700 MPa. Additional lubrication of the threads affects the coefficient of friction and will result in unpredictable tightening conditions.

4.1.4.1 Metric threads

	DN														
	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700
Bolt Ø	M16					M20					M24			M27	
Tightening torque	125 Nm					240 Nm					340 Nm			500 Nm	

	DN				
	800	900	1000	1200	1400
Bolt Ø	M30		M33	M36	M39
Tightening torque	700 Nm		900 Nm	1200 Nm	1400 Nm

	DN	
	1600	1800
Bolt Ø	M45	
Tightening torque	2000 Nm	

4.1.4.2 UNC threads

	DN								
	50 (2“)	65 (2,5“)	80 (3“)	100 (4“)	125 (5“)	150 (6“)	200 (8“)	250 (10“)	300 (12“)
Bolt Ø	$^{5}/_{8}$“ UNC			$^{3}/_{4}$“ UNC			$^{7}/_{8}$“ UNC		
Tightening torque	125 Nm			240 Nm			280 Nm		

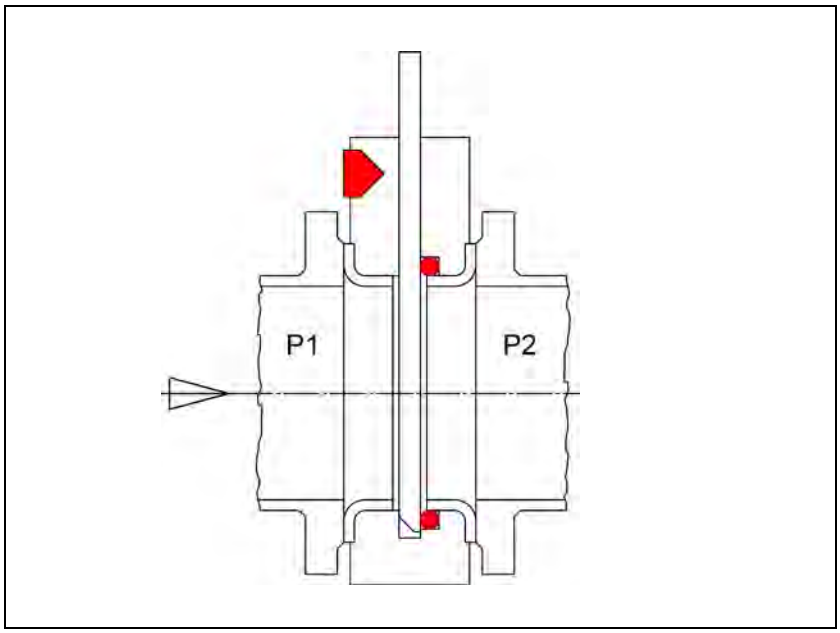
	DN								
	350 (14“)	400 (16“)	450 (18“)	500 (20“)	600 (24“)	700 (28“)	800 32“	900 36“	1000 40“
Bolt Ø	1“ UNC			1. $^{1}/_{8}$“ UNC			1. $^{1}/_{4}$“ UNC		
Tightening torque	400 Nm			700 Nm			630 Nm		

	DN		
	1200 (48“)	1400 (56“)	1600 (66“)
Bolt Ø	1 $^{5}/_{8}$ “ UNC	1 $^{7}/_{8}$ “ UNC	
Tightening torque	1028 Nm	1258 Nm	

4.1.5 Direction of pressure / flow

- When installing valves with direction arrows on the housing or bracket, observe the direction of installation.
- On all valve types (see 1.5), with the exception of CNA and CNAA, the direction arrow indicates the direction of flow of the medium.

P1 ≥ P2



- On valve types CNA and CNAA, the direction arrow indicates the direction of the pressure, i.e. pressure P1 must be greater than pressure P2 when the valve is closed. The higher pressure pushes the valve plate against the seal.
- Valve types without direction arrow are exposed to the same pressure on both sides.

4.1.6 Flange bore dimensions

CAUTION

Risk of damage to property from bolts of incorrect length

Prevent damage to the valve from bolts that are too long.

- Observe the depth of thread in the housing (t_{max}) and choose suitable bolts (lengths).
- Observe the specifications on the label attached to the valve.

4.1.6.1 Selecting correct bolt length

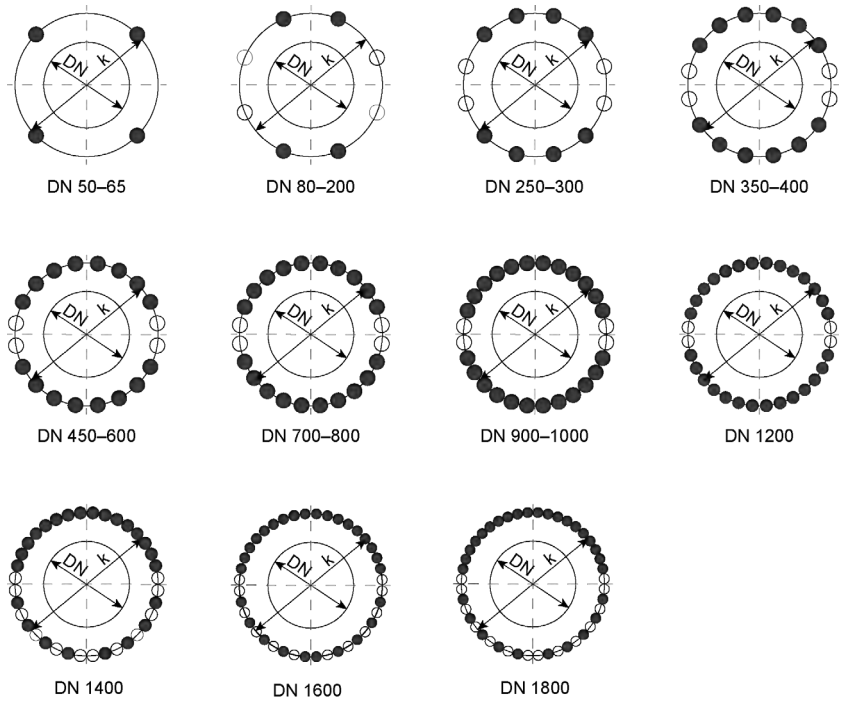
The length of the bolt for threaded holes is calculated as follows:

- Usable depth of thread (t_{max})
- Thickness of flange seal
- Thickness of washers
- Flange thickness, rim thickness, gasket thickness

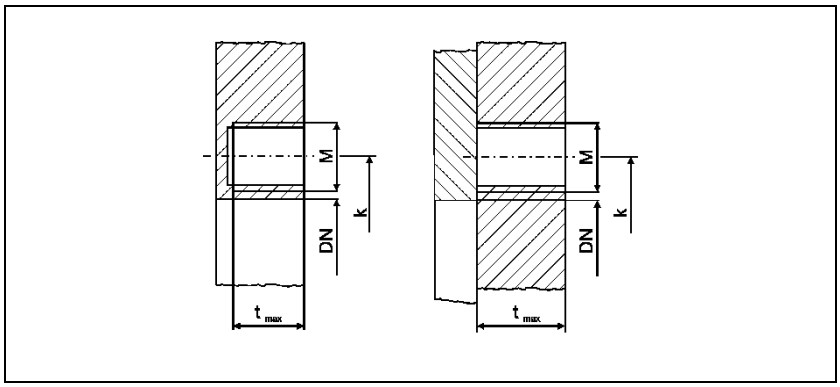
4.1.6.2 Flange bores according to DIN EN 1092-1 PN10

Valve type:

CNA, CNAA, CNA-Bi, CAW, CBS, CBSA, CGNA, CGBS



Threaded bore shapes with usable depth of thread



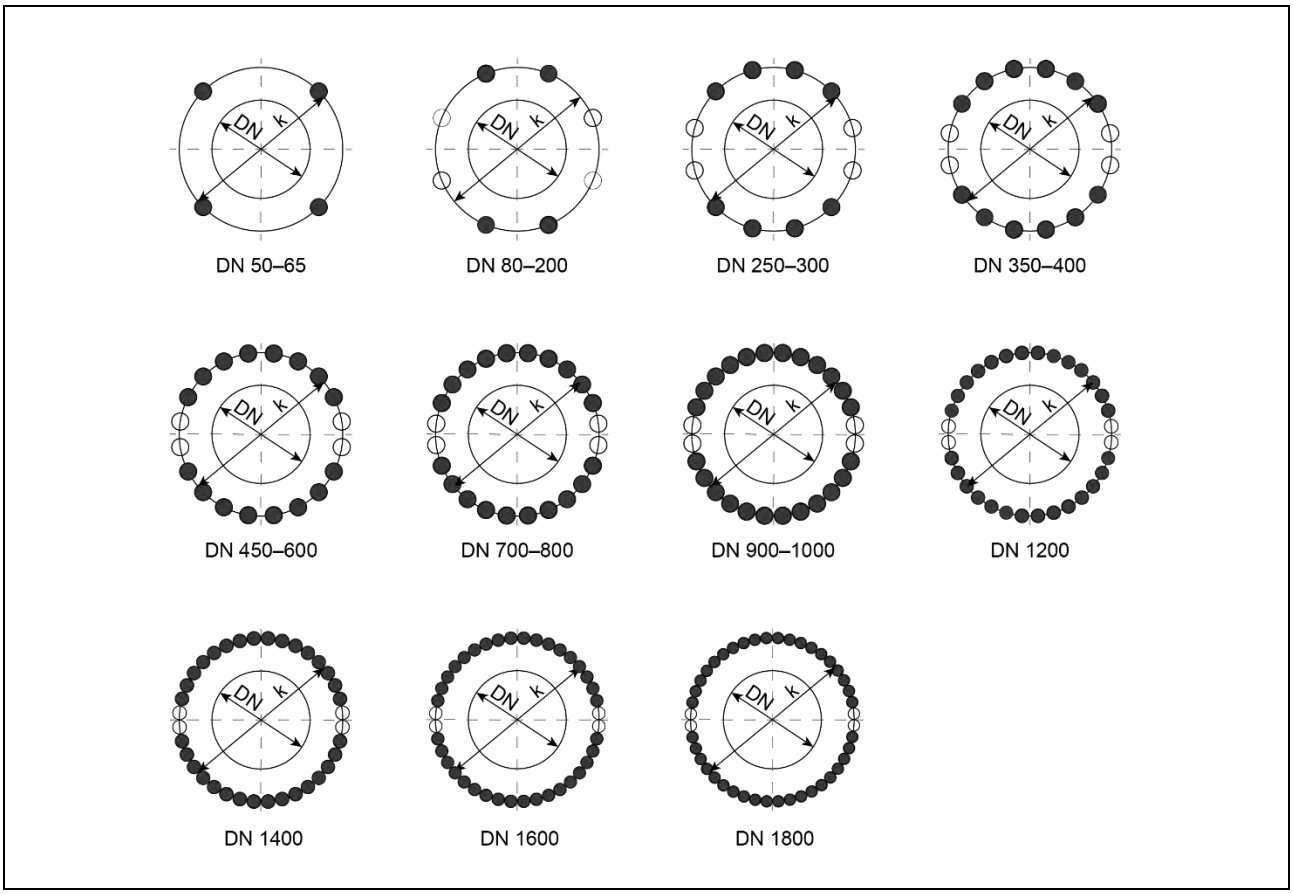
Nominal diameter DN 50 – 300									
Nominal diameter DN [mm]	**50**	**65**	**80**	**100**	**125**	**150**	**200**	**250**	**300**
Bore circle Ø k [mm]	125	145	160	180	210	240	295	350	400
● Number of threaded bores	4	4	4	4	4	4	4	8	8
○ Number of through bores			4	4	4	4	4	4	4
Thread size M	M16	M16	M16	M16	M16	M20	M20	M20	M20
Usable depth of thread t_{max} [mm]	12	12	12	12	12	16	16	20	20

Nominal diameter DN 350 – 1000									
Nominal diameter DN [mm]	**350**	**400**	**450**	**500**	**600**	**700**	**800**	**900**	**1000**
Bore circle Ø k [mm]	460	515	565	620	725	840	950	1050	1160
● Number of threaded bores	12	12	16	16	16	20	20	24	24
○ Number of through bores	4	4	4	4	4	4	4	4	4
Thread size M	M20	M24	M24	M24	M27	M27	M30	M30	M33
Usable depth of thread t_{max} [mm]	20	23	30	30	35	40	45	45	45

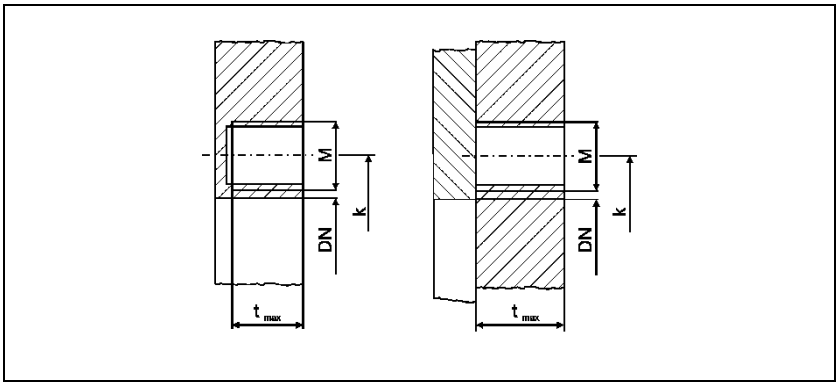
Nominal diameter DN 1200 – 1800									
Nominal diameter DN [mm]	**1200**	**1400**	**1600**	**1800**					
Bore circle Ø k [mm]	1380	1590	1820	2020					
● Number of threaded bores	28	24	28	30					
○ Number of through bores	4	12	12	14					
Thread size M	M36	M39	M45	M45					
Usable depth of thread t_{max} [mm]	45	45	45	45					

Valve type:

CDS, CDSV, CDSA, CDSR, CGDS, CPD, TA



Threaded bore shapes with usable depth of thread



Nominal diameter DN 50 – 300									
Nominal diameter DN [mm]	**50**	**65**	**80**	**100**	**125**	**150**	**200**	**250**	**300**
Bore circle Ø k [mm]	125	145	160	180	210	240	295	350	400
● Number of threaded bores	4	4	4	4	4	4	4	8	8
○ Number of through bores			4	4	4	4	4	4	4
Thread size M	M16	M16	M16	M16	M16	M20	M20	M20	M20
Usable depth of thread t_{max} [mm]									
all types, except TA + CPD	12	12	12	12	12	16	16	20	20
Valve type TA					12	16	16	20	20
Valve type CPD			10	10	10	10	10	10	10

Nominal diameter DN 350 – 1000									
Nominal diameter DN [mm]	**350**	**400**	**450**	**500**	**600**	**700**	**800**	**900**	**1000**
Bore circle Ø k [mm]	460	515	565	620	725	840	950	1050	1160
● Number of threaded bores	12	12	16	16	16	20	20	24	24
○ Number of through bores	4	4	4	4	4	4	4	4	4
Thread size M	M20	M24	M24	M24	M27	M27	M30	M30	M33
Usable depth of thread t_{max} [mm]									
all types, except TA + CPD	20	23	30	30	35	40	45	45	45
Valve type TA	20	23	28	28	28	28			
Valve type CPD	12	12							

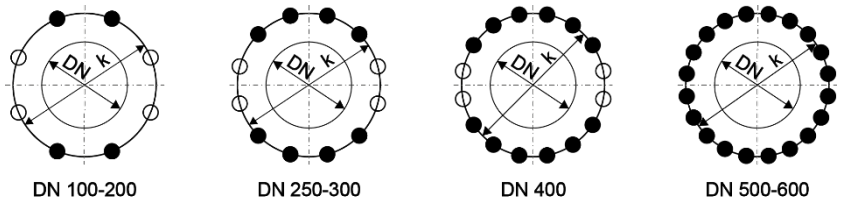
Nominal diameter DN 1200 – 1600									
Nominal diameter DN [mm]	**1200**	**1400**	**1600**	**1800**					
Bore circle Ø k [mm]	1380	1590	1820	2020					
● Number of threaded bores	28	32	36	40					
○ Number of through bores	4	4	4	4					
Thread size M	M36	M39	M45	M45					
Usable depth of thread t_{max} [mm]									
all types, except TA + CPD	45	45	50	45					
Valve type TA									
Valve type CPD									

4.1.6.3 Flange bores according to LOHSE standard with metric thread

Valve type:

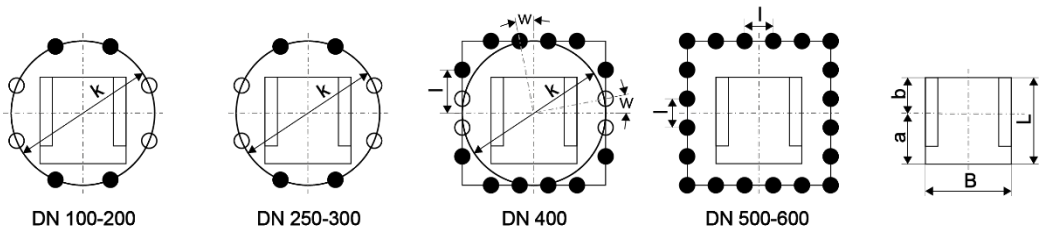
NAQ, RQS, RQSV

Inlet side according DIN EN 1092-1 PN10:

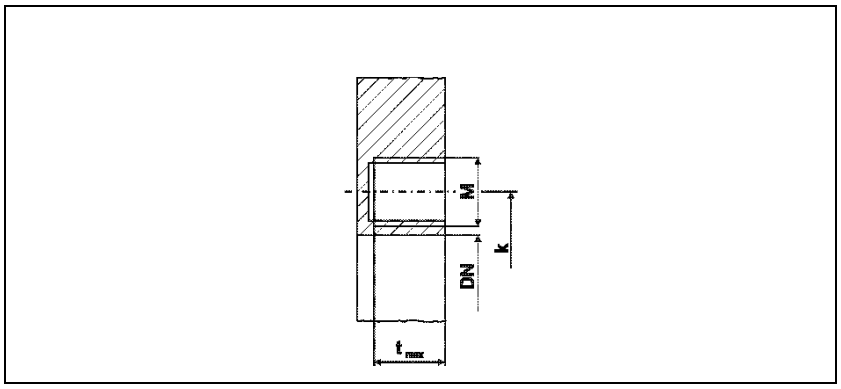


Outlet side according LOHSE standard:

Flange bores and internal dimensions of flange outlet end:



Threaded bore shapes with usable depth of thread

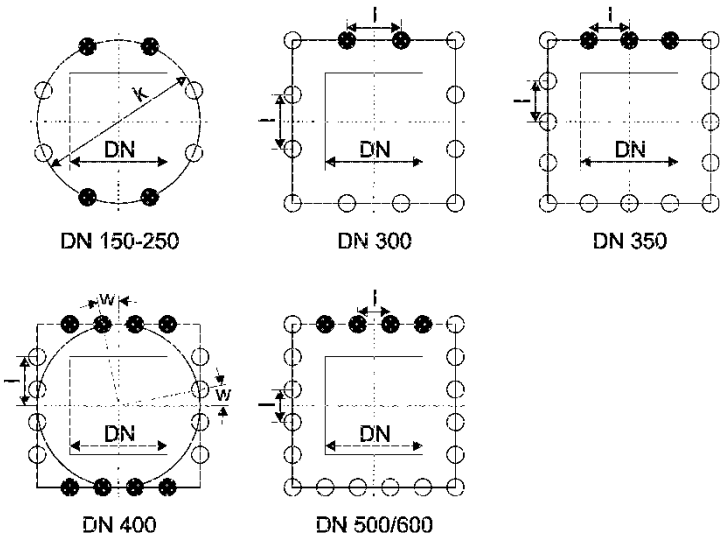


Nominal diameter DN 150 – 600							
Nominal diameter DN [mm]	**150**	**200**	**250**	**300**	**400**	**500**	**600**
Bore circle Ø k [mm]	240	295	350	400	515	620	725
● Number of threaded bores	4	4	8 bzw. 4	8 bzw. 4	12	20	20
○ Number of through bores	4	4	4	4	4		
Thread size M	M20	M20	M20	M20	M24	M24	M27
Distance between bores l [mm]				}	170	121	143
Usable depth of thread t [mm]	18	20	22	22	24	34	35
L [mm]	163	217	267	317	418	520	627
B [mm]	167	215	270	335	435	540	642
a [mm]	92	117	142	167	218	270	327
b [mm]	75	100	125	150	200	250	300

Valve type:

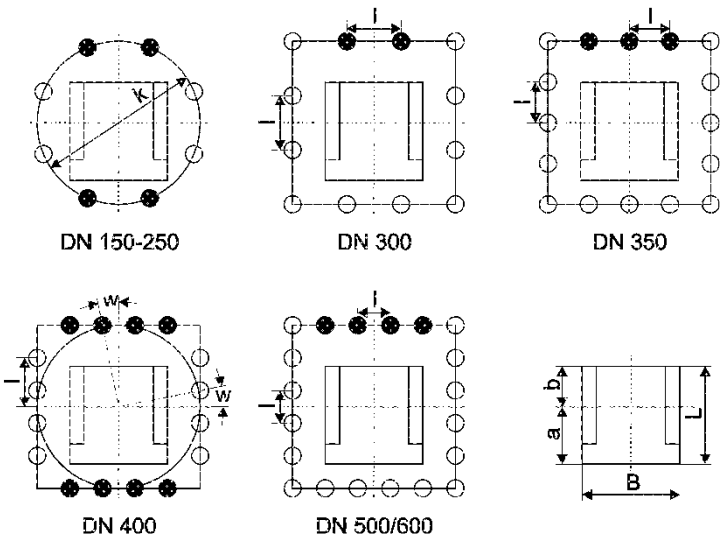
AEQ

Inlet side according LOHSE standard:

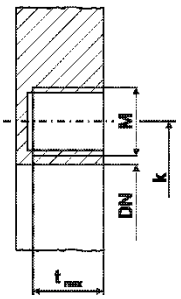


Outlet side according LOHSE standard:

Flange bores and internal dimensions of flange outlet end:



Threaded bore shapes with usable depth of thread

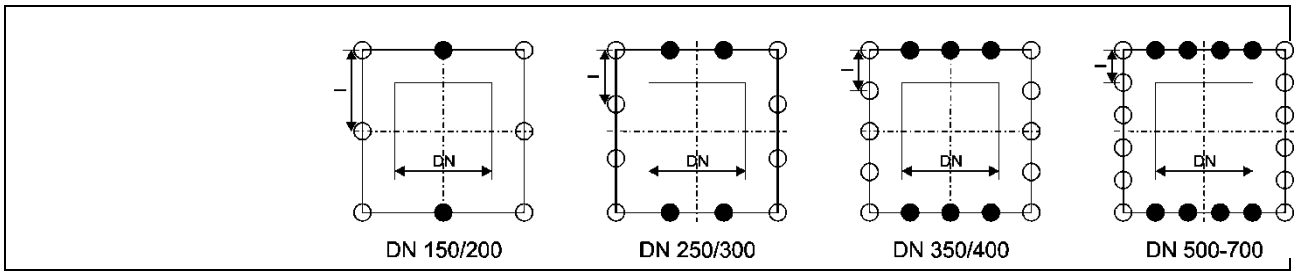


Nominal diameter DN 150 – 600								
Nominal diameter DN [mm]	**150**	**200**	**250**	**300**	**350**	**400**	**500**	**600**
,Bore circle Ø k [mm]	240	295	350			515		
● Number of threded bores	4	4	4	2	3	8	4	4
○ Number of through bores	4	4	4	10	13	8	16	16
Thread size M	M20	M20	M20	M20	M20	M24	M24	M27
Distance between bores I [mm]				129	110	170	121	143
Usable depth of threads t [mm]	18	20	22	24	26	24	34	35
Angle w [°]						11,25		
L [mm]	156	211	260	317	367	418	520	620
B [mm]	167	222	270	335	385	437	540	640
a [mm]	83	111	135	167	192	218	270	320
b [mm]	73	100	125	150	175	200	250	300

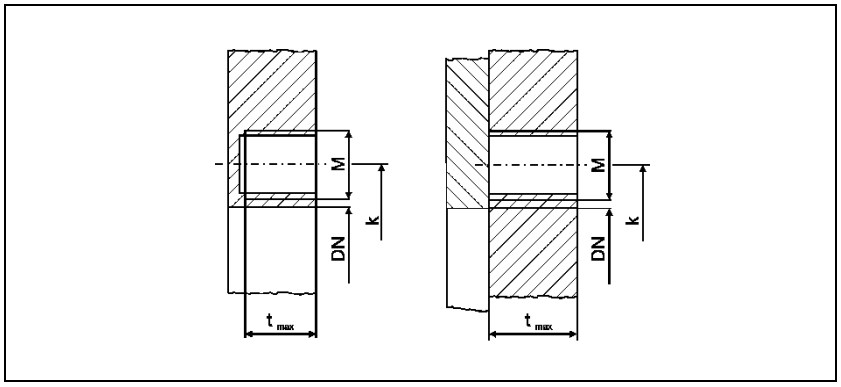
Valve type:

TAQ, TRE

according LOHSE standard



Threaded bore shapes with usable depth of thread

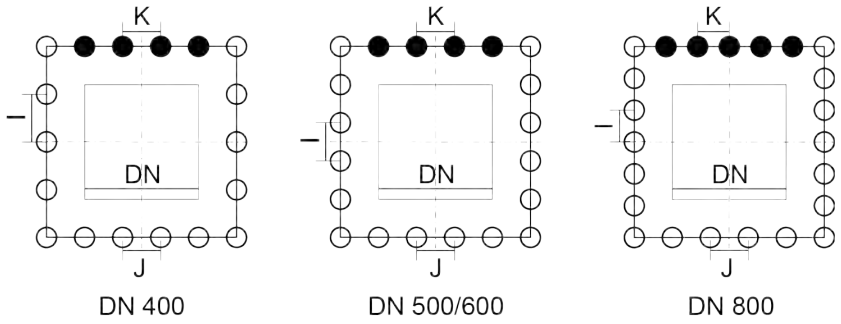


Nominal diameter DN 150 – 600									
Nominal diameter DN [mm]	**150**	**200**	**250**	**300**	**350**	**400**	**450**	**500**	**600**
● Number of threaded bores	2	2	4	4	6	6	8	8	8
○ Number of through bores	6	6	8	8	10	10	12	12	12
Thread size M	M20	M20	M20	M20	M20	M24	M24	M24	M27
Distance between bores l [mm]	118	143	112	129	110	126.5	112	121	143
Usable depth of thread t [mm]	18	18	18	18	20	20	20	20	23

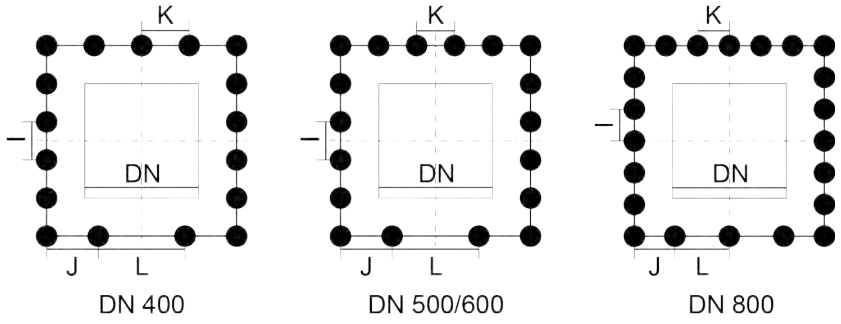
Valve type:

SAQ

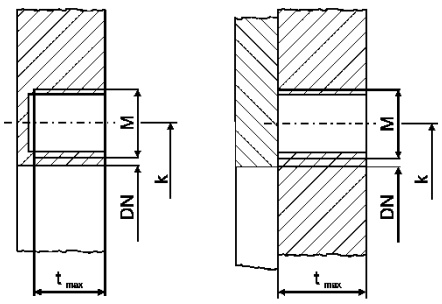
Inlet side according LOHSE standard:



Outlet side according LOHSE standard:



Threaded bore shapes with usable depth of thread



Inlet side according LOHSE standard:

Nominal diameter DN 400 – 800									
Nominal diameter DN [mm]	**400**	**500**	**600**	**800**					
● Number of threaded bores	4	4	4	5					
○ Number of through bores	14	16	16	18					
Thread size M	M16	M20	M20	M20					
Distance between bores I [mm]	125	113	132	153					
Distance between bores J [mm]	103	123	145	186					
Distance between bores K [mm]	103	123	145	155					
Usable depth of thread t [mm]	21	16	16	23					

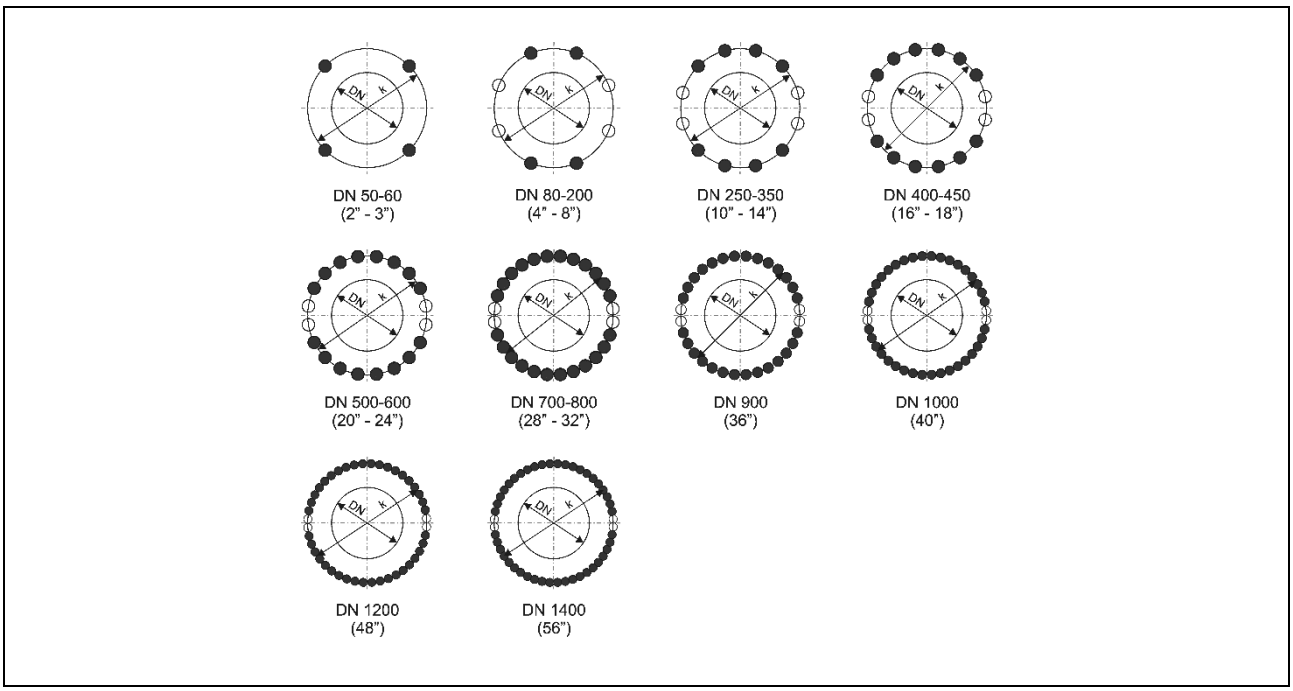
Outlet side according LOHSE standard:

Nominal diameter DN 400 – 800									
Nominal diameter DN [mm]	**400**	**500**	**600**	**800**					
● Number of threaded bores	17	18	18	23					
○ Number of through bores	0	0	0	0					
Thread size M	M12	M12	M12	M12					
Distance between bores I [mm]	99	122	150	135					
Distance between bores J [mm]	130	150	187	208					
Distance between bores K [mm]	110	109	131	170					
Distance between bores L [mm]	180	246	290	217					
Usable depth of thread t [mm]	15	15	17	20					

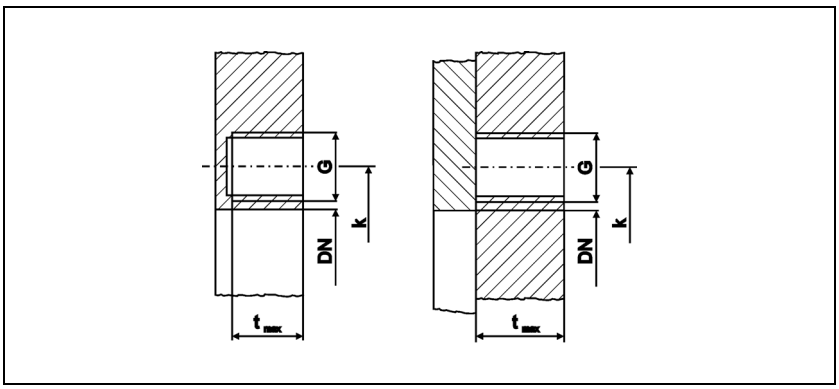
4.1.6.4 Flange bores according to ANSI B 16.5 class 150 ≥ DN 700: ANSI B 16.47 class 150

Valve type:

CNA, CNAA, CNA-Bi, CAW, CBS, CBSA CGNA, CGBS, CDS, CDSV, CDSA, CDSR, CGDS, TA



Threaded bore shapes with usable depth of thread



Nominal diameter DN 50-300									
Nominal diameter DN [mm]	**50**	**65**	**80**	**100**	**125**	**150**	**200**	**250**	**300**
Nominal diameter [inch]	**2**	**2 1/2**	**3**	**4**	**5**	**6**	**8**	**10**	**12**
Bore circle Ø k [inch]	4 3/4	5 1/2	6	7 1/2	8 1/2	9 1/2	11 3/4	14 1/4	17
● Number of threaded bores	4	4	4	4	4	4	4	8	8
○ Number of through bores				4	4	4	4	4	4
Thread size G [inch]	5/8	5/8	5/8	5/8	3/4	3/4	3/4	7/8	7/8
Usable depth of thread t_{max} [inch]									
all types, except TA	1/2	1/2	1/2	1/2	1/2	5/8	5/8	5/8	¾
Valve type TA					1/2	5/8	5/8	5/8	3/4

Nominal diameter DN 350-1000									
Nominal diameter DN [mm]	**350**	**400**	**450**	**500**	**600**	**700**	**800**	**900**	**1000**
Nominal diameter [inch]	**14**	**16**	**18**	**20**	**24**	**28**	**32**	**36**	**40**
Bore circle Ø k [inch]	18 3/4	21 1/4	22 3/4	25	29 1/2	34	38 1/2	42 3/4	47 1/4
● Number of threaded bores	8	12	12	16	16	24	24	28	32
○ Number of through bores	4	4	4	4	4	4	4	4	4
Thread size G [inch]	1	1	1 1/8	1 1/8	1 1/4	1 1/4	1 1/2	1 1/2	1 1/2
Usable depth of thread t_{max} [inch]									
all types, except TA	3/4	7/8	1 3/16	1 3/16	1 3/8	1 9/16	1 3/4	1 3/4	1 3/4
Valve type TA	3/4	7/8	1 1/8	1 1/8	1 1/8	1 1/8			

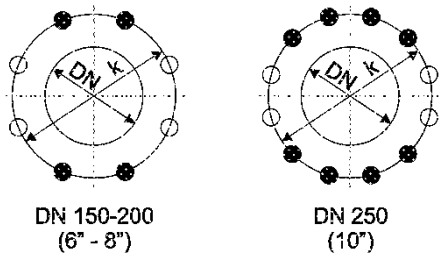
Nominal diameter DN 1200 - 1600									
Nominal diameter DN [mm]	**1200**	**1400**							
Nominal diameter [inch]	**48**	**56**							
Bore circle Ø k [inch]	56	65							
● Number of threaded bores	40	44							
○ Number of through bores	4	4							
Thread size G [inch]	1 1/2	1 3/4							
Usable depth of thread t_{max} [inch]									
all types, except TA	12 1/2	14 1/4							
Valve type TA									

4.1.6.5 Flange bores according to LOHSE standard with UNC thread

Valve type:

NAQ, RQS, RQSV

Inlet side according ANSI B16.5 Class 150:

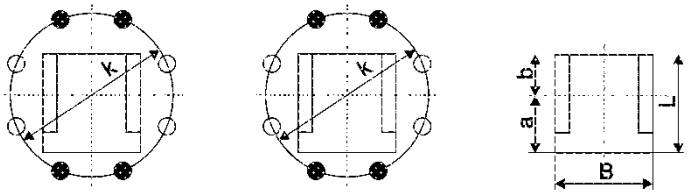


DN 150-200 (6" - 8")

DN 250 (10")

Outlet side according LOHSE standard:

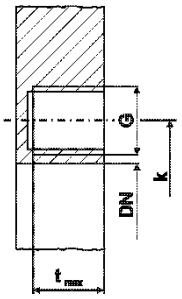
Flange bores and internal dimensions of flange outlet end:



DN 150-200 (6" - 8")

DN 250 (10")

Threaded bore shapes with usable depth of thread

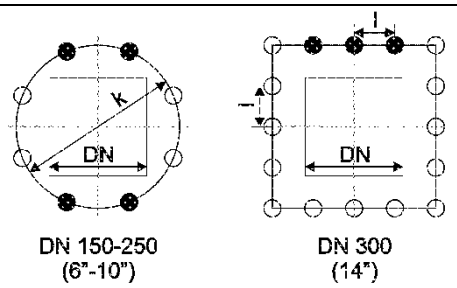


Nominal diameter DN 150 - 250			
Nominal diameter DN [mm]	150	200	250
Nominal diameter [inch]	6	8	10
Bore circle Ø k [inch]	9 1/2	11 3/4	14 1/4
● Number of threaded bores	4	4	8 bzw. 4
○ Number of through bores	4	4	4
Thread size G [inch]	3/4	3/4	7/8
Usable depth of thread t [inch]	11/16	3/4	7/8
L [mm]	163	217	267
B [mm]	167	215	270
a [mm]	92	117	142
b [mm]	75	100	125

Valve type:

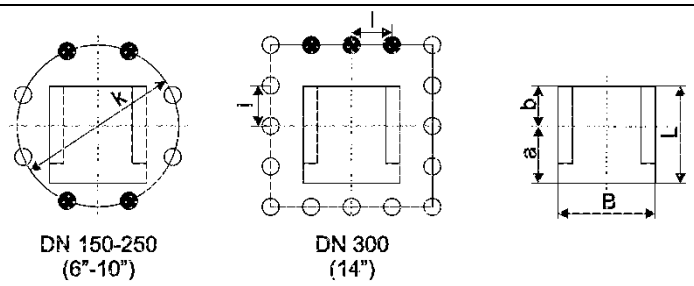
AEQ

Inlet side according LOHSE standard:

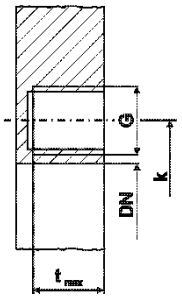


Outlet side according LOHSE standard:

Flange bores and internal dimensions of flange outlet end:



Threaded bore shapes with usable depth of thread



Nominal diameter DN 150 – 350				
Nominal diameter DN [imm]	150	200	250	300
Nominal diameter [inch]	6	8	10	14
Bore circle Ø k [inch]	9 ½	11 3/4	14 1/4	
• Number of threaded bores	4	4	4	3
○ Number of through bores	4	4	4	13
Thread size G [inch]	3/4	3/4	7/8	1
Distance between bores I [inch]				4 5/16
Usable depth of thread t [inch]	11/16	3/4	7/8	1
L [mm]	156	211	260	317
B [mm]	167	222	270	335
a [mm]	83	111	135	167
b [mm]	73	100	125	150

4.1.6.6 Additional flange bore dimensions

e.g. JIS, BS, see additional data sheet

4.2 Dismantling

ATTENTION

Risk of injury during dismantling

The system must be shut down prior to removing the valve. The system must also be secured against accidental startup. This also applies to upstream and downstream machines and pumps.

- Observe the safety instructions in chapter 2.

5 Maintenance

5.1 General

LOHSE valves are virtually maintenance free and easy to service. The maintenance tasks vary depending on the valve type and the operating conditions.

To ensure optimum operation of the valve and a long service life, it must be regularly serviced. Regularly inspect the valve, the attached actuator and all accessories to ensure safe and trouble-free operation. Check the flange bores for proper tightening torque of the flange bolts and inspect the flange seals (see manufacturer instructions).

5.2 Safety instructions

DANGER

Risk of injury from escaping media

Before carrying out any maintenance, cleaning and repair work, depressurise the line sections in front of and behind the valve and ensure that it cannot be inadvertently pressurised (by shutting down pumps and machines). Secure all connected pumps and machines

- against inadvertent switching on
- Empty the lines

DANGER

Risk of injury from shearing, crushing and snagging

Danger by moving valve parts that

- Safety devices must only be removed for maintenance work

After completion of the maintenance task, mount all safety devices

DANGER

Risk of injury from pressurised pneumatic or hydraulic cylinders

The moving cylinder rod of a pressurised pneumatic or hydraulic cylinder poses a risk of injury!

- Before carrying out maintenance, cleaning or repair work on the valve, pressure lines must be depressurised and removed.

DANGER

DANGER OF LIFE for users

Valves with electric actuators must be disconnected from the power supply.

- Disconnect the actuator or valve from the mains line. Secure the motor against inadvertent switching on.

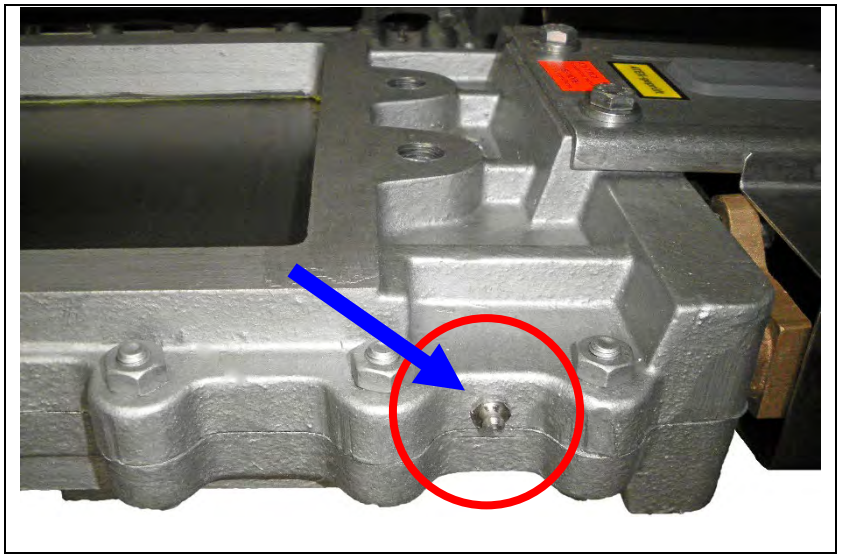
5.3 Cleaning of the valve

Dirt can impair the operation of the valve and must therefore be removed. Clean moving valve parts under consideration of safety instructions.

5.4 Lubrication of the valve

Moving parts (valve plate, stem) must be lubricated every 30 days with a product that is suitable for the operating range, conditions and medium.

Valves of types AEQ, NAQ and RQS are equipped with lubrication nipples on the housing.

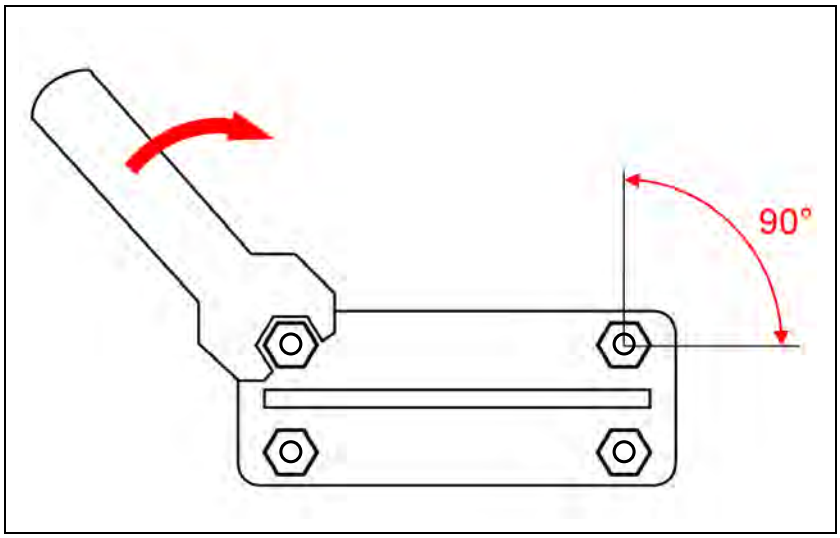


DN	Lubricant quantity per lubrication nipple [g]
100	30
150	30
200	30
250	45
300	45
350	45
400	60
500	60
600	60

5.5 Packing seals

If there is leakage at the packing seals, retighten them with the same torque (crosswise). Tighten the bolts in steps of ¼ revolutions (90°) until the leak is sealed.

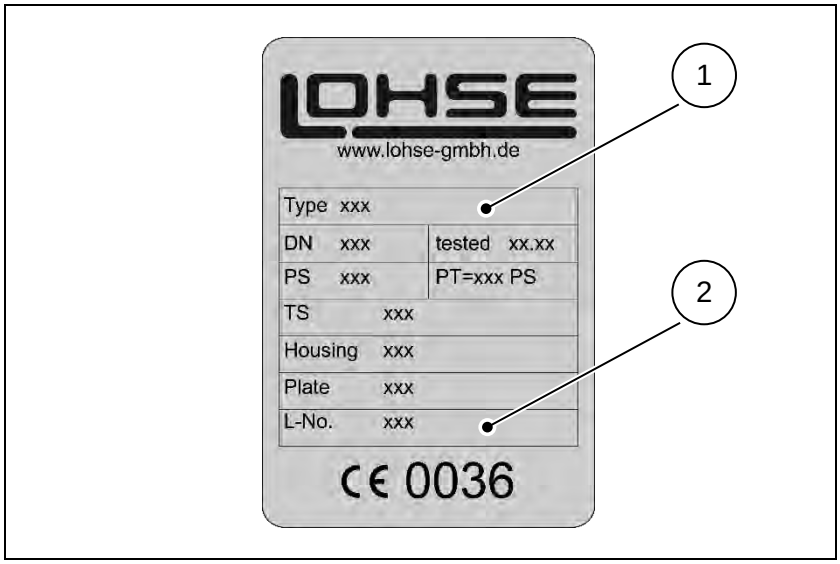
The maximum tightening torque of the respective screw must thereby not be exceeded.



If it is not possible to seal the leak by retightening the bolts, replace the packing seal (for details, see service instructions for the respective valve type).

5.6 Type plate

1	Type designation
2	L number



When ordering wear and spare parts, always quote the type designation and the L number (see type plate). Spare parts lists can be ordered separately.

5.7 Additional instructions

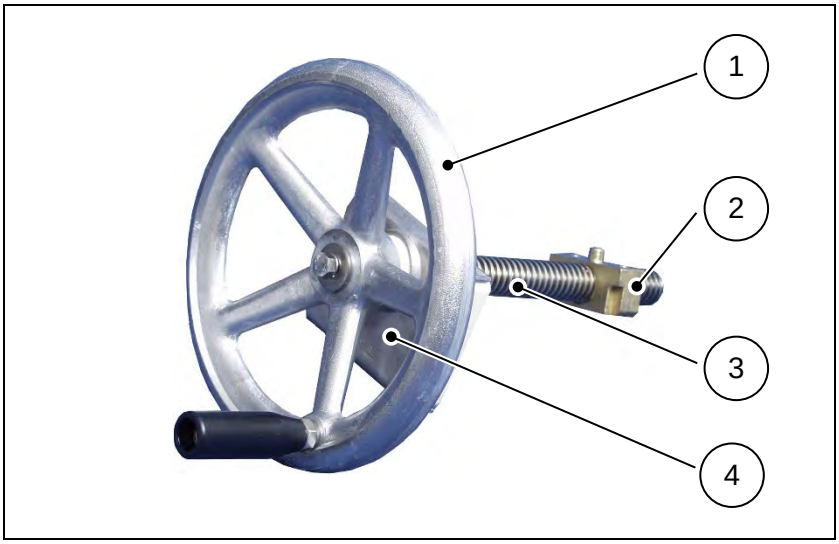
For additional information and maintenance instructions, please refer to the service manual.

6 Actuators for COMPACT valves and reject valves

6.1 Handwheel actuator

6.1.1 Handwheel, non-rising "Hns"

1	Attach a barrel handle to the handwheel of valves of type CNAHns, CBSHns and CAWHns up to DN 250
2	Stem nut
3	non-rising stems (left-hand trapezoidal thread)
4	Bracket plate for the fixture and bearing of the handwheel on the valve bracket



Valid for types: CNA, CNAA, CNA-Bi, CAW, CBS, CBS, CBSA, CGNA, CGBS

Nominal diameter DN	Handwheel Ø	Weight
50	180 mm	1.8 kg
65	180 mm	1.8 kg
80	180 mm	1.8 kg
100	225 mm	2.6 kg
125	225 mm	2.7 kg
150	225 mm	2.7 kg
200	280 mm	4.7 kg
250	280 mm	4.9 kg
300	360 mm	5.8 kg

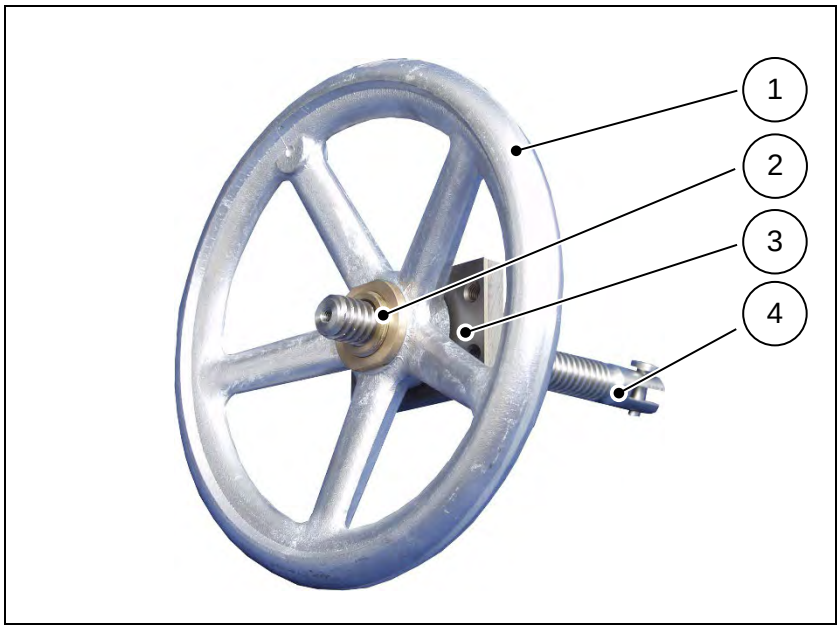
Valid for types: CDS, CDSV, CDSA, CDSR, CGDS, NAQ, RQS, RQSV, AEQ

Nominal diameter DN	Handwheel Ø	Weight
50	225 mm	1.8 kg
65	225 mm	2.4 kg
80	225 mm	2.4 kg
100	280 mm	3.9 kg
125	280 mm	4.1 kg
150	280 mm	4.3 kg
200	360 mm	5.7 kg
250	360 mm	6.0 kg

Nominal diameter DN	Handwheel Ø	Weight
300	360 mm	6.2 kg

6.1.2 Handwheel, rising "H"

1	Handwheel
2	Stem nut
3	Bracket plate for the fixture and bearing of the handwheel on the valve bracket
4	Rising stem (left-hand trapezoidal thread) with stop sleeve



Valid for all valve types

Nominal diameter DN	Handwheel Ø	Weight
50	225 mm	1.9 kg
65	225 mm	1.9 kg
80	225 mm	1.9 kg
100	280 mm	3.3 kg
125	280 mm	3.3 kg
150	280 mm	3.4 kg
200	360 mm	6.0 kg
250	360 mm	6.2 kg
300	360 mm	6.4 kg
350	500 mm	8.9 kg
400	500 mm	9.9 kg
450	500 mm	11.4 kg
500	500 mm	15.1 kg
600	640 mm	25.9 kg
700	800 mm	33.6 kg
800	800 mm	34.1 kg

6.1.3 Function

- Turn clockwise: valve "CLOSED"
- Turn anticlockwise: valve "OPEN"

6.1.4 Maintenance

- The stem must be cleaned and lubricated every 30 days with a product that is suitable for the operating range, conditions and medium.

6.1.5 Recommendation

For valves with handwheels a nominal diameter of more than DN 300, we recommend using a bevel gear drive mechanism.

6.2 LOHSE pneumatic cylinders

LOHSE pneumatic cylinders are controlled with compressed air at pressures of between 5 and 7 bar (6 bar*) through a multi-port valve. The control valve can be operated manually, electrically (solenoid valve) or pneumatically.

Optimum function at 6 bar. A minimum pressure of 5 bar is required to operate the valve under normal operating conditions. The maximum pressure of 7 bar (6 bar*) must not be exceeded.

LOHSE pneumatic cylinders are virtually maintenance-free. They are factory-lubricated.

* PC Ø 500 for max. 6 bar

Caution

Risk of damage to property from improperly treated compressed air

Improperly treated compressed air can cause damage to valve components.

- Use only properly treated compressed air. Always install a filter unit that removes particles greater than 40 µm.
- The compressed air must be dry (no moisture) and uncontaminated by aggressive media.
- Once oiled compressed air has been used, you must continue using oiled compressed air.

LOHSE pneumatic cylinders are factory-set for the respective valve type and size.

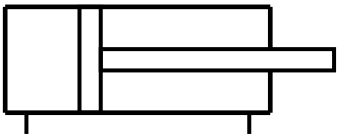
Caution

Risk of damage to property from changed settings

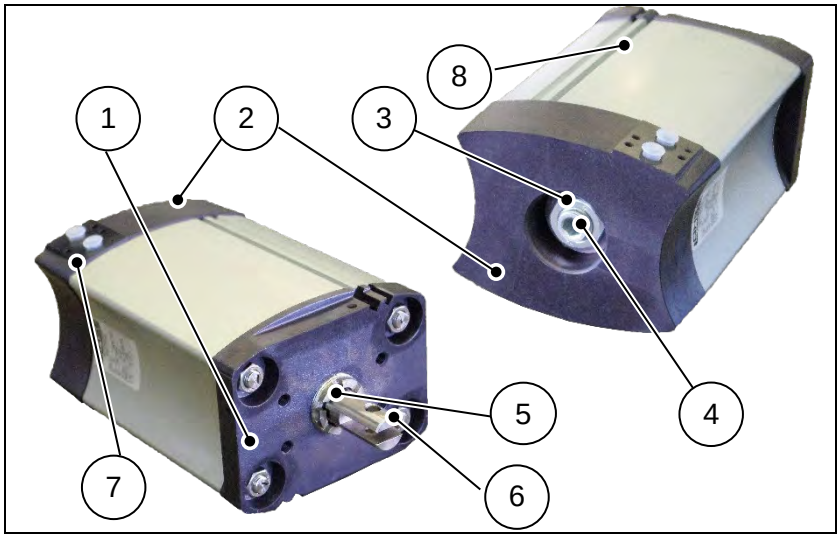
Incorrect changes to the stroke can cause damage to valve components.

- Changes to the settings are only permitted after consultation with MARTIN LOHSE GmbH.

6.2.1 Pneumatic cylinder VC (double-acting)



1	Cylinder base
2	Cylinder cover
3	Nut
4	Adjusting screw
5	Adjusting nut
6	Cylinder rod
7	NAMUR interface in accordance with VDI/VDE 384
8	slot for solenoid switch



LOHSE VC pneumatic cylinders are double-acting cylinders. In closing direction, the stroke can be adjusted with the adjusting nut (5). In opening direction, it can be adjusted with the adjusting screw (4).

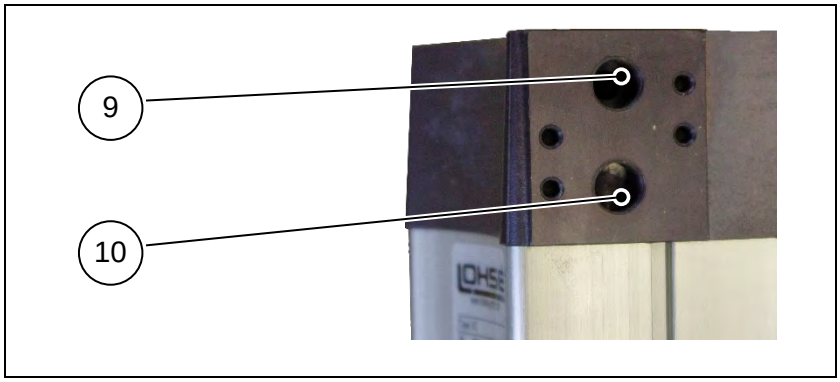
Sizes: Ø 100 to Ø 230

For solenoid valves the cylinder tube is equipped on both sides with a T-slot (5.5 mm) and a C-slot (3.2 mm), respectively.

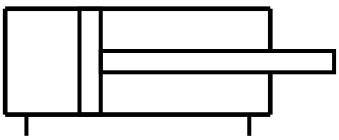
Stroke: adjusted to suit valve type and size

NAMUR interface:

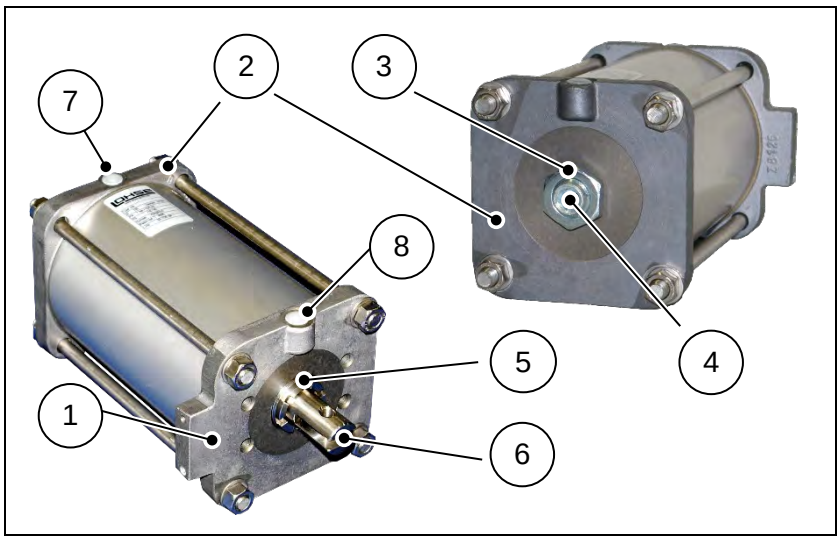
9	Air connection (extend)
10	Air connection (retract)



6.2.2 Pneumatic cylinder VM (double-acting)



1	Cylinder base
2	Cylinder cover
3	Nut
4	Adjusting screw
5	Adjusting nut
6	Cylinder rod
7	Air connection (extend)
8	Air connection (retract)

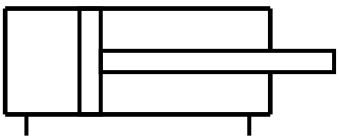


LOHSE VM pneumatic cylinders are double-acting cylinders. In closing direction, the stroke can be adjusted with the adjusting nut (5). In opening direction, it can be adjusted with the adjusting screw (4).

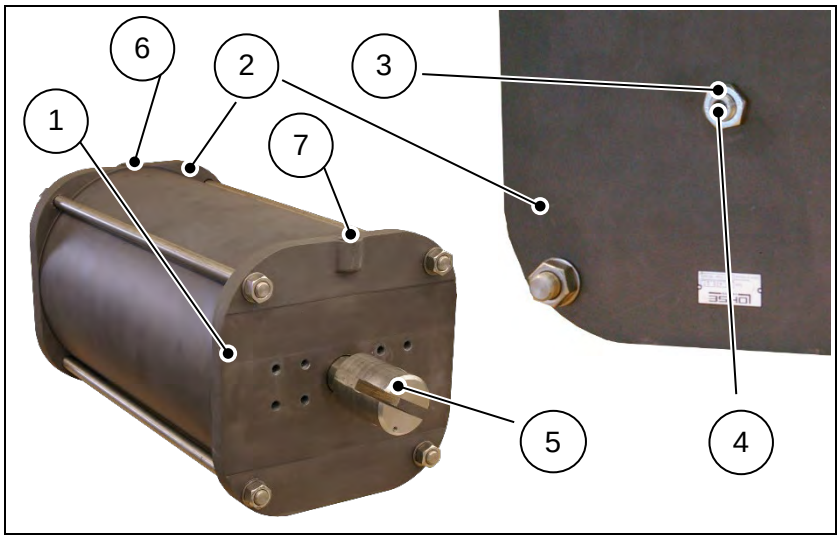
Sizes: Ø 300

Stroke: adjusted to suit valve type and size

6.2.3 Pneumatic cylinder PZ (double-acting)



1	Cylinder base
2	Cylinder cover
3	Nut
4	Adjusting screw
5	Cylinder rod with fork head
6	Air connection (extend)
7	Air connection (retract)

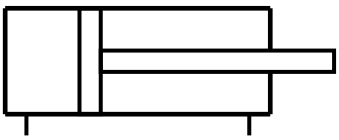


LOHSE PZ pneumatic cylinders are equipped with a fixed stop in closing direction (no adjusting nut). In opening direction, their stroke can be adjusted by means of the adjusting screw (4).

Sizes: Ø 400 and Ø 500

Stroke: adjusted to suit valve type and size

6.2.4 Pneumatic cylinder VMV (double-acting)

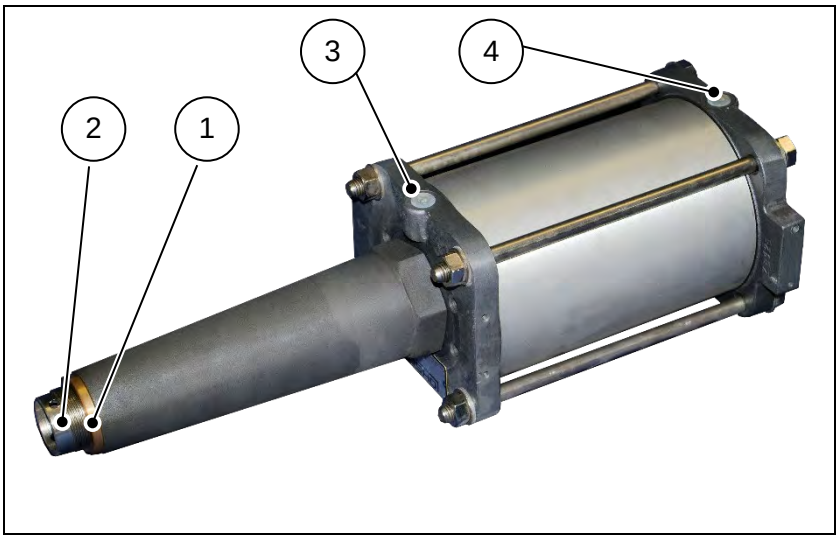


LOHSE VMV pneumatic cylinders are cylinders with adjustable stroke limitation across the entire stroke length.

- VMV "CLOSED" stop in closing direction
- VMV "OPEN" stop in opening direction

6.2.4.1 Pneumatic cylinder VMV "CLOSE"

1	Nut
2	Adjusting tube
3	Air connection (extend)
4	Air connection (retract)



The stroke can only be adjusted, if the valve is fully opened.

1 Loosen nut (1).

2 Adjust adjusting tube (2).

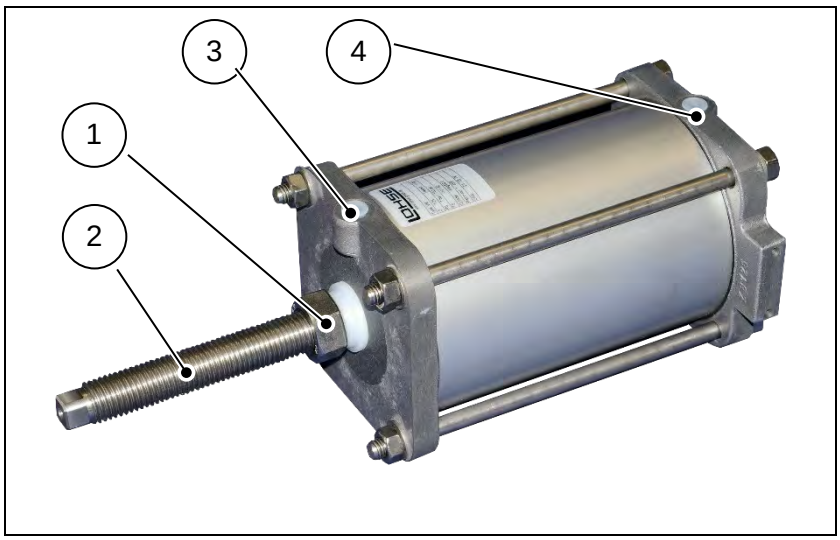
- Turn adjusting tube clockwise: the stroke in closing direction of the valve is increased.
- Turn adjusting tube anticlockwise: the stroke in closing direction of the valve is reduced.

Up to VMV cylinder Ø 200, one revolution of the adjusting tube corresponds to a stroke adjustment of 1.5 mm. From VMV cylinder Ø 230, one revolution of the adjusting tube corresponds to a stroke adjustment of 2 mm.

3 Tighten nut (1).

6.2.4.2 Pneumatic cylinder VMV "OPEN"

1	Nut
2	Adjusting screw
3	Air connection (extend)
4	Air connection (retract)



The stroke can only be adjusted, if the valve is fully closed.

1 Loosen nut (1).

2 Adjust adjusting screw (2).

- Turn clockwise: the stroke in opening direction of the valve is reduced.
- Turn anticlockwise: the stroke in opening direction of the valve is increased.

In VMV cylinder Ø 100, one revolution of the adjusting screw corresponds to a stroke adjustment of 2 mm. From VMV cylinder Ø 125, one revolution of the adjusting screw corresponds to a stroke adjustment of 3 mm.

3 Tighten nut (1).

6.2.5 Pneumatic cylinder VMF (single-acting)

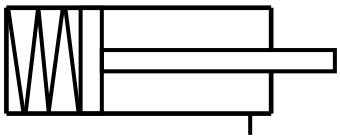
LOHSE VMF pneumatic cylinders are single-acting cylinders that are closed or opened by spring force.

LOHSE VMF pneumatic cylinders are factory-set and sealed with a seal for safety reasons.

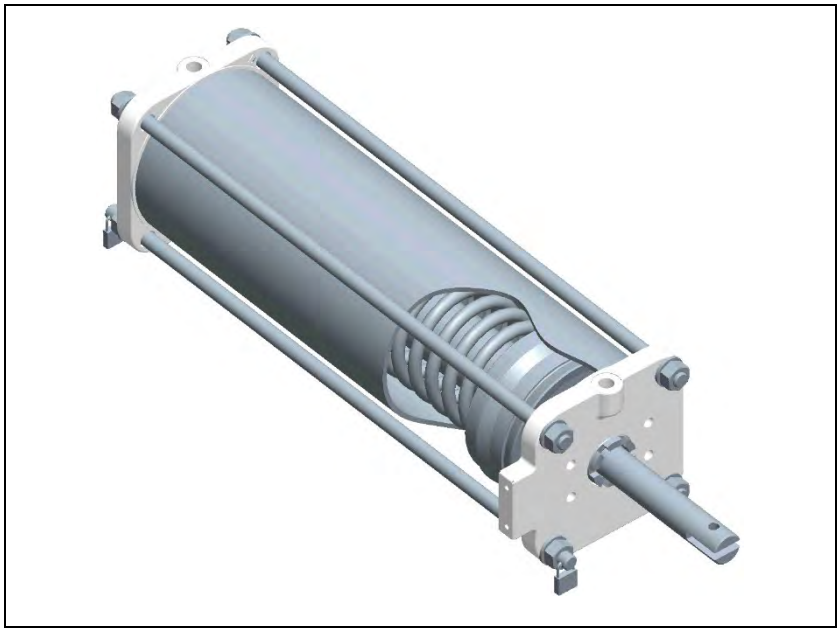
If the seal is missing or damaged, it is forbidden to operate the cylinder!

Sizes: Ø 125 to Ø 200

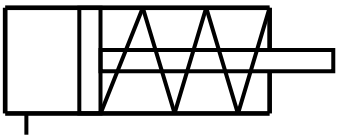
Stroke: adjusted to suit valve type and size



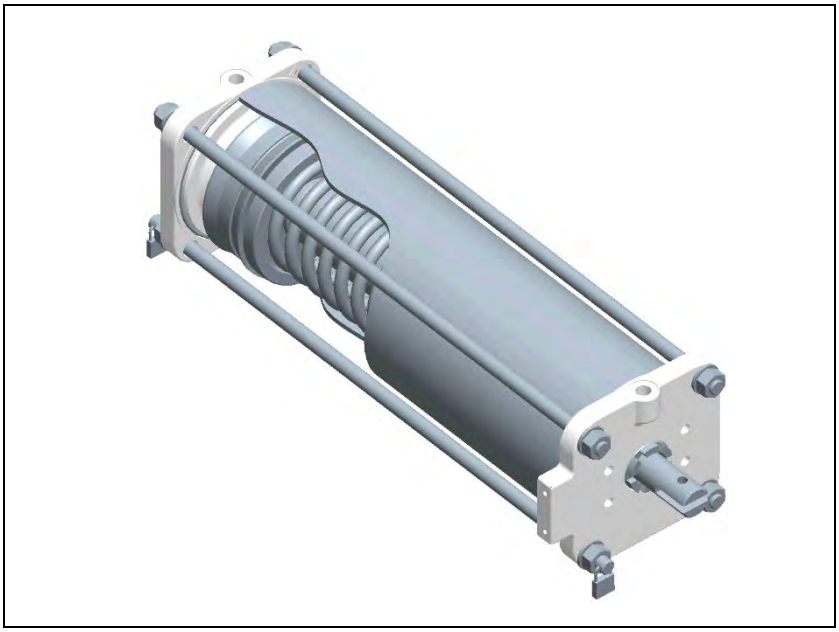
6.2.5.1 Pneumatic cylinder VMF "spring-closing"



When not pressurised, the cylinder rod is fully extended.



6.2.5.2 Pneumatic cylinder VMF "spring-opening"



When not pressurised, the cylinder rod is fully retracted.

6.2.6 Maintenance

DANGER

Risk of injury from pressurised pneumatic cylinders

The moving cylinder rod of a pressurised pneumatic cylinder poses a risk of injury!

- Before carrying out maintenance or repair work on the pneumatic cylinder, disconnect the pneumatic lines.

DANGER

Risk of injury from stressed compression springs

If the components are dismantled without proper care, there is a risk of injury from the highly stressed compression springs.

- Pneumatic cylinders with spring return mechanism must be dismantled by specially instructed personnel! After repair, one pressure rod must be secured with a lead seal!

6.2.7 Accessories

- Multi-port valve
- Silencer
- Flow control valve
- Air-controlled directional valve (booster)

6.2.8 Air consumption

Formula for the calculation of the air consumption in double-acting and single acting pneumatic cylinders (VM, PZ, VMV, VMF)

$$Q\ [Nl/stroke] = \frac{1.033 + P}{1.033} \times \text{piston surface } [dm^2] \times \text{stroke } [dm]$$

P = operating pressure [bar]

Q = air volume [normal litre / stroke]

CNAP				CBSP				CDSP/CDSVP/CDSAP/CDSRP			
DN [mm]	**Cyl. Ø [mm]**	**Stroke [mm]**	**Q [Nl/stroke] p=6 bar**	**DN [mm]**	**Cyl. Ø [mm]**	**Stroke [mm]**	**Q [Nl/stroke] p=6 bar**	**DN [mm]**	**Cyl. Ø [mm]**	**Stroke [mm]**	**Q [Nl/stroke] p=6 bar**
50	100	56	3,0	**50**	100	62	3,4	**50**	100	58	3,1
65	100	73	3,9	**65**	100	73	3,9	**65**	100	73	4,0
80	100	89	4,8	**80**	100	89	4,8	**80**	100	88	4,7
100	100	106	5,7	**100**	100	106	5,7	**100**	125	109	9,1
125	125	132	11,0	**125**	125	132	11,0	**125**	125	134	11,2
150	125	156	13,0	**150**	125	156	13,0	**150**	160	159	21,8
200	160	210	28,7	**200**	160	210	28,7	**200**	200	210	44,9
250	160	260	35,6	**250**	160	260	35,6	**250**	200	260	55,6
300	160	312	42,7	**300**	160	312	42,7	**300**	230	310	87,7
350	200	362	77,4	**350**	200	362	77,4	**350**	300	360	173,2
400	200	412	88,1	**400**	200	412	88,1	**400**	300	410	197,3
450	230	462	130,6	**450**	230	462	130,6	**450**	300	460	221,4
500	230	512	144,8	**500**	230	512	144,8	**500**	400	512	437,8
600	300	612	294,5	**600**	300	612	294,5	**600**	400	612	523,4
700	400	712	598,9	**700**	400	712	598,9	**700**	500	715	955,3
800	400	812	694,7					**800**	500	815	1089,0

CAWP				TAP / TAQP				CPDP			
DN [mm]	Cyl. Ø [mm]	Stroke [mm]	Q [Nl/stroke] p=6 bar	DN [mm]	Cyl. Ø [mm]	Stroke [mm]	Q [Nl/stroke] p=6 bar	DN [mm]	Cyl. Ø [mm]	Stroke [mm]	Q [Nl/stroke] p=6 bar
50	100	52	2,8								
65	100	67	3,6								
80	100	82	4,4					**80**	100	85	4,5
100	100	99	5,3	**100**	125	50	4,2	**100**	100	105	5,6
125	125	124	10,4	**125**	125	62,5	5,2	**125**	100	130	7,0
150	125	149	12,5	**150**	160	75	9,0	**150**	100	155	8,3
200	160	202	27,6	**200**	200	100	21,4	**200**	125	205	17,1
250	160	252	34,5	**250**	200	125	26,7	**250**	125	255	21,3
300	160	302	47,4	**300**	230	150	42,4	**300**	160	305	41,7
350	200	352	75,3	**350**	300	175	84,2	**350**	160	355	48,6
400	200	402	86,0	**400**	300	200	96,2	**400**	160	405	55,5
450	230	452	127,8	**450**	300	225	108,3				
500	230	502	142,0	**500**	400	250	213,8				
600	300	602	289,7	**600**	400	300	256,5				
700	400	702	600,3	**700**	500	350	467,6				
800	400	802	685,8	**800**	500	400	534,5				

RQSP / NAQP				AEQP				TREP			
DN [mm]	Cyl. Ø [mm]	Stroke [mm]	Q [Nl/stroke] p=6 bar	DN [mm]	Cyl. Ø [mm]	Stroke [mm]	Q [Nl/stroke] p=6 bar	DN [mm]	Cyl. Ø [mm]	Stroke [mm]	Q [Nl/stroke] p=6 bar
100	125	114	9,5	**100**	125	102	8,5				
150	160	164	22,5	**150**	160	147	20,2	**150**	160	77,6	10,6
200	200	214	45,8	**200**	200	202	43,2	**200**	200	103,5	22,1
250	200	275	58,8	**250**	200	247	52,8	**250**	200	129,4	27,7
300	230	325	91,9	**300**	230	302	85,3	**300**	230	155,3	43,9
350	300	375	180,4	**350**	300	352	169,3	**350**			
400	300	425	204,5	**400**	300	402	193,5	**400**	300	207,1	99,7
500	400	530	453,3	**500**	400	502	429,3	**500**	400	258,8	221,3
600	400	630	538,7	**600**	400	602	514,8	**600**	400	310,6	265,6
800	500	830	1109,0								

SAQP			
DN [mm]	Zyl. Ø [mm]	Hub [mm]	Q [Nl/Hub] p=6 bar
400	300	420	202,0
500	400	525	448,9
600	400	625	534,5
800	500	825	1102,3

6.2.9 Closing force

Cyl. ø [mm]	Operating pressure 6 [bar] (60 N/cm²)
100	4,7 kN
125	7,4 kN
145	9,9 kN
160	12,1 kN
175	14,4 kN
200	18,9 kN
230	24,9 kN
300	42,4 kN
400	75,4 kN
500	117,8 kN

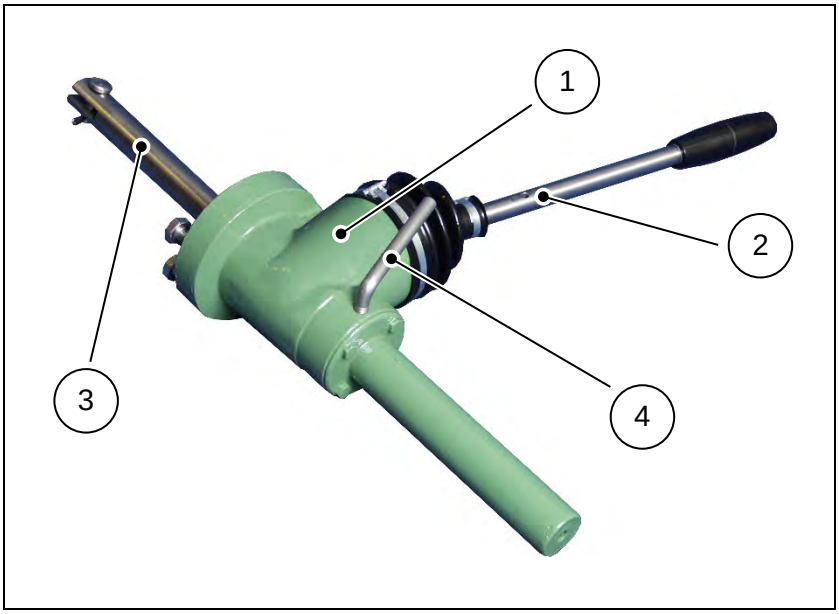
6.2.10 Compressed air connection

Cyl. ø [mm]	Compressed air connection	Min. line inside ø	Min. pressure	Max. pressure
100	G $^1/_4$"	7 mm	5 bar	7 bar
125	G $^1/_4$"	7 mm	5 bar	7 bar
145	G $^1/_4$"	7 mm	5 bar	7 bar
160	G $^1/_4$"	7 mm	5 bar	7 bar
175	G $^1/_2$"	11 mm	5 bar	7 bar
200	G $^1/_2$"	11 mm	5 bar	7 bar
230	G $^1/_2$"	11 mm	5 bar	7 bar
300	G $^1/_2$"	11 mm	5 bar	7 bar
400	G $^3/_4$"	20 mm	5 bar	7 bar
500	G $^3/_4$"	20 mm	5 bar	7 bar

6.3 Lever drive

6.3.1 Design

1	Stroke lever housing
2	Transport lever
3	Transport rod
4	Locking lever screw



6.3.2 Function

The valve is gradually closed and opened by moving the transport lever up or down respectively. The stroke lever must subsequently be locked with the lever locking screw (not self-locking).

The stroke lever mechanism can be repositioned on the valve in steps of 45°.

6.3.3 Maintenance

Regularly clean the transport lever to remove all dirt with proper cleaning material.

6.4 Electrical actuator

In principle, the valves can be operated with all conventional electrical actuators. The technical data in the following tables refers to the AUMA model designed for 400 V / 50 Hz.

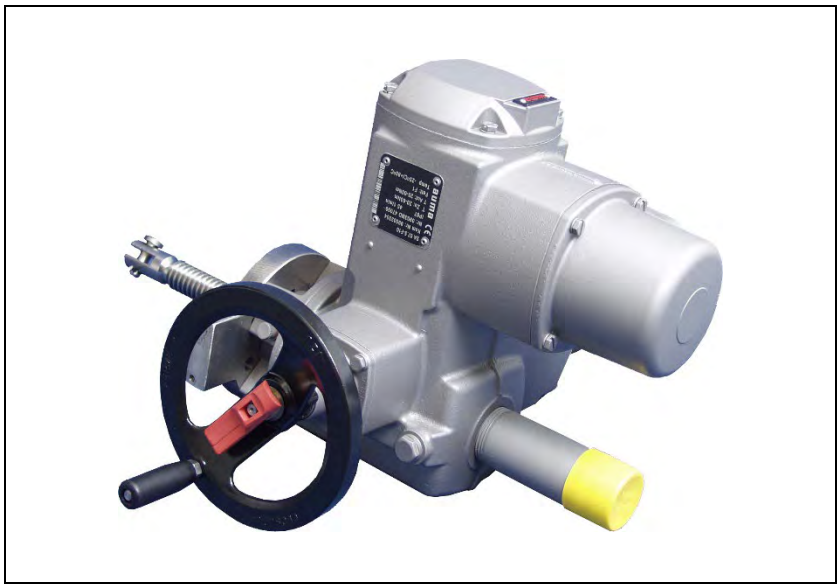
The stem tube is delivered separately and must be attached to the actuator before it can be commissioned.

Caution

Adjustment of the electrical actuator settings

Incorrectly set travel and torque settings can cause damage to the valve.

- Adjust the settings as described in the operating manual of the actuator manufacturer and the details provided in the tables below.



6.4.1 Electrical actuators for CNA, CNAA, CNA-Bi, CGNA

DN	Actuator type (AUMA)	Torque		Actuating time	Power
		opening	closing		
50	SA 07.2 A45	30 Nm	20 Nm	17.3 sec	0.10 kW
65	SA 07.2 A45	30 Nm	20 Nm	24.4 sec	0.10 kW
80	SA 07.2 A45	30 Nm	20 Nm	29.7 sec	0.10 kW
100	SA 07.6 A45	30 Nm	20 Nm	28.3 sec	0.20 kW
125	SA 07.6 A45	40 Nm	30 Nm	35.2 sec	0.20 kW
150	SA 07.6 A45	40 Nm	30 Nm	41.6 sec	0.20 kW
200	SA 10.2 A45	80 Nm	60 Nm	46.7 sec	0.40 kW
250	SA 10.2 A45	80 Nm	60 Nm	57.8 sec	0.40 kW
300	SA 10.2 A45	80 Nm	60 Nm	68.9 sec	0.40 kW
350	SA 10.2 A45	120 Nm	80 Nm	78.0 sec	0.40 kW
400	SA 10.2 A45	120 Nm	80 Nm	90.0 sec	0.40 kW
450	SA 10.2 A45	120 Nm	80 Nm	101.0 sec	0.40 kW
500	SA 14.2 A45	250 Nm	200 Nm	112.0 sec	0.75 kW
600	SA 14.2 A63	250 Nm	200 Nm	83.0 sec	1.40 kW
700	SA 14.6 A63	500 Nm	400 Nm	97.0 sec	3.00 kW
800	SA 14.6 A63	500 Nm	400 Nm	110.0 sec	3.00 kW
900	SA 16.2 A63	800 Nm	600 Nm	108.4 sec	3.00 kW
1000	SA 16.2 A63	800 Nm	600 Nm	120.8 sec	5.00 kW
1200	SA 16.2 A63	800 Nm	700 Nm	129.6 sec	5.00 kW
1400	SA 25.1 A63	1800 Nm	1400 Nm	136.2 sec	15.00 kW
1600	SA 30.1 A63	2400 Nm	2000 Nm	129.4 sec	30.00 kW
1800	SA 16.2 A45 + GST 30.1	2400 Nm	2000 Nm	666.9 sec	3 kW

6.4.2 Electrical actuators for CAW

DN	Actuator type (AUMA)	Torque		Actuating time	Power
		opening	closing		
50	SA 07.2 A45	30 Nm	20 Nm	17.3 sec	0.10 kW
65	SA 07.2 A45	30 Nm	20 Nm	22.4 sec	0.10 kW
80	SA 07.2 A45	30 Nm	20 Nm	27.3 sec	0.10 kW
100	SA 07.6 A45	30 Nm	20 Nm	26.4 sec	0.20 kW
125	SA 07.6 A45	40 Nm	30 Nm	33.1 sec	0.20 kW
150	SA 07.6 A45	40 Nm	30 Nm	39.7 sec	0.20 kW
200	SA 10.2 A45	80 Nm	60 Nm	44.8 sec	0.40 kW
250	SA 10.2 A45	80 Nm	60 Nm	56.0 sec	0.40 kW
300	SA 10.2 A45	80 Nm	60 Nm	67.1 sec	0.40 kW
350	SA 10.2 A45	120 Nm	80 Nm	78.2 sec	0.40 kW
400	SA 10.2 A45	120 Nm	80 Nm	89.3 sec	0.40 kW
450	SA 10.2 A45	120 Nm	80 Nm	100.4 sec	0.40 kW
500	SA 14.2 A45	250 Nm	200 Nm	111.6 sec	0.75 kW
600	SA 14.2 A63	250 Nm	200 Nm	81.9 sec	1.40 kW
700	SA 14.6 A63	500 Nm	400 Nm	99.5 sec	3.00 kW
800	SA 14.6 A63	500 Nm	400 Nm	109.1 sec	3.00 kW
900	SA 16.2 A63	800 Nm	700 Nm	107.6 sec	3.00 kW
1000	SA 16.2 A63	800 Nm	700 Nm	119.5 sec	5.00 kW

6.4.3 Electrical actuators for CBS, CBSA, CGBS (triangular or pentagonal orifice)

DN	Actuator type (AUMA)	Torque		Actuating time		Power
		opening	closing	triangular	pentagonal	
50	SA 07.2 A11	30 Nm	20 Nm	55.9 sec	66.8 sec	0.045 kW
65	SA 07.2 A11	30 Nm	20 Nm	70.9 sec	84.5 sec	0.045 kW
80	SA 07.2 A11	30 Nm	20 Nm	85.9 sec	103.6 sec	0.045 kW
100	SA 07.6 A11	30 Nm	20 Nm	85.0 sec	102.5 sec	0.09 kW
125	SA 07.6 A11	40 Nm	30 Nm	105.8 sec	126.5 sec	0.09 kW
150	SA 07.6 A11	40 Nm	30 Nm	127.6 sec	151.6 sec	0.09 kW
200	SA 10.2 A11	80 Nm	60 Nm	113.1 sec	167.3 sec	0.18 kW
250	SA 10.2 A11	80 Nm	60 Nm	173.6 sec	208.2 sec	0.18 kW
300	SA 10.2 A11	80 Nm	60 Nm	207.3 sec	249.1 sec	0.18 kW
350	SA 10.2 A16	120 Nm	80 Nm	166.3 sec	200.0 sec	0.37 kW
400	SA 10.2 A16	120 Nm	80 Nm	189.4 sec	228.2 sec	0.37 kW
450	SA 10.2 A16	120 Nm	80 Nm	213.1 sec	256.3 sec	0.37 kW
500	SA 14.2 A16	250 Nm	150 Nm	236.3 sec	284.4 sec	0.75 kW
600	SA 14.2 A22	250 Nm	150 Nm	183.1 sec	212.7 sec	0.75 kW
700	SA 14.6 A22	500 Nm	300 Nm	208.4 sec	250.5 sec	1.50 kW
800	SA 14.6 A22	500 Nm	300 Nm	235.8 sec	283.6 sec	1.50 kW

6.4.4 Electrical actuators for CDS, CDSV, CDSA, CDSR, CDSQ, CGDS

DN	Actuator type (AUMA)	Torque		Actuating time	Power
		opening	closing		
50	SA 07.6 A45	30 Nm	20 Nm	19.3 sec	0.20 kW
65	SA 07.6 A45	30 Nm	20 Nm	24.3 sec	0.20 kW
80	SA 07.6 A45	30 Nm	20 Nm	29.3 sec	0.20 kW
100	SA 07.6 A45	30 Nm	20 Nm	29.1 sec	0.20 kW
125	SA 07.6 A45	40 Nm	30 Nm	35.7 sec	0.20 kW
150	SA 07.6 A45	40 Nm	30 Nm	42.4 sec	0.20 kW
200	SA 10.2 A45	80 Nm	60 Nm	45.0 sec	0.40 kW
250	SA 10.2 A45	80 Nm	60 Nm	56.4 sec	0.40 kW
300	SA 10.2 A45	80 Nm	60 Nm	68.9 sec	0.40 kW
350	SA 14.2 A45	120 Nm	80 Nm	78.4 sec	0.75 kW
400	SA 14.2 A45	120 Nm	80 Nm	89.8 sec	0.75 kW
450	SA 14.2 A45	120 Nm	80 Nm	100.9 sec	0.75 kW
500	SA 14.6 A45	250 Nm	200 Nm	112.2 sec	1.60 kW
600	SA 14.6 A63	250 Nm	200 Nm	83.0 sec	3.00 kW
700	SA 14.6 A63	500 Nm	400 Nm	96.6 sec	3.00 kW
800	SA 14.6 A63	500 Nm	400 Nm	110.2 sec	3.00 kW
900	SA 16.2 A63	900 Nm	700 Nm	108.4 sec	5.00 kW
1000	SA 16.2 A63	900 Nm	700 Nm	120.8 sec	5.00 kW
1200	SA 25.1 A63	1800 Nm	1400 Nm	116.7 sec	15.00 kW
1400	SA 25.1 A63	1800 Nm	1400 Nm	136.2 sec	15.00 kW
1600	SA 30.1 A63	2400 Nm	2000 Nm	129.4 sec	30.00 kW
1800	SA 16.2 A45 + GST 30.1	2200 Nm	2200 Nm	561,0 sec	3,00 kW

6.4.5 Operating manual of actuator

Observe the instructions in the operating manual of the respective electrical actuator manufacturer.

6.4.6 Maintenance

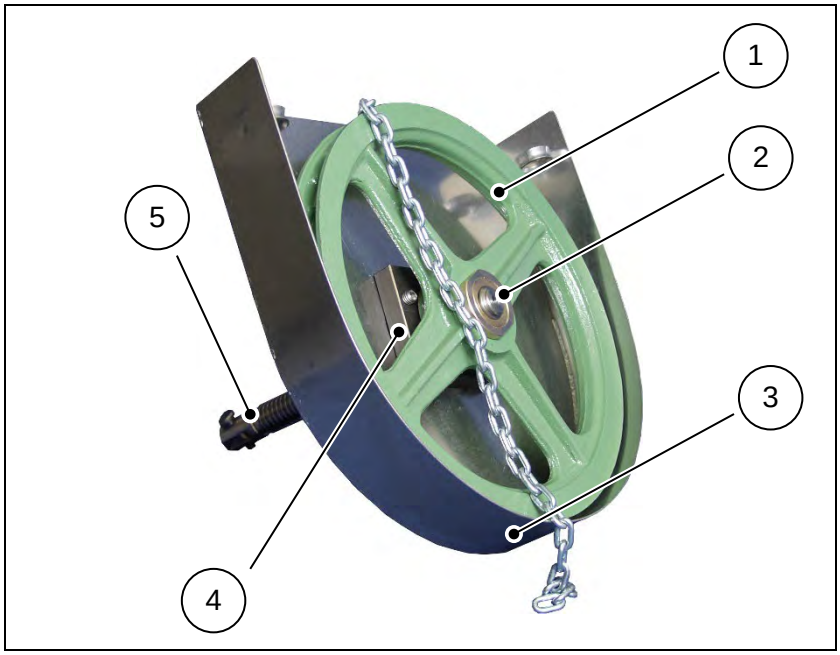
- The stem must be cleaned and lubricated every 30 days with a product that is suitable for the operating range, conditions and medium.

6.4.7 Note

Actuators supplied by MARTIN LOHSE GmbH are factory-set.

6.5 Chain wheel actuator

1	Sprocket wheel (for DIN 766 A round steel chains)
2	Stem nut
3	Safety device
4	Bracket plate for the fixture and bearing of the sprocket wheel and the safety device on the valve bracket
5	rising stem



Nominal diameter DN for all COMPACT and reject valves	Sprocket wheel Ø
50	260 mm
65	260 mm
80	260 mm
100	300 mm
125	300 mm
150	300 mm
200	380 mm
250	380 mm
300	380 mm
350	500 mm
400	500 mm

6.5.1 Alignment of chain guide

Upon mounting, align the chain guide to the installation position of the valve, completing the following steps:

- Loosen the fastening bolts from the bracket plate.
- Align the safety device with the chain guide by turning it on the valve bracket to the desired position.
- Tighten the fastening bolts.

6.5.2 Function

- Turn clockwise: valve "CLOSED"

- Turn anticlockwise: valve "OPEN"

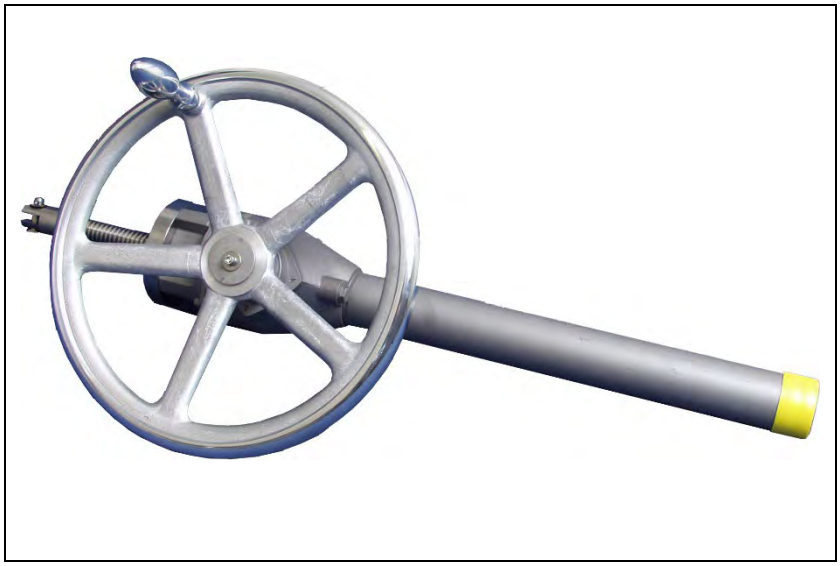
6.5.3 Maintenance

- The stem must be cleaned and lubricated every 30 days with a product that is suitable for the operating range, conditions and medium.

6.6 Bevel gear actuator

In principle, the valves can be operated with all conventional bevel gear actuators. The technical data in the tables below refer to AUMA actuators.

The stem tube is delivered separately and must be attached to the actuator before it can be commissioned.



Nominal diameter DN for all COMPACT and reject valves	Bevel gear actuator type (AUMA)	Handwheel Ø
150 - 300	GK10.2	360 mm
350 - 500	GK10.2	400 mm
600 - 800	GK14.2	500 mm
900 - 1000	GK14.6	640 mm

6.6.1 Technical data

- Bevel gear actuator types 10.2 and 14.2 are single-speed gear mechanisms
- Speed reduction ratio i = 2:1
- Max. torque:
  GK 10.2 : 120 Nm
  GK 14.2 : 250 Nm
  GK 14.6 : 500 Nm

6.6.2 Function

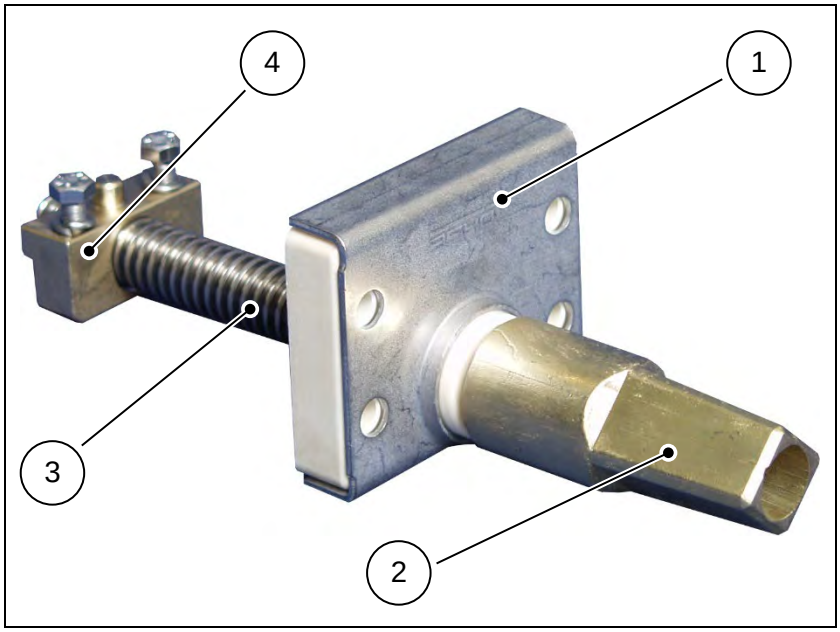
- The actuators are operated manually.
- Turn clockwise: valve "CLOSED"
- Turn anticlockwise: valve "OPEN"

6.6.3 Maintenance

- The stem must be cleaned and lubricated every 30 days with a product that is suitable for the operating range, conditions and medium.

6.7 Square head actuator

1	Bracket plate for the fixture and bearing of the square head on the valve bracket
2	Square head DIN 3223 "C"
3	non-rising stem
4	Stem nut



6.7.1 Function

- The square head actuator is operated by means of a DIN 3223 "C" fitting wrench.
- Turn clockwise: valve "CLOSED"
- Turn anticlockwise: valve "OPEN"

6.7.2 Maintenance

- The stem must be cleaned and lubricated every 30 days with a product that is suitable for the operating range, conditions and medium.

6.8 Hydraulic cylinder

In principle, the valves can be operated with all conventional hydraulic cylinder units. For technical data, refer to the documentation of the respective manufacturer.

6.8.1 Operating manual of the hydraulic cylinder

Observe the instructions in the operating manual of the respective hydraulic cylinder manufacturer.

6.8.2 Maintenance

- According to manufacturer instructions.

6.8.3 Note

Hydraulic cylinders supplied by MARTIN LOHSE GmbH are adjusted to suit the respective valve type.

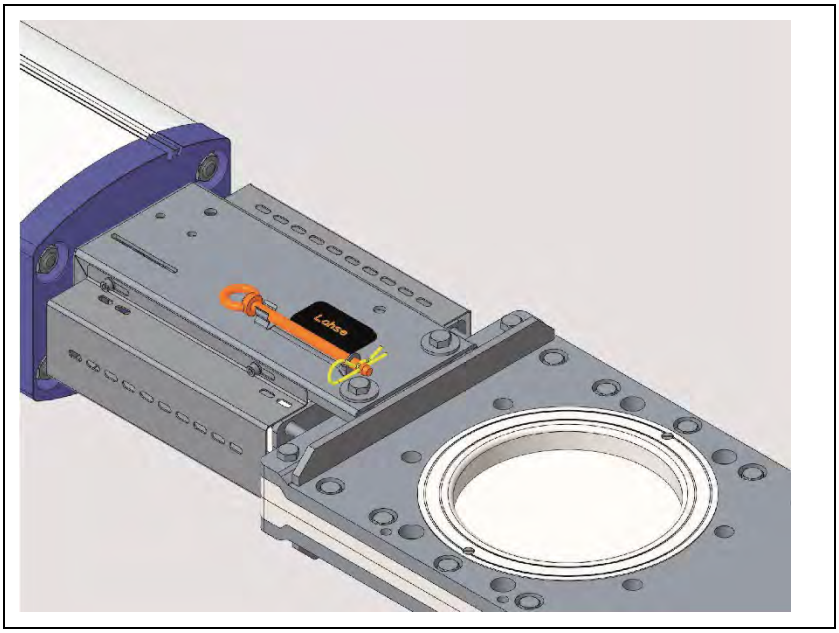
7 Optional equipment

7.1 Locking device

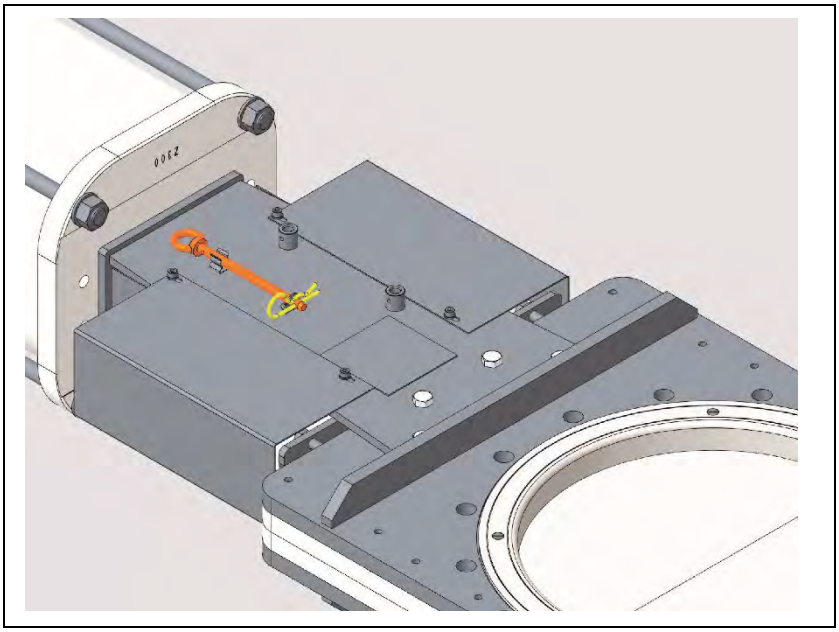
The LOHSE locking device makes it possible to secure the valve against unintentional / automatic movement during shutdown, maintenance work or similar.

7.1.1 Locking bolt with safety split pin in delivery condition:

Valves type CNA/CAW/CBS/CDS/RQS/NAQ/AEQ:



Valves type TA/TAQ:

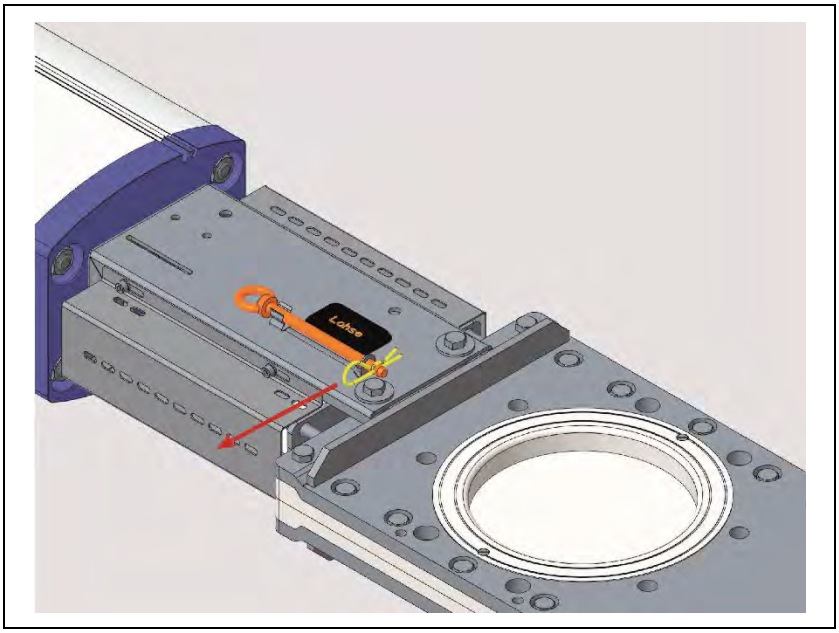


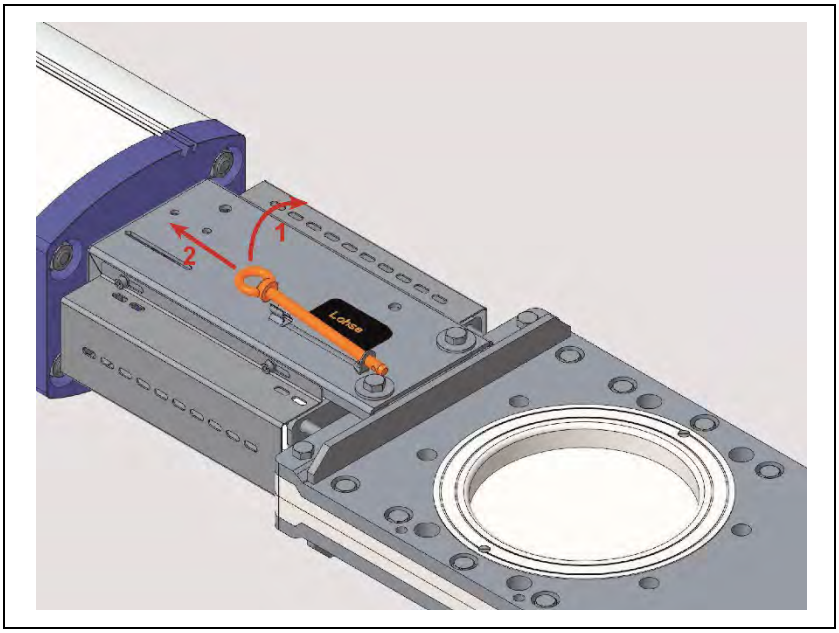
7.1.2 Before maintenance work

Locking the valve

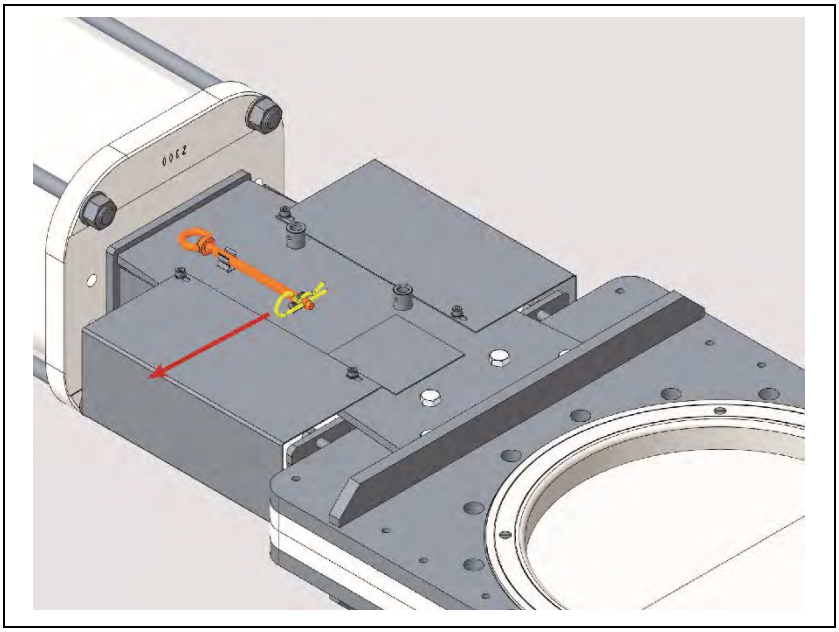
If a LOHSE valve has to be locked in one position, pull the safety split pin and remove the locking bolt from its holder.

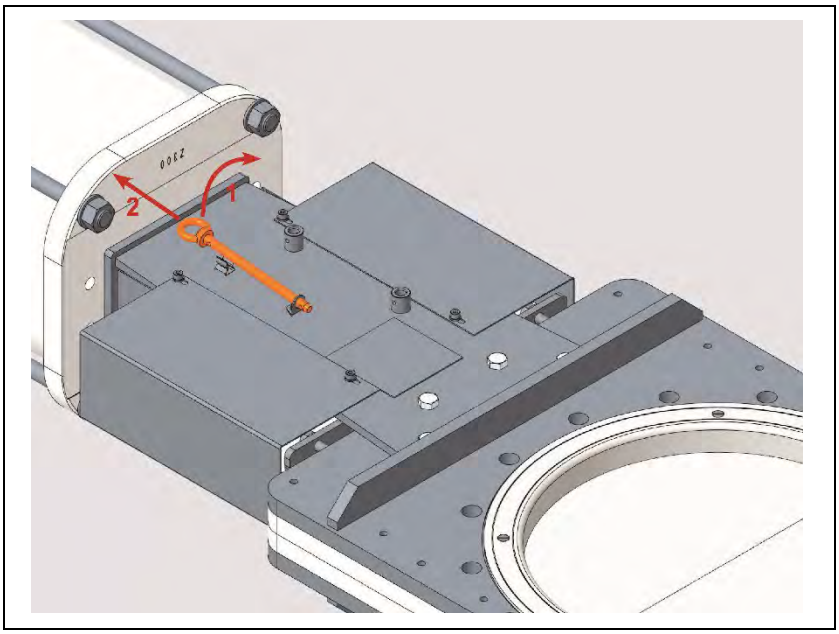
Valves type CNA/CAW/CBS/CDS/RQS/NAQ/AEQ:





Valves type TA/TAQ:





Move the valve to the desired position in which it should be locked: "valve OPEN" or "valve CLOSED".

After reaching the position ("OPEN" or "CLOSED"), make sure to depressurise and de-energise the valve, the actuator and the pipeline!

The locking bolt is designed to prevent the valve plate from moving under its own weight!

CAUTION

Risk of damage and injury

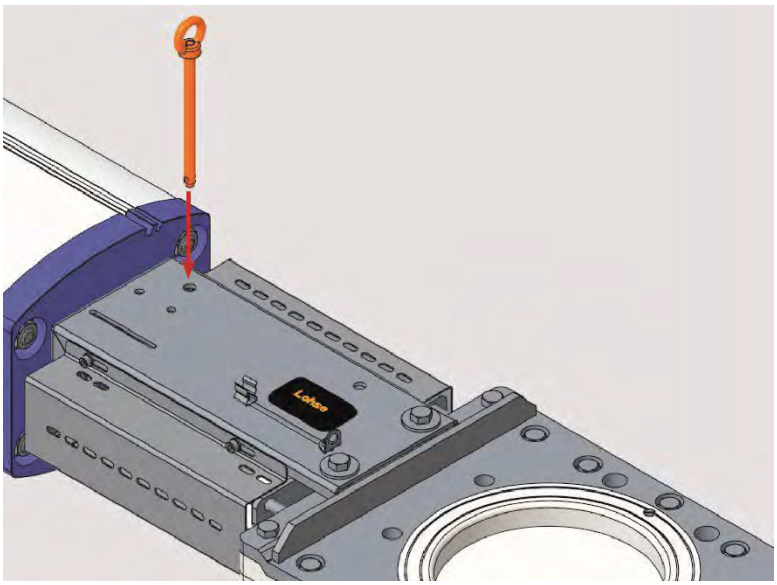
If the valve started up with the locking bolt inserted, there is a risk of injury and damage to the valve.

- Secure the valve against moving - depressurise the pneumatic drive, de-energise the electric drive, etc..

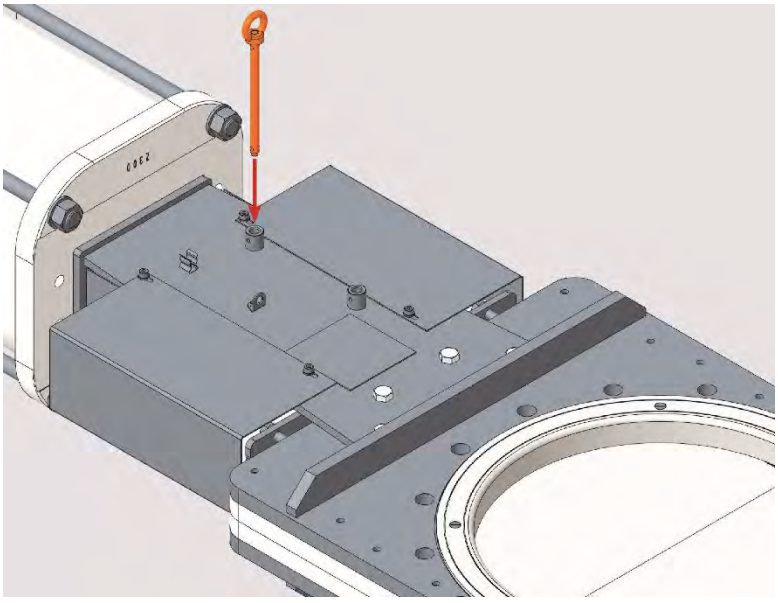
Locking the valve in the "OPEN" position

To lock the valve in the "OPEN" position, insert the bolt in this position near the actuator:

Valves type CNA/CAW/CBS/CDS/RQS/NAQ/AEQ:



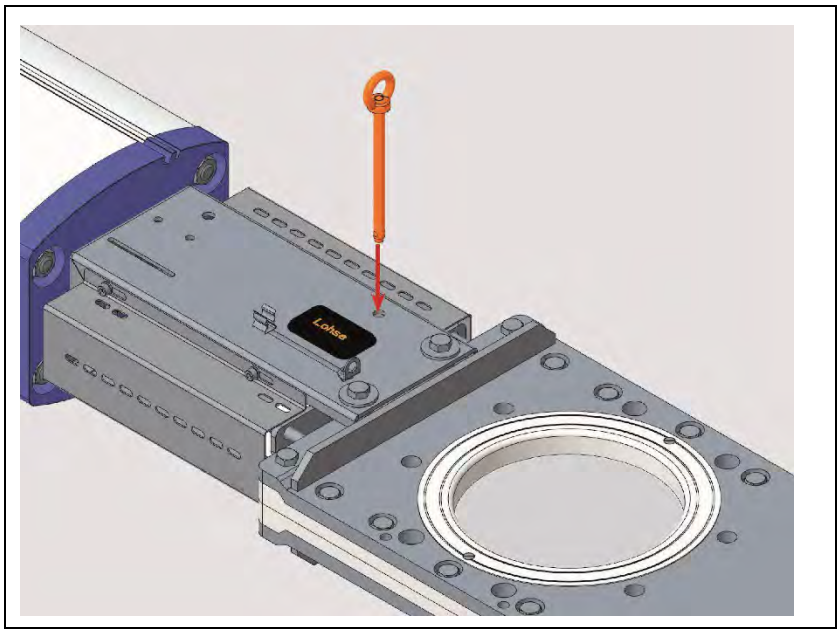
Valves type TA/TAQ:



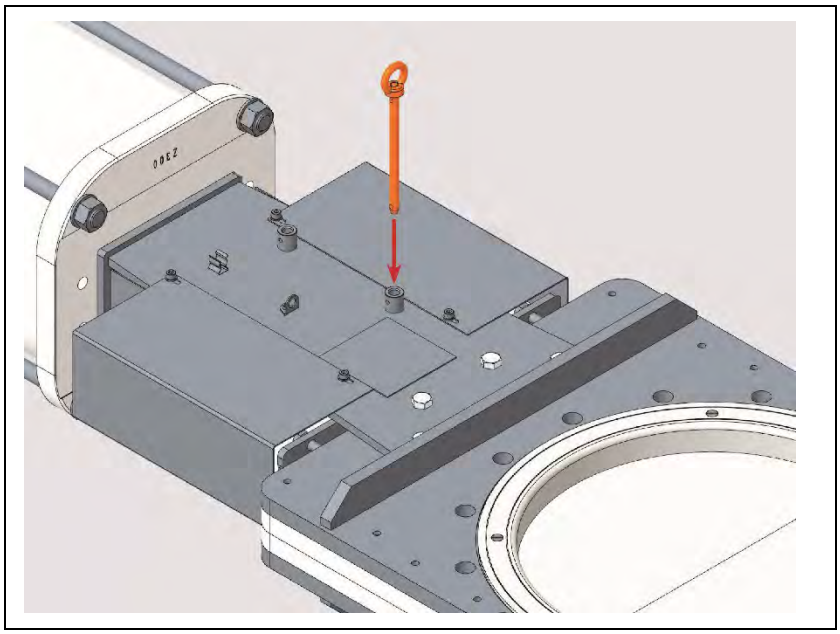
Locking the valve in the "CLOSED" position

To lock the valve in the "CLOSED" position, insert the bolt in this position near the flow area:

Valves type CNA/CAW/CBS/CDS/RQS/NAQ/AEQ:

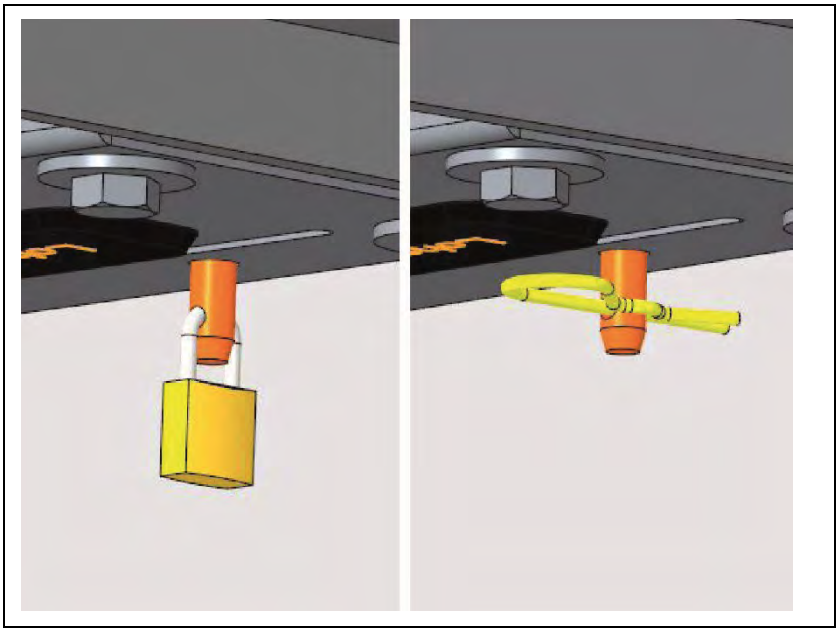


Valves type TA/TAQ:

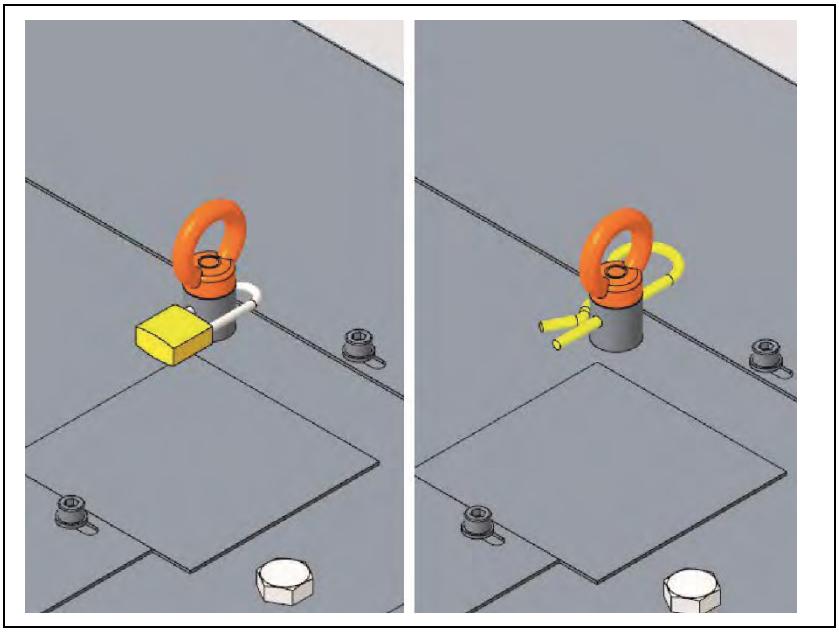


Insert the bolt completely and secure it on the opposite with the split pin or a padlock (not included).

Valves type CNA/CAW/CBS/CDS/RQS/NAQ/AEQ on the opposite:



Valves type TA/TAQ on the same site:



The valve is now mechanical locked and secure for maintenance work.

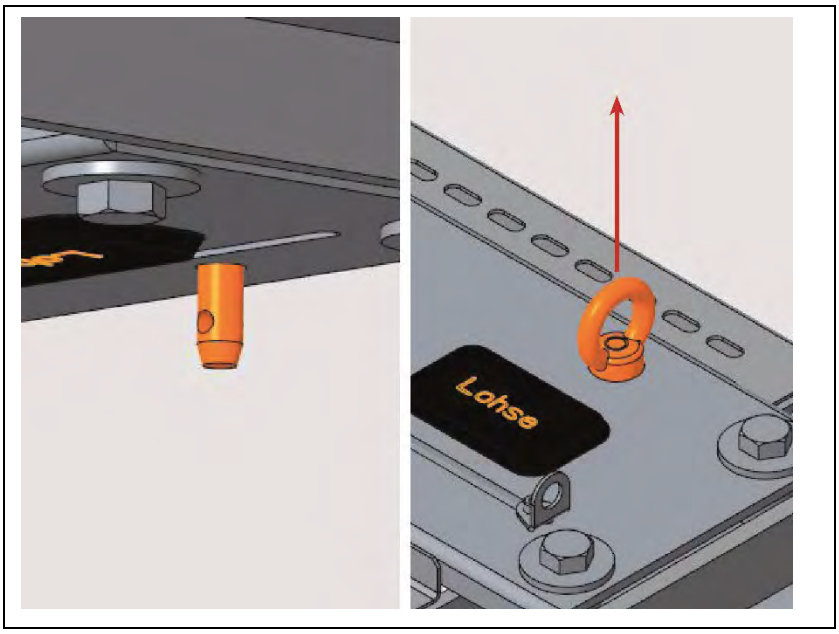
7.1.3 After maintenance work / before restarting the valve

Release the locking device of the valve

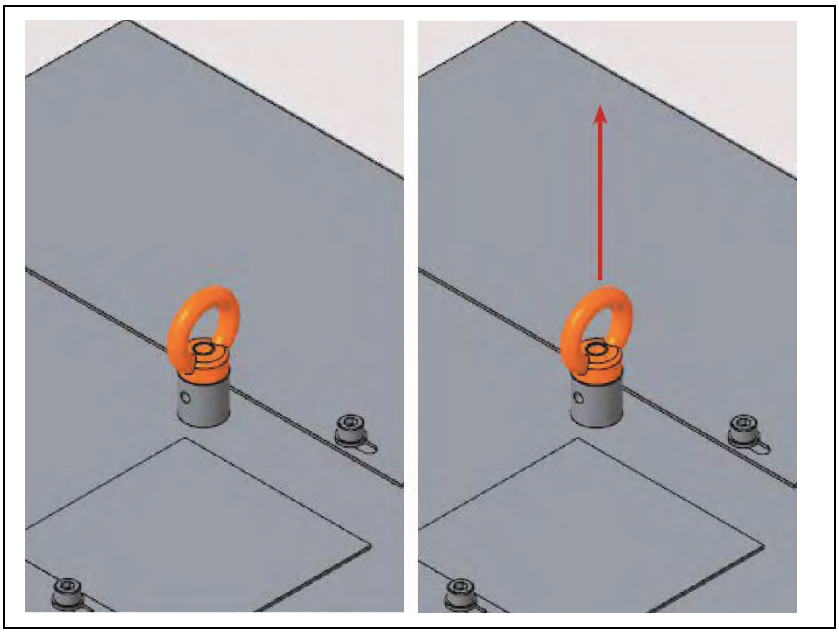
When releasing the locking device, proceed in reverse procedure:

Remove the securing of the bolt (split pin or padlock), afterwards remove the bolt.

Valves type CNA/CAW/CBS/CDS/RQS/NAQ/AEQ:

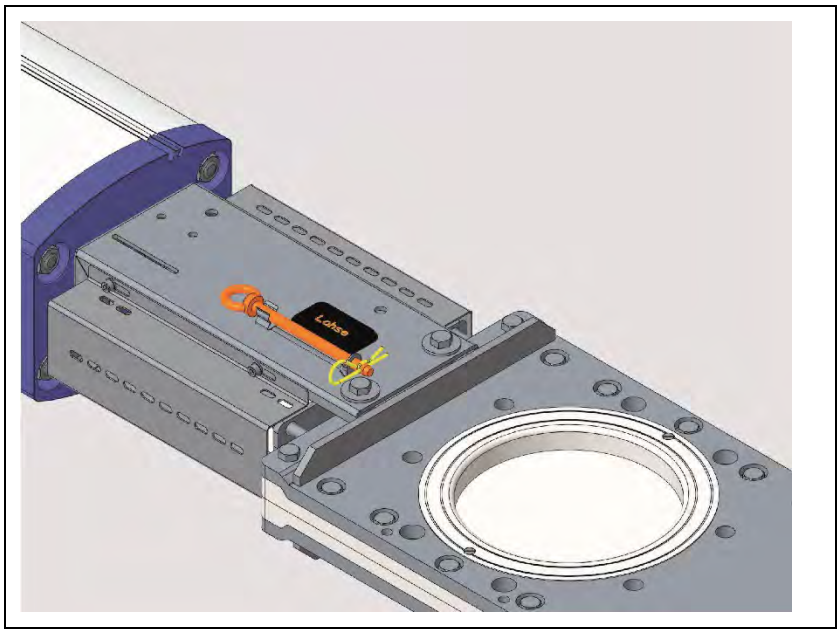


Valves type TA/TAQ:

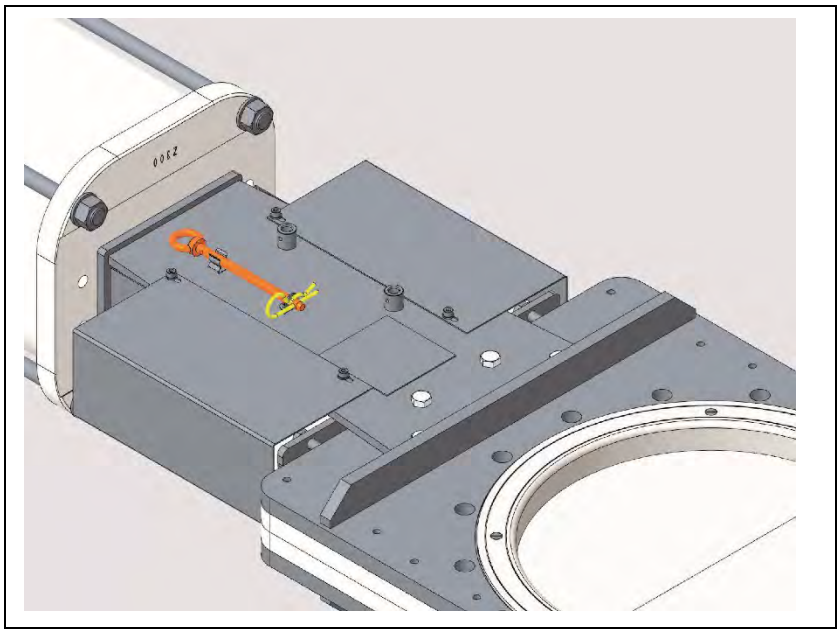


Insert bolt into the holder and secure with the split pin.

Valves type CNA/CAW/CBS/CDS/RQS/NAQ/AEQ:



Valves type TA/TAQ:



After removing the locking bolt, the valve /the actuator can be pressurised with compressed air / electricity again.

Now the valve is not mechanical locked anymore.

The valve can be started up again.

8 Troubleshooting

Problem	Possible cause		Remedy
External leakage from the packing chamber	Packing not tight		Retighten packing, lubricate valve plate
	Packing defective		Replace packing, clean and grease valve plate
Leakage along flow-through section	Object jammed between valve plate and housing		Open valve slightly, remove jammed object and repeat closing procedure
	Sealing in flow-through section defective		Dismantle valve and replace seals
	Pneumatically operated valve	Incorrect stroke settings	Check stroke and readjust, if necessary
	Electrically operated valve	Incorrect limit switch settings	Check stroke and adjust travel-controlled limit switch, if necessary (for instructions, see manufacturer documentation)
Leakage at flange connection	Valve jammed during installation		Loosen flange bolts and reinstall valve according to the instructions
	Flange seal defective		Dismantle valve and replace flange seals
	Flange seal missing		Install flange seal(s)

Problem	Possible cause		Remedy
Valve stiff (difficult to close or open)	Valve blocked and/or valve plate dirty		Dismantle valve and clean it; lubricate valve plate
	Flange bolts too tight		Loosen flange bolts, especially through bolts
	Flange bolts too long		Remove flange bolts from threaded bores, check length and replace, if necessary (for depth of thread, see attached label) Check the inner shells for damage
	Insufficient fastening		Following the instructions in the operating manual, fasten with suitable means at the corresponding points
	Manually operated valve	Stem dirty	Check stem, clean and grease
	Pneumatically operated valve	Insufficient operating pressure	Check operating pressure and increase, if necessary
		Control valve blocked	Clean control valve
		Line connections defective	Check lines and replace, if necessary
		Complete piston defective	Dismantle complete piston and replace; check cylinder seals; replace and grease, if necessary

Problem	Possible cause		Remedy
Valve plate cannot be moved	Flange bolts too long		Remove flange bolts from threaded bores, check length and replace, if necessary (for depth of thread, see attached label)
	Lubricant washed off		Clean and lubricate
	Insufficient fastening		Following the instructions in the operating manual, fasten with suitable means at the corresponding points
	Manually operated valve	Actuator element defective	Check stem; replace defective parts
	Pneumatically operated valve	No operating pressure	Check operating pressure supply
		Control valve not powered	Check control valve for power
		Control valve blocked or defective	Check control valve; clean or replace, if necessary
		Cylinder seal defective	Check seals and replace, if necessary
		Connection between cylinder rod and valve plate broken	Check connecting bolt and replace, if necessary
	Electrically operated valve	Electrical actuator	Check motor for power supply
			Check electrical actuator for defects
		Limit switch	Check limit switch and settings; readjust or replace, if necessary (for instructions, see manufacturer documentation)
		Gear mechanism/stem	Check gear mechanism or stem nut for dry run or defects; clean and lubricate; replace, if necessary (for instructions, see manufacturer documentation)

The replacement of wear parts is described in the respective service manual.

9 Repair

In the event of a return or repair, please contact MARTIN LOHSE GmbH.

9.1 General notes

When returning a valve for servicing or repair, please always indicate the pressurised medium for which it is used.

WARNING

Residue of hazardous substances

Residue of hazardous substances can affect the health of persons.

- Decontaminate and clean the valve before sending it back.

9.2 Disposal

The packaging is made from environmentally friendly materials. Dispose of the packaging through the available recycling channels.

The valve is made from materials that can be recycled by specialised recycling firms.

Proper disposal of the product prevents any negative impact on the environment and human health and allows for the recycling of valuable commodities.

Should you not be in a position to dispose of the valve through a recycling firm, please contact MARTIN LOHSE GmbH for a return for disposal.

10 Appendix

10.1 Recommended lubricants for valves and actuators

The table below contains a list of lubricants recommended by MARTIN LOHSE GmbH for LOHSE valves and actuators. If you wish to use other lubricants, you must first contact MARTIN LOHSE GmbH.

Area of application	Type and trade name of lubricant	Properties and application of lubricant
Packing chamber and guide mechanisms	Grease for hot and cold water *Berulub Hydrohaf 2*	Extremely viscous lubricant, resistant against liquids Apply ample grease to the packing chamber and guides.
Sealing rings and valve plate	Synthetic fluidized transmission grease *OKS 428*	Grease with very good lubricating properties. For use on sealing rings and in flow-through section for easy assembly. Apply to valve plate for improved sliding
Bolts	High-performance grease, black *STABYL MO 500*	High performance graphite grease preventing cold sealing. Apply this product to all bolt threads.
Studs and pins Screws	Anti-seizing paste, white *Bechem Antiseize 932*	Prevents cold sealing. Apply to the studs on the gland an all pins.
Pneumatic cylinder	Slideway oil *Avia Gleitbahnöl CG 220*	Apply to the inside of the cylinder barrel of the pneumatic cylinder for permanent lubrication.
Packings, guides and seals in valves used for food processing	SI fitting grease, white *Berulub Sihaf 2*	Approved according to KTW, W270 and FDA Apply to packings, guides and seals for valves used in the food sector and drinking water supply systems.