Neles™ Neldisc™ high performance butterfly valves

Series L6, LW, LG Model D

Installation, maintenance and operating instructions

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EAC This product meets the requirements set by the Customs Union of the Republic of Belarus, the Republic of Kazakhstan and the Russian Federation.

READ THESE INSTRUCTIONS FIRST!

These instructions provide information about safe handling and operation of the valve.

If you require additional assistance, please contact the manufacturer or manufacturer's representative.

SAVE THESE INSTRUCTIONS!

Addresses and phone numbers are printed on the back cover.

L series Neles™ Neldisc™ high performance butterfly valves

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INTRODUCTION

READ THESE INSTRUCTIONS FIRST!

These instructions provide information about safe handling and operation of the valve. If you require additional assistance, please contact the manufacturer or manufacturer's representative. Addresses and phone numbers are printed on the back cover. See also www.neles.com/products/valves for the latest documentation.

SAVE THESE INSTRUCTIONS!

The following instructions should be thoroughly reviewed and understood prior to installing, operating or performing maintenance on this equipment. Throughout the text, safety and/or caution notes will appear and must be strictly adhered to, otherwise, serious injury or equipment malfunction could result.

Valmet has highly skilled personnel available for startup, maintenance and repair of our valves and component parts. Arrangements for this service can be made through your local Valmet representative or sales department. When performing maintenance use only Valmet replacement parts. Parts are obtainable through your local representative or spare parts department.

When ordering parts, always include Model and Serial Number of the unit being repaired.

1. GENERAL

These installation and maintenance instructions apply to 3"-12" (DN 80-300), pressure class 150 and 300 Model D L series valves regardless of the type of material used. The L series valves are designed with built in versatility making them well-suited to handle a wide variety of process applications.

Recommended spare parts required for maintenance refer to section 9. The model number, size, rating and serial number of the valve are shown on the identification tag located on the valve.

1.1 Scope of this manual

This installation, operation and maintenance manual provides essential information on the L series Neldisc triple eccentric disc valves. The actuators and instrumentation to be used with the L series valves are also discussed briefly. Refer to the separate actuator and control equipment instruction manuals for further information.

For valves in oxygen service, please see also the separate installation, maintenance and operating instructions for oxygen service (see Neles document id: 10O270EN.pdf).

1.2 Description

Neles™ Neldisc™series L is a metal seated triple eccentric butterfly valve available in wafer, lugged and double flanged styles. The valve operates both in control and shut-off applications.

Offset Design

The disc is elliptical and has a triple eccentric mounting. When the valve is closed, the elliptical disc at the major axis displaces the seat ring outward, causing the seat ring to contact the disc at the minor axis. When the valve is opened, the contact is released, and the seat ring returns to its original circular shape (see Figure 1). The disc is connected to the shafts with pins and there are no holes through the disc. Construction details of individual valves are included in the type code shown on the valve identification plate. To interpret the type code, please refer to Section 12. The valve Operates both in control and shut-off applications.

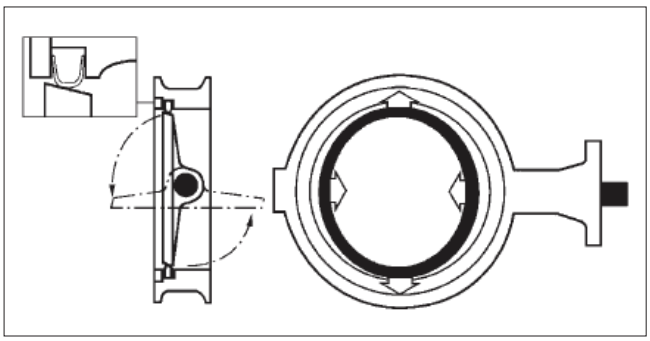


Fig. 1 Neldisc sealing principle

Positive Stop Feature

To prevent seat damage from over-travel of the disc beyond the closed position (usually during field mounting of a handle or actuator), a "positive stop" feature has been designed into the valve. The location of this feature is shown in (Figure 2).

IMPORTANT NOTE: Maximum shut-off pressure rating depends on the materials chosen. Refer to the tag attached to each valve for this rating. Do not use a valve at service conditions that exceed the rating of the tag.

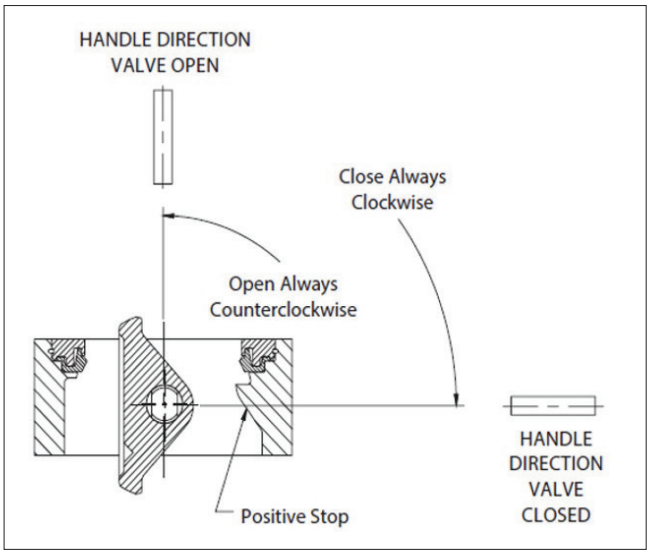


Fig. 2 Positive Stop Feature

1.3 Valve Markings

Body markings are cast on the body. The valve also has an identification plate attached to it (see Figure 3).

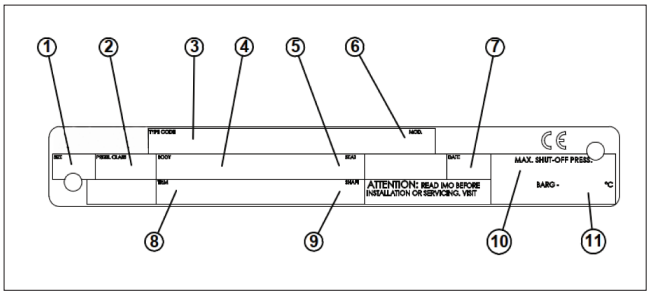


Fig. 3 Identification plate

Identification plate marking:

1. Size
2. Pressure class
3. Type code
4. Body material
5. Seat material
6. Model number
7. Date
8. Trim material
9. Shaft material
10. Maximum shut-off pressure
11. Maximum temperature

1.4 Technical Specificatons

The following designs are available in sizes 3”–12” (DN 80–300):

	Wafer	Lugged	Double Flanged
Design	API 609	API 609	API 609
	ASME B16.34	ASME B16.34	ASME B16.34
	EN 593	EN 593	EN 593
Pressure Class	ASME Class 150 & 300	ASME Class 150 & 300	ASME Class 150 & 300
	PN10-40	PN10-40	PN10-40
Face to Face	API 609 EN 558 Part 1, Table 5 Basic Series 16, 20 & 25	API 609 EN 558 Part 1, Table 5 Basic Series 16, 20 & 25	API 609 Cat B Short Pattern EN 558 Part 1, Table 5 Basic Series 13 ISO 5752 Series 13
Flange Connection/Drilling	ASME B16.5 EN 1092-1	ASME B16.5 EN 1092-1	ASME B16.5 EN 1092-1
Temp Range	-50°C to 600°C (-58°F to 1120°F)		

1.5 Valve Approvals

API 607 Fire Test for Quarter-turn Valves and Valves Equipped with Nonmetallic Seats

ISO 15848 INDUSTRIAL VALVES. MEASUREMENT, TEST AND QUALIFICATION PROCEDURES FOR FUGITIVE EMISSIONS

Group II Category 2 according to directive 2014/34/EU (ATEX).

NACE MR0103 & MR0175

1.6 CE Marking

The valve meets the requirements of the European Directive 2014/68/EU relating to pressure equipment and has been marked according to the Directive.

1.7 Recycling and Disposal

Most valve parts can be recycled if sorted according to material. Most parts have material marking. A material list is supplied with the valve. In addition, separate recycling and disposal instructions are available from the manufacturer. A valve can also be returned to the manufacturer for recycling and disposal against a fee.

1.8 Safety Precautions

WARNING:

DO NOT EXCEED THE VALVE PERFORMANCE LIMITATIONS!

EXCEEDING THE PRESSURE OR TEMPERATURE LIMITATIONS MARKED ON THE VALVE IDENTIFICATION PLATE MAY CAUSE DAMAGE AND LEAD TO UNCONTROLLED PRESSURE RELEASE. DAMAGE OR PERSONAL INJURY MAY RESULT.

WARNING:

SEAT AND BODY RATINGS!

THE PRACTICAL AND SAFE USE OF THIS PRODUCT IS DETERMINED BY BOTH THE SEAT AND BODY RATINGS. READ THE IDENTIFICATION PLATE AND CHECK BOTH RATINGS. THIS PRODUCT IS AVAILABLE

WITH A VARIETY OF SEAT MATERIALS. SOME OF THE SEAT MATERIALS HAVE PRESSURE RATINGS THAT ARE LESS THAN THE BODY RATINGS. ALL OF THE BODY AND SEAT RATINGS ARE DEPENDENT ON VALVE TYPE AND SIZE, SEAT MATERIAL, AND TEMPERATURE. DO NOT EXCEED THESE RATINGS!

WARNING:

DO NOT DISMANTLE THE VALVE OR REMOVE IT FROM THE PIPELINE WHILE THE VALVE IS PRESSURIZED!

DISMANTLING OR REMOVING A PRESSURIZED VALVE WILL RESULT IN UNCONTROLLED PRESSURE RELEASE. ALWAYS ISOLATE THE RELEVANT PART OF THE PIPELINE, RELEASE THE PRESSURE FROM THE VALVE AND REMOVE THE MEDIUM BEFORE DISMANTLING THE VALVE.

BE AWARE OF THE TYPE OF MEDIUM INVOLVED. PROTECT PEOPLE AND THE ENVIRONMENT FROM ANY HARMFUL OR POISONOUS SUBSTANCES. MAKE SURE THAT NO MEDIUM CAN ENTER THE PIPELINE DURING VALVE MAINTENANCE. FAILURE TO DO THIS MAY RESULT IN DAMAGE OR PERSONAL INJURY.

WARNING:

BEWARE OF DISC MOVEMENT!

KEEP HANDS, OTHER PARTS OF THE BODY, TOOLS AND OTHER OBJECTS OUT OF THE OPEN FLOW PORT. LEAVE NO FOREIGN OBJECTS INSIDE THE PIPELINE. WHEN THE VALVE IS ACTUATED, THE DISC FUNCTIONS AS A CUTTING DEVISE. DISCONNECT ANY PNEUMATIC SUPPLY LINES, ANY ELECTRICAL POWER SOURCES AND MAKE SURE SPRINGS IN SPRING-RETURN ACTUATORS ARE IN THE FULL EXTENDED/RELAXED STATE BEFORE PERFORMING ANY VALVE MAINTENANCE. FAILURE TO DO THIS MAY RESULT IN DAMAGE OR PERSONAL INJURY!

WARNING:

WHEN HANDLING THE VALVE OR VALVE/ACTUATOR ASSEMBLY, TAKE ITS WEIGHT INTO ACCOUNT!

NEVER LIFT THE VALVE OR VALVE/ACTUATOR ASSEMBLY BY THE ACTUATOR, POSITIONER, LIMIT SWITCH OR THEIR PIPING. PLACE LIFTING DEVICES SECURELY AROUND THE VALVE BODY. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN DAMAGE OR PERSONAL INJURY FROM FALLING PARTS (SEE FIGURE 4).

CAUTION:

BEWARE OF NOISE EMISSIONS!

THE VALVE MAY PRODUCE NOISE IN THE PIPELINE. THE NOISE LEVEL DEPENDS ON THE APPLICATION. OBSERVE THE RELEVANT WORK ENVIRONMENT REGULATIONS ON NOISE EMISSION. THIS CAN BE MEASURES OR CALCULATED USING NELES NELPROF SOFTWARE.

CAUTION:

BEWARE OF A VERY COLD OR HOT VALVE!

THE VALVE BODY MAY BE VERY COLD OR VERY HOT DURING USE. PROTECT YOURSELF AGAINST COLD INJURIES OR BURNS.

NOTE:

Do not turn the disc more than 90° as this could damage the seat. The valve is so constructed that the disc operates only between 0-90°.

CAUTION:

Potential electrostatic charging hazard. Ensure the protection in the process.

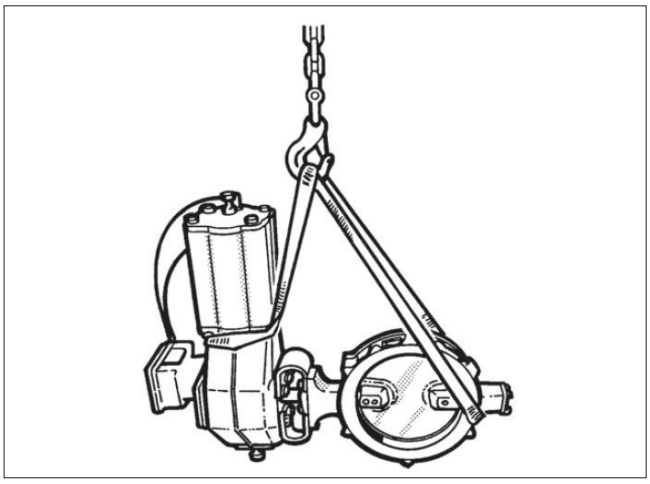


Fig. 4 Lifting of the valve

1.9 Welding notes

WARNING:

Welding and/or grinding stainless steel and other alloys containing chromium metal may cause the release of hexavalent chromium. Hexavalent chromium(VI) or Cr(VI), is known to cause cancer. Be sure to use all appropriate personal protective equipment (PPE) when welding metals containing chromium.

NOTE:

A qualified welder must do the installation welding. The welder and welding procedure should be qualified in accordance with the ASME Boiler and Pressure Vessel Code Section IX or other applicable regulation.

CAUTION:

To prevent damage to the seat and seals, do not allow the temperature of the seat and body seal area to exceed 94 °C (200 °F).

It is recommended that thermal chalks be used to check the temperature in these areas during welding.

CAUTION:

Ensure that any weld splatter does not fall onto the valve closing members eg. ball or seats. This may damage critical seating surfaces and cause leaks.

2. TRANSPORTATION, RECEPTION AND STORAGE

Check the valve and the accompanying devices for any damage that may have occurred during transport.

Store the valve carefully before installation, preferably indoors in a dry place.

Do not remove the flow port protectors until installing the valve. Move the valve to its intended location just before installation. The valve is usually delivered in the closed position. A valve equipped with a spring-return actuator is delivered in a position determined by the spring. During storage the valve must be lightly closed. If the valve(s) are to be stored for a long duration, follow the recommendations of M-1147-En.

2.1 Unpacking

Care must be exercised when unpacking the valve to prevent damage to the accessories and component parts. Contact the local Valmet Sales office or Service Center with any issues or problems. Be sure to note the valve model number and serial number in all correspondence.

3. INSTALLATION

1. Read all **WARNINGS!**
2. **IMPORTANT:** Only operating handle stops or actuator stop screws must be used to stop the disc position. DO NOT use the “positive stop” by itself to limit travel.
3. Before installing a closed valve in the pipeline, be sure that the handle or actuator is attached so that a counter-clockwise rotation, viewed from above, opens the valve (See Figure 2). Fully close the valve again before installing in the pipeline.
4. The valve must be centered between flanges to avoid disc-pipe contact which could damage the disc and shaft. Any flange or pipeline welding should be done prior to installation of the valves. If this is impossible, protective covering or shields must be placed in the pipeline between the valve and the area being welded prior to welding. Not only must the valve be protected against weld slag, but also against any excessive heat, which could cause seat damage. It is essential that all weld slag, rods, debris, tools, etc., be removed from the pipeline before valves are installed or cycled.
5. It is not recommended to install the valve with the stem on the underneath side because dirt in the pipeline may then enter the body cavity and potentially damage the stem packing (see Figure 5).

3.1 General

Remove the flow port protectors and check that the valve is undamaged and clean inside.

Before installing the valve in the line, clean piping and valve of all foreign material such as welding chips, scale, oil, grease or dirt. Gasket surfaces should be thoroughly cleaned to ensure leak-proof joints.

3.2 Installing in the Pipeline

WARNING:

THE VALVE SHOULD BE TIGHTENED BETWEEN FLANGES USING APPROPRIATE GASKETS AND FASTENERS COMPATIBLE WITH THE APPLICATION, AND IN COMPLIANCE WITH APPLICABLE PIPING CODES AND STANDARDS. CENTER THE FLANGE GASKETS CAREFULLY WHEN FITTING THE VALVE BETWEEN FLANGES. DO NOT ATTEMPT TO CORRECT PIPELINE MISALIGNMENT BY MEANS OF FLANGE BOLTING!

Flush or blow the pipeline carefully before installing the valve. Foreign particles, such as sand or pieces of welding electrode, will damage the disc sealing surface and seat.

The valve may be installed in any position and offers tightness in both directions except shown in Figure 5.

Install the valve in the pipeline so that the shaft is horizontal if possible. However, Valmet does not recommend installing the valve with the actuator on the underside because dirt in the pipeline may then enter the body cavity and damage the gland packing.

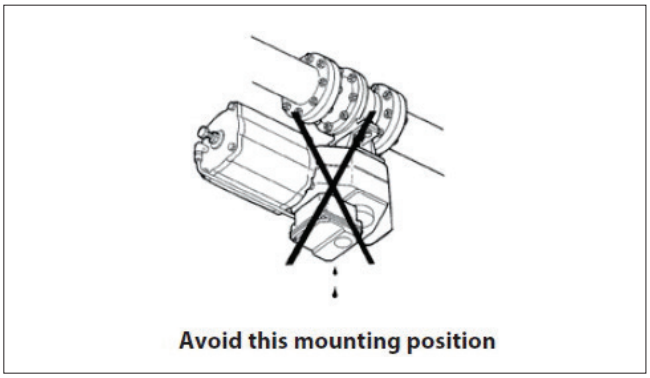


Fig. 5 Avoid this mounting position

Select flange gaskets according to the operating conditions.

Do not attempt to correct pipeline misalignment by means of flange bolting.

It may be necessary to firmly support the pipeline to protect the valve from excess stress. Sufficient support will also reduce pipeline vibrations and this ensures proper functioning of the positioner. Do not fasten supports to the flange bolting or to the actuator.

It is recommended that the length of any straight pipe preceding the control valve is at least 2 x pipe diameter.

The flow causes a so-called dynamic torque against the valve disc which attempts to close the valve. In a pipe elbow the pressure on the outer edge is higher than on the inner edge.

When installing the triple eccentric disc valve immediately after a pipe elbow, the valve shaft must be directed toward the center point of the pipe (see Fig. 6). This is especially important when the valve is used as a control valve.

The shaft of a valve mounted after the centrifugal pump must be perpendicular to the pump shaft (see Fig. 7).

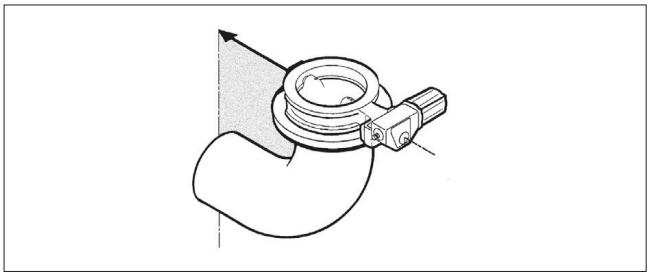


Fig. 6 Mounting after a pipe elbow

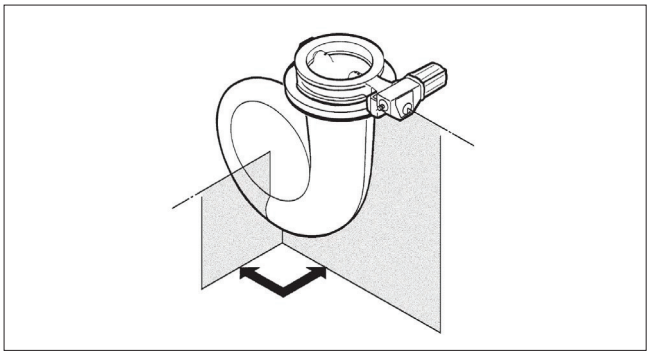


Fig. 7 Mounting after the centrifugal pump

When thus installed, the valve disc will be more evenly loaded and vibrations otherwise possible in the intermediate positions will be eliminated.

When mounting the valve it must be in a closed position and be carefully centered between the pipe flanges so that the turning disc does not touch the pipe edge or flange gaskets, see Fig.8 and Table 1.

Use caution when installing valve with Spring-to-open actuator.

In case of sudden shutdown of the energy supply the valve will open unexpectedly due to pre-stressed spring package. This may cause significant harm to people and material around the valve.

In valves with certain nominal sizes some flange bolts do not pass the valve body. The valve body is thus equipped with holes, see Fig. 9 and Tables 2...4.

Ensure that the disc can turn to the open position after preliminary tightening of the flange bolts. The actuators of control valves can be equipped with position stops to limit the allowable travel of the disc. Length of stud bolts in Figure 9 are based on:

- gasket thickness of 1.5 mm
- heavy nuts with washers

flange thickness of weldneck flanges per DIN or ISO.

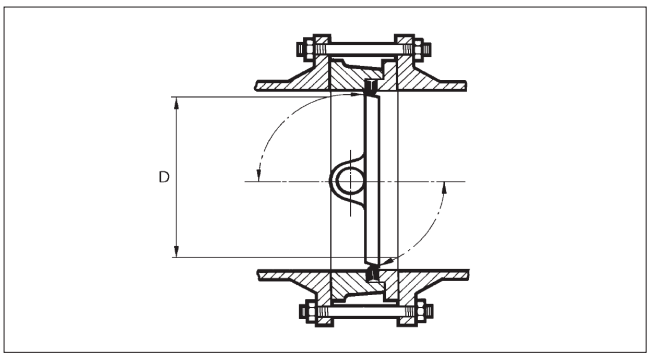


Fig. 8 Minimum pipe inside dimensions

Table 1 Minimum pipe inside dimensions

Valve size [NPS]	Class 150 EN PN10-16	Class 300 EN PN25-40
3	Standard weight	Extra strong
4	Standard weight	Extra strong
6	Standard weight	Extra strong
8	Standard weight	Extra strong
10	Standard weight	Extra strong
12	Standard weight	Extra strong

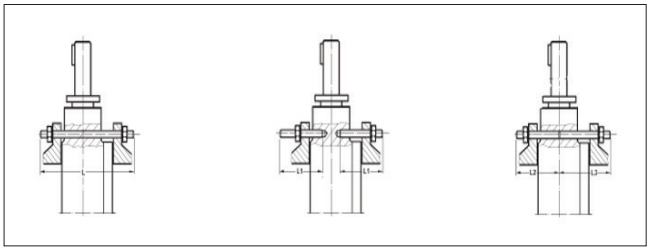


Fig. 9 Stud bolt length

Below are presented the minimum dimensions for the stud bolts. Next size standard length bolt can be used.

Table 2 Minimum stud bolt dimensions, LW

LW6	ASME 150			PN10			PN16		
DN / NPS	Thread	L	Qty	Thread	L	Qty	Thread	L	Qty
80 / 3	5/8” UNC	145	4	M16	143	8	M16	143	8
100 / 4	5/8” UNC	161	8	M16	149	8	M16	149	8
150 / 6	3/4” UNC	176	8	M20	165	8	M20	165	8
200 / 8	3/4” UNC	189	8	M20	176	8	M20	176	8
250 / 10	7/8” UNC	208	12	M20	187	12	M24	199	12
300 / 12	7/8” UNC	221	12	M20	197	12	M24	213	12

LW7	ASME 150			PN10			PN16		
DN / NPS	Thread	L	Qty	Thread	L	Qty	Thread	L	Qty
80 / 3	5/8" UNC	146	4	M16	144	8	M16	144	8
100 / 4	5/8" UNC	163	8	M16	151	8	M16	151	8
150 / 6	3/4" UNC	189	8	M20	178	8	M20	178	8
200 / 8	3/4" UNC	196	8	M20	183	8	M20	183	8
250 / 10	7/8" UNC	213	12	M20	192	12	M24	204	12
300 / 12	7/8" UNC	223	12	M20	199	12	M24	215	12

LW8	ASME 300					PN25					PN40				
DN	Thread	L	Qty	L1	Qty	Thread	L	Qty	L1	Qty	Thread	L	Qty	L1	Qty
80 / 3	3/4” UNC	189	8			M16	167	8			M16	171	8		
100 / 4	3/4” UNC	195	8			M20	176	8			M20	180	8		
150 / 6	3/4” UNC	219	8			M24	208	8			M24	212	8		
200 / 8	7/8” UNC	257	16			M24	225	12			M27	243	12		
250 / 10	1” UNC	307	12	148	8	M27	260	12			M30	282	12		
300 / 12	1 1/8” UN	322	12	138	8	M27	264	12	132	8	M30	290	12	145	8

LW5	ASME 300					PN25					PN40				
DN	Thread	L	Qty	L1	Qty	Thread	L	Qty	L1	Qty	Thread	L	Qty	L1	Qty
80 / 3	3/4" UNC	189	8			M16	167	8			M16	171	8		
100 / 4	3/4" UNC	195	8			M20	176	8			M20	180	8		
150 / 6	3/4" UNC	219	8			M24	210	8			M24	214	8		
200 / 8	7/8" UNC	257	16			M24	234	12			M27	252	12		
250 / 10	1" UNC	307	12	154	8	M27	272	12			M30	294	12		
300 / 12	1 1/8" UN	322	12	143	8	M27	275	12	132	8	M30	301	12	151	8

Table 3 Stud bolt dimensions, LG

LG6	ASME 150					PN10					PN16				
DN	Thread	L2	Qty	L3	Qty	Thread	L2	Qty	L3	Qty	Thread	L2	Qty	L3	Qty
80 / 3	5/8” UNC	68	4	78	4	M16	67	8	77	8	M16	67	8	77	8
100 / 4	5/8” UNC	75	8	85	8	M16	70	8	80	8	M16	70	8	80	8
150 / 6	3/4” UNC	82	8	93	8	M20	77	8	88	8	M20	77	8	88	8
200 / 8	3/4” UNC	89	8	101	8	M20	82	8	94	8	M20	82	8	94	8
250 / 10	7/8” UNC	98	12	110	12	M20	88	12	100	12	M24	94	12	106	12
300 / 12	7/8” UNC	105	12	117	12	M20	93	12	105	12	M24	101	12	113	12

LG7	ASME 150					PN10					PN16				
DN	Thread	L2	Qty	L3	Qty	Thread	L2	Qty	L3	Qty	Thread	L2	Qty	L3	Qty
80 / 3	5/8" UNC	68	4	78	4	M16	67	8	77	8	M16	67	8	77	8
100 / 4	5/8" UNC	76	8	86	8	M16	71	8	81	8	M16	71	8	81	8
150 / 6	3/4" UNC	89	8	100	8	M20	77	8	101	8	M20	77	8	101	8
200 / 8	3/4" UNC	92	8	104	8	M20	81	8	102	8	M20	81	8	102	8
250 / 10	7/8" UNC	101	12	113	12	M20	87	12	105	12	M24	93	12	111	12
300 / 12	7/8" UNC	106	12	118	12	M20	94	12	106	12	M24	102	12	114	12

LG8	ASME 150					PN10					PN16				
DN	Thread	L2	Qty	L3	Qty	Thread	L2	Qty	L3	Qty	Thread	L2	Qty	L3	Qty
80 / 3	3/4" UNC	82	8	108	8	M16	71	8	97	8	M16	73	8	99	8
100 / 4	3/4" UNC	88	8	108	8	M20	93	8	98	8	M20	80	8	100	8
150 / 6	3/4" UNC	96	12	121	12	M24	110	8	117	12	M24	93	8	119	12
200 / 8	7/8" UNC	111	12	137	12	M24	119	12	125	12	M27	109	12	134	12
250 / 10	1" UNC	127	16	168	16	M27	136	12	150	16	M30	121	12	161	16
300 / 12	1 1/8" UN	139	16	171	16	M27	138	16	148	16	M30	129	16	161	16

LG5	ASME 150					PN10					PN16				
DN	Thread	L2	Qty	L3	Qty	Thread	L2	Qty	L3	Qty	Thread	L2	Qty	L3	Qty
80 / 3	3/4" UNC	90	8	100	8	M16	79	8	89	8	M16	81	8	91	8
100 / 4	3/4" UNC	93	8	103	8	M20	83	8	93	8	M20	85	8	95	8
150 / 6	3/4" UNC	95	8	125	8	M24	90	8	120	8	M24	92	8	122	8
200 / 8	7/8" UNC	123	16	135	16	M24	111	12	123	12	M27	120	12	132	12
250 / 10	1" UNC	148	16	160	16	M27	130	12	142	12	M30	141	12	153	12
300 / 12	1 1/8" UN	155	16	167	16	M27	132	16	144	16	M30	145	16	157	16

Table 4 Stud bolt dimensions, L6

L64C	ASME 150					PN10					PN16				
DN	Thread	L		L1		Thread	L		L1		Thread	L		L1	
		Lenght	Qty	Lenght	Qty		Lenght	Qty	Lenght	Qty		Lenght	Qty	Lenght	Qty
80 / 3	5/8" UNC	80	4	65	4	M16	80	4	65	4	M16	80	4	65	4
100 / 4	5/8" UNC	90	12	80	4	M16	90	12	80	4	M16	90	12	80	4
150 / 6	3/4" UNC	100	12	80	4	M20	100	12	80	4	M20	100	12	80	4
200 / 8	3/4" UNC	110	12	90	4	M20	110	12	90	4	M20	110	12	90	4
250 / 10	7/8" UNC	115	20	95	4	M20	115	20	95	4	M24	115	20	95	4
300 / 12	7/8" UNC	120	20	100	4	M20	120	20	100	4	M24	120	20	100	4

L64D	ASME 300					PN25					PN40				
DN	Thread	L		L1		Thread	L		L1		Thread	L		L1	
		Lenght	Qty	Lenght	Qty		Lenght	Qty	Lenght	Qty		Lenght	Qty	Lenght	Qty
80 / 3	3/4" UNC	110	12	90	4	M16	80	4	110	4	M16	110	12	90	4
100 / 4	3/4" UNC	115	12	100	4	M20	90	12	115	4	M20	115	12	100	4
150 / 6	3/4" UNC	120	12	100	4	M24	100	12	120	4	M24	120	12	100	4
200 / 8	7/8" UNC	140	20	110	4	M24	110	12	140	4	M27	140	20	110	4
250 / 10	1" UNC	160	24	120	8	M27	115	20	160	8	M30	160	24	120	8
300 / 12	1 1/8" UNC	170	24	130	8	M27	120	20	170	8	M30	170	24	130	8

3.3 Valve Insulation

If necessary, the valve may be insulated. Insulation must not continue above the upper level of the valve (see Figures 10 to 11).

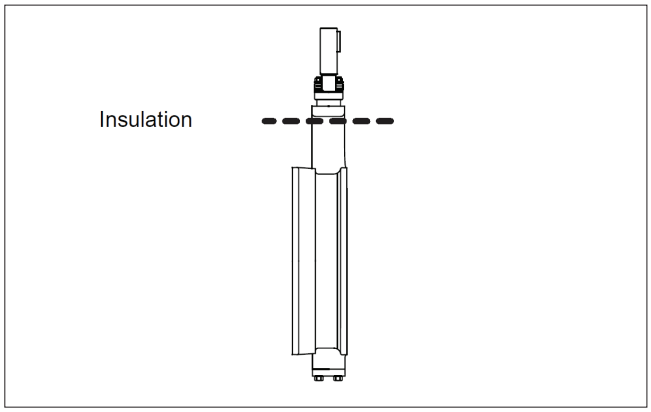


Fig. 10 Insulation of the valve

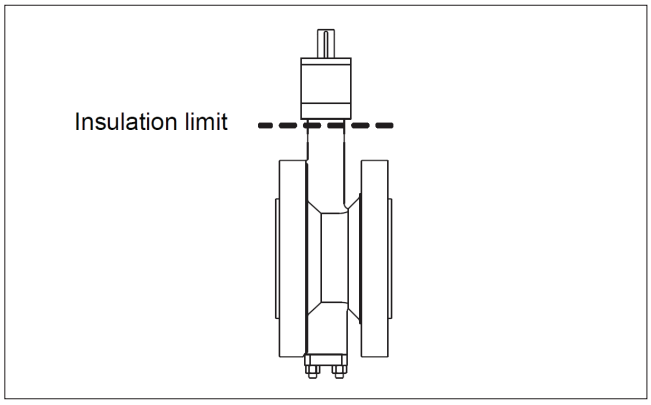


Fig. 11 Insulation of the valve

3.4 Actuator

CAUTION:

The actuator must not touch the pipeline, because pipeline vibration may damage it or interfere with its operation. In some certain cases, when a large-size actuator is used, extended stems are required or when the pipeline vibrates heavily, supporting the actuator is recommended.

When installing the actuator on the valve, make sure that the valve package functions properly. See instructions for installing in Section 6.

Observe the space needed for removal of the actuator. The actuator should be installed in a manner that allows plenty of room for its removal.

The upright position is recommended for the actuator cylinder.

In some cases, e.g. when a large-size actuator is used or when the pipeline vibrates heavily, supporting the actuator is recommended.

Please contact Valmet for further information.

4. COMMISSIONING

Ensure that no dirt or foreign objects are left inside the valve or pipeline. Flush the pipeline carefully. Keep the valve 30-40° open during flushing.

When starting up the pump, ensure that the valve in the pipeline is closed or, at the very most, 20° open.

A waterhammer, which follows the start-up of high-capacity pumps, creates a torque peak in the disc. This can damage the pin connection between disc and shaft when the valve is 30-90° open.

5. MAINTENANCE

WARNING:

Observe the safety precautions mentioned in Section 1.8 before maintenance!

CAUTION:

When handling the valve or the valve package as a whole, be mindful of the weight of the valve or the entire package.

WARNING:

For safety reasons the retaining plates MUST always be installed according to Section 5.3.

5.1 General

Although Neles valves are designed to work under severe conditions, proper preventative maintenance can significantly help to prevent unplanned downtime and in real terms reduce the total cost of ownership. Valmet recommends inspecting valves at least every five (5) years. The inspection and maintenance frequency depend on the actual application and process condition. The inspection and maintenance intervals can be specified together with your local Valmet experts. During this periodic inspection the parts detailed in the Spare Part Set should be replaced. Time in storage should be included in the inspection interval.

Maintenance can be performed as presented below. For maintenance assistance, please contact your local Valmet office. The part numbers in the text refer to the exploded view and to the parts list in Section 9, unless otherwise stated.

Overhaul maintenance consists of replacing seats and seals. A standard repair kit consisting of these parts may be obtained through Valmet or your authorized Valmet Distributor.

NOTE: Repair kits include body gasket (32), blind flange gasket (31) and packing ring set (22). Refer to section 10.

WARNING:

FOR YOUR SAFETY IT IS IMPORTANT THE FOLLOWING PRECAUTIONS BE TAKEN PRIOR TO REMOVAL OF THE VALVE FROM THE PIPELINE OR BEFORE ANY DISASSEMBLY:

1. WEAR ANY PROTECTIVE CLOTHING OR EQUIPMENT NORMALLY REQUIRED WHEN WORKING WITH THE FLUID INVOLVED.
2. DEPRESSURIZE THE PIPELINE AND CYCLE THE VALVE AS FOLLOWS:
   - PLACE THE VALVE IN THE OPEN POSITION AND DRAIN THE PIPELINE.
- CYCLE THE VALVE TO RELIEVE RESIDUAL PRESSURE IN THE BODY CAVITY BEFORE REMOVAL FROM THE PIPELINE.

AFTER REMOVAL AND BEFORE ANY DISASSEMBLY, CYCLE THE VALVE AGAIN SEVERAL TIMES.

NOTE:

When sending goods to the manufacturer for repair, do not disassemble them. Clean the valve carefully and flush the valve internals. For safety reasons, inform the manufacturer of the type of medium used in the valve (include material safety datasheets (MSDS).

NOTE:

In order to ensure safe and effective operation, always use original spare parts to make sure that the valve functions as intended.

NOTE:

For safety reasons, replace pressure retaining bolting if the threads are damaged, have been heated, stretched or corroded.

5.2 Removing the valve from the pipeline

It is generally most convenient to detach the actuator and its auxiliary devices before removing the valve from the pipeline. If the valve package is small or if it is difficult to access, it may be more practical to remove the entire assembly.

NOTE:

To ensure proper reassembly, observe the position of the actuator and positioner/limit switch with respect to the valve before detaching the actuator.

WARNING:

ALWAYS DISCONNECT THE ACTUATOR FROM ITS POWER SOURCE, PNEUMATIC, HYDRAULIC OR ELECTRICAL, BEFORE ATTEMPTING TO REMOVE IT FROM THE VALVE!

WARNING:

DO NOT REMOVE A SPRING-RETURN ACTUATOR UNLESS A STOP-SCREW IS CARRYING THE SPRING FORCE!

1. Detach the air supply, electrical supply, hydraulic supply and control signal cables or pipes from their connectors.
2. Unscrew the actuator mounting bracket screws.
3. Lift the actuator straight up in line with the valve stem until the coupling between actuator drive and valve stem is completely disengaged.
4. Place actuator in a safe location to avoid damage or personal injury.

WARNING:

Do not dismantle the valve or remove it from pipeline while the valve is pressurized.

CAUTION:

Valve must be fully closed before removing it from the pipeline.

CAUTION:

Valves equipped with spring-to-open (air-to-close) actuators must be disconnected from the actuators and then closed.

Ensure that the valve is not pressurized and the pipeline is empty. Ensure that the medium cannot flow into the section where servicing is to take place. Support the valve carefully with a hoist. Place ropes carefully and unscrew the pipe flange bolts. Ensure that the ropes are positioned correctly. Lift valve correctly (see Fig. 3).

5.3 Replacing the gland packing

WARNING:

DO NOT DISMANTLE THE VALVE OR REMOVE IT FROM PIPELINE WHILE THE VALVE IS PRESSURIZED.

PTFE V-rings are used as a standard gland packing and graphite rings for high temperature constructions. The packing construction is live loaded as standard.

The gland packing (23) must be changed if leakage occurs even after the hex nuts (43) have been tightened as recommended.

- Make sure the valve is not pressurized.
- Unfasten the nuts (43) and remove the disc spring sets (21), the retaining plates (24) and the gland (9).
- Remove old packing rings (22). Do not damage the surfaces of the packing ring counterbore and shaft. It is not necessary to change anti-extrusion ring (23).
- Clean the gland packing and packing ring counterbore. Install new set of packings (V-ring or graphite). Slip the rings onto the shaft. Ensure that there are no burrs in the keyway groove which could damage the packing.
- The installation order of packing is to first slide in one anti-extrusion ring with chamfer downward, then the packing rings, finally the other anti-extrusion ring with chamfer upward. For graphite packing rings make sure the seam in the ring is in 90 degree angle compared with the ring below it.
- Install the gland.
- Install one stud
- Install the retainer plates, one on top of another on the stud and the opposite another way around (Figure 12). Once the retainer plates are in the right place, install the other stud.

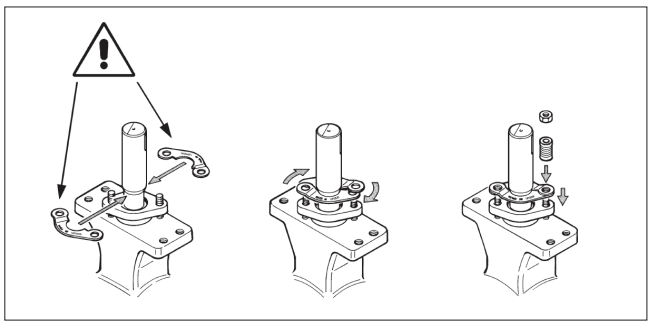


Fig. 12 Mounting the retainer

- Mount the disc spring sets.
- Place the nuts on the studs.
- **For the standard live-loading option (Figure 13), please refer to Table 5 for the tightening torques. Install the disc springs one at a time, in opposite orientations, make sure the first installed disc spring has its wider area pointing down.**
- For the high performance live-loading option (Figure 14), pre compress the gland packing until the top cap reach the shell holder (housing) to ensure proper force in use.
- Carry out 3…5 operation cycles with the valve. Suitable range of movement is about 80 %. It is not necessary to fully close or open the valve during the operation.
- Fasten the nuts and disc springs.

Table 5 Tightening of gland packing (mm)

Rating 150#, PN10, PN16	Rating 300#, PN25, PN40	Spring set dia Graphite	Spring set dia PTFE	Thread
Size				
80	80	22.4	22.4	M8
100, 150	100	22.4	22.4	M8
200	150	26.4	26.4	M10
250		27.4	26.4	M12
300	200	27.4	26.4	M12
	250	27.4	26.4	M12
	300	44.4	35.9	M16

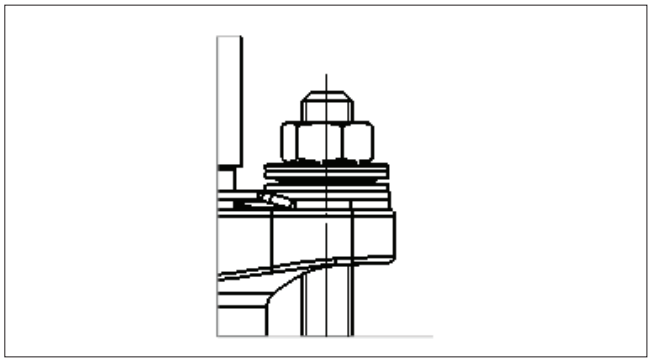


Fig. 13 Standard live-loading

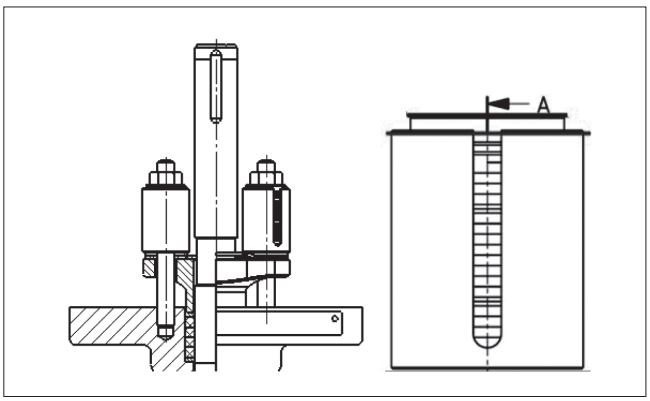


Fig. 14 High performance live-loading

- If the leakage still occurs when the valve is pressurized, re-tighten the nuts but don't exceed the values in the Table 5 by 50 % or do not fully compress the disc springs.

5.4 Valve leakage

Valve leakage is not always caused by a damaged seat ring or disc. The reason can also be that the disc is not in the closed position.

- Check the position of the actuator relative to the valve. The screws may be loose or the bracket damaged.
- Check the adjustment in the closed position (see Section 6.5).

The marking line parallel to the disc on the valve shaft head shows roughly the closed position of the disc (see Fig. 15). Pressure shocks can cause loosening of the pin connection between disc and shaft; consequently the shaft moves while the disc remains in place and this prevents full closing of the disc. If the reason for the leakage does not become apparent after doing the above, the valve must be disassembled for replacing the parts.

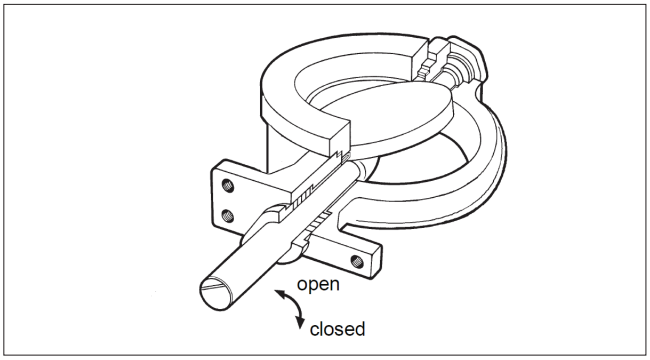


Fig. 15 Open and closed positions of the valve

5.5 Replacing the seat ring

WARNING:
Do not dismantle the valve or remove it from pipeline while the valve is pressurized.

- Ensure that the valve is not pressurized.
- Remove the valve from the pipeline. The valve must be in a closed position during removal.
- Follow the lifting methods shown in Section 3.
- Remove the clamp ring (2) by untightening the screws (45).

- Remove the old body gasket (32) and the seat ring (4). Change the seat ring if it is damaged.
- Clean all the surfaces of the seats and check the surface of the seat ring.
- Check also the condition of the disc. A damaged disc must be changed (see Section 5.6).
- Check the condition of the pin connection. Repair it if necessary (see Section 5.6).
- Install a new body gasket.
- Spray a thin layer of dry lubricating fluid, e.g. Molykote 321R or equivalent, to the sealing surface of body, disc and clamp ring.
- Install the seat ring (4) carefully into the seat groove on the body and turn the disc to maintain light contact with the seat. Make sure the seam on the seat is pointing 2 o'clock when the shaft is pointing at 12 o'clock.
- Install the graphite gasket carefully.
- Mount the clamp ring and tighten the screws (27) lightly.
- Turn the disc slightly open and pull it back to set the seat into the proper position.
- Tighten the screws (27) crosswise and evenly. Recommended torque values for screws are listed in Table 6. An unevenly tightened flange may damage the seat ring.

Table 6 Clamp ring/blind flange screw torque, Nm +/- 10%

Thread mm / UNC	Torque
M5	7.5
M6	13
M8	31
M10	60
M12	100

- Check the position between the seat ring and the disc. The valve closes clockwise (see Fig. 15).
- Mount the actuator into the valve. Adjust the closed position limit and check the open position limit (see Section 6).

5.6 Replacing the disc, shafts and bearings

Disassembling the valve

The pin connection of the disc must be opened by drilling for changing the disc (3), shafts (5) and bearings (11).

- Remove the valve from the pipeline and the actuator from the valve.
- Remove the clamp ring (2) and seat ring (4) according to section 5.
- Set the valve horizontally on a sturdy surface so that the flat side of the disc lays against the surface (see Fig. 16).

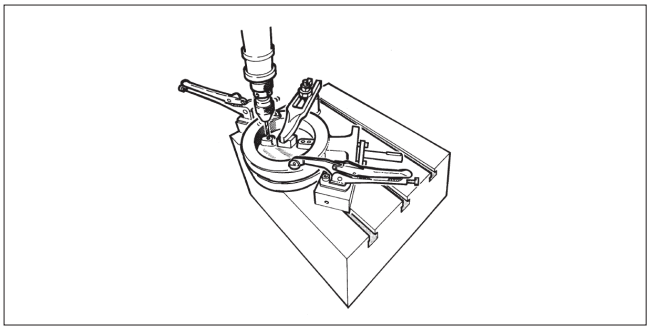


Fig. 16 Pressing the pins

- Drill the holes carefully to the center of the pins (16). Choose a drill 0.2-0.5 mm smaller than the diameter of the pin.
- Drill the holes deep, but not enough to reach the disc.
- Pull the pins out.
- Dismantle the gland packing including anti-extrusion ring (23) according to Section 5.3.
- Detach the screws (44) and the blind flange (8) and remove the gasket (31).
- Place rubber strips or other protection between the disc edge and the body and remove the shafts (see fig 17).
- Remove the bearings (11).
- Clean and check all parts carefully.

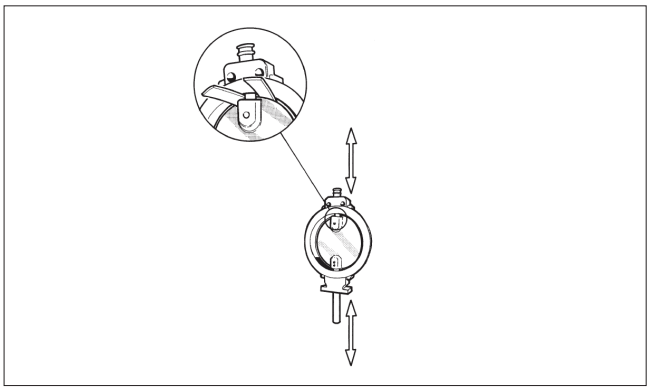


Fig. 17 Protecting the disc during disassembly and assembly

Checking Parts

1. Clean all disassembled parts.
2. Check the shaft (5) and disc (3) for damage. Pay particular attention to the sealing areas.
3. Check all sealing and gasket surfaces of the body (1) and clamp ring (2).
4. Replace any damaged parts.

NOTE: When ordering spare parts, always include the following information:

- Valve catalog code from Identification plate,
- If the valve is serialized – the serial number (stamped on the valve body)

Assembling the valve

- Replace damaged parts with new ones.
- Set the disc (3) and the shaft (5 & 6) together beforehand. In case the pin holes have been damaged during removal of the old pins the holes can be drilled to a larger pin size. File off any burrs from the shafts.
- Mount the bearings (11) into the body (1) from flow port side.
- High temperature-construction: Spray a thin layer of dry lubricating fluid, e.g. Molykote 321R or equivalent, into the inside surface of the bushing and the shaft bearing groove. Mount the bearing on the shaft. Press the bushing with a tightening clamp on the shaft´s bearing groove and fit the shaft with the bearings carefully into the body.
- Place thrust bearings (12) at the end of the shaft
- Place the disc horizontally on a surface so that the flat side of the disc lays against the surface. Lift the body around the disc so that the shaft bores are aligned with the bores in the disc. Protect the disc (see Fig. 17).
- Press the shafts into the disc drillings. Align the pin holes. The shaft (5) position against the disc must be according to Figure 15.

NOTE:
Use only pins supplied by the manufacturer!

NOTE:
The pins must be pressed with enough force to deform them so that the connection will be free from backlash.

- Support the disc well in a horizontal position during mounting of the pins. Push the new pins into the holes and press them in a press to final form (see Fig. 18). Use slightly larger pressing tool than the pin diameter. See Table 7 for forces.

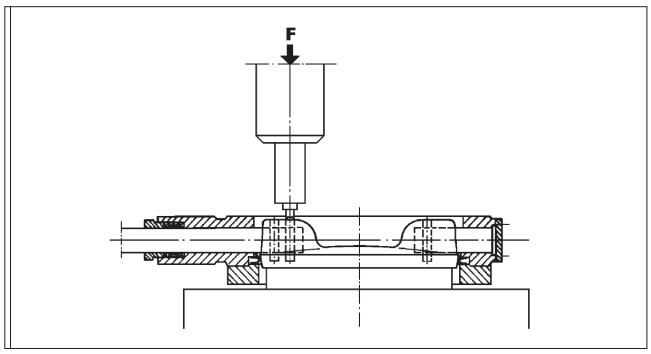


Fig. 18 Pressing the pins

Table 7 Pin pressing force, kN

PIN material	DIAMETER OF PIN (mm)						
	5,1	6,9	8,4	10,2	11,9	13,4	16,9
	DIA OF PRESSING TOOL (TOOL MUST BE SAME AS PIN OR SIZE BIGGER)						
	6	8	10	12	12	15	20
	PIN PRESSING FORCE (kN)						
316	25	45	67	99	135	171	272
17-4PH	44	80	119	176	239	303	482
XM-19	51	93	139	204	278	353	561

- Install the gasket (31) and the blind flange (8). Screws of the blind flange must be tightened evenly. An unevenly tightened flange will damage the seat.
- Install the seat ring. See details in Section 5.5.
- Install the body gasket (32) and the clamp ring (2). See details in Section 5.5.
- Install the gland packing (see Section 5.3).
- Check the contact line between the seat ring and the disc (see Fig. 15).

6. INSTALLING AND DETACHING THE ACTUATOR

6.1 General

WARNING:
BEFORE INSTALLING THE VALVE AND ACTUATOR, BE SURE THAT THE INDICATOR POINTER ON TOP OF THE ACTUATOR IS CORRECTLY INDICATING THE VALVE POSITION. FAILURE TO ASSEMBLE THESE PRODUCTS TO INDICATE CORRECT VALVE POSITION COULD RESULT IN DAMAGE OR PERSONAL INJURY.

CAUTION:
WHEN INSTALLING A LINKAGE OR SERVICING A VALVE/ ACTUATOR ASSEMBLY, THE BEST PRACTICE IS TO REMOVE THE ENTIRE ASSEMBLY FROM SERVICE.

CAUTION:
AN ACTUATOR SHOULD BE REMOUNTED ON THE VALVE FROM WHICH IT WAS REMOVED. THE ACTUATOR MUST BE READJUSTED FOR PROPER OPEN AND CLOSE POSITION EACH TIME IT IS REMOUNTED.

WARNING:
THE LINKAGE HAS BEEN DESIGNED TO SUPPORT THE WEIGHT OF THE NELES ACTUATORS AND RECOMMENDED ACCESSORIES. USE OF THIS LINKAGE TO SUPPORT ADDITIONAL EQUIPMENT SUCH AS PEOPLE, LADDERS, ETC. MAY RESULT IN THE FAILURE OF THE LINKAGE, VALVE OR ACTUATOR AND MAY CAUSE PERSONAL INJURY.

CAUTION:
BEFORE DISMANTLING, CAREFULLY OBSERVE THE POSITION OF THE VALVE WITH RESPECT TO THE ACTUATOR AND POSITIONER/LIMIT SWITCH SO AS TO ENSURE THAT THE PACKAGE CAN BE PROPERLY REASSEMBLED. MOUNTING AN OPEN ACTUATOR TO A CLOSED VALVE MAY RESULT IN VALVE STEM DAMAGE.

CAUTION:
WHEN HANDLING THE VALVE OR THE VALVE PACKAGE, BEAR IN MIND ITS WEIGHT!

WARNING:
THE ACTUATOR MUST NOT BE REMOVED FROM THE VALVE IN A PIPELINE UNDER PRESSURE AS RESULT OF DYNAMIC TORQUE!

WARNING:
DO NOT DETACH A SPRING-RETURN ACTUATOR UNLESS A STOPSCREW IS CARRYING THE SPRING FORCE!

CAUTION:

DO NOT TURN THE DISC MORE THAN 90° AS THIS COULD DAMAGE THE SEAT. THE VALVE IS SO CONSTRUCTED THAT THE DISC OPERATES ONLY BETWEEN 0-90°.

NOTE:

The actuator is factory-mounted on the valve and the stroke limit stop screws are adjusted in advance.

6.2 Installing the B1 series actuator

- Turn the valve to the closed position before mounting the actuator.
- Clean the shaft and the shaft bore and file off any burrs which could interfere with mounting. Protect the joint surfaces from corrosion, e.g. with Cortec VCI 369.
- If a bushing is required between the actuator shaft bore and the valve shaft, mount it first in the actuator shaft bore.
- The valve keyway is on the side opposite the flat side of the disc. The actuator shaft bore has two keyways set 90° apart.
- For double-acting cylinder actuator, B1C, and spring return cylinder actuator, B1J (spring-to-close), choose the keyway which establishes the piston in its upper position (at the top end of the cylinder) when the valve is closed.
- In the spring-return cylinder actuator B1JA (spring to-open), choose the keyway which establishes the piston in its lower position when the valve is open.
- Check visually that the actuator is correctly positioned relative to the valve. Tighten all the fastening screws as tightly as possible.
- Adjust the stop screws to the closed position (see Section 6.5).
- The opening angle in a control valve can be limited by a stop screw to 80°. The opening angle of a shutoff valve is 90°.
- When a shaft extension is required, the sizing of the shaft extension must be discussed with the valve manufacturer.

6.3 Detaching the B1 series actuator

- Disconnect the actuator from its power source; detach the air supply pipe and control signal cables or pipes from their connectors.
- Unscrew the bracket screws.
- Detach the actuator using a suitable extractor. The correct tool can be ordered from the manufacturer (see Fig. 20).
- Remove the bracket and coupling, if any.

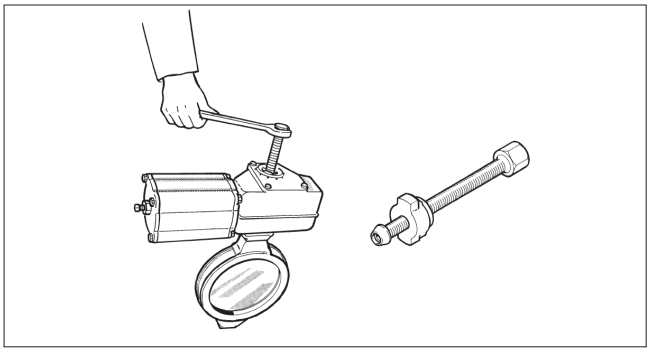


Fig. 19 Actuator removal, B1 series

6.4 Detaching and installing other actuator types

See actuator's manual for details.

6.5 Stop screw adjustment

General

Close the metal seated triple eccentric disc valve by turning the disc with a torque against the seat. Choose the torque from Tables 9 and 10 for adjusting the stop screw to the closed position of the actuator. Try not to exceed the given values since excessive torque would strain the seat and the joint between the disc and the shaft. Always readjust the stop screw after changing the seat and after mounting the actuator.

Actuators other than tabulated

Close the valve as per the tabulated torque Mc and adjust the stops accordingly. Note the increased torque created by the actuator while the valve is closed.

NOTE:

Valmet accepts no responsibility for compatibility of actuators not installed by Valmet.

Changing the mounting position

WARNING:

THE ACTUATOR MUST NOT BE REMOVED FROM THE VALVE IN A PIPELINE UNDER PRESSURE AS RESULT OF DYNAMIC TORQUE!

Always remove the actuator from the valve shaft before mounting it into another key groove. Readjust the closed position limit as instructed.

If manually operated, the valve should close when the handwheel is turned clockwise. In a double-action cylinder, the piston must be in the upper position of the cylinder when the valve is closed. In this position the actuator creates maximum torque. Do not turn the disc more than 90° as this could damage the seat.

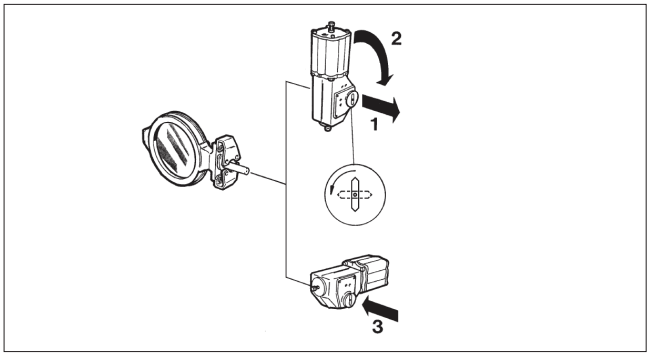


Fig. 20 Changing the mounting position

Double-acting cylinder actuator B1C

- Apply the tabulated shut-off pressure Pc to the air connection at the cylinder base.

- With the stop screw removed, check through the air connection hole that the piston does not touch the cylinder end. If it does, loosen the bracket screws and turn the actuator clockwise to increase the adjusting margin.
- Turn the closed position stop screw until it touches the piston, then turn back 1/4 turn and lock up. An O-ring is used for leakproofing the stop screw.
- An extra long screw is needed for opening angles < 80°.

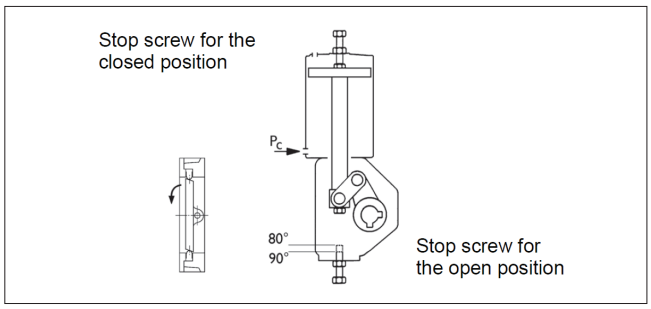


Fig. 21 Cylinder actuator, series B1C

Spring return cylinder actuator B1J

“Spring-to-close”

- Before mounting the cylinder, screw in the closed position stop screw completely.
- The table indicates *) spring when the spring-created torque does not exceed the maximum permitted closing torque Mc. Otherwise, apply the tabulated pressure Pc into the air connection at the cylinder end against the spring force. The stop screw must not be removed when the cylinder is pressurized! Open the stop screw until it does not touch the piston.
- Turn the closed position stop screw until it touches the piston, then turn back 1/4 turn and lock up. An O-ring is used for leakproofing the stop screw.
- After adjusting, check the adjusting margin through the air connection hole. The piston must not touch the cylinder end. If necessary, increase the margin by loosening the bracket screws and turning the actuator clockwise.
- An extra long screw is needed for opening angles < 80°.

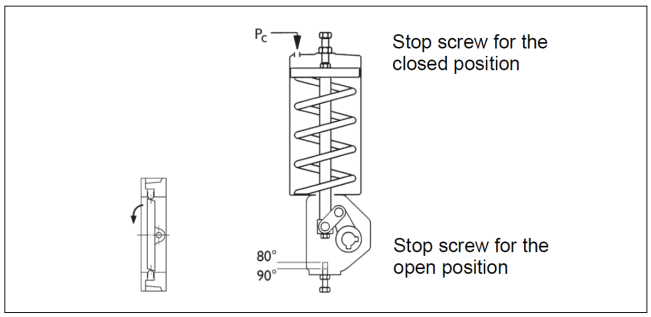


Fig. 22 Cylinder actuator, series B1J

Spring return cylinder actuator B1JA

“Spring-to-open”

- The actuator being unpressurized the valve is open. Unscrew the close limit stop screw (actuator housing). Apply tabulated shut-off pressure Pc to the air connection at the cylinder bottom end against the spring force to close the valve.
- Check through the stop screw hole that the piston rod does not touch the cylinder top end. If it does, loosen the bracket screws and turn the actuator clockwise to increase the adjusting margin.
- Turn the closed position stop screw until it touches the piston, then turn back 1/4 turn and lock up. An O-ring is used for leakproofing the stop screw.
- An extra long screw is needed for opening angles < 80°.

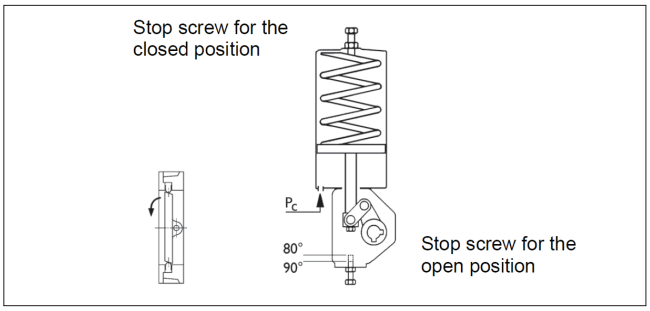


Fig. 23 Cylinder actuator, series B1JA

M series operator

- Close the valve as per the tabulated primary torque M1 (handwheel torque) given in Tables 9 and 10.
- Tighten the closed position stop screw until it touches the linkage, then turn back 1/4 turn and lock up with Loctite locking glue.

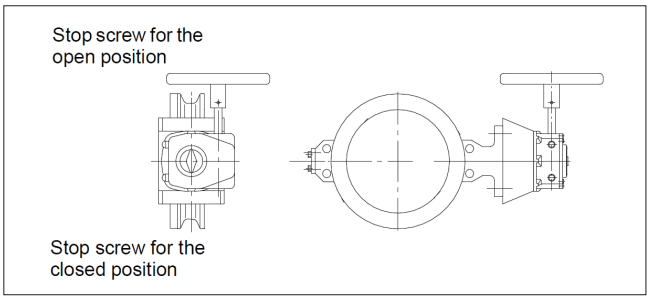


Fig. 24 Actuator, series M

7. TROUBLESHOOTING TABLE

Table 8 Troubleshooting

Symptom	Possible fault	Recommended action
Leakage through a closed valve	Wrong stop screw adjustment of the actuator	Adjust the stop screw for closed position
	Faulty zero setting of the positioner	Adjust the positioner
	Damaged seat	Replace the seat
	Damaged closing member	Replace the closing member
	Closing member in a wrong position relative to the actuator	Select the correct keyway in the actuator
Leakage through body joint	Damaged gasket	Replace the gasket
	Loose body joint	Tighten the nuts or screws
Irregular valve movements	Actuator or positioner malfunction	Check the operation of the actuator and positioner
	Process medium accumulated on the sealing surface	Clean the sealing surface
	Closing member or seat damaged	Replace the closing member or seat
	Crystallizing medium has entered the bearing spaces	Flush the bearing spaces
Gland packing leaking	Gland packing worn or damaged	Replace the gland packing
	Loose packing	Tighten the packing nuts

8. TOOLS

No special tools are needed for servicing the valve. However, we recommend an extractor tool (ID-code table in actuator's IMO) for removing the actuator from the valve. The tool can be ordered from the manufacturer.

9. ORDERING SPARE PARTS

When ordering spare parts, always include the following information:

- type code, sales order number, serial number (stamped on a valve body)
- number of the parts list, part number, name of the part and quantity required

This information can be found from the identification plate or documents.

Table 9 LW, LG, L6 ASME 150 & PN10-16 closing torques

DN SIZE	Mc		BC and BJ	BC pc		BJ pc		BJA **) pc		BJK pc		BJKA **) pc		BJV pc		BJVA **) pc		Q-P							
																		spring close			**) spring open		Manual operator	Input torque M1	
	(Nm)	(lbf ft)	SIZE	(bar)	(psi)	(bar)	(psi)	(bar)	(psi)	(bar)	(psi)	(bar)	(psi)	(bar)	(psi)	(bar)	(psi)	actuator	(bar)	(psi)	(bar)	(psi)		(Nm)	(lbf ft)
80 3"	60	44	**6**	3.3	47.9	*)spring		4.3	62.4	*)spring		3.7	53.7	*)spring		4.9	71.1	**QP2C**	0.4	5.8	3.9	56.6	**M07**	5	0
			8			0.5	7.25	3.4	49.3	0.2	2.9	2.7	39.2	1.0	14.5	3.8	55.1	**QP3C**	1.0	14.5	3.3	47.9	**M10**	5	0
			9	1.6	23.2																				
			10			0.9	13.1	2.9	42.1	0.6	8.7	2.3	33.4	1.4	20.31	3.4	49.3								
100 4"	100	74	**6**	5.4	78.32	*)spring		5.5	79.8	*)spring		4.9	71.1	*)spring		6.1	88.5	**QP2C**			4.8	69.6	**M07**	9	6
			8			*)spring		4.0	58.0	*)spring		3.3	47.9	0.4	5.8	4.4	63.8	**QP3C**	0.6	8.7	3.8	55.1	**M10**	9	6
			9	2.6	37.71													**QP4C**	1.1	15.95	3.2	46.4			
			10			0.6	8.7	3.2	46.4	0.3	4.4	2.6	37.7	1.1	16.0	3.7	53.7								
			11	1.4	20.31																				
			12			1.1	16.0	2.9	42.1	0.6	8.7	2.2	31.9	1.5	21.76	3.4	49.3								
150 6"	150	111	**6**	8.2	118.9	*)spring		7.0	101.5	*)spring		6.5	94.3	*)spring		7.7	111.7	**QP3C**	0.1	1.5	4.3	62.4	**M07**	13	10
			8			*)spring		4.7	68.2	*)spring		4.0	58.0	*)spring		5.1	74.0	**QP4C**	0.9	13.05	3.5	50.8	**M10**	13	10
			9	3.9	56.56																				
			10			0.3	4.4	3.6	52.2	*)spring		3.0	43.5	0.8	11.6	4.1	59.5								
			11	2.1	30.46																				
			12			0.9	13.1	3.1	45.0	0.5	7.3	2.4	34.8	1.3	18.85	3.6	52.2								
200 8"	350	258	**10**			*)spring		5.1	74.0	*)spring		4.5	65.3	*)spring		5.6	81.2	**QP4C**			4.6	66.7	**M10**	30	22
			11	4.9	71.07													**QP5C**	0.7	10.15	3.6	52.2	**M12**	29	21
			12			0.1	1.5	3.9	56.6	*)spring		3.2	46.4	0.6	8.7	4.4	63.8								
			13	2.4	34.81																				
			16			0.7	10.2	3.2	46.4	0.3	4.4	2.6	37.7	1.2	17.4	3.9	56.6								
			17	1.3	18.85																				
250 10"	500	369	**12**			*)spring		4.4	63.8	*)spring		3.7	53.7	0.1	1.5	4.9	71.1	**QP5C**	0.3	4.4	4.0	58.0	**M10**	43	32
			13	3.4	49.31													**QP6C**	0.9	13.1	3.3	47.9	**M12**	42	31
			16			0.4	5.8	3.5	50.8	0.1	1.5	2.9	42.1	0.9	13.1	4.2	60.9								
			17	1.8	26.11																				
			20	1.5	21.76	0.9	13.1	3.0	43.5	0.5	7.3	2.4	34.8	1.3	18.9	3.4	49.3								
300 12"	800	590	**13**	5.4	78.32													**QP6C**	0.4	5.8	3.7	53.7	**M12**	66	49
			16			*)spring		4.2	60.9	*)spring		3.5	50.8	0.3	4.4	4.8	69.6						**M14**	61	45
			17	2.9	42.06																				
			20	2.4	34.81	0.6	8.7	3.3	47.9	0.2	2.9	2.7	39.2	1.0	14.5	3.7	53.7								

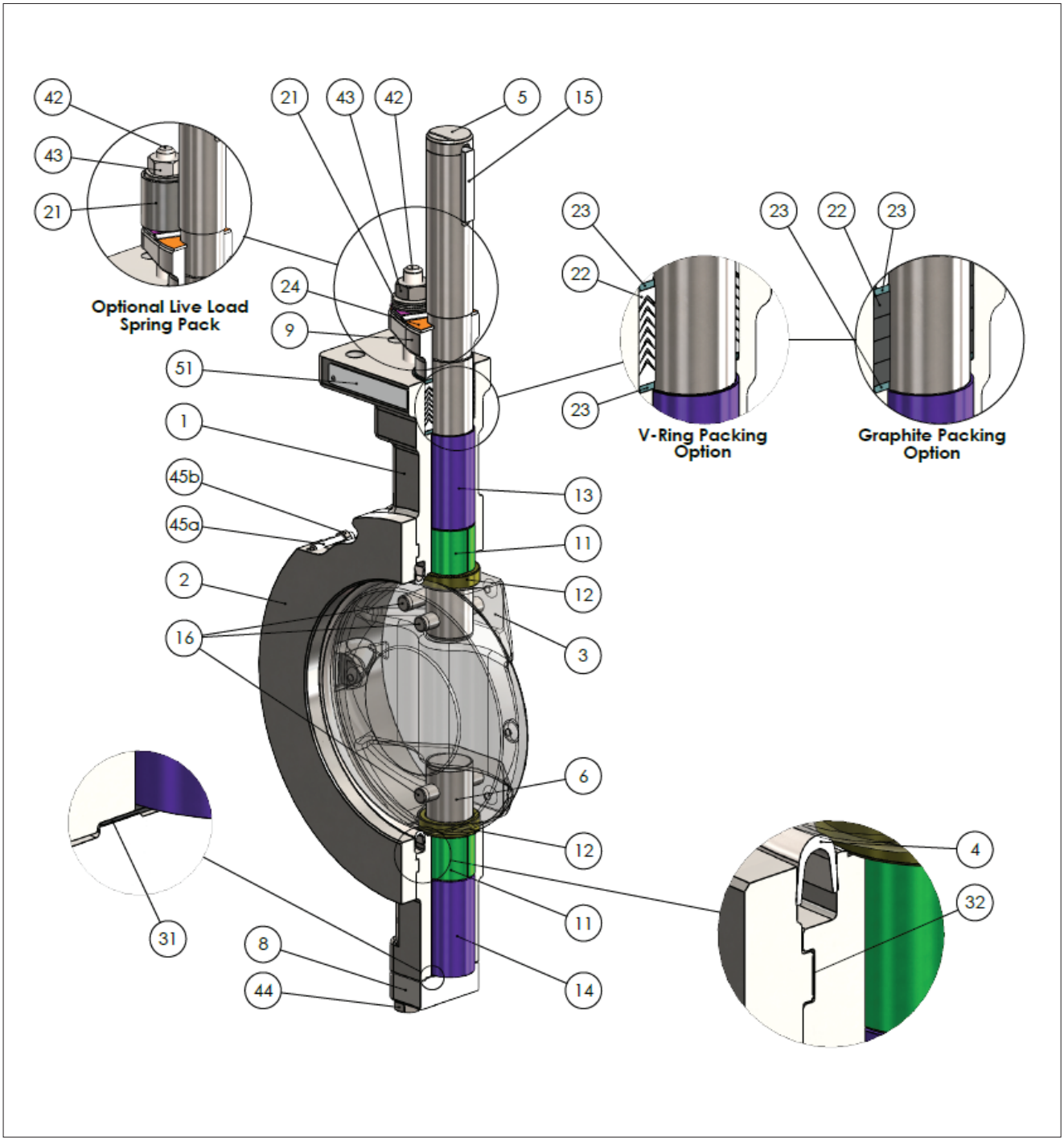
*) spring = spring torque not adequate to reach tightness according to ISO 5208 Rate D, BS 6755 Part 1 Rate D, ANSI/FCI 70.2 Class V, IEC 534-4 or MSS-SP72/1970
**) Adjust the supply pressure regulator to the pressure below. Do not exceed given value.

Table 10 LW, LG, L6 ASME 300 & PN25-40 closing torques

DN SIZE	Mc		BC and BJ	BC pc		BJ pc		BJA **) pc		BJK pc		BJKA **) pc		BJV pc		BJVA **) pc		Q-P							
																		spring close			**) spring open		Manual operator	Input torque M1	
	(Nm)	(lbf ft)	SIZE	(bar)	(psi)	(bar)	(psi)	(bar)	(psi)	(bar)	(psi)	(bar)	(psi)	(bar)	(psi)	(bar)	(psi)	actuator	(bar)	(psi)	(bar)	(psi)		(Nm)	(lbf ft)
80 3"	60	44	**6**	3.3	47.9	*)spring		4.3	62.4	*)spring		3.7	53.7	*)spring		4.9	71.1	**QP2C**	0.4	5.8	3.9	56.6	**M07**	5	0
			8			0.5	7.25	3.4	49.3	0.2	2.9	2.7	39.2	1.0	14.5	3.8	55.1	**QP3C**	1.0	14.5	3.3	47.9	**M10**	5	0
			9	1.6	23.2																				
			10			0.9	13.1	2.9	42.1	0.6	8.7	2.3	33.4	1.4	20.31	3.4	49.3								
100 4"	100	74	**6**	5.4	78.32	*)spring		5.5	79.8	*)spring		4.9	71.1	*)spring		6.1	88.5	**QP2C**			4.8	69.6	**M07**	9	6
			8			*)spring		4.0	58.0	*)spring		3.3	47.9	0.4	5.8	4.4	63.8	**QP3C**	0.6	8.7	3.8	55.1	**M10**	9	6
			9	2.6	37.71													**QP4C**	1.1	16.0	3.2	46.4			
			10			0.6	8.7	3.2	46.4	0.3	4.4	2.6	37.7	1.1	16.0	3.7	53.7								
			11	1.4	20.31																				
			12			1.1	16.0	2.9	42.1	0.6	8.7	2.2	31.9	1.5	21.76	3.4	49.3								
150 6"	230	170	**9**	6.0	87.0													**QP4C**	0.4	5.8	3.9	56.6	**M07**	20	15
			10			*)spring		4.2	60.9	*)spring		3.6	52.2	0.2	2.9	4.7	68.2	**QPC5**	1.1	16.0	3.3	47.9	**M10**	20	15
			11	3.2	46.41																				
			12			0.6	8.7	3.4	49.3	0.2	2.9	2.7	39.2	1.1	16.0	3.9	56.6								
			13	1.6	23.21																				
			16			1.0	14.5	3.0	43.5	0.6	8.7	2.3	33.4	1.5	21.8	3.6	52.2								
200 8"	400	295.02	**11**	5.6	81.22													**QPC5**	0.6	8.7	3.8	55.1	**M10**	34	25
			12			*)spring		4.1	59.5	*)spring		3.4	49.3	0.4	5.8	4.6	66.7	**QP6C**	1.0	14.5	3.1	45.0	**M12**	33	24
			13	2.7	39.16																		**M14**	30	22
			16			0.6	8.7	3.3	47.9	0.2	2.9	2.7	39.2	1.1	16.0	4.0	58.0								
			17	1.4	20.31																				
			20	1.2	17.4	1.0	14.5	2.9	42.1	0.6	8.7	2.2	31.9	1.4	20.3	3.3	47.9								
250 10"	700	516	**13**	4.7	68.17													**QP6C**	0.6	8.7	3.6	52.2	**M12**	58	43
			16			*)spring		3.9	56.6	*)spring		3.3	47.9	0.5	7.3	4.6	66.7						**M14**	53	39
			17	2.5	36.26																				
			20	2.1	30.46	0.7	10.15	3.2	46.4	0.3	4.4	2.6	37.7	1.1	16.0	3.6	52.2								
300 12"	1100	811	**16**			*)spring		4.8	69.6	*)spring		4.1	59.5	*)spring		5.4	78.3	**QP6C**			4.1	59.5	**M14**	84	62
			17	4.0	58.0																		**M15**	58	43
			20	3.2	46.41	0.3	4.4	3.6	52.2	*)spring		3.0	43.5	0.7	10.2	4.0	58.0								
			25	1.7	24.66	0.8	11.6	3.0	43.5	0.5	7.3	2.4	34.8	1.3	18.9	3.5	50.8								
			32	0.8	11.6	1.1	16.0	2.8	40.6	0.7	10.2	2.1	30.5	1.6	23.2	3.3	47.9								

*) spring = spring torque not adequate to reach tightness according to ISO 5208 Rate D, BS 6755 Part 1 Rate D, ANSI/FCI 70.2 Class V, IEC 534-4 or MSS-SP72/1970
**) Adjust the supply pressure regulator to the pressure below. Do not exceed given value.

10. ASSEMBLY AND PARTS LIST



Parts list

Item	Qty	Description	Material	Spare part category
1	1	BODY	ASTM A216 gr. WCB/1.0619	
			A351 gr. CF8M/1.4408	
2	1	CLAMP RING	A351 gr. CF8M/1.4408	
3	1	DISC	ASTM A351 gr. CF8M	
4	1	SEAT	UNS N08825+HCr	
5	1	DRIVE SHAFT	A564 gr. 630 H1150D	
			ASTM A479 gr. 316	
6	1	TRUNNION	A564 gr. 630 H1150D	
			ASTM A479 gr. 316	
8	1	BLIND FLANGE	A351 gr. CF8M/1.4408	
9	1	GLAND	A351 gr. CF8M/1.4408	
11	2	BEARING	625+PVDC	
			316L+RPTFE	
12	2	THRUST BEARING	ASTM A269 gr.316+HCr	
13	1	BEARING SPACER	AISI 316	
			PTFE	
14	1	BEARING SPACER	AISI 316	
			PTFE	
15	1	KEY	EN 10088-1.4460	
16	2/3	PIN	A564 gr. 630 H1150D	
			ASTM A479 gr. 316	
21	2	DISC SPRING SET	AISI 303//50CrV4+ENP	
			AISI 304	
22	1	PACKING RING SET	GRAPHITE	1
			PTFE	
23	2	ANTI EXTRUSION RING	AISI 316	
24	2	RETAINER	AISI 316	
31	1	GASKET	GRAPHITE	1
32	1	BODY GASKET	GRAPHITE	1
42	2	STUD	ASTM A193 gr. B8M cl. 2	
43	2	HEXAGON NUT	ASTM A194 gr. 8M	
44		HEXAGON SCREW	ASTM A193 gr. B8M cl. 2	
45		SOCKET HEAD SCREW	ASTM A320 gr. L7M	
			ASTM A193 gr. B8M cl. 2	
45a		STUD	ASTM A193 gr. B8M cl. 2	
45b		HEXAGON NUT	ASTM A194 gr. 8M	
51	1	IDENTIFICATION PLATE	AISI 316	

Spare part set category 1: Recommended soft parts, always needed for the repair. Delivered as a set.

Repair kits

When ordering repair kits for your valve refer to Section 1.3, Valve Markings and check area “5” on your valve’s identification plate to determine the correct seat material for your valve. Please provide the full type code from the identification plate.

Service / spare part

Valmet recommends that valves be directed to our service centers for maintenance. The service centers are equipped to provide rapid turn-around at a reasonable cost and offer new valve warranty with all reconditioned valves.

NOTE: When sending goods to the service center for repair, do not disassemble them. Clean the valve carefully and flush the valve internals. Include the material safety datasheet(s) (MSDS) for all media flowing through the valve. Valves sent to the service center without MSDS datasheet(s) will not be accepted.

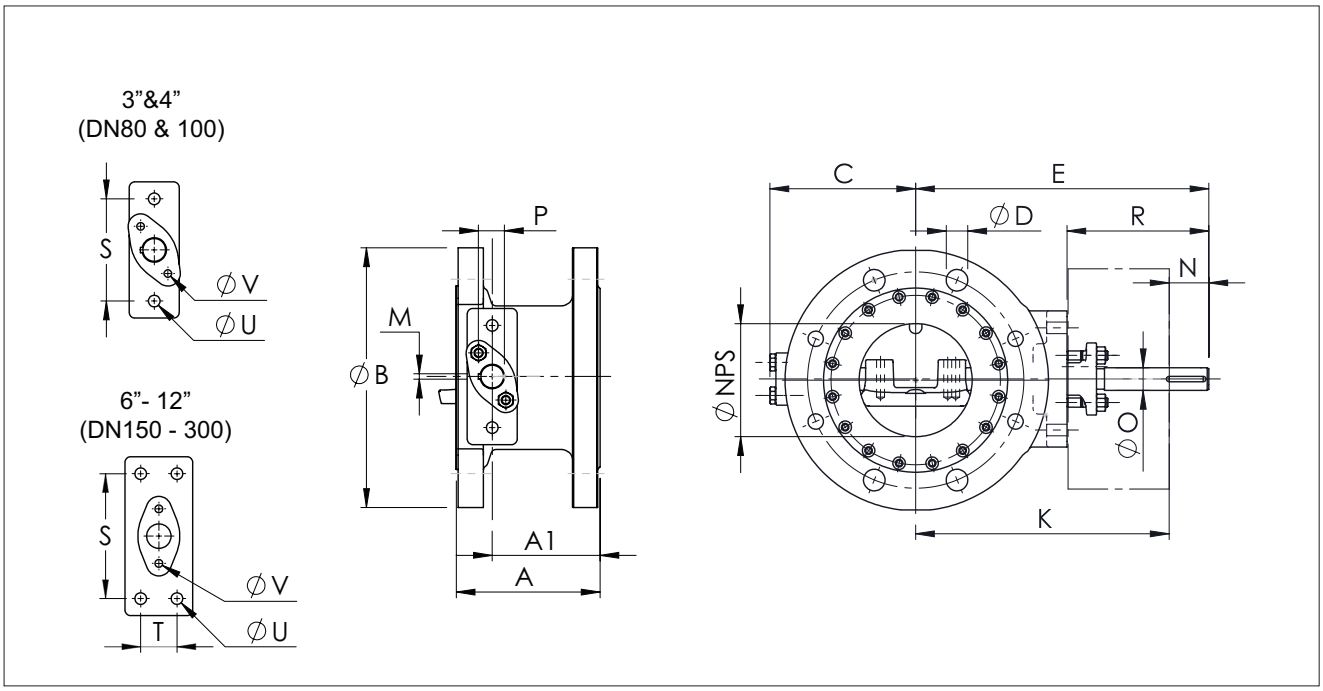
For further information on spare parts and service or assistance visit our web-site at www.neles.com/valves.

NOTE: When ordering spare parts, always include the following information:

- Valve type code from identification plate
- If the valve is serialized – the serial number (from identification plate)

11. DIMENSIONS AND WEIGHTS

L6 Double flanged design



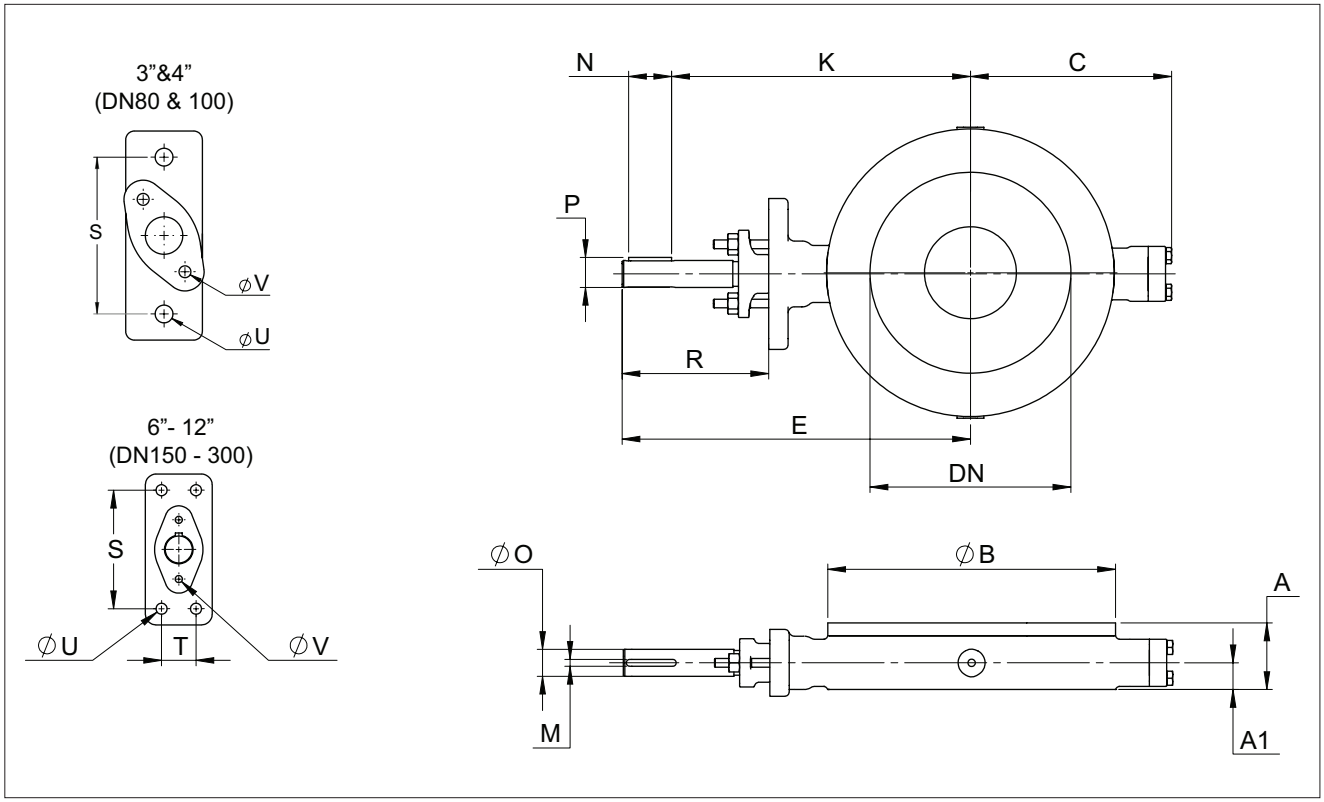
L64 (ASME 150, PN10-16)

DN	NPS	Dimensions (mm)																Weight (Kg)
		A (API/Series 13)	A1	ØB	C	D	E	K	M	N	O	P	R	S	T	U	V	
80	3	114	86	190	109	19	226	201	4.8	25	15	17.0	105	70	-	M10	M8	10
100	4	127	95	230	129	19	258	223	4.8	35	20	22.2	125	90	-	M12	M8	18
150	6	140	107	280	159	22	277	242	4.8	35	20	22.2	125	110	32	M12	M8	26
200	8	152	115	345	187	22	323	277	6.4	46	25	27.8	136	110	32	M12	M10	43
250	10	165	125	405	226	25	393	342	6.4	51	30	32.9	161	130	32	M12	M12	61
300	12	178	134	485	262	25	428	370	9.5	58	35	39.1	168	130	32	M12	M12	94

L64 (ASME 300, PN25-40)

DN	NPS	Dimensions (mm)																Weight (Kg)
		A (API/Series 13)	A1	ØB	C	D	E	K	M	N	O	P	R	S	T	U	V	
80	3	114	86	210	109	22	226	201	4.8	25	15	17.0	105	70	-	M10	M8	15
100	4	127	95	255	129	22	258	223	4.8	35	20	22.2	125	90	-	M12	M8	25
150	6	140	104	320	178	22	321	275	6.4	46	25	27.8	136	110	32	M12	M10	47
200	8	152	108	380	215	25	381	323	9.5	58	35	39.1	168	130	32	M12	M12	71
250	10	165	117	445	254	29	442	374	9.5	68	40	44.2	188	160	40	M16	M12	108
300	12	178	124	520	301	32	535	445	12.7	90	50	55.5	230	160	55	M20	M16	169

LW Wafer design



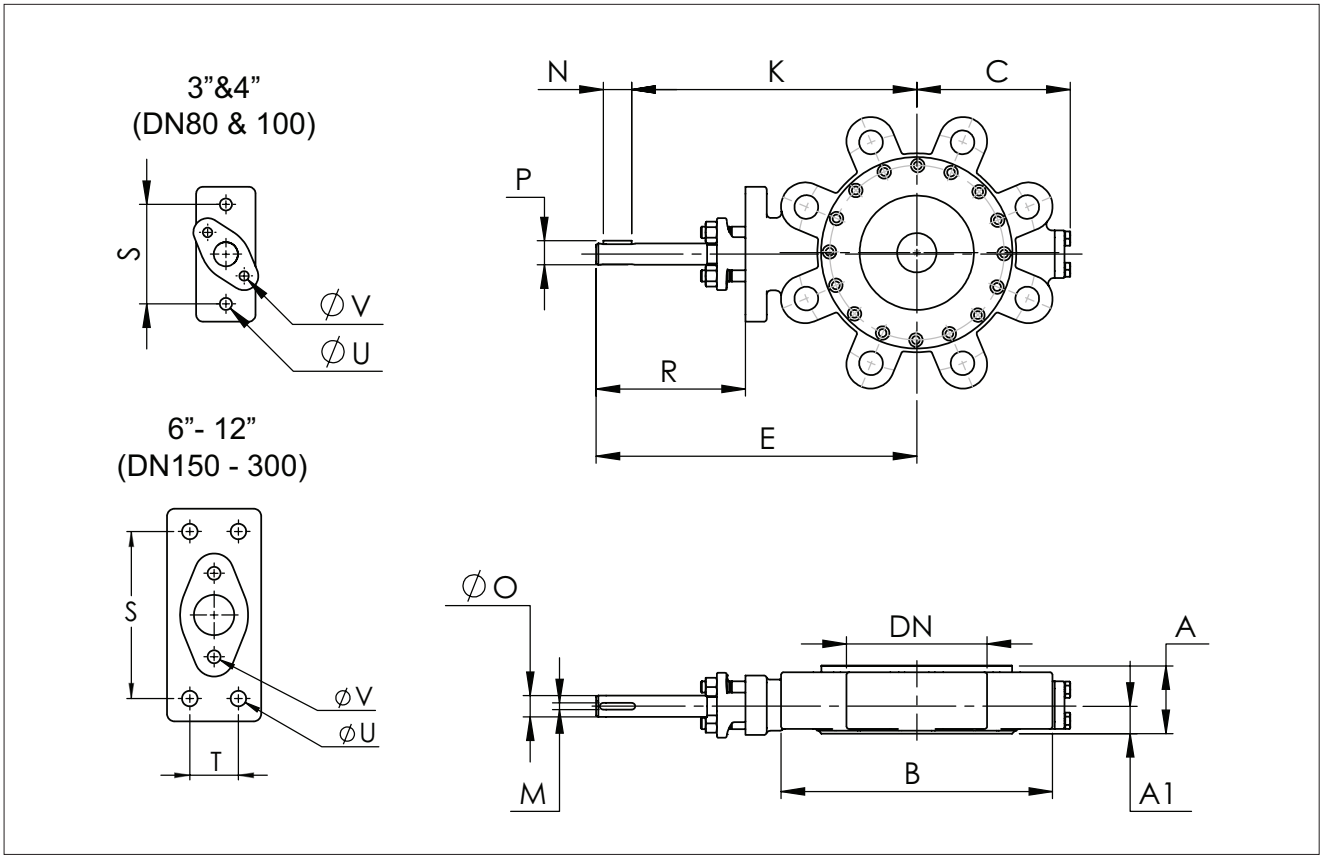
LW6 & LW7 (ASME 150, PN10, PN16)

DN	NPS	Dimensions (mm)																Weight (Kg)
		LW6A (K1/API/ Series 20)	LW7A (K2/ Series 25)	A1	ØB	C	E	K	M	N	O	P	R	S	T	U	V	
80	3	48	49	20	131	109	226	201	4.8	25	15	17.0	105	70	-	M10	M8	5
100	4	54	56	22	156	129	258	223	4.8	35	20	22.2	125	90	-	M12	M8	7
150	6	57	70	24	217	159	277	242	4.8	35	20	22.2	125	110	32	M12	M8	14
200	8	64	71	25	267	187	323	277	6.4	46	25	27.8	136	110	32	M12	M10	21
250	10	71	76	30	328	226	393	342	6.4	51	30	32.9	161	130	32	M12	M12	32
300	12	81	83	37	375	262	428	370	9.5	58	35	39.1	168	130	32	M12	M12	44

LW5 & LW8 (ASME 300, PN25-40)

DN	NPS	Dimensions (mm)																Weight (Kg)
		LW5 A (K1/API)	LW8 A (K3/Series 16)	A1	ØB	C	E	K	M	N	O	P	R	S	T	U	V	
80	3	48	64	20	131	109	226	201	4.8	25	15	17.0	105	70	-	M10	M8	6
100	4	54	64	22	156	129	258	223	4.8	35	20	22.2	125	90	-	M12	M8	8
150	6	59	76	25	217	178	321	275	6.4	46	25	27.8	136	110	32	M12	M10	16
200	8	73	89	32	280	215	381	323	9.5	58	35	39.1	168	130	32	M12	M12	35
250	10	83	114	38	340	254	442	374	9.5	68	40	44.2	188	160	40	M16	M12	60
300	12	92	114	41	400	301	535	445	12.7	90	50	55.5	230	160	55	M20	M16	91

LG Lug design



LG6 & LG7 (ASME 150, PN10-16)

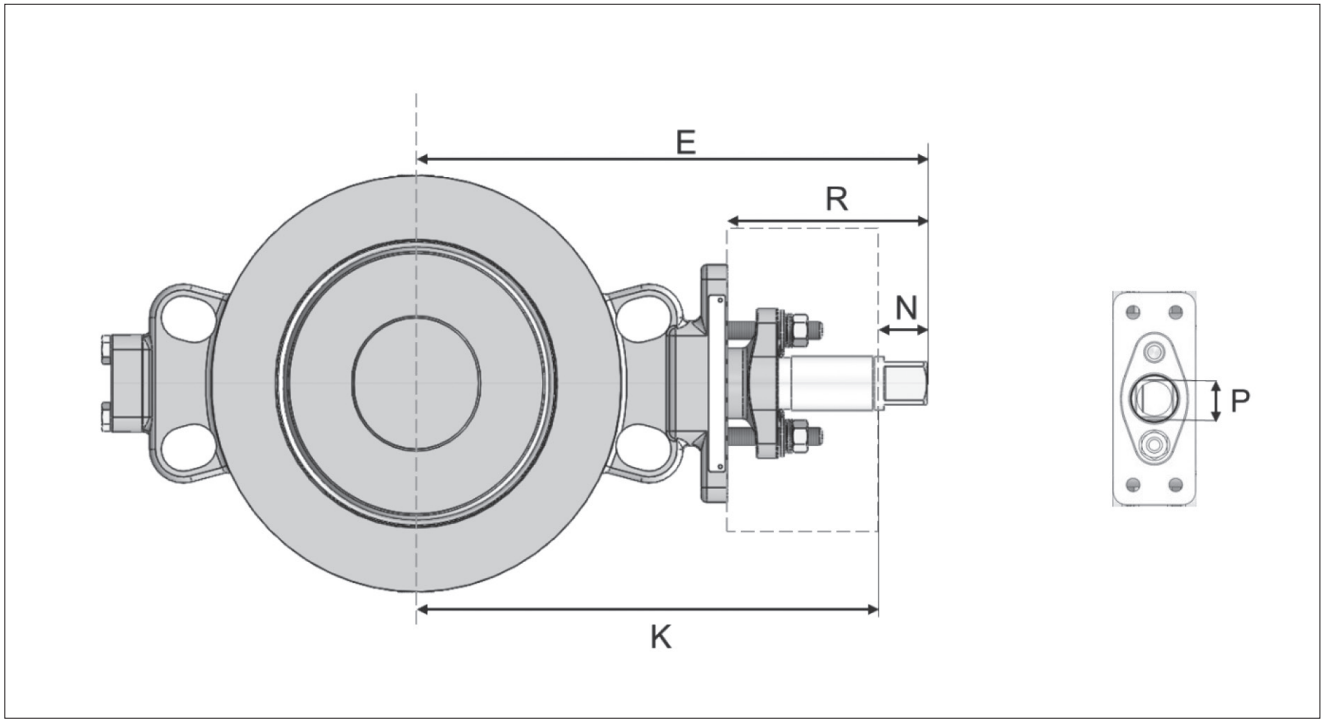
DN	NPS	Dimensions (mm)																Weight (Kg)
		LG6A (K1/API/ Series 20)	LG7A (K2/ Series 25)	A1	B	C	E	K	M	N	O	P	R	S	T	U	V	
80	3	48	49	20	135	109	226	201	4.8	25	15	17.0	105	70	-	M10	M8	8
100	4	54	56	22	222	129	258	223	4.8	35	20	22.2	125	90	-	M12	M8	13
150	6	57	70	24	257	159	277	242	4.8	35	20	22.2	125	110	32	M12	M8	18
200	8	64	71	25	319	187	323	277	6.4	46	25	27.8	136	110	32	M12	M10	30
250	10	71	76	30	391	226	393	342	6.4	51	30	32.9	161	130	32	M12	M12	43
300	12	81	83	37	458	262	428	370	9.5	58	35	39.1	168	130	32	M12	M12	59

LG5 & LG8 (ASME 300, PN25-40)

DN	NPS	Dimensions (mm)																Weight (Kg)
		LG5A (K1/API)	LG8 A (K3/Series 16)	A1	B	C	E	K	M	N	O	P	R	S	T	U	V	
80	3	48	64	20	191	109	226	201	4.8	25	15	17.0	105	70	-	M10	M8	10
100	4	54	64	22	222	129	258	223	4.8	35	20	22.2	125	90	-	M12	M8	14
150	6	59	76	25	306	178	321	275	6.4	46	25	27.8	136	110	32	M12	M10	28
200	8	73	89	31	365	215	381	323	9.5	58	35	39.1	168	130	32	M12	M12	46
250	10	83	114	37	431	254	442	374	9.5	68	40	44.2	188	160	40	M16	M12	84
300	12	92	114	40	493	301	535	445	12.7	90	50	55.5	230	160	55	M20	M16	113

Dimensions for valves with square shaft connection

Same dimensions apply for all body types. Other dimensions as in above tables



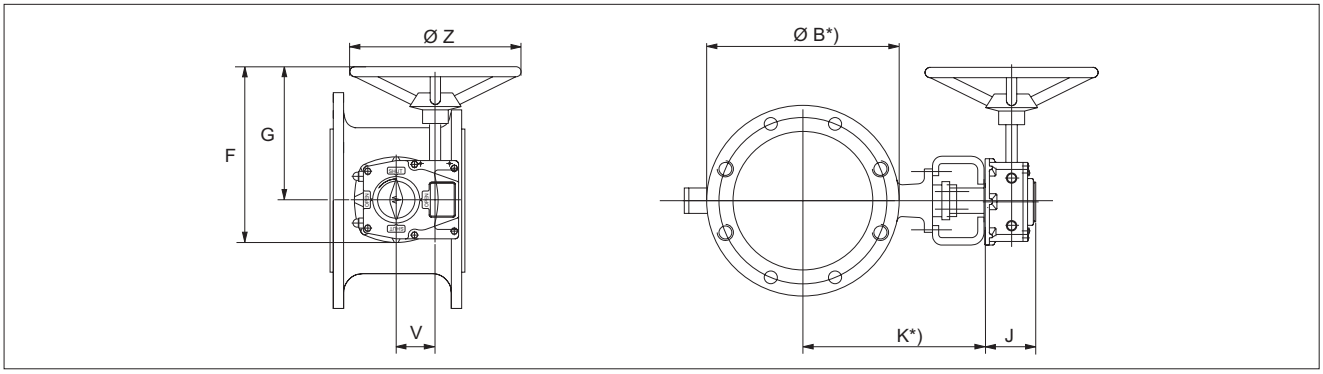
ASME 150, PN10-16

Size		E	K	N	P	R
DN	Inch					
80	3	213	201	12	11	92
100	4	239	223	16	14	106
150	6	258	242	16	14	106
200	8	298	277	21	19	111
250	10	366	342	24	22	134
300	12	399	370	29	27	139

ASME 300, PN25-40

Size		E	K	N	P	R
DN	Inch					
80	3	213	201	12	11	92
100	4	239	223	16	14	106
150	6	296	275	21	19	111
200	8	352	323	29	27	139
250	10	406	374	32	30	152
300	12	483	445	38	36	178

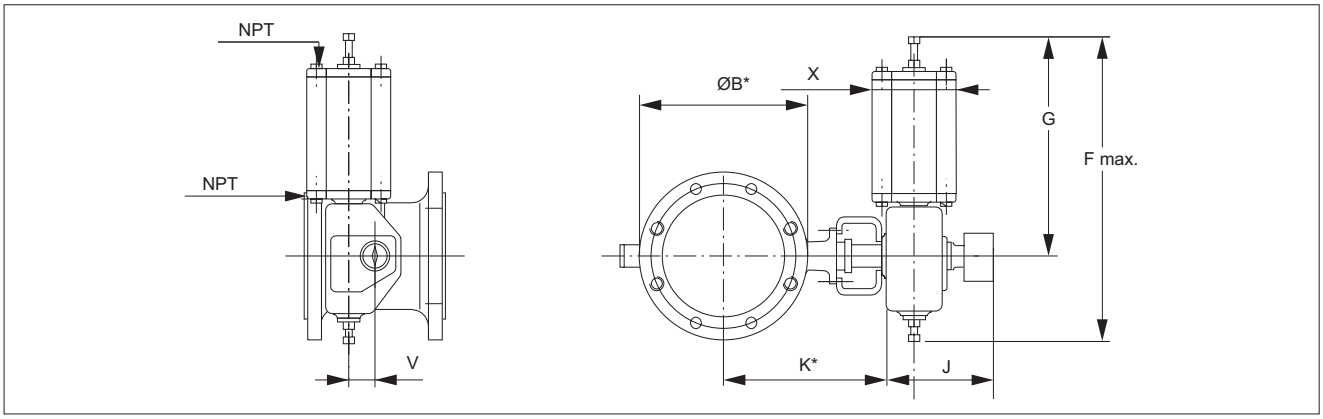
VALVE + PNEUMATIC ACTUATOR B1C, B1J, B1JA



Type	Dimensions, mm					kg
	F	G	J	V	Z	
M07	241	185	65	52	160	3.8
M10	243	187	65	52	200	4.3
M12	304	235	88	71	315	10
M14	405	305	93	86	200	18.2
M15	456	346	102	105	500	26.2
M16	491	348	120	153	600	31.8
M25	597	412	160	182	600	60.8

Type	Dimensions, in					lb
	F	G	J	V	Z	
M07	9.49	7.28	2.56	2.05	6.30	8.4
M10	9.57	7.36	2.56	2.05	7.87	9.5
M12	11.97	9.25	3.46	2.80	12.40	22
M14	15.94	12.01	3.66	3.39	7.87	40.1
M15	17.95	13.62	4.02	4.13	19.69	57.8
M16	19.33	13.70	4.72	6.02	23.62	70.1
M25	23.50	16.22	6.30	7.17	23.62	134

VALVE + PNEUMATIC ACTUATOR B1C, B1J, B1JA



Type	Dimensions, mm					NPT	kg
	X	G	F	V	J		
B1C6	90	270	395	36	283	1/4	4.2
B1C9	110	315	450	43	279	1/4	9.6
B1C11	135	375	535	51	290	3/8	16
B1C13	175	445	640	65	316	3/8	31
B1C17	215	555	785	78	351	1/2	54
B1C20	215	590	880	97	385	1/2	73
B1C25	265	725	1075	121	448	1/2	131
B1C32	395	920	1370	153	525	3/4	256
B1C40	505	1150	1670	194	595	3/4	446
B1C50	610	1390	2060	242	690	1	830

Type	Dimensions, in					NPT	lb
	X	G	F	V	J		
B1C6	3.54	10.63	15.55	1.42	11.14	1/4	9
B1C9	4.33	12.40	17.70	1.69	10.98	1/4	21
B1C11	5.31	14.80	21.10	2.01	11.42	3/8	35
B1C13	6.89	17.50	25.20	2.56	12.44	3/8	68
B1C17	8.46	21.90	30.90	3.07	13.82	1/2	119
B1C20	8.46	23.20	34.70	3.82	15.16	1/2	161
B1C25	10.43	28.50	42.30	4.76	17.64	1/2	289
B1C32	15.55	36.20	53.90	6.02	20.67	3/4	564
B1C40	19.88	45.30	65.70	7.64	23.43	3/4	983
B1C50	24.02	54.70	81.10	9.53	27.17	1	1829

Type	Dimensions, mm					NPT	kg
	X	G	F	V	J		
B1J, B1JA8	135	420	555	43	279	3/8	17
B1J, B1JA10	175	480	640	51	290	3/8	30
B1J, B1JA12	215	620	815	65	316	1/2	57
B1J, B1JA16	265	760	990	78	351	1/2	100
B1J, B1JA20	395	940	1230	97	358	3/4	175
B1J, B1JA25	505	1140	1490	121	448	3/4	350
B1J, B1JA32	540	1435	1885	153	525	1	671

Type	Dimensions, in					NPT	lb
	X	G	F	V	J		
B1J, B1JA8	5.31	16.50	21.90	1.69	10.98	3/8	37
B1J, B1JA10	6.89	18.90	25.20	2.01	11.42	3/8	66
B1J, B1JA12	8.46	24.40	32.10	2.56	12.44	1/2	126
B1J, B1JA16	10.43	29.90	38.00	3.07	13.82	1/2	220
B1J, B1JA20	15.55	37.00	48.40	3.82	14.09	3/4	386
B1J, B1JA25	19.88	44.90	58.70	4.76	17.64	3/4	771
B1J, B1JA32	21.26	56.50	74.20	6.02	20.67	1	1479

12. TYPE CODE

Neles™ Neldisc™ high performance butterfly valves. Series L6, LW, LG Model D												
1.	**2.**	**3.**	**4.**	**5.**	**6.**	**7.**	**8.**	**9.**	**10.**	**11.**	**12.**	**13**
-	LW	6	K	B	A	200	A	A	A	A	T	D

1. sign	FLOW BALANCING CONSTRUCTION
-	Standard construction

2. sign	PRODUCT SERIES / DESIGN
LW	Wafer type, metal seated butterfly valve
LG	Lug type, metal seated butterfly valve
L6	Double flange type, metal seated butterfly valve

3. sign	FACE TO FACE
LW & LG	
6	EN 558-part 1, table 5 / basic series 20 (DIN 3202-K1) (with PN10-16) API 609 category B class 150 (with ASME 150)
7	EN 558-part 1, table 5 / basic series 25 (DIN 3202-K2) (with PN10-16)
8	EN 558-part 1, table 5 / basic series 16 (DIN 3202-K3) (with PN25-40)
5	API 609 category B class 300 (with ASME 300)
L6	
4	API 609 category B, Double-flanged (short pattern) (with all pressure classes)

4. sign	PRESSURE RATING & DRILLING
C	ASME 150
D	ASME 300
J	PN 10
K	PN 16
L	PN 25
M	PN 40

5. sign	VALVE-ACTUATOR CONNECTION AND SHAFT CONSTRUCTION
B	Drive shaft + trunnion with two keyways / bracket Neles standard
A	Through shaft with two keyways / bracket Neles standard
D	Drive shaft + trunnion with square drive / bracket Neles standard

6. sign	CONSTRUCTION
A	STANDARD
N/1N	EXTENDED SERVICE
Z	OXYGEN SERVICE (max. +200°C) • BAM/WHA approved soft parts • Otherwise as A-construction

7. sign	SIZE (inches / mm)
ASME	03, 04, 06, 08, 10, 12
PN	080, 100, 150, 200, 250, 300

8. sign	Body	9. sign	Disc	10. sign	Shaft & pins
Note: Material coding specifies only the type of material not grade (cast, wrought, bar, forged...) which can change based on size or type. Below material combinations are not fixed by each row.					
A	CF8M / 1.4408	A	CF8M/ F316	C	Gr. 630 (17-4PH)
P	CF8M / 1.4408	B	CF8M / F316+ cobalt based alloy on disc edge		

11. sign	STANDARD SEAT
A	Incoloy 825 (=UNS N08825), hard chrome plated

12. sign	SHAFT SEAL OPTIONS
T	Standard live loaded PTFE V-ring packing (ISO15848-1 certified)
G	Standard live loaded graphite packing (Fire safe and ISO15848-1 certified)
T1	High performance live loaded PTFE V-ring packing (ISO15848-1 certified)
G1	High performance live loaded graphite packing (Fire safe and ISO15848-1 certified)

13. sign	
D	Mod D, modular butterfly valve platform

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