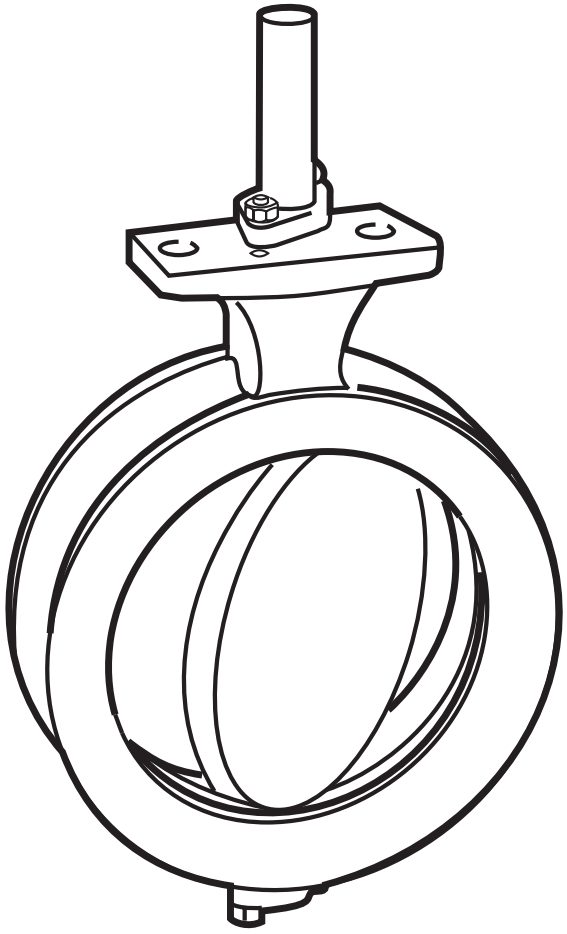
Neles™ Neldisc™ high performance butterfly valves

Series L12

Installation, maintenance and operating instructions



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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

These instructions provide the customer/operator with important information in addition to the customer/operator's normal operation and maintenance procedures. Since operation and maintenance philosophies vary, Valmet does not attempt to dictate specific procedures, but to provide basic limitations and requirements created by the type of equipment provided.

These instructions assume that operators already have a general understanding of the requirements for safe operation of mechanical and electrical equipment in potentially hazardous environments. Therefore, these instructions should be interpreted and applied in conjunction with the safety rules and regulations applicable at the site and the particular requirements for operation of other equipment at the site.

These instructions do not intend to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the customer/ operator's purposes the matter should be referred to Valmet.

The rights, obligations and liabilities of Valmet and the customer/operator are strictly limited to those expressly provided in the contract relating to the supply of the equipment. No additional representations or warranties by Valmet regarding the equipment or its use are given or implied by the issue of these instructions.

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.valmet.com/flowcontrol/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. department.

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

1. GENERAL

These installation and maintenance instructions apply to 3-56" (DN80-1400), pressure class ASME150/PN25 L12 series valves regardless of the type of material used. The valve body is one-part in sizes DN80-600 and the sizes DN700-1400 have a bolted clamp ring. The L12 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 L12 is a metal seated triple eccentric butterfly valve available in wafer.

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.

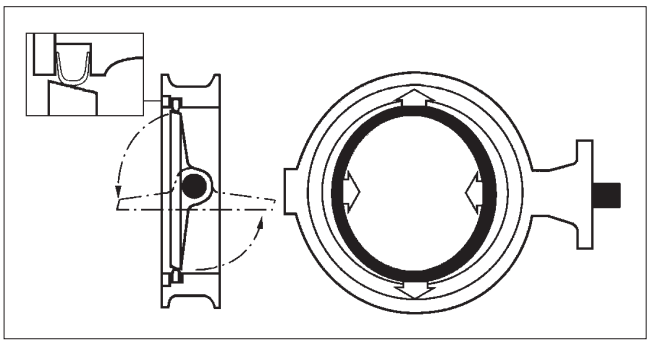


Fig. 1 Construction of a triple eccentric disc valve. Neldisc sealing principle.

1.3 Valve markings

Body markings are cast or stamped on the body. The valve also has an identification plate attached to it (see Fig. 2).

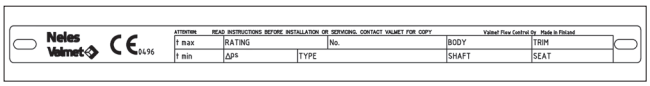


Fig. 2 Identification plate

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
12. Certification and approvals, eg. CE, Atex etc.

1.4 Technical specifications

Type:	Full bore, metal seated triple eccentric disc valve	
Pressure class		
Body:	ASME 150 / PN 25	
Rated pressure differential for the trim.	DN 80–150	Δp_{max}=25 bar
	DN 200	Δp_{max}=20 bar
	DN 250–1000	Δp_{max}=10 bar
	DN 1200, 1400	Δp_{max}=6 bar
Temperature range:	-40° to +260 °C	
Flow direction:	Free	
Dimensions:	See Section 11	
Weight:	See Section 11	

1.5 Valve approvals

API 607 fire test for quarter-turn valves and valves equipped with nonmetallic seats. Valve with codes T or G are TA-Luft approved (sizes DN700 and above). Group II Category 2 according to directive 2014/34/EU (ATEX). NACE MR0103 & MR0175.

1.6 CE and ATEX 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.

When applicable, the valve meets the requirements of the European Directive 2014/34/EU relating to equipment and protective systems intended for use in potentially explosive atmospheres, 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 device. 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 .
Please consult separate document: instructions for lifting Neles products. (See Neles document id: 10LIFT70EN.PDF).

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 measured 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°.

NOTE:
Contact Valmet experts for dead-end service compliance.
Wafer type is not applicable for dead-end service.

ATEX/Ex Safety

CAUTION!
Potential electrostatic hazard, ensure the protection (grounding, etc.) in the process.

CAUTION!
The actual surface temperature of valve is dependent on the process temperature. The protection from high or low temperature must be considered by the end user before valve is put into service.

CAUTION!
Ensure the general process and worker protection from static electricity in the facilities.
Note! Within series there is possibility to Category 2, Category 3 and non-ATEX 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. trim 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.
3. 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.
4. 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 3).

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. For lowest operating torque it is recommended that the valve is installed with the clamp ring towards the higher pressure (shaft downstream).

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 (Figure 3) because dirt in the pipeline may damage the gland packing.

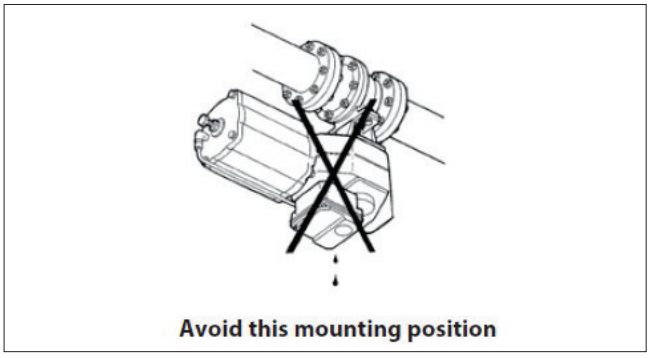


Fig. 3 Avoid this mounting position

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. 4). 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. 5).

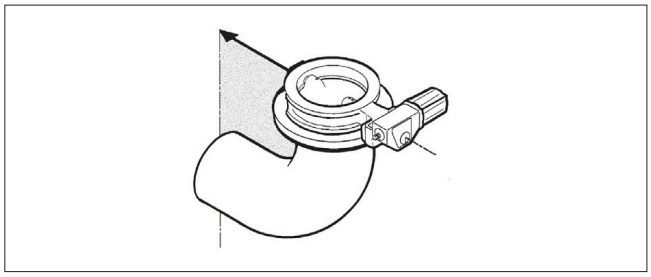


Fig. 4 Mounting after a pipe elbow

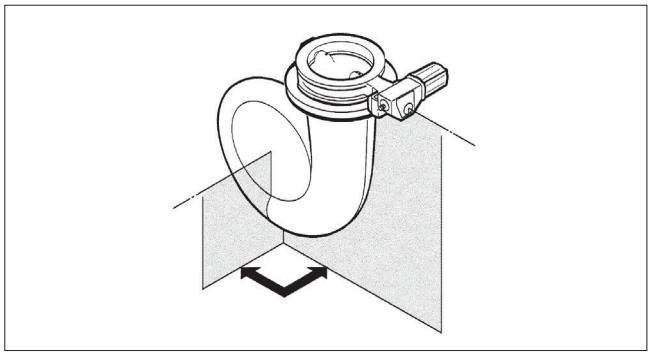


Fig. 5 Mounting after the centrifugal pump

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. 6 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. 8 and Table 3.

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.

See Figure 8 and Table 3, length of stud bolts are based on:

- gasket thickness of 3 mm
- heavy nuts with washers

flange thickness of weldneck flanges per DIN or ISO.

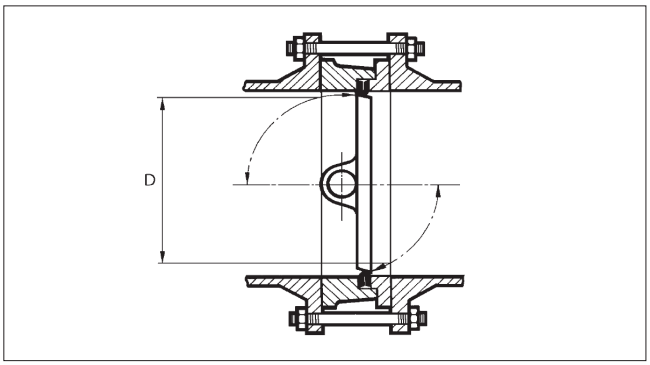


Fig. 6 Minimum pipe inside dimensions

Table 1 Mounting dimensions (mm)

Valve size	D
	L12
80	67
100	87
125	112
150	143
200	191
250	241
300	287
350	330
400	371
500	464
600	565
700	676
800	773
900	874
1000	968
1200	1150
1400	1350

Mounting options

- **X** Flange bolts pass the neck of the body
- **SB** Stud bolts at the neck of the body

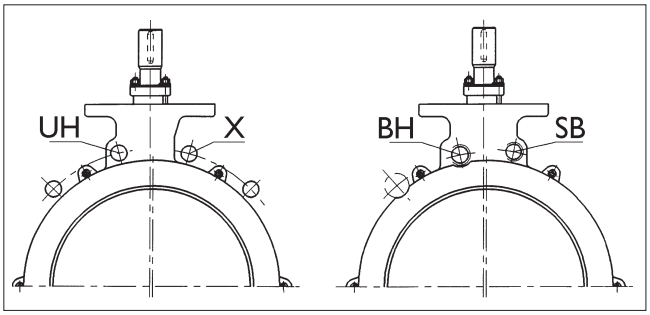


Fig. 7 Mounting options

Table 2 Mounting options

Valve type	PN 10	PN 16	PN 25	ANSI 150
L12A 80	X	X	X	X
L12A 100	X	X	X	X
L12A 125	X	X	X	X
L12A 150	X	X	X	X
L12A 200	X	X	X	X
L12A 250	X	X	X	X
L12A 300	X	X	X	X
L12A 350	X	X	X	X
L12A 400	X	X	X	X
L12A 500	SB	SB	SB	SB
L12A 600	SB	SB	SB	SB
L12B 700	SB	SB	SB	SB
L12B 800	SB	SB	SB	SB
L12B 900	SB	SB	SB	SB
L12B 1000	SB	SB	SB	SB
L12B 1200	SB	SB	SB	SB
L12B 1400	SB	SB	SB	SB

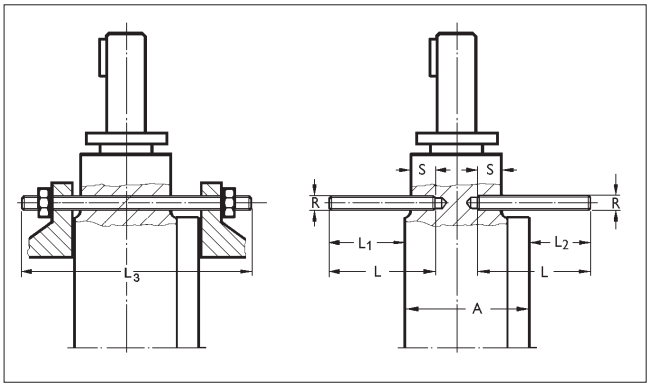


Fig. 8 Stud bolt mounting dimensions, mounting option SB

Table 3 Stud bolt dimensions (mm) and quantities per valve, mounting option SB

		PN 10								PN 16								PN 25								Class 150							
			Through studs		Body mounted studs						Through studs		Body mounted studs						Through studs		Body mounted studs						Through studs		Body mounted studs					
Valve type	A	Thread	Qty	L3	Qty	L	L1	L2	S	Thread	Qty	L3	Qty	L	L1	L2	S	Thread	Qty	L3	Qty	L	L1	L2	S	Thread	Qty	L3	Qty	L	L1	L2	S
L12A 500	127	M24	16	340	8	125	87	87	33	M30	16	340	8	140	102	102	33	M33	16	340	8	140	104	104	31	1 1/8-8 UN	16	340	8	140	106	106	29
L12A 600	154	M27	16	370	8	150	106	106	39	M33	16	390	8	160	116	116	39	M36	16	410	8	170	128	128	37	1 1/4-8 UN	16	370	8	150	108	108	37
L12B 700	165	M27	20	340	8	135	100	71	29	M33	20	380	8	150	119	90	25	M39	20	410	8	165	135	106	24	1 1/4-8 UN	24	440	8	175	151	122	18
L12B 800	190	M30	20	380	8	155	110	80	40	M36	20	410	8	165	124	94	36	M45	20	460	8	190	151	121	34	1 1/2-8 UN	24	510	8	205	173	143	27
L12B 900	203	M30	24	390	8	145	102	82	37	M36	24	420	8	160	119	99	35	M45	24	470	8	185	146	126	33	1 1/2-8 UN	28	520	8	205	169	149	30
L12B 1000	216	M33	24	410	8	165	111	85	44	M39	24	450	8	180	130	104	40	M52	24	520	8	210	164	138	36	1 1/2-8 UN	32	540	8	215	176	150	29
L12B 1200	254	M36	28	520	8	210	153	115	51	M45	28	570	8	230	173	135	46	M52	28	610	8	240	188	150	37	1 1/2-8 UN	40	620	8	260	217	179	51
L12B 1400	279	M39	32	520	8	200	143	100	53	M45	32	580	8	230	173	130	53	M56	32	620	8	240	191	148	45	1 3/4-8 UN	44	610	8	230	186	143	40

Valve insulation

If necessary, the valve may be insulated. Insulation must not continue above the upper level of the valve body, see Figure 9.

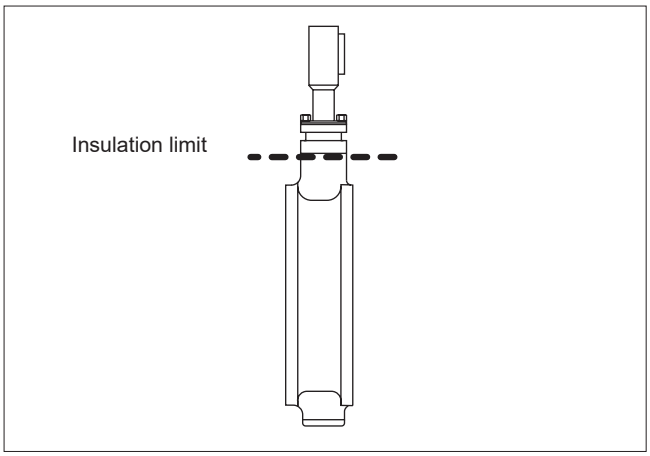


Fig. 9 Insulation of the valve

3.3 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.

The packing construction is live loaded. If the leakage occurs, re-tighten the gland nuts but don't exceed the values in the Tables 4 and 5 by 50 % or do not fully compress the disc springs.

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, bear in mind the weight of the valve or the entire package.

WARNING:
For safety reasons the retaining plates MUST always be installed acc. to section 5.3.

5.1 General

Triple eccentric disc valves require no regular maintenance. However, check the packing regularly for tightness. If the valve should require maintenance for some reason, a few simple service measures are normally sufficient.

The inspection and maintenance interval depends 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 10, unless otherwise stated.

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.

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

CAUTION:
Do not dismantle the valve or remove it from the pipeline while the valve is pressurized!

It is generally most convenient to detach the actuator and its auxiliary devices (see Section 6) before removing the valve from the pipeline. If the valve package is small or difficult to access, it may be more practical to remove the entire package at the same time.

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. The valve must be in a closed position when removing.

Support the valve carefully with a hoist. Place ropes carefully and unscrew the pipe flange bolts. Ensure that the ropes are positioned correctly.

5.3 Replacing the gland packing

CAUTION:
Do not dismantle the valve or remove it from the pipeline while the valve is pressurized!

PTFE rings are used as a standard gland packing and graphite rings for high temperature constructions. Tightness is ensured by contact between the glandfollower and the packing rings.

The gland packing (20) must be changed if leakage occurs even after the hex nuts (25) have been tightened.

Standard packing

- Make sure the valve is not pressurized.
- Unfasten the nuts (25) and remove the retaining plates (42) and the gland (9) (see Fig. 11).
- Remove the old packing V-rings (20). Do not damage the surfaces of the packing ring counterbore and shaft.
- Ensure that there are no burrs in the keyway groove which could damage the packing. Clean the gland packing and packing ring counterbore. Install new set of packings (V-ring or graphite). Slip the rings onto the shaft.

- Install the gland.
- Mount the retaining plates with the text UPSIDE on top (see Fig. 10).
- Place the nuts on the studs and tighten the gland packings while the valve is not pressurized (see Table 4).
- Retighten if necessary.

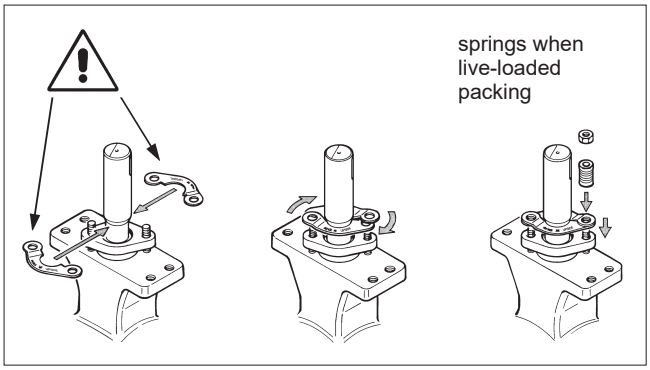


Fig. 10 Mounting the retaining plates

Table 4 Tightening of gland packing (no springs)

Size	Thread	Torque Nm	
		Packing ring material	
DN / NPS	M, UNC	Graphite + PTFE	PTFE
80 / 3	M8, 5/16	10	5
100 / 4	M8, 5/16	12	7
125 / 5	M8, 5/16	12	7
150 / 6	M8, 5/16	12	7
200 / 8	M10, 3/8	24	15
250 / 10	M10, 3/8	24	15
300 / 12	M10, 3/8	29	14
350 / 14	M10, 3/8	29	20
400 / 16	M10, 3/8	29	20
500 / 20	M14, 1/2	65	39
600 / 24	M18, 5/8	100	67
700 / 28	M18, 5/8	100	67
800 / 32	M18, 5/8	110	79
900 / 36	M20, 3/4	220	150
1000 / 40	M20, 3/4	220	150
1200 / 48	M20, 3/4	240	150
1400 / 56	M20, 3/4	240	190

Live-loaded packing

- Make sure the valve is not pressurized.
- Unfasten the nuts (25) and remove the disc spring (TA-Luft) sets (44), the retaining plates (42) and the gland (9) (see Fig. 11).
- Remove old packing rings (20). Do not damage the surfaces of the packing ring counterbore and shaft.
- 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.
- Install the gland.
- Mount the retaining plates with the text UPSIDE on top (see Fig. 10).
- Mount the disc spring sets.
- Place the nuts on the studs.
- Pre-compress the gland packing by tightening the nuts with a tool until the disc springs have value of compression (h1–h2) as in Table 5.
- 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.
- Unfasten the nuts and disc springs.
- Measure the height h1 of the disc springs and use these values as a basis when defining the final height of the springs (as compressed condition).
- Re-install the disc springs and tighten the nuts with the tool. Tighten the nuts until the set value of compression (h1–h2) of disc springs is achieved, see Table 5.

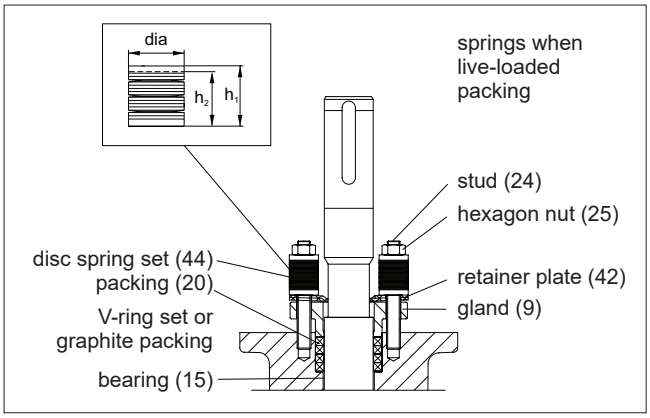


Fig. 11 Gland packing

- 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.

Table 5 Tightening of live-loaded gland packing

Size	Spring set dia	Thread	Compression (h_1–h_2) mm	
			Packing ring material	
DN / NPS	mm	M, UNC	Graphite + PTFE	PTFE
80 / 3	20	M8, 5/16	2.0	1.0
100 / 4	20	M8, 5/16	2.5	1.5
125 / 5	20	M8, 5/16	2.5	1.5
150 / 6	20	M8, 5/16	2.5	1.5
200 / 8	25	M10, 3/8	2.5	1.5
250 / 10	25	M10, 3/8	2.5	1.5
300 / 12	25	M10, 3/8	3.0	1.5
350 / 14	25	M10, 3/8	3.0	2.0
400 / 16	25	M10, 3/8	3.0	2.0
500 / 20	35.5	M14, 1/2	4.0	2.5
600 / 24	40	M18, 5/8	4.5	3.0
700 / 28	40	M18, 5/8	4.5	3.0
800 / 32	40	M18, 5/8	5.0	3.5
900 / 36	50	M20, 3/4	6.0	4.0
1000 / 40	50	M20, 3/4	6.0	4.0
1200 / 48	50	M20, 3/4	6.5	4.0
1400 / 56	50	M20, 3/4	6.5	5.0

5.4 Replacing the seat ring, sizes DN 700–1400

CAUTION:
Do not dismantle the valve or remove it from the 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.
- Remove the clamp ring (2) by untightening the screws (27).
- Remove the clamp ring, the old body seal (19) and the seat ring (4). Change the seat ring if it is damaged.
- Clean all the seating surfaces of the body and clamp ring. Check the surface of the seat ring.
- Check also the condition of the disc. A damaged disc must be changed (see Section 5.5).
- Check the condition of the pin connection. Repair it if necessary (see Section 5.5).
- Mount a new, self-adhesive body seal (19) into the body. The surface must be clean and free of grease. Handle the ends of the seal according to Fig. 12.

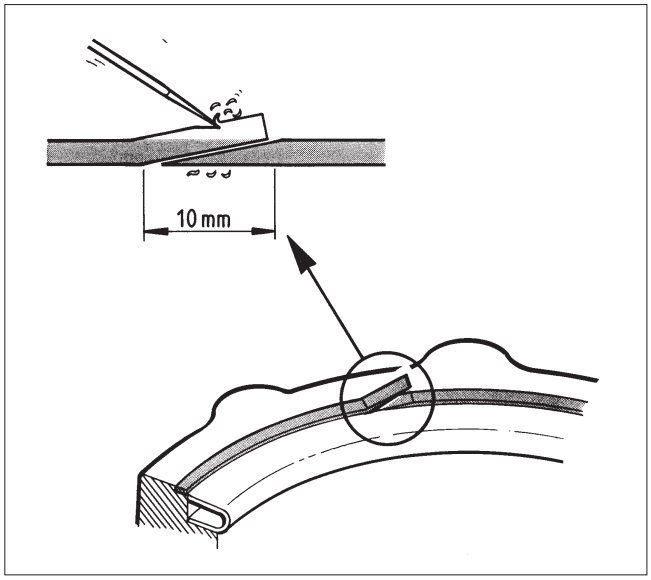


Fig. 12 Mounting the body seal

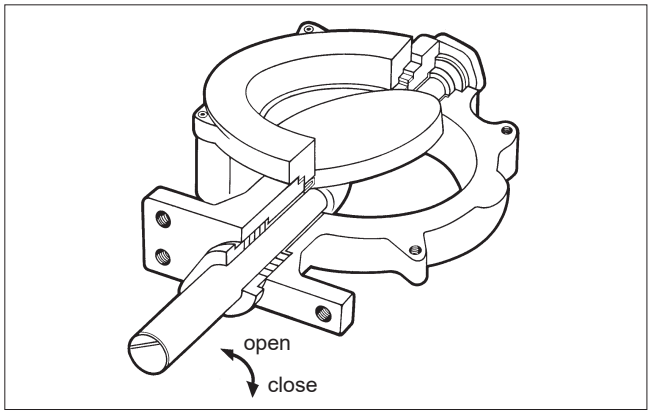


Fig. 13 The contact line between the disc and seat

- Spray a thin layer of dry lubricant, e.g. Molykote 321R or equivalent, into the seat groove, surfaces of the clamp ring and seat ring.
- Centre the seat ring (4) carefully into its groove and turn the disc to maintain light contact with the seat.
- 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) evenly. An unevenly tightened flange may damage the seat ring.
- Check the position between the seat ring and the disc. The valve closes clockwise (see Fig. 13).
- Mount the actuator into the valve. Adjust the closed position limit and check the open position limit (see Section 6).

5.5 Replacing the disc, shafts and bearings, sizes DN 700–1400

Disassembling the valve

The pin connection of the disc must be opened by drilling for changing the disc (3), shafts (11, 12) and bearings (15, 16).

- Remove the valve from the pipeline and the actuator from the valve.
- Remove the clamp ring (2) and seat ring (4) according to section 5.4.
- Set the valve horizontally on a sturdy surface so that the flat side of the disc lays against the surface, see Fig. 14.
- Drill the holes carefully to the centre of the pins (14). Choose a drill 0.2–0.5 mm smaller than the diameter of the pin.

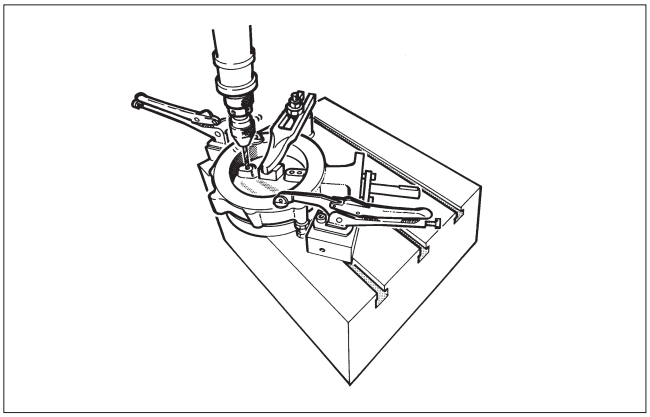


Fig. 14 Drilling the pins

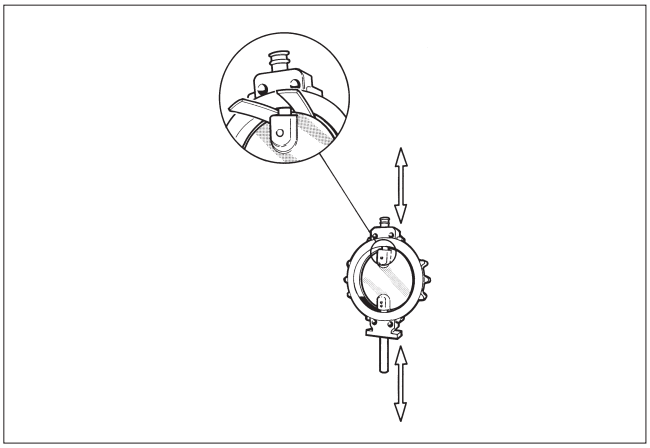


Fig. 15 Protecting the disc during disassembly and assembly

- Drill the holes deep enough, but not to reach the disc.
- Pull the pins out.
- Dismantle the gland packing according to Section 5.3.
- Detach the screws (26) and the blind flange (10) and remove the gasket (18).
- Place rubber strips or other protection between the disc edge and the body and remove the shafts, Fig. 15.
- Remove the bearings (15, 16).
- Clean and check all parts carefully.

5.6 Assembling the valve

- Replace damaged parts with new ones.
- Set the disc and the shaft together beforehand. File off any burrs from the shafts.

The bearing material of the standard construction valves is PTFE-impregnated stainless steel net.

The bearings for the high temperature valves (H-construction) are cobalt alloy bushings which are mounted into the body together with the shafts.

- Mount the bearings into the body (see Fig. 16).

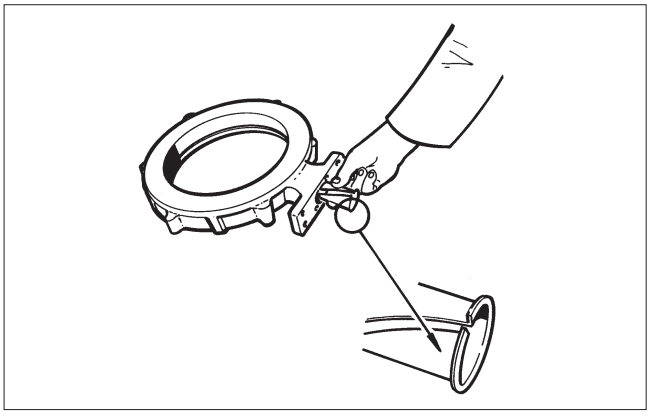


Fig. 16 Mounting the standard bearings

- 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. 15).
- Press the shafts into the disc drillings. Align the pin holes. The shaft (11) position against the disc must be according to Fig. 13

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.

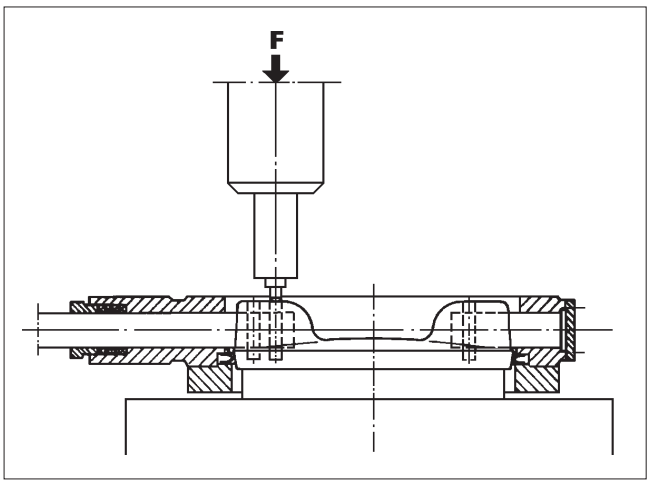


Fig. 17 Pressing the pins

Table 6 Pin pressing force, kN

PIN material	DIAMETER OF PIN (mm)									
	5	6	8	10	12	15	20	25	30	35
	DIA OF PRESSING TOOL (TOOL MUST BE SAME AS PIN OR SIZE BIGGER)									
	6	8	10	12	15	20	25	30	35	40
	PIN PRESSING FORCE (kN)									
1.4460 / 1.4462	32	46	82	128	184	287	511	798	1149	1563
17-4PH H1150M	39	56	100	156	224	350	623	973	1401	1907

- 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. 17). Use slightly larger pressing tool than the pin diameter. See Table 6 for force needed.
- Install the gasket (18) and the blind flange (10). Screws of the blind flange must be tightened evenly, see Table 7. An unevenly tightened flange will damage the seat.

Table 7 Clamp ring/blind flange screw torque, Nm ± 10%

TORQUE FOR A2-70	
Thread size [mm]	**Torque [Nm]**
M5	5
M6	9
M8	21
M10	41
M12	70
M14	110
M16	170
M20	340
M24	590

- Install the seat ring. See details in Section 5.4.
- Install the body seal (19) and the clamp ring (2). See details in Section 5.4.
- Install the gland packing (see Section 5.3).
- Check the contact line between the seat ring and the disc.

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:
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:
When Valmet supplies whole valve-actuator assembly, the actuator is mounted at Valmet factory on the valve and the stroke limit stops are adjusted by Valmet.

6.2 Mounting the actuator onto the valve

Mounting B series actuators

- 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.
- Adjust the stop screws to the closed position (see Section 6.4).
- 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. 18).
- Remove the bracket and coupling, if any.

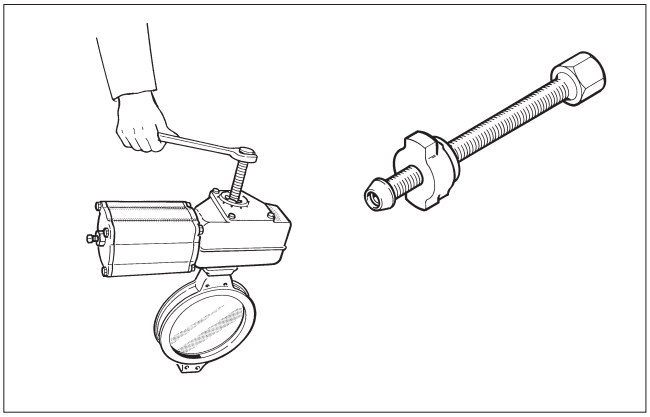


Fig. 18 Detaching B series actuators with an extractor

6.4 Stop screw adjustment

General

Close the metal seated triple eccentric disc valve by turning the disc with a torque wrench against the seat. Choose the torque from Table 11 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 it will result dynamic torque!

Always remove the actuator from the valve shaft before mounting it into another key area. 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.**

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.

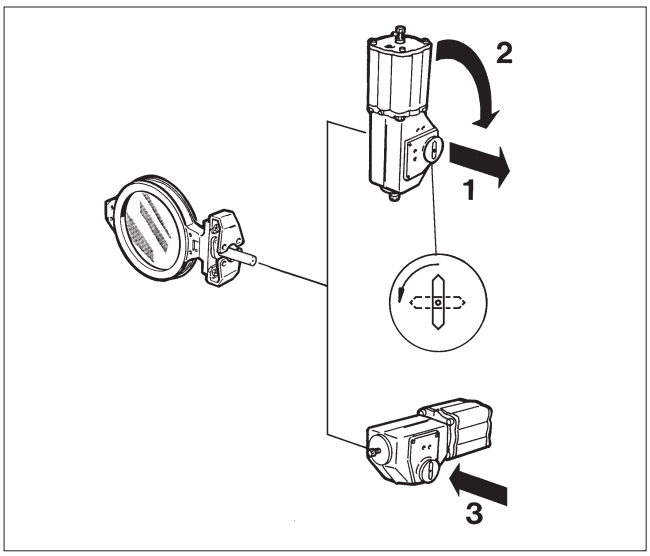


Fig. 19 Changing the mounting position

- 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°.

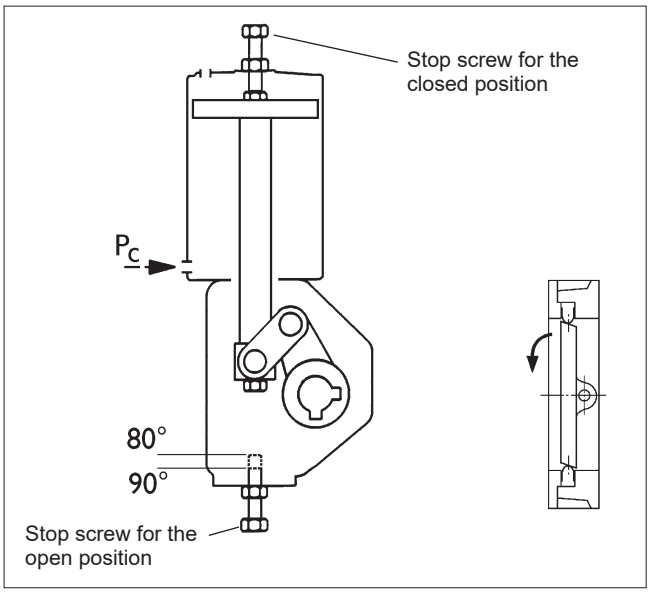


Fig. 20 Cylinder actuator, Series B1C

Spring-return cylinder actuator B1J

Spring-to-close

- Before mounting the cylinder, screw in the closed position stop screw completely.
- The Table 11 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°.

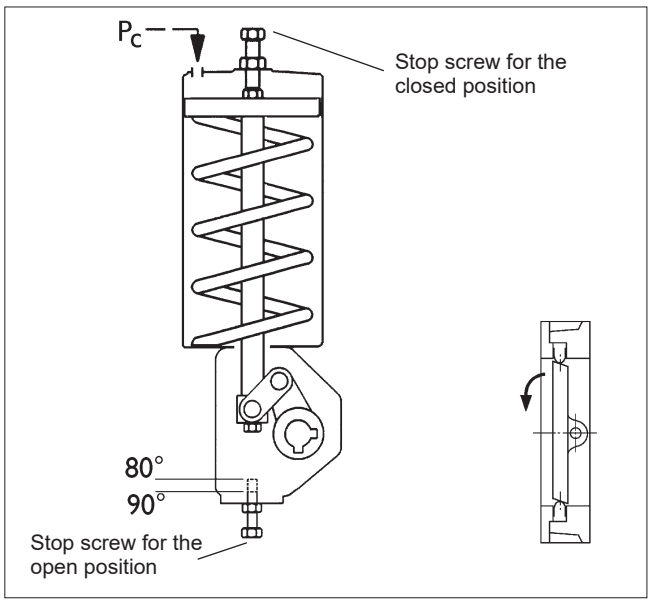


Fig. 21 Cylinder actuator, Series B1J

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 (Table 11) 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°.

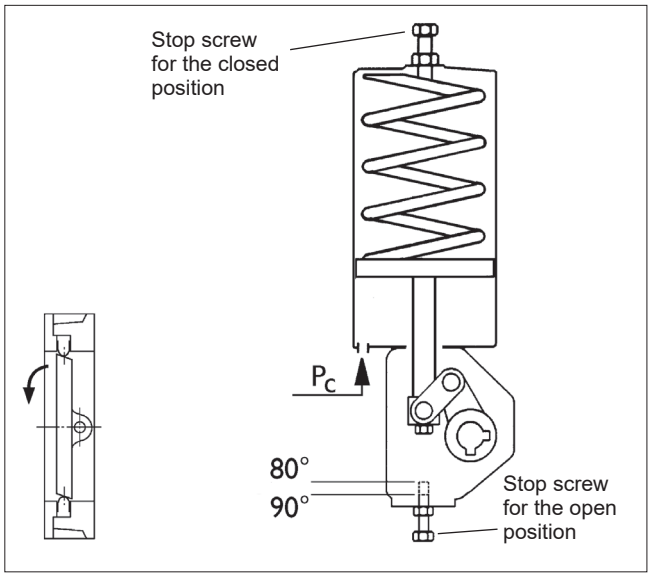


Fig. 22 Cylinder actuator, Series B1JA

Manual operator M

- Close the valve as per the tabulated primary torque M1 (handwheel torque) given in Table 11.
- Tighten the closed position stop screw until it touches the linkage, then turn back 1/4 turn and lock up with Loctite locking glue.

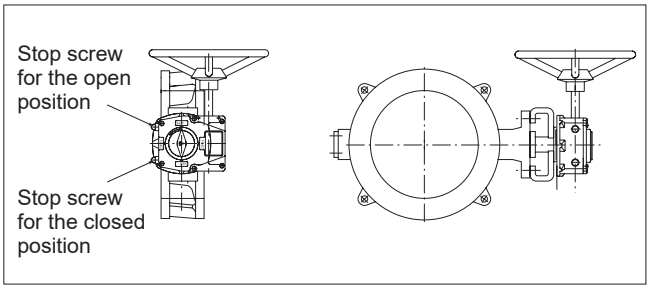


Fig. 23 Manual operator, series M

Hand lever RH

- Mount the hand lever on the valve, but do not fasten hex screws (A). Turn the lever using force F in Table 8.
- When closing torque is applied, turn the housing (B) cog of the closing limit to maintain contact with the lever arm. Fasten hex screws (A).

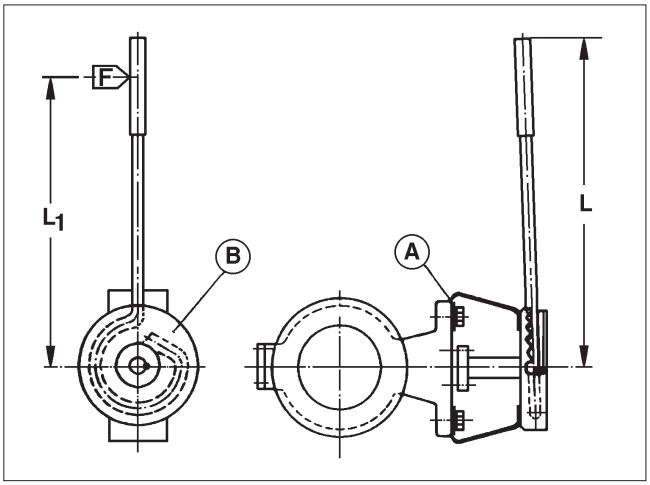


Fig. 24 Hand lever, Series RH

Table 8 Hand lever RH, adjustment values

Size		L		L1		Torque		F	
DN	"	mm	"	mm	"	Nm	lbf ft	N	lbf
80	03	400	16	350	14	40	30	115	26
100	04	400	16	350	14	70	52	200	45
125	05	400	16	350	14	100	74	285	63
150	06	500	20	450	18	135	100	300	67

7. TROUBLESHOOTING TABLE

Table 9 Trouble shooting

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 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 surfaces
	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.

Table 10 Extractor tools (Actuator Series B1C/B1J)

Product:	ID
B1C/B1J 6	303821
B1C 8-11 / B1J 8-10	8546-1
B1C 12-17 / B1J 12-16	8546-2
B1C/B1J 20	8546-3

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

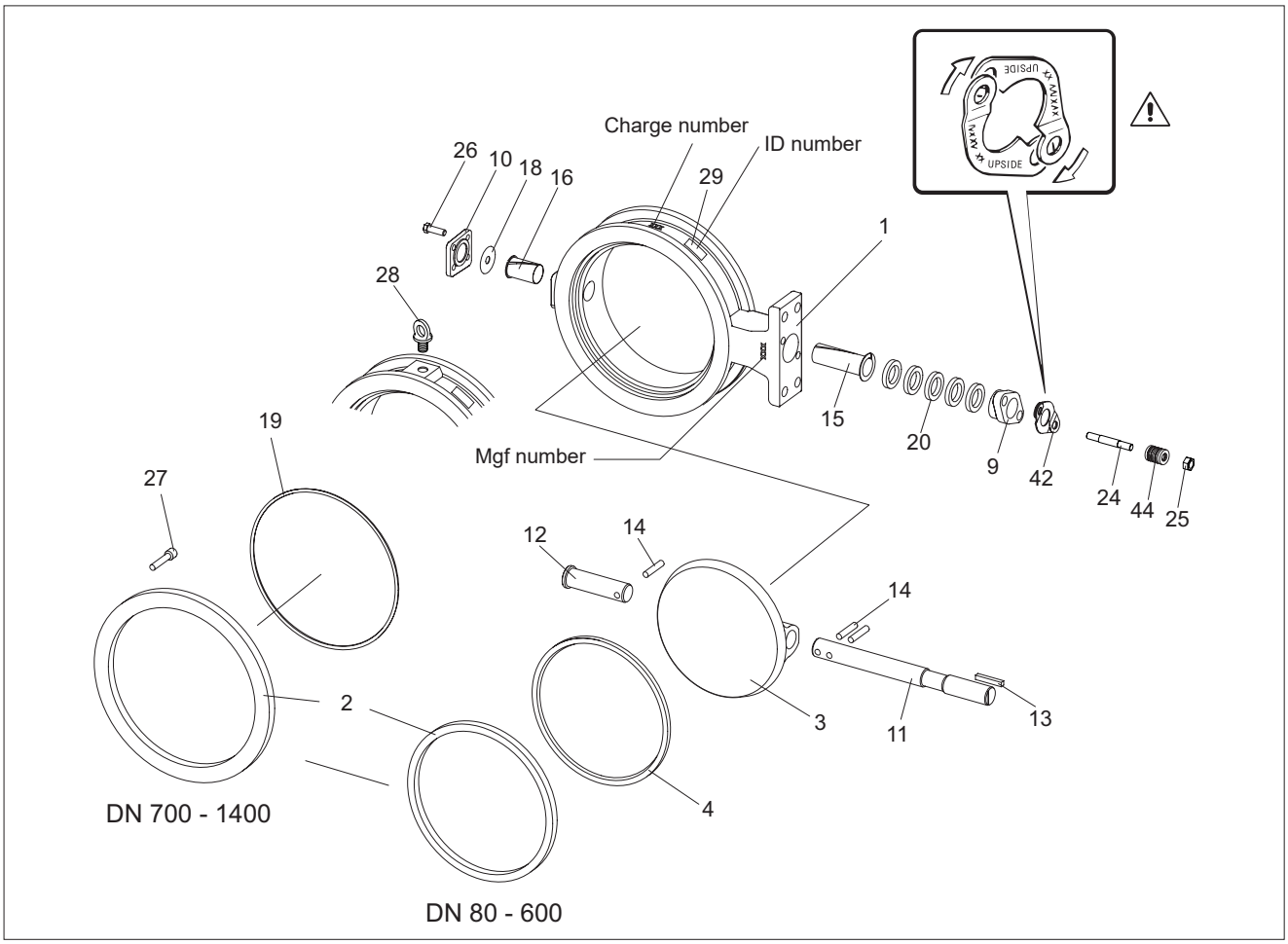
This information can be found from the identification plate or documents.

Table 11 Series L12, closing torques

DN SIZE	Mc		BC & BJ SIZE	BC pc		BJ pc		BJA**) pc		BJK pc		BJKA**) pc		BJV pc		BJVA**) pc		EC & EJ	Manual operator	Input torque M1	
	(Nm)	(lbf ft)		(bar)	(psi)	(bar)	(psi)	(bar)	(psi)	(bar)	(psi)	(bar)	(psi)	(bar)	(psi)	(bar)	(psi)	SIZE		(Nm)	(lbf ft)
80 3	45	33	6	2.5	36													5	M07	4	3
			8	2.1	30	0.7	10	3.3	48	0.3	4	2.8	41	1.1	16	4	58	7	AR11	4	3
			10	1.6	23	1.1	16	2.8	41	0.7	10	2.2	32	1.6	23	3.4	49	10			
100 4"	75	55	6	4.1	59													5	M07	7	5
			8	3.4	49	0.2	3	3.8	55	*)spring		3.3	48	0.6	9	4.6	68	7	AR11	6	4
			9	2.1	30													10			
			10	1.9	28	0.9	13	3.1	45	0.5	7	2.6	38	1.4	20	3.7	54	12			
			11	1.1	16													14			
125 5"	110	80	6	6	87													5	M07	10	7
			8	5	72	*)spring		4.5	65			3.8	55	*)spring		5.3	77	7	AR11	9	7
			9	3	43													10			
			10	2.4	35	0.6	9	3.4	49	0.2	3	2.9	42	1.1	16	4	58	12			
			11	1.5	22													14			
			12	1.3	19	1.1	16	2.9	42	0.7	10	2.2	32	1.6	23	3.7	54				
150 6"	150	110	6	8.2	119													5	M07	14	10
			9	4.1	59													7	AR11	12	9
			10	3.3	48	0.2	3	3.8	55	*)spring		3.2	46	0.8	12	4.3	62	10			
			11	2.1	30													12			
			12	1.6	23	0.9	13	3.1	45	0.5	7	2.6	38	1.5	22	3.9	57	14			
200 8"	300	220	10	6.5	94	*)spring		5	72			4.4	64	*)spring		5.6	81	5	M10	27	20
			11	4.2	61													7	AR11	24	18
			12	3.3	48	0.2	3	3.8	55	*)spring		3.2	46	0.8	12	4.6	68	10			
			13	2.1	30													12			
			16	1.6	23	0.9	13	3.1	45	0.5	7	2.6	38	1.3	19	3.8	55	14			
250 10"	350	260	11	4.9	71													5	M10	32	24
			12	3.9	57	0.1	1	4	58	*)spring		3.4	49	0.6	9	4.8	70	7	AR11	28	21
			13	2.4	35													10	AR21	20	15
			16	1.9	28	0.7	10	3.2	46	0.4	6	2.7	39	1.2	17	4	58	12			
			17	1.3	19													14			
300 12"	580	430	13	4	58													7	M12	51	38
			16	3.2	46	0.3	4	3.7	54	*)spring		3.2	46	0.8	12	4.5	65	10	AR21	34	25
			17	2.1	30													12			
			20	1.7	25	0.8	12	3.1	45	0.5	7	2.6	38	1.4	20	3.6	52	14			
350 14"	800	590	13	5.6	81													7	M12	67	49
			16	4.4	64	*)spring		4.2	61			3.6	52	0.4	6	4.9	71	10	M14	49	36
			17	2.9	42													12	AR21	46	34
			20	2.3	33	0.6	9	3.3	48	0.3	4	2.8	41	1.2	17	3.8	55	14			
400 16"	1160	860	16	6.4	93	*)spring		4.9	71			4.3	62	*)spring		5.7	83		M14	72	53
			17	4.2	61														AR21	67	50
			20	3.3	48	0.3	4	3.7	54	*)spring		3.1	45	0.8	12	4.2	61		AR31	50	37
			25	1.7	25	0.8	12	3.1	45	0.5	7	2.6	38	1.4	20	3.6	52				
500 20"	1900	1400	20	5.4	78	*)spring		4.5	65			3.9	57	0	0	5	73		M14	145	107
			25	2.8	41	0.5	7	3.5	51	0.1	1	2.9	42	1	14	4	58		M15	93	69
																			AR31	80	60
600 24"	3100	2290	25	4.5	65	*)spring		4.1	59			3.5	51	0.4	6	4.7	68		M15	163	120
			32	2.2	32	0.7	10	3.3	48	0.3	4	2.8	41	1.2	17	3.9	57		M16	117	86
																			AR41	130	95
700 28"	3500	2580	25	5.1	74	*)spring		4.3	62	*)spring		-		0.1	1	0.5	7		M16	132	97
			32	2.6	38	0.5	7	3.4	49	0.2	3	2.8	41	1.0	15	3.9	57		AR41	147	108
800 32"	5000	3685	32	3.6	52	0.2	3	3.8	55	*)spring		3.2	46	0.6	9	4.3	62		M25	182	134
			40	1.5	22														AR41	147	108
900 36"	6500	4790	32	4.7	68	*)spring		4.2	61	-		3.6	52	0.3	4	4.7	68		M25	236	174
			322	0.6	9	0.6	9	3.4	49	0.2	3	2.7	39	1.1	16	3.9	57				
			40	2.3	33			-													
1000 40"	8500	6260	322	0.8	12	0.4	6	3.6	52	*)spring		2.9	42	0.8	12	4.1	59				
			40	3.0	43			-													
1200 48"	10500	7740	322			0.1	1	3.9	57	*)spring		3.2	46								
			40	3.7	54																
			50	1.9	28																
1400 56"	14500	10690	322			*)spring		4.4	64			3.7	54								
			40	5.1	74																
			50	2.6	38																

*) spring = spring torque not adequete 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.

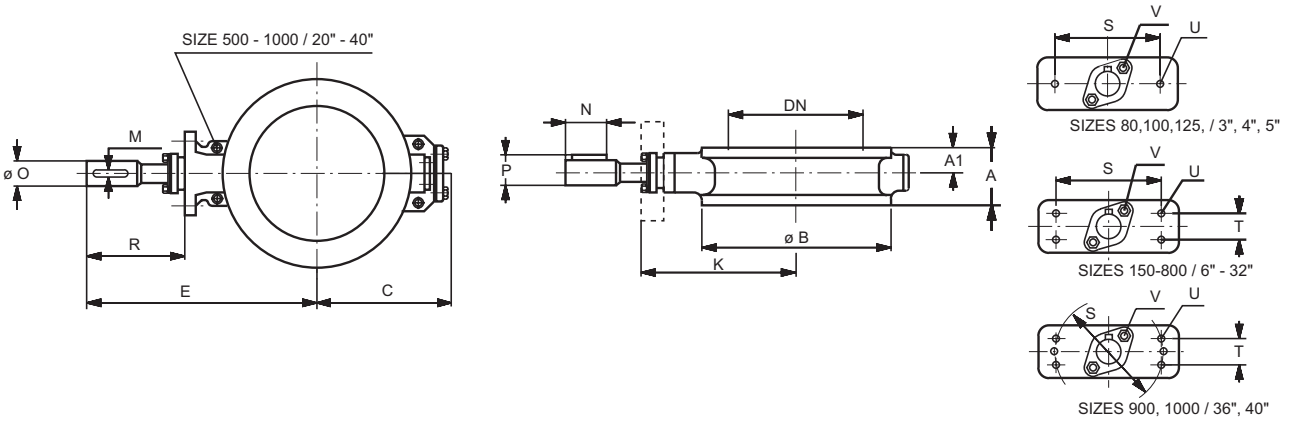
10. EXPLODED VIEW AND PARTS LIST



Item	Qty	Description	Spare part category
1	1	Body	
2	1	Clamp ring	
3	1	Disc (sizes DN 700–1400)	3
4	1	Seat ring (sizes DN 700–1400)	2
9	1	Gland	
10	1	Blind flange	
11	1	Drive shaft (sizes DN 700–1400)	3
12	1	Shaft (sizes DN 700–1400)	3
13	1	Key	3
14	3	Pin (sizes DN 700–1400)	3
15	1	Bearing (sizes DN 700–1400)	3
16	1	Bearing (sizes DN 700–1400)	3
18	1	Gasket	1
19	1	Body seal (sizes DN 700–1400)	1
20	5	Gland packing	1
24	2	Stud	
25	2	Hexagon nut	
26		Hexagon screw	
27	6/8	Hexagon socket screw	
28	1	Lifting eye bolt (sizes DN 1200, 1400)	
29	1	Identification plate	
42	2	Retaining plate	
44	2	Disc spring set (sizes DN 700–1400)	

Spare part category 1: Recommended soft parts, always needed for the repair. Delivered as a set.
Spare part category 2: Parts for replacing of the seat
Spare part category 3: Parts for replacing of the closing element
Spares for the full overhaul: All parts from the categories 1, 2 and 3

11. DIMENSIONS AND WEIGHTS



Type	DN	Dimensions, mm													Thread		kg
		A	A1	øB	C	E	K	S	T	O	R	M	P	N	U	V	
L12A 80	80	47	20	132	80	213	190	70	-	15	105	4.763	17	25	M12	M8	4
L12A 100	100	52	25	160	100	256	220	90	-	20	125	4.763	22.2	35	M12	M8	5
L12A 125	125	56	27	180	115	269	235	90	-	20	125	4.763	22.2	35	M12	M8	7
L12A 150	150	56	28	216	130	305	270	110	32	20	125	4.763	22.2	35	M12	M8	11
L12A 200	200	61	27	272	160	346	300	110	32	25	136	6.35	27.8	46	M12	M10	16
L12A 250	250	68	32	327	200	376	330	130	32	25	156	6.35	27.8	46	M12	M10	27
L12A 300	300	78	34	373	270	409	360	130	32	30	159	6.35	32.9	51	M12	M10	40
L12A 350	350	78	34	416	310	473	415	160	40	35	178	9.525	39.1	58	M16	M10	45
L12A 400	400	102	45	480	330	513	445	160	40	40	188	9.525	44.2	68	M16	M10	75
L12A 500	500	127	63.5	590	420	610	520	160	55	50	230	12.7	55.5	90	M20	M14	120
L12A 600	600	154	77	690	480	739	620	230	90	70	299	19.05	78.2	119	M24	M16	220
L12B 700	700	165	65	800	536	829	710	230	90	70	299	19.05	78.2	119	M24	M16	331
L12B 800	800	190	80	900	622	937	791	230	90	85	326	22.225	94.7	146	M24	M16	489
L12B 900	900	203	91.4	1000	678	1058	902	330	120	95	376	22.225	104.8	156	M30	M20	651
L12B 1000	1000	216	95	1110	728	1108	952	330	120	95	376	22.225	104.8	156	M30	M20	805
L12B 1200	1200	254	108	1330	855	1250	1080	330	120	105	400	25.4	116.2	170	M30	M20	1200
L12B 1400	1400	279	118	1540	950	1395	1200	360	135	120	455	31.75	133.8	195	M30	M20	1900

Type	Size	Dimensions, in													Thread		lb
		A	A1	øB	C	E	K	S	T	O	R	M	P	N	U	V	
L12A 80	3	1.85	0.79	5.20	3.15	8.39	7.48	2.76	-	0.59	4.13	0.19	0.67	0.98	M12	M8	8.8
L12A 100	4	2.05	0.98	6.30	3.94	10.08	8.66	3.54	-	0.79	4.92	0.19	0.87	1.38	M12	M8	11
L12A 125	5	2.20	1.06	7.48	4.53	10.59	9.25	3.54	-	0.79	4.92	0.19	0.87	1.38	M12	M8	15.4
L12A 150	6	2.20	1.10	8.50	5.12	12.01	10.63	4.33	1.26	0.79	4.92	0.19	0.87	1.38	M12	M8	24.2
L12A 200	8	2.40	1.06	10.71	6.30	13.62	11.81	4.33	1.26	0.98	5.35	0.25	1.09	1.81	M12	M10	35.2
L12A 250	10	2.68	1.26	12.87	7.87	14.80	12.99	5.12	1.26	0.98	6.14	0.25	1.09	1.81	M12	M10	59.4
L12A 300	12	3.07	1.34	14.69	10.63	16.10	14.17	5.12	1.26	1.18	6.26	0.25	1.30	2.01	M12	M10	88
L12A 350	14	3.07	1.34	16.38	12.20	18.62	16.34	6.30	1.57	1.38	7.01	0.38	1.54	2.28	M16	M10	99
L12A 400	16	4.02	1.77	18.90	12.99	20.20	17.52	6.30	1.57	1.57	7.40	0.38	1.74	2.68	M16	M10	165
L12A 500	20	5.00	2.50	23.23	16.54	24.02	20.47	6.30	2.17	1.97	9.06	0.50	2.19	3.54	M20	M14	264
L12A 600	24	6.06	3.03	27.17	18.90	29.09	24.41	9.06	3.54	2.76	11.77	0.75	3.08	4.69	M24	M16	484
L12B 700	28	6.5	2.55	31.5	21.1	32.64	27.95	9.05	3.54	2.76	11.77	0.75	3.08	4.68	M24	M16	730
L12B 800	32	7.48	3.15	35.4	24.5	36.89	31.14	9.05	3.54	3.35	12.83	0.875	3.72	5.75	M24	M16	1078
L12B 900	36	8	3.6	39.4	26.7	41.65	35.51	13	4.72	3.74	14.80	0.875	4.13	6.14	M30	M20	1435
L12B 1000	40	8.5	3.74	43.7	28.7	43.62	37.48	13	4.72	3.74	14.80	0.875	4.13	6.14	M30	M20	1774
L12B 1200	48	10.00	4.25	52.36	33.66	49.21	42.52	12.99	4.72	4.13	15.75	1.00	4.57	6.69	M30	M20	2640
L12B 1400	56	10.98	4.65	60.63	37.40	54.92	47.24	14.17	5.31	4.72	17.91	1.25	5.27	7.68	M30	M20	4180

12. EU DECLARATION OF CONFORMITY FOR ATEX APPROVED VALVES

EU DECLARATION OF CONFORMITY

for ATEX approved valves

Manufacturer:
Valmet Flow Control Oy
01380 Vantaa, Finland
*Valmet Flow Control (Jiaxing) Co., Ltd.
Jiaxing, China
*) Also manufactures certain series

EU Authorised Representative: Valmet Flow Control Oy, Vanha Porvoontie 229, 01380 Vantaa, Finland. Contact details: +358 10 417 5000

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Product:	Neles Butterfly Valves
Type:	L-series (L1, L2, L4, L5, L6, L12, LG, LW),
ATEX group and category:	II 2 GD, II 3 GD
Ex GAS:	Ex h IIC 85°C…Tmax Gb
Ex DUST:	Ex h IIIC T85°C…T(Tmax) Db

Tmax= valve max. temperature in name plate

Manufacturer's certificates:

Standard / Directive	Notified Body and NoBo number	Certificate No.
ISO 9001:2015	LRQA (Certification body)	10531829
PED 2014/68/EU Module H	DNV Business Assurance Italy S.r.l. 0496	142306-2013-CE-FIN-ACCREDIA
ATEX 2014/34/EU Annex IV	DNV Product Assurance AS Norway 2460	Presafe 18 ATEX 91983Q Issue 6

ATEX 2014/34/EU Annex VIII technical files are archived by Notified Body number 0537

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

PED 2014/68/EU	Valve
ATEX 2014/34/EU	Non-electrical equipment

Main components:

Valve:
The valve is suitable for service up to PED Cat III
Valve design standard: ASME B16.34

Installation, Maintenance and Operating instructions manual (IMO) must be followed before installation in order to ensure proper and safe mounting and usage of equipment.

The product above is manufactured in compliance with the applicable European directives and technical specifications/standards (EN10204). The product is in conformity with the customer order.

Instrumentation and accessories having equal protection concept, level and performance specification with the original can be presumed to be in conformity with this Declaration of Conformity.

Protection from e.g. static electricity caused by the process or connected equipment must be considered by the user (EN 60079-14 § 6). EN 60079-19 applies for modifications.

Non-electrical equipment is according EN 80079-37:2016 and EN 80079-36:2016. The actual surface temperature of non-electrical equipment is depended on the process and ambient conditions (EN 80079-36:2016 § 6.2.5 and 6.2.7). The protection from high or low temperature must be considered by the end user before put into service.

The product does not possess any residual risk according to hazard analysis conducted under the applicable directives providing that the procedures stated by the IMO are followed and the product is used under conditions mentioned in the technical specifications.

Documents with digital and/or e-signature conveyed by Valmet Flow Control conform to the Regulation (EU) No 910/2014 as well as the national code on e-signatures. In order to secure the integrity of the document, the authenticity of the sender, and indisputableness of the dispatch the identification is covered by individual ID codes, passwords, and by regularly changing passwords. The authorization to sign documents is based on organizational position and/or is task related. The impartial third party in the company bestows the access right with predefined authorities to particular databases.

Vantaa 10.9.2024

Juha Virolainen, Global Quality Director

13. TYPE CODE

Neles™ Neldisc™ high performance butterfly valves, series L12								
1.	**2.**	**3.**	**4.**	**5.**	**6.**		**7.**	**8.**
L12	A	150	A	A	-	/		K

1.	PRODUCT SERIES
L12	Wafer type, full bore, metal-seated Face-to-face lenght acc. to API 609

2.	PRESSURE RATINGS
A	Body rating DN 80–125: PN 50 / ASME 300 DN 150–600: PN 25 / ASME 150 Maximum shut-off pressure DN 80–125 Ps = 25 bar (ASME 150), welded clamp ring DN 150 Ps = 25 bar, welded clamp ring DN 200 Ps = 20 bar, welded clamp ring DN 250–600 Ps = 10 bar, welded clamp ring
B	Body rating PN 25 / ASME 150 Maximum shut-off pressure DN 700–1000 Ps = 10 bar, bolted clamp ring DN 1200,1400 Ps = 6 bar, bolted clamp ring

3.	DIAMETER NOMINAL
	080, 100, 125, 150, 200, 250, 300, 350, 400, 500, 600, 700, 800, 900, 1000, 1200, 1400

4.	BODY, DISC AND SHAFT MATERIAL
A	Body and disc: stainless steel ASTM A351 gr. CF8M shaft: SIS 2324, DN 80–1400
H	Body and disc: stainless steel ASTM A351 gr. CF8M shaft: 17-4PH + hard facing, only DN 700–1400

5.	SEAT MATERIAL
A	Stainless steel ASTM B 424 (Incoloy 825) hard chrome plated only for DN 80–600
B	W.No 1.4418 + hard chrome plated available only for DN 700–1400

6.	GLAND PACKING
-	PTFE, standard, without sign (Available only for sizes DN 80–600) (for sizes DN 700–1400 the sign is always “T”)
T	Live loaded PTFE packing with disc springs sets, TA-Luft tested and certified by TÜV. Sizes DN 80–1400
G	Live loaded graphite packing with disc springs sets, TA-Luft tested and certified by TÜV. Sizes DN 80–1400

7.	FLANGE FACING
-	EN1092-1Type B1, (Ra 3,2–12.5) Covering: ASME B16.5, (Ra 3.2–6.3) old DIN 2526 Form E (Ra 4)

8.	FLANGE DRILLING (DN 500 - 1400)
C	ASME B 16.5 Class 150 sizes DN 500–600 ASME B 16.47 Series A Class 150 size 26” and bigger.
J	PN 10
K	PN 16
L	PN 25
R	JIS 10K
S	JIS 16K

14. GENERAL SAFETY WARNINGS AND DISCLAIMERS

General safety warnings (Only for Neles Neldisc™ L-series)

Lifting

1. Always use a lifting plan created by a qualified person to lift this equipment. Lifting guidance is provided in this IMO (Installation, Maintenance and Operation manual) to assist in lifting plan development. Think about the center of gravity (CG) of the equipment being lifted. Make sure the CG is always under the central lifting point.
2. Valves may be equipped with lifting threads on the body or on the flanges. These are intended to be used with the lifting plan.
3. Use only correct and approved lifting devices. Ensure that lifting devices and straps are securely attached to the equipment prior to lifting.
4. Check, that lifting devices are not damaged and in good condition with a valid check stamp prior to use.
5. Workers must be trained for lifting and handling valves.
6. Never lift an assembly by the instrumentation (solenoid, positioner, limit switch, etc.) or by the instrumentation piping. Straps and lifting devices should be fitted to prevent damage to instrumentation and instrumentation piping. Failure to follow the lifting guidance provided may result in damage and personal injury from falling objects.

Work activities on the valve

1. Wear your personal safety equipment. Personal safety equipment includes but is not limited to protective shoes, protective clothing, safety glasses, helmet, hearing protection and working gloves.
2. Always follow the local safety instructions in addition to the Valmet instructions. If Valmet instructions conflict with local safety instructions, stop work and contact Valmet for more information.
3. Before beginning service on the equipment, make sure that the actuator is disconnected from any kind of power source (pneumatic, hydraulic, and/or electric), and no stored energy is applied on the actuator (compressed spring, compressed air volumes, etc.). Do not attempt to remove a spring return actuator unless the stop screw is carrying the spring force.
4. Make sure that there is a LOTOTO (Lock Out / Tag Out / Try Out) procedure in place for the system in which the valve is installed and strictly follow it.
5. Always make sure that the pipeline is depressurized and in ambient temperature condition before maintenance work is started.
6. Keep hands and other body parts out of the flow port when the valve is being serviced and the actuator is connected to the valve. There is a high risk of serious injury to hands and/or fingers due to malfunction if the valve suddenly starts to operate.
7. Beware of Trim (Disc, Ball or Plug) movement even when the valve is disassembled. Trim may move simply due to the weight of the part or change in position of the valve. Keep hands or other body parts away from locations where they may be injured by movement of the trim. Do not leave objects near or in the valve port which may fall in and need to be retrieved.

General disclaimers

Receiving, handling and unpacking

1. Respect the safety warnings above!
2. Valves are critical components for pipelines to control high pressure fluids and must therefore be handled with care.
3. Store valves and equipment in a dry and protected area until the equipment is installed.
4. Do not exceed the maximum storage temperatures given in the IMO (installation, maintenance, and operating instructions).
5. Keep the original packaging on the valve as long as possible to avoid environmental contamination by dust, water, dirt, etc.
6. Remove the valve endcaps just before mounting into the pipeline.
7. FOR YOUR SAFETY IT IS IMPORTANT TO FOLLOW THESE PRECAUTIONS BEFORE REMOVAL OF THE VALVE FROM THE PIPELINE OR ANY DISASSEMBLY:
   - Be sure you know what flow medium is in the pipeline. If there is any doubt, confirm with the proper supervisor.
   - Wear any personal protective equipment (PPE) required for working with the flow medium involved in addition to any other PPE normally required.
   - Depressurize the pipeline, bring to ambient temperature, and drain the pipeline flow medium.
   - Cycle the valve to relieve any residual pressure in the body cavity.
   - After removal but before disassembly, cycle the valve again until no evidence of trapped pressure remains.
   - The valves with offset shaft (Butterfly, eccentric rotary plug) have greater trim area on one side of the shaft. This will cause the valve to open when pressurized from the FTO direction.
   - **WARNING:** DO NOT PRESSURIZE THE ECCENTRIC VALVE WITHOUT A HANDLE OR AN ACTUATOR MOUNTED ON IT!
   - **WARNING:** DO NOT REMOVE A HANDLE OR AN ACTUATOR FROM AN ECCENTRIC VALVE WHILE PRESSURIZED!
   - Before installing the eccentric valve in or remove it from the pipeline, cycle the valve closed. Eccentric valves must be in the closed position to bring the trim within the face to face of the valve. Failure to follow these instructions will cause damage to the valve and may result in personal injury.

Operating

8. The identification plate (ID-plate, type plate, nameplate, or engraved markings) on the valve gives the information of max. process conditions to the valve.
9. (For soft seats) The practical and safe use of this product is determined by both the temperature and pressure ratings of the seat and body. Read the identification plate and check both ratings. This product is available with a variety of seat materials. Some seat materials have pressure ratings that are lower than the body ratings. All body and seat ratings are dependent on the valve type, size and material of the body and seat. Never exceed the marked rating.
10. Temperatures and pressures must never exceed values marked on the valve. Exceeding these values may cause uncontrolled release of pressure and process medium. Damage or personal injury may result.
11. The operating torque of the valve may rise over time due to wear, particles or other damage of the seat. Never exceed the actuator torque preset values (air supply, position). Application of excessive torque may cause damage to the valve.

12. Valmet valves typically are designed to be used in atmospheric conditions. Do not use valves under external pressurized conditions unless specifically designed and explicitly marked for this service.
13. Avoid Pressure shocks or water hammer. Systems with high pressure valves should be equipped with a bypass to reduce the differential pressure before opening the valve to avoid pressure shock.
14. Avoid thermal shock. High temperature, Low temperature and cryogenic valves should be operated in a way that limits the rate of increase or decrease in temperature. The valve should be thermally stabilized before being pressurized.
15. Materials of the valve are carefully selected for the process conditions. Changes to the process media can have a major impact on function and safety of the valve. Always confirm the materials are suitable for the service prior to installation.
16. As the use of the valve is application specific, several factors should be considered when selecting a valve for a given application. Therefore, some situations in which the valves are used are outside the scope of this manual.
17. It is the end user's responsibility to confirm compatibility of the valve materials with the intended service, however if you have questions concerning the use, application, or compatibility of the valve for the intended service, contact Valmet for more information.
18. Never use a valve with enriched or pure oxygen if the valve is not explicitly designed and cleaned for oxygen. Selected materials and design have a major impact on the safety to operate the valve with oxygen.
19. Valves intended for use in or with explosive atmospheres must be equipped with a grounding device and marked according ATEX (or equivalent international standards).
20. Manual handles are available for specific butterfly valve sizes and maximum line pressures. Do not operate a valve with a handle or wrench outside the size and pressure limits stated in the IMO. High line pressure may create a large enough force to pull the handle from the operator's hands. Damage or personal injury may result.

Maintenance

21. Respect the safety warnings above!
22. Plan service and maintenance actions, that spare parts, lifting devices and service personnel is available.
23. Maintain the valve within the recommended minimum maintenance intervals or within the recommended maximum operating cycles.
24. Always make sure that the valve and the pipeline is depressurized before starting any kind of maintenance work at a valve.
25. Always check the position of the valve before starting maintenance work. Follow the Lock out /tag out (LOTO) rules at the site before starting any maintenance activity.
    - See IMO for the correct stem position.
    - Consider that the positioner may give the wrong signals.
26. Sealing materials (soft sealing parts) should be changed when the valve is in maintenance. Always use original equipment manufacturers (OEM) spare parts to ensure proper performance of the repaired valve.
27. All pressure containing parts must be inspected visually for damage or corrosion. Damaged parts must be replaced.
28. Valve pressure retaining parts and all internals must be inspected for corrosion or erosion which may result in reduced wall thickness on pressure retaining parts. Damaged pressure retaining parts must be replaced with original equipment manufacturer's (OEM) replacement parts or repaired to factory specifications by an authorized Valmet service partner in order to maintain the warranty.
29. Do not use sharp tools, grinding machines, or files to work on functional surfaces such as sealing, seating or bearing surfaces as this can damage these surfaces.
30. Check the condition of sealing surfaces on the seats, trim (disc, ball, plug, etc.), body and body cap. Replace parts if there are significant wear, scratches, or damage.
31. Check the wear of bearings and bearing contact surfaces on the shaft and replace damaged parts if necessary.
32. Do not weld on pressure retaining parts without an ASME and PED qualified procedure and personnel.
33. Pressure retaining parts of valves in high temperature applications must be carefully examined for the effects of material creep and fatigue.
34. Make sure that the valve is positioned in the correct flow direction into the pipeline.
35. If the valves are marked to be suitable for explosive atmospheres, the correct function of the discharging device must be tested before returning to service.
36. Always work in a clean environment. Avoid getting particles inside the valve due to machining, grinding, or welding nearby.
37. Never store a valve in maintenance without flow port protection.
38. When pressure testing valve seats, never exceed the maximum operating pressure of the system or the maximum shut-off pressure marked on the valve identification plate.
39. Actuator mounting and unmounting:
    - Before installing the actuator on to the valve, be sure the actuator is properly indicating the valve position. Failure to assemble these to indicate correct valve position may result in damage or personal injury.
    - When installing or removing a linkage kit, best practice is to remove the entire linkage assembly, including couplings which may fall off the valve during lifting or when position changes.
    - Mounting sets have been designed to support the weight of the Valmet actuator and recommended accessories either as is or with additional actuator support. Use of the linkage to support additional equipment or additional weight such as people, ladders, etc. may result in equipment damage or personal injury.
40. The valve should be installed between flanges using appropriate gaskets and fasteners that are compatible with the application, and in compliance with applicable piping codes and standards. Center the gaskets carefully when fitting the valve between the flanges. Do not attempt to correct pipeline misalignment by means of the flange bolting.
41. Repairs on valves for special service like Oxygen, Chlorine, and Peroxide, have special requirements.
    - Parts must be cleaned appropriate to the service and protected from contamination prior to assembly.
    - Assembly areas and tools must be clean and dry to prevent contamination of the parts during assembly.
    - Test equipment must be clean and dry to prevent contamination during testing. This includes the test equipment internals that may allow particles or other contamination into the test medium during the test.
    - Lubrication shall be used only if specifically required in the instructions. Where lubrication is required, the lubricant must be approved for the service by the end user.

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