



Trunnion mounted ball valves

Installation, operation and maintenance manual



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NOTE:

This manual must be read and its instructions must be followed when installing, operating and/or performing maintenance on the valve as well as its manual gear or actuator.

These instructions are of general nature and do not cover all possible operating scenarios. For more specific guidance on the installation, operation and maintenance of the valve or its suitability for an intended use, please contact the manufacturer.

Vexve Oy reserves the right to make alterations to these instructions.

Vexve Oy is not responsible for damages caused by incorrect transportation, handling, installation, operation or maintenance. Furthermore, Vexve Oy is not responsible for damage caused by foreign objects or impurities.

Warranty

Warranty according to Vexve Oy's "General terms and conditions of sale".

The warranty covers manufacturing and material faults. The warranty does not apply to damages caused by inappropriate installation, operation, maintenance, or storage ie. these instructions must be followed for the warranty to apply. Vexve Oy requires that any faulty products under warranty are to be returned to the factory for inspection. Only after the product has been found faulty, Vexve Oy can grant compensation.

Please refer to Vexve Oy's "General terms and conditions of sale" for detailed warranty clauses. The document is available from the manufacturer.

Warnings and symbols

Ignoring the warnings and symbols may lead to serious injury or equipment damage. Persons authorized to use the equipment must be familiar with the warnings and instructions.

Appropriate transportation, storage and installation as well as careful commissioning are essential to ensure faultless and stable operation.

The following symbols are used in this manual to draw attention to actions essential to ensure the proper use and safety of the device.



Meaning of the symbol: NOTE

The NOTE symbol is used for actions and functions that are essential for the proper use of the device. Ignoring this symbol may have harmful consequences.



Meaning of the symbol: WARNING

The WARNING symbol is used for actions and functions that, if carried out incorrectly, may lead to injury or equipment damage.

1. General

Vexve's fully welded trunnion mounted ball valve is designed for clean mediums and to be used in district heating and district cooling pipelines. The trunnion mounted ball valve can also be used in heating and cooling systems and applications where the water is oxygen free. Vexve's trunnion mounted ball valve is also suitable for oil piping systems.

In the trunnion mounted ball valve design the sealing rings are floating and the ball is fixed. The ball and the stem are attached to each other on both sides of the ball, which provides more support especially as the ball size increases. Vexve's trunnion mounted ball valves have rate A tightness in both directions.

Trunnion mounted ball valve can be used within the following temperature-pressure range. Please note that the maximum allowable working pressure depends on the operating temperature.

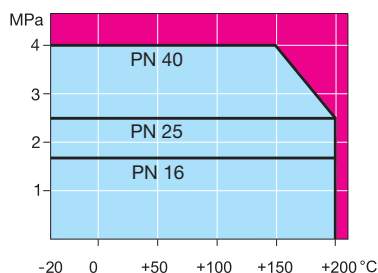


Chart 1.
Pressure-temperature chart
DN 150-1200 full bore.



NOTE:

When intending to use the valve for other media or applications please contact Vexve Oy to ensure its suitability.



NOTE:

Dimensions in this manual generally refer to full bore ball valves. Manual can be utilized also as a reduced bore ball valve's user manual. However must be noticed that a reduced bore ball valve follows user instructions of a one size smaller full bore ball valve. For example a DN 200 reduced bore ball valve follows user instructions of a DN 150 full bore ball valve.

Parts lists for Vexve Oy's steel ball valves are presented in Appendices 7.1 and 7.2

For detailed technical information including dimensions and weights, torques, Kv-values etc please refer to www.vexve.com.

2. Valve identification

The identification plate locates at the valve body. It has the following information:

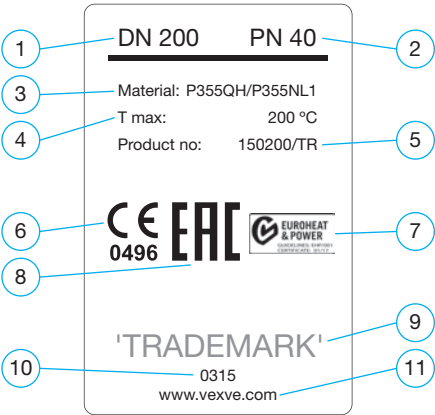
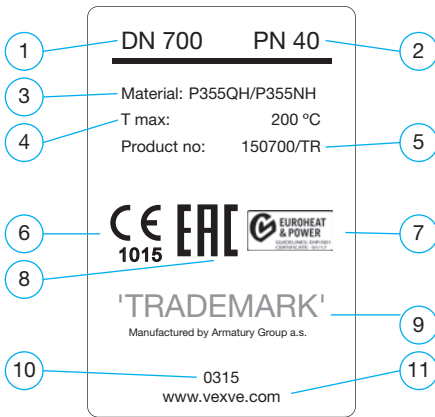


Figure 1. Identification plate for DN 150–400FB.

1. Valve DN size
2. Pressure class
3. Valve Body Material
4. Maximum Allowable Temperature
5. Product number
6. CE-Mark and the number of the notified body
7. EHP003 certification
8. Eurasian conformity valve certification
9. Trademark
10. Manufacturing date
11. Manufacturer's Website



1. Valve DN size
2. Pressure class
3. Valve Body Material
4. Maximum Allowable Temperature
5. Product number
6. CE-Mark and the number of the notified body
7. EHP003 certification
8. Eurasian conformity valve certification
9. Trademark
10. Manufacturing date
11. Manufacturer's Website

Figure 2. Identification plate for DN 450–1200FB.

3. Unloading and storage

Check that the contents of the delivery is as ordered. Check that the valve and related equipment have not been damaged during transportation.

Store the valve carefully before installation, preferably in a well-ventilated, dry place, on a shelf or a wooden grid to protect it from rising damp.

Protect bare metal surfaces, shaft parts, and flange surfaces with anti-corrosive agent before storage.

The valve must be transported to the installation site in a sturdy package. Do not remove the flow port protectors before installation. Protect the valve from sand, dust, and other impurities.

Use lifting ropes when lifting the large size valves. It is forbidden to lift the valve by its actuator or stem (see Figure 3).



NOTE:

Take the weight of the valve into account when handling it and use only approved lifting equipment.

When delivered, the valve is in the open position. During storage, the valve must also be in the open position.

Maximum recommended storage time is two years. If the valve is stored for more than two years, it should be operated and cleaned yearly.

Packaging:

Vexve Oy's products are protected during transportation with special packaging. The packaging consists of environmentally friendly materials that are easy to sort and recycle.

Recycling the packaging materials at designated waste collection points is recommended.

The following packaging materials are used: wood, cardboard, paper, and polyethylene sheets.

Recycling and disposal

Nearly all parts of the valve are made of recyclable materials. The material type is marked on most parts. Separate recycling and disposal instructions are available from the manufacturer. The valve can also be returned to the manufacturer for recycling and disposal against a fee.

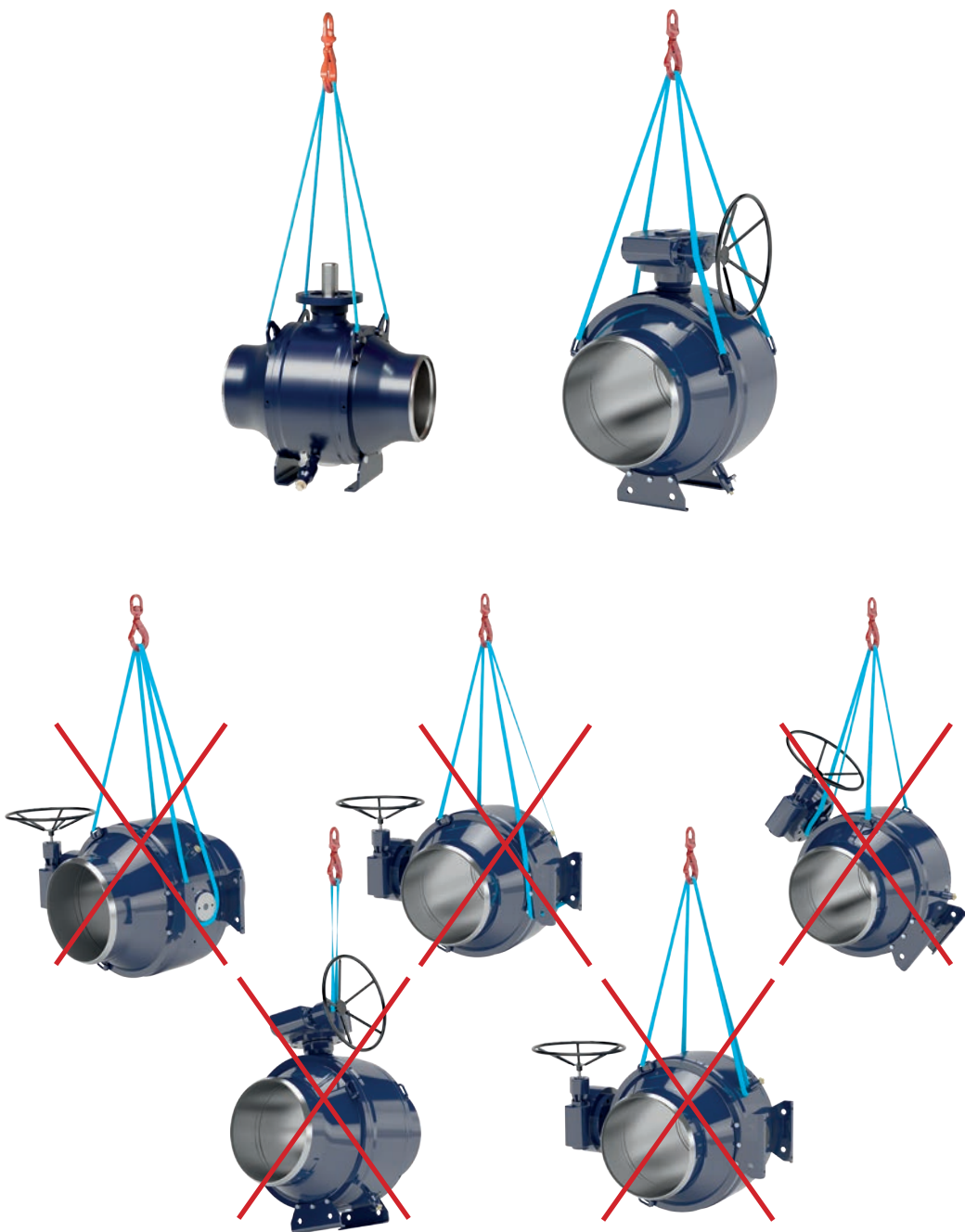


Figure 3. Lifting the valve

4. Valve installation



WARNING:

Incorrect installation may result in serious personal injury and it may damage or cause malfunction of the equipment. These instructions must therefore be followed carefully when installing the valve.

These general instructions do not cover all possible operating scenarios. For more specific guidance on the use of the valve or its suitability for an intended use, please contact the manufacturer.

- Do not remove the flow port protectors before installation. Keep the valve protected from sand, dust, and other impurities.
- If the valve was delivered with the actuator installed, avoid removing the actuator during installation.
- Incorrect re-installation or adjustment of the actuator will result in a high risk of damage and leakage.
- Exercise extreme caution when testing the valve before installation in the pipeline.
- The valve or valve assembly must not be lifted from the actuator. If the valve is equipped with lifting lugs, use them (see Figure 3). Dropping or incorrect lifting of the valve can result in personal injury or equipment damage.
- Use one of the allowed lifting methods shown in Figure 3.



NOTE:

The valve must be used only in applications for which it is intended.

Prior to installation:

- Remove the flow port protectors and check that the inside of the valve is clean.
- Remove the protective tapes that are covering seat and ball.



NOTE:

The recommended installation position for the valve is with the shaft in the vertical or horizontal position.



WARNING:

The pipeline and valve shall be carefully cleaned prior to installation as any welding debris or other impurities can damage the valve.



NOTE:

Make sure that the base of the valve is properly supported in the installation location. With sizes DN 500 full bore and bigger we recommend using concrete base to ensure proper support for the valve.

4.1 Installation of valve with weld connections



NOTE:

Electric welding must be used to weld the valve in place.

- Recommended welding method is manual metal arc welding. Recommended welding rod is ESAB OK 48.00 or equal (standard: EN ISO 2560-A; classification: E 42 4 B 42 H5).
- A valve may be welded only by an authorized mechanic, following valid norms and standards.
- The valve must remain open during installation and welding to ensure that welding residue does not damage the seal surfaces.
- The ends of the pipes must be parallel to the valve and correctly aligned.
- The length of the valve must be the same as the distance between the pipe ends, taking into consideration the welding gaps.
- Diameter and wall thickness of the pipes must be compatible with the welding ends of the valve.
- Do not overheat the valve. Use cooling during the welding. Use wet fabric to protect the valve seat from excess heat during the welding. The welder should have the proper qualification to do this kind of welding procedures.

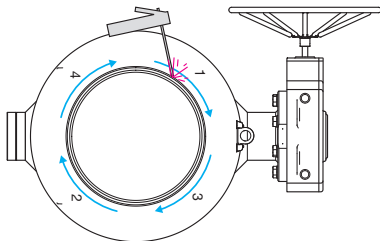


Figure 4. Welding the seams.



NOTE:

The recommended installation position for the valve is with the shaft in the vertical or horizontal position.



NOTE:

Cool down the valve (after welding) before normal operation. The valve may not be opened or/and closed after the welding before it has cooled down.

- The valve must first be bridged to the pipeline using spot welding, with 4–8 seams alternately on opposite sides of the valve.
- Then the seams between the bridges are welded as shown in Figures 4. and 5. Welding order: 1-2-3-4.
- Any lid welding must be carried minimum at 200 mm from the valve seam.
- During welding the ground must be connected to the pipe of the valve body or the pipeline. Ground cable should be connected to the pipe on the same side as the welding seam. Otherwise the current may damage the valve seal. Never connect the ground to the valve neck, top flange or actuator.

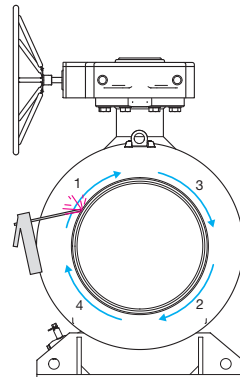


Figure 5. Welding the seams.

4.2 Installation of valve with flanges

- Valve may be installed only by an authorized mechanic, following valid norms and standards.
 - The valve must remain open during installation to ensure that any residue or dirt does not damage the sealing faces.
 - The sealing faces of the pipe flanges must be parallel to the valve sealing faces and correctly aligned.
 - The length of the valve must be the same as the distance between the flanges in the pipe line, taking into consideration the gasket.
 - The flanges in the pipeline must be compatible with valve flanges. For detailed information please refer to the standard EN1092-1.
- The bolts and nuts used on installation must be selected to match operating conditions at installation location. Bolts and nuts must also fulfill requirements of the pressure, temperature, flange material and gasket. For detailed information please refer to the standards EN 1515-1, EN1515-2 and EN 1515-4.
 - The bolts and nuts shall be tightened in a crosswise manner.
 - The gasket used on installation must be selected to match operating conditions, temperature, pressure and medium. Gasket dimensions must be compatible with sealing faces of the flanges. For detailed information please refer to the standard EN1514.
 - Recommended installation position for the valve is with the shaft in the vertical or horizontal position.

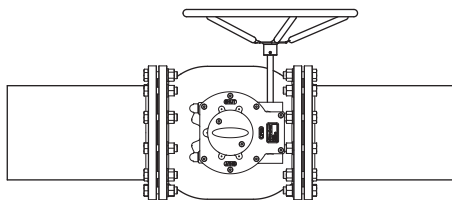


Figure 6. Horizontal installation.

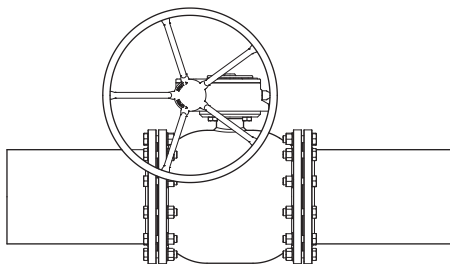


Figure 7. Vertical installation.

4.3 Installation at the end of pipeline



NOTE:

Do not use the valve at the end of the pipeline – a blank flange must always be installed after the valve (see Figure 8. and 9.).

When the valve is installed at the end of the pipeline, there is a risk of corrosion-causing oxygen-rich water or air collecting on the empty rear side of the valve. To prevent corrosion, the space after the valve must be filled with oxygen-free water.

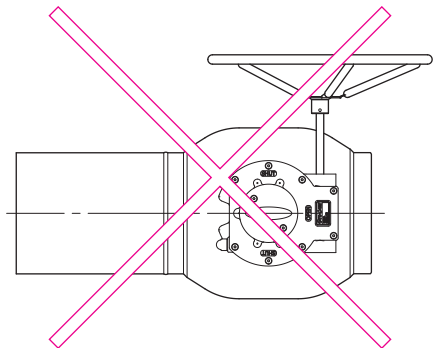


Figure 8. Do not use the valve at the end of the pipeline.

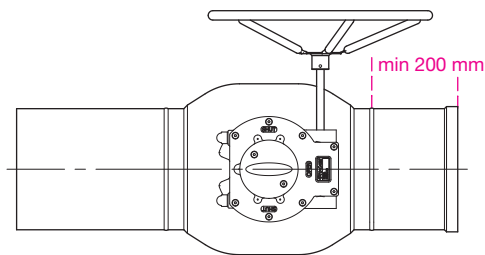


Figure 9. Blank flange.

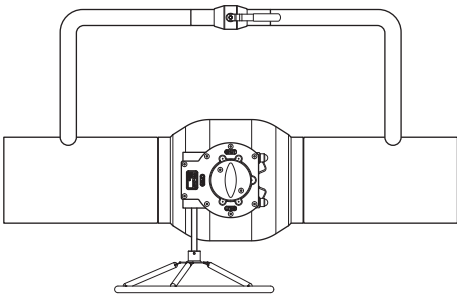
Min. 200 mm pipe must be installed between the valve and the blank flange.



NOTE:

If the valve is located near to the blind flange at the end of the pipeline, valve must be in the fully open position to prevent a closed space from forming between the valve and blind flange. If water in the closed space expands (for example due to temperature), it may damage the valve.

4.4 Before commissioning



To avoid pressure shocks and to reduce the forces caused by opening the valve under pressure, it is recommended to use a by-pass valve in connection with trunnion mounted ball valves (see Figure 10).

Figure 10. By-pass valve.

4.5 Commissioning and Pressure testing

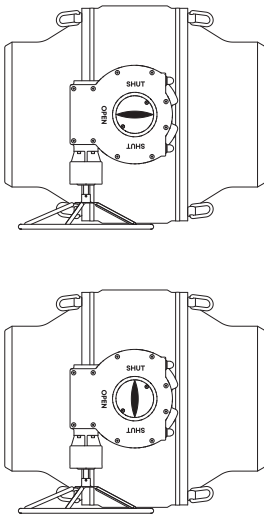


Figure 11. Check that the valve is either in an open or close position.

Exceeding of permitted values marked on the valve may damage the valve and, in the worst case, cause uncontrolled venting of the pressure. This leads to equipment damage and possibly also to personal injuries. The largest allowable testing pressure is 1,1xPN, when the valve is closed. During the pipeline pressure testing (1,5xPN), the valve must be open.

The shut-off valves are designed to be fully open or close. The valves shall not be used in intermediate positions. Check that the valve is either in an open or close position against the stopper. The valve is equipped with a manual gear or an actuator, operate the valve with the help of it.

5. Gear and actuator disassembly and installation



NOTE:

Avoid removing the actuator/gear from the valve. The actuator/gear has been calibrated at the factory to ensure that the valve is tight. If the actuator/gear is removed, it may have to be re-calibrated.

Vexve Oy accepts responsibility only for actuators/gears installed by Vexve Oy.

Refer to the separate adjustment instructions, available from the manufacturer.



WARNING:

The manual gear or actuator may not be removed or dismantled if the valve is pressurized! It is recommended to use the special actuator removal tools!

Incorrect disconnection may cause serious personal injuries as well as malfunction and damage to the equipment. Extreme caution must be exercised during the disconnection!

Do not use too high torques to operate the valve. Too high torques can damage the valve or the actuator/gear!

5.1 Disassembly and reinstallation of ProGear/Rotork manual gear

Part numbers mentioned in this chapter refer to the figure 12.

Disassembly:

1. Turn the valve to the open position before removing the gear. Valve opens when you turn the hand wheel of the gear counterclockwise
2. Turn the hand wheel slightly towards the close position (clockwise) to release forces between the valve and the gear in order to make it easier to remove the gear. To do this, turn the hand wheel only that much that it rotates easily
3. Remove the bolts (2) of the position indicator plate and remove the position indicator plate (3). Mark the position of the valve stem to the bush of the gear (1) in order to make it easier to reinstall the gear back into the right position
4. Remove the attachment bolts of the gear and then remove the gear

Reinstallation:

5. When reinstalling the manual gear back to valve, check that the gear is in the right position
 - If the gear is installed back to its original position there is no need to adjust the gear settings
 - If the gear is turned 180 degrees from its original position, you must carefully check that the valve closes and opens correctly. If the mechanical limits (parts 4-7) are not correct you must adjust the gear as described in the chapter "5.2 Adjustment of manual gear"
6. Install the gear back to the valve and tighten the attachment bolts
7. Check that the valve opens and closes correctly. If the mechanical limits (parts 4-7) are not correct you must adjust the gear as described in the chapter "5.2 Adjustment of manual gear"

5.2 Adjustment of ProGear/Rotork manual gear

Part numbers mentioned in this chapter refer to the figure 12.

1. Remove the plastic dust caps (4) from the top of the mechanical limits. Open the locking nuts (5) and loosen the adjusting screws (6 & 7)
2. Turn the valve to the open position. Valve opens when you turn the hand wheel of the gear counterclockwise. Valve is in the open position when the flow port of the valve ball is concentric with the seat of the ball
3. Tighten the OPEN position adjusting screw (7) until it stops turning. Fix it with the locking nut (5) and put the dust cup in its place (4)
4. Turn the valve 90 degrees to the closed position. Valve closes when you turn the hand wheel of the gear clockwise
5. Tighten the CLOSE position adjusting screw (6) until it stops turning. Fix it with the locking nut (5) and put the dust cup in its place (4)
6. Check that the valve opens and closes correctly

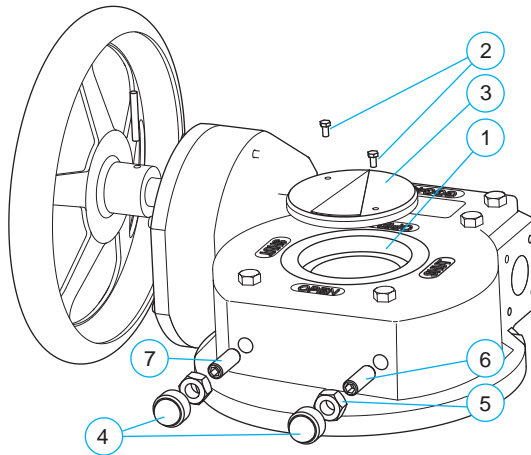


Figure 12. Manual gear.

5.3 Disassembly and reinstallation of AUMA electric actuator

Part numbers mentioned in this chapter refer to the figure 13.

Disassembly:

1. Before removing the actuator, turn the valve to the open position either electrically or manually by rotating the hand wheel (3) of the motor unit (2) counterclockwise
2. Turn off the power supply of the actuator
3. Turn the hand wheel (3) of the motor unit (2) slightly towards the close position (clockwise) to release forces between the valve and the actuator in order to make it easier to remove the actuator. To do this, turn the hand wheel (3) only that much that it rotates easily
4. Remove the bolts (4) of the position indicator plate. Remove the position indicator plate (5), the retaining ring (6) and the cover plate (7)
5. Before removing the actuator, mark the position and the place of the bushing (8) in relation to the actuator and the valve
6. Remove the attachment bolts of the actuator and remove the actuator. The bushing (8) will stay at the valve stem

Reinstallation:

7. When reinstalling the actuator back to the valve, check that the actuator is in the right position
 - If the actuator is installed back to its original position there is no need to adjust the actuator settings
 - If the actuator is turned 180 degrees from its original position, you must carefully check that the valve closes and opens correctly. If the actuator limits are not correct you must adjust the actuator as described in the chapter 5.4 "Adjustment of the mechanical limits of AUMA electric actuator"
8. Install the actuator back to the valve and tighten the attachment bolts of the actuator
9. Check that the valve opens and closes correctly. If the actuator limits are not correct you must adjust the actuator as described in the chapter 5.4 "Adjustment of the mechanical limits of AUMA electric actuator"

5.4 Adjustment of the mechanical limits of AUMA electric actuator

Part numbers mentioned in this chapter refer to the figure 13.

If the actuator is already installed to the valve, you can skip the points 1-8

1. Vexve Oy's ball valves are delivered from the factory in the open position. If the valve has been operated so that it is in some other position, turn the valve to the open position. Remove the device (handle/actuator) that you used to operate the valve
2. Check that the valve stem is intact and clean. Check also that the key of the valve stem is properly in its groove
3. Put the bushing (8) on the valve stem and set it to the right depth. Check that the overlap between the valve stem and the bushing is long enough. Usually a proper gap between the bushing and the actuator flange of the valve is about 10 mm
4. Tighten the locking screw (9) with an Allen key
5. Turn the actuator to the open position
6. Install the actuator on the valve in the preferred position. The gear unit (1) must fit the bushing (8) easily and you must not force it in its place
7. Grease the attachment screws of the actuator. Put all the washers and the attachment screws first loosely in their places and finally tighten them up
8. (If the motor unit (2) is not installed to the gear unit (1), install it now. Put all the washers and the attachment screws first loosely in their places and finally tighten them up)
9. Turn the hand wheel (3) a couple of revolutions clockwise. Remove the attachment screws (10) of the limiting bush (11)
10. (Set the position and torque limit of the motor unit (or control unit if included) according to separate AUMA's instructions)
11. Turn the valve to the open position
12. Turn the limiting bush counterclockwise until it stops turning. Then turn it backwards (clockwise) app. 1/8 turn
13. Pull the limiting bush out and put it back in its place so that the holes of it will match the holes of the gear unit. Fasten the limiting bush (11) tightly with the attachment screws (10).
14. Check that the actuator works properly

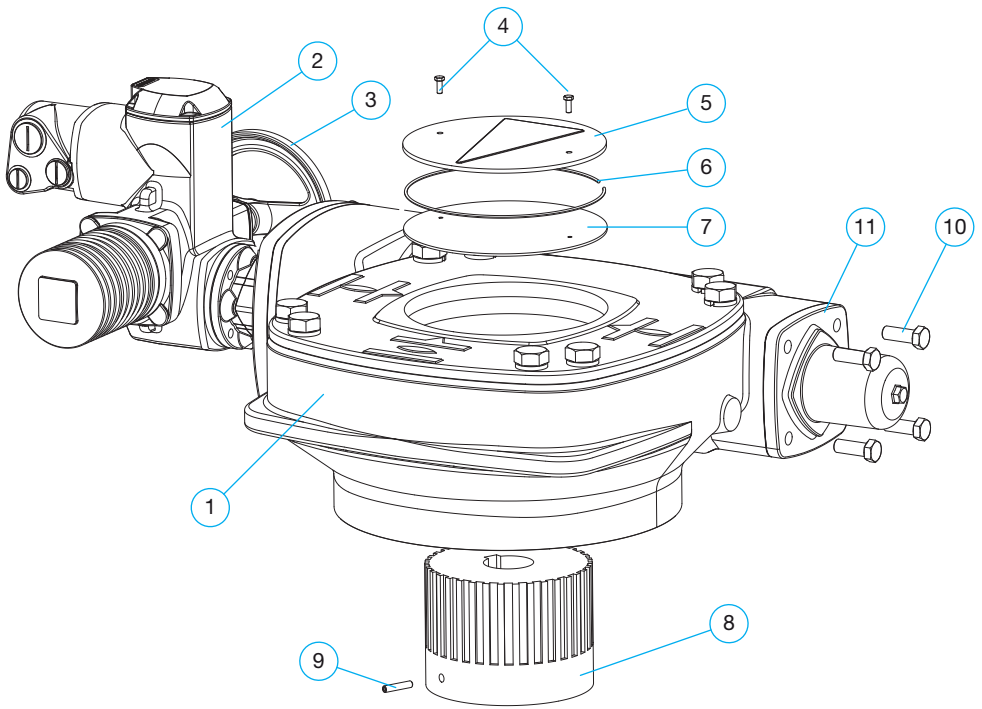


Figure 13. Electric actuator.

5.5 Assembly/disassembly of pneumatic actuator

Please refer to the separate installation/adjustment instructions, available from the manufacturer.

5.6 Assembly/disassembly of hydraulic actuator

Please refer to the separate installation/adjustment instructions, available from the manufacturer.

6. Maintenance

Vexve Oy's ball valves are virtually maintenance-free.

Correct choice of valve as well as careful installation, commissioning, and use significantly reduce any need for maintenance.



WARNING:

When the valve is installed in the line, its surface temperature may be dangerously high. Protect yourself against burns.

We recommend checking the following periodically:

Check that the valve is free from surface damage and shaft leaks, and carefully repair any damage.

To ensure long-term operational reliability, even when seldom used (around ten times a year or less), we recommend the following:

Approximately six months after commissioning and then once a year, inspect the valve for shaft leaks, check the manual gear / actuator, and ensure the tightness of the screws between valves.

6.1 Double block and bleed functionality

The double block and bleed functionality allows draining of the valve body to check the tightness of the valve, even when the pipeline is pressurized. The draining of the valve body is possible to do in both valve positions — open or closed.

Checking the tightness of the valve with double block and bleed functionality can be done as follows. The medium flows through the valve when the valve is in the open position. The seats ensure that the valve is tight. Testing the tightness of the valve can be done by closing the valve and draining the accumulated medium from the ball cavity. After the ball cavity is empty, you can check that the valve is tight by noticing that the flow from the draining valve stops.

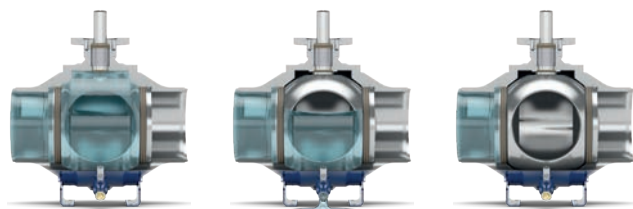


Figure 14. Double block and bleed functionality.

In addition to draining valve, large ball valves from DN 450 full bore to DN 1200 full bore can be equipped with air release valve at the upper part of valve body.



WARNING:

When using the draining valve to drain valve body, make sure that objects or persons can not be exposed to the flow. Relieve the pressure by opening the plug only slightly at first.

6.2 Replacing the O-ring seal of stem



NOTE!

When reassembling, be sure to put the retaining ring (4) properly into its groove in the stem and make sure that the stem is in the right position. Make sure that the gap in the retaining ring (4) is not located in the same place with the key (1).



NOTE!

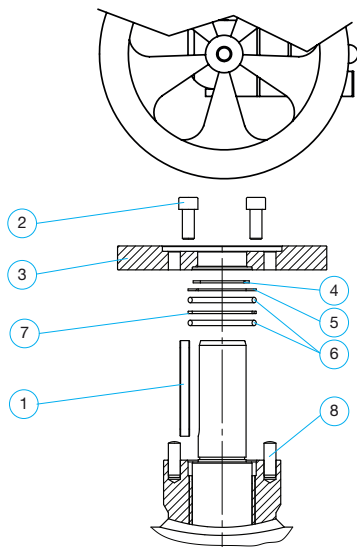
Clean the stem hole of the actuator before reinstalling the actuator. Actuator must fit the stem easily so that it won't press the stem downwards.



WARNING:

Stem sealing O-rings can only be replaced when the valve body contains no pressure. Because of the double block and bleed construction, the pressure is possible to be relieved through the draining valve.

6.2.1 Replacing the O-ring seal of stem in valves DN 150–400



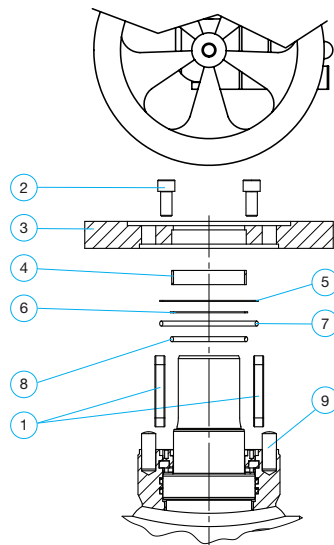
Instructions:

- remove the actuator, hex screws (2), the key (1) and the actuator flange (3). The pins (8) may be left at their place.
 - **TIP:** You can remove the actuator flange with the help of M12 screws: drive the screws into the flange and pull it away. (Screw holes of the flange are equipped with M12 thread. Screws (2) that you removed earlier are M10 screws)
- remove the retaining ring (4), the sliding plate (5), the upper O-ring (6), the distance plate (7) and the lower o-ring (6)
- put the new lower o-ring (6), the distance plate (7) and the new upper o-ring (6) in their places. Install the o-rings by pressing them evenly downwards from the upper edge
- assemble the rest of the removed parts in reverse order

	Part	DN 150–200	DN 250–300	DN 350–400
1	Key	040001	070005	070006
2	Hex screw (4 pcs)	070044	070044	070044
3	Actuator flange	935501	935503	935505
4	Retaining ring	009006	009008	070014
5	Sliding plate	630469	630470	940280
6	O-ring (2 pcs)	010027	981121	070002
7	Bottom distance plate	940163	630471	970058
8	Cylindrical pin (4 pcs)	004011	004017	004016

6.2.2 Replacing the O-ring seal of stem in valves with actuators

DN 450–1200 (manufactured after 2021)



Instructions:

- remove the actuator, bolts (2), the keys (1), the actuator flange (3) and the bearing (4). The pins (9) may be left at their place.
- remove the distance plates (5,6) and the O-rings (7,8)
- put the new o-rings (7,8) and the distance plates (5,6) in their places. Install the o-rings by pressing them evenly downwards from the upper edge
- assemble the rest of the removed parts in reverse order

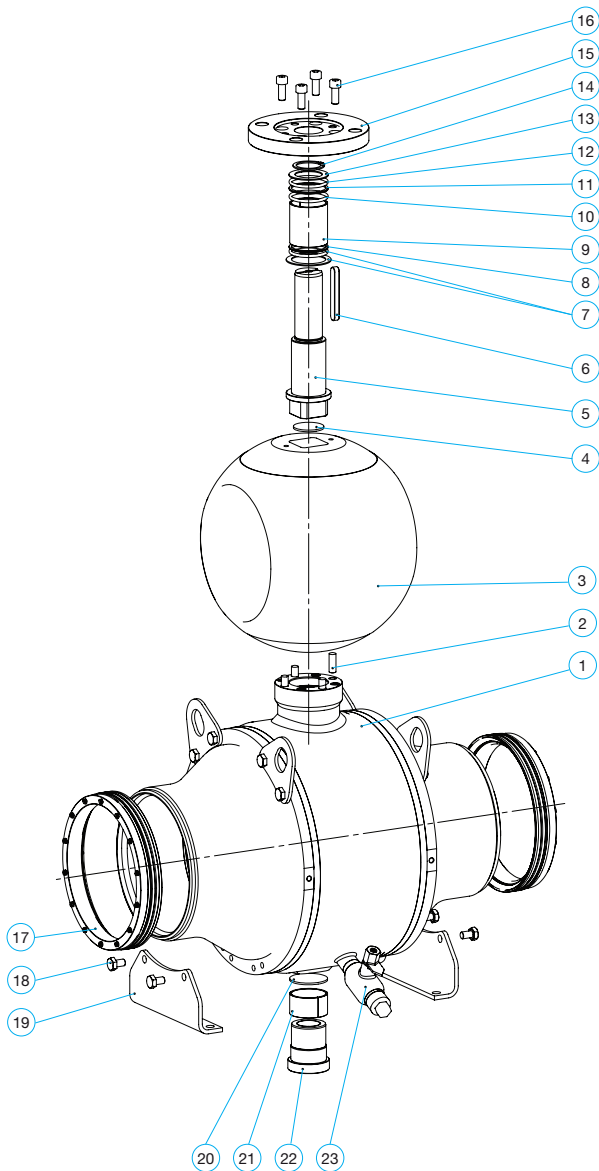
	Part	DN 450	DN 500	DN 600
1	Keys	OHSR562X201210001001	OHSR562X251410001001	OHSR562X281612001001
2	Bolts	OHSS143X1603501001	OHSS143X1603501001	OHSS143X1603501001
3	Actuator flange			
4	Bearing	OVLK008020001	OVLK010020001	OVLK010020001
5	Distance plate	OVTKT01X118110015002	OVTKT01X13813015001	OVTKT01X13813015001
6	Distance plate	OVTKT01X08908015002	OVTKT01X109100215001	OVTKT01X109100215001
7	O-ring	OVPOV00X0107325336001	OVPOV00X0129545337001	OVPOV00X0129545337001
8	O-ring	OVPOV00X0078745336001	OVPOV00X0097795336002	OVPOV00X0097795336002
9	Cylindrical pin (4 pcs)	OHSK150X1605001001	OHSK150X2005501001	OHSK150X2005501001

	Part	DN 700	DN 800	DN 900
1	Keys	OHSR562X281613001001	OHSR562X321814001001	OHSR562X321814001001
2	Bolts	OHSS143X1603501001	OHSS143A2405003001	OHSS143A2405003001
3	Actuator flange			
4	Bearing	OVLK012030001	OVLK012535001	OVLK012535001
5	Distance plate	OVTKT01X158150215001	OVTKT01X169160215001	OVTKT01X169160215001
6	Distance plate	OVTKT01X129120015002	OVTKT01X13412515001	OVTKT01X13412515001
7	O-ring	OVPOV00X0148595336002	OVPOV00X0158125336001	OVPOV00X0158125336001
8	O-ring	OVPOV00X0116845336002	OVPOV00X0120025336001	OVPOV00X0120025336001
9	Cylindrical pin (4 pcs)	OHSK150X2005501001	0440-D75851	0440-D75851

	Part	DN 1000	DN 1200	
1	Keys	OHSR562X362018001001	OHSR562X362020001001	
2	Bolts	OHSS143A2405003001	OHSS143X2406002001	
3	Actuator flange			
4	Bearing	OVLK014040001	OVLK015040001	
5	Distance plate	OVTKT01X19218015002	OVTKT01X202190215001	
6	Distance plate	OVTKT01X152140015001	OVTKT01X162150015001	
7	O-ring	OVPOV00X0177176996001	OVPOV00X0189876996001	
8	O-ring	OVPOV00X0139076996001	OVPOV00X0148606996001	
9	Cylindrical pin (4 pcs)	0440-D75851	0440-D75851	

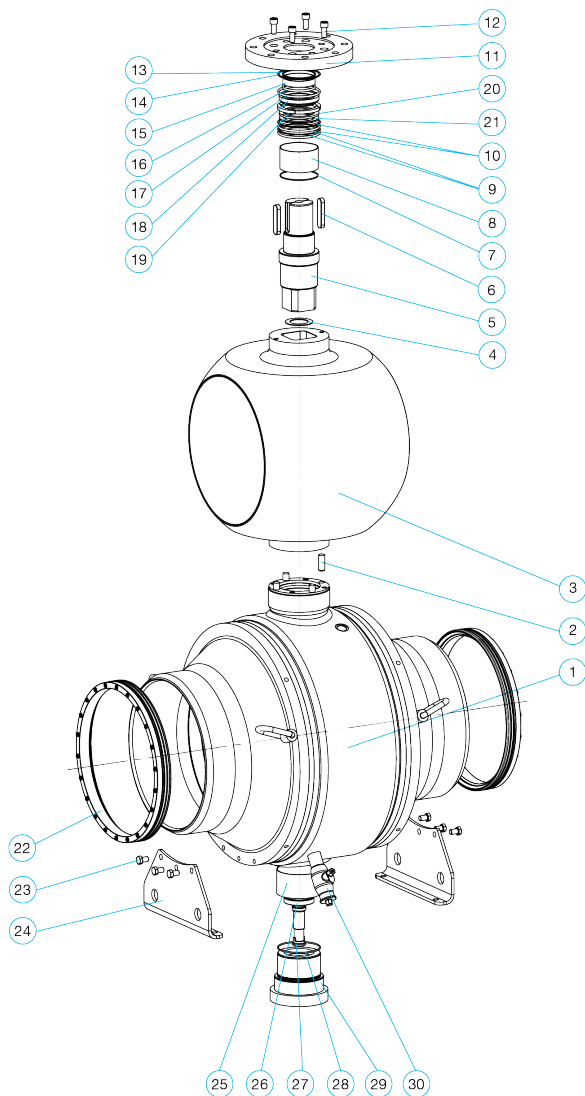
7. Appendices

7.1 Parts list for trunnion mounted ball valves DN 150–400



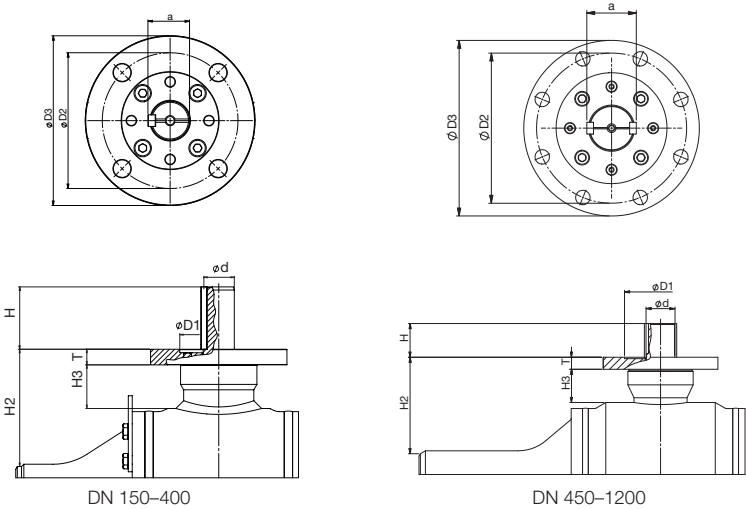
Part number		qty
1	Valve body	1
2	Pin	4
3	Ball	1
4	Sliding plate	1
5	Upper stem	1
6	Key	1
7	Sliding plate	2
8	O-ring	1
9	Sliding bearing	1
10	O-ring	1
11	Bottom distance plate	1
12	O-ring	1
13	Sliding plate	1
14	Retaining ring	1
15	Top flange	1
16	Socket head screw	4
17	Seal assembly	2
18	Hex screw	4
19	Mounting support	2
20	Sliding plate	1
21	Sliding bearing	1
22	Lower stem	1
23	Drain valve	1

7.2 Parts list for trunnion mounted ball valves DN 450–1200



Part number		qty
1	Valve body	1
2	Pin	4
3	Ball	1
4	Sliding plate	1
5	Upper stem	1
6	Key	2
7	O-ring	1
8	Sliding bearing	1
9	O-ring	2
10	Distance plate	2
11	Top flange	1
12	Socket head screw	4
13-14	Top distance plate	2
15	Sliding bearing	1
16-17	O-ring	2
18	O-ring bushing	1
19	Segment ring	1
20-21	Distance plate	2
22	Seat assembly	2
23	Hex screw	6
24	Mounting support	2
25	Sliding bearing	1
26	Lower stem	1
27-28	O-ring	2
29	Base plate	1
30	Drain valve	1

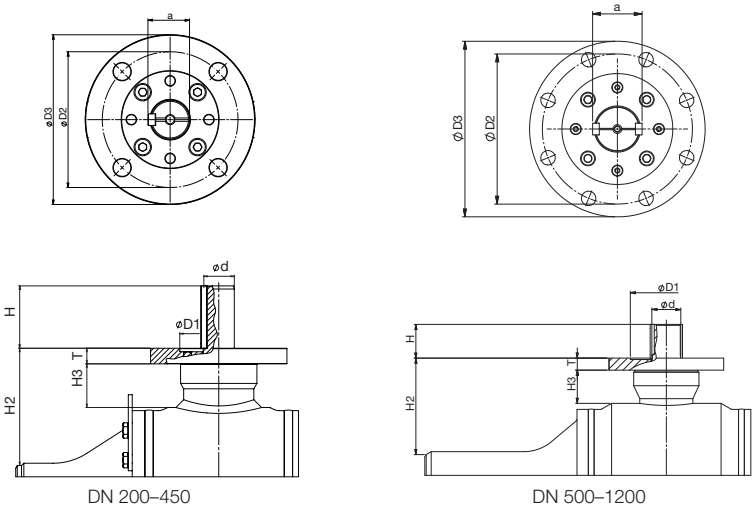
7.3 Coupling dimensions, full bore ball valves DN 150–1200 with actuators



DN	H	Ød	T	H2	H3	a	D1	D2	D3	Bolts	Key	Flange ISO5211
150	80	40	20	150	57	43	100	140	175	4xM6	A-12x8 - 80	F14
200	80	40	20	150	56	43	100	140	175	4xM16	A-12x8 - 80	F14
250	82	50	20	166	62	53.5	130	165	210	4xM20	A-14x9 - 90	F16
300	82	50	20	175	62	53.5	130	165	210	4xM20	A-14x9 - 80	F16
350	105	70	25	222	80	74.5	200	254	300	8xM16	A-20x12 - 100	F25
400	105	70	25	222	80	74.5	200	254	300	8xM16	A-20x12 - 100	F25
450	100	75	34	262	88	84.2	230	298	350	8xM20	A-20x12 - 100	F30
500	100	90	38	283	88	100.6	230	298	350	8xM20	A-25x14 - 100	F30
600	121	98	38	311	88	110.2	230	298	350	8xM20	A-28x16 - 120	F30
700*	130	98	48	366	111	110.2	260	356	415	8xM30	A-28x16 - 130	F35
800	140	120	50	426	138	133.8	260	356	415	8xM30	A-32x18 - 140	F35
900*	140	120	50	451	138	133.8	300	406	475	8xM36	A-32x18 -140	F40
1000	180	135	54	502	156	150.4	300	406	475	8xM36	A-36x20-180	F40
1200	205	140	54	555	156	155.4	300	406	475	8xM36	A-36x20-200	F40
Toler.		-0.1										

Note: DN 150–1000 coupling dimensions are for PN 25 & PN40 valves. DN 1200 coupling dimensions applies for PN 25.

7.4 Coupling dimensions, reduced bore ball valves DN 200–1200 with actuators



DN	H	Ød	T	H2	H3	a	D1	D2	D3	Bolts	Key	Flange ISO5211
200	80	40	20	150	57	43	100	140	175	4xM6	A-12x8 - 80	F14
250	80	40	20	150	56	43	100	140	175	4xM16	A-12x8 - 80	F14
300	82	50	20	166	62	53.5	130	165	210	4xM20	A-14x9 - 90	F16
350	82	50	20	175	62	53.5	130	165	210	4xM20	A-14x9 - 80	F16
400	105	70	25	222	80	74.5	200	254	300	8xM16	A-20x12 - 100	F25
450	105	70	25	222	80	74.5	200	254	300	8xM16	A-20x12 - 100	F25
500	100	75	34	262	88	84.2	230	298	350	8xM20	A-20x12 - 100	F30
600	100	90	38	283	88	100.6	230	298	350	8xM20	A-25x14 - 100	F30
700	121	98	38	311	88	110.2	230	298	350	8xM20	A-28x16 - 120	F30
800	130	98	48	366	111	110.2	260	356	415	8xM30	A-28x16 - 130	F35
900	140	120	50	426	138	133.8	260	356	415	8xM30	A-32x18 - 140	F35
1000	140	120	50	400	138	133.8	300	406	475	8xM36	A-32x18 - 140	F40
1200	180	135	54	400	156	150.4	300	406	475	8xM36	A-36x20-200	F40
Toler.		-0.1										

Note: DN 200–1200 coupling dimensions are for PN 25 & PN40 valves.



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