

Vexve X[™] shut-off and balancing valves, steel and stainless steel installation, operation, adjustment and maintenance manual



Contents

1.	General	4
2.	Valve identification	5
3.	Reception of consignments and storage	6
4.	Installing the valve	7
	4.1 Making a press fit connection	8
	4.2 Installation on the end of the pipe	11
	4.3 Commissioning and pressure testing	12
	4.4 Determining the pre-set value for the balancing valve	12
	4.5 Setting the pre-set values	13
	4.6 Measuring the valve's flow rate	13
5.	Maintenance	14
	5.1 Replacing the O-ring in the valves of X series	15
6.	Appendices	16
	6.1 Structure of balancing valves < DN 50	16
	6.2 Structure of ball valves < DN 50	17
	6.3 Pressure loss diagrams for balancing valves	18

Note:



Read these instructions carefully and comply with them when installing, using and maintaining the valve.

These are general instructions, and they do not cover every possible usage condition. The manufacturer can provide further guidance on installing, using and maintaining the valve if required. If you are not sure whether the valve is suitable for the intended application, contact the manufacturer.

Vexve Oy reserves the right to change these instructions without notifying the customer.

Vexve Oy shall not be liable for loss or damage incurred due to the incorrect transportation, handling, installation, use or maintenance of the product.

Vexve Oy shall not be liable for loss or damage due to the presence of objects, particles or impurities that should not be in the system.

Warranty

See Vexve Oy's General Conditions of Sale for more information about the warranty.

The warranty covers manufacturing and material defects. The warranty does not cover damage incurred due to the incorrect installation, use, maintenance or storage of the product. Failure to follow these instructions may void the warranty. Defective products covered by the warranty should be returned to the manufacturer for investigation. Vexve Oy may grant a refund only when the product has been found to be defective.

The warranty conditions are set out in Vexve Oy's General Conditions of Sale, which are available from the manufacturer.

Warnings and symbols

Failure to observe the warnings and symbols may lead to severe personal injury or product damage.

The people using the products must be familiar with the warnings and instructions.

To guarantee flawless, stable operation, the product must be transported, stored and installed correctly and commissioned carefully.

The following symbols are used in these instructions to draw the reader's attention to actions that are essential in order to guarantee safety and the correct use of the product.



Meaning of the NOTE symbol:

The NOTE symbol is used alongside actions that are essential in terms of the correct use of the product. Failure to observe this symbol may have damaging consequences.



Meaning of the WARNING symbol:

The WARNING symbol is used alongside actions that must be performed correctly in order to avoid severe personal injury or product damage.

1. General

The shut-off and balancing valves belonging to the Vexve X series have integrated press fit connections. They are designed to provide the optimal shut-off and balancing functionality for heating and cooling networks in buildings. Steel valves are suitable to use with EN 10305 thin-walled steel pipes. Stainless steel valves are suitable to use with EN 10312 thin-walled stainless steel pipes.

The steel valve (turquoise) is designed for clean media, such as oxygen-free water or water–glycol mixtures.



The stainless steel valve (grey) is designed for clean media. Vexve's stainless steel balancing valves are also suitable for many industrial systems with media such as process waters, ethanol, methanol, water–glycol mixtures or freezium.

The valves in the X series can be used within the limits shown by the pressure-temperature graph below.







Suitability of press fit connection's O-ring (CIIR/EPDM):

- · heating water
- · cooling water without antifreeze
- · cooling water with antifreeze
- district heating water ≤ 120 °C
- · extinguishing water (wet)
- · sprinkler (wet)
- · compressed air (oil cleanliness class 0-3)



Note:

If you intend to use the valve with other media or in other applications, contact Vexve to verify that the value is compatible with the planned use.

The structure of the valves in the X series is shown in Appendices 6.1 and 6.2.

For more detailed technical information relating to the dimensions, weights, torques, Kv values and other characteristics, see Vexve's product list and data sheets (www.vexve.com). Valve product information can also be found in MagiCAD database.

2. Valve identification

The identification plate is on the body of the valve. It contains the following information:



Figure 1. Identification plate

- 1. DN size (nominal size) of the valve
- 2. Pressure class
- 3. Material of the valve's body
- 4. Operating temperature range
- 5. Product number
- 6. LVI number (only in Finland)
- 7. CE marking
- 8. Flow direction (balancing valves)
- 9. Product brand
- 10. Date of manufacture
- 11. Manufacturer's website address

3. Reception of consignments and storage

Check that the content of the delivery corresponds to the order. Also check that the valve and related accessories were not damaged in transit.

Store the valve carefully until it is installed. It is recommended to store the valve in a dry, wellventilated place, such as a shelf or on a wooden pallet, where it is protected from rising damp.

The valve must be transported to the installation location in a robust package. The protective covers for the flow openings must be removed immediately before installation. The valve should be protected from sand, dust and other impurities.

The valve is delivered from the factory in the open position. The valve must remain in the open position during storage.

The maximum storage period is two years.

Package

Vexve's products come in packages designed for transportation. The packages are made from environmentally friendly material that is easy to sort and recycle.

We recommend recycling the packaging material.

The packaging material is wood, cardboard, paper and polyethylene plastic.

Recycling and disposal

Almost all of the components of the valve are manufactured from recyclable material. The material is marked on the majority of the components. Separate instructions on recycling and disposal are available from the manufacturer. For a fee, the valve can also be delivered to the manufacturer, who will recycle and dispose of the valve appropriately.

4. Installing the valve



WARNING:

Incorrect installation may lead to severe personal injury and may damage the product or cause it to malfunction. For this reason, these instructions must be followed carefully when the valve is installed.

These instructions are general instructions, and they do not cover every possible usage condition. If you require further guidance related to using the valve or additional information on its suitability for the intended application, contact the manufacturer.

- · M- and V-profile press jaws are suitable for pressing.
- The compressive force of the press tool for pressing the 18-35 mm size valves must be at least 19 kN.
- Loop-type press jaws are recommend for pressing the 42 mm and 54 mm sizes, and the compressive force of the press tool must be at least 32 kN.
- The protective covers for the flow openings must only be removed immediately before installation. The valve should be protected from sand, dust and other impurities.
- · Take great care when you test the valve before fitting it to the pipe network.
- The valve must not be lifted by the handle or precision control knop. Dropping the valve or lifting it incorrectly may lead to severe personal injury or product damage.



Note:

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

Immediately before installation:

Remove the protective covers for the flow openings (shut-off valve) and check that the internal surfaces
of the valve are clean and the leak before press (LBP) O-rings at the ends of the press connection are
in place and undamaged.



WARNING:

The end of the pipe to be connected must be cut straight and all sharp burrs must be removed carefully from the external and internal surfaces. Any impurities in the valve or pipe could damage the valve or its coupling heads.

4.1 Making a pressed connection



1. Cutting the pipe

Cut the pipe using a tool intended for cutting thin-walled pipes.



2. Removing burrs

Remove all burrs from the cut pipe using a tool intended for the purpose.



3. Cleaning

Clean any loose debris from the coupling head and check that there are no sharp burrs on it.



4. Check the coupling heads

Check the coupling head of the pipe: it must be circular and undamaged.



5. Marking the installation depth

Mark the correct installation depth on the pipe using the Vexve installation depth gauge.



6. Checking the coupling heads of the valve Visually inspect the valve's coupling head for any damage and ensure that the O-ring is in place in its groove.





7. Fitting the pipe into the valve

Fit the coupling head of the pipe into the valve to the fullest extent and ensure that the installation depth marking matches up.



8. Check before pressing Before pressing, check that the O-ring groove on the valve meets the groove on the tool.



9. Pressing the connection

Press the connection using a standard-compliant M or V profile press tool intended for pressing thin-walled steel pipes.



10. Removing the collar Remove the cracked collar by hand if it does not detach of its own accord.

Minimum installation distances:

In the Figure 2, D = the diameter of the pipeline







Flow direction >>>

Figure 2. Minimum installation distances



Note:

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

4.2 Installation on the end of the pipe



Note:

The valve must not be used as a terminal for the pipe – a cap plug must always be fitted to the other side of the valve (see Figures 3 and 4).

If the valve is installed onto the end of a pipeline, there is a danger of corrosive, acidic water or air collecting in the empty end of the valve. To prevent corrosion, there must be oxygen-free water in the section beyond the valve.



Figure 3. The valve must not be used as a terminal for the pipeline

Figure 4. Cap plug. There must be at least 200 mm of pipe between the valve and the cap plug.

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Note:

If the valve and the cap plug are installed as the terminal for a pipeline, the valve must be completely in the open position. A closed area must not be allowed to arise between the valve and the cap plug because the valve may be damaged if the water expands in a closed area (for example, due to a change in temperature).

4.3 Commissioning and pressure testing

Exceeding the permitted values shown on the valve may damage the valve and, in the worst case, lead to an uncontrolled pressure discharge. This can damage the product and could also cause personal injury and property damage. When the valve is closed, the maximum permitted testing pressure is 1.1xPN. While the pipeline is being pressure-tested, (1.5xPN) the valve must be opened.

4.4 Determining the pre-set value for the balancing valve

The desired Kv value can be pre-set for the valve:

- If the desired Kv value is known, the suitable valve size and pre-set value can be verified using Table 1.
- If the desired Kv value is not known, the suitable valve size and pre-set value can be determined using pressure loss diagrams (pages 18–20) if the valve's flow rate and pressure loss are known.

Pre-set value	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50
1,0	-	0,04	0,19	0,22	0,48	0,71
1,5	0,04	0,07	0,35	0,41	0,6	1,29
2,0	0,06	0,12	0,56	0,61	0,82	2,09
2,5	0,11	0,20	0,77	0,85	1,29	3,10
3,0	0,18	0,30	1,10	1,21	1,84	4,02
3,5	0,25	0,45	1,41	1,67	2,47	5,11
4,0	0,33	0,63	1,80	2,17	3,29	6,48
4,5	0,45	0,83	2,29	2,68	4,19	8,20
5,0	0,59	1,02	2,86	3,46	5,44	10,43
5,5	0,72	1,51	3,60	4,50	7,05	13,01
6,0	0,90	2,10	4,63	5,89	9,09	16,25
6,5	1,13	2,72	5,62	7,35	11,45	20,39
7,0	1,42	3,52	6,77	9,14	13,99	24,53
7,5	1,70	4,39	8,35	11,01	17,09	29,30
8,0	2,04	5,40	9,96	12,85	20,24	34,13
8,5	2,32	6,66	11,76	15	22,78	37,10
9,0	2,61	8,18	13,75	17,29	25,14	39,73

Table 1. Kv values for Vexve X balancing valves

4.5 Setting the pre-set values See Figure 5

Balancing valves

- 1. Set the limiter (2) to the specified pre-set value (1)
- 2. Adjust the hand (3) so it rests on the edge of the limiter (2)

4.6 Measuring the valve's flow rate

The valve's flow rate can be measured using a separate flowmeter. These devices measure the pressure on both sides of the valve and calculate the pressure loss caused by the valve on the basis of the measurements. The measuring device determines the flow rate based on the pressure loss and the Kv value corresponding to the valve's pre-set value. Contact Vexve Oy for additional information on suitable flowmeters.



Figure 5. Setting the pre-set value.

5. Maintenance

Valves of Vexve X series are practically maintenance-free.

The need for maintenance is significantly reduced by selecting the correct valve for the application and ensuring error-free installation, commissioning and use.



Warning:

When the valve is connected to the pipeline, the temperature of the external surface may be dangerously high. Protect yourself from burns.

We recommend regularly checking the following:

- Check that the valve's surface is not damaged and that there are no discernible leaks from the shaft structure.
- Repair any damage carefully.

In the event that the valve is used rarely (ten times per year or fewer), we recommend checking the following to ensure the long-term reliability of the valve:

• Check that there are no discernible leaks from the stem structure, check the condition of the handle or control knop, and check that the measuring blocks are sealed.

5.1 Replacing the O-ring in the valves of X series



- Remove the handle or control knop by pulling hard on it directly upwards
- · Remove the retaining ring
- · Remove the stem sealing bush
- · Remove the damaged O-ring
- Put the new O-ring in place by pressing the upper surface evenly downwards
- Put the new stem sealing bush in place by pressing the upper surface evenly downwards
- · Put the new retaining ring in place
- · Put the removed handle or control knop back in place

	Component	Steel	Stainless steel
1	Retaining ring	299415	289115
2	Stem sealing bush	901088	901088
3	O-ring	901105	901101
4	Handle	901115	901115
5	Precision control knop	901130T	901130H

6. Appendices

6.1 Structure of balancing valves < DN 50



Compo- nent number	Name	Units
1	Body	1
2	Extension pipe, pressed	2
3	Ball seal	2
4	Support plate	2
5	Spring plate	2
6	Stem bush	1
7	Stem	1
8	Sealing cuff	1
9	Retaining ring	1
10	Sliding plate	1
11	O-ring	2
12	Ball	1
13	Flow pipe	1
14	Precision control knop	1
15	LBP O-ring	2
16	Measuring block, blue	1
17	Measuring block, red	1

6.2 Structure of ball valves < DN 50



Compo- nent number	Name	Units
1	Body	1
2	Extension pipe, pressed	2
3	Ball	1
4	Ball seal	2
5	Support plate	2
6	Spring plate	2
7	Stem bush	1
8	Stem	1
9	Stem sealing bush	1
10	Retaining ring	1
11	Sliding plate	1
12	O-ring	2
13	O-ring	1
14	Handle	1
15	Handle cover	1
16	LBP O-ring	2

6.3 Pressure loss diagrams for balancing valves



DN 15

DN 20







DN 32







DN 50





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