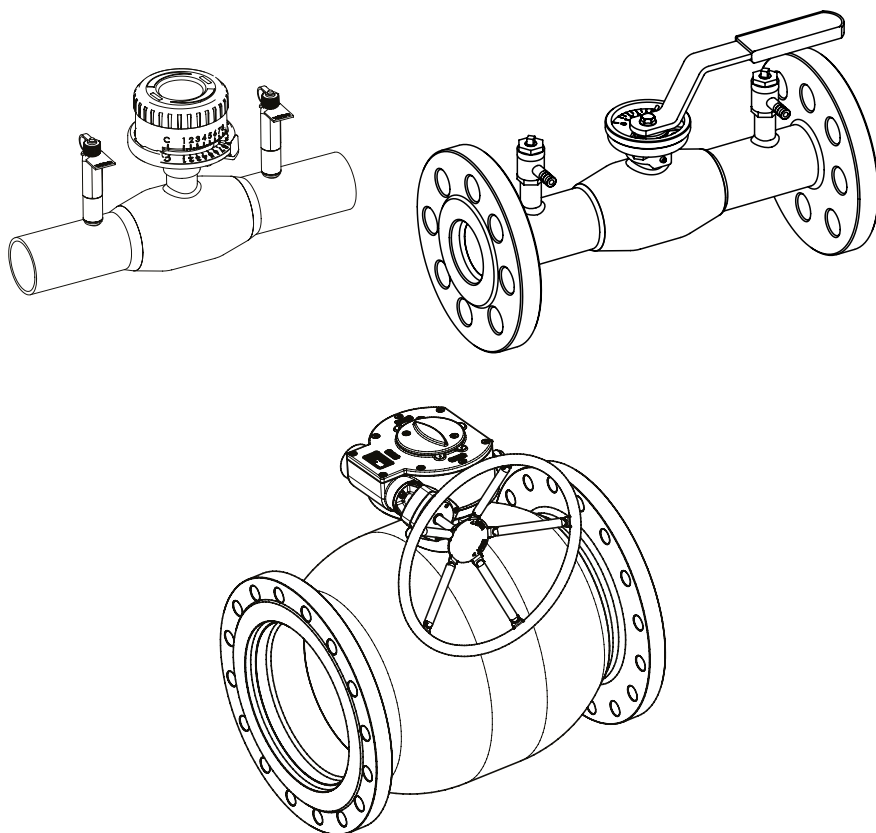


TA-BVS 240/243 (DN 15-250)

TA-BVS 140/143 (DN 15-300, DN 400)

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.

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, please contact IMI Hydronic Engineering.

IMI Hydronic Engineering reserves the right to make alterations to these instructions.

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

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 symbol: **NOTE**

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 symbol: **WARNING**

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

1. General

TA-BVS balancing valves are suitable for shut-off and balancing purposes in heating and cooling systems (HVAC).

Steel balancing valve TA-BVS 140/143 (color blue) is designed for clean mediums such as oxygen-free water or water-glycol mixtures.

Stainless steel balancing valve TA-BVS 240/243 (color grey) is designed for clean media. Also suitable for industrial system with e.g., process water or glycol. For media freezium, ethanol or methanol on request with EPDM O-rings.

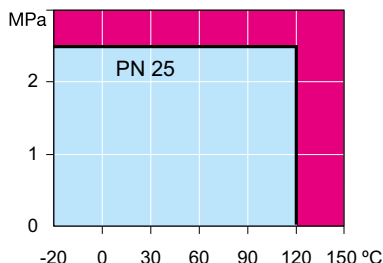
For more information, contact IMI Hydronic Engineering.

These balancing valves can be used within the following pressure-temperature range. Please note that the maximum allowable working pressure depends on the operating temperature.

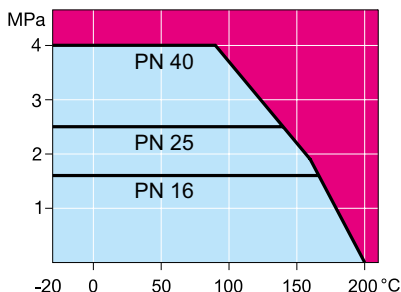
Chart 1

Pressure-temperature chart.

DN 15-50



DN 65-400



Note: Not for steam.

Below -20°C contact IMI Hydronic Engineering.



NOTE:

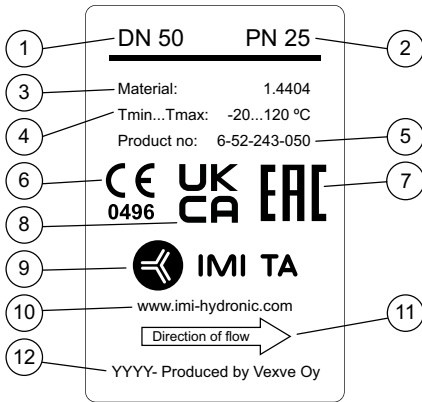
When intending to use the valve for other media or applications please contact IMI Hydronic Engineering to ensure its suitability.

For detailed technical information including dimensions and weights, torques, Kv-values etc., please refer to IMI Hydronic Engineering's technical leaflet available on www.imi-hydronic.com.

2. Valve identification

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

Figure 1. Identification plate.



1. Valve size (DN)
2. Pressure class
3. Valve body material
4. Allowed temperature range
5. Article number
6. CE mark and notified body number
7. Eurasian customs Union
8. UK Conformity Assessed marking
9. Supplier
10. Supplier's website
11. Direction of flow
12. Manufacturing year and manufacturer

3. Unloading 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 and well-ventilated 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.

Use lifting ropes when lifting the large size valves. It is forbidden to lift the valve by its actuator or stem (see Fig. 2).



NOTE:

Take the weight of the valve into account when handling it.

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..

Packaging

The 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.

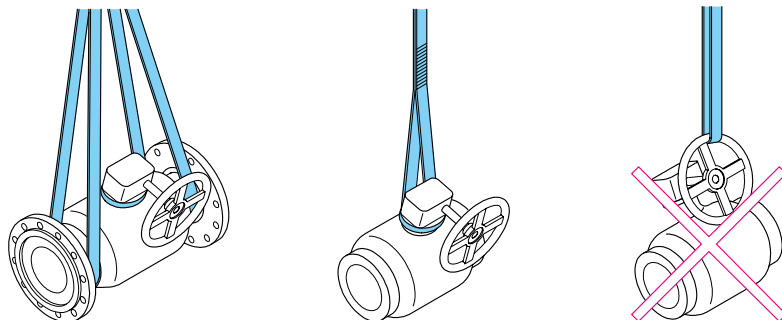
Recycling and disposal

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.

Figure 2. Lifting the valve.



4. Valve installation



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 or welding methods. If you require further guidance related to using the valve or additional information on its suitability for the intended application, contact IMI Hydronic Engineering.

- 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. 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 2.
-



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.
-



WARNING:

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

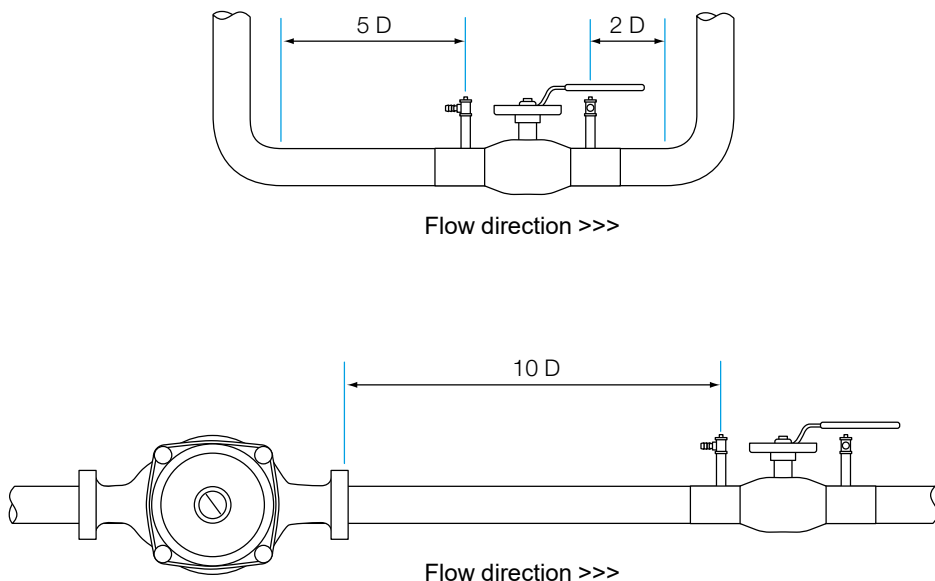
Following minimum installation distances should be followed:

In the picture D = pipeline diameter

Note:

It is recommended to install the valve with the stem horizontal or vertically upwards.

Figure 3. Minimum installation distances for DN 15-400



4.1 Installation of valve with welded connection

4.1.1. Balancing valves DN 15-250

Shielded metal arc and TIG welding are recommended.

Valve size DN 125 and bigger must be welded to the pipeline by using electric welding.

Welding

The valve must not overheat. Cool the valve during welding. One way to protect the valve seal from overheating is to place a wet fabric on the exterior surface of the valve near the seat.

The welder must have the required qualification for the welding method.

Before welding the entire seam, the valve should be welded to the pipeline with 4–8 spot-welded joints. Spot welds should be made on alternating sides of the valve in turn. During welding, the earthing (return cable) must be connected to the valve body or the pipeline.

The earthing cable should be connected to the same side of the valve as the welded seam so that the electrical current does not damage the valve sealing. **NOTE:** The valve must never be earthed via the valve handle, stem bush, actuator flange, or actuator.

Installing the valve horizontally

The valve must be open during welding to ensure that no welding contamination becomes affixed to the surface of the ball (See Fig. 4.4).

Installing the valve vertically

When the upper seam is welded, the valve must be open to ensure that no welding contamination becomes affixed to the surface of the ball (see Fig. 4.1).

When the lower seam is welded, the valve must be closed to prevent it from overheating (see Fig. 4.2).

Figure 4.1. Vertical position

When the upper seam is welded, the valve must be open to ensure that no welding contamination becomes affixed to the surface of the ball.

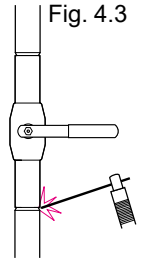
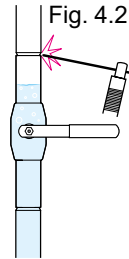
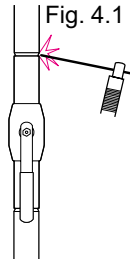


Figure 4.2. Vertical position

If the valve is welded onto a vertical pipeline and the lower side of the valve is pressurized, the valve must be closed. The valve ball and ball seal should be protected from hot welding contamination by filling the upper side of the valve with at least 40 mm of water.

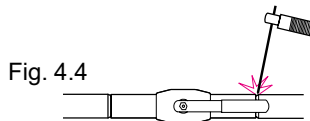


Figure 4.3. Vertical position

When the lower seam is welded, the valve must be closed.

NOTE! When welding a valve with gas, the other side of the valve must never be pressurized.

Figure 4.4. Horizontal position

The valve must be in open position.

NOTE: Cool the valve after welding and before beginning normal use. The valve may not open/close until it has cooled down thoroughly.



WARNING:

When welding with gas, the valve must always be closed and cooled down, for example with a wet cloth, during welding. The flow tube of the balancing valve may be damaged if the internal temperature of the valve rises above 180 °C



WARNING:

The earthing (return cable) must never be connected to the valve handle!

4.1.2. Balancing valves DN 300-400

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

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

Installation

- 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 surface.
- 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.
- The inner diameter of the pipes must be the same as the inner diameter of the ends of the valve.

Welding

- The valve must first be bridged to the pipeline using spot welding, with 4-8 seams alternately on opposite sides of the valves.
- Then the seams between the bridges are welded as shown in Figures 5 and 6. 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. **NOTE:** Never connect the ground to the valve neck, top flange or actuator.

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.

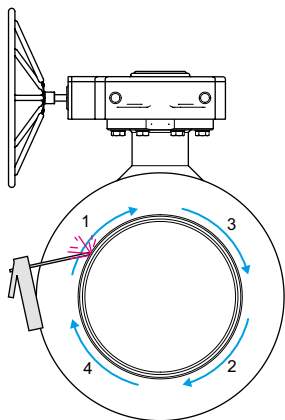


Figure 5. Welding the seams.

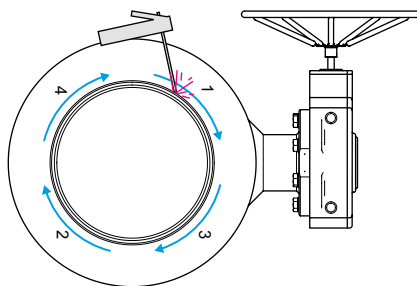


Figure 6. Welding the seams

4.2 Installation of valve with flanges

- Valves may only be installed by an authorised person. The applicable norms and standards should be observed during installation.
- The valve must be open during installation to ensure that no contamination can damage the sealing surfaces.
- The sealing surfaces of the pipeline and valve flanges must be parallel, and they must meet each other correctly.
- The valve length (including flange seals) must be the same as the distance between the pipeline's flanges.
- The pipeline flanges must be compatible with the valve flanges. For detailed information on flanges, see the EN1092-1 standard.
- The bolts and nuts used in the connection must be suitable for the conditions prevailing in the location of the valve. The screws and nuts must also meet the requirements applying to the pressure, temperature, flange material and sealant. For detailed information on this topic, see the EN 1515-1, EN 1515-2 and 1515-4 standards.
- The seal must be suitable for the operating conditions, and it must meet the requirements applying to the pressure, temperature and medium. The dimensions of the seal must be compatible with the dimensions of the seal surfaces. For detailed information on this topic, see the EN 1514 standard.
- It is recommended to install the valve with the stem horizontal or vertically upwards.

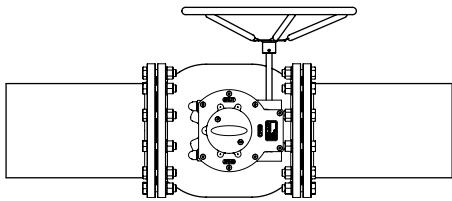


Figure 7. Horizontal installation.

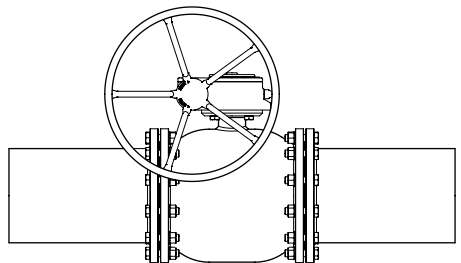


Figure 8. Vertical installation

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 9. and 10.).

When 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.

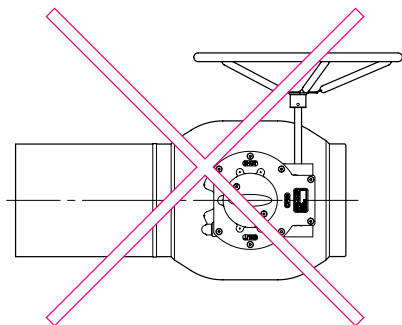


Figure 9. Do not use the valve at the end of the pipeline.

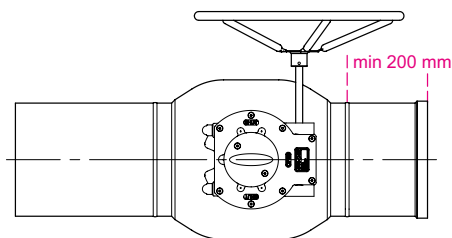


Figure 10. Blank flange.
Min. 200 mm pipe must be installed between the valve and the blank flange.



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 valves of size DN 150 and larger (see Fig. 11).

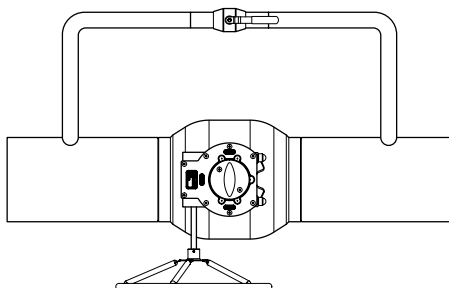


Figure 11. By-pass valve.

4.5 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..

4.6 Defining the pre-set value

Pre-set value of a valve can be defined by desired Kv-value of the valve.

- If the desired Kv-value is known, the suitable valve size and pre-set value can be checked from the table 1a and 1b.
- If the desired Kv-value is not known, suitable valve size and pre-set value can be determined with the help of Kv-curves, see technical specification on www.imi-hydraulic.com in case the desired flow rate and pressure drop across the valve are known.

Table 1a. Kv-values

NOTE: New Kv values for valves DN 15-50 equipped with precision control handwheel. In softwares (HySelect, HyTools) and balancing instrument (TA-SCOPE) the TA-BVS, DN 15-50, is named TA-BVS*.

Kv values for DN 65 and up remain the same.

Setting	DN														
	15	20	25	32	40	50	65	80	100	125	150	200	250	300*	400*
1,0	-	0,04	0,19	0,22	0,48	0,71	2,52	3,42	6,48	6,84	13,7	19,7	35,0	54,5	162
1,5	0,04	0,07	0,35	0,41	0,60	1,29	3,64	5,37	9,47	13,3	20,2	20,2	51,2	80,0	242
2,0	0,06	0,12	0,56	0,61	0,82	2,09	4,75	7,31	12,5	18,0	26,6	38,4	66,5	105	362
2,5	0,11	0,20	0,77	0,85	1,29	3,10	6,34	10,2	16,3	24,3	35,5	51,1	90,0	142	429
3,0	0,18	0,30	1,10	1,21	1,84	4,02	7,92	13,1	20,1	30,6	44,3	63,8	110	176	552
3,5	0,25	0,45	1,41	1,67	2,47	5,11	9,78	16,1	24,5	37,8	55,1	79,3	140	220	665
4,0	0,33	0,63	1,80	2,17	3,29	6,48	11,6	19,1	28,8	45,0	65,9	95,0	165	260	810
4,5	0,45	0,83	2,29	2,68	4,19	8,20	14,2	23,3	35,8	55,3	84,1	121	215	336	970
5,0	0,59	1,02	2,86	3,46	5,44	10,43	16,7	27,5	42,8	65,5	102	147	260	408	1194
5,5	0,72	1,51	3,60	4,50	7,05	13,01	20,9	33,2	51,8	81,7	127	183	325	510	1420
6,0	0,90	2,10	4,63	5,89	9,09	16,25	25,2	38,9	60,8	97,9	152	219	380	600	1744
6,5	1,13	2,72	5,62	7,35	11,45	20,39	29,5	46,3	75,4	122	197	282	500	785	2110
7,0	1,42	3,52	6,77	9,14	13,99	24,53	33,8	53,6	90,0	146	241	325	576	950	2636
7,5	1,70	4,39	8,35	11,01	17,09	29,30	39,8	64,6	113	177	290	417	740	1156	3380
8,0	2,04	5,40	9,96	12,85	20,24	34,13	45,7	75,6	137	209	338	486	866	1353	4191
8,5	2,32	6,66	11,76	15,00	22,78	37,10	53,5	91,8	169	251	400	576	1020	1594	5545
9,0	2,61	8,18	13,75	17,29	25,14	39,73	61,2	108	216	294	461	660	1170	1840	7159

*) TA-BVS 140/143 only

Table 1b. Kv-values (old)

Old Kv values for DN 15-50 valves equipped with removable **handle**.

Setting	DN				
	15/20	25	32	40	50
1,0	-	-	0,39	0,60	1,26
1,5	-	0,35	0,57	1,01	1,80
2,0	0,14	0,49	0,83	1,48	2,70
2,5	0,28	0,99	1,08	2,02	3,55
3,0	0,42	1,36	1,44	2,70	4,39
3,5	0,61	1,66	1,80	3,24	5,61
4,0	0,80	2,00	2,30	3,96	6,84
4,5	1,02	2,40	2,74	4,86	8,34
5,0	1,24	3,00	3,42	5,98	9,83
5,5	1,64	3,50	4,21	7,18	11,9
6,0	2,04	4,50	5,11	8,57	14,0
6,5	2,64	5,10	5,97	10,2	16,9
7,0	3,24	6,70	7,27	12,3	19,8
7,5	3,84	7,30	8,64	14,4	23,4
8,0	4,45	9,30	10,1	17,6	27,0
8,5	5,04	10,0	11,5	20,9	30,6
9,0	5,83	12,6	13,1	22,6	34,2

4.7 Setting the pre-set value

Valves DN 15-50 (Fig. 12.1)

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

Note: If preset value **C** is selected, the valve will function as a shut-off valve.

Valves DN 65-150 and earlier DN 15-50 with removable handle (Fig. 12.2)

- Set the desired pre-set value (1).
- Open the locking screw of the limiter (2).
- Move the limiter against the edge of the scale plate (3).
- Tighten the locking screw of the limiter (2).

Valves DN 200-400 (Fig. 12.3)

- Set the desired pre-set value (1).

Figure 12.
Setting the pre-set value.

Fig. 12.1

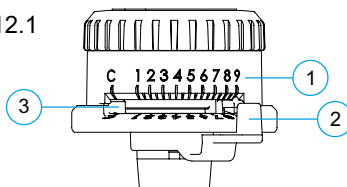


Fig. 12.2

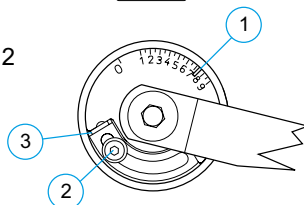
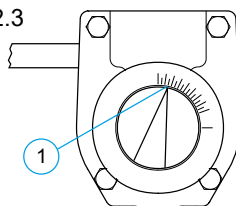


Fig. 12.3



4.8 Measuring the flow rate through the valve

Flow rate through the valve can be measured by using special flow measuring devices. These devices measure the pressure drop across the valve and calculate the flow rate based on the pressure drop measurements.

For more detailed information on measuring the flow rate, please refer to user manuals of flow measuring devices. For more information on suitable flow measuring devices, please contact IMI Hydronic Engineering.

5. Maintenance

TA-BVS balancing valves are maintenance free in practice.

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 stem 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:

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

In case of need to replace O-ring seal then please contact IMI Hydronic Engineering.

We reserve the right to introduce technical alterations without previous notice.