

DZR Brass Commissioning Partner Valve – Fixed Orifice

Static balancing valve with fixed-orifice Venturi flow measurement and memory pre-setting. Sizes 1/2" to 2".



PRODUCT CODES

Brymec code	Description	Barcode (GTIN-13)
38891	1/2" DZR Brass Commissioning Partner Valve - Fixed Orifice	5056126106695
38892	3/4" DZR Brass Commissioning Partner Valve - Fixed Orifice	5056126106701
38893	1" DZR Brass Commissioning Partner Valve - Fixed Orifice	5056126106718
38894	1 1/4" DZR Brass Commissioning Partner Valve - Fixed Orifice	5056126106725
38895	1 1/2" DZR Brass Commissioning Partner Valve - Fixed Orifice	5056126106732
38896	2" DZR Brass Commissioning Partner Valve - Fixed Orifice	5056126106749

DESCRIPTION

The static balancing valve allows the flow of fluid circulating in a pipework system to be accurately adjusted and measured. It is used for the static balancing of heating systems and in any application where flow needs to be set and measured easily. The handwheel with graduated scale adjusts the flow through the valve from maximum to fully closed, without the need for tools. Two pressure test points for needle probes allow the differential pressure across a calibrated Venturi (fixed orifice) to be measured, so that the flow rate can be calculated with high accuracy. The valve also has a memory pre-setting system, so the previously set flow rate can be restored quickly after the valve has been used to shut off. The drain point can be used to connect the capillary tube of a differential pressure control valve (DPCV).

SIZING

Use the sizing diagram (Fig. 12) to select the correct valve size. Steps A to D of the Guide to sizing (Fig. 11) explain how to use it.

TECHNICAL FEATURES

Maximum allowable pressure (PN)	25 bar
Maximum allowable temperature	110 °C
Minimum temperature	0 °C (no ice)
Compatible fluids	Water (not steam) Water-glycol solutions, max. 50% glycol
Pipe connections	Threads to ISO 228-1
Drain plug	1/4" female parallel thread to ISO 228-1
Pressure test point connection	3/8"-24 UNF thread to ANSI B1.1
Needle probe hole size	Ø 3 mm

MATERIALS

Body	Brass EN 12165-CW602N (DZR)
Internal parts in contact with water	Brass EN 12164-CW602N (DZR)
Internal parts not in contact with water	Brass EN 12164-CW614N
O-rings and other seals	EPDM rubber
Seat	PTFE
Plastic parts	Glass-fibre reinforced PA12; PP



SAFETY INFORMATION

Read these instructions fully before installing, commissioning or maintaining the valve.

- Small amounts of hot water may escape from the pressure test points when the probes are inserted. Wear protective clothing and safety goggles to prevent injury while measuring pressure.
- Do not use lubricant to help insert the probes. If necessary, use clean water only.
- Do not leave the measuring needle in the test point for long periods, as this may cause leaks.
- The fluid flowing through the valve must never exceed the maximum permitted temperature or pressure. Use the valve only with compatible fluids.
- Do not dismantle the valve until the system pressure has been fully released.
- The valve must be installed by qualified personnel in accordance with national safety regulations. Failure to follow these instructions may result in incorrect installation, commissioning or maintenance, which may cause the valve to malfunction and lead to damage to property or injury to people.
- When making the connections, make sure all joints are watertight: even small leaks can cause considerable damage.
- If the water temperature exceeds 50 °C, take the necessary precautions to prevent serious burns and other hazards to people.
- Each valve is carefully checked before dispatch. Brymec accepts no liability for damage caused by improper transport or handling, and accepts no responsibility for damage to the valve or to connected equipment, or for injury or damage to property, arising from improper use or from incorrect installation and commissioning of the product.
- At the end of its life, remove and dispose of the product in accordance with the national legislation in force in the country where it was used.
- This product is manufactured under an ISO 9001:2015 certified quality management system.
- All information in these instructions, including technical data, illustrations and descriptions, is not binding and may change without notice.
- For more information, please contact Brymec at sales@brymec.com or visit www.brymec.com.

INSTALLATION

Install the valve on the flow pipe of the branch where possible (Fig. 1). If this is not possible, it can be installed on the return pipe, but it cannot then be combined with a DPCV. A strainer should also be fitted upstream of the valve to remove impurities in the water that could cause it to malfunction.

For the most accurate flow measurement, install the valve in a section of the system where:

- the pipework is the same nominal size (DN) as the valve
- there is a straight length of pipe of $5 \times \text{DN}$ upstream of the valve ($10 \times \text{DN}$ at a pump outlet) and $2 \times \text{DN}$ downstream
- jointing material and any burrs on the pipe ends do not obstruct the flow of water, even partially

Install the valve as follows:

1. Flush the pipework to prevent impurities from damaging the valve.
2. Check that the operating pressures and temperatures are within the permitted range.
3. Leave enough space around the valve for adjustment and maintenance.
4. Make sure the direction of flow matches the arrow on the valve body.
5. Apply sufficient jointing material, such as PTFE or equivalent, to the connections.

Once installed, the valve must be commissioned by qualified personnel in accordance with current legislation. We recommend that commissioning is stopped if these instructions have not been fully read and understood, or if any aspect of the installation or system does not meet the stated requirements.

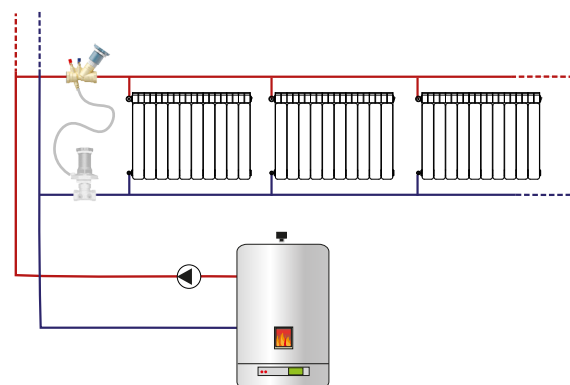


Fig. 1 Typical installation on the flow pipe of a heating branch

ADJUSTMENT AND FLOW MEASUREMENT

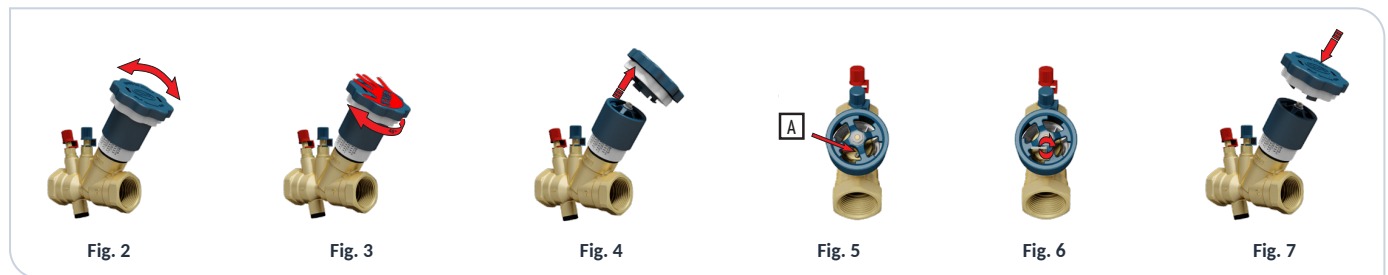
— ADJUSTMENT

The valve has a mechanical memory that limits how far the handwheel can open, set by a locking screw (A, Figs. 5 and 8).

1. Using the blue graduated knob (Fig. 2), set the valve to the setting for the required flow rate, taken from the sizing diagram (Fig. 12) or the head loss diagrams.
2. Hold the blue knob and turn the white knob beneath it 45° clockwise (Fig. 3).
3. Keeping the white knob turned by 45°, pull the blue knob upwards (Fig. 4). Both knobs will come off the valve.
4. Locate the memory locking screw A (Fig. 5).
5. Using a 1.5 mm hex (Allen) key, turn locking screw A clockwise until it stops (Fig. 6).
6. Refit the knobs by pressing them gently down onto the valve (Fig. 7).

The valve can also shut off the flow completely if required. Turn the knob clockwise until it is closed, taking care not to over-tighten it, as this can damage the internal parts of the valve. When reopening, turn the knob anticlockwise to the memory stop; this restores the flow rate previously set.

Please note: if the knob cannot be turned properly because of the position of the memory locking screw (A), tighten the screw until the knob turns freely.



— FLOW MEASUREMENT

The valve has a fixed-orifice flow meter (Venturi principle), which gives a fixed Kv. With needle probes inserted into pressure test points B and C (Fig. 8), the differential pressure (Δp) across the fixed orifice can be read with a differential pressure gauge. The Kv of the fixed orifice is marked on each valve body and given in the table in Fig. 9. Calculate the flow rate Q using:

$$Q = K_{V_{\text{Venturi}}} \times \sqrt{\Delta p} \quad Q \text{ in m}^3/\text{h}, \Delta p \text{ in bar}$$

Δp must be measured at the pressure test points. For fluids with a density ρ different from that of water, use:

$$Q = K_{V_{\text{Venturi}}} \times \sqrt{\Delta p \times \frac{\rho_{\text{water}}}{\rho}} \quad Q \text{ in m}^3/\text{h}, \Delta p \text{ in bar}, \rho \text{ in kg/m}^3$$

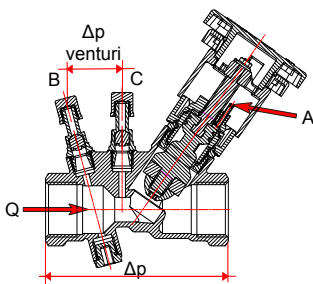


Fig. 8 Pressure test points B and C, memory screw A

Valve size	Kv Venturi flow meter	Kv complete valve
1/2"	2.5	2.2
3/4"	4.2	3.8
1"	8.4	7.6
1 1/4"	18.5	11.0
1 1/2"	27.5	15.9
2"	38.0	21.2

Fig. 9 Kv values

The same formula can be rearranged to find the Δp that corresponds to the required flow rate:

$$\Delta p = \left(\frac{Q}{K_{V_{\text{Venturi}}}} \right)^2 \quad Q \text{ in m}^3/\text{h}, \Delta p \text{ in bar}$$

For fluids with a density ρ different from that of water, use:

$$\Delta p = \left(\frac{Q}{K_{V_{\text{Venturi}}}} \right)^2 \times \left(\frac{\rho}{\rho_{\text{water}}} \right) \quad Q \text{ in m}^3/\text{h}, \Delta p \text{ in bar}, \rho \text{ in kg/m}^3$$

To set the required flow rate, adjust the knob until the calculated Δp is measured across test points B and C. Alternatively, use the diagram in Fig. 10: from the measured Δp , read off the flow rate Q for the valve size.

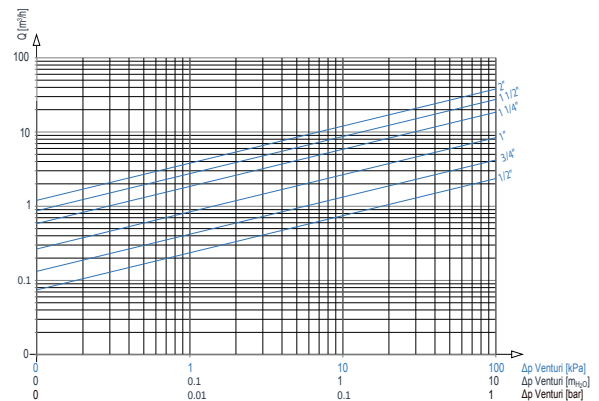


Fig. 10 Flow rate Q against Venturi Δp , by valve size

SIZING

GUIDE TO SIZING

Fig. 11

The valve is designed to perform best within the operating range shown in Fig. 12. To size the valve:

A Find the required flow rate Q and pressure drop Δp on their axes. For example, $Q = 2.5 \text{ m}^3/\text{h}$ and $\Delta p = 0.1 \text{ bar}$.

B Draw a line through these two points and extend it until it meets the K_v axis. In the example, $K_v = 8 \text{ m}^3/\text{h}$.

C Follow the horizontal line from this K_v value. The bars it crosses are the valve sizes suitable for the installation; in the example, 1 1/4", 1 1/2" and 2".

D Choose the smallest suitable size; in the example, 1 1/4". Where the horizontal line crosses the selected bar gives the required handwheel setting; in this case, 17.

For reference: 1 l/s = 3.6 m^3/h ; 1 bar = 10 mH_2O = 100 kPa.

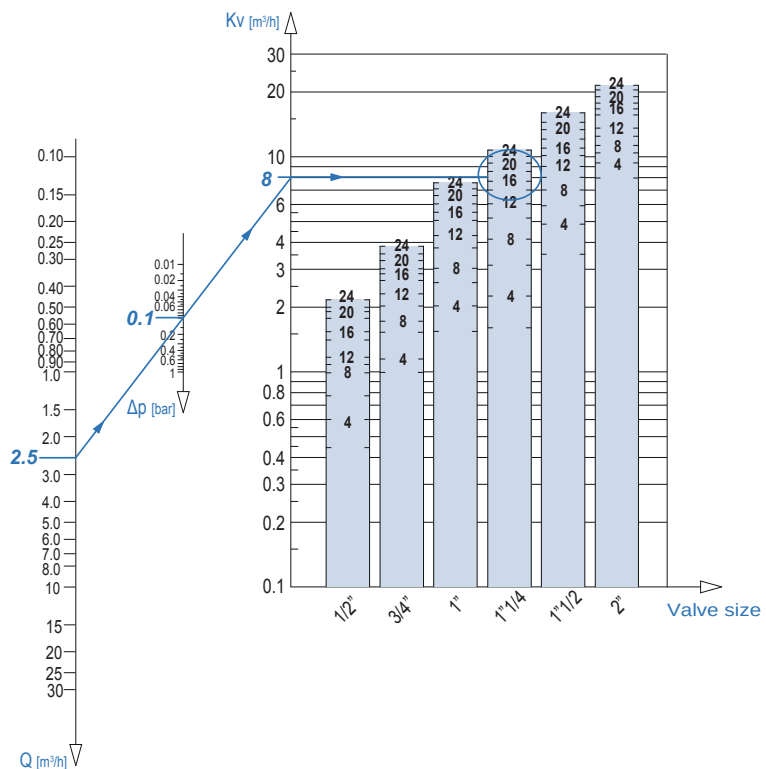


Fig. 12 Sizing diagram, showing the worked example from steps A to D

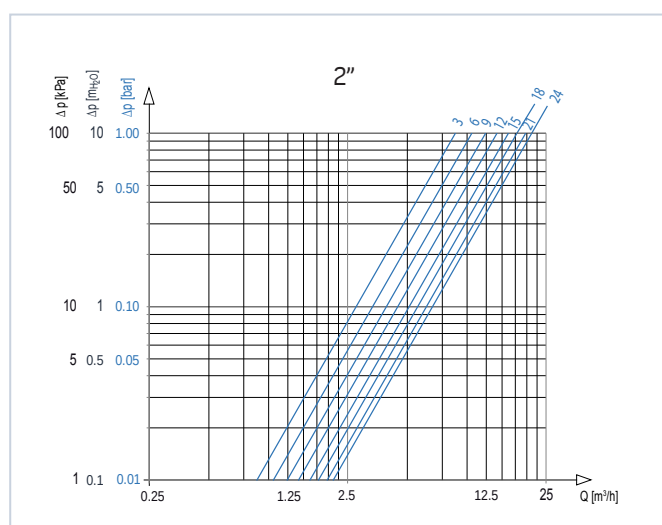
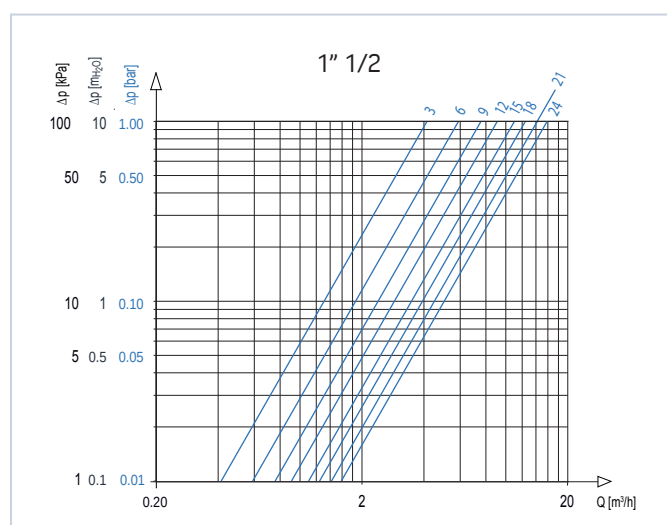
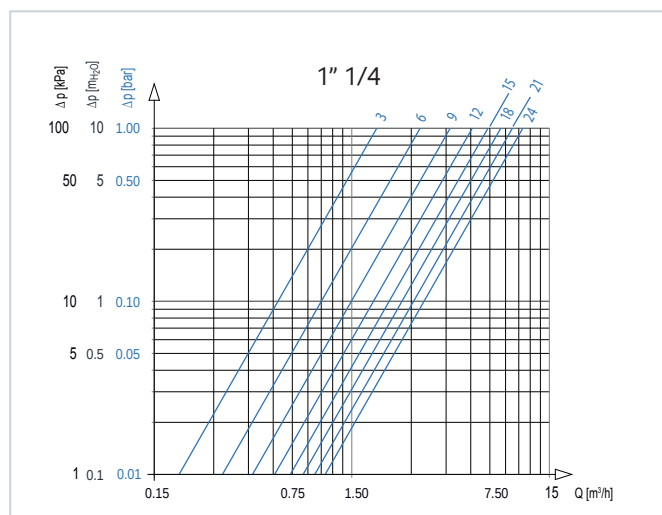
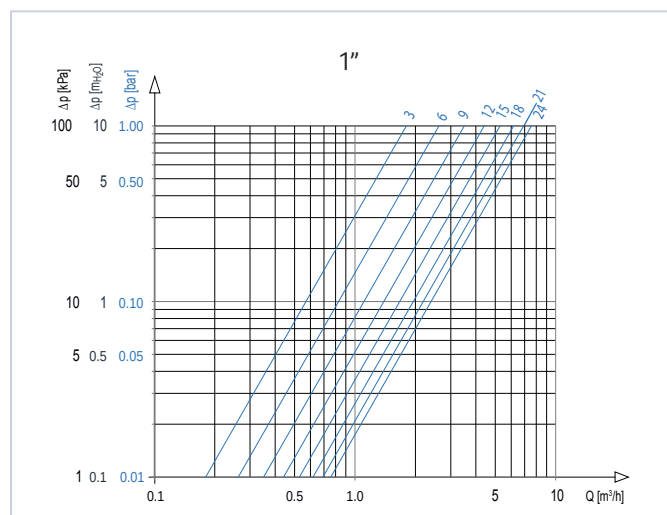
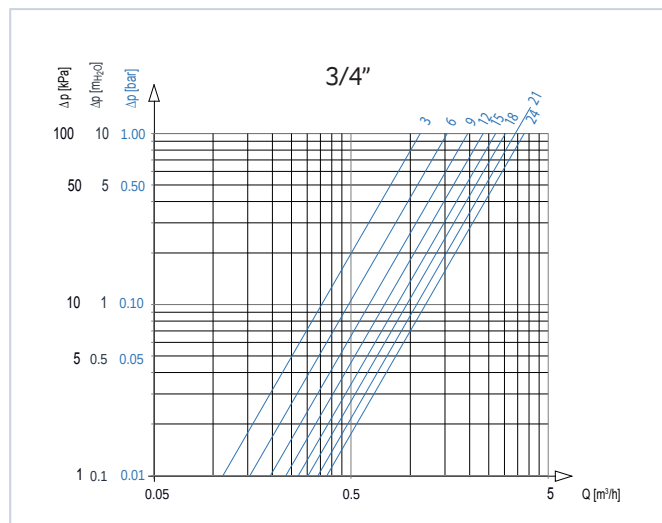
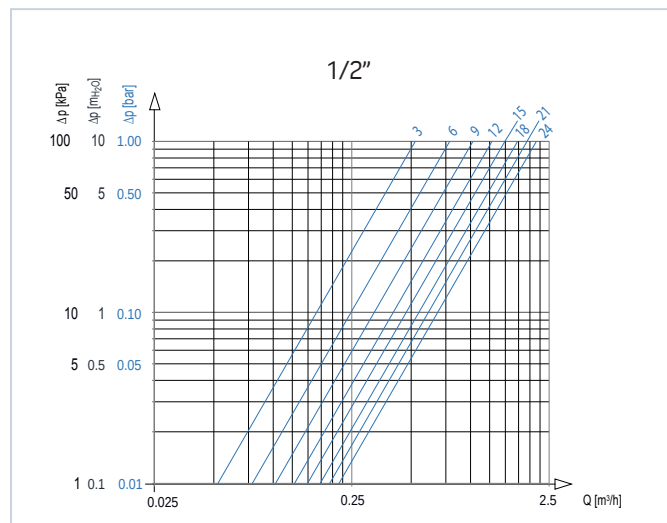
Kv at each handwheel setting (m^3/h)

Setting	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
1/2"	2.16	2.07	2.00	1.93	1.88	1.81	1.73	1.66	1.59	1.49	1.42	1.34	1.28	1.21	1.12	1.03	0.96	0.88	0.78	0.71	0.60	0.52	0.46	0.38
3/4"	3.78	3.69	3.54	3.41	3.27	3.14	3.04	2.90	2.80	2.71	2.60	2.46	2.34	2.21	2.06	1.96	1.79	1.65	1.54	1.42	1.25	1.12	0.96	0.85
1"	7.57	7.38	7.14	6.92	6.61	6.38	6.17	5.85	5.60	5.28	5.03	4.68	4.40	4.13	3.84	3.50	3.18	2.94	2.62	2.37	2.08	1.80	1.50	1.15
1 1/4"	11.00	10.59	10.18	9.74	9.38	8.93	8.51	8.11	7.77	7.33	7.01	6.61	6.11	5.67	5.22	4.72	4.24	3.81	3.32	2.83	2.42	2.01	1.64	0.92
1 1/2"	15.87	15.40	14.72	14.21	13.68	13.01	12.44	12.07	11.52	11.00	10.16	9.73	9.08	8.71	8.20	7.57	7.00	6.51	5.89	5.27	4.88	4.14	3.62	3.19
2"	21.17	20.91	20.30	19.73	19.04	18.41	17.83	17.32	16.68	16.15	15.51	14.80	14.15	13.69	13.14	12.40	11.82	11.19	10.57	9.90	9.40	8.73	7.98	5.93

HEAD LOSS

— HEAD LOSS DIAGRAMS

Pressure drop (Δp) against flow rate (Q) for each handwheel setting. Lines are labelled with the setting number.



Kv values at each setting are tabulated on page 4.