

Characterised control valve, 6-way, Internal thread

- Two sequences (cooling/heating) with one 90° rotary actuator
- Switching or modulating control on the water side of thermal heating/cooling elements
- For closed water systems



Picture may differ from product

### Type overview

| Type             | DN | Rp<br>["] | Kvs (Sequence 1)<br>[m³/h] | Kvs (Sequence 2)<br>[m³/h] | PN |
|------------------|----|-----------|----------------------------|----------------------------|----|
| R3015-P25-P25-B2 | 15 | 1/2       | 0.25                       | 0.25                       | 16 |
| R3015-P25-P4-B2  | 15 | 1/2       | 0.25                       | 0.4                        | 16 |
| R3015-P25-P63-B2 | 15 | 1/2       | 0.25                       | 0.63                       | 16 |
| R3015-P25-1-B2   | 15 | 1/2       | 0.25                       | 1                          | 16 |
| R3015-P25-1P3-B2 | 15 | 1/2       | 0.25                       | 1.3                        | 16 |
| R3015-P25-1P8-B2 | 15 | 1/2       | 0.25                       | 1.8                        | 16 |
| R3015-P4-P25-B2  | 15 | 1/2       | 0.4                        | 0.25                       | 16 |
| R3015-P4-P4-B2   | 15 | 1/2       | 0.4                        | 0.4                        | 16 |
| R3015-P4-P63-B2  | 15 | 1/2       | 0.4                        | 0.63                       | 16 |
| R3015-P4-1-B2    | 15 | 1/2       | 0.4                        | 1                          | 16 |
| R3015-P4-1P3-B2  | 15 | 1/2       | 0.4                        | 1.3                        | 16 |
| R3015-P4-1P8-B2  | 15 | 1/2       | 0.4                        | 1.8                        | 16 |
| R3015-P63-P25-B2 | 15 | 1/2       | 0.63                       | 0.25                       | 16 |
| R3015-P63-P4-B2  | 15 | 1/2       | 0.63                       | 0.4                        | 16 |
| R3015-P63-P63-B2 | 15 | 1/2       | 0.63                       | 0.63                       | 16 |
| R3015-P63-1-B2   | 15 | 1/2       | 0.63                       | 1                          | 16 |
| R3015-P63-1P3-B2 | 15 | 1/2       | 0.63                       | 1.3                        | 16 |
| R3015-P63-1P8-B2 | 15 | 1/2       | 0.63                       | 1.8                        | 16 |
| R3015-1-P25-B2   | 15 | 1/2       | 1                          | 0.25                       | 16 |
| R3015-1-P4-B2    | 15 | 1/2       | 1                          | 0.4                        | 16 |
| R3015-1-P63-B2   | 15 | 1/2       | 1                          | 0.63                       | 16 |
| R3015-1-1-B2     | 15 | 1/2       | 1                          | 1                          | 16 |
| R3015-1-1P3-B2   | 15 | 1/2       | 1                          | 1.3                        | 16 |
| R3015-1-1P8-B2   | 15 | 1/2       | 1                          | 1.8                        | 16 |
| R3015-1P3-P25-B2 | 15 | 1/2       | 1.3                        | 0.25                       | 16 |
| R3015-1P3-P4-B2  | 15 | 1/2       | 1.3                        | 0.4                        | 16 |
| R3015-1P3-P63-B2 | 15 | 1/2       | 1.3                        | 0.63                       | 16 |
| R3015-1P3-1-B2   | 15 | 1/2       | 1.3                        | 1                          | 16 |
| R3015-1P3-1P3-B2 | 15 | 1/2       | 1.3                        | 1.3                        | 16 |
| R3015-1P3-1P8-B2 | 15 | 1/2       | 1.3                        | 1.8                        | 16 |
| R3015-1P8-P25-B2 | 15 | 1/2       | 1.8                        | 0.25                       | 16 |
| R3015-1P8-P4-B2  | 15 | 1/2       | 1.8                        | 0.4                        | 16 |
| R3015-1P8-P63-B2 | 15 | 1/2       | 1.8                        | 0.63                       | 16 |
| R3015-1P8-1-B2   | 15 | 1/2       | 1.8                        | 1                          | 16 |
| R3015-1P8-1P3-B2 | 15 | 1/2       | 1.8                        | 1.3                        | 16 |
| R3015-1P8-1P8-B2 | 15 | 1/2       | 1.8                        | 1.8                        | 16 |
| R3020-P63-1P6-B2 | 20 | 3/4       | 0.63                       | 1.6                        | 16 |
| R3020-P63-2P5-B2 | 20 | 3/4       | 0.63                       | 2.5                        | 16 |
| R3020-P63-4-B2   | 20 | 3/4       | 0.63                       | 4                          | 16 |
| R3020-1-1P6-B2   | 20 | 3/4       | 1                          | 1.6                        | 16 |
| R3020-1-2P5-B2   | 20 | 3/4       | 1                          | 2.5                        | 16 |
| R3020-1-4-B2     | 20 | 3/4       | 1                          | 4                          | 16 |
| R3020-1P6-P63-B2 | 20 | 3/4       | 1.6                        | 0.63                       | 16 |

## Type overview

| Type             | DN | Rp<br>["] | Kvs (Sequence 1)<br>[m³/h] | Kvs (Sequence 2)<br>[m³/h] | PN |
|------------------|----|-----------|----------------------------|----------------------------|----|
| R3020-1P6-1-B2   | 20 | 3/4       | 1.6                        | 1                          | 16 |
| R3020-1P6-1P6-B2 | 20 | 3/4       | 1.6                        | 1.6                        | 16 |
| R3020-1P6-2P5-B2 | 20 | 3/4       | 1.6                        | 2.5                        | 16 |
| R3020-1P6-4-B2   | 20 | 3/4       | 1.6                        | 4                          | 16 |
| R3020-2P5-P63-B2 | 20 | 3/4       | 2.5                        | 0.63                       | 16 |
| R3020-2P5-1-B2   | 20 | 3/4       | 2.5                        | 1                          | 16 |
| R3020-2P5-1P6-B2 | 20 | 3/4       | 2.5                        | 1.6                        | 16 |
| R3020-2P5-2P5-B2 | 20 | 3/4       | 2.5                        | 2.5                        | 16 |
| R3020-2P5-4-B2   | 20 | 3/4       | 2.5                        | 4                          | 16 |
| R3020-4-P63-B2   | 20 | 3/4       | 4                          | 0.63                       | 16 |
| R3020-4-1-B2     | 20 | 3/4       | 4                          | 1                          | 16 |
| R3020-4-1P6-B2   | 20 | 3/4       | 4                          | 1.6                        | 16 |
| R3020-4-2P5-B2   | 20 | 3/4       | 4                          | 2.5                        | 16 |
| R3020-4-4-B2     | 20 | 3/4       | 4                          | 4                          | 16 |
| R3025-6P3-6P3-B3 | 25 | 1         | 6.3                        | 6.3                        | 16 |

## Technical data

|                 |                                        |                                                                                                                |
|-----------------|----------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Functional data | Fluid                                  | Water, water with glycol up to max. 50% vol.                                                                   |
|                 | Fluid temperature                      | 6...80°C [43...176°F]                                                                                          |
|                 | Close-off pressure $\Delta p_s$        | 350 kPa                                                                                                        |
|                 | Differential pressure $\Delta p_{max}$ | 100 kPa                                                                                                        |
|                 | Differential pressure note             | low-noise operation $\Delta p_{v100} < 50$ kPa                                                                 |
|                 | Flow characteristic                    | linear                                                                                                         |
|                 | Leakage rate                           | air-bubble tight, leakage rate A (EN 12266-1)                                                                  |
|                 | Angle of rotation                      | 90°                                                                                                            |
|                 | Angle of rotation note                 | Sequence 1: 0...30° (cooling recommended)<br>Dead zone: 30...60°<br>Sequence 2: 60...90° (heating recommended) |
|                 | Pipe connection                        | Internal thread<br>according to ISO 7-1                                                                        |
|                 | Installation orientation               | upright to horizontal (in relation to the spindle)                                                             |
|                 | Servicing                              | maintenance-free                                                                                               |
| Materials       | Valve body                             | Nickel-plated brass body                                                                                       |
|                 | Body finish                            | nickel-plated                                                                                                  |
|                 | Closing element                        | chrome-plated brass                                                                                            |
|                 | Spindle                                | nickel-plated brass                                                                                            |
|                 | Spindle seal                           | EPDM O-ring                                                                                                    |
|                 | Seat                                   | PTFE, O-ring EPDM                                                                                              |
|                 | Flow rate disc                         | Stainless steel                                                                                                |

## Safety notes



- The valve has been designed for use in stationary heating, ventilation and air-conditioning systems and must not be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied with during installation.
- The valve does not contain any parts that can be replaced or repaired by the user.
- The valve may not be disposed of as household refuse. All locally valid regulations and requirements must be observed.
- When determining the flow rate characteristic of controlled devices, the recognised directives must be observed.

## Product features

**Operating mode** The 6-way characterised control valve is adjusted by a rotary actuator. The actuator is connected by a modulating control system or a bus signal and moves the ball of the ball valve to the position dictated by the control signal.

If the valve is adjusted in the clockwise direction (till the end stop), e.g. the cooling sequence is completely enabled; if the valve is adjusted in the counter-clockwise direction (90°), e.g. the heating sequence is completely enabled.

**Pressure compensation** In cases of combined heating/cooling control elements, the fluid remains in the control element when in the closed position (no heating or cooling). The pressure of the enclosed fluid can rise or fall due to changes in fluid temperature caused by the ambient temperature. The 6-way characterised control valves have an integrated pressure relief function for the purpose of compensating for such pressure changes.

The pressure relief function is active in the closed position (45°) of the valve; reliable separation of sequences 1 and 2 continues. For additional information, consult the notes for project planning for the 6-way characterised control valve.

## Accessories

| Mechanical accessories | Description                                                      | Type        |
|------------------------|------------------------------------------------------------------|-------------|
|                        | Elbow 90° male/female DN 15 Rp 1/2", R 1/2", Set of 2 pcs.       | P2P15PE-1GE |
|                        | Fixing bracket for 6-way valve DN 15/20                          | ZR-004      |
|                        | Pipe connector for ball valve with internal thread DN 15 Rp 1/2" | ZR2315      |
|                        | Elbow 90° male/female DN 20 Rp 3/4", R 3/4", Set of 2 pcs.       | P2P20PF-1GE |
|                        | Pipe connector for ball valve with internal thread DN 20 Rp 3/4" | ZR2320      |
|                        | Elbow 90° male/female DN 25 Rp 1", R 1", Set of 2 pcs.           | P2P25PE-1GE |
|                        | Fixing bracket for 6-way valve DN 25                             | ZR-005      |
|                        | Pipe connector for ball valve with internal thread DN 25 Rp 1"   | ZR2325      |

## Installation notes

**Permissible installation orientation** The ball valve can be installed upright to horizontal. The ball valve may not be installed in a hanging position, i.e. with the spindle pointing downwards.



**Water quality requirements** The water quality requirements specified in VDI 2035 must be adhered to. Belimo valves are regulating devices. For the valves to function correctly in the long term, they must be kept free from particle debris (e.g. welding beads during installation work). The installation of a suitable strainer is recommended.

**Servicing** Ball valves and rotary actuators are maintenance-free. Before any service work on the control element is carried out, it is essential to isolate the rotary actuator from the power supply (by unplugging the electrical cable if necessary). Any pumps in the part of the piping system concerned must also be switched off and the appropriate slide valves closed (allow all components to cool down first if necessary and always reduce the system pressure to ambient pressure level). The system must not be returned to service until the ball valve and the rotary actuator have been correctly reassembled in accordance with the instructions and the pipeline has been refilled by professionally trained personnel.

**Installation notes**

**Flow direction** The flow direction must be observed. The position of the ball can be identified from the L-marking on the spindle.

Flow sequence 1 and sequence 2



**Valve characteristic curve** The lower diagram shows the valve characteristic curve in relation to the ball position.

Valve characteristic curve



**Using an additional flow limiter** When using additional flow limiting valves (e.g. PIQCV C2..QP(T)-.. with manual flow rate setting) or an additional pressure-independent control valve (e.g. motorised PIQCV) at the system level, it is not necessary to use the flow characterised disc in the 6-way valve in the system to reduce the Kvs value.

**Dimensions**
**Dimensional drawings**


The actuator dimensions can be found on the respective actuator data sheet.

| Type               | DN | Rp<br>["] | L<br>[mm] | L1<br>[mm] | L2<br>[mm] | B<br>[mm] | B1<br>[mm] | H<br>[mm] | H1<br>[mm] | H2<br>[mm] | X<br>[mm] | Y<br>[mm] |  |
|--------------------|----|-----------|-----------|------------|------------|-----------|------------|-----------|------------|------------|-----------|-----------|-------------------------------------------------------------------------------------|
| <b>R3015...-B2</b> | 15 | 1/2       | 79        | 39.5       | 13         | 54        | 33         | 118       | 45         | 45         | 200       | 40        | 0.99                                                                                |
| <b>R3020...-B2</b> | 20 | 3/4       | 100       | 50         | 14         | 70        | 43         | 146       | 59         | 52         | 230       | 40        | 2.0                                                                                 |
| <b>R3025...-B3</b> | 25 | 1         | 120       | 60         | 16         | 84.5      | 52         | 171       | 69         | 60         | 270       | 60        | 3.6                                                                                 |

**Further documentation**

- The complete product range for water applications
- Data sheets for actuators
- Installation instructions for actuators and/or ball valves
- Notes for project planning for 6-way characterised control valves