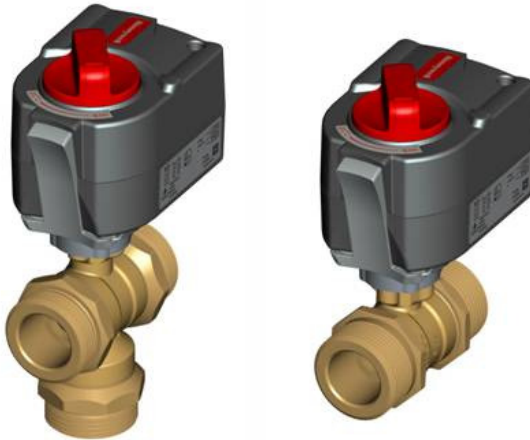


## VBGx-xx-xx Externally Threaded Control Ball Valves

PN25 (DN15 TO DN32)

### SPECIFICATION DATA



### APPLICATION

The VBG2 2-Way and VBG3 3-Way Control Ball Valves control hot and chilled water with glycol solutions up to 50% according to VDI2035 in heating, ventilating, and air conditioning (HVAC) systems to provide two-position or modulating functions.

### Features

- Sizes from DN15 to DN32 with external (male) BSPP (G) connections 1" to 2".
- Equal percentage flow characteristic.
- Compatible MVN Rotary Valve Actuators: 2-position, floating, modulating, non-spring return.
- Removable manual operating handle to control valve during installation or in the event of power failure.
- Actuator can be mounted on the valve in any of four orientations.
- Wide range of  $k_{vs}$  choices from 0.25 to 25.
- Nickel-chrome plated brass ball.
- Valve installs in a globe valve "T" pattern, no extra elbows or piping required.
- Mixing or diverting control for 3-way valves.
- Leakage rate A, air bubble-tight (according to EN 12266-1).

### Specifications

|   |   |
|---|---|
| <b>Valve type</b>                           | Control Ball Valve  |
| <b>Body pattern</b>                         | 2-way (VBG2-xx-xx),<br>3-way (VBG3-xx-xx)   |
| <b>Nominal pressure rating</b>              | PN25  |
| <b>Media temperature range</b>              | +5 ... +120 °C (+41 ... +248 °F)  |
| <b>Connection type</b>                      | Male BSPP, threaded connections, flat sealing   |
| <b>Controlled fluid</b>                     | Chilled or hot water according to VDI2035 with up to 50% Glycol. Not for use with steam or fuels.   |
| <b>Leakage rating</b>                       |   |
| <b>VBG2</b>                                 | Leakage rate A, air bubble-tight according to EN 12266-1  |
| <b>VBG3</b>                                 | Leakage rate A, air bubble-tight according to EN 12266-1 for A-AB port, Rate I according to EN 1349 and EN 60534-4 for B-AB port (0.1% of $k_v$ ) |
| <b>Capacity index (<math>k_{vs}</math>)</b> | see Table 1 and Table 2   |
| <b>Close-off pressures</b>                  | see Table 1 and Table 2   |
| <b>Materials:</b>                           |   |
| Body  | DZR Brass   |
| Stem  | Brass   |
| Ball  | Chrome-plated brass   |
| Seat  | Teflon® seals with EPDM O-rings   |
| Flow control insert                         | Noryl®  |
| <b>Body Style:</b>                          |   |
| 2-way ball valve                            | Straight-through flow, full or reduced port using patented flow control insert  |
| 3-way ball valve                            | A-B-AB flow, full or reduced port using patented flow control insert  |
| <b>Body pressure rating</b>                 | PN25  |
| <b>Flow Characteristics:</b>                |   |
| 2-way                                       | Equal percentage with flow control insert   |
| 3-way                                       | Port A to AB: Equal percentage;<br>Port B to AB: Linear   |
| <b>Approvals/Standards</b>                  | CE  |

**Table 1. VBG2 Two-way control ball valves**

| DN | K <sub>vs</sub> A-B | O.S. no.     | Close-off pressure with MVN Rotary Valve Actuators (kPa) | External thread size |
|----|---------------------|--------------|--|----------------------|
| 15 | 0.25                | VBG2-15-0.25 | 890  | 1"                   |
|    | 0.4                 | VBG2-15-0.4  |  |                      |
|    | 0.63                | VBG2-15-0.63 |  |                      |
|    | 1                   | VBG2-15-1    |  |                      |
|    | 1.6                 | VBG2-15-1.6  |  |                      |
|    | 2.5                 | VBG2-15-2.5  |  |                      |
|    | 4                   | VBG2-15-4    |  |                      |
| 20 | 6.3                 | VBG2-15-6.3  | 890  | 1 ¼"                 |
|    | 4                   | VBG2-20-4    |  |                      |
|    | 6.3                 | VBG2-20-6.3  |  |                      |
| 25 | 8.6                 | VBG2-20-8.6  | 680  | 1 ½"                 |
|    | 6.3                 | VBG2-25-6.3  |  |                      |
|    | 10                  | VBG2-25-10   |  |                      |
|    | 16                  | VBG2-25-16   |  |                      |
| 32 | 25                  | VBG2-25-25   | 270  | 2"                   |
|    | 16                  | VBG2-32-16   |  |                      |

**Table 2. VBG3 Three-way control ball valves**

| DN | k <sub>vs</sub> A-B | k <sub>vs</sub> B-AB | O.S. no.     | Close-off pressure with MVN Rotary Valve Actuators (kPa) | External thread size |
|----|---------------------|----------------------|--------------|--|----------------------|
| 15 | 0.63                | 0.5                  | VBG3-15-0.63 | 340  | 1"                   |
|    | 1                   | 0.8                  | VBG3-15-1    |  |                      |
|    | 1.6                 | 1.28                 | VBG3-15-1.6  |  |                      |
|    | 2.5                 | 2                    | VBG3-15-2.5  |  |                      |
|    | 4                   | 3.2                  | VBG3-15-4    |  |                      |
|    | 6.3                 | 5.04                 | VBG3-15-6.3  |  |                      |
| 20 | 4                   | 3.2                  | VBG3-20-4    | 340  | 1 ¼"                 |
|    | 6.3                 | 5.04                 | VBG3-20-6.3  |  |                      |
|    | 8.6                 | 6.88                 | VBG3-20-8.6  |  |                      |
| 25 | 6.3                 | 5.04                 | VBG3-25-6.3  | 340  | 1 ½"                 |
|    | 10                  | 8                    | VBG3-25-10   |  |                      |
|    | 16                  | 12.8                 | VBG3-25-16   |  |                      |
| 32 | 16                  | 12.8                 | VBG3-32-16   | 270  | 2"                   |
|    | 25                  | 20                   | VBG3-32-25   |  |                      |

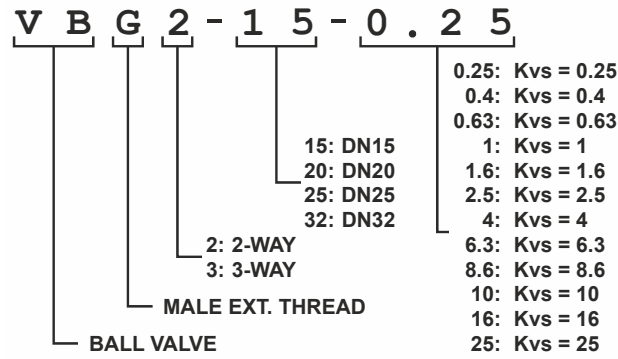


Fig. 1. VBG product key

Table 3. Valve accessories and replacement parts

| Part no.  | Description  |
|-----------|--|
| 5112-19   | Replacement stem assembly for VBG, DN15-20                                   |
| 5112-20   | Replacement stem assembly for VBG, DN25-32                                   |
| MVNAAA    | Replacement valve adaptor, standard profile, pre-assembled on the VBG valves |
| AC-15TF-1 | Fittings accessories DN15 VBG valves   |
| AC-20TF   | Fittings accessories DN20 VBG valves   |
| AC-25TF   | Fittings accessories DN25 VBG valves   |
| AC-32TF   | Fittings accessories DN32 VBG valves   |

Table 4. Connection sets



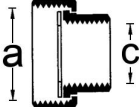
| Connection      | Pipe size | DN | O.S. no.  | Connection set  | Description   |
|-----------------|-----------|----|-----------|---|---|
| Internal thread | R ½"      | 15 | AC-15TF-1 |  |  |
|                 | R ¾"      | 20 | AC-20TF   |   |   |
|                 | R 1"      | 25 | AC-25TF   |   |   |
|                 | R 1-¼"    | 32 | AC-32TF   |   |   |

Table 5. Connection set dimensions

| Connection set  | a        | c        | O.S. no.  |
|---|----------|----------|-----------|
|  | G 1"     | G 1/2"   | AC-15TF-1 |
|   | G 1-1/4" | G 3/4"   | AC-20TF   |
|   | G 1-1/2" | G 1"     | AC-25TF   |
|   | G 2"     | G 1-1/4" | AC-32TF   |

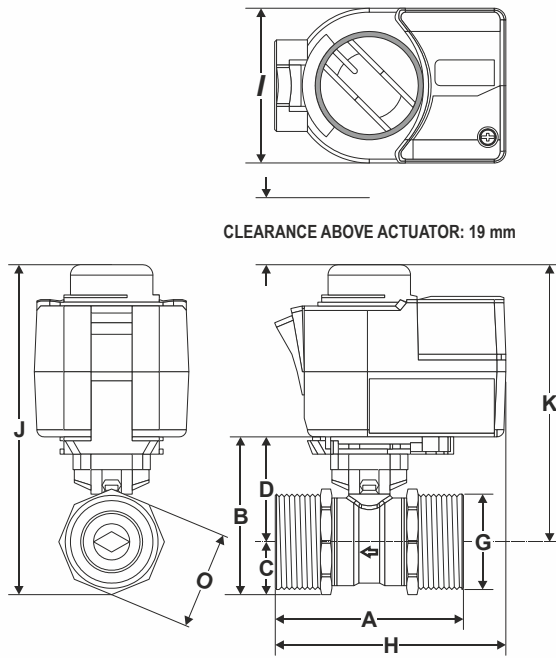


Fig. 2. MVN with 2-way ball valve (see also Table 6)

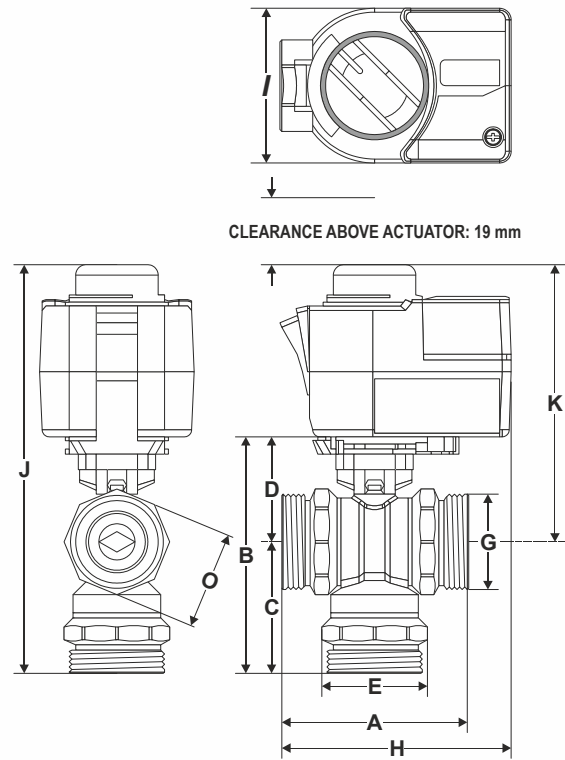


Fig. 3. MVN with 3-way ball valve (see also Table 7)

Table 6. VBG2 dimensions (in mm)

| DN | A     | B    | C    | D    | G    | H     | I    | J     | K     | O    |
|----|-------|------|------|------|------|-------|------|-------|-------|------|
| 15 | 74.0  | 67.1 | 19.1 | 48.0 | G1"  | 92.3  | 71.0 | 142.1 | 123.0 | 36.0 |
| 20 | 85.5  | 77.2 | 24.7 | 52.7 | G1¼" | 98.05 | 71.0 | 152.2 | 127.7 | 46.0 |
| 25 | 84.5  | 84.1 | 26.8 | 57.5 | G1½" | 97.55 | 71.0 | 159.1 | 132.5 | 50.0 |
| 32 | 102.0 | 98.1 | 36.0 | 63.4 | G2"  | 106.3 | 71.0 | 173.1 | 138.4 | 65.0 |

Table 7. VBG3 dimensions (in mm)

| DN | A     | B     | C    | D    | E    | G    | H      | I    | J     | K     | O    |
|----|-------|-------|------|------|------|------|--------|------|-------|-------|------|
| 15 | 74.0  | 107.1 | 41.1 | 49.1 | 44.0 | G1"  | 92.3   | 71.0 | 182.1 | 124.1 | 41.0 |
| 20 | 85.5  | 109.4 | 46.9 | 49.1 | 49.5 | G1¼" | 98.05  | 71.0 | 184.4 | 124.1 | 46.0 |
| 25 | 84.5  | 118.4 | 44.4 | 53.1 | 53.5 | G1½" | 97.55  | 71.0 | 193.4 | 128.1 | 50.0 |
| 32 | 107.5 | 142.3 | 50.9 | 63.0 | 69.0 | G2"  | 109.05 | 71.0 | 217.3 | 138.0 | 65.0 |

## Mounting

When installing the valve care must be taken that the flow direction is correct (see section "Typical Operation" below). The valve must not be mounted with the stem pointing downward.

The valve is supplied complete with mounting instructions. The water quality must meet VDI 2035 requirements.

**NOTE:** Mount the actuator by hand, only. Do not use a tool, as this could result in damage

## Typical Operation

All types of valves should be mounted in the return flow. If the  $D_p$ -values exceed 300 kPa, attention should be paid to the development of noise.

### Two-Way Valves

Direction of flow always from port A to port B

Port B: Outlet

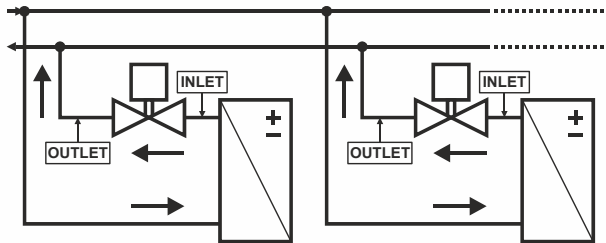


Fig. 4. Two-way valve operation

### Three-Way Valves

These valves are used preferably as mixing valves. This means:

Port AB: Total flow outlet

Port A: Controlled flow inlet

Port B: Bypass inlet

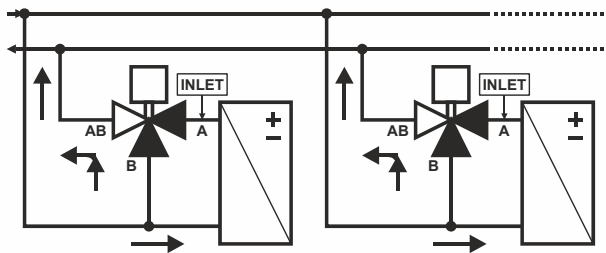


Fig. 5. Three-way mixing valve operation

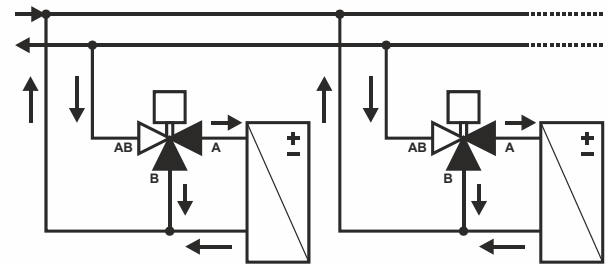
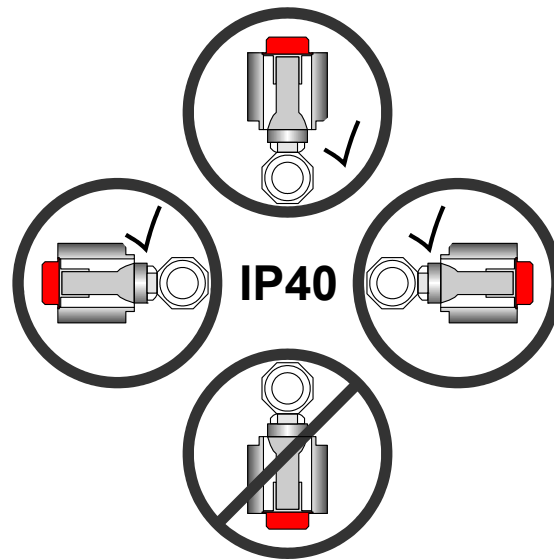
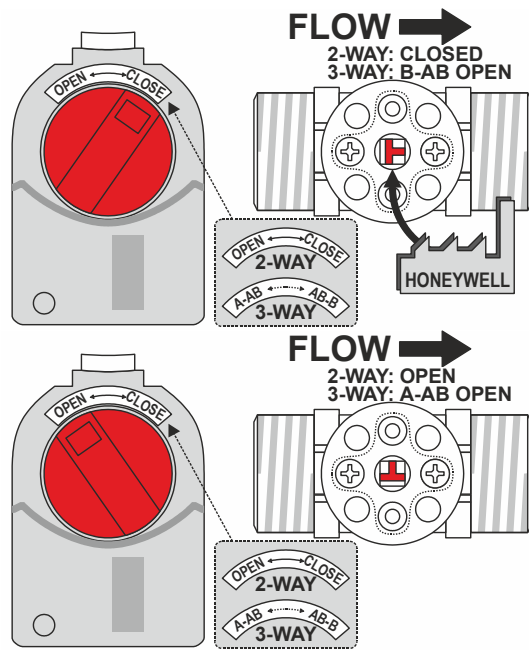


Fig. 6. Three-way diverting valve operation



## DISPOSAL OF VBG CONTROL BALL VALVES

OBSERVE LOCAL REQUIREMENTS ON PROPER WASTE RECYCLING / DISPOSAL!

- Dezincification-resistant brass body
- Chrome-plated brass ball
- Teflon® seals with EPDM O-rings
- Noryl® flow control insert

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