



2-year warranty

## Type overview

| Type   | DN |
|--------|----|
| B220VS | 20 |

## Technical data

|                    |                                   |                                               |
|--------------------|-----------------------------------|-----------------------------------------------|
| Functional data    | Valve size [mm]                   | 0.75" [20]                                    |
|                    | Fluid                             | chilled or hot water, up to 60% glycol, steam |
|                    | Fluid Temp Range (water)          | -22...280°F [-30...138°C]                     |
|                    | Body Pressure Rating              | 600 psig WOG psi                              |
|                    | Close-off pressure Δps            | 600 psi                                       |
|                    | Flow characteristic               | modified equal percentage                     |
|                    | Max Differential Pressure (Steam) | 35 psi                                        |
|                    | Flow Pattern                      | 2-way                                         |
|                    | Leakage rate                      | ANSI Class VI                                 |
|                    | Controllable flow range           | 90° rotation                                  |
|                    | Cv                                | 51                                            |
|                    | Maximum Inlet Pressure (Steam)    | 35 psi [241 kPa]                              |
|                    | Maximum Velocity                  | 15 FPS                                        |
| Materials          | Valve body                        | Bronze B584-C84400                            |
|                    | Housing seal                      | PTFE                                          |
|                    | Stem                              | 316 stainless steel                           |
|                    | Stem seal                         | RPTFE                                         |
|                    | Seat                              | RPTFE                                         |
|                    | Lock nut                          | stainless steel                               |
|                    | Pipe connection                   | NPT                                           |
|                    | Retainer                          | B16 Brass                                     |
|                    | Ball                              | 316 stainless steel                           |
| Suitable actuators | Non-Spring                        | NMB(X)<br>GRCB(X)<br>GRB(X)                   |
|                    | Spring                            | NF                                            |

## Safety notes

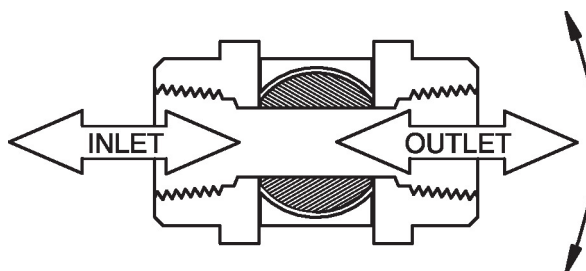


- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

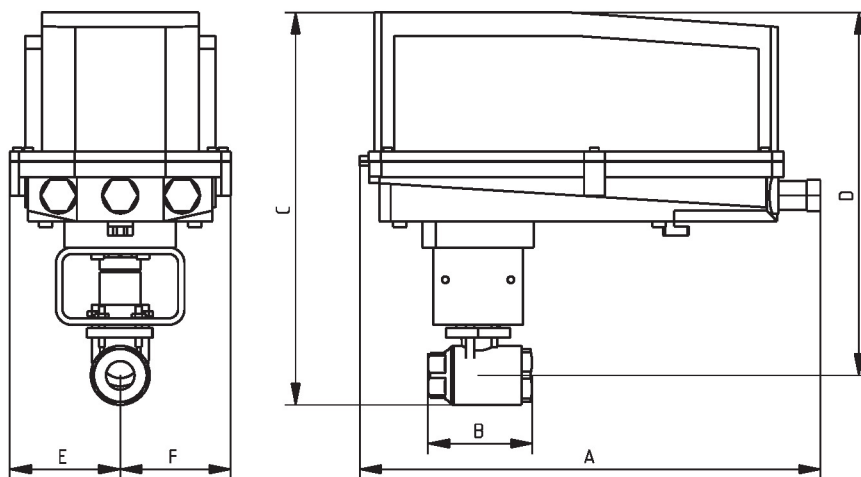
**Product features**

**Application** This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV Box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow. This valve is designed with MFT functionally which facilitates the use of various control input.

Up to 35 psi steam  
 1/2" - 2" 600 PSIG WOG, Cold Non-Shock  
 Federal Specification: WW-V-35C, Type II  
 Composition: BZ  
 Style: 3

**Flow/Mounting details**

**Dimensions**

| Type   | DN | Weight            |
|--------|----|-------------------|
| B220VS | 20 | 1.76 lb [0.80 kg] |



B220VS+GRC..N4

| A           | B         | C           | D           | E         | F         |
|-------------|-----------|-------------|-------------|-----------|-----------|
| 14.1" [358] | 3.2" [82] | 12.0" [305] | 11.1" [282] | 3.4" [86] | 3.4" [86] |



5-year warranty


**MFT**

## Technical data

|                        |                                    |                                                                                              |
|------------------------|------------------------------------|----------------------------------------------------------------------------------------------|
| <b>Electrical data</b> | Nominal voltage                    | AC/DC 24 V                                                                                   |
|                        | Nominal voltage frequency          | 50/60 Hz                                                                                     |
|                        | Nominal voltage range              | AC 19.2...28.8 V / DC 21.6...28.8 V                                                          |
|                        | Power consumption in operation     | 3.5 W                                                                                        |
|                        | Power consumption in rest position | 1.3 W                                                                                        |
|                        | Transformer sizing                 | 6 VA                                                                                         |
|                        | Electrical Connection              | 18 GA plenum cable, 1 m, with 1/2" conduit connector (3 m and 5 m available)                 |
|                        | Overload Protection                | electronic throughout 0...95° rotation                                                       |
| <b>Functional data</b> | Operating range Y                  | 2...10 V                                                                                     |
|                        | Operating range Y note             | 4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)                                                  |
|                        | Input Impedance                    | 100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA, 1500 Ω for PWM, On/Off and Floating point |
|                        | Operating range Y variable         | Start point 0.5...30 V<br>End point 2.5...32 V                                               |
|                        | Operating modes optional           | variable (VDC, PWM, on/off, floating point)                                                  |
|                        | Position feedback U                | 2...10 V                                                                                     |
|                        | Position feedback U note           | Max. 0.5 mA                                                                                  |
|                        | Position feedback U variable       | VDC variable                                                                                 |
|                        | Direction of motion motor          | selectable with switch 0/1                                                                   |
|                        | Manual override                    | external push button                                                                         |
|                        | Angle of rotation                  | Max. 95°                                                                                     |
|                        | Angle of rotation note             | adjustable with mechanical stop                                                              |
|                        | Running Time (Motor)               | 150 s / 90°                                                                                  |
|                        | Running time motor variable        | 45...170 s                                                                                   |
|                        | Noise level, motor                 | 45 dB(A)                                                                                     |
|                        | Position indication                | Mechanically, 30...65 mm stroke                                                              |
| <b>Safety data</b>     | Power source UL                    | Class 2 Supply                                                                               |
|                        | Degree of protection IEC/EN        | IP54                                                                                         |
|                        | Degree of protection NEMA/UL       | NEMA 2                                                                                       |
|                        | Enclosure                          | UL Enclosure Type 2                                                                          |
|                        | Agency Listing                     | ISO, CE, cCSAus                                                                              |
|                        | Quality Standard                   | ISO 9001                                                                                     |
|                        | UL 2043 Compliant                  | Suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC  |
|                        | Ambient humidity                   | Max. 95% RH, non-condensing                                                                  |
|                        | Ambient temperature                | -22...122°F [-30...50°C]                                                                     |
|                        | Storage temperature                | -40...176°F [-40...80°C]                                                                     |

|                    |                                                                         |                                      |
|--------------------|-------------------------------------------------------------------------|--------------------------------------|
| <b>Safety data</b> | Servicing                                                               | maintenance-free                     |
| <b>Weight</b>      | Weight                                                                  | 2.2 lb [1.0 kg]                      |
| <b>Materials</b>   | Housing material                                                        | Galvanized steel and plastic housing |
| <b>Footnotes</b>   | †Rated Impulse Voltage 800V, Type action 1, Control Pollution Degree 3. |                                      |

## Accessories

| Electrical accessories | Description                                         | Type       |
|------------------------|-----------------------------------------------------|------------|
|                        | Battery backup system, for non-spring return models | NSV24 US   |
|                        | Battery, 12 V, 1.2 Ah (two required)                | NSV-BAT    |
|                        | Auxiliary switch 1 x SPDT add-on                    | S1A        |
|                        | Auxiliary switch 2 x SPDT add-on                    | S2A        |
|                        | Feedback potentiometer 140 Ω add-on, grey           | P140A GR   |
|                        | Feedback potentiometer 1 kΩ add-on, grey            | P1000A GR  |
|                        | Feedback potentiometer 10 kΩ add-on, grey           | P10000A GR |
|                        | Feedback potentiometer 2.8 kΩ add-on, grey          | P2800A GR  |
|                        | Feedback potentiometer 500 Ω add-on, grey           | P500A GR   |
|                        | Feedback potentiometer 5 kΩ add-on, grey            | P5000A GR  |

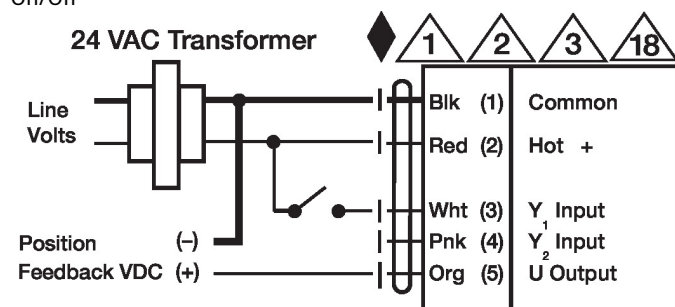
## Electrical installation

### ⚡ INSTALLATION NOTES

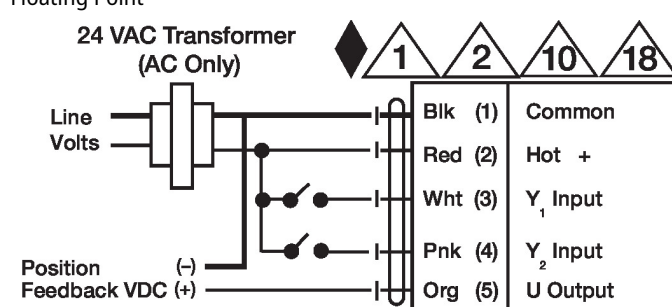
- Ⓐ Actuators with appliance cables are numbered.
- ⚠ Provide overload protection and disconnect as required.
- ⚠ Actuators may also be powered by DC 24 V.
- ⚠ Only connect common to negative (-) leg of control circuits.
- ⚠ A 500 Ω resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
- ⚠ Control signal may be pulsed from either the Hot (Source) or Common (Sink) 24 V line.
- ⚠ For triac sink the Common connection from the actuator must be connected to the Hot connection of the controller. Position feedback cannot be used with a triac sink controller; the actuator internal common reference is not compatible.
- ⚠ Actuators may be connected in parallel if not mechanically linked. Power consumption and input impedance must be observed.
- ⚠ IN4004 or IN4007 diode. (IN4007 supplied, Belimo part number 40155).
- ◆ Meets cULus requirements without the need of an electrical ground connection.
- ⚠ **Warning! Live electrical components!**  
During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

### Wiring diagrams

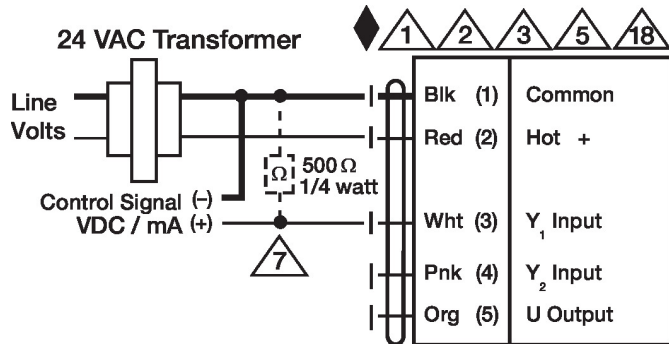
On/Off



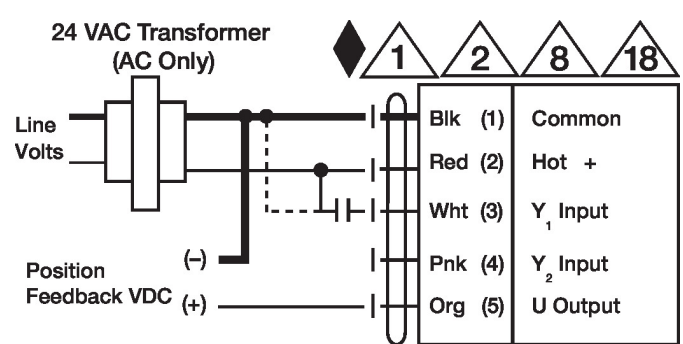
Floating Point



## VDC/mA Control



## PWM Control



## Override Control

