**5**

5-year warranty

## Type overview

| Type | DN |
|------|-----|
| G780-250 | 80 |

## Technical data

| | | |
|---|---|---|
| **Functional data** | Valve size [mm] | 3" [80] |
| | Fluid | chilled or hot water, up to 60% glycol |
| | Fluid Temp Range (water) | 32...350°F [0...176°C] |
| | Body Pressure Rating | ANSI Class 250, up to 280 psi below 350°F |
| | Flow characteristic | linear |
| | Servicing | repack/rebuild kits available |
| | Rangeability Sv | 50:1 |
| | Flow Pattern | 3-way Mixing |
| | Leakage rate | ANSI Class III |
| | Controllable flow range | stem up - open B – AB |
| | Cv | 85 |
| **Materials** | Valve body | Cast iron - ASTM A126 Class B |
| | Valve plug | bronze |
| | Spindle | stainless steel |
| | Spindle seal | NLP EPDM (no lip packing) |
| | Seat | Stainless steel AISI 316 |
| | Pipe connection | 250 lb flanged |
| **Suitable actuators** | Non-Spring | EVB(X) <br> RVB(X) |
| | Spring | AF <br> (2*AFB(X)) |
| | Electrical fail-safe | AVKB(X) <br> (2*GKB(X)) |

## 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
- 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 authorized specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The valve does not contain any parts that can be replaced or repaired by the user.
- When determining the flow rate characteristic of controlled devices, the recognised directives must be observed.
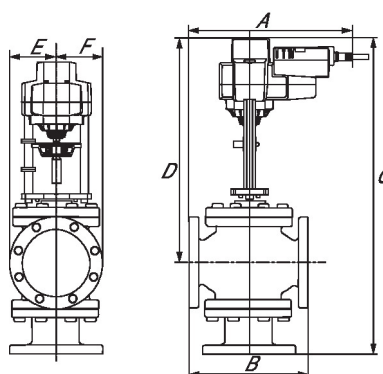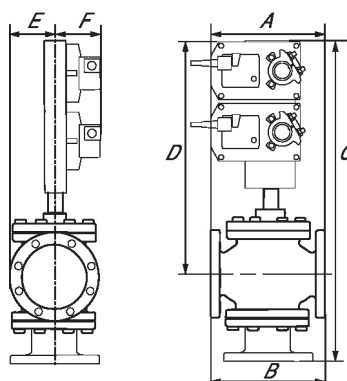
## Product features

### Flow/Mounting details



A → AB
B

## Dimensions

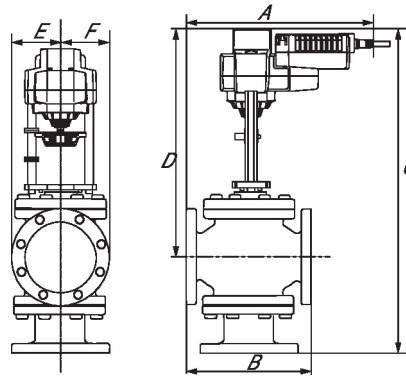| Type | DN |
|---|---|
| G780-250 | 80 |



EVB, EVX, RVB, RVX

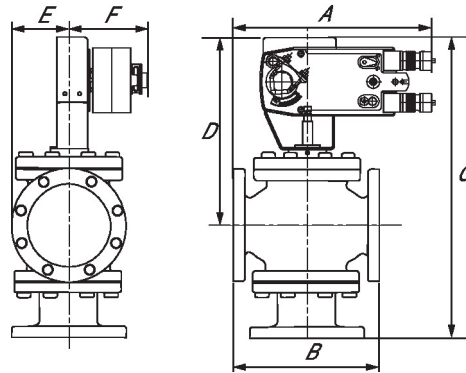| A | B | C | D | E | F | Number of Bolt Holes |
|---|---|---|---|---|---|---|
| 12.6" [320] | 10.7" [273] | 27.3" [693] | 19.0" [483] | 4.1" [105] | 4.1" [105] | 8 |



2*GMB, 2*GMX, 2*GKB, 2*GKX

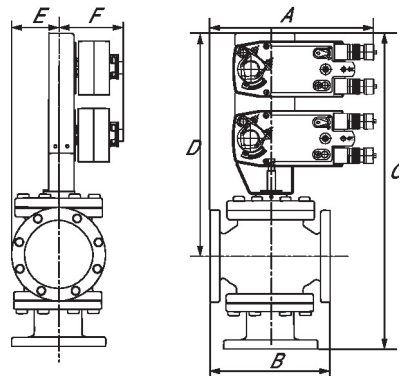| A | B | C | D | E | F | Number of Bolt Holes |
|---|---|---|---|---|---|---|
| 12.7" [323] | 10.7" [273] | 30.5" [775] | 22.5" [572] | 4.1" [105] | 5.3" [135] | 8 |

AVKB, AVKX

| A | B | C | D | E | F | Number of Bolt Holes |
|---|---|---|---|---|---|---|
| 12.6" [320] | 10.7" [273] | 27.3" [693] | 19.0" [483] | 4.1" [105] | 4.1" [105] | 8 |



AFB, AFX

| A | B | C | D | E | F | Number of Bolt Holes |
|---|---|---|---|---|---|---|
| 12.7" [323] | 10.7" [273] | 25.6" [650] | 17.5" [445] | 4.1" [105] | 5.3" [135] | 8 |



2*AFB, 2*AFX

| A | B | C | D | E | F | Number of Bolt Holes |
|---|---|---|---|---|---|---|
| 12.7" [323] | 10.7" [273] | 30.5" [775] | 22.5" [572] | 4.1" [105] | 5.3" [135] | 8 |

# BELIMO

**Modulating, Non-Spring Return, Linear, 24 V, Multi-Function Technology®**

**5-year warranty**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC/DC 24 V |
| | Nominal voltage frequency | 50/60 Hz |
| | Power consumption in operation | 6 W |
| | Power consumption in rest position | 1.5 W |
| | Transformer sizing | 11 VA (class 2 power source) |
| | Electrical Connection | 18 GA plenum cable, 3 ft [1 m], with 1/2" conduit connector, degree of protection NEMA 2 / IP54 |
| | Overload Protection | electronic throughout full stroke |
| | Electrical Protection | actuators are double insulated |
| **Functional data** | Actuating force motor | 4500 N [1010 lbf] |
| | 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 On/Off |
| | Operating range Y variable | Start point 0.5...30 V End point 2.5...32 V |
| | Options positioning signal | variable (VDC, 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 |
| | Manual override | 5 mm hex crank (3/16" Allen), supplied |
| | Stroke | 2" [50 mm] |
| | Running Time (Motor) | 90 s / |
| | Running time motor variable | 90...150 s |
| | Noise level, motor | 65 dB(A) |
| | Position indication | Mechanically, with pointer |
| **Safety data** | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2 |
| | Enclosure | UL Enclosure Type 2 |
| | Agency Listing | cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU |
| | Quality Standard | ISO 9001 |
| | Ambient temperature | -22...122°F [-30...50°C] |
| | Storage temperature | -40...176°F [-40...80°C] |
| | Ambient humidity | Max. 95% RH, non-condensing |
| | Servicing | maintenance-free |

| **Materials** | Housing material | Die cast aluminium and plastic casing |
|---|---|---|

**Footnotes** † Use flexible metal conduit. Push the listed conduit fitting device over the actuator's cable to butt against the enclosure. Screw in conduit connector. Jacket the actuators input wiring with listed flexible conduit. Properly terminate the conduit in a suitable junction box. Rated impulse Voltage 800V. Type of action 1. Control pollution degree 3.

## Accessories

| **Gateways** | Description | Type |
|---|---|---|
| | Gateway MP to BACnet MS/TP | UK24BAC |
| | Gateway MP to Modbus RTU | UK24MOD |
| | Gateway MP to LonWorks | UK24LON |

| **Electrical accessories** | Description | Type |
|---|---|---|
| | Battery backup system, for non-spring return models | NSV24 US |
| | Battery, 12 V, 1.2 Ah (two required) | NSV-BAT |
| | Belimo PC-Tool, Software for adjustments and diagnostics | MFT-P |
| | Auxiliary switch 2 x SPDT for NG GV Actuators | S2A-GV |
| | Service Tool, with ZIP-USB function, for programmable and communicative Belimo actuators, VAV controller and HVAC performance devices | ZTH US |

| **Service tools** | Description | Type |
|---|---|---|
| | Connection cable 10 ft [3 m], A: RJ11 6/4 ZTH EU, B: 3-pin Weidmüller and supply connection | ZK4-GEN |
| | Service Tool, with ZIP-USB function, for programmable and communicative Belimo actuators, VAV controller and HVAC performance devices | ZTH US |

## Electrical installation

⚒ INSTALLATION NOTES

⚠2 Actuators may be connected in parallel. Power consumption and input impedance must be observed.

⚠3 Actuators may also be powered by DC 24 V.

⚠7 A 500 Ω resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.

⚠8 Control signal may be pulsed from either the Hot (Source) or Common (Sink) 24 V line.
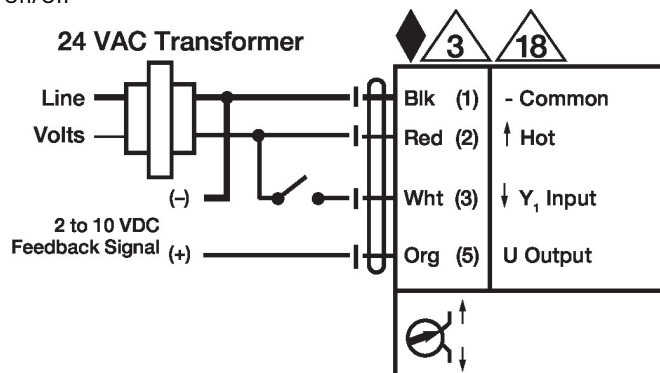
⚠9 For triac sink the common connection from the actuator must be connected to the hot connection of the controller. Contact closures A & B also can be triacs. A & B should both be closed for the triac source and open for triac sink.

⚠18 Actuators with plenum cable do not have numbers; use color codes instead.

◆ 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

**24 VAC Transformer**

Line
Volts

(–)

2 to 10 VDC
Feedback Signal (+)

◆ △3 △18

| Blk | (1) | – Common |
| Red | (2) | ↑ Hot |
| Wht | (3) | ↓ Y₁ Input |
| Org | (5) | U Output |

### Floating Point

**24 VAC Transformer**

Line
Volts

A
B

△8
△9

2 to 10 VDC (–)
Feedback Signal (+)

◆ △2 △18

| Blk | (1) | – Common |
| Red | (2) | + Hot |
| Wht | (3) | Y₁ Input |
| Pnk | (4) | Y₂ Input |
| Org | (5) | U Output |

Direction of rotation switch

| A | B | A | B |
| ↓ | ↑ | ↑ | ↓ |

### VDC / 4 to 20 mA

**24 VAC Transformer**

Line
Volts

Control Signal (–)
VDC/mA (+)

500Ω
1/4 W

△7

◆ △3 △18

| Blk | (1) | – Common |
| Red | (2) | + Hot |
| Wht | (3) | Y₁ Input |
| Org | (5) | U Output |
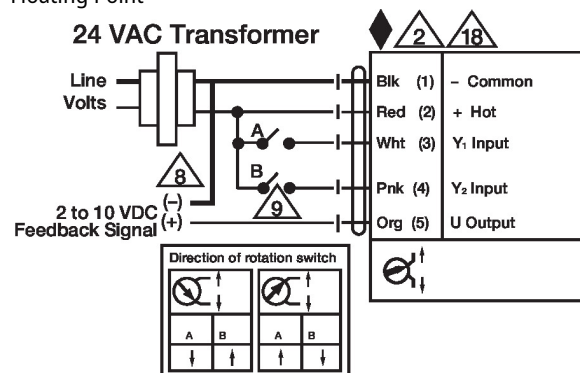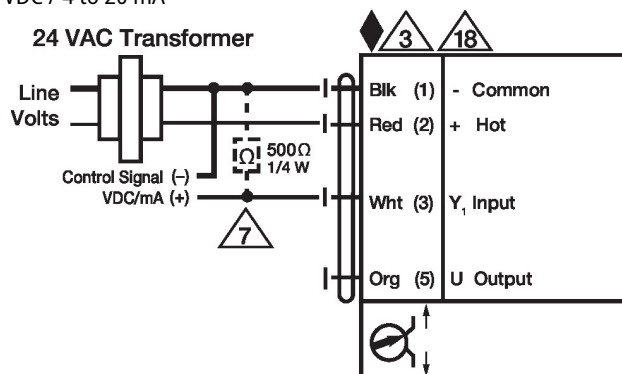
### Override Control Min, Mid, Max Positions

**24 VAC Transformer (AC Only)**

Line
Volts

Control Signal (–)
VDC/mA (+)

A
B
C

500 Ω
1/4 W

△7

◆ △18

| Blk | (1) | – Common |
| Red | (2) | + Hot |
| Wht | (3) | Y₁ Input |
| Org | (5) | U Output |

| Functions | | a | b | c |
|---|---|---|---|---|
| Min | 0% | | | |
| Mid | 50% | | | |
| Max | 100% | | | |
| Normal | Control mode acc. to Y | | | |