2-way, Characterized Control Valve, Stainless Steel Ball and Stem



Picture may differ from product

5-year warranty

## Type overview

| Type | DN | Cv | Body Pressure Rating |
|---|---|---|---|
| B6500S-290 | 5" [125] | 290 | ANSI Class 125, standard class B |

## Technical data

| | | |
|---|---|---|
| **Functional data** | Valve size [mm] | 5" [125] |
| | Fluid | chilled or hot water, up to 60% glycol |
| | Fluid Temp Range (water) | 0...250°F [-18...120°C] |
| | Close-off pressure | Δps 175 psi |
| | Flow characteristic | equal percentage |
| | Leakage rate | 0% for A–AB |
| | Pipe connection | Flange<br>for use with ASME/ANSI class 125 |
| | Servicing | maintenance-free |
| | Flow Pattern | 2-way |
| | Controllable flow range | 75° |
| **Materials** | Valve body | Cast iron - GG 25 |
| | Stem | stainless steel |
| | Stem seal | EPDM (lubricated) |
| | Seat | PTFE |
| | Characterized disc | Stainless steel |
| | O-ring | EPDM (lubricated) |
| | Ball | stainless steel |
| **Suitable actuators** | Non Fail-Safe | GRB(X) |
| | Electronic fail-safe | GKRB(X) |

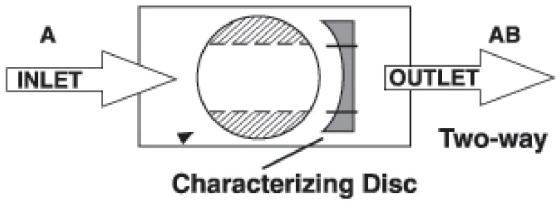
## Product features

**Application**

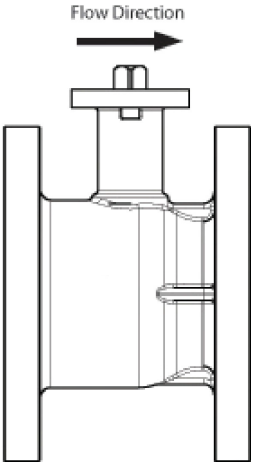
This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.

## Product features

**Flow/Mounting details**

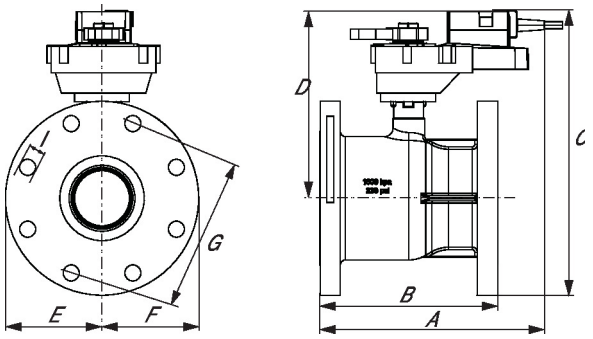



Upstream A
Downstream AB

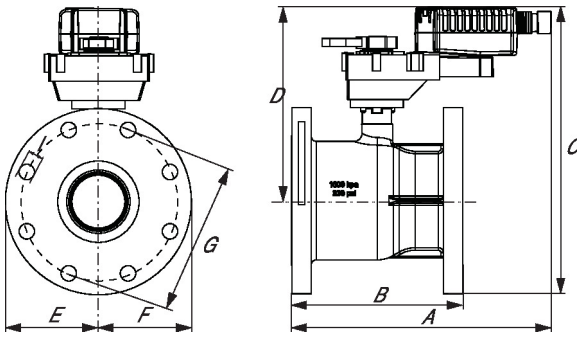



## Dimensions

| Type | DN | Weight |
|---|---|---|
| B6500S-290 | 5" [125] | 67 lb [31 kg] |



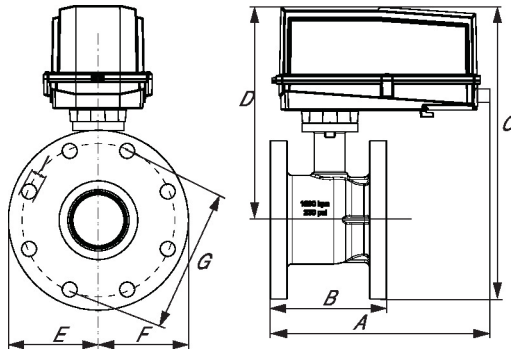

| A | B | C | D | E | F | G | I | Number of Bolt Holes |
|---|---|---|---|---|---|---|---|---|
| 13.3" [338] | 10.3" [262] | 14.4" [366] | 9.4" [239] | 5.0" [127] | 5.0" [127] | 8.5" [216] | 0.9" [22] | 8 |




| A | B | C | D | E | F | G | I | Number of Bolt Holes |
|---|---|---|---|---|---|---|---|---|
| 13.5" [343] | 10.3" [262] | 14.4" [366] | 9.7" [246] | 5.0" [127] | 5.0" [127] | 8.5" [216] | 0.9" [22] | 8 |

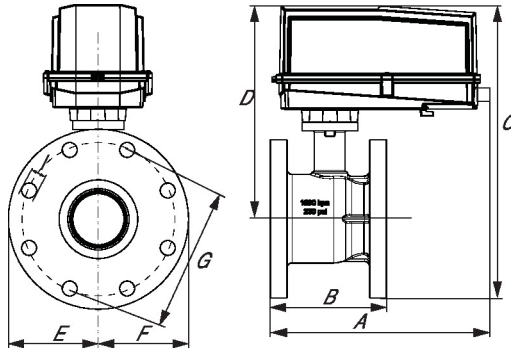
## Dimensions

GRX, GKRX




| A | B | C | D | E | F | G | I | Number of Bolt Holes |
|---|---|---|---|---|---|---|---|---|
| 17.5" [444] | 10.3" [262] | 17.0" [433] | 13.6" [345] | 5.0" [127] | 5.0" [127] | 8.5" [216] | 0.9" [22] | 8 |

GRX, GKRX




| A | B | C | D | E | F | G | I | Number of Bolt Holes |
|---|---|---|---|---|---|---|---|---|
| 17.5" [444] | 10.3" [262] | 17.0" [433] | 13.6" [345] | 5.0" [127] | 5.0" [127] | 8.5" [216] | 0.9" [22] | 8 |

MFT/programmable, Electronic fail-safe, 24 V



5-year warranty

Please note: Due to a supplier issue, certain NEMA 4 actuator covers will be supplied in gray instead of orange until further notice. This change ensures uninterrupted shipping and the same protective properties and product specifications.

## Technical data

| | | |
|---|---|---|
| **Electrical data** | 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 | 12 W |
| | Power consumption in rest position | 3 W |
| | Transformer sizing | 21 VA |
| | Overload Protection | electronic thoughout 0...90° rotation |
| **Functional data** | 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, on/off, floating point) |
| | Position feedback U | 2...10 V |
| | Position feedback U note | Max. 0.5 mA |
| | Position feedback U variable | VDC variable |
| | Bridging time (PF) | 2 s |
| | Bridging time (PF) variable | 0...10 s |
| | Pre-charging time | 5...20 s |
| | Direction of motion motor | selectable with switch 0/1 |
| | Direction of motion fail-safe | reversible with switch |
| | Manual override | under cover |
| | Angle of rotation | Max. 95° |
| | Angle of rotation note | adjustable with mechanical stop |
| | Running Time (Motor) | 150 s / 90° |
| | Running time motor variable | 90...150 s |
| | Running time fail-safe | <35 s |
| | Sound power level motor | 52 dB(A) |
| | Sound power level, fail-safe | 61 dB(A) |
| | Position indication | Mechanical, 30...65 mm stroke |
| **Safety data** | Power source UL | Class 2 Supply |
| | Degree of protection NEMA/UL | NEMA 4X |
| | Housing | UL Enclosure Type 4X |

## Technical data

| | | |
|---|---|---|
| **Safety data** | 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 humidity | Max. 100% RH |
| | Ambient temperature | -22...122°F [-30...50°C] |
| | Ambient temperature note | -40...122°F [-40...50°C] for actuator with integrated heating |
| | Storage temperature | -40...176°F [-40...80°C] |
| | Servicing | maintenance-free |
| **Weight** | Weight | 7.5 lb [3.4 kg] |
| **Materials** | Housing material | Die cast aluminium and plastic casing |

**Footnotes** †Rated Impulse Voltage 800V, Type of action 1.AA, Control Pollution Degree 3

## Product features

**Bridging time**

Power failures can be bridged up to a maximum of 10 s.

In the event of a power failure, the actuator will remain stationary in accordance with the set bridging time. If the power failure is greater than the set bridging time, the actuator will move into the selected fail-safe position.

The bridging time set at the factory is 2 s. It can be modified on site in operation by means of the Belimo service tool MFT-P.

Settings: The rotary knob must not be set to the "PROG FAIL-SAFE" position!

For retroactive adjustments of the bridging time with the Belimo service tool MFT-P or with the ZTH EU adjustment and diagnostic device only the values need to be entered.

## Accessories

| **Tools** | **Description** | **Type** |
|---|---|---|
| | Connecting cable 10 ft [3 m], A: RJ11 6/4 LINK.10, B: 3-pin Weidmüller and supply connection | ZK4-GEN |
| | Service tool, with ZIP-USB function, for configurable and communicative Belimo actuators, VAV controller and HVAC performance devices | ZTH US |

| **Electrical accessories** | **Description** | **Type** |
|---|---|---|
| | Feedback potentiometer 140 Ω add-on, grey | P140A GR |
| | Feedback potentiometer 500 Ω add-on, grey | P500A GR |
| | Feedback potentiometer 1 kΩ add-on, grey | P1000A GR |
| | Feedback potentiometer 2.8 kΩ add-on, grey | P2800A GR |
| | Feedback potentiometer 5 kΩ add-on, grey | P5000A GR |
| | Feedback potentiometer 10 kΩ add-on, grey | P10000A GR |
| | Auxiliary switch 1x SPDT add-on | S1A |
| | Auxiliary switch 2x SPDT add-on | S2A |
| | Service tool, with ZIP-USB function, for configurable and communicative Belimo actuators, VAV controller and HVAC performance devices | ZTH US |

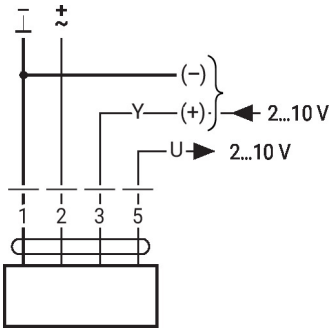
| **Gateways** | **Description** | **Type** |
|---|---|---|
| | Gateway MP to BACnet MS/TP | UK24BAC |
| | Gateway MP to Modbus RTU | UK24MOD |
| | Gateway MP to LonWorks | UK24LON |

| **Factory add-on option only** | **Description** | **Type** |
|---|---|---|
| | Heater, with adjustable thermostat | ACT_PACK_H |

## Electrical installation

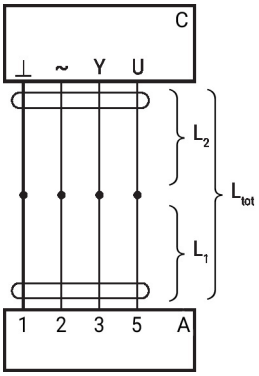
**Wire colors:**
1 = black
2 = red
3 = white
5 = orange

AC/DC 24 V, modulating




| 1 | 2 | 3 | 0 1 | 0 1 |
|---|---|---|---|---|
| | | 2 V | | |
| | | 10 V | | |

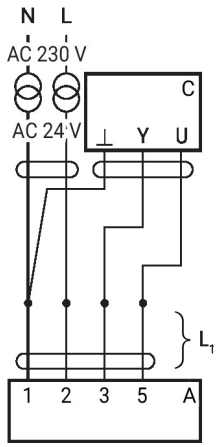
Signal cable lengths




| $L_2$ ⊥ / ~ | $L_{tot} = L_1 + L_2$ AC | DC |
|---|---|---|
| 0.75 mm² | ≤30 m | ≤5 m |
| 1.00 mm² | ≤40 m | ≤8 m |
| 1.50 mm² | ≤70 m | ≤12 m |
| 2.50 mm² | ≤100 m | ≤20 m |

A = Actuator
C = Control unit (controlling unit)
L1 = Connecting cable of the actuator
L2 = Customer cable
Ltot = Maximum signal cable length

Note:
When several actuators are connected in parallel, the maximum signal cable length must be divided by the number of actuators.

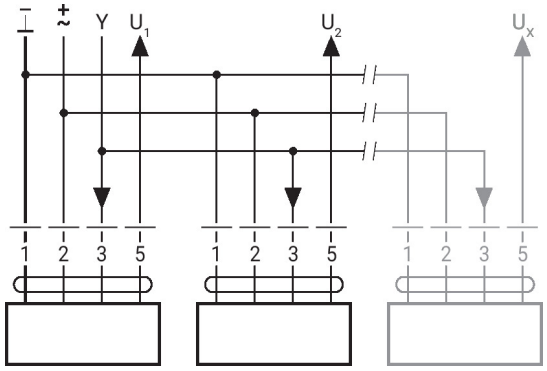



A = Actuator
C = Control unit (controlling unit)
L1 = Connecting cable of the actuator

Note:
There are no special restrictions on installation if the supply and the data cable are routed separately.

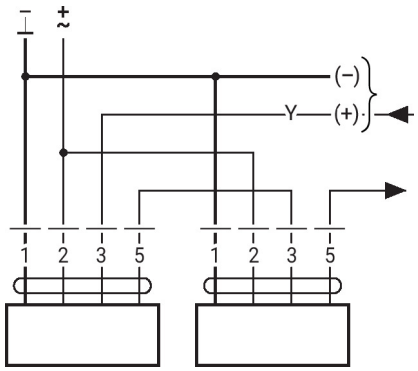
## Electrical installation

Parallel operation




Max. 8 actuators in parallel
Parallel operation is permitted only on non-connected axes
Do not fail to observe performance data with parallel operation

Wiring diagram piggy-back operation (mechanically coupled actuators)

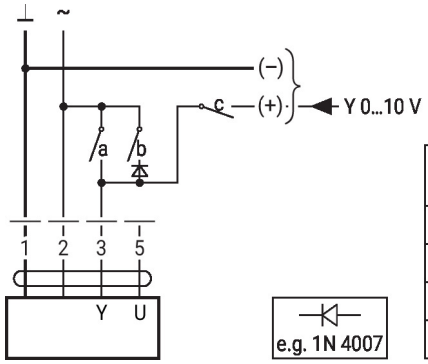



Max. 2 actuators in primary/secondary operation
Primary/secondary operation is permitted only on one fixed shaft or on two mechanically coupled shafts
The programming of the primary actuator is adopted by the secondary actuator

## Further electrical installations

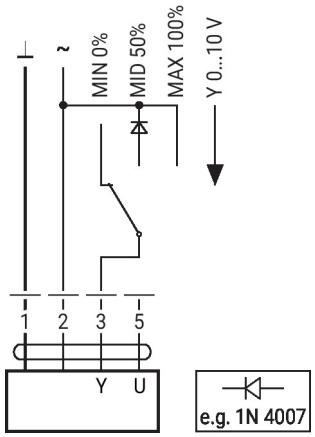
### Functions with basic values (conventional mode)

Override control with AC 24 V with relay contacts




| 1 | 2 | a | b | c | |
|---|---|---|---|---|---|
| | | | | | 0 % |
| | | | | | ZS 50% |
| | | | | | 100% |
| | | | | | Y |

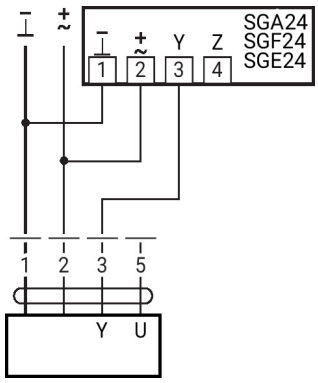
Override control with AC 24 V with rotary switch



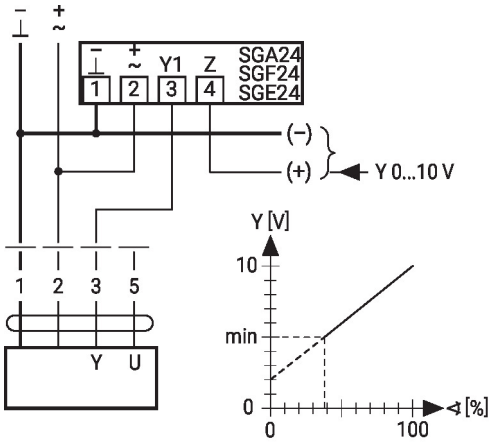
## Further electrical installations

### Functions with basic values (conventional mode)

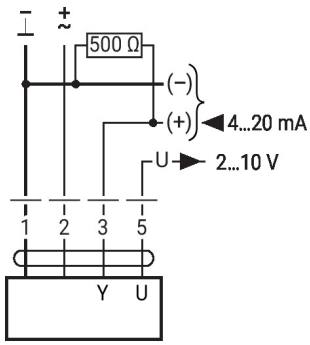
Control remotely 0...100% with positioner SG..




Minimum limit with positioner SG..

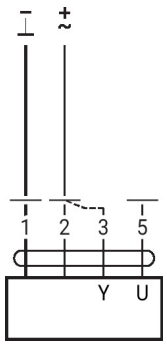



Control with 4...20 mA via external resistor




Caution:
The operating range must be set to DC 2...10 V.
The 500 Ohm resistor converts the 4...20 mA current signal to a voltage signal DC 2...10 V.

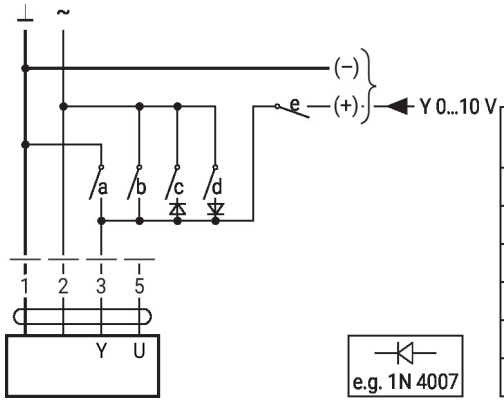
Functional check




**Procedure**
1. Connect 24 V to connections 1 and 2
2. Disconnect connection 3:
– With direction of rotation 0: Actuator rotates to the left
– With direction of rotation 1: Actuator rotates to the right
3. Short-circuit connections 2 and 3:
– Actuator runs in opposite direction

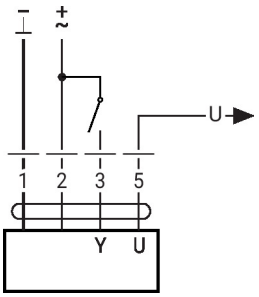
### Functions with specific parameters (configuration necessary)

Override control and limiting with AC 24 V with relay contacts




| 1 | 2 | a | b | c | d | e | |
|---|---|---|---|---|---|---|---|
| | | | | | | | Close |
| | | | | | | | MIN |
| | | | | | | | ZS |
| | | | | | | | MAX |
| | | | | | | | Open |
| | | | | | | | Y |

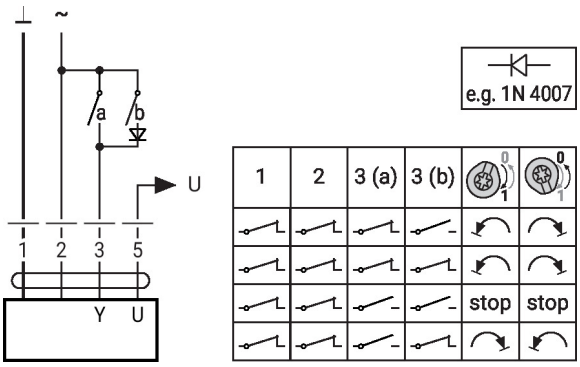
Control on/off



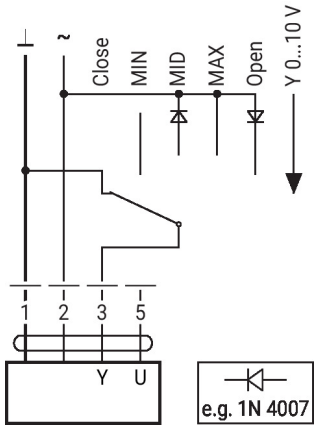
## Further electrical installations

### Functions with specific parameters (configuration necessary)

Control 3-point with AC 24 V




Override control and limiting with AC 24 V with rotary switch




Caution:
The "Close" function is only guaranteed if the start point of the operating range is defined as min. 0.5 V.