

3-way Mixing/Diverting, Characterized Control Valve, Stainless Steel Ball and Stem



Picture may differ from product



5-year warranty


Type overview

| | |
|-------------|-----------|
| Type | DN |
| B308 | 1/2" [15] |

Technical data

| | | |
|---------------------------|--------------------------|--|
| Functional data | Valve size [mm] | 0.5" [15] |
| | Fluid | chilled or hot water, up to 60% glycol |
| | Fluid Temp Range (water) | 0...250°F [-18...120°C] |
| | Body Pressure Rating | 600 psi |
| | Close-off pressure Δps | 200 psi |
| | Flow | A-port: as stated in chart B-port: 70% of A-AB Cv |
| | Flow characteristic | A-port equal percentage, B-port modified for constant common port flow |
| | Leakage rate | 0% for A-AB, <2.0% for B-AB |
| | Pipe connection | Internal thread NPT (female) |
| | Servicing | maintenance-free |
| | Flow Pattern | 3-way Mixing/Diverting |
| | Controllable flow range | 75° |
| | Cv | 0.46 |
| | Materials | Valve body |
| Stem | | stainless steel |
| Stem seal | | EPDM (lubricated) |
| Seat | | PTFE |
| Characterized disc | | TEFZEL® |
| O-ring | | EPDM (lubricated) |
| Ball | | stainless steel |
| Suitable actuators | Non Fail-Safe | TR LRB(X) LRQB(X) NRB(X) N4 |
| | Spring | TFRB(X) LF |

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

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 or constant flow.

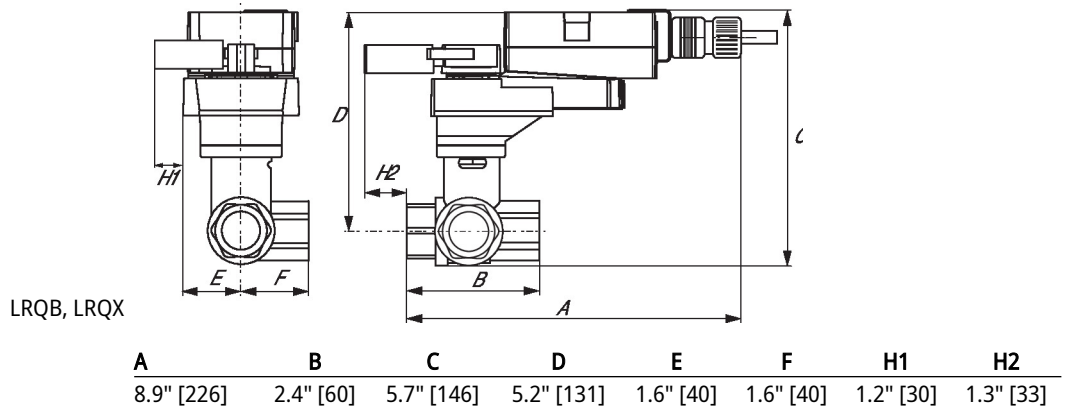
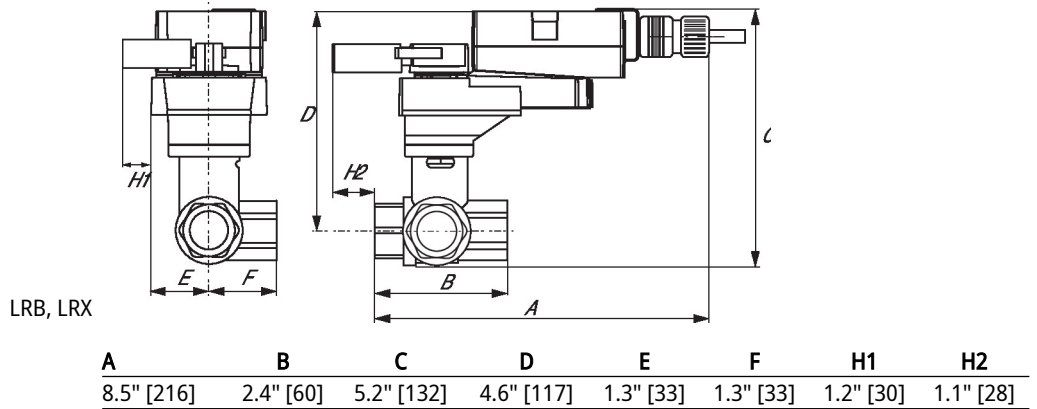
Flow/Mounting details

This valve is not suitable for use as a change over valve.



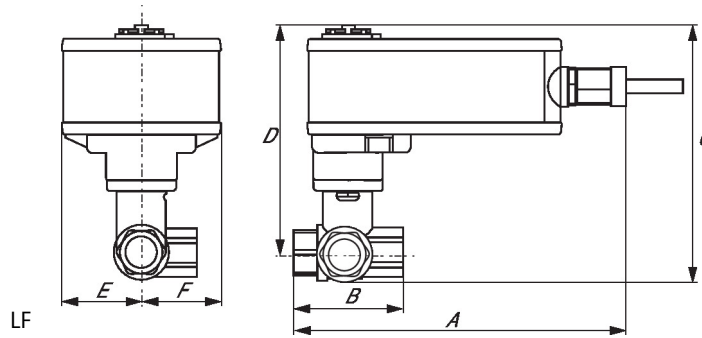
Dimensions

| Type | DN | Weight |
|------|-----------|-------------------|
| B308 | 1/2" [15] | 0.60 lb [0.27 kg] |

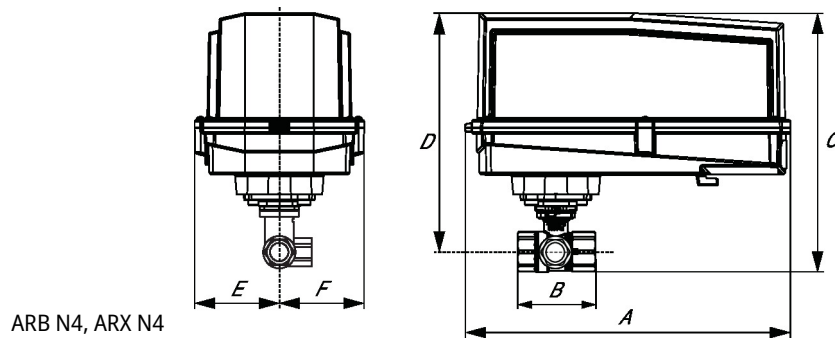


Dimensions

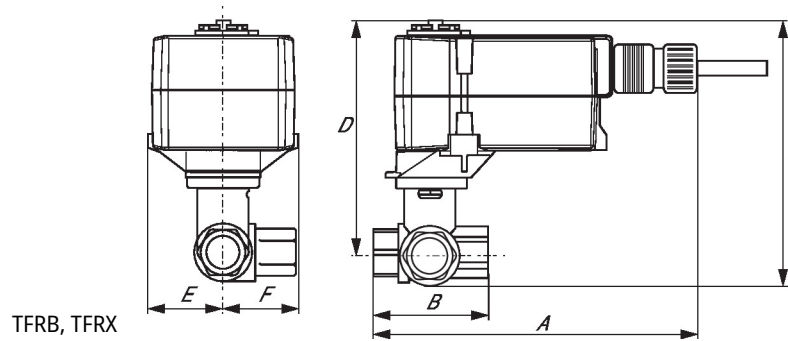
| A | B | C | D | E | F |
|-----------|-----------|------------|------------|-----------|-----------|
| 3.7" [95] | 2.4" [60] | 4.8" [122] | 4.2" [107] | 1.3" [33] | 1.2" [31] |



| A | B | C | D | E | F |
|-------------|-----------|------------|------------|-----------|-----------|
| 7.91" [200] | 2.4" [60] | 5.7" [146] | 5.1" [129] | 1.8" [46] | 1.9" [48] |

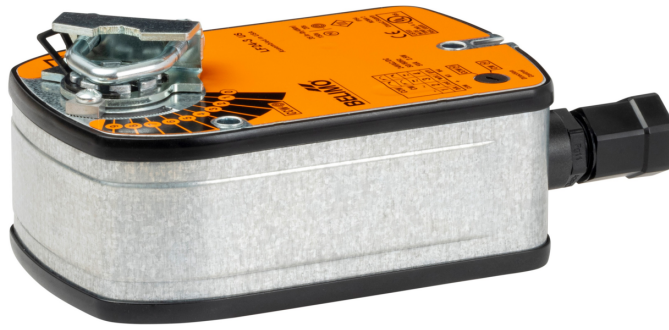


| A | B | C | D | E | F |
|-------------|-----------|-------------|------------|-----------|-----------|
| 11.4" [289] | 2.4" [60] | 7.25" [184] | 6.7" [169] | 3.1" [80] | 3.1" [80] |



| A | B | C | D | E | F |
|------------|-----------|------------|------------|-----------|-----------|
| 6.6" [167] | 2.4" [60] | 4.9" [124] | 4.3" [110] | 1.5" [39] | 1.5" [39] |

Modulating, On/Off, Floating point, Fail-Safe,
24 V



Picture may differ from product

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...35.0 V |
| | Power consumption in operation | 2 W |
| | Power consumption in rest position | 0.8 W |
| | Transformer sizing | 3.5 VA |
| | Auxiliary switch | 1x SPDT, 1 mA...3 A (0.5 A inductive), DC 5 V...AC 250 V, adjustable 0...95° |
| | Connection supply/control | cable 3 ft. [1 m], 4x 0.75 mm ² |
| | Parallel operation | Yes (note the performance data) |
| Data bus communication | Communicative control | MP-Bus |
| | Number of nodes | MP-Bus max. 16 |
| Functional data | Torque motor | 35 in-lb [4 Nm] |
| | Torque Fail-Safe | 4 NM |
| | Operating range Y | 2...10 V |
| | Input impedance | 100 kΩ |
| | Operating range Y variable | Start point 0.5...30 V 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. 1 mA |
| | Position feedback U variable | Start point 0.5...8 V End point 2.5...10 V |
| | Position accuracy | ±5% |
| | Direction of motion motor | selectable with switch L/R |
| | Direction of motion variable | electronically reversible |
| | Direction of motion fail-safe | selectable by mounting L/R |
| | Manual override | No |
| | Angle of rotation | Max. 95° |
| | Angle of rotation note | Adjustable 37...100% with integrated mechanical limitation |
| | Running Time (Motor) | / 90° |
| | Running time motor variable | 75...300 s |
| | Running time fail-safe | <20 s @ -20...50°C, <60 s @ -30°C |
| | Sound power level, motor | 36 dB(A) |
| Adaptation Setting Range | with Belimo Assistant 2 | |
| Override control | MIN (minimum position) = 0% MID (intermediate position, AC only) = 50% MAX (maximum position) = 100% | |

Technical data

| | | |
|------------------------|------------------------------|---|
| Functional data | Override control variable | MIN = 0%...(MAX – 32%) MID = MIN...MAX MAX = (MIN + 32%)...100% |
| | Mechanical interface | Universal shaft clamp 8...16 mm |
| | Position indication | Mechanical |
| | Service life | Min. 60'000 fail-safe positions |
| Safety data | Power source UL | Class 2 Supply |
| | Degree of protection NEMA/UL | NEMA 2 |
| | Housing | UL Enclosure Type 2 |
| | Agency Listing | cULus acc. To UL 873 and CAN/CSA C22.2 No. 24-93 |
| | 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] |
| | Servicing | maintenance-free |
| Weight | Weight | 3.2 lb [1.5 kg] |

Product features

| | |
|-------------------------------------|---|
| Operating mode | <p>Conventional operation:</p> <p>The actuator is connected with an analog control signal Y (note the operating range) and drives to the position defined.</p> <p>The actuator moves the valve to the operating position at the same time as tensioning the return spring. The damper is turned back to the fail-safe position by spring force when the supply voltage is interrupted.</p> <p>Operation on Bus:</p> <p>The actuator receives its digital control signal from the higher level controller via the MP-Bus and drives to the position defined. Connection U serves as communication interface and does not supply an analogue measuring voltage.</p> |
| Converter for sensors | <p>Connection option for an active sensor. The actuator serves as an analog/digital converter for the transmission of the sensor signal via MP-Bus to the higher-level system.</p> <p>Additional material may be required for the sensor connection. See "Electrical accessories".</p> |
| Configurable Device | <p>The factory settings cover the most common applications. Single parameters can be modified with the Belimo Assistant 2 or ZTH US.</p> |
| Adjustable angle of rotation | <p>Adjustable angle of rotation with mechanical end stops.</p> |
| High functional reliability | <p>The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.</p> |
| Innovative motorization | <p>The actuator uses the powerful Belimo M600 microchip in combination with the INFORM method. It provides the full starting torque from a standstill with high precision (sensorless INFORM-Drive by Prof. Schrödl).</p> |
| Home position | <p>The first time the supply voltage is switched on, i.e. at the time of commissioning, the actuator carries out a synchronization. The synchronization is in the home position (0%).</p> <p>The actuator then moves into the position defined by the control signal.</p> |

Product features

Adaptation An adaptation can be triggered manually by switching the direction-of-rotation switch from the left to the right twice within 5 s or with Belimo Assistant 2. Both mechanical end stops are detected during the adaptation (entire setting range).
The actuator then moves into the position defined by the control signal.
A range of settings can be made using the Belimo Assistant 2.

Accessories

| Tools | Description | Type |
|-------|--|--------------------|
| | Service tool for wired and wireless setup, on-site operation and troubleshooting. | Belimo Assistant 2 |
| | Connecting cable 16 ft [5 m], A: RJ11 6/4 LINK.10, B: free wire end for connection to MP/PP terminal | ZK2-GEN |
| | Belimo Assistant Link Bluetooth and USB to NFC and MP-Bus converter for configurable and communicative devices | LINK.10 |

Electrical installation

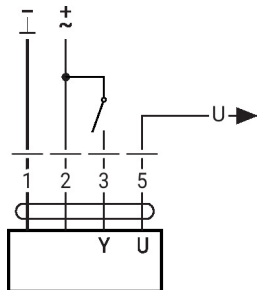


Supply from isolating transformer.
Parallel connection of other actuators possible. Observe the performance data.

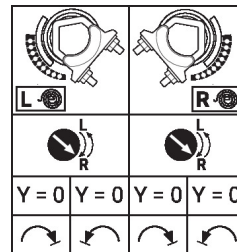
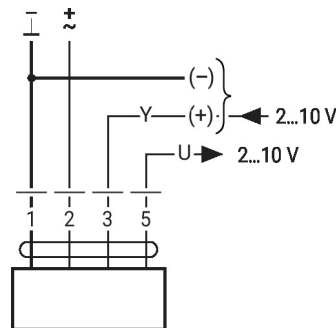
Wire colors:

- 1 = black
- 2 = red
- 3 = white
- 5 = white

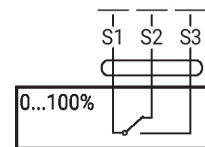
Control on/off



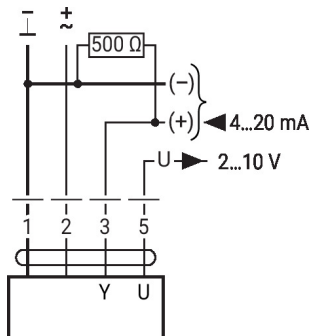
AC/DC 24 V, modulating



Auxiliary switch



Control with 4...20 mA via external resistor

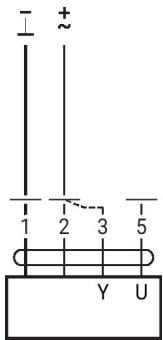


Caution:
The operating range must be set to DC 2...10 V.
The 500 Ohm resistor converts the 4...20 mA current signal to a voltage signal DC 2...10 V.

Further electrical installations

Functions with basic values (conventional mode)

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 basic values (conventional mode)

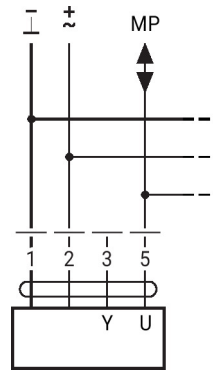
MP-Bus network topology



There are no restrictions regarding the network topology (bus, star, ring or mixed forms are permitted). Supply and communication in one and the same 3-wire cable

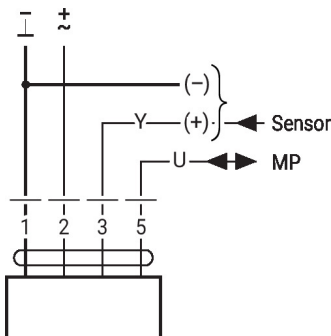
- no shielding or twisting necessary
- no terminating resistors required

Connection on the MP-Bus

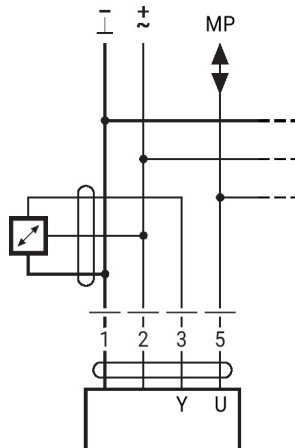


Max. 8 MP-Bus nodes

MP-Bus



Connection of active sensors

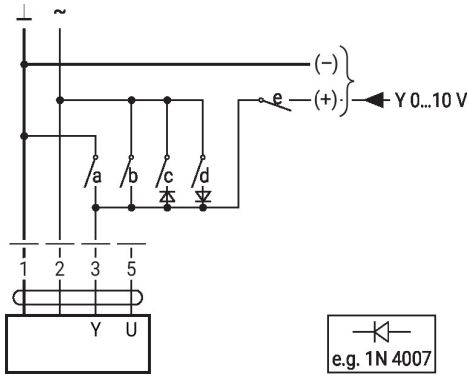


- Supply AC/DC 24 V
- Output signal 0...10 V (max. 0...32 V)
- Resolution 30 mV

Further electrical installations

Functions with specific parameters (configuration necessary)

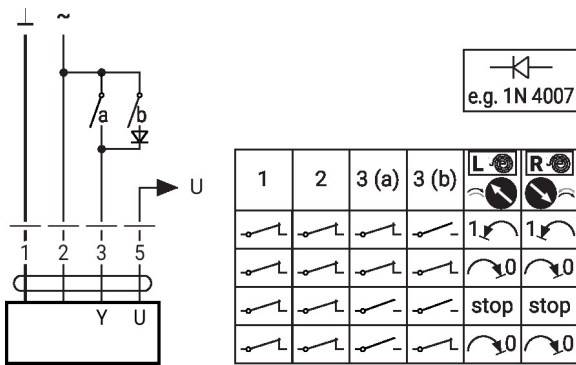
Override control and limiting with AC 24 V with relay contacts



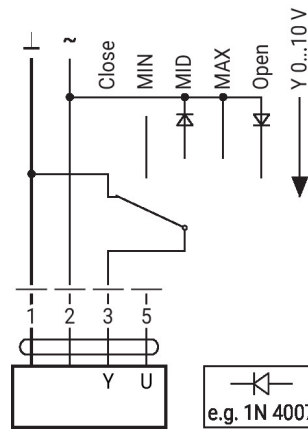
| 1 | 2 | a | b | c | d | e | M | B |
|---|---|---|---|---|---|---|-------|-------|
| | | | | | | | Close | Close |
| | | | | | | | MIN | - |
| | | | | | | | MID | MID |
| | | | | | | | MAX | MAX |
| | | | | | | | Open | Open |
| | | | | | | | Y | Y |

M = modulating
B = Bus

Control 3-point with AC 24 V

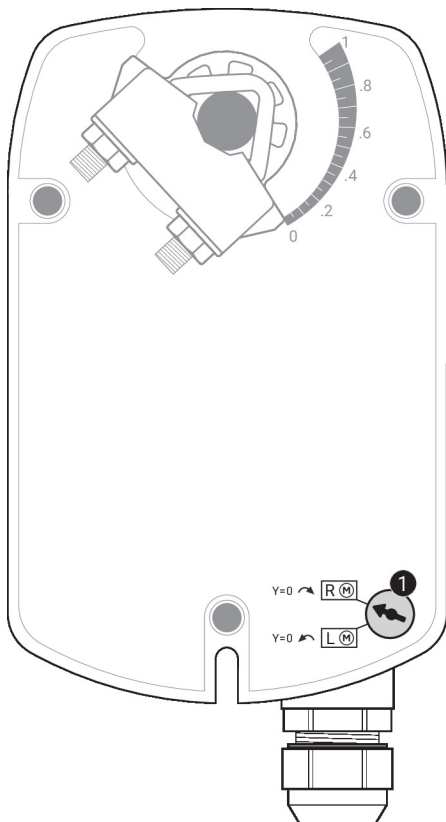


Override control and limiting with AC 24 V with rotary switch



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

Operating controls and indicators



1 MP addressing

Move direction of rotation switch in opposite position and backwards (within 4 seconds)

Service

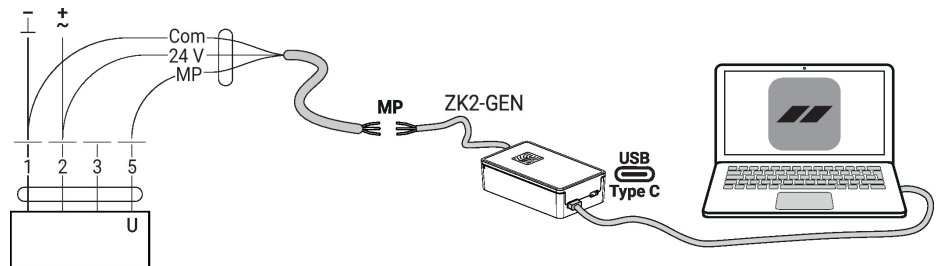
Using Belimo Assistant 2, device parameters can be modified. Belimo Assistant 2 can operate on a smartphone, tablet, or PC. The available connection options vary depending on the hardware on which Belimo Assistant 2 is installed.

For more information about Belimo Assistant 2, refer to the Quick Guide – Belimo Assistant 2.

Wired connection

Alternatively, the Belimo devices can be accessed by connecting Belimo Assistant Link to the USB port on a PC or laptop and to the MP-Bus wire on the device.

Belimo Assistant 2 acts as MP client. Therefore, no other MP client shall be connected to the device.



Dimensions

Shaft length

| | |
|--|--------------------|
| | Min. 84 |
| | Min. 0.75" [20 mm] |

Clamping range

| | |
|--------|--------|
| | |
| 8...16 | 8...16 |

Further documentation

- Overview MP Cooperation Partners
- Tool connections
- Introduction to MP-Bus Technology
- Quick Guide – Belimo Assistant 2