



5-year warranty



Technical data

| | | |
|---------------------------|---------------------------|---|
| Functional data | Valve Size | 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 characteristic | A-port Equal percentage; B-port modified linear for constant flow |
| | Servicing | maintenance-free |
| | Flow Pattern | 3-way Mixing/Diverting |
| | Leakage rate | 0% for A – AB, <2.0% for B – AB |
| | Controllable flow range | 75° |
| | Cv | 16 |
| | Body pressure rating note | 600 psi |
| | No Characterized Disc | TRUE |
| | Cv Flow Rating | A-port: as stated in chart B-port: 70% of A – AB Cv |
| Materials | Valve body | Nickel-plated brass body |
| | Stem seal | EPDM (lubricated) |
| | Seat | PTFE |
| | Pipe connection | NPT female ends |
| | O-ring | EPDM (lubricated) |
| | Ball | chrome plated brass |
| Suitable actuators | Non-Spring | TR |
| | | LRB(X) |
| | | NR |

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

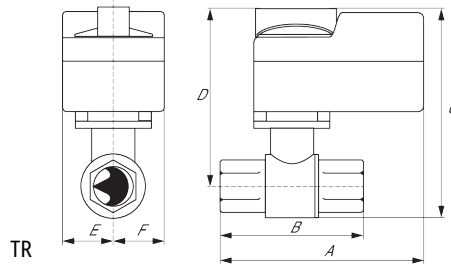
Application This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable or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

Flow/Mounting details

Dimensions
Dimensional drawings


LRB, LRX

| A | B | C | D | E | F | H1 | H2 |
|------------|-----------|------------|------------|-----------|-----------|-----------|-----------|
| 8.5" [216] | 2.4" [60] | 5.2" [132] | 5.0" [127] | 1.3" [33] | 1.3" [33] | 1.2" [30] | 1.1" [28] |



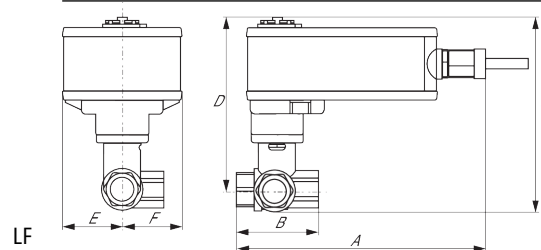
TR

| A | B | C | D | E | F |
|-----------|-----------|------------|------------|-----------|-----------|
| 3.7" [95] | 2.4" [60] | 5.2" [132] | 4.6" [117] | 1.3" [33] | 1.3" [33] |



TFRB, TFRX

| A | B | C | D | E | F |
|------------|-----------|------------|------------|-----------|-----------|
| 6.6" [167] | 2.4" [60] | 4.9" [124] | 4.7" [120] | 1.5" [39] | 1.3" [33] |



LF

| A | B | C | D | E | F |
|------------|-----------|------------|------------|-----------|-----------|
| 7.9" [200] | 2.4" [60] | 6.1" [154] | 5.5" [140] | 1.8" [46] | 1.9" [48] |

| A | B | C | D | E | F |
|------------|-----------|------------|------------|-----------|-----------|
| 7.9" [200] | 2.4" [60] | 6.1" [154] | 5.5" [140] | 1.8" [46] | 1.9" [48] |



TFRB, TFRX

| A | B | C | D | E | F |
|------------|-----------|------------|------------|-----------|-----------|
| 6.6" [167] | 2.4" [60] | 4.9" [124] | 4.7" [120] | 1.5" [39] | 1.3" [33] |



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Technical data

| | | |
|------------------------|--------------------------------|--|
| Electrical data | Nominal voltage | AC/DC 24 V |
| | Nominal voltage frequency | 50/60 Hz |
| | Power consumption in operation | 0.5 W |
| | Transformer sizing | 1 VA (class 2 power source) |
| | Electrical Connection | 18 GA plenum cable, 3 ft [1 m] |
| | Overload Protection | electronic throughout full 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 |
| | Direction of motion motor | selectable with switch |
| | Manual override | push down handle |
| | Angle of rotation | 90° |
| | Running Time (Motor) | 90 s / 90° |
| | Noise level, motor | 35 dB(A) |
| | Position indication | Mechanically, pluggable |
| Safety data | Degree of protection IEC/EN | IP40 |
| | Degree of protection NEMA/UL | NEMA 1 UL Enclosure Type 1 |
| | Agency Listing | cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC |
| | Quality Standard | ISO 9001 |
| | Ambient temperature | -22...122°F [-30...50°C] |
| | Storage temperature | -40...176°F [-40...80°C] |
| | Ambient humidity | max. 95% r.H., non-condensing |
| | Servicing | maintenance-free |
| | Weight | Weight |

Safety notes

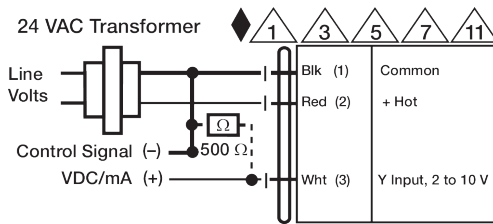


- Cable for ZIP-RS232 US and ZIP-USB-MP US to Belimo gateways.
- Battery Back Up System for SY(7-10)-110
- 120 to 24 VAC, 40 VA transformer.
- Cable for ZTH US to actuators w/o diagnostics socket.
- 50% voltage divider kit (resistors with wires).
- PC Tool computer programming interface, serial port.

Electrical installation

✂ INSTALLATION NOTES

- 1** Provide overload protection and disconnect as required.
 - 3** Actuators may also be powered by 24 VDC.
 - 5** Only connect common to negative (-) leg of control circuits.
 - 7** A 500 Ω resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
 - 11** Actuators may be connected in parallel if not mechanically linked. Power consumption and input impedance must be observed.
- ◆ 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.



2...10 V / 4...20 mA Control