



5-year warranty



Technical data

|                           |                           |   |
|---------------------------|---------------------------|---|
| <b>Functional data</b>    | 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                        | 3   |
|                           | Body pressure rating note | 600 psi   |
|                           | Cv Flow Rating            | A-port: as stated in chart B-port: 70% of A – AB Cv               |
|                           | <b>Materials</b>          | Valve body  |
| Stem seal                 |                           | EPDM (lubricated)   |
| Seat                      |                           | PTFE  |
| Pipe connection           |                           | NPT female ends   |
| O-ring                    |                           | EPDM (lubricated)   |
| Ball                      |                           | chrome plated brass   |
| <b>Suitable actuators</b> | Non-Spring                | TR  |
|                           |                           | LRB(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](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 or constant flow.

**Flow/Mounting details**

**Dimensions**
**Dimensional drawings**

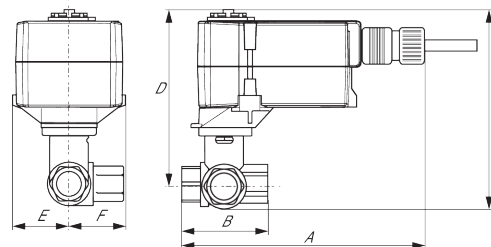

LRB, LRX

| 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] |



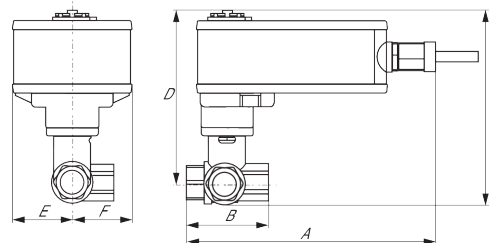
TR

| 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

|                        |                                |  |
|------------------------|--------------------------------|--|
| <b>Electrical data</b> | 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          | Screw terminal (for 26 to 14 GA wire)  |
|                        | Overload Protection            | electronic throughout full 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  |
|                        | 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        |  |
| <b>Safety data</b>     | 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   |
| <b>Weight</b>          | Weight                         | 0.61 lb [0.28 kg]  |

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation



- Provide overload protection and disconnect as required.
- Actuators may also be powered by 24 VDC.
- 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.
- Actuators are provided with a numbered screw terminal strip instead of a cable.
- 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