



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 $\Delta$ ps | 200 psi                                                                |
|                           | Flow characteristic            | A-port equal percentage, B-port modified for constant common port 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                    |
| <b>Materials</b>          | Valve body                     | Nickel-plated brass body                                               |
|                           | Stem seal                      | EPDM (lubricated)                                                      |
|                           | Seat                           | PTFE                                                                   |
|                           | Pipe connection                | NPT female ends                                                        |
|                           | O-ring                         | EPDM (lubricated)                                                      |
|                           | Ball                           | stainless steel                                                        |
| <b>Suitable actuators</b> | Non-Spring                     | TR                                                                     |
|                           |                                | LRB(X)                                                                 |
|                           |                                | NRB(X) N4                                                              |

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] |



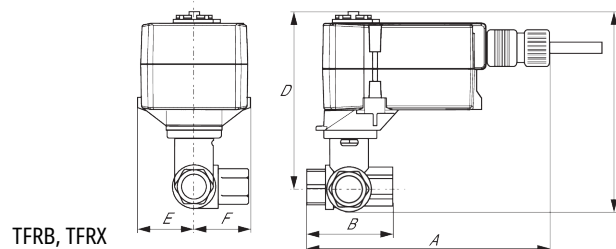
LRQB, LRQX

| A          | B         | C          | D          | E         | F         | H1        | H2        |
|------------|-----------|------------|------------|-----------|-----------|-----------|-----------|
| 8.9" [226] | 2.4" [60] | 5.7" [146] | 5.2" [131] | 1.6" [40] | 1.6" [40] | 1.2" [30] | 1.3" [33] |



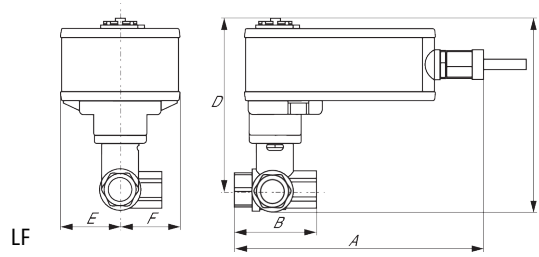
TR

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

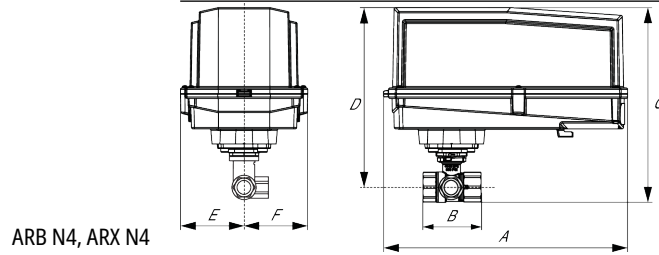


TFRB, TFRX

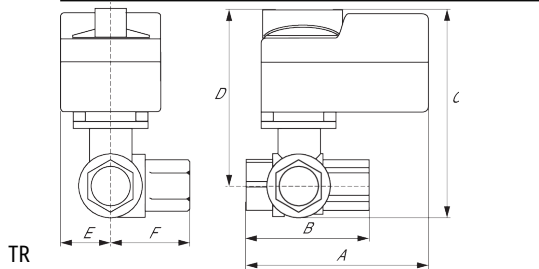
| A          | B         | C          | D          | E         | F         |
|------------|-----------|------------|------------|-----------|-----------|
| 6.6" [167] | 2.4" [60] | 4.9" [124] | 4.3" [110] | 1.5" [39] | 1.5" [39] |



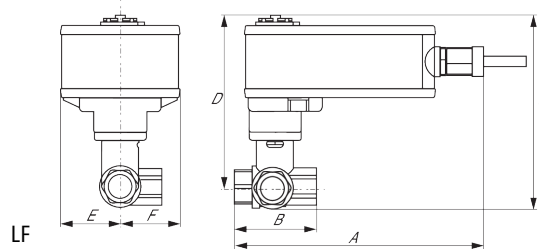
| A          | B         | C          | D          | E         | F         |
|------------|-----------|------------|------------|-----------|-----------|
| 7.9" [200] | 2.4" [60] | 5.7" [146] | 5.1" [129] | 1.8" [46] | 1.8" [46] |



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



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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      | 2 W                                                                                                                                                                                                          |                  |
|                        | Power consumption in rest position  | 1 W                                                                                                                                                                                                          |                  |
|                        | Transformer sizing                  | 4 VA (class 2 power source)                                                                                                                                                                                  |                  |
|                        | Auxiliary switch                    | 1 x SPDT, 3 A resistive (0.5 A inductive) @ AC 250 V, adjustable 0...95°                                                                                                                                     |                  |
|                        | Switching capacity auxiliary switch | 3 A resistive (0.5 A inductive) @ AC 250 V                                                                                                                                                                   |                  |
|                        | Electrical Connection               | (2) 18 GA appliance cables with 1/2" conduit connectors, 3 ft [1 m],                                                                                                                                         |                  |
|                        | Overload Protection                 | electronic throughout 0...95° 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                                                                                                                                                            |                  |
|                        | Position feedback U                 | 2...10 V                                                                                                                                                                                                     |                  |
|                        | Position feedback U note            | Max. 0.5 mA                                                                                                                                                                                                  |                  |
|                        | Direction of motion motor           | selectable with switch 0/1                                                                                                                                                                                   |                  |
|                        | Direction of motion fail-safe       | reversible with cw/ccw mounting                                                                                                                                                                              |                  |
|                        | Angle of rotation                   | Max. 95°, 90°                                                                                                                                                                                                |                  |
|                        | Angle of rotation note              | 90°                                                                                                                                                                                                          |                  |
|                        | Running Time (Motor)                | 95 s                                                                                                                                                                                                         |                  |
|                        | Running time fail-safe              | <25 s t <sub>amb</sub> = 68°F [20°C]                                                                                                                                                                         |                  |
|                        | Noise level, motor                  | 35 dB(A)                                                                                                                                                                                                     |                  |
|                        | Noise level, fail-safe              | 62 dB(A)                                                                                                                                                                                                     |                  |
| Position indication    | Mechanical                          |                                                                                                                                                                                                              |                  |
| <b>Safety data</b>     | Degree of protection IEC/EN         | IP42                                                                                                                                                                                                         |                  |
|                        | Degree of protection NEMA/UL        | NEMA 2 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; 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                                                                                                                                                                                                       | 1.8 lb [0.80 kg] |

Materials Housing material

UL94-5VA

Electrical installation

**INSTALLATION NOTES**

- Provide overload protection and disconnect as required.
- Actuators may be connected in parallel. Power consumption and input impedance must be observed.
- 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.
- One built-in auxiliary switch (1x SPDT), for end position indication, interlock control, fan startup, etc.
- Meets cULus requirements without the need of an electrical ground connection.
- Apply only AC line voltage or only UL-Class 2 voltage to the terminals of auxiliary switches. Mixed or combined operation of line voltage/safety extra low voltage is not allowed.
- 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.

