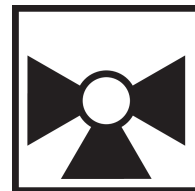




5-year warranty



## Technical data

|                           |                                 |                                                                        |
|---------------------------|---------------------------------|------------------------------------------------------------------------|
| <b>Functional data</b>    | Valve Size                      | 0.75" [20]                                                             |
|                           | 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 $\Delta p_s$ | 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                              | 4.7                                                                    |
|                           | 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                      | 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                                                              |

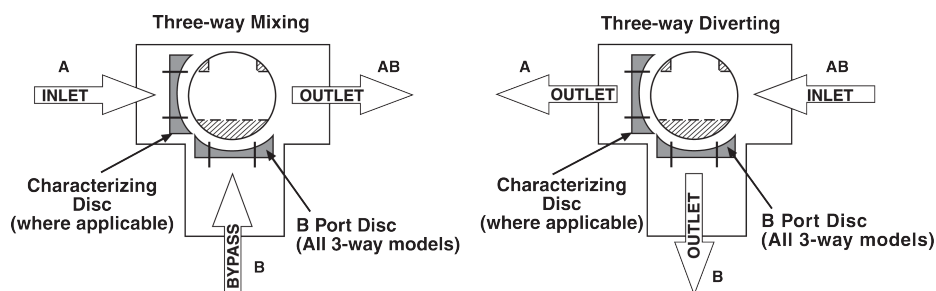
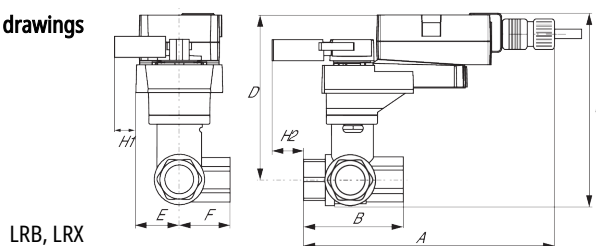
## Safety notes



- **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)

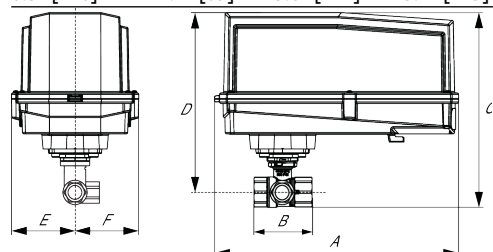
## Product features

- 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**


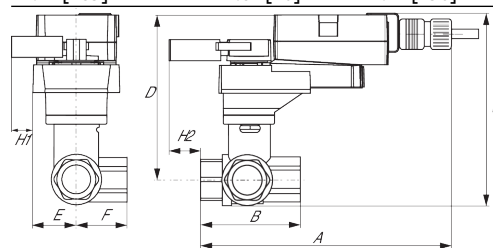
LRB, LRX

| A          | B         | C          | D          | E         | F         | H1        | H2      |
|------------|-----------|------------|------------|-----------|-----------|-----------|---------|
| 8.5" [216] | 2.7" [69] | 5.8" [147] | 5.1" [129] | 1.3" [33] | 1.5" [39] | 1.2" [30] | 1" [25] |



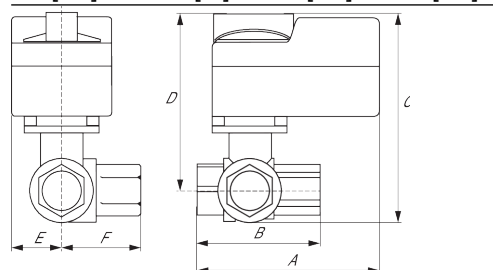
ARB N4, ARX N4

| A           | B         | C          | D          | E         | F         |
|-------------|-----------|------------|------------|-----------|-----------|
| 11.4" [289] | 2.8" [70] | 7.7" [196] | 7.0" [179] | 3.1" [80] | 3.1" [80] |



LRQB, LRQX

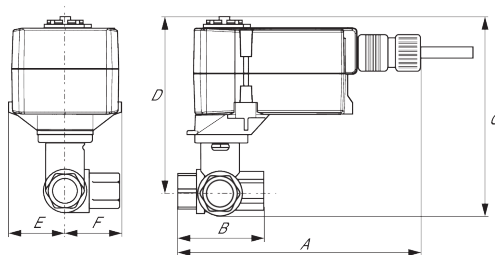
| A          | B         | C          | D          | E         | F         | H1        | H2        |
|------------|-----------|------------|------------|-----------|-----------|-----------|-----------|
| 8.9" [226] | 2.7" [69] | 6.3" [159] | 5.6" [142] | 1.6" [40] | 1.6" [40] | 1.2" [30] | 1.3" [33] |



TR

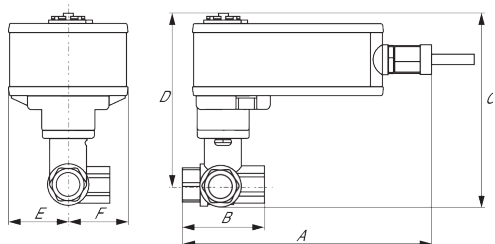
| A         | B         | C          | D          | E         | F         |
|-----------|-----------|------------|------------|-----------|-----------|
| 3.7" [95] | 2.7" [69] | 4.8" [122] | 4.2" [107] | 1.3" [33] | 1.2" [31] |

TFRB, TFRX

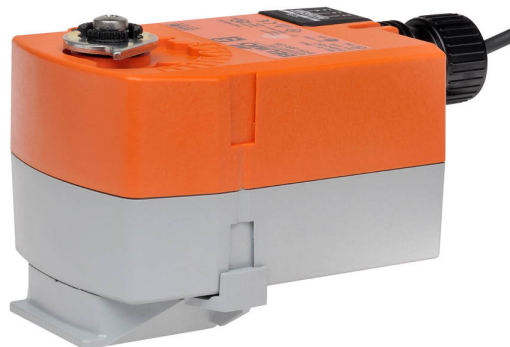


| A          | B         | C          | D          | E         | F         |
|------------|-----------|------------|------------|-----------|-----------|
| 6.6" [167] | 2.7" [69] | 4.9" [124] | 4.3" [110] | 1.5" [39] | 1.5" [39] |

LF



| A          | B         | C          | D          | E         | F         |
|------------|-----------|------------|------------|-----------|-----------|
| 8.6" [218] | 2.7" [69] | 6.3" [159] | 5.6" [142] | 1.8" [46] | 1.9" [48] |



5-year warranty



## Technical data

|                        |                                    |                                                                                                                                                                                                              |
|------------------------|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Electrical data</b> | Nominal voltage                    | AC/DC 24 V                                                                                                                                                                                                   |
|                        | Nominal voltage frequency          | 50/60 Hz                                                                                                                                                                                                     |
|                        | Power consumption in operation     | 2.5 W                                                                                                                                                                                                        |
|                        | Power consumption in rest position | 1 W                                                                                                                                                                                                          |
|                        | Transformer sizing                 | 4 VA (class 2 power source)                                                                                                                                                                                  |
|                        | Electrical Connection              | 18 GA appliance or plenum cables, 3 ft [1 m], 10 ft [3 m] or 16ft [5 m], with or without 1/2" conduit connector                                                                                              |
|                        | 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, 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                                                                                                                                                               |
|                        | Options positioning signal         | variable (VDC, PWM, on/off, floating point)                                                                                                                                                                  |
|                        | Position feedback U                | 2...10 V                                                                                                                                                                                                     |
|                        | Position feedback U note           | Max. 0.5 mA                                                                                                                                                                                                  |
|                        | Position feedback U variable       | VDC variable                                                                                                                                                                                                 |
|                        | 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)               | default 150 s, variable 75...300 s                                                                                                                                                                           |
|                        | Running time motor variable        | 75...300 s                                                                                                                                                                                                   |
|                        | Running time fail-safe             | <25 s 20 s @ -10...55°C / <60 s @ -30...-10°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] |
| <b>Materials</b> | Housing material | UL94-5VA         |

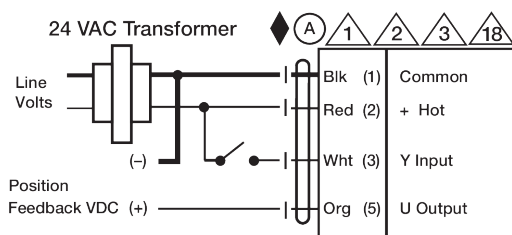
## Accessories

| Gateways      | Description                                                                                                                             | Type    |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------|---------|
|               | Gateway MP to BACnet MS/TP                                                                                                              | UK24BAC |
|               | Gateway MP to LonWorks                                                                                                                  | UK24LON |
|               | Gateway MP to Modbus RTU                                                                                                                | UK24MOD |
| Service tools | Description                                                                                                                             | Type    |
|               | Connection cable 10 ft [3 m], A: RJ11 6/4 ZTH EU, B: 3-pin Weidmüller and supply connection                                             | ZK4-GEN |
|               | Service Tool, with ZIP-USB function, for parametrisable and communicative Belimo actuators, VAV controller and HVAC performance devices | ZTH US  |

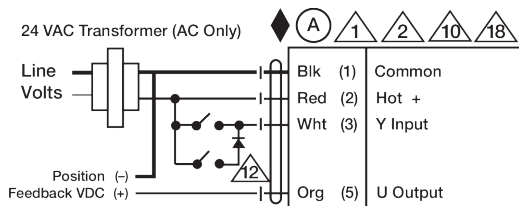
## Electrical installation

### ✂ INSTALLATION NOTES

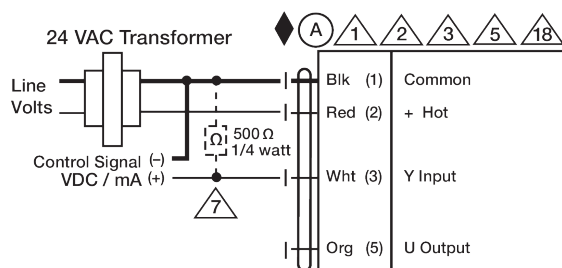
- Ⓐ Actuators with appliance cables are numbered.
- 1 Provide overload protection and disconnect as required.
- 2 Actuators may be connected in parallel. Power consumption and input impedance must be observed.
- 3 Actuators may also be powered by 24 VDC.
- 4 Two built-in auxiliary switches (2x SPDT), for end position indication, interlock control, fan startup, etc.
- 5 Only connect common to negative (-) leg of control circuits.
- 7 A 500  $\Omega$  resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
- 8 Control signal may be pulsed from either the Hot (Source) or Common (Sink) 24 V line.
- 10 For triac sink the Common connection from the actuator must be connected to the Hot connection of the controller. Position feedback cannot be used with a triac sink controller; the actuator internal common reference is not compatible.
- 12 IN4004 or IN4007 diode. (IN4007 supplied, Belimo part number 40155).
- 18 Actuators with plenum cable do not have numbers; use color codes instead.
- ◆ 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.



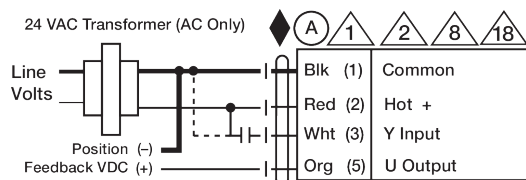
On/Off



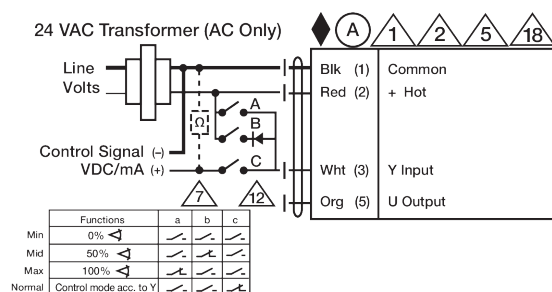
Floating Point



VDC/mA Control



PWM Control



Override Control