

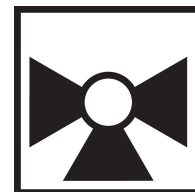
3-way Mixing/Diverting, Characterized Control Valve, Stainless Steel Ball and Stem



Picture may differ from product



5-year warranty



## Type overview

| Type | DN        |
|------|-----------|
| B316 | 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<br>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<br>NPT (female)                                        |
|                    | Servicing                | maintenance-free                                                       |
|                    | Flow Pattern             | 3-way Mixing/Diverting                                                 |
|                    | Controllable flow range  | 75°                                                                    |
|                    | Cv                       | 16                                                                     |
|                    | No Characterized Disc    | TRUE                                                                   |
| Materials          | Valve body               | Nickel-plated brass 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<br>LRB(X)<br>LRQB(X)<br>NRB(X) N4                                   |
|                    | Spring                   | TFRB(X)<br>LF                                                          |

## Safety notes



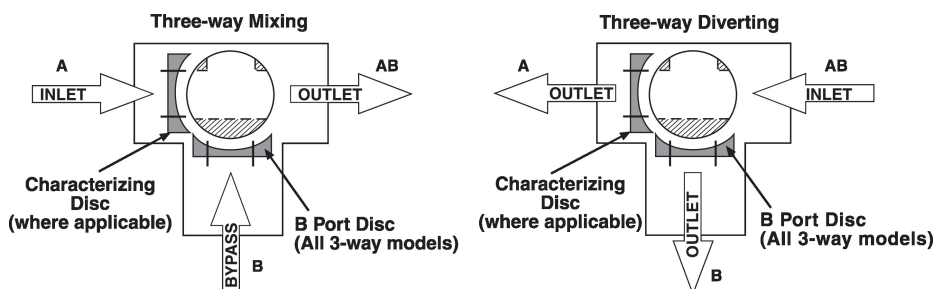
- **WARNING:** This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## 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.

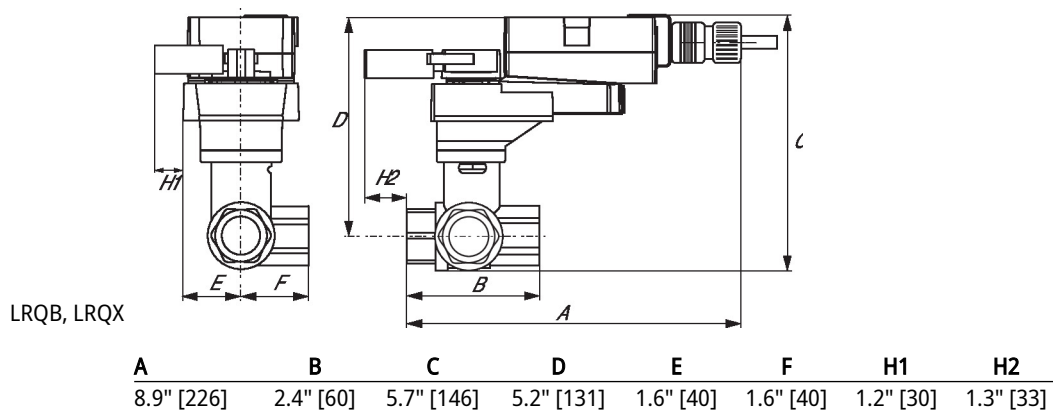
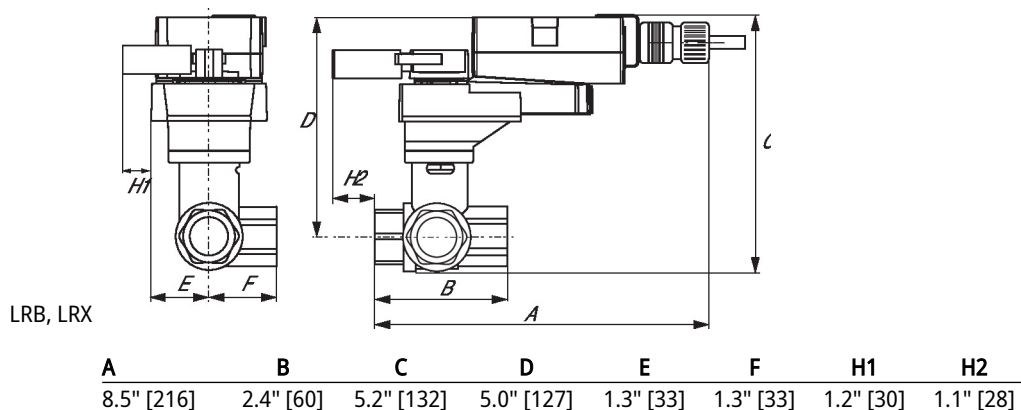
## Flow/Mounting details

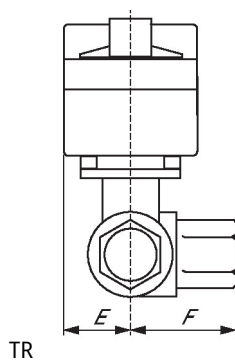
This valve is not suitable for use as a change over valve.



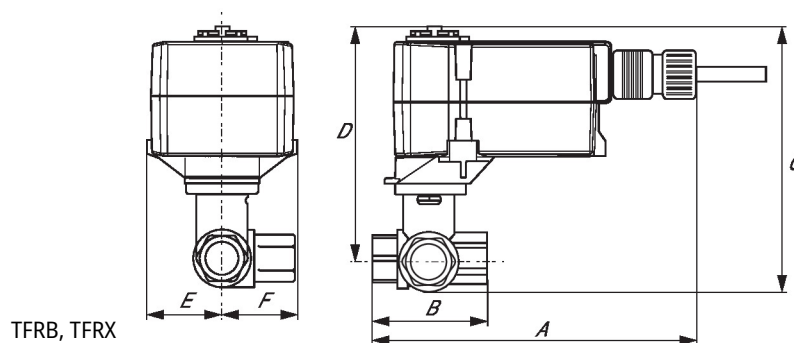
## Dimensions

| Type | DN        | Weight            |
|------|-----------|-------------------|
| B316 | 1/2" [15] | 0.71 lb [0.32 kg] |

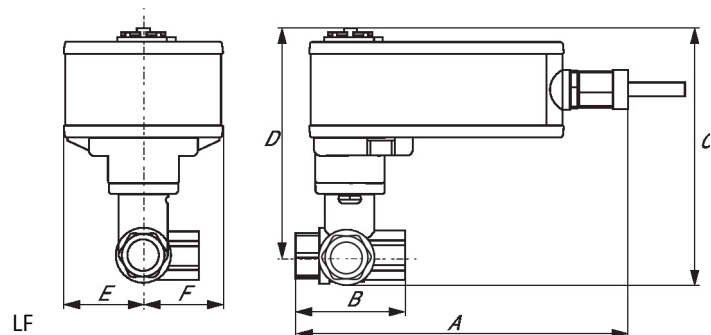


**Dimensions**

**TR**

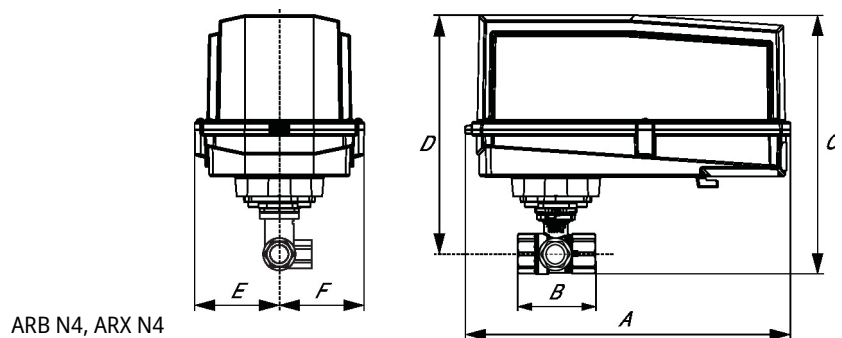
| A         | B         | C          | D          | E         | F         |
|-----------|-----------|------------|------------|-----------|-----------|
| 3.7" [95] | 2.4" [60] | 4.8" [122] | 4.2" [107] | 1.3" [33] | 1.2" [31] |


**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] |


**LF**

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

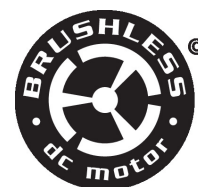

**ARB N4, ARX N4**

| A           | B         | C          | D          | E         | F         |
|-------------|-----------|------------|------------|-----------|-----------|
| 11.4" [289] | 2.4" [60] | 7.2" [184] | 6.7" [169] | 3.1" [80] | 3.1" [80] |

MFT/programmable, Non fail-safe, 24 V



5-year warranty



## Technical data

|                        |                                    |                                                                                 |
|------------------------|------------------------------------|---------------------------------------------------------------------------------|
| <b>Electrical data</b> | Nominal voltage                    | AC/DC 24 V                                                                      |
|                        | Nominal voltage frequency          | 50/60 Hz                                                                        |
|                        | Nominal voltage range              | AC 19.2...28.8 V / DC 21.6...28.8 V                                             |
|                        | Power consumption in operation     | 3.5 W                                                                           |
|                        | Power consumption in rest position | 1.3 W                                                                           |
|                        | Transformer sizing                 | 6 VA                                                                            |
|                        | Electrical Connection              | Screw terminal (for 26...14 AWG wire), 1/2" NPT 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 DC 2...10 V (0.1 mA), 500 Ω for 4...20 mA, 1500 Ω for PWM and On/Off |
|                        | Operating range Y variable         | Start point 0.5...30 V<br>End point 2.5...32 V                                  |
|                        | Operating modes optional           | 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                                                      |
|                        | Manual override                    | external push button                                                            |
|                        | Angle of rotation                  | Max. 90°                                                                        |
|                        | Angle of rotation note             | adjustable with mechanical stop                                                 |
|                        | Running Time (Motor)               | 150 s / 90°                                                                     |
|                        | Running time motor variable        | 45...150 s                                                                      |
|                        | Noise level, motor                 | 45 dB(A)                                                                        |
|                        | Position indication                | pointer                                                                         |
| <b>Safety data</b>     | Power source UL                    | Class 2 Supply                                                                  |
|                        | Degree of protection IEC/EN        | IP66/67                                                                         |
|                        | Degree of protection NEMA/UL       | NEMA 4X                                                                         |
|                        | Housing                            | UL Enclosure Type 4X                                                            |

|                    |                                                                              |                                                                                           |
|--------------------|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <b>Safety data</b> | Agency Listing                                                               | cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU |
|                    | Quality Standard                                                             | ISO 9001                                                                                  |
|                    | Ambient humidity                                                             | Max. 100% RH                                                                              |
|                    | Ambient temperature                                                          | -22...122°F [-30...50°C]                                                                  |
|                    | Ambient temperature note                                                     | -40...50°C [104...122°F] for actuator with integrated heating                             |
|                    | Storage temperature                                                          | -22...122°F [-30...50°C]                                                                  |
|                    | Servicing                                                                    | maintenance-free                                                                          |
| <b>Weight</b>      | Weight                                                                       | 3.7 lb [1.7 kg]                                                                           |
| <b>Materials</b>   | Housing material                                                             | Die cast aluminium and plastic casing                                                     |
| <b>Footnotes</b>   | †Rated Impulse Voltage 800V, Type of action 1.AA, Control Pollution Degree 3 |                                                                                           |

## Accessories

|                                   |                                                                                                                                       |             |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-------------|
| <b>Gateways</b>                   | <b>Description</b>                                                                                                                    | <b>Type</b> |
|                                   | Gateway MP to BACnet MS/TP                                                                                                            | UK24BAC     |
|                                   | Gateway MP to Modbus RTU                                                                                                              | UK24MOD     |
| <b>Electrical accessories</b>     | Gateway MP to LonWorks                                                                                                                | UK24LON     |
|                                   | <b>Description</b>                                                                                                                    | <b>Type</b> |
|                                   | Auxiliary switch 1x SPDT add-on                                                                                                       | S1A         |
|                                   | Auxiliary switch 2x SPDT add-on                                                                                                       | S2A         |
|                                   | Feedback potentiometer 140 Ω add-on, grey                                                                                             | P140A GR    |
|                                   | Feedback potentiometer 1 kΩ add-on, grey                                                                                              | P1000A GR   |
|                                   | Feedback potentiometer 10 kΩ add-on, grey                                                                                             | P10000A GR  |
|                                   | Feedback potentiometer 2.8 kΩ add-on, grey                                                                                            | P2800A GR   |
|                                   | Feedback potentiometer 500 Ω add-on, grey                                                                                             | P500A GR    |
|                                   | Feedback potentiometer 5 kΩ add-on, grey                                                                                              | P5000A GR   |
| <b>Tools</b>                      | <b>Description</b>                                                                                                                    | <b>Type</b> |
|                                   | Connecting cable 10 ft [3 m], A: RJ11 6/4 LINK.10, B: 3-pin Weidmüller and supply connection                                          | ZK4-GEN     |
|                                   | Service tool, with ZIP-USB function, for configurable and communicative Belimo actuators, VAV controller and HVAC performance devices | ZTH US      |
| <b>Factory add-on option only</b> | <b>Description</b>                                                                                                                    | <b>Type</b> |
|                                   | Heater, with adjustable thermostat                                                                                                    | ACT_PACK_H  |

## Electrical installation

### INSTALLATION NOTES

-  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 DC 24 V.
-  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.
-  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).
-  16 Actuators are provided with a numbered screw terminal strip instead of a cable.

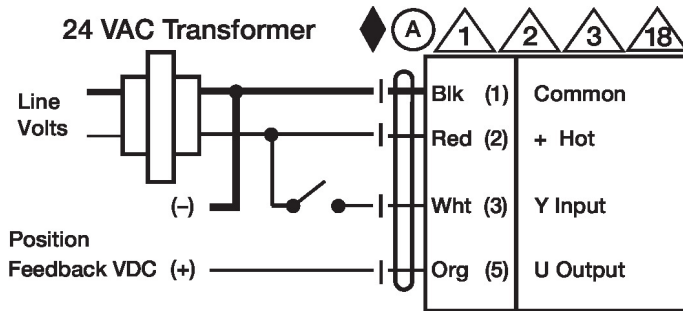
◆ Meets cULus requirements without the need of an electrical ground connection.

## ⚠ Warning! Live electrical components!

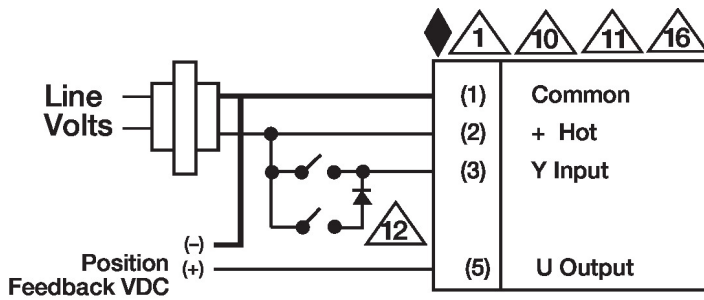
During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.

## Wiring diagrams

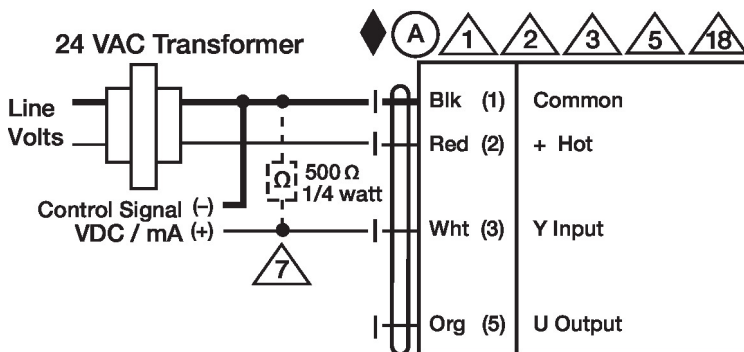
### On/Off



### Floating Point AC 24 V Transformer (AC Only)



### VDC/mA Control



## Electrical installation

### Wiring diagrams

#### Override Control

