

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



Picture may differ from product



5-year warranty



## Type overview

| Type | DN      |
|------|---------|
| B322 | 1" [25] |

## Technical data

|                    |                          |                                                                        |
|--------------------|--------------------------|------------------------------------------------------------------------|
| Functional data    | Valve size [mm]          | 1" [25]                                                                |
|                    | 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 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                       | 7.4                                                                    |
| 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            | LRB(X)<br>LRQB(X)<br>NRB(X) N4                                         |
|                    | Spring                   | LF                                                                     |

## Safety notes



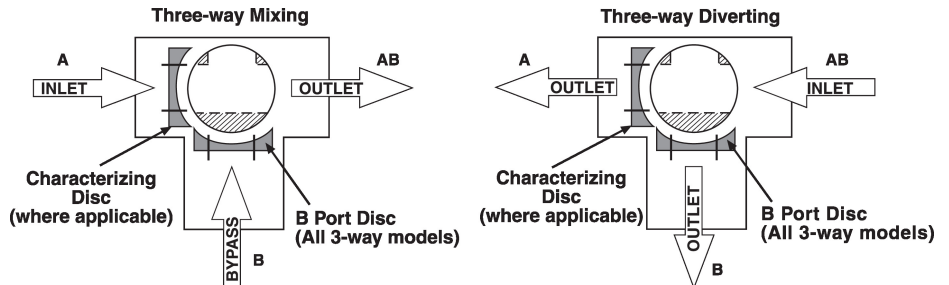
- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## 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.

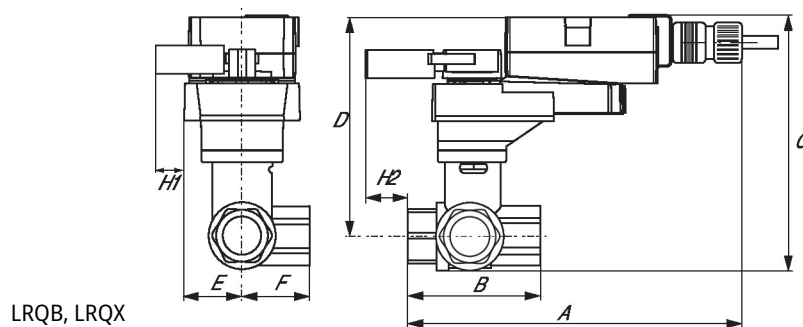
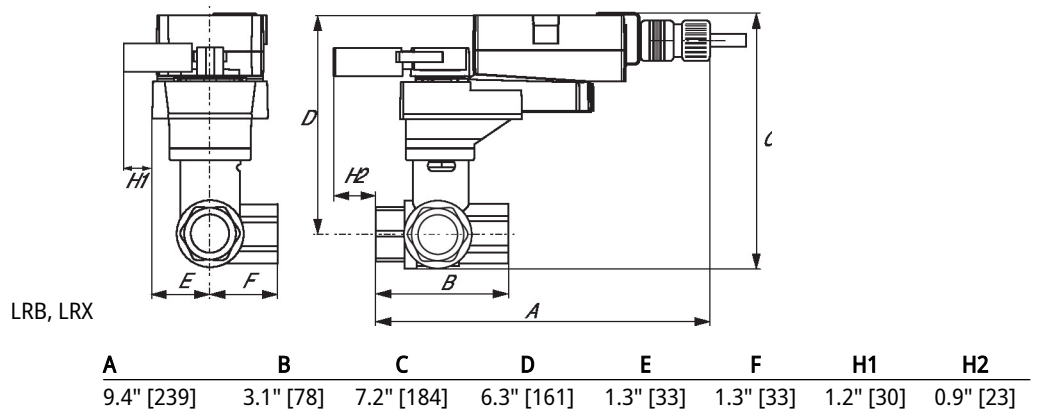
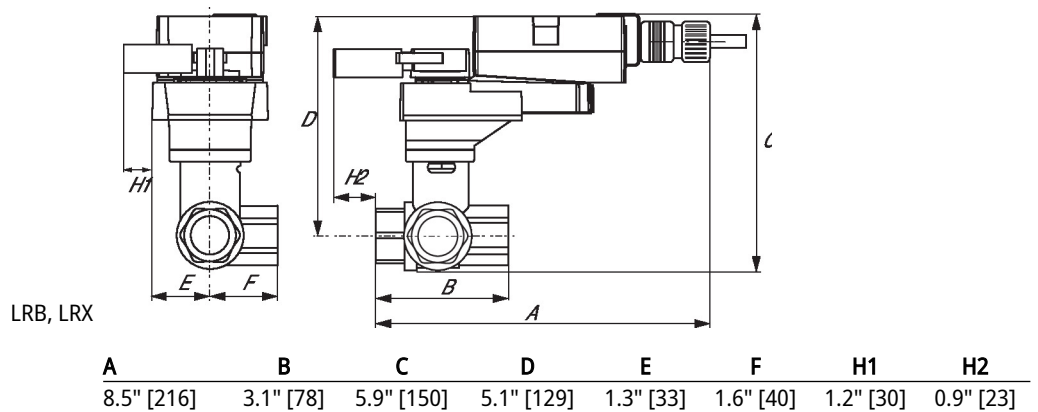
## Flow/Mounting details

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

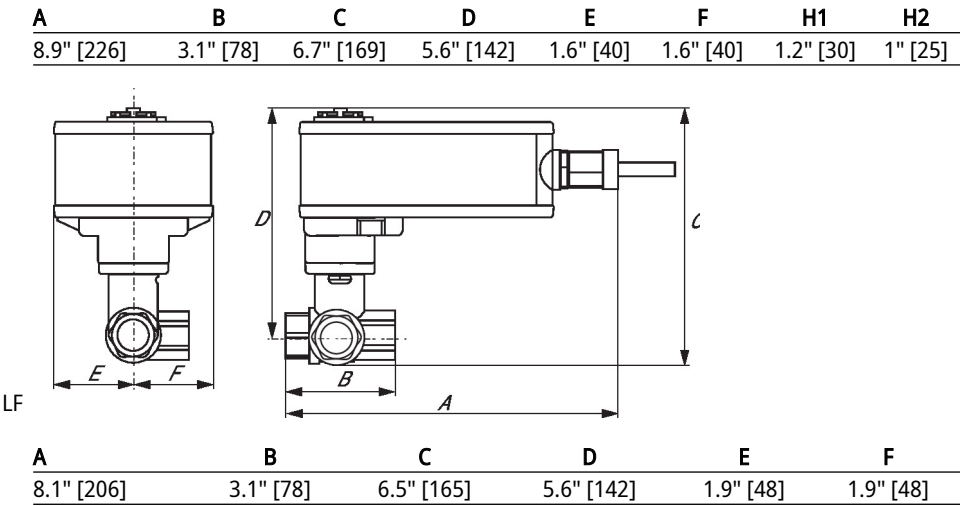


## Dimensions

| Type | DN      | Weight           |
|------|---------|------------------|
| B322 | 1" [25] | 1.3 lb [0.58 kg] |



Dimensions



MFT/programmable, Spring return, 24 V



5-year warranty



## Technical data

|                 |                                     |                                                                                              |
|-----------------|-------------------------------------|----------------------------------------------------------------------------------------------|
| Electrical data | 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      | 2.5 W                                                                                        |
|                 | Power consumption in rest position  | 1 W                                                                                          |
|                 | Transformer sizing                  | 5 VA                                                                                         |
|                 | Auxiliary switch                    | 1x SPDT, 1 mA...3 A (0.5 A inductive), DC 5 V...AC 250 V, adjustable 0...95°                 |
|                 | Switching capacity auxiliary switch | 1 mA...3 A (0.5 A inductive), DC 5 V...AC 250 V                                              |
|                 | Electrical Connection               | (2) 18 GA appliance cables, 3 ft [1 m], with 1/2" NPT conduit connectors                     |
|                 | Overload Protection                 | electronic throughout 0...95° 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, 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                                               |
|                 | Operating modes optional            | variable (VDC, 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                   | 90°                                                                                          |
|                 | Running Time (Motor)                | 150 s / 90°                                                                                  |
|                 | Running time motor variable         | 75...300 s                                                                                   |
|                 | Running time fail-safe              | <25 s @ -4...122°F [-20...50°C], <60 s @ -22°F [-30°C]                                       |
|                 | Noise level, motor                  | 50 dB(A)                                                                                     |
|                 | Noise level, fail-safe              | 62 dB(A)                                                                                     |
|                 | Position indication                 | Mechanical                                                                                   |
| Safety data     | Power source UL                     | Class 2 Supply                                                                               |
|                 | Degree of protection IEC/EN         | IP54                                                                                         |
|                 | Degree of protection NEMA/UL        | NEMA 2                                                                                       |
|                 | Enclosure                           | UL Enclosure Type 2                                                                          |

## Technical data

|             |                                             |                                                                                             |
|-------------|---------------------------------------------|---------------------------------------------------------------------------------------------|
| Safety data | Agency Listing                              | cULus acc. To UL 873 and CAN/CSA C22.2 No. 24-93                                            |
|             | Quality Standard                            | ISO 9001                                                                                    |
|             | UL 2043 Compliant                           | Suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC |
|             | Ambient humidity                            | Max. 95% RH, non-condensing                                                                 |
|             | Ambient temperature                         | -22...122°F [-30...50°C]                                                                    |
|             | Storage temperature                         | -40...176°F [-40...80°C]                                                                    |
|             | Servicing                                   | maintenance-free                                                                            |
| Weight      | Weight                                      | □                                                                                           |
| Materials   | Housing material                            | galvanized steel                                                                            |
| Footnotes   | *Variable when configured with MFT options. |                                                                                             |

## Accessories

| Electrical accessories | Description                                                                                                                           | Type   |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------|--------|
|                        | Service tool, with ZIP-USB function, for programmable and communicative Belimo actuators, VAV controller and HVAC performance devices | ZTH US |

## Electrical installation

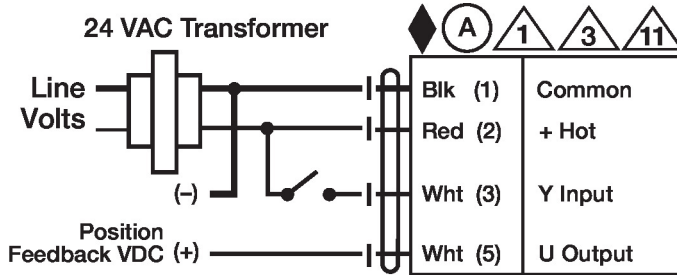
 **INSTALLATION NOTES**

-  Actuators with appliance cables are numbered.
-  Provide overload protection and disconnect as required.
-  Actuators may also be powered by DC 24 V.
-  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.
-  Control signal may be pulsed from either the Hot (Source) or Common (Sink) 24 V line.
-  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.
-  Actuators may be connected in parallel if not mechanically linked. Power consumption and input impedance must be observed.
-  IN4004 or IN4007 diode. (IN4007 supplied, Belimo part number 40155).
-  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.

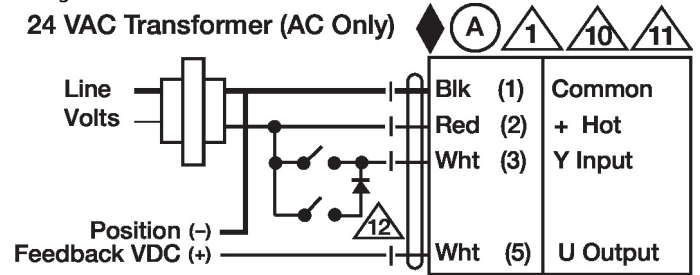
### Electrical installation

#### Wiring diagrams

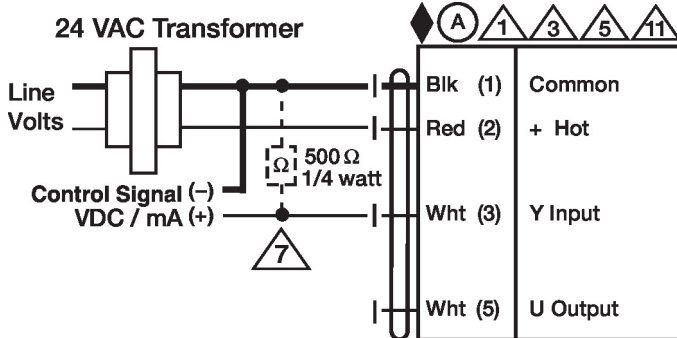
##### On/Off



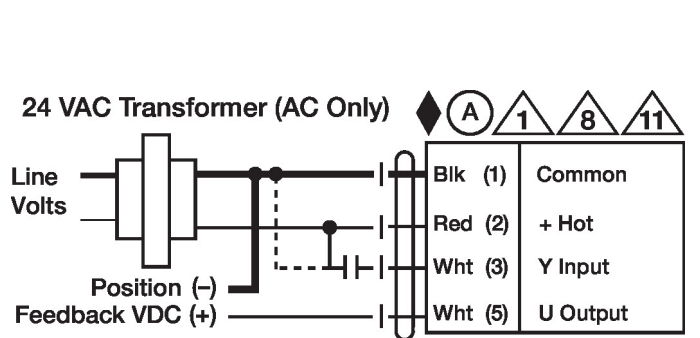
##### Floating Point



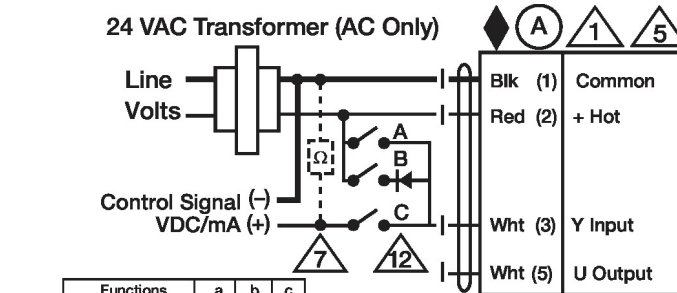
##### VDC/mA Control



##### PWM Control



##### Override Control



| Functions | a                      | b                      | c                      |
|-----------|------------------------|------------------------|------------------------|
| Min       | 0%                     | 50%                    | 100%                   |
| Mid       | 50%                    | 100%                   | Control mode acc. to Y |
| Max       | 100%                   | Control mode acc. to Y |                        |
| Normal    | Control mode acc. to Y |                        |                        |

##### Auxiliary Switches

