5

5-year warranty

Technical data

Functional data		
	Valve Size	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
	Body pressure rating note	600 psi
	Close-off pressure Δps	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	10
	Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	Valve body	Nickel-plated brass body
	Stem	stainless steel
	Stem seal	EPDM (lubricated)
	Seat	PTFE
	Characterizing disk	TEFZEL®
	Pipe connection	NPT female ends
	O-ring	EPDM (lubricated)
	Ball	stainless steel
Suitable actuators	Non-Spring	LRB(X) 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

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

Three-way Mixing

A → INLET — AB → OUTLET

Characterizing Disc (where applicable)

B Port Disc (All 3-way models)

BYPASS / B

Three-way Diverting

A ← OUTLET — AB ← INLET

Characterizing Disc (where applicable)

B Port Disc (All 3-way models)

OUTLET / B

Dimensions

Dimensional drawings

LRB, LRX

Type	DN	Weight [kg] [kg]
B323	25	0.60

A	B	C	D	E	F	H1	H2
8.5" [216]	3.1" [78]	5.9" [150]	5.1" [129]	1.3" [33]	1.6" [40]	1.2" [30]	0.9" [23]

LRB, LRX

A	B	C	D	E	F	H1	H2
9.4" [239]	3.1" [78]	7.2" [184]	6.3" [161]	1.3" [33]	1.3" [33]	1.2" [30]	0.9" [23]
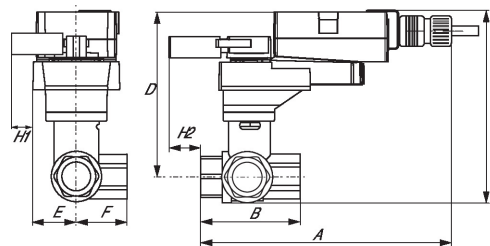
LRQB, LRQX

A	B	C	D	E	F	H1	H2
8.9" [226]	3.1" [78]	6.7" [169]	5.6" [142]	1.6" [40]	1.6" [40]	1.2" [30]	1" [25]
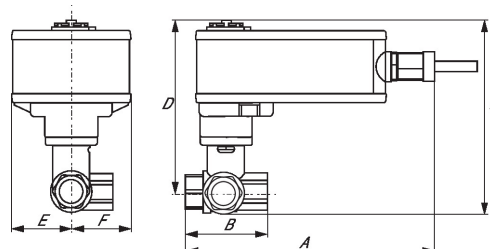
LF

A	B	C	D	E	F
8.1" [206]	3.1" [78]	6.5" [165]	5.6" [142]	1.9" [48]	1.9" [48]

5

5-year warranty

Technical data

Electrical data	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	5 VA (class 2 power source)
	Electrical Connection	18 GA appliance cable, 3 ft [1 m], with 1/2" conduit connector
	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 End point 2.5...32 V
	Options positioning signal	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)	default 150 s, variable 75...300 s
	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	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2
	Enclosure	UL Enclosure Type 2
	Agency Listing	cULus acc. To UL 873 and CAN/CSA C22.2 No. 24-93; 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% RH, non-condensing
	Servicing	maintenance-free
Weight	Weight	3.1 lbs (1.40 kg.)

Materials	Housing material	galvanized steel

Product features

Mode of operation	FBGL W'Shld for F7 HS(U) below 4" AF/GM (specify valve size)

Accessories

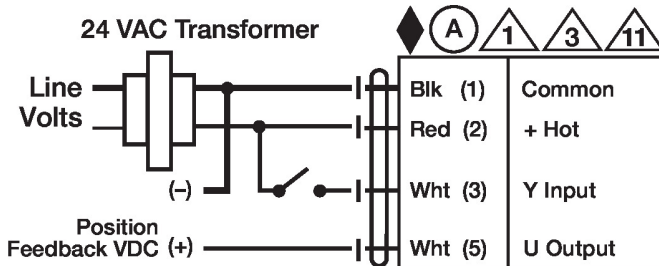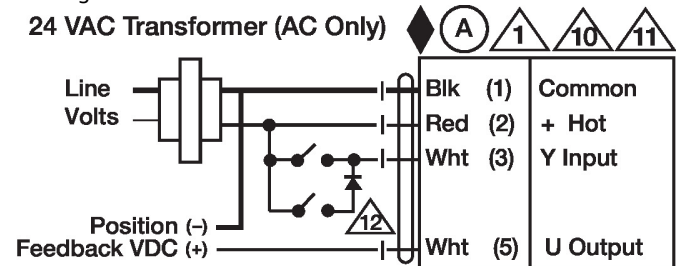| **Electrical accessories**	Description	Type
	Service Tool, with ZIP-USB function, for programmable and communicative Belimo actuators, VAV controller and HVAC performance devices	ZTH US

Electrical installation

⚒ INSTALLATION NOTES

Ⓐ Actuators with appliance cables are numbered.

⚠ Provide overload protection and disconnect as required.

⚠2 Actuators may be connected in parallel. Power consumption and input impedance must be observed.

⚠⚡ 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.

⚠3 Actuators may also be powered by DC 24 V.

⚠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 Ω 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.

⚠11 Actuators may be connected in parallel if not mechanically linked. Power consumption and input impedance must be observed.

⚠12 IN4004 or IN4007 diode. (IN4007 supplied, Belimo part number 40155).

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

⚠4 Actuators are provided with color coded wires. Wire numbers are provided for reference.

⚠ **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.
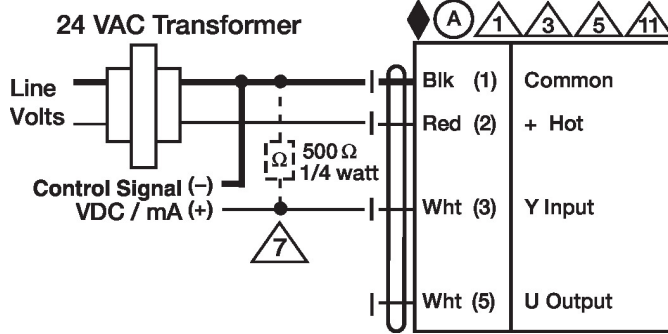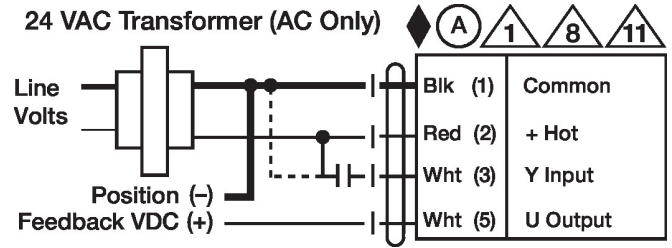
Wiring diagrams

On/Off

Floating Point

VDC/mA Control

24 VAC Transformer

Line Volts

Control Signal (−)
VDC / mA (+)

500 Ω
1/4 watt

◆ (A) /1\ /3\ /5\ /11\

Blk	(1)	Common
Red	(2)	+ Hot
Wht	(3)	Y Input
Wht	(5)	U Output

/7\

PWM Control

24 VAC Transformer (AC Only)

Line Volts

Position (−)
Feedback VDC (+)

◆ (A) /1\ /8\ /11\

Blk	(1)	Common
Red	(2)	+ Hot
Wht	(3)	Y Input
Wht	(5)	U Output

Dimensions