Bronze Body, Stainless Steel Ball and Stem

2

2-year warranty

Type overview

Type	DN
B220VS	20

Technical data

Functional data	Valve size [mm]	0.75" [20]
	Fluid	chilled or hot water, up to 60% glycol, steam
	Fluid Temp Range (water)	-22...280°F [-30...138°C]
	Body Pressure Rating	600 psig WOG psi
	Close-off pressure Δps	600 psi
	Flow characteristic	modified equal percentage
	Max Differential Pressure (Steam)	35 psi
	Flow Pattern	2-way
	Leakage rate	ANSI Class VI
	Controllable flow range	90° rotation
	Cv	51
	Maximum Inlet Pressure (Steam)	35 psi [241 kPa]
	Maximum Velocity	15 FPS
Materials	Valve body	Bronze B584-C84400
	Housing seal	PTFE
	Spindle	316 stainless steel
	Spindle seal	RPTFE
	Seat	RPTFE
	Lock nut	stainless steel
	Pipe connection	NPT female ends
	Retainer	B16 Brass
	Ball	316 stainless steel
Suitable actuators	Non-Spring	NMB(X)
		GRCB(X)
		GRB(X)
	Spring	NF

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 flow.

This valve is designed with MFT functionally which facilitates the use of various control input.
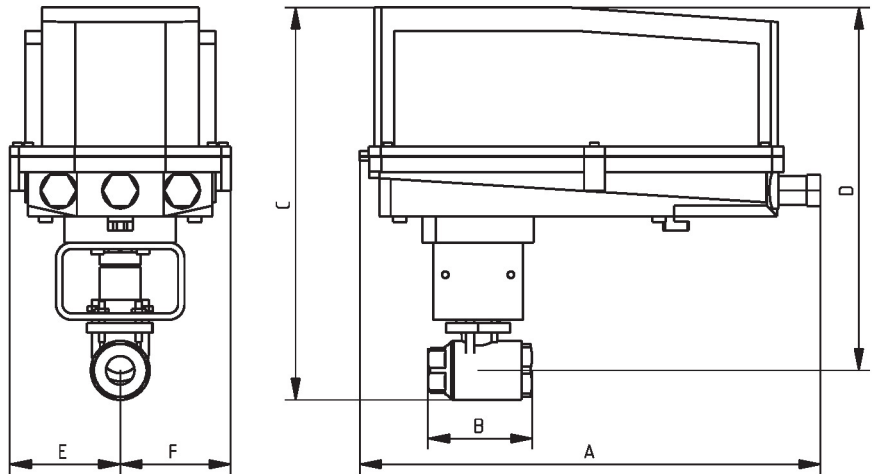
Up to 35 psi steam

1/2" - 2" 600 PSIG WOG, Cold Non-Shock

Federal Specification: WW-V-35C, Type II

Composition: BZ

Style: 3

Flow/Mounting details

Dimensions

Type	DN
B220VS	20

B220VS+GRC..N4

A	B	C	D	E	F
14.1" [358]	3.2" [82]	12.0" [305]	11.1" [282]	3.4" [86]	3.4" [86]

Modulating, Spring Return, 24 V, Multi-Function Technology®

5
5-year warranty

LISTED
94 D5
TEMP. IND. &
REG. EQUIP.

Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	6.5 W
	Power consumption in rest position	3 W
	Transformer sizing	9 VA (class 2 power source)
	Auxiliary switch	2 x SPDT, 3 A resistive (0.5 A inductive) @ AC 250 V, one set at 10°, one adjustable 10...90°
	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
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Operating range Y variable	Start point 0.5...30 V 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
	Manual override	5 mm hex crank (3/16" Allen), supplied
	Angle of rotation	95°
	Running Time (Motor)	150 s / 90°
	Running time motor variable	40...150 s
	Running time fail-safe	<20 s @ -4...122°F [-20...50°C], <60 s @ -22°F [-30°C]
	Override control	MIN (minimum position) = 0% MID (intermediate position) = 50% MAX (maximum position) = 100%
	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	UL 873 listed, CSA C22.2 No. 24 certified Listed to UL 2043 - suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC

BELIMO®

Safety data	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

Materials	Housing material	Galvanized steel and plastic housing

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
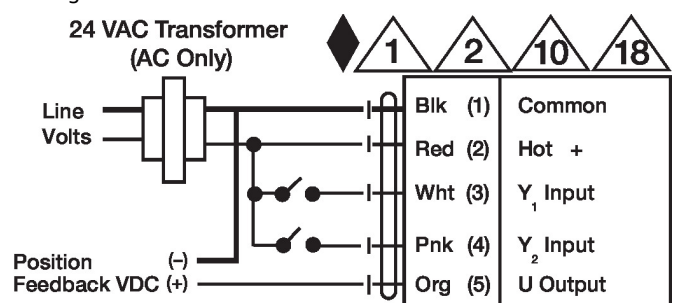
Ⓐ Actuators with appliance cables are numbered.

⚠1 Provide overload protection and disconnect as required.

⚠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).

⚡ 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.

◆ 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.
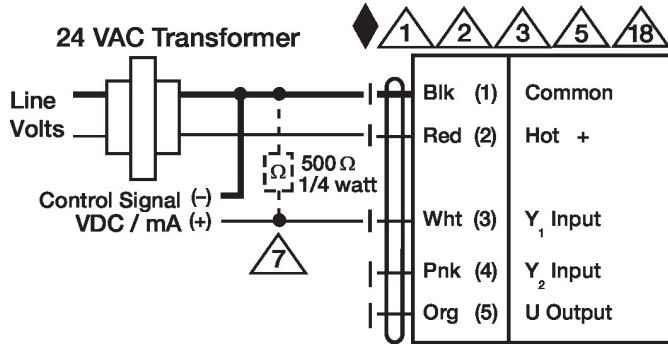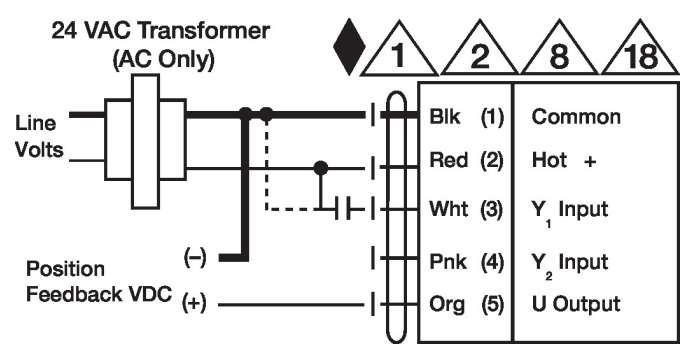
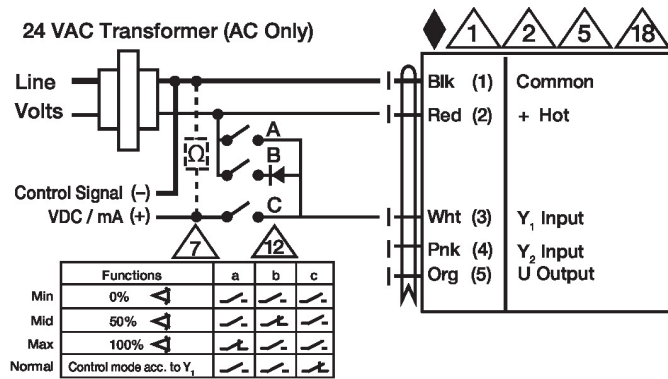### Wiring diagrams

On/Off
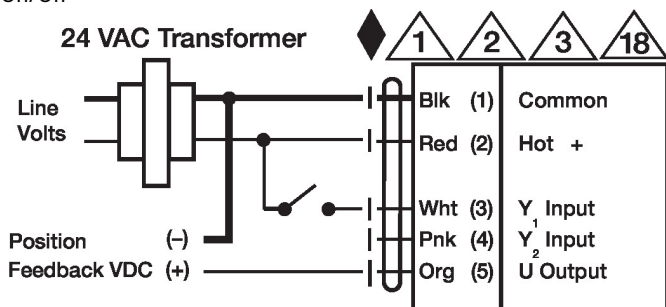
Floating Point

VDC/mA Control

PWM Control

Override Control

Functions		a	b	c
Min	0%			
Mid	50%			
Max	100%			
Normal	Control mode acc. to Y₁			

Auxiliary Switches