

Ball Valve (VS), 2", 2-way, Cv 108



2-year warranty

## Type overview

Type	DN
B249VS	50

## Technical data

Functional data	Valve size [mm]	2" [50]
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 $\Delta$ ps	600 psi	
Flow characteristic	modified equal percentage	
Leakage rate	ANSI Class VI	
Pipe connection	Internal thread NPT (female)	
Max Differential Pressure (Steam)	35 psi	
Flow Pattern	2-way	
Controllable flow range	90° rotation	
Cv	108	
Maximum Inlet Pressure (Steam)	35 psi [241 kPa]	
Maximum Velocity	15 FPS	
Materials	Valve body	Bronze B584-C84400
Housing seal	PTFE	
Stem	316 stainless steel	
Stem seal	RPTFE	
Seat	RPTFE	
Lock nut	stainless steel	
Retainer	B584-C84400 bronze	
Ball	316 stainless steel	
Suitable actuators	Non Fail-Safe	GMB(X) PRB(X) SY1
Spring	AF	
Electrical fail-safe	GMB(X) PKRB(X)	

## Safety notes

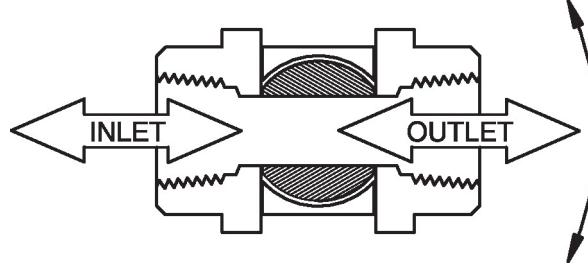


- **WARNING:** This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

<b>Application</b>	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

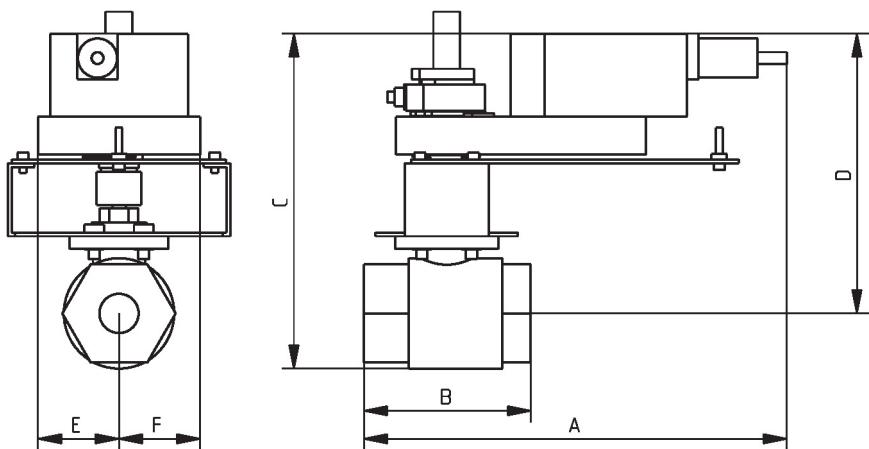
## Flow/Mounting details



## Dimensions

Type	DN	Weight
B249VS	50	6.2 lb [2.8 kg]

## Dimensions



B249VS+GK..X1

A	B	C	D	E	F
11.9" [302]	4.7" [119]	10.0" [254]	7.9" [200]	2.3" [58]	2.3" [58]

MFT/programmable, Electrical fail-safe, 24 V



## 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	12 W
	Power consumption in rest position	3 W
	Transformer sizing	21 VA
	Electrical Connection	18 GA plenum cable, 1 m, 3 m, or 5 m with 1/2" NPT conduit connector, degree of protection NEMA 2 / IP54
	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
	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
	Bridging time (PF)	2 s
	Bridging time (PF) variable	0...10 s
	Pre-charging time	5...20 s
	Direction of motion motor	selectable with switch 0/1
	Direction of motion fail-safe	reversible with switch
	Manual override	external push button
	Angle of rotation	Max. 95°
	Angle of rotation note	adjustable with mechanical stop
	Running Time (Motor)	150 s / 90°
	Running time motor variable	95...150 s
	Running time fail-safe	<35 s
	Noise level, motor	52 dB(A)
	Noise level, fail-safe	61 dB(A)
	Position indication	Mechanical, 30...65 mm stroke
Safety data	Power source UL	Class 2 Supply

## Technical data

<b>Safety data</b>	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2
	Enclosure	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
<b>Quality Standard</b>	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	
<b>Weight</b>	Weight	4.0 lb [1.8 kg]
<b>Materials</b>	Housing material	Galvanized steel and plastic housing

**Footnotes** †Rated Impulse Voltage 800V, Type of action 1.AA, Control Pollution Degree 3

## Product features

<b>Bridging time</b>	Power failures can be bridged up to a maximum of 10 s.  In the event of a power failure, the actuator will remain stationary in accordance with the set bridging time. If the power failure is greater than the set bridging time, the actuator will move into the selected fail-safe position.  The bridging time set at the factory is 2 s. It can be modified on site in operation by means of the Belimo service tool MFT-P.  Settings: The rotary knob must not be set to the "PROG FAIL-SAFE" position!  For retroactive adjustments of the bridging time with the Belimo service tool MFT-P or with the ZTH EU adjustment and diagnostic device only the values need to be entered.
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## Accessories

Electrical accessories	Description	Type
Feedback potentiometer 140 Ω add-on, grey		P140A GR
Feedback potentiometer 500 Ω add-on, grey		P500A GR
Feedback potentiometer 1 kΩ add-on, grey		P1000A GR
Feedback potentiometer 2.8 kΩ add-on, grey		P2800A GR
Feedback potentiometer 5 kΩ add-on, grey		P5000A GR
Feedback potentiometer 10 kΩ add-on, grey		P10000A GR
Auxiliary switch 1x SPDT add-on		S1A
Auxiliary switch 2x SPDT add-on		S2A
Service tool, with ZIP-USB function, for programmable and communicative Belimo actuators, VAV controller and HVAC performance devices		ZTH US

## Electrical installation

 **INSTALLATION NOTES**

 **A** Actuators with appliance cables are numbered.

 **1** Provide overload protection and disconnect as required.

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

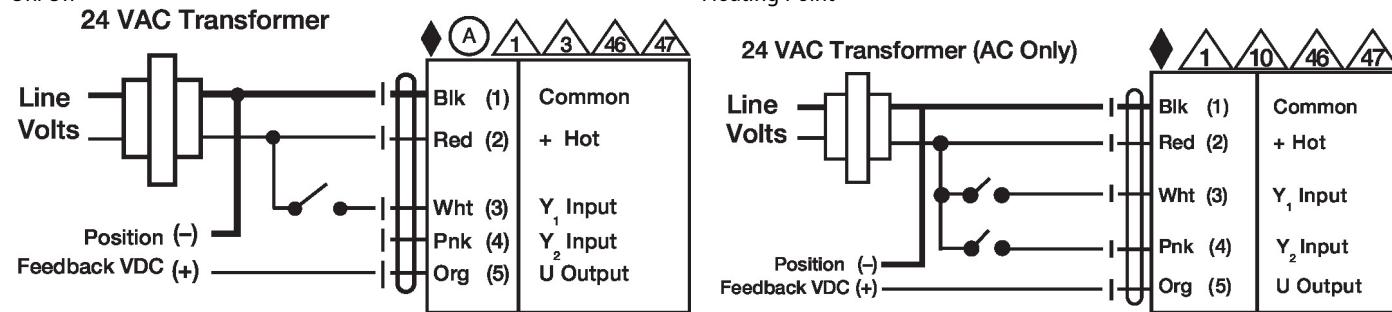
## Electrical installation

- ⚠ 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).
- ⚠ 46 Actuators may be controlled in parallel. Current draw and input impedance must be observed.
- ⚠ 47 Master-Slave wiring required for piggy-back applications. Feedback from Master to control input(s) of Slave(s).
- ◆ Meets cULus requirements without the need of an electrical ground connection.
- ⚠ Warning! Live electrical components!

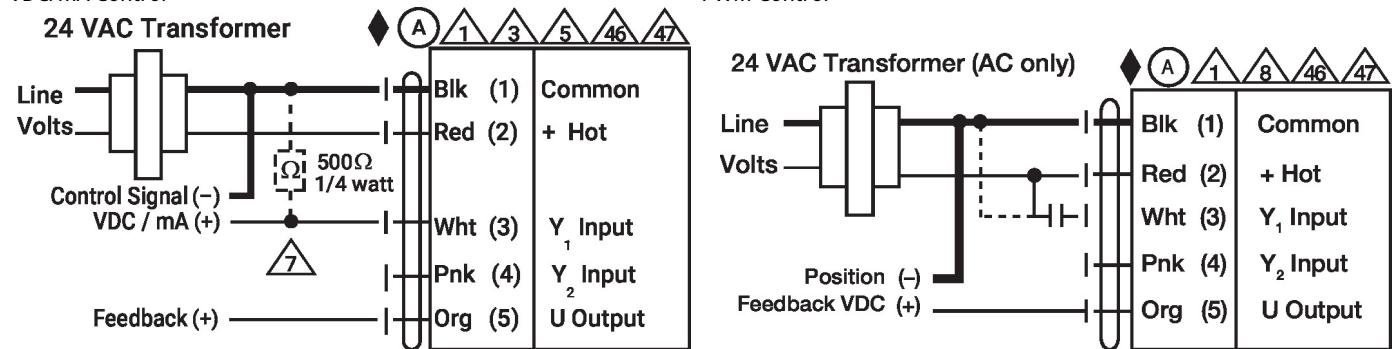
During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow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

## Wiring diagrams

On/Off



## VDC/mA Control



## Override Control

