

# B2...VS Series, 2-Way, Ball Valve Bronze Body, Stainless Steel Ball and Stem



- Live-load packing set
- Stainless steel ball & stem
- Blow-out proof stem design

## 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.

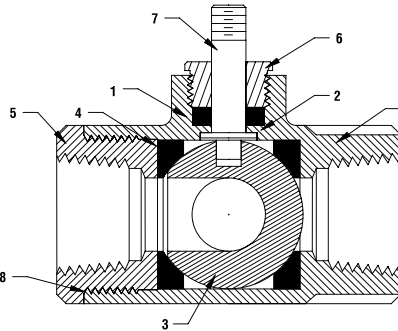
This valve is designed with MFT functionality which facilitates the use of various control input.

- Up to 35 psi steam
- 1/2" - 600 PSIG WOG, Cold Non-Shock.
- Federal Specification: WW-V-35C, Type II  
Composition: BZ  
Style: 3

## Technical Data

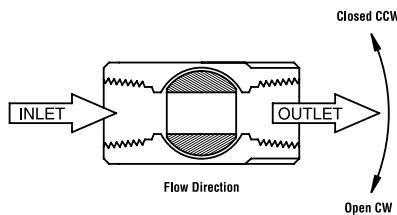
Media	Chilled or hot water, glycol, 35# steam
Flow Characteristic	Modified equal percentage
Action	90° rotation valve open CW, valve closed CCW
Sizes	1/2", 3/4", 1", 1 1/4", 1 1/2", 2", 2 1/2", 3"
Type of end fitting	SAE NPT (Female Connections)
<b>Materials:</b>	
1 Stem Packing	Reinforced PTFE
2 Stem Bearing	Reinforced PTFE
3 Ball	316 Stainless Steel
4 Seat (x2)	Reinforced PTFE w/ Durafill
5 Retainer	B16 (3/4" - 1") Brass B584 (1 1/4" - 3") Brass
6 Gland	B16 Brass
7 Stem	316 Stainless Steel
8 Jam Nut	Stainless Steel
9 Body Seal	PTFE (1-1/4" to 3")
10 Body	B584-C84400 Bronze

Cv	Valve Nominal Size		Type	Suitable Return Actuators	
	Inches	DN [mm]	2-way NPT	Spring	Non-Spring
1	1/2	15	B2050VS-01	LF Series	LM Series
2	1/2	15	B2050VS-02		
4	1/2	15	B2050VS-04		
15	1/2	15	B2050VS-15	NF	NM
30	3/4	20	B219VS		
51	3/4	20	B220VS	AF Series	AM Series
43	1	25	B224VS		
68	1	25	B225VS		
48	1 1/4	32	B232VS		
84	1 1/2	40	B239VS		
177	1 1/2	40	B240VS		
108	2	50	B249VS	GM Series	SY Series
389	2	50	B250VS		
503	2 1/2	65	B265VS		
370	3	80	B280VS		

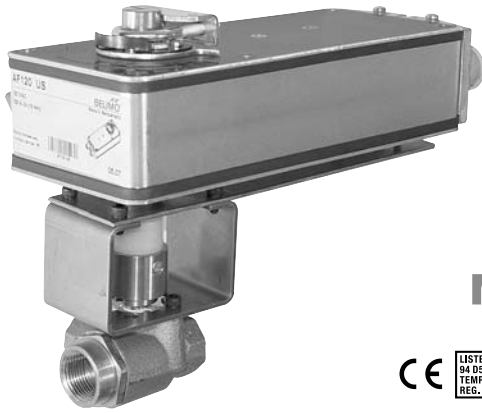


Pressure rating	600 psig WOG
Media temp. range	-22°F to 280°F (-30°C to 138°C)
Close-off pressure	600 psig @ 100°F
Maximum differential pressure (ΔP)	<600 psig

## Flow Patterns



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**MFT**

**2**  
YEAR  
WARRANTY



## Models

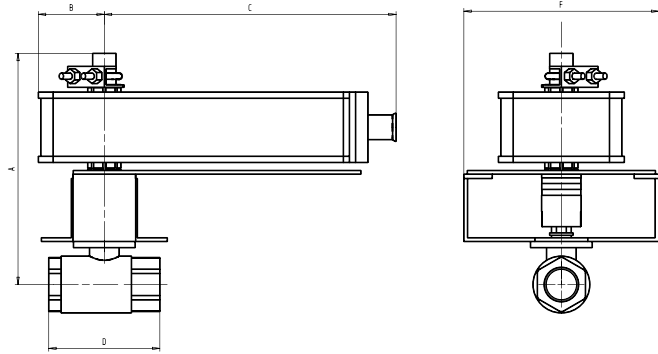
AF24-MFT US  
AF24-MFT-S US w/built-in Aux. Switches  
AF24-MFT95 US

Technical Data	
Control	MFT
Control signal	2 to 10 VDC, (4 to 20 mA with 500 Ω resistor) 0-135 Ω (MFT95)
Power supply	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Power consumption	running 6 W holding 2.5 W
Transformer sizing	10 VA, class 2 power
Electrical connection (-S model has 2 cables)	½" conduit connector 3 ft [1m], 18 GA appliance cable
Overload protection	electronic throughout rotation
Input impedance	100 kΩ for 2 to 10 VDC (0.1 mA) 500 Ω for 4 to 20 mA 750 Ω for PWM 1500 Ω for on/off and floating point
Feedback output	2 to 10 VDC, 0.5 mA max
Angle of rotation	95°
Direction of Rotation	spring reversible with CW/CCW mounting motor reversible with built-in ↻/↻ switch
Position indication	visual indicator
Manual override	hex crank
Running time	control 150 sec. independent of load spring <20 sec.
Ambient temperature	-22° F to 122° F [-30° C to 50° C]
Housing	NEMA 2 / IP54
Agency listings	UL 873, CSA C22.2 No. 24 certified, CE
Noise level	max. 45 dB(A)

AF24-MFT-S US	
Auxiliary switches	2 x SPDT, 7A (2.5A) @ 250 VAC, UL listed, one switch is fixed at +5°, one is adjustable 25° to 85° (double insulated)

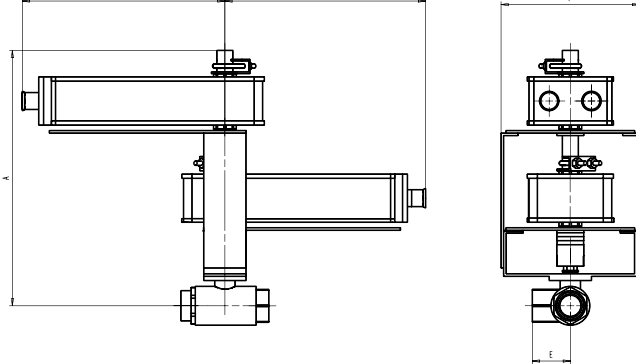
\* Dual Mounted Actuators

## Dimensions with 2-Way Valve



Valve Body	COP	Valve Nominal Size		Dimensions (Inches)				
		Inches	DN [mm]	A	B	C	D	F
B224VS	400	1	25	7.00	2.00	8.00	3.37	6.25
B225VS	50	1	25	7.00	2.00	8.00	3.62	6.25
B232VS	200	1¼	32	7.25	2.00	8.00	3.97	6.25
*B239VS	400	1½	40	7.50	2.00	8.00	4.37	6.25
*B240VS	50	1½	40	7.50	2.00	8.00	4.75	6.25
*B249VS	200	2	50	8.00	2.00	8.00	4.68	6.25
B219VSS	1000	¾	20	6.70	2.00	8.00	2.25	6.25
B224VSS	1000	1	25	7.00	2.00	8.00	3.37	6.25
B232VSS	1000	1¼	32	7.25	2.00	8.00	3.97	6.25
*B232VSS	1000	1¼	32	7.25	2.00	8.00	3.97	6.25
*B239VSS	1000	1½	40	6.70	2.00	8.00	4.37	6.25
*B249VSS	400	2	50	8.00	2.00	8.00	4.68	6.25

## Dimensions with 3-Way Valve



Valve Body	COP	Valve Nominal Size		Dimensions (Inches)					
		Inches	DN [mm]	A	B	C	D	E	F
B325VS	75	1	25	7.00	2.00	8.00	3.56	1.88	3.86
B332VS	75	1¼	32	7.00	2.00	8.00	4.13	2.07	6.25
*B325VS	200	1	25	7.00	2.00	8.00	3.56	1.88	3.86
*B332VS	200	1¼	32	7.00	2.00	8.00	4.13	2.07	6.25
*B340VS	75	1½	40	7.00	2.00	8.00	4.44	2.25	6.25
*B350VS	75	2	50	7.00	2.00	8.00	5.38	2.75	6.25

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### Wiring Diagrams

#### INSTALLATION NOTES

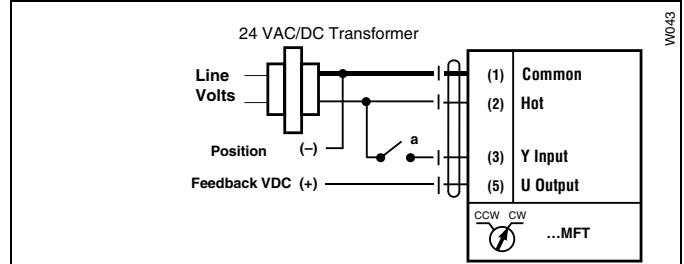
- 2 **CAUTION Equipment damage!**  
Actuators may be connected in parallel if not mechanically mounted to the same shaft. Power consumption and input impedance must be observed.
- 3 Actuators may also be powered by 24 VDC.
- 4 IN4004 or IN4007 diode (IN4007 supplied, Belimo part number 40155).
- 5 Triac A and B can also be contact closures.
- 6 Control signal may be pulsed from either the Hot (Source) or Common (Sink) 24 VAC line.
- 7 Position feedback cannot be used with Triac sink controller. The actuators internal common reference is not compatible.

#### APPLICATION NOTES

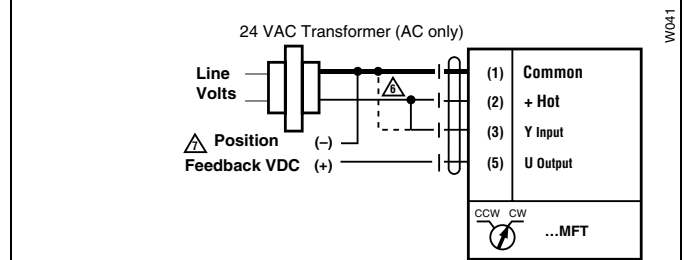
- ◆ The ZG-R01 500 Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC, up to 2 actuators may be connected in parallel.
- ◆ Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

**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.

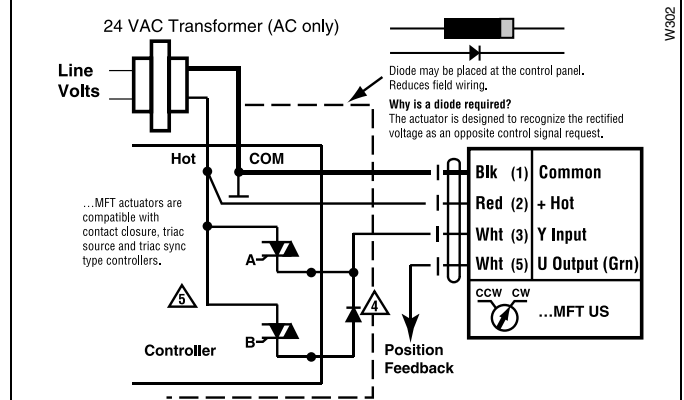
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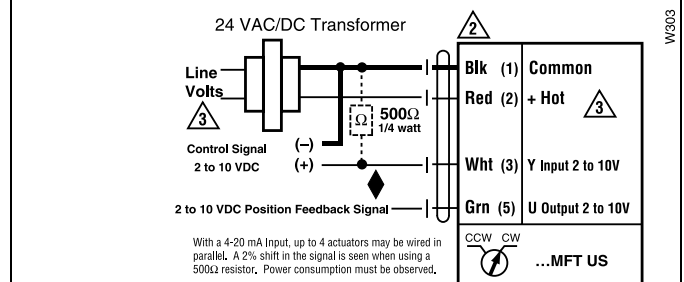
On/Off control



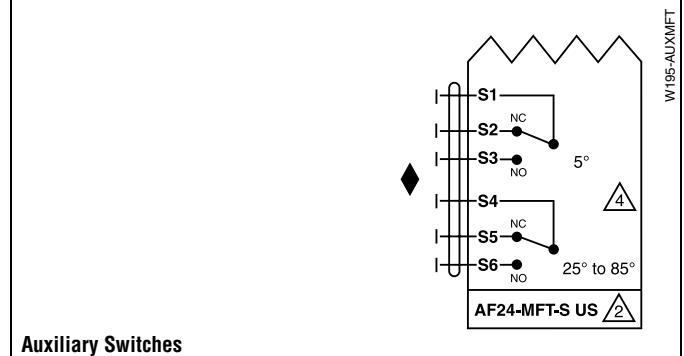
PWM, triac source and sink



Floating Point control



Proportional 2 to 10 or 4 to 20 mA control signal



Auxiliary Switches

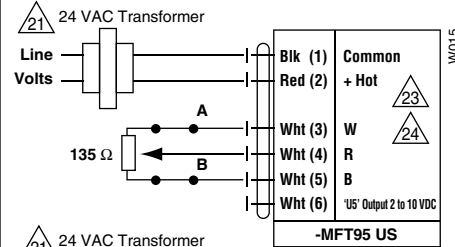
## INSTALLATION NOTES

- 21 Provide overload protection and disconnect as required.
- 22 Actuators and controller must have separate transformers.
- 23 Consult controller instruction data for more detailed information.
- 24 Resistor value depends on the type of controller and the number of actuators. Honeywell® resistor kits may also be used.
- 25 To reverse control rotation, use the reversing switch.

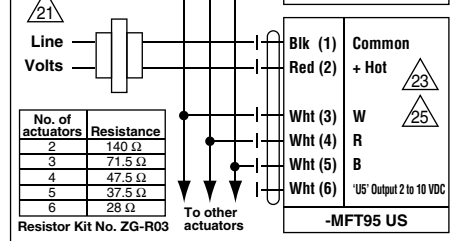
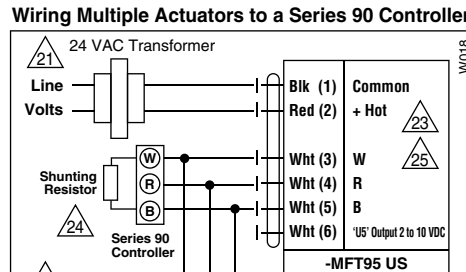
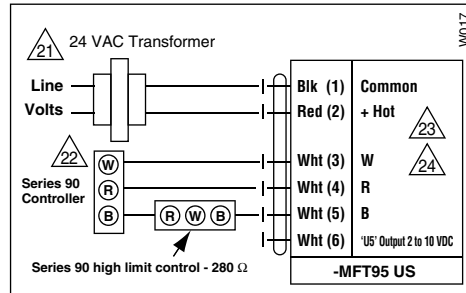
### Override

Switch A	Switch B	Damper Position
		Damper Open
		Damper Closed

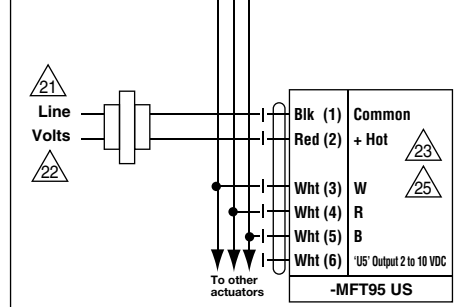
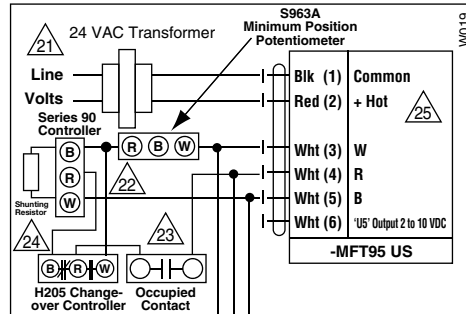
The direction of rotation switch is set so that the fail safe position and the position of the damper is closed with no signal at wire R.



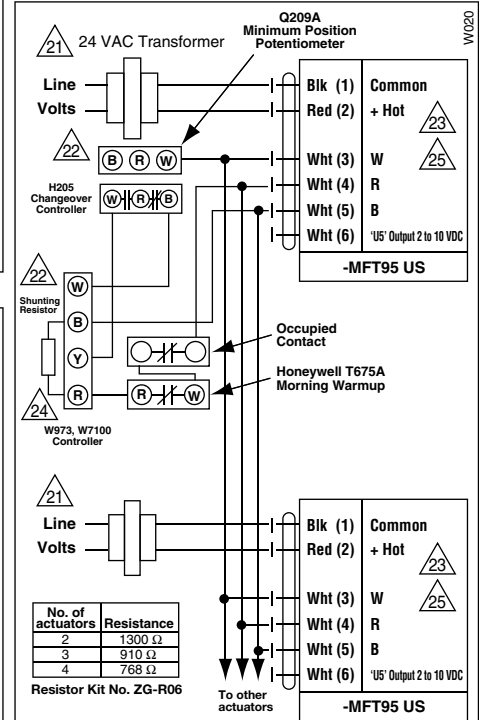
### High Limit Control



### Wiring Multiple Actuators to a Series 90 Controller using a Minimum Position Potentiometer



### Typical wiring diagrams for multiple actuators used with the W973, W7100 and T775 controllers



No. of actuators	Resistance
2	1300 Ω
3	910 Ω
4	768 Ω

Resistor Kit No. ZG-R06

Used with the W973 and W7100 controllers

