



- 200 psi (2" to 12") bubble tight shut-off
- Long stem design allows for 2" insulation
- Completely assembled and tested, ready for installation

### Application

These valves are designed to meet the needs of HVAC and commercial applications requiring bubble tight shut-off for liquids. Typical applications include chiller isolation, cooling tower isolation, change-over systems, large air handler coil control, bypass and process control applications. The large C<sub>v</sub> values provide for an economical control valve solution for larger flow applications.

### Jobsite Note

Valves should be stored in a weather protected area prior to construction.

Technical Data	
Service	chilled, hot water, 60% glycol
Flow characteristic	modified equal percentage
Action	90° rotation
Sizes	2" to 12"
Type of end fitting	grooved ANSI/AWWA (C606)
Materials*	
Body	ductile iron ASTM A536, grade 65-45-12
Disc	electroless nickel coated ductile iron
Seat	EPDM
Shaft	416 stainless steel
Body pressure rating	300 psi at -30°F to 275°F
Media temperature range	-30°F to 250°F [-34°C to 120°C]
Operation ambient temperature range	-22°F to 122°F [-30°C to 50°C]
Maximum close-off pressure	200 psi
Maximum velocity	20 FPS

\*VIC®300 Masterseal™ as manufactured by Victaulic Company

C <sub>v</sub> 90°	C <sub>v</sub> 60°	2-way			Suitable Actuators			
		Valve Nominal Size	DN [mm]	Type	Spring Return	Non-Spring Return		
		IN		2-way	VIC	VIC	VIC	VIC
115	36	2"	50	F650VIC	AF Series	AM Series	GM Series	SY Series
260	80	2½"	65	F665VIC				
440	140	3"	80	F680VIC				
820	250	4"	100	F6100VIC				
1200	370	5"	125	F6125VIC				
1800	560	6"	150	F6150VIC				
3400	1050	8"	200	F6200VIC				
5800	1800	10"	250	F6250VIC				
9000	2790	12"	300	F6300VIC				

Valve	Size	C <sub>v</sub>	30°	40°	50°	60°	70°	90°
F650VIC	2"	115	7	14	23	36	60	115
F665VIC	2-1/2"	260	16	30	50	80	140	260
F680VIC	3"	440	26	50	90	140	230	440
F6100VIC	4"	820	50	100	160	250	430	820
F6125VIC	5"	1200	70	140	240	370	620	1200
F6150VIC	6"	1800	110	220	360	560	940	1800
F6200VIC	8"	3400	200	410	670	1050	1770	3400
F6250VIC	10"	5800	350	700	1150	1800	3020	5800
F6300VIC	12"	9000	540	1080	1780	2790	4680	9000

### Maximum Dimensions (Inches)

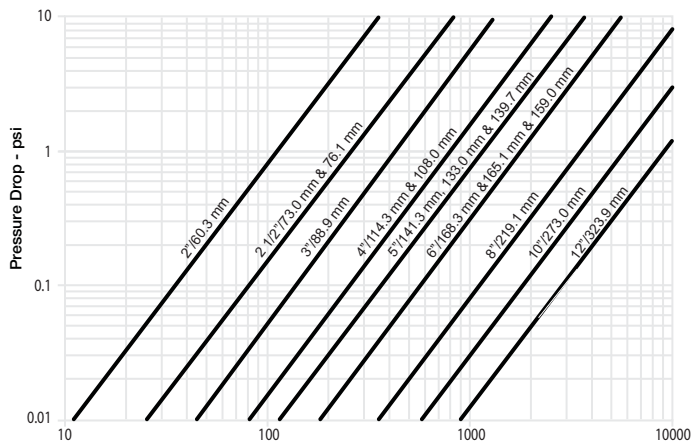
Valve	Size	C <sub>v</sub> 90°	A(Max)	B (Max)	C (Max)	D(Max)	Actuator	Close-Off (PSI)	
F650VIC	2"	115	3.21 [81.5]	4.7 [120]	8.0 [204]	13.2 [334]	AM...	200	Non-Spring Return
F665VIC	2½"	260	3.77 [95.8]	4.7 [120]	8.0 [204]	13.6 [345]		50	
F665VIC	2½"	260	3.77 [95.8]	7.0 [178]	8.0 [204]	14.0 [358]		200	
F680VIC	3"	440	3.77 [95.8]	7.0 [178]	8.0 [204]	14.3 [364]	GM...	200	
F6100VIC	4"	820	4.63 [117.6]	8.6 [219]	8.0 [204]	19.6 [499]		2*GM	
F650VIC	2"	115	3.21 [81.5]	2.0 [51]	8.6 [219]	14.0 [357]	AF...	200	
F665VIC	2½"	260	3.77 [95.8]	2.0 [51]	8.6 [219]	14.5 [368]		50	
F665VIC	2½"	260	3.77 [95.8]	8.6 [219]	8.6 [219]	18.7 [476]	2*AF...	200	
F680VIC	3"	440	3.77 [95.8]	2.0 [51]	8.6 [219]	14.7 [374]	AF...	50	
F650VIC	2"	115	3.21 [82]	3.2 [82]	2.4 [61]	15.7 [398]	SY1...	200	Non-Spring Return
F665VIC	2½"	260	3.77 [96]	3.2 [82]	2.4 [61]	16.2 [409]		200	
F680VIC	3"	440	3.77 [96]	3.2 [82]	2.4 [61]	16.4 [415]		50	
F680VIC	3"	440	3.77 [96]	4.6 [117]	9.2 [234]	26 [660]	SY2...	200	
F6100VIC	4"	820	4.63 [118]	4.6 [117]	9.2 [234]	26.7 [679]		200	
F6125VIC	5"	1200	5.88 [150]	4.6 [117]	9.2 [234]	27.7 [704]	SY2.../ SY3...	50/200	
F6150VIC	6"	1800	5.88 [150]	4.6 [117]	9.2 [234]	28.2 [717]	SY2.../ SY3...	50/200	
F6200VIC	8"	3400	5.33 [136]	7.3 [184]	10.9 [275]	33.3 [846]	SY4...	200	
F6250VIC	10"	5800	6.40 [163]	7.3 [184]	10.9 [275]	35 [890]	SY4.../ SY5...	50/200	
F6300VIC	12"	9000	6.50 [165]	7.3 [184]	10.9 [275]	36 [916]	SY6...	200	

†SY6 and larger available in 110/220 VAC versions only.  
 SY... maximum actuator ambient temperature is 150°F.

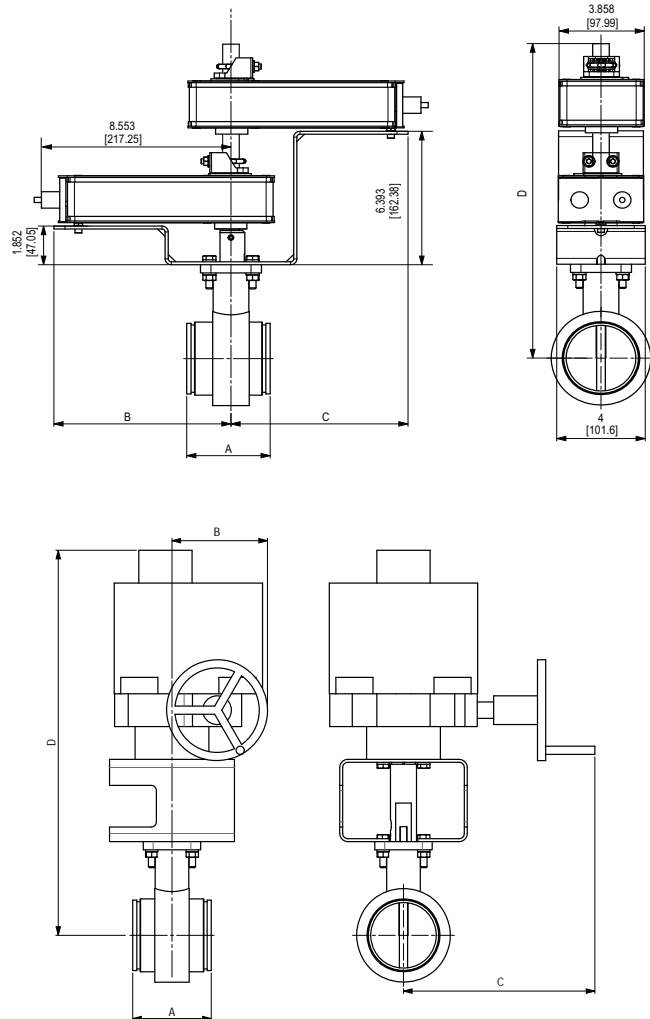
### Application Notes

1. Valves are rated at 200 psi differential pressure in the closed position
2. 2-way assemblies are furnished assembled and tested, ready for installation.
3. Dimension "D" allows for actuator removal without the need to remove the valve from the pipe.
4. Belimo SY Series actuators are NEMA 4X rated.
5. Provide support for the actuator if it is mounted at any angle other than 90° vertical.
6. Installer is to use rigid type couplings for connecting the valve to the piping.

### Flow Rate (GPM)



### Dimensions



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Technical Data	
Service	chilled, hot water, 60% glycol
Flow characteristic	modified linear
Action	90° rotation
Sizes	2" to 12"
Type of end fitting	grooved ANSI/AWWA (C606)
Valve Materials*	
Body	ductile iron ASTM A536, grade 65-45-12
Disc	electroless nickel coated ductile iron
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Shaft	416 stainless steel
Body pressure rating	300 psi at -30°F to 275°F
Media temperature range	-30°F to 250°F [-34°C to 120°C]
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Maximum close-off pressure	200 psi
Maximum velocity	20 FPS

\*VIC®300 Masterseal™ as manufactured by Victaulic Company

C <sub>v</sub> 90°	C <sub>v</sub> 60°	3-way		Suitable Actuators				
		Valve Nominal Size		Type	Spring Return		Non-Spring Return	
		IN	DN [mm]	2-way	VIC	VIC	VIC	VIC
115	36	2"	50	F750VIC	AF Series	AM	GM Series	SY Series
260	80	2½"	65	F765VIC				
440	140	3"	80	F780VIC				
820	250	4"	100	F7100VIC				
1200	370	5"	125	F7125VIC				
1800	560	6"	150	F7150VIC				
3400	1050	8"	200	F7200VIC				
5800	1800	10"	250	F7250VIC				
9000	2790	12"	300	F7300VIC				

Valve	Size	C <sub>v</sub>	30°	40°	50°	60°	70°	90°
F750VIC	2"	115	7	14	23	36	60	115
F765VIC	2-1/2"	260	16	30	50	80	140	260
F780VIC	3"	440	26	50	90	140	230	440
F7100VIC	4"	820	50	100	160	250	430	820
F7125VIC	5"	1200	70	140	240	370	620	1200
F7150VIC	6"	1800	110	220	360	560	940	1800
F7200VIC	8"	3400	200	410	670	1050	1770	3400
F7250VIC	10"	5800	350	700	1150	1800	3020	5800
F7300VIC	12"	9000	540	1080	1780	2790	4680	9000

### Maximum Dimensions (Inches)

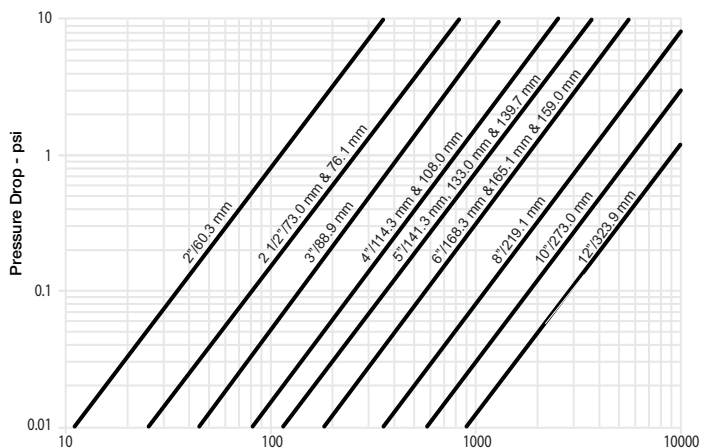
Valve	Size	C <sub>v</sub> 90°	A(Max)	B(Max)	C(Max)	D(Max)	Actuator	Close-Off (PSI)	
F750VIC	2"	115	3.2 [82]	6.5 [165]	13.1 [334]	13.2 [334]	AM...	50	Non-Spring Return
F750VIC	2"	115	3.2 [82]	6.5 [165]	13.6 [347]	13.6 [345]	GM...	200	
F765VIC	2½"	260	3.8 [96]	7.5 [191]	14.1 [356]	14.0 [358]		50	
F765VIC	2½"	260	3.8 [96]	7.5 [191]	14.1 [356]	14.3 [364]	2*GM	200	
F780VIC	3"	440	3.8 [96]	8.0 [204]	14.3 [364]	19.6 [499]		50	Spring Return
F650VIC	2"	115	3.21 [81.5]	2.0 [51]	8.6 [219]	14.0 [357]	AF...	200	
F665VIC	2½"	260	3.77 [95.8]	2.0 [51]	8.6 [219]	14.5 [368]	2*AF...	50	
F665VIC	2½"	260	3.77 [95.8]	8.6 [219]	8.6 [219]	18.7 [476]		200	
F750VIC	2"	115	3.2 [82]	6.5 [165]	15.7 [398]	15.7 [398]	SY1...	200	Non-Spring Return
F765VIC	2½"	260	3.8 [96]	7.5 [191]	16.2 [409]	16.2 [409]		50	
F765VIC	2½"	260	3.8 [96]	7.5 [191]	25.7 [654]	16.4 [415]		200	
F780VIC	3"	440	3.8 [96]	8.0 [204]	26.0 [660]	26 [660]	SY2...	200	
F7100VIC	4"	820	4.6 [118]	9.6 [245]	26.7 [679]	26.7 [679]		200	
F7125VIC	5"	1200	5.9 [150]	11.4 [290]	27.7 [704]	27.7 [704]		200	
F7150VIC	6"	1800	5.9 [150]	12.4 [315]	28.3 [717]	28.2 [717]	SY3...	50	
F7150VIC	6"	1800	5.9 [150]	12.4 [315]	32.1 [814]	33.3 [846]		200	
F7200VIC	8"	3400	5.3 [135]	13.1 [333]	33.3 [846]	35 [890]	SY4...	200	
F7250VIC	10"	5800	6.4 [163]	15.4 [392]	35.1 [890]	35.1 [890]	SY6...	50	
F7250VIC	10"	5800	6.4 [163]	15.4 [392]	38.7 [981]	38.7 [981]		200	
F7300VIC	12"	9000	6.5 [165]	16.5 [419]	39.7 [1007]	39.7 [1007]	SY7...	200	

†SY6 and larger available in 110/220 VAC versions only.  
SY... maximum actuator ambient temperature is 150°F.

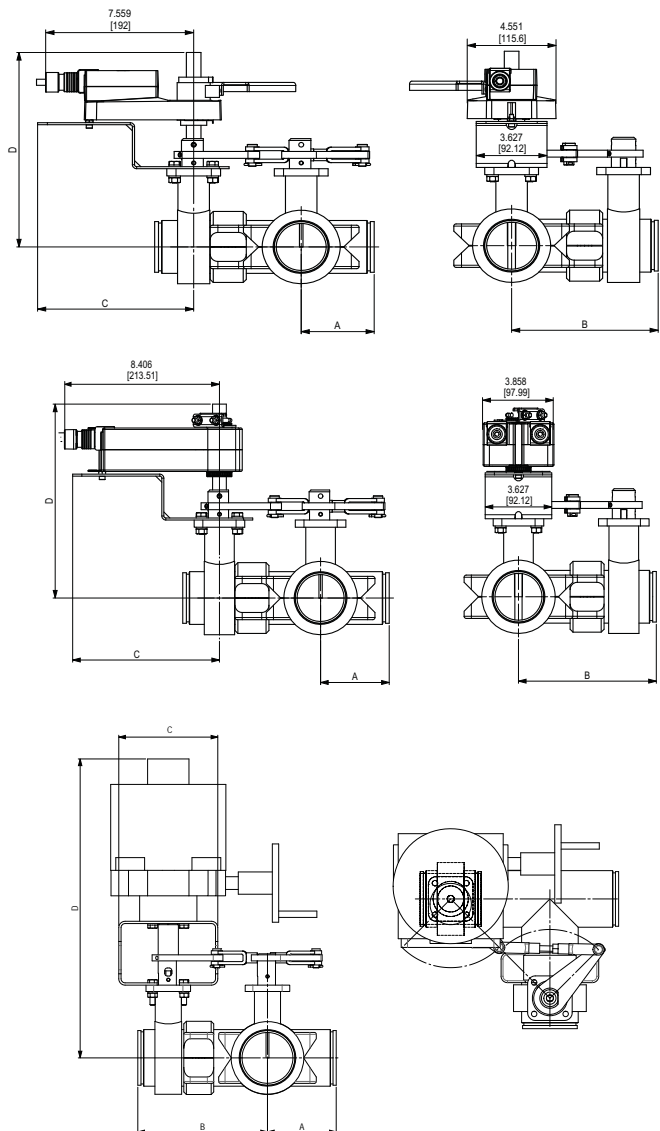
### Application Notes

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### Flow Rate (GPM)



### Dimensions



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## Models

AFX24-MFT-X1

AFX24-MFT-S-X1 w/built-in Aux. Switches

### Technical Data

Power supply	24 VAC, +/- 20%, 50/60 Hz 24 VDC, +20% / -10%
Power running consumption	7.5 W
Power holding consumption	3 W
Transformer sizing	10 VA (Class 2 power source)
Electrical connection	AFX... 3 ft [1m] default, 10 ft [3m] or 16 ft [5m] 18 GA appliance or plenum cables, with or without 1/2" conduit connector <b>-S models:</b> two 3 ft [1m] default, 10 ft [3m] or 16 ft [5m] appliance cables with or without 1/2" conduit connectors
Overload protection	electronic throughout 0 to 95° rotation
Operating range Y*	2 to 10 VDC, 4 to 20 mA (default) variable (VDC, PWM, floating point, on/off)
Input impedance	100 kΩ for 2 to 10 VDC (0.1 mA) 500 Ω for 4 to 20 mA 1500 Ω for PWM, floating point and on/off control
Feedback output U*	2 to 10 VDC, 0.5 mA max
Torque	minimum 180 in-lb (20 Nm)
Direction of rotation	spring reversible with cw/ccw mounting motor reversible with built-in switch
Mechanical angle of rotation*	95° (adjustable with mechanical end stop, 35° to 95°)
Running time	spring <20 sec @ -4°F to 122°F [-20° C to 50° C]; <60 sec @ -22°F [-30° C] motor* 150 seconds (default), variable (70 to 220 seconds)
Angle of Rotation adaptation	off (default)
Override control*	min position = 0% mid. position = 50% max. position = 100%
Position indication	visual indicator, 0° to 95° (0° is spring return position)
Manual override	5 mm hex crank (3/16" Allen), supplied
Humidity	max. 95% RH, non-condensing
Ambient temperature	-22 to 122° F (-30 to 50° C)
Storage temperature	-40 to 176° F (-40 to 80° C)
Housing	NEMA 2, IP54, Enclosure Type 2
Housing material	zinc coated metal and plastic casing
Noise level	≤40dB(A) motor @ 150 seconds, run time dependent ≤62dB(A) spring return
Agency listings †	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EC & 2006/95/EC
Quality standard	ISO 9001
Servicing	maintenance free
Weight	4.6 lbs. (1.9 kg), 4.9 lbs. (2 kg) with switch

\* Variable when configured with MFT options

† Rated Impulse Voltage 800V, Type of action 1.AA (1.AA.B for -S version), Control Pollution Degree 3.

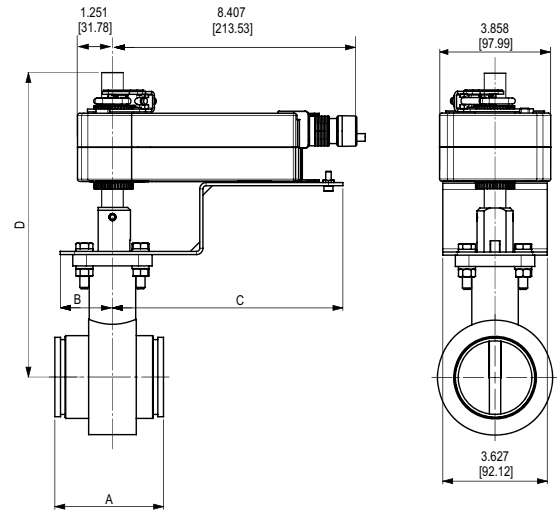
♦ Programmed for 70 sec motor run time. At 150 sec motor run time, transformer sizing is 8.5 VA and power consumption is 6 W running / 3 W holding.

### AFX24-MFT-S-X1

Auxiliary switches	2 x SPDT 3A (0.5A) @ 250 VAC, UL approved one set at +10°, one adjustable 10° to 90°
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## AFX Actuators, Multi-Function Technology

### Dimensions with 2-Way Valve

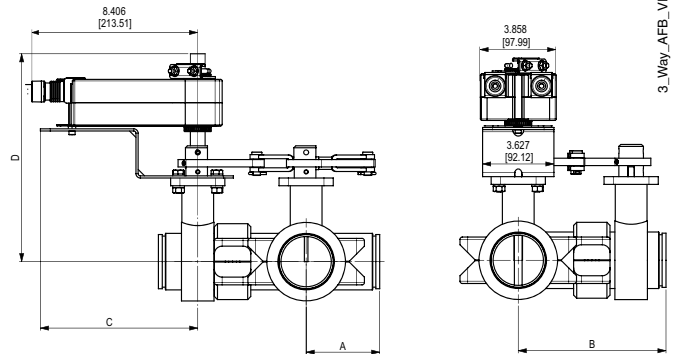


2\_Way\_AFB\_VIC

### Dimensions (Inches)

Valve	Size	A	B	C	D(Max)	PSI
F650VIC	2"	3.20	2.00	8.00	14.00	200
F665VIC	2½"	3.70	2.00	8.00	14.50	50

### Dimensions with 3-Way Valve



3\_Way\_AFB\_VIC

### Dimensions (Inches)

Valve	Size	A	B	C	D(Max)	PSI
F750VIC	2"	3.20	2.00	8.00	14.00	50

## Wiring Diagrams

### INSTALLATION NOTES

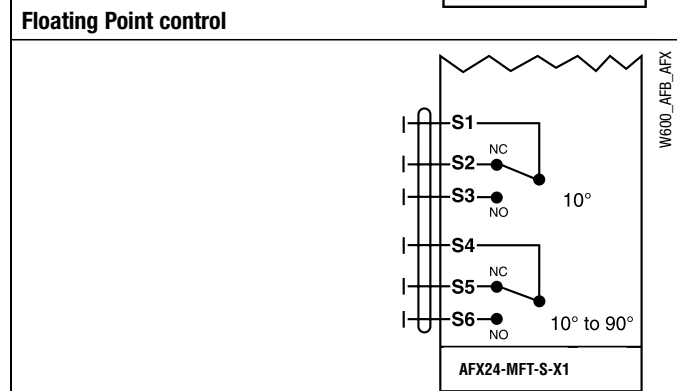
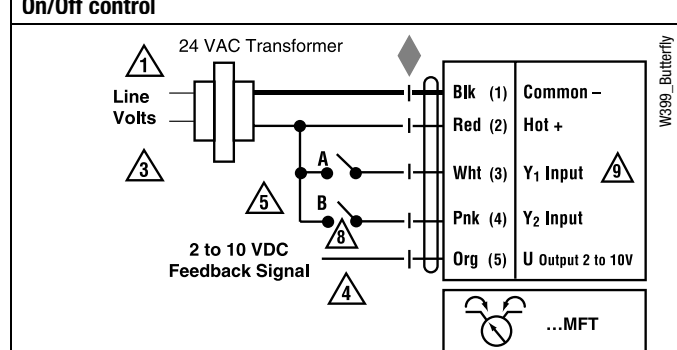
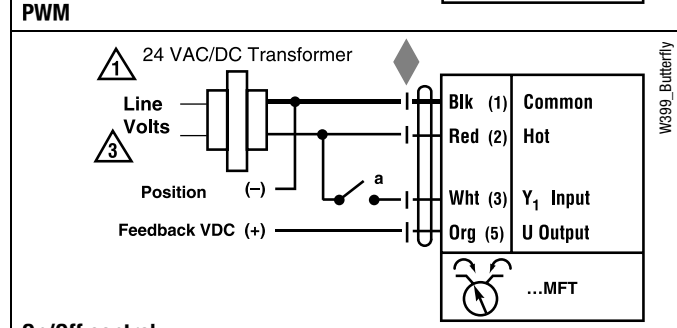
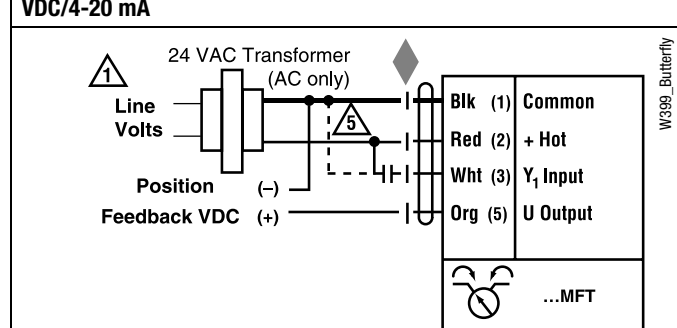
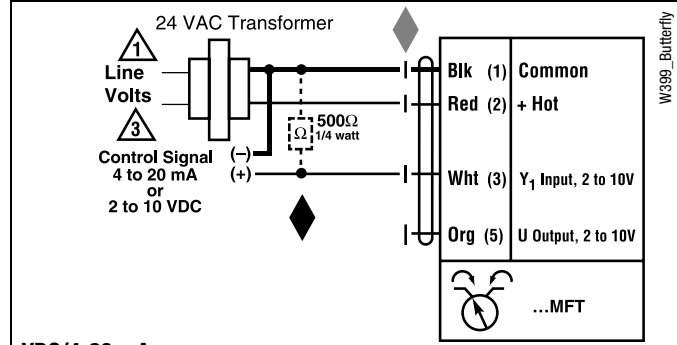
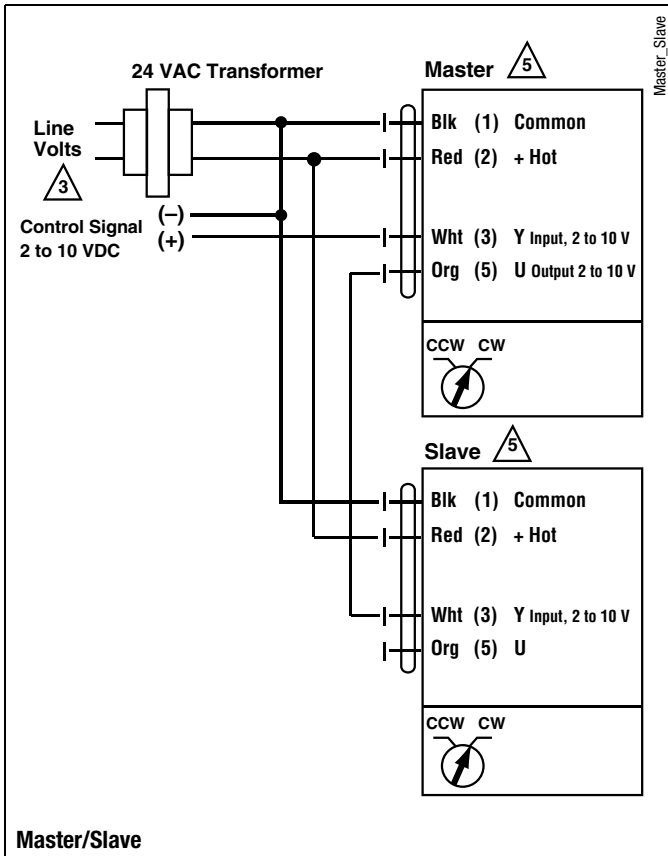
- 3 Actuators may also be powered by 24 VDC.
- 4 IN4004 or IN4007 diode (IN4007 supplied, Belimo part number 40155).
- 5 Triac A and B can also be contact closures.
- 6 Control signal may be pulsed from either the Hot (Source) or Common (Sink) 24 VAC line.
- 7 Position feedback cannot be used with Triac 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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