

# Electronic Globe Valves

G2...(S), G3...(D) Series

<b>G2...(S)</b>	<b>Two-way Screwed Bronze or Stainless Trim</b>
<b>G3...(D)</b>	<b>Three-way Screwed Bronze Trim</b>

Three-way Valves available in Mixing or Diverting

**½" to 2"**

<b>Service</b>	<b>Chilled/hot water, 60% glycol, steam (G2, G2S)</b>
<b>C<sub>v</sub> Range</b>	<b>0.4-40 (Two-way) 2.2-41 (Three-way Mixing) 4.4-40 (Three-way Diverting)</b>
<b>Material</b>	<b>Stainless steel stem, Bronze plug or Stainless plug</b>
<b>Control</b>	<b>On/Off, Floating, 2-10 VDC Multi-Function Technology® Spring Return or Non-Spring Return</b>



## FEATURES

- Self-adjusting stroke
- Visual sliding stroke indicators  
– Position indicators adjusted automatically
- Assembly can be mounted with valve stem horizontal to the pipe
- Self locking valve coupling

## BENEFITS

- Utilizes full control signal for maximum resolution
- Speeds installation and system check
- Piping flexibility
- Proper valve-actuator connection is ensured

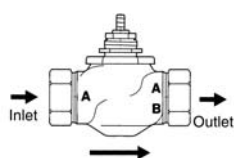
# G2...(S) 2-way Globe Valve, Bronze or Stainless Steel Trim



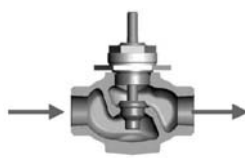
Technical Data		
	G2	G2...S
Service	chilled or hot water, 60% glycol, steam	
Flow characteristic	equal percentage	linear
Action	stem up - open A to AB	
Sizes	½" to 2"	
End fitting	NPT female ends	
Materials		
Body	bronze	bronze
Seat	bronze	stainless steel
Stem	stainless steel	stainless steel
Plug	brass	stainless steel
Packing	spring loaded TFE	spring loaded TFE
Disc	composition (EPDM)	Teflon
ANSI class	ANSI 250 (up to 400 psi below 150°F)	
Leakage	ANSI class IV	
Max steam inlet		
NV actuators	15 psi (103 kPa)	50 psi (345 kPa)
Rotary actuators	35 psi (241 kPa)	100 psi (689 kPa)
Media temperature		
Water	20°F to 250°F (-7°C to 120°C)	20°F to 300°F (-7°C to 149°C)
Maximum ΔP*		
Water	35 psi (241 kPa)	35 psi (241 kPa)
Steam (NV Actuator)	15 psi (103 kPa)	35 psi (241 kPa)
Steam (Rotary Actuator)	20 psi (138 kPa)	35 psi (241 kPa)
Rangeability	G2(S) 100:1	
Valve weights	G212(S), G213(S), G214(S), G215(S)	2 lbs
	G219(S), G220(S)	3 lbs
	G224(S), G225(S), G232(S)	5.5 lbs
	G240(S), G250(S)	13 lbs

\*(50% or more open)

## G2...(S) 2-way Flow Patterns



Flow Direction



Stem Up - Open A to AB

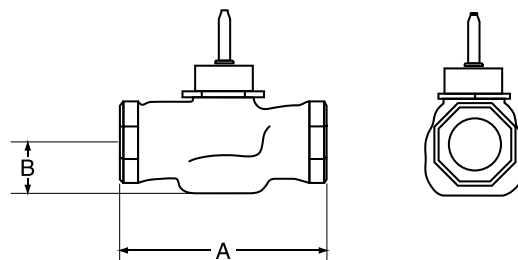
## Application

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 reheat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.

Bronze and stainless steel trim valves can be used for steam applications, depending on actuator and close-off combinations.

C <sub>v</sub>	Valve Nominal Size		Type	Suitable Actuators		
	Inches	DN [mm]	2-way NPT	Non-Spring	Spring	
0.4	½	15	G212(S)	LM Series	NV Series	LF Series
1.3	½	15	G213(S)			
2.2	½	15	G214(S)			
4.4	½	15	G215(S)			
5.5	¾	20	G219(S)			
7.5	¾	20	G220(S)	NM Series	NV Series	LF Series
10	1	25	G224(S)			
14	1	25	G225(S)			
20	1¼	32	G232(S)	AM Series	NV Series	AF(X)
28	1½	40	G240(S)			
40	2	50	G250(S)			NV Series

## Dimensions



0081-2W

Valve Body	Valve Nominal Size		Dimensions (Inches [mm])	
	Inches	DN [mm]	A	B
G212(S)-G215(S)	½"	15	3.06" [78]	1.06" [27]
G219(S)-G220(S)	¾"	20	3.62" [92]	1.06" [27]
G224(S)-G225(S)	1"	25	4.62" [117]	1.12" [29]
G232(S)	1¼"	32	4.62" [117]	1.37" [35]
G240(S)	1½"	40	5.37" [137]	1.50" [38]
G250(S)	2"	50	6.12" [156]	1.56" [40]

## Piping

The valves should be mounted in a weather-protected area in a location that is within the ambient limits of the actuator. Allow sufficient room for valve with actuator and for service. For the NV Series, allow 6" for cover removal and 12" for complete actuator removal. The G2(S) and G3(D) preferred mounting position of the valve is with the valve stem vertical above the valve body, for maximum life. However, the assemblies can be mounted with the valve stem vertical or horizontal in relation to the pipe. The actuators should never be mounted underneath the valve, as condensation can build up and result in a failure of the actuators. Do not reverse flow direction.

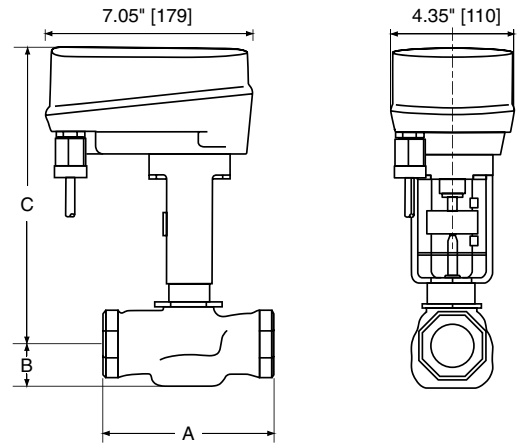


### Models

NV24-3 US  
NVD24-3 US

Technical Data	
Power supply	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Nominal voltage range	19.2...28.8 VAC, 21.6...28.8 VDC
Power consumption	3 W
Transformer sizing	5 VA (Class 2 power source)
Electrical connection	3 ft [1m] 18 GA plenum rated cable ½" conduit connector
Overload protection	electronic throughout stroke
Control	on/off, floating point
Maximum stroke	¾" [20mm]
Force	
NV24-3 US	225 lbf [1000 N]
NVD24-3 US	90 lbf [400 N]
Position indication	stroke indicator on bracket
Manual override	3/16" hex, 5mm hex or phillips screwdriver
Running time	20mm/150 seconds, independent of load
Humidity	5 to 95% RH non-condensing
Ambient temperature	32°F to 122°F [0°C to 50°C]
Storage temperature	20°F to 176°F [-7°C to 80°C]
Housing	NEMA 2/IP54 with cable entry down
Housing material	UL94-5V (flammability rating)
Agency listings†	cULus to UL 60730-1A/UL60730-2-14 and CAN/CSA E60730-1/CSA C22.2 No. 24-93 CE acc. to 2004/108/EC & 2006/95/EC, tested to 1EC/EN 60730-1 and 1EC/EN 60370-2-14
Noise level	<52 dB(A)
Quality standard	ISO 9001

### Dimensions with G2... Series 2-Way Valve Assembly using UNV-001 Bracket

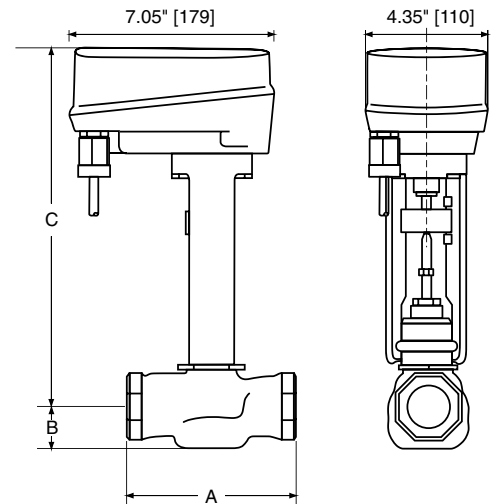


D081

Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2	1/2"	15	3.00" [76]	1.06" [27]	9.75" [248]
G2	3/4"	20	3.62" [92]	1.06" [27]	9.75" [248]
G2	1"	25	4.62" [117]	1.12" [29]	10.43" [265]
G2	1-1/4"	32	4.62" [117]	1.37" [35]	10.43" [265]
G2	1-1/2"	40	5.37" [137]	1.50" [38]	10.50" [267]
G2	2"	50	6.12" [156]	1.56" [40]	10.81" [275]

### Dimensions with G2...S Series 2-Way Valve

Assembly using UNV-035 Bracket (Bracket is 1.563" longer than UNV-001)



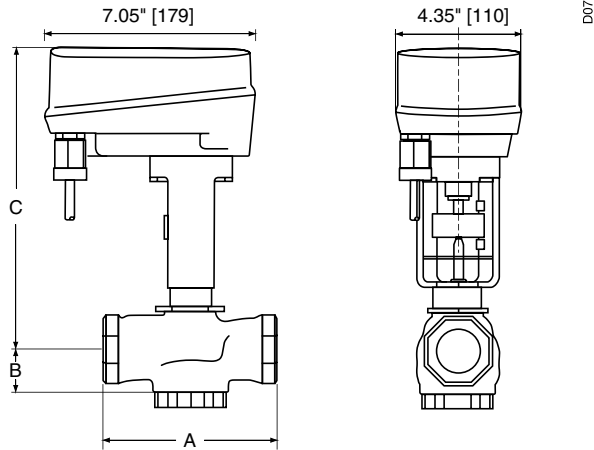
D056

Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2S	1/2"	15	3.00" [76]	1.06" [27]	11.31" [287]
G2S	3/4"	20	3.62" [92]	1.06" [27]	11.31" [287]
G2S	1"	25	4.62" [117]	1.12" [29]	12.00" [305]
G2S	1-1/4"	32	4.62" [117]	1.37" [35]	12.00" [305]
G2S	1-1/2"	40	5.37" [137]	1.50" [38]	12.06" [306]
G2S	2"	50	6.12" [156]	1.56" [40]	12.37" [314]

# NV(D)24-3 US Actuators, On/Off, Floating Point

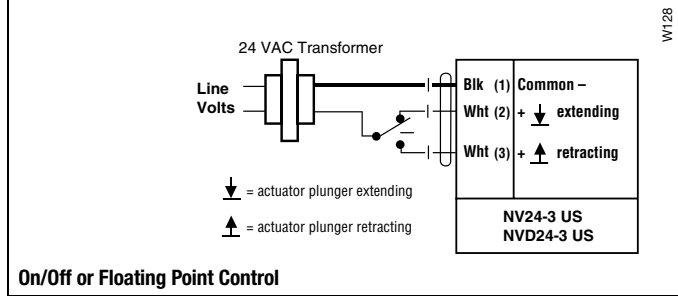


## Dimensions with G3...(D) Series 3-Way Valve



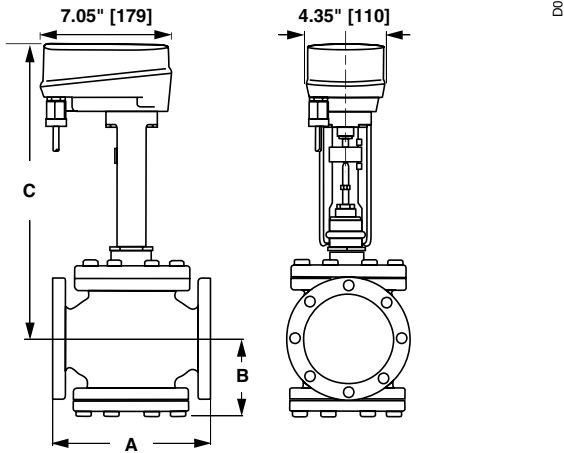
Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G3(D)	1/2"	15	3.00" [76]	1.37" [35]	9.75" [248]
G3(D)	1/2"	15	3.00" [76]	1.37" [35]	9.75" [248]
G3(D)	3/4"	20	3.62" [92]	1.68" [43]	9.75" [248]
G3(D)	1"	25	4.62" [117]	1.56" [40]	9.81" [249]
G3(D)	1-1/4"	32	4.62" [117]	1.62" [41]	10.06" [256]
G3(D)	1-1/2"	40	5.37" [137]	1.62" [41]	9.18" [234]
G3(D)	2"	50	6.12" [156]	1.87" [48]	9.25" [235]

## Wiring Diagrams



On/Off or Floating Point Control

## Dimensions with G6...C ANSI 125 Series 2-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G6C ANSI 125	2-1/2"	65	9.00" [229]	4.75" [120]	15.00" [381]
G6C ANSI 125	3"	80	10.00" [254]	5.37" [137]	15.43" [392]

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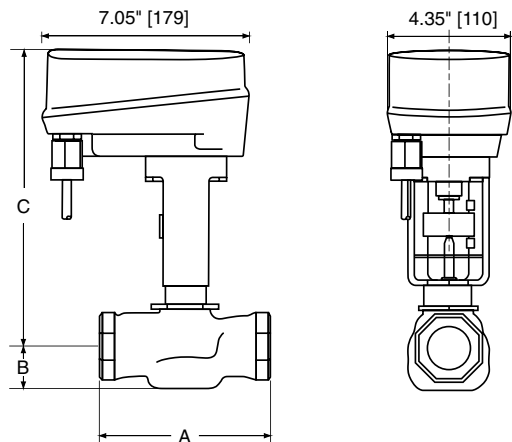
### Models

NVD24-MFT US  
 NV24-MFT US  
 NVG24-MFT US

Technical Data	
Power supply	24 VAC ± 20% 50/60 Hz, 24 VDC ± 10%
Nominal voltage range	19.2...28.8 VAC, 21.6...28.8 VDC
Power consumption	
NVD24-MFT US	3 W
NV24-MFT US	3 W
NVG24-MFT US	4 W
Transformer sizing	5 VA (Class 2 power source)
Electrical connection	3 ft, 18 GA plenum rated cable ½" conduit connector
Overload protection	electronic throughout stroke
Control	Multi-Function Technology
Control signal Y	2 to 10 VDC (V-10001 default), PWM available
Operating range	2 to 10 VDC 4 to 20 mA (w/500 Ω, ¼ W resistor) ZG-R01
Input impedance	100 kΩ for 2 to 10 VDC (0.1 mA) 500 Ω for 4 to 20 mA 1500 Ω for PWM, on/off and floating point
Feedback output U	2 to 10 VDC, 0.5 mA max
Maximum stroke	¾" [20mm]
Force	
NVD24-3 US	90 lbf [400 N]
NV24-3 US	225 lbf [1000 N]
NVG24-MFT US	360 lbf [1600 N]
Position indication	stroke indicator on bracket
Manual override	3/16" hex, 5mm hex or phillips screwdriver
Running time	150 seconds, independent of load
Humidity	5 to 95% RH non-condensing
Ambient temperature	32°F to 122°F [0°C to 50°C]
Storage temperature	20°F to 176°F [-7°C to 80°C]
Housing	NEMA 2/IP54 with cable entry down
Housing material	UL94-5V (flammability rating)
Agency listings†	cULus to UL 60730-1A/UL60730-2-14 and CAN/CSA E60730-1/CSA C22.2 No. 24-93 CE acc. to 2004/108/EC & 2006/95/EC, tested to 1EC/EN 60730-1 and 1EC/EN 60370-2-14
Noise level	<35 dB(A)
Quality standard	ISO 9001

### Dimensions with G2... Series 2-Way Valve

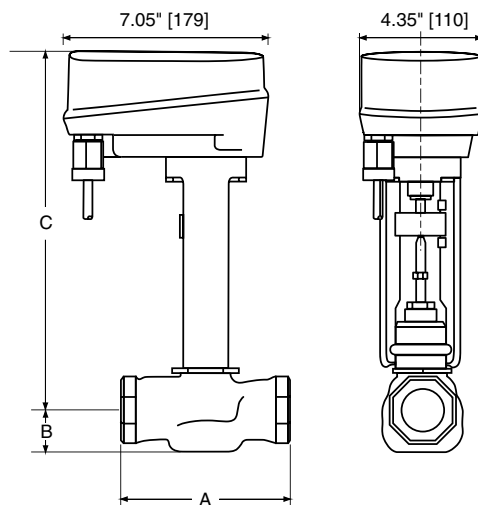
Assembly using UNV-001 Bracket



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2	1/2"	15	3.00" [76]	1.06" [27]	9.75" [248]
G2	3/4"	20	3.62" [92]	1.06" [27]	9.75" [248]
G2	1"	25	4.62" [117]	1.12" [29]	10.43" [265]
G2	1-1/4"	32	4.62" [117]	1.37" [35]	10.43" [265]
G2	1-1/2"	40	5.37" [137]	1.50" [38]	10.50" [267]
G2	2"	50	6.12" [156]	1.56" [40]	10.81" [275]

### Dimensions with G2...S Series 2-Way Valve

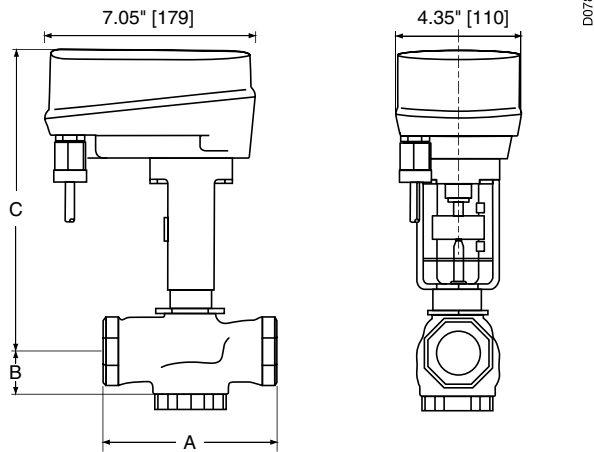
Assembly using UNV-035 Bracket (Bracket is 1.563" longer than UNV-001)



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2S	1/2"	15	3.00" [76]	1.06" [27]	11.31" [287]
G2S	3/4"	20	3.62" [92]	1.06" [27]	11.31" [287]
G2S	1"	25	4.62" [117]	1.12" [29]	12.00" [305]
G2S	1-1/4"	32	4.62" [117]	1.37" [35]	12.00" [305]
G2S	1-1/2"	40	5.37" [137]	1.50" [38]	12.06" [306]
G2S	2"	50	6.12" [156]	1.56" [40]	12.37" [314]

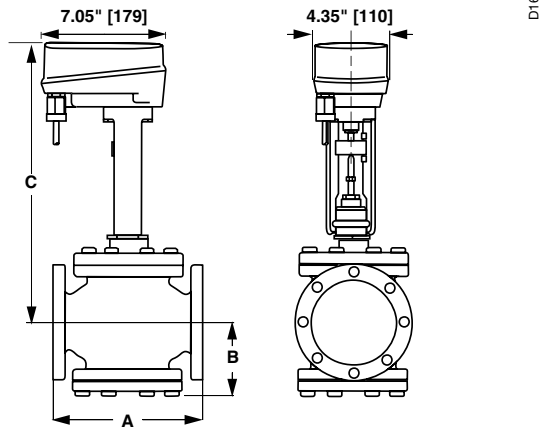
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### Dimensions with G3...(D) Series 3-Way Valve



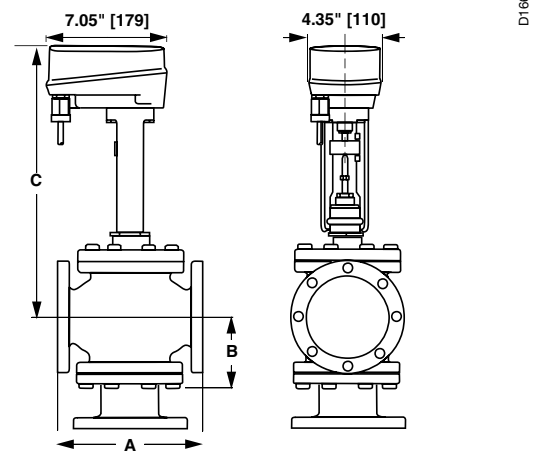
Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G3(D)	1/2"	15	3.00" [76]	1.37" [35]	9.75" [248]
G3(D)	1/2"	15	3.00" [76]	1.37" [35]	9.75" [248]
G3(D)	3/4"	20	3.62" [92]	1.68" [43]	9.75" [248]
G3(D)	1"	25	4.62" [117]	1.56" [40]	9.81" [249]
G3(D)	1-1/4"	32	4.62" [117]	1.62" [41]	10.06" [256]
G3(D)	1-1/2"	40	5.37" [137]	1.62" [41]	9.18" [234]
G3(D)	2"	50	6.12" [156]	1.87" [48]	9.25" [235]

### Dimensions with G6/G6C ANSI 125 and G6 ANSI 250 Series 2-Way Valve



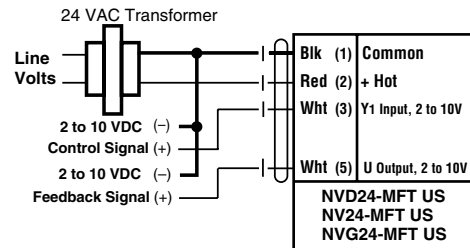
Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G6/G6C ANSI 125	2-1/2"	65	9.00" [229]	4.75" [120]	15.00" [381]
G6/G6C ANSI 125	3"	80	10.00" [254]	5.37" [137]	15.43" [392]
G6 ANSI 250	2-1/2"	65	9.62" [244]	4.75" [120]	15.00" [381]
G6 ANSI 250	3"	80	10.75" [273]	5.37" [137]	15.43" [392]

### Dimensions with G7 and G7D ANSI 125/250 Series 3-Way Valve

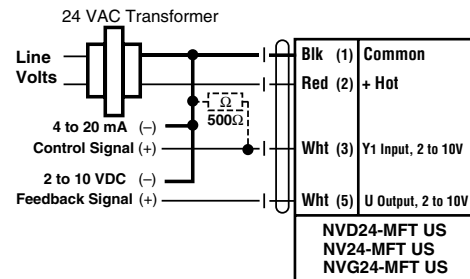


Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G7 ANSI 125	2-1/2"	65	9.00" [229]	7.12" [181]	15.37" [391]
G7 ANSI 125	3"	80	10.00" [254]	8.00" [203]	15.93" [405]
G7D ANSI 125	2-1/2"	65	9.00" [229]	7.12" [181]	15.12" [384]
G7D ANSI 125	3"	80	10.00" [254]	8.00" [203]	15.93" [405]
G7D ANSI 125	4"	100	13.00" [330]	9.87" [251]	16.75" [425]
G7 ANSI 250	2-1/2"	65	9.62" [244]	7.37" [187]	15.50" [394]
G7 ANSI 250	3"	80	10.75" [273]	8.37" [213]	16.12" [410]
G7D ANSI 250	2-1/2"	65	9.62" [244]	7.37" [187]	15.25" [387]
G7D ANSI 250	3"	80	10.75" [273]	8.37" [213]	16.06" [408]
G7D ANSI 250	4"	100	13.62" [346]	10.25" [260]	16.87" [429]

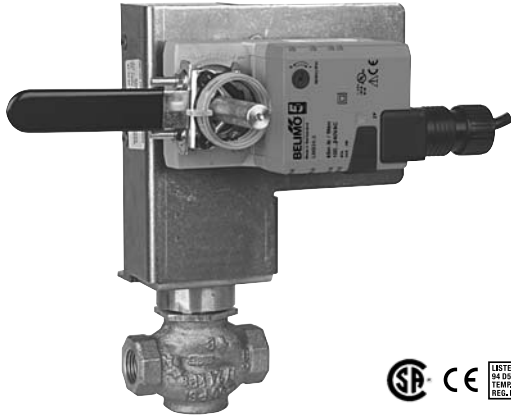
### Wiring Diagrams



### 2 to 10 VDC Control Signal



### 4 to 20 mA Control Signal



### Models

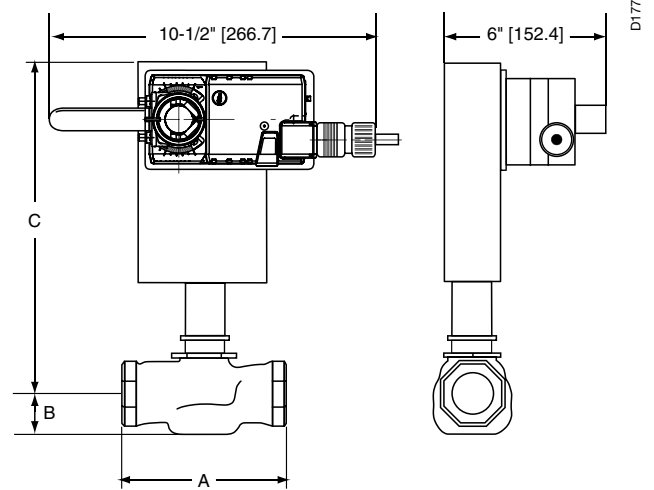
LMB24-3-X1

LMB24-3-S-X1

w/built-in Aux. Switch

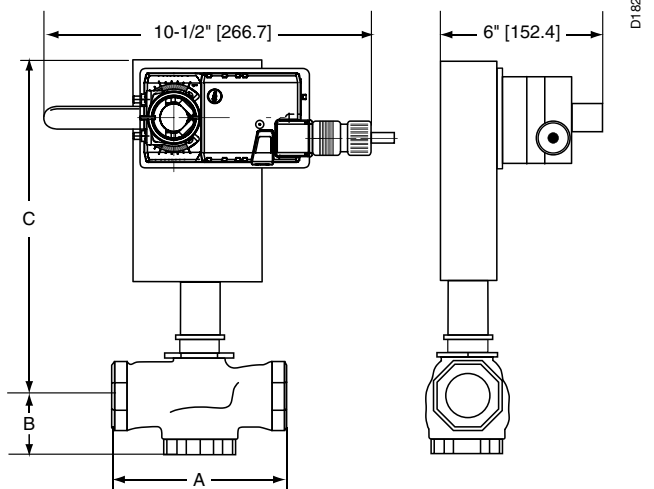
Technical Data		
Control		on/off, floating point
Power supply		24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Power consumption	running	1.5 W
	holding	0.2 W
Transformer sizing		3 VA (class 2 power source)
Electrical connection		½" conduit connector
	LMB24-3-X1	3 ft, 18 GA plenum rated cables
	LMB24-3-S-X1	3 ft, 18 GA appliance cables
Overload protection		electronic throughout 0° to 95° rotation
Input impedance		600 Ω
Angle of rotation		95°
Torque		45 in-lb [5 Nm]
Direction of rotation		reversible with  switch
Position indication		reflective visual indicator (snap-on)
Manual override		external push button
Running time		95 seconds, constant independent of load
Humidity		5 to 95% RH non-condensing (EN 60730-1)
Ambient temperature		-22° F to 122° F [-30° C to 50° C]
Storage temperature		-40° F to 176° F [-40° C to 80° C]
Housing		NEMA type 2/IP54
Housing material		UL94-5VA
Agency listings		cULus acc. to UL 60730-1/-2-14, CAN/CSA C22.2 No. 24 certified, CE acc. to 73/23/EEC
Noise level		<35 db(A)
Quality standard		ISO 9001
<b>LMB24-3-S-X1</b>		
Auxiliary switch		1 x SPDT, 6A (1.5A) @ 250 VAC, UL Listed, adjustable 0° to 95° (double insulated)

### Dimensions with G2...(S) Series 2-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2(S)	½"	15	3.00" [76]	1.06" [27]	7.56" [192]
G2(S)	¾"	20	3.62" [92]	1.06" [27]	7.56" [192]

### Dimensions with G3...(D) Series 3-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G3(D)	½"	15	3.00" [76]	1.37" [35]	7.87" [200]
G3(D)	¾"	20	3.62" [92]	1.68" [43]	8.18" [208]

## Wiring Diagrams

### ✂️ INSTALLATION NOTES

1 Provide overload protection and disconnect as required.

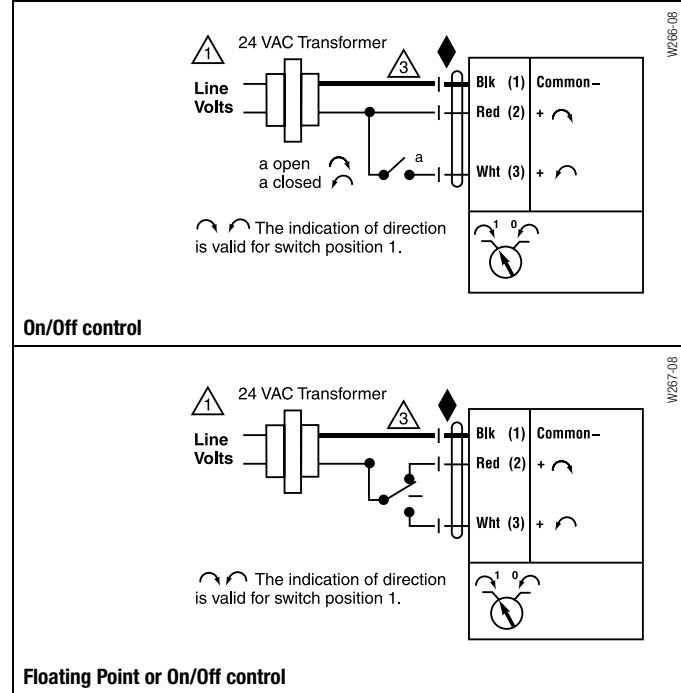
3 Actuators may also be powered by 24 VDC.

### 📄 APPLICATION NOTES

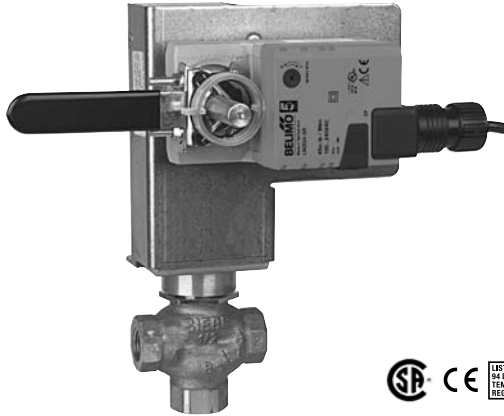
◆ Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

### ⚠️ 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.





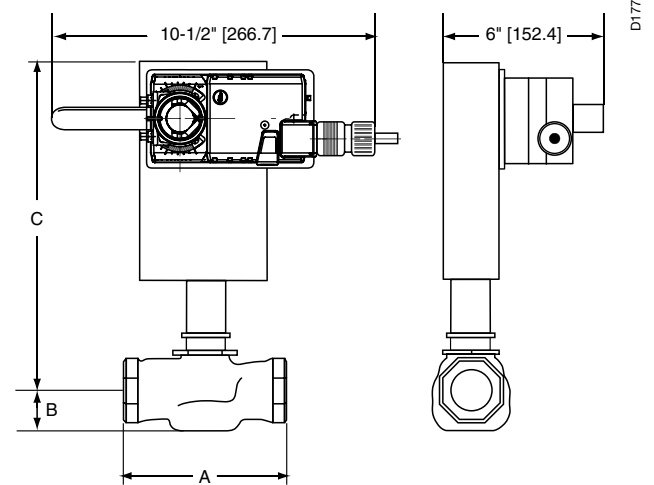


### Models

LMB24-SR-X1 w/built-in Aux. Switch

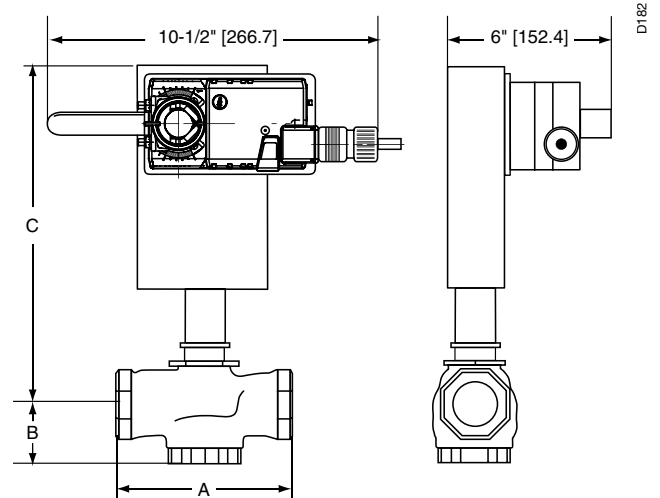
Technical Data	
Control	proportional
Power supply	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Power consumption	running 1.5 W holding 0.4 W
Transformer sizing	3 VA (class 2 power source)
Electrical connection	3 ft, 18 GA plenum rated cable ½" conduit connector
Overload protection	electronic throughout 0° to 95° rotation
Operating range Y	2 to 10 VDC, 4 to 20 mA
Input impedance	100 kΩ (0.1 mA), 500 Ω
Angle of rotation	max 95°, adjustable with mechanical stop
Torque	45 in-lb [5 Nm]
Direction of rotation	reversible with  switch =CCW with decreasing control signal (10-2V) =CW with decreasing control signal (10-2V)
Position indication	reflective visual indicator (snap-on)
Manual override	external push button
Running time	95 seconds, constant independent of load
Humidity	5 to 95% RH non-condensing (EN 60730-1)
Ambient temperature	-22° F to 122° F [-30° C to 50° C]
Storage temperature	-40° F to 176° F [-40° C to 80° C]
Housing	NEMA type 2/IP54
Housing material	UL94-5VA
Agency listings	cULus acc. to UL 60730-1/-2-14, CAN/CSA C22.2 No. 24 certified, CE acc. to 73/23/EEC
Noise level	<35 db(A)
Quality standard	ISO 9001

### Dimensions with G2...(S) Series 2-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2(S)	½"	15	3.00" [76]	1.06" [27]	7.56" [192]
G2(S)	¾"	20	3.62" [92]	1.06" [27]	7.56" [192]

### Dimensions with G3...(D) Series 3-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G3(D)	½"	15	3.00" [76]	1.37" [35]	7.87" [200]
G3(D)	¾"	20	3.62" [92]	1.68" [43]	8.18" [208]

# LMB24-SR-X1 Actuators, Proportional



## Wiring Diagrams

### INSTALLATION NOTES

1 Provide overload protection and disconnect as required.

2 **CAUTION Equipment damage!**  
Actuators may be connected in parallel.  
Power consumption and input impedance must be observed.

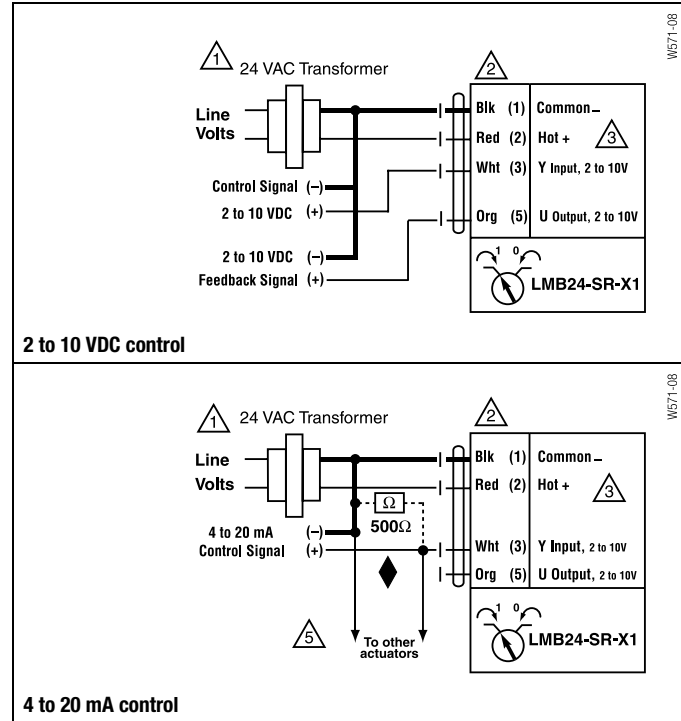
3 Actuators may also be powered by 24 VDC.

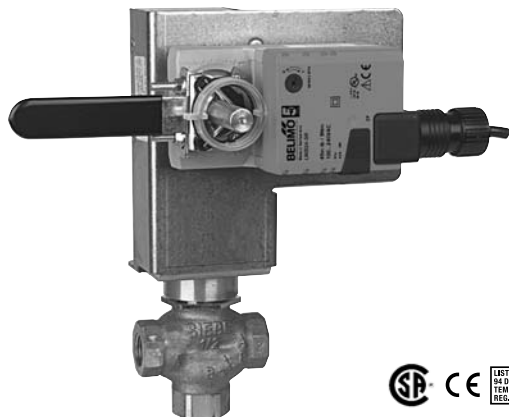
5 Only connect common to neg. (-) leg of control circuits.

### APPLICATION NOTES

The ZG-R01 500  $\Omega$  resistor converts the 4 to 20 mA control signal to 2 to 10 VDC, up to 2 actuators may be connected in parallel.

**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.



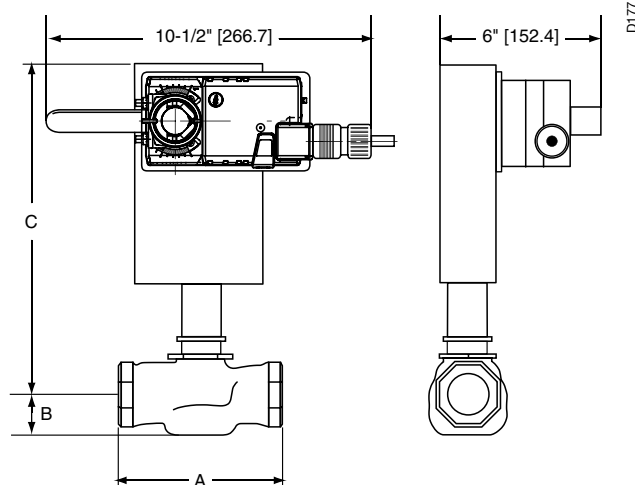


### Models

LMX24-MFT-X1

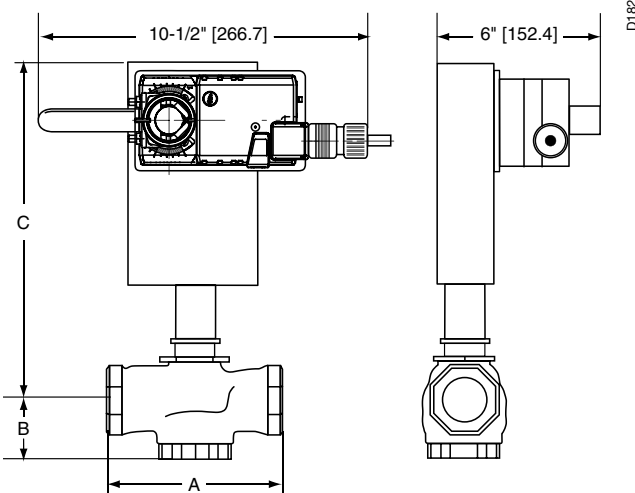
Technical Data	
Power supply	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Power consumption	2 W (1.2 W)
Transformer sizing	3.5 VA (class 2 power source)
Electrical connection	3 ft, 10 ft, 16ft, 18 GA plenum rated cable ½" conduit connector
Overload protection	electronic throughout 0° to 95° rotation
Operating range Y	2 to 10 VDC, 4 to 20 mA (default) variable (VDC, PWM, floating point, on/off)
Input impedance	100 kΩ (0.1 mA), 500 Ω 1500 Ω (PWM, floating point, on/off)
Feedback output U	2 to 10 VDC, 0.5 mA max, VDC variable
Angle of rotation	max 95°, adjustable with mechanical stop electronically variable
Torque	45 in-lb [5 Nm]
Direction of rotation	reversible with  switch
Position indication	reflective visual indicator (snap-on)
Manual override	external push button
Running time	default 150 seconds variable 35 to 150 seconds
Humidity	5 to 95% RH non-condensing (EN 60730-1)
Ambient temperature	-22° F to 122° F [-30° C to 50° C]
Storage temperature	-40° F to 176° F [-40° C to 80° C]
Housing	NEMA type 2/IP54
Housing material	UL94-5VA
Agency listings	cULus acc. to UL 60730-1A/-2-14, CAN/CSA E60730-1, CSA C22.2 No. 24-93, CE acc. to 89/336/EEC
Noise level	<35 db(A)
Quality standard	ISO 9001

### Dimensions with G2...(S) Series 2-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2(S)	½"	15	3.00" [76]	1.06" [27]	7.56" [192]
G2(S)	¾"	20	3.62" [92]	1.06" [27]	7.56" [192]

### Dimensions with G3...(D) Series 3-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G3(D)	½"	15	3.00" [76]	1.37" [35]	7.87" [200]
G3(D)	¾"	20	3.62" [92]	1.68" [43]	8.18" [208]

## Wiring Diagrams

### INSTALLATION NOTES

1 Provide overload protection and disconnect as required.

2 **CAUTION Equipment damage!**  
Actuators may be connected in parallel.  
Power consumption and input impedance must be observed.

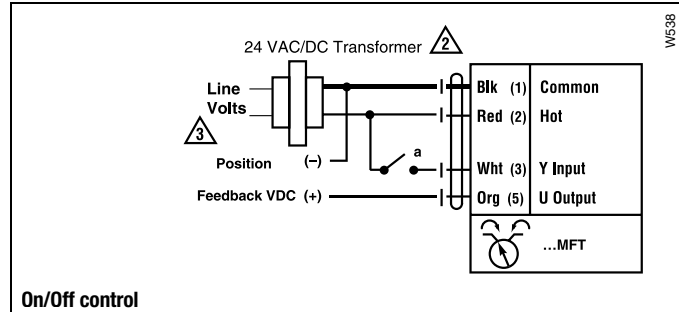
3 Actuators may also be powered by 24 VDC.

5 Only connect common to neg. (-) leg of control circuits.

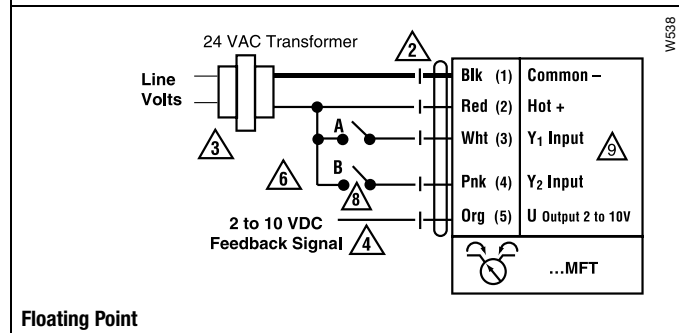
### APPLICATION NOTES

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.

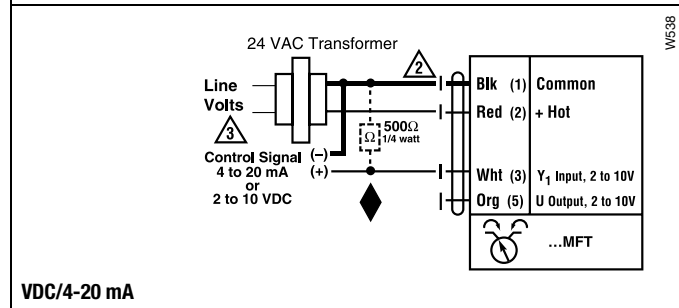
**WARNING Live Electrical Components!**  
During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components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



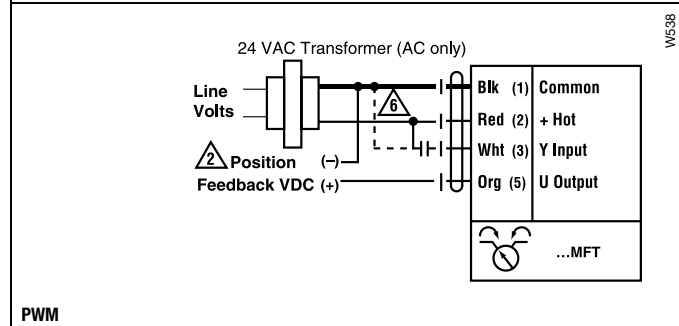
On/Off control



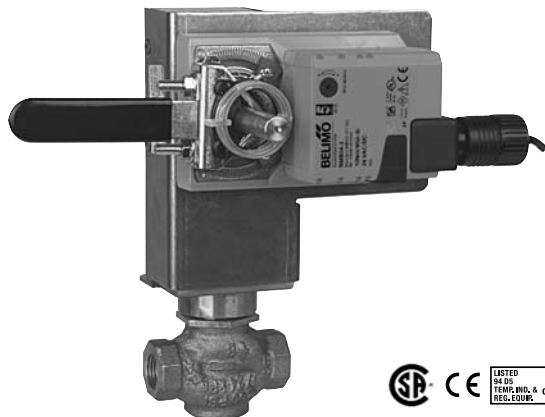
Floating Point



VDC/4-20 mA



PWM

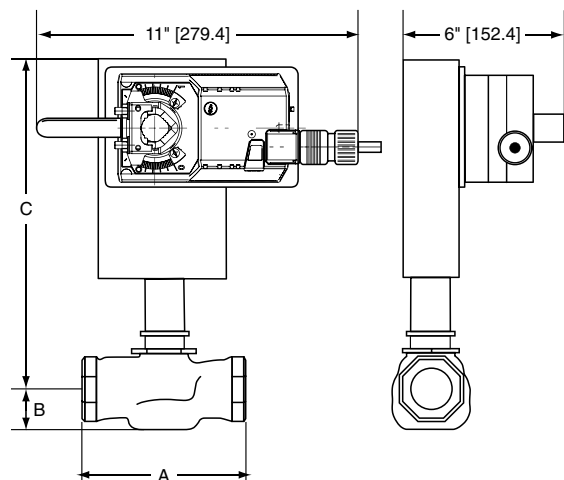


### Models

NMB24-3-X1

Technical Data	
Control	on/off, floating point
Power supply	24 VAC $\pm$ 20% 50/60 Hz 24 VDC $\pm$ 10%
Power consumption	running 2.0 W holding 0.2 W
Transformer sizing	4 VA (class 2 power source)
Electrical connection	3 ft, 18 GA plenum rated cable ½" conduit connector
Overload protection	electronic throughout 0° to 95° rotation
Input impedance	600 $\Omega$
Angle of rotation	max 95°, adjustable with mechanical stop
Torque	90 in-lb [10 Nm]
Direction of rotation	reversible with  switch =CCW with decreasing control signal (10-2V) =CW with decreasing control signal (10-2V)
Position indication	reflective visual indicator (snap-on)
Manual override	external push button
Running time	95 seconds, constant independent of load
Humidity	5 to 95% RH non-condensing (EN 60730-1)
Ambient temperature	-22° F to 122° F [-30° C to 50° C]
Storage temperature	-40° F to 176° F [-40° C to 80° C]
Housing	NEMA type 2/IP54
Housing material	UL94-5VA
Agency listings	cULus acc. to UL 60730-1/-2-14, CAN/GSA C22.2 No. 24 certified, CE acc. to 73/23/EEC
Noise level	<45 db(A)
Quality standard	ISO 9001

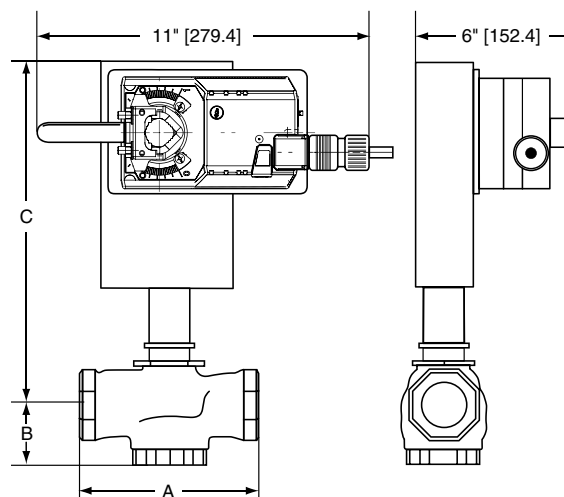
### Dimensions with G2...(S) Series 2-Way Valve



D178

Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2(S)	1"	25	4.62" [117]	1.12" [29]	8.12" [206]
G2(S)	1¼"	32	4.62" [117]	1.37" [35]	8.37" [213]

### Dimensions with G3...(D) Series 3-Way Valve



D188

Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G3(D)	1"	25	4.62" [117]	1.56" [40]	8.56" [217]
G3(D)	1¼"	32	4.62" [117]	1.62" [41]	8.62" [219]

## Wiring Diagrams

### INSTALLATION NOTES

1 Provide overload protection and disconnect as required.

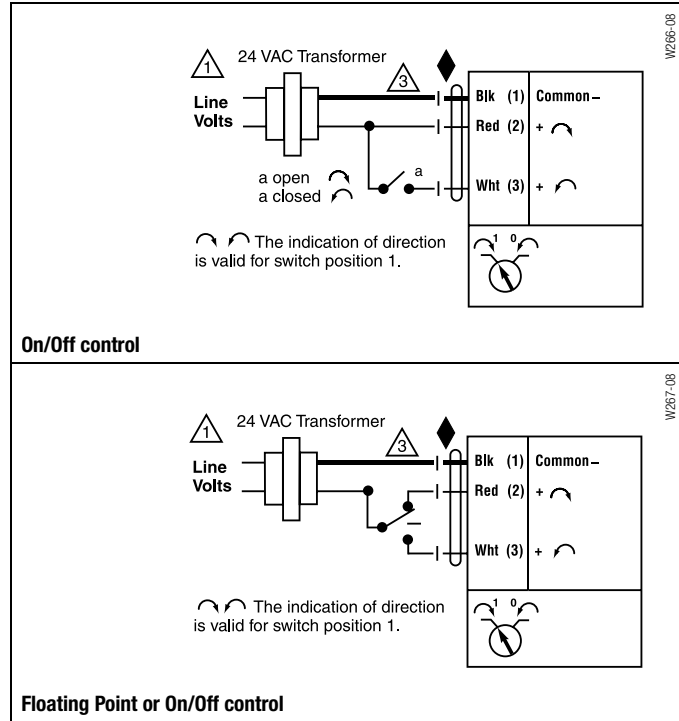
3 Actuators may also be powered by 24 VDC.

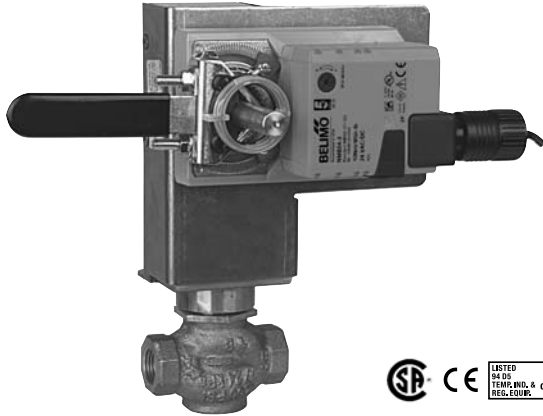
### APPLICATION NOTES

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.



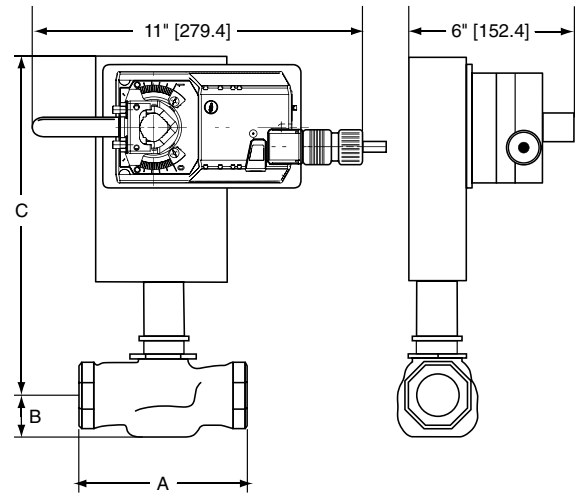


### Models

NMB24-SR-X1

Technical Data	
Control	proportional
Power supply	24 VAC $\pm$ 20% 50/60 Hz 24 VDC $\pm$ 10%
Power consumption	running 2.5 W holding 0.4 W
Transformer sizing	5 VA (Class 2 power source)
Electrical connection	3 ft, 18 GA plenum rated cable ½" conduit connector
Overload protection	electronic throughout 0° to 95° rotation
Operating range Y	2 to 10 VDC, 4 to 20 mA
Input impedance	100 k $\Omega$ (0.1 mA), 500 $\Omega$
Angle of rotation	max 95°, adjustable with mechanical stop
Torque	90 in-lb [10 Nm]
Direction of rotation	reversible with  switch
Position indication	reflective visual indicator (snap-on)
Manual override	external push button
Running time	95 seconds, constant independent of load
Humidity	5 to 95% RH non-condensing (EN 60730-1)
Ambient temperature	-22° F to 122° F [-30° C to 50° C]
Storage temperature	-40° F to 176° F [-40° C to 80° C]
Housing	NEMA type 2/IP54
Housing material	UL94-5VA
Agency listings	cULus acc. to UL 60730-1/-2-14, CAN/CSA C22.2 No. 24 certified, CE acc. to 73/23/EEC
Noise level	<45 db(A)
Quality standard	ISO 9001

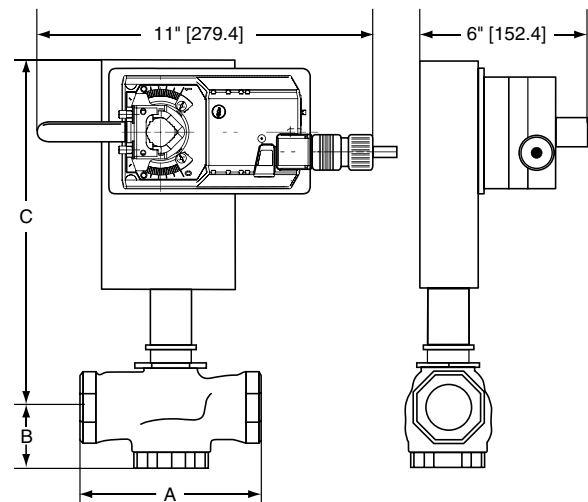
### Dimensions with G2...(S) Series 2-Way Valve



D178

Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2(S)	1"	25	4.62" [117]	1.12" [29]	8.12" [206]
G2(S)	1¼"	32	4.62" [117]	1.37" [35]	8.37" [213]

### Dimensions with G3...(D) Series 3-Way Valve



D188

Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G3(D)	1"	25	4.62" [117]	1.56" [40]	8.56" [217]
G3(D)	1¼"	32	4.62" [117]	1.62" [41]	8.62" [219]

## Wiring Diagrams

### INSTALLATION NOTES

1 Provide overload protection and disconnect as required.

2 **CAUTION Equipment damage!**  
Actuators may be connected in parallel.  
Power consumption and input impedance must be observed.

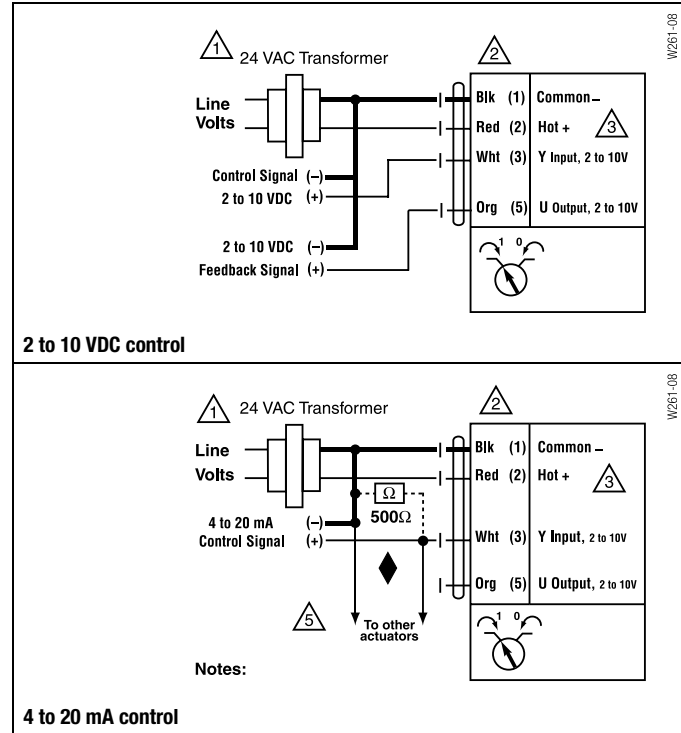
3 Actuators may also be powered by 24 VDC.

5 Only connect common to neg. (-) leg of control circuits.

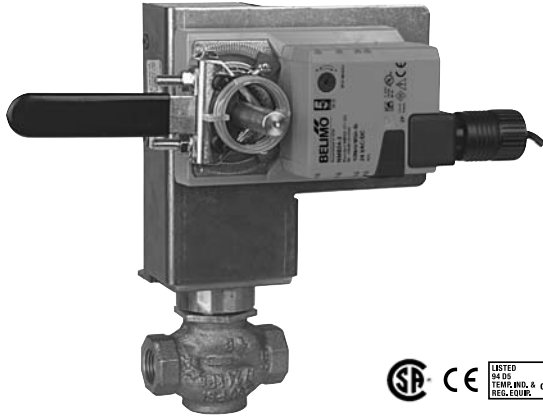
### APPLICATION NOTES

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.





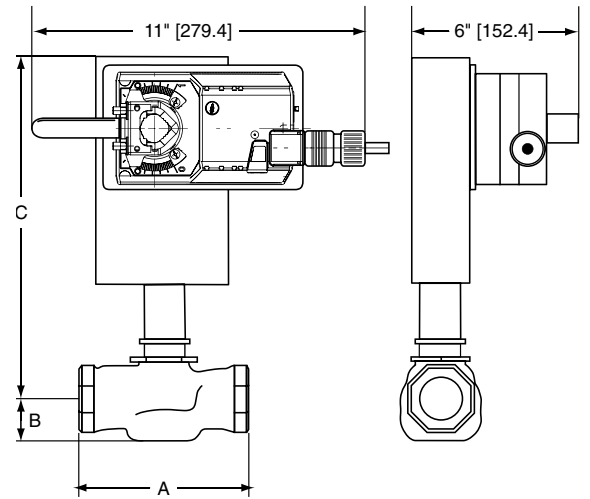


### Models

NMX24-MFT-X1

Technical Data	
Power supply	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Power consumption	3.5 W (1.25 W)
Transformer sizing	5.5 VA (Class 2 power source)
Electrical connection	3 ft, 10ft, 16ft, 18 GA plenum rated cable ½" conduit connector
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 (0.1 mA), 500 Ω 1500 Ω (PWM, floating point, on/off)
Feedback output U	2 to 10 VDC, 0.5 mA max, VDC variable
Angle of rotation	max 95°, adjustable with mechanical stop electronically variable
Torque	90 in-lb [10 Nm]
Direction of rotation	reversible with  switch
Position indication	reflective visual indicator (snap-on)
Manual override	external push button
Running time	default 150 seconds variable 45 to 170 seconds
Humidity	5 to 95% RH non-condensing (EN 60730-1)
Ambient temperature	-22° F to 122° F [-30° C to 50° C]
Storage temperature	-40° F to 176° F [-40° C to 80° C]
Housing	NEMA type 2/IP54
Housing material	UL94-5VA
Agency listings	cULus acc. to UL 60730-1A/-2-14, CAN/CSA E60730-1, CSA C22.2 No. 24-93, CE acc. to 89/336/EEC
Noise level	<45 db(A)
Quality standard	ISO 9001

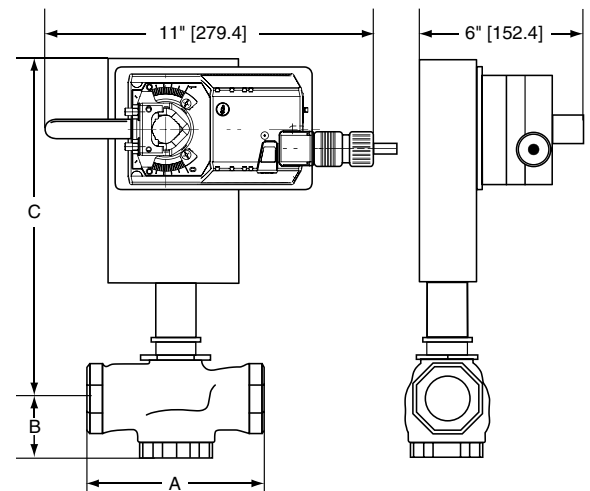
### Dimensions with G2...(S) Series 2-Way Valve



D178

Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2(S)	1"	25	4.62" [117]	1.12" [29]	8.12" [206]
G2(S)	1¼"	32	4.62" [117]	1.37" [35]	8.37" [213]

### Dimensions with G3...(D) Series 3-Way Valve



D183

Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G3(D)	1"	25	4.62" [117]	1.56" [40]	8.56" [217]
G3(D)	1¼"	32	4.62" [117]	1.62" [41]	8.62" [219]

## Wiring Diagrams

### INSTALLATION NOTES

1 Provide overload protection and disconnect as required.

2 **CAUTION Equipment damage!**  
Actuators may be connected in parallel.  
Power consumption and input impedance must be observed.

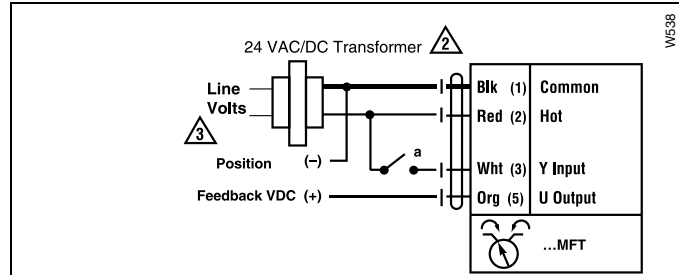
3 Actuators may also be powered by 24 VDC.

5 Only connect common to neg. (-) leg of control circuits.

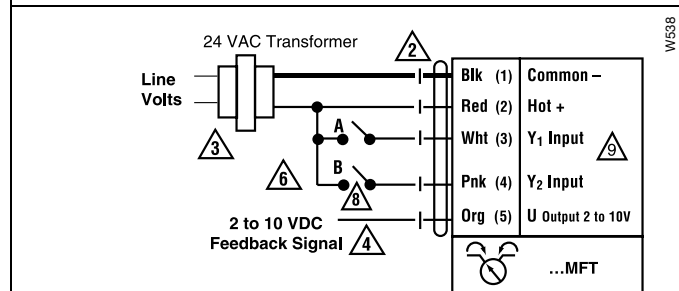
### APPLICATION NOTES

◆ Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

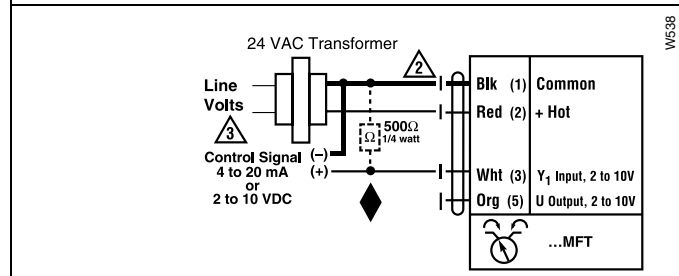
⚠ **WARNING Live Electrical Components!**  
During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components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



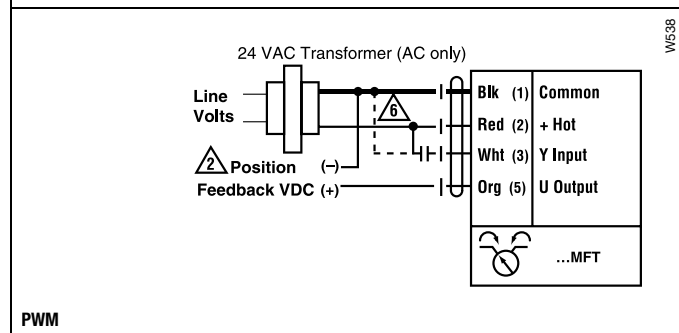
On/Off control



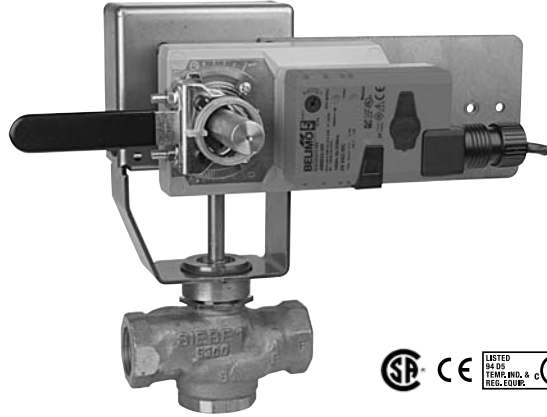
Floating Point



VDC/4-20 mA



PWM



### Models

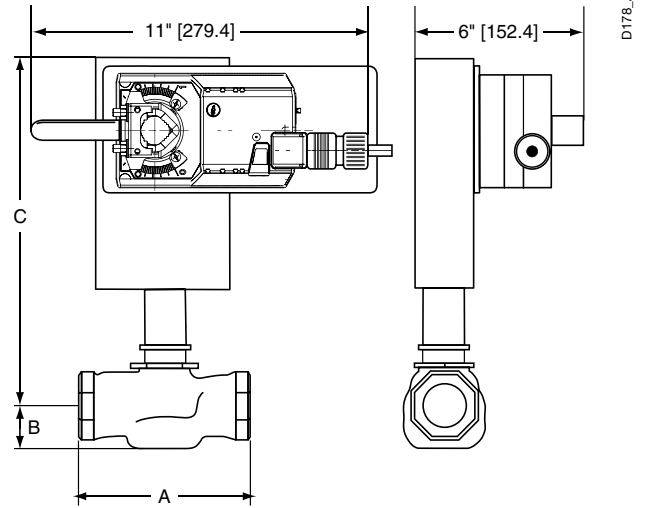
AMB24-3-X1

AMB24-3-S-X1

w/built-in Aux. Switch

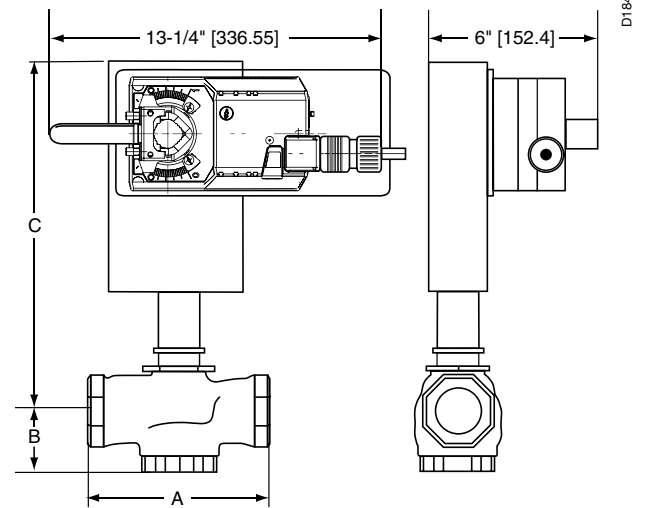
Technical Data		
Control		on/off, floating point
Power supply		24 VAC $\pm$ 20% 50/60 Hz
		24 VDC $\pm$ 10%
Power consumption	running	2.5 W
	holding	0.2 W
Transformer sizing		5.5 VA (Class 2 power source)
Electrical connection		1/2" conduit connector
	AMB24-3-X1	3 ft, 18 GA plenum rated cable
	AMB24-3-S-X1	3 ft, 18 GA appliance cable
Overload protection		electronic throughout 0° to 95° rotation
Input impedance		600 $\Omega$
Angle of rotation		max 95°, adjustable with mechanical stop
Torque		180 in-lb [20 Nm]
Direction of rotation		reversible with  switch
Position indication		reflective visual indicator (snap-on)
Manual override		external push button
Running time		95 seconds, constant independent of load
Humidity		5 to 95% RH non-condensing (EN 60730-1)
Ambient temperature		-22° F to 122° F [-30° C to 50° C]
Storage temperature		-40° F to 176° F [-40° C to 80° C]
Housing		NEMA type 2/IP54
Housing material		UL94-5VA
Agency listings		cULus acc. to UL 60730-1/-2-14, CAN/GSA C22.2 No. 24 certified, CE acc. to 73/23/EEC
Noise level		<45 db(A)
Quality standard		ISO 9001
<b>AMB24-3-S-X1</b>		
Auxiliary switch		1 x SPDT, 6A (1.5A) @ 250 VAC, UL Listed, adjustable 0° to 95° (double insulated)

### Dimensions with G2...(S) Series 2-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2(S)	1 1/2"	40	5.37" [137]	1.50" [38]	8.50" [216]
G2(S)	2"	50	6.12" [156]	1.56" [40]	8.56" [217]

### Dimensions with G3...(D) Series 3-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G3(D)	1 1/2"	40	5.37" [137]	1.62" [41]	8.62" [219]
G3(D)	2"	50	6.12" [156]	1.87" [48]	8.87" [225]

## Wiring Diagrams

### INSTALLATION NOTES

1 Provide overload protection and disconnect as required.

2 **CAUTION Equipment damage!**  
Actuators may be connected in parallel.  
Power consumption and input impedance must be observed.

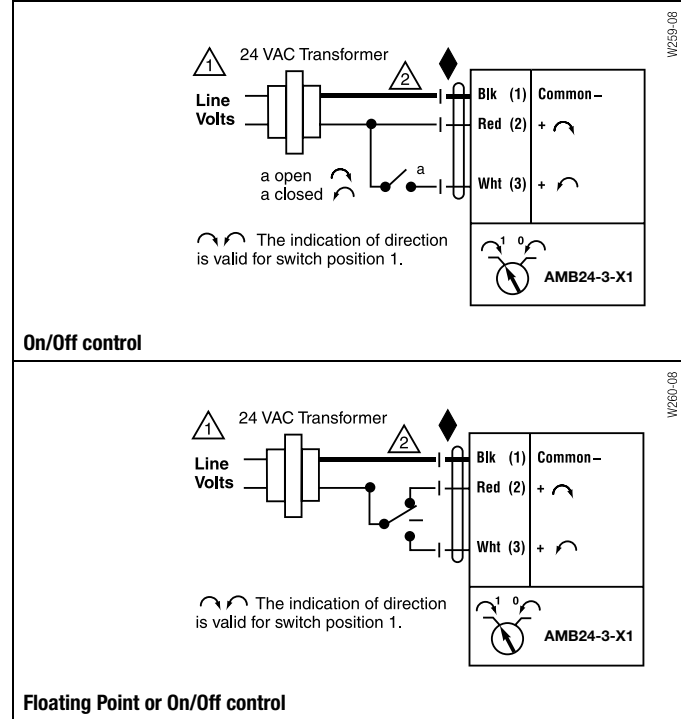
3 Actuators may also be powered by 24 VDC.

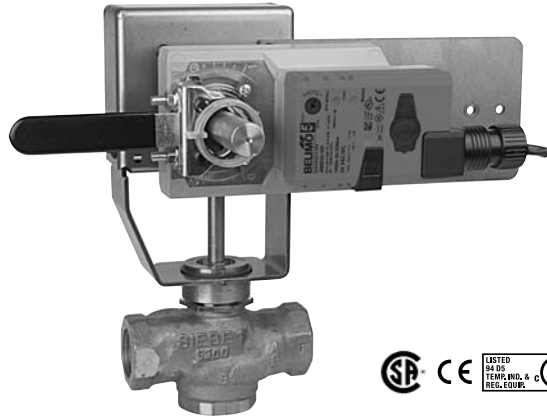
5 Only connect common to neg. (-) leg of control circuits.

### APPLICATION NOTES

Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

**WARNING Live Electrical Components!**  
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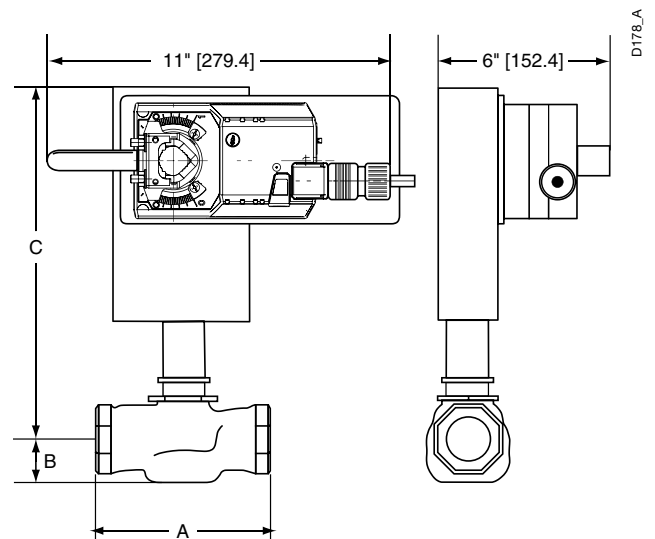


### Models

AMB24-SR-X1

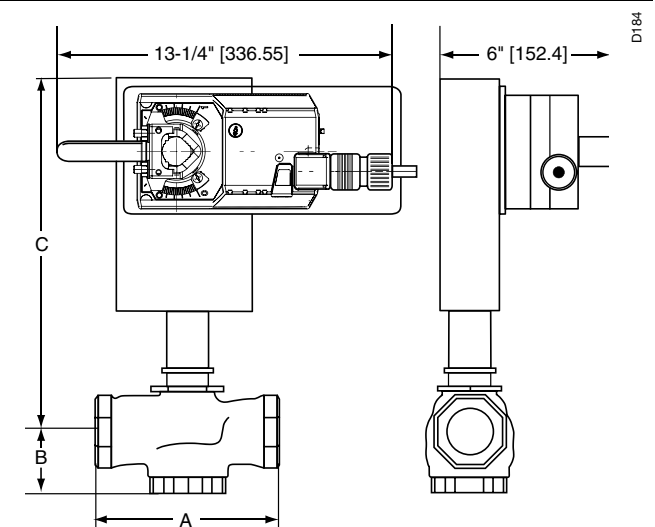
Technical Data	
Control	proportional
Power supply	24 VAC $\pm 20\%$ 50/60 Hz 24 VDC $\pm 10\%$
Power consumption	running 2.5 W holding 0.4 W
Transformer sizing	5 VA (Class 2 power source)
Electrical connection	3 ft, 18 GA appliance cable $\frac{1}{2}$ " conduit connector
Overload protection	electronic throughout 0° to 95° rotation
Operating range Y	2 to 10 VDC, 4 to 20 mA
Input impedance	100 k $\Omega$ (0.1 mA), 500 $\Omega$
Angle of rotation	max 95°, adjustable with mechanical stop
Torque	180 in-lb [20 Nm]
Direction of rotation	reversible with  switch =CCW with decreasing control signal (10-2V) =CW with decreasing control signal (10-2V)
Position indication	reflective visual indicator (snap-on)
Manual override	external push button
Running time	95 seconds, constant independent of load
Humidity	5 to 95% RH non-condensing (EN 60730-1)
Ambient temperature	-22° F to 122° F [-30° C to 50° C]
Storage temperature	-40° F to 176° F [-40° C to 80° C]
Housing	NEMA type 2/IP54
Housing material	UL94-5VA
Agency listings	cULus acc. to UL 60730-1/-2-14, CAN/CSA C22.2 No. 24 certified, CE acc. to 73/23/EEC
Noise level	<45 db(A)
Quality standard	ISO 9001

### Dimensions with G2...(S) Series 2-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2(S)	1½"	40	5.37" [137]	1.50" [38]	8.50" [216]
G2(S)	2"	50	6.12" [156]	1.56" [40]	8.56" [217]

### Dimensions with G3...(D) Series 3-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G3(D)	1½"	40	5.37" [137]	1.62" [41]	8.62" [219]
G3(D)	2"	50	6.12" [156]	1.87" [48]	8.87" [225]

## Wiring Diagrams

### INSTALLATION NOTES

1 Provide overload protection and disconnect as required.

2 **CAUTION Equipment damage!**  
Actuators may be connected in parallel.  
Power consumption and input impedance must be observed.

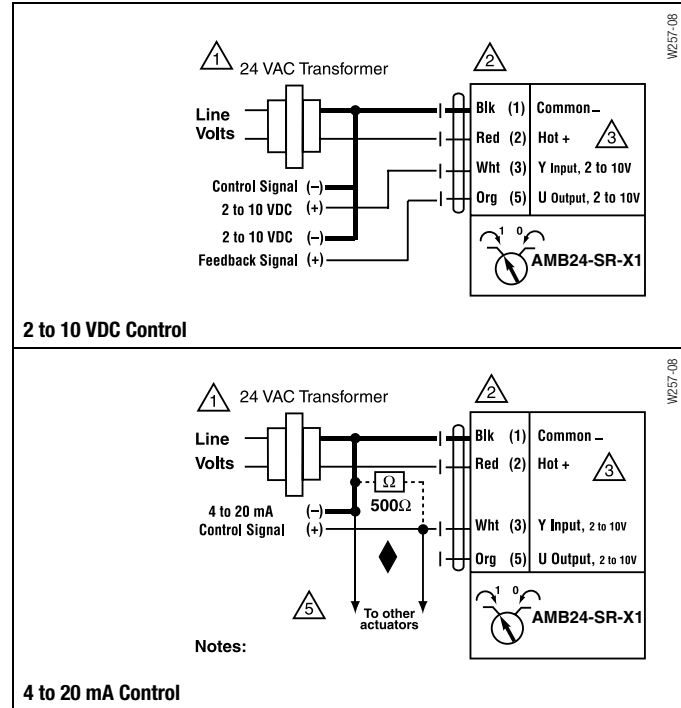
3 Actuators may also be powered by 24 VDC.

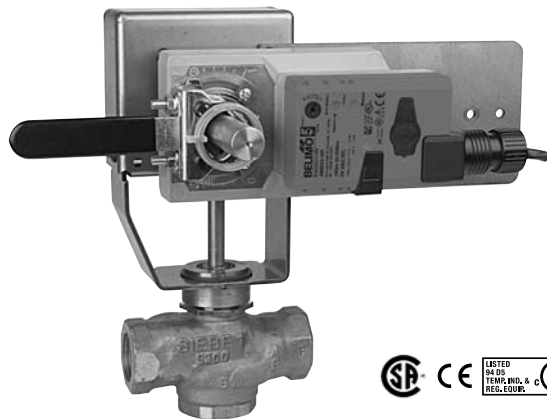
5 Only connect common to neg. (-) leg of control circuits.

### APPLICATION NOTES

The ZG-R01 500  $\Omega$  resistor converts the 4 to 20 mA control signal to 2 to 10 VDC, up to 2 actuators may be connected in parallel.

**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.



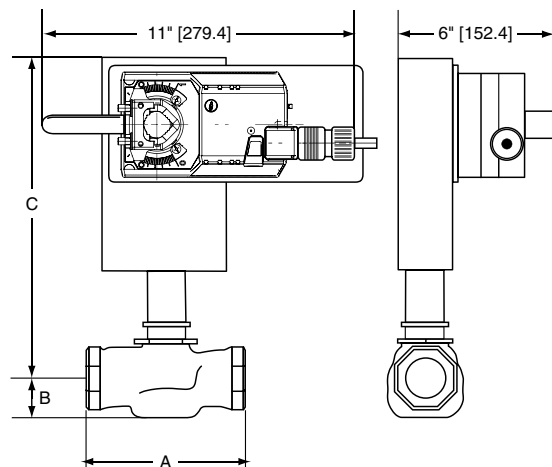


## Models

AMX24-MFT-X1

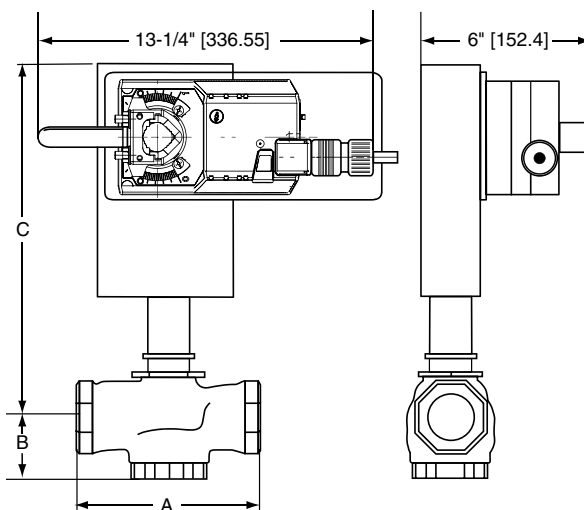
Technical Data	
Power supply	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Power consumption	4 W (1.25 W)
Transformer sizing	6 VA (Class 2 power source)
Electrical connection	3 ft, 10ft, 16ft, 18 GA plenum rated cable ½" conduit connector
Overload protection	electronic throughout 0° to 95° rotation
Operating range Y	2 to 10 VDC, 4 to 20 mA (default) variable (VDC, PWM, floating point, on/off)
Input impedance	100 kΩ (0.1 mA), 500 Ω 1500 Ω (PWM, floating point, on/off)
Feedback output U	2 to 10 VDC, 0.5 mA max, VDC variable
Angle of rotation	max 95°, adjustable with mechanical stop electronically variable
Torque	180 in-lb [20 Nm]
Direction of rotation	reversible with  switch
Position indication	reflective visual indicator (snap-on)
Manual override	external push button
Running time	default 150 seconds variable 90 to 350 seconds
Humidity	5 to 95% RH non-condensing (EN 60730-1)
Ambient temperature	-22° F to 122° F [-30° C to 50° C]
Storage temperature	-40° F to 176° F [-40° C to 80° C]
Housing	NEMA type 2/IP54
Housing material	UL94-5VA
Agency listings	cULus acc. to UL 60730-1A/-2-14, CAN/CSA E60730-1, CSA C22.2 No. 24-93, CE acc. to 89/336/EEC
Noise level	<45 db(A)
Quality standard	ISO 9001

### Dimensions with G2...(S) Series 2-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2(S)	1½"	40	5.37" [137]	1.50" [38]	8.50" [216]
G2(S)	2"	50	6.12" [156]	1.56" [40]	8.56" [217]

### Dimensions with G3...(D) Series 3-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G3(D)	1½"	40	5.37" [137]	1.62" [41]	8.62" [219]
G3(D)	2"	50	6.12" [156]	1.87" [48]	8.87" [225]

## Wiring Diagrams

### INSTALLATION NOTES

1 Provide overload protection and disconnect as required.

2 **CAUTION Equipment damage!**  
Actuators may be connected in parallel.  
Power consumption and input impedance must be observed.

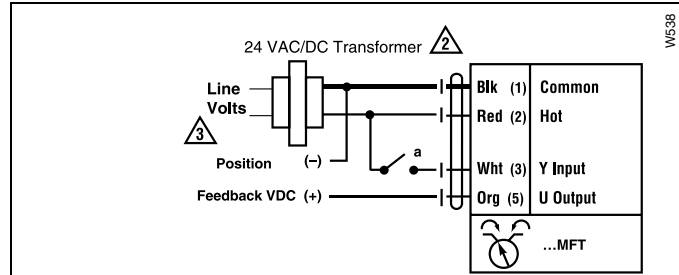
3 Actuators may also be powered by 24 VDC.

5 Only connect common to neg. (-) leg of control circuits.

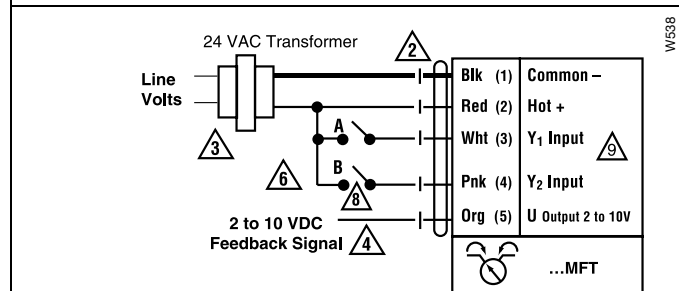
### APPLICATION NOTES

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.

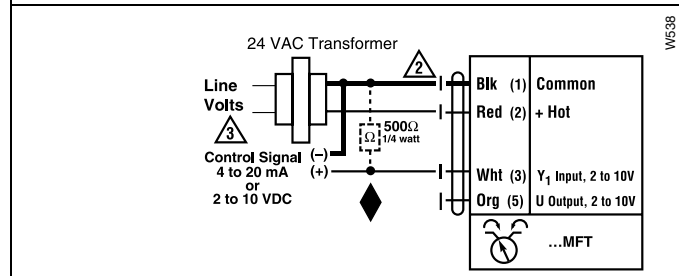
**WARNING Live Electrical Components!**  
During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components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



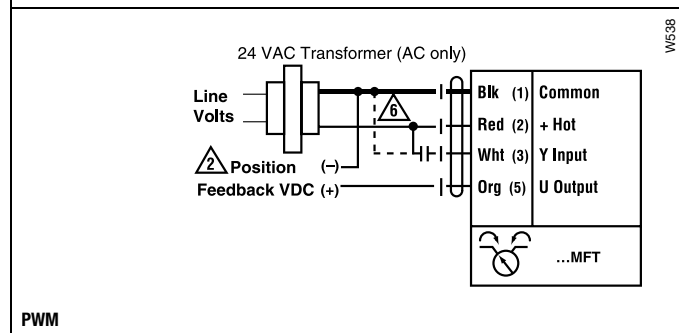
On/Off control



Floating Point



VDC/4-20 mA



PWM



# NVF(D)24(-E) US Actuators, On/Off



## Models

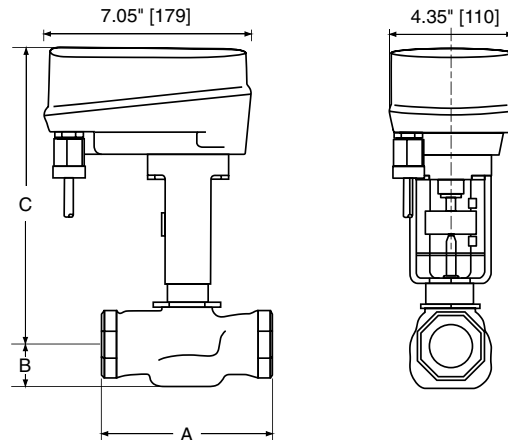
NVF24 US	Spring Up
NVF24-E US Spring Down	
NVFD24 US Spring Up	
NVFD24-E US	Spring Down

## Technical Data

Power supply	24 VAC ± 20% 50/60 Hz, 24 VDC ± 10%
Nominal voltage range	19.2...28.8 VAC, 21.6...28.8 VDC
Power consumption	5.5 W
Transformer sizing	10 VA (Class 2 power source)
Electrical connection	3 ft, 18 GA plenum rated cable ½" conduit connector
Overload protection	electronic throughout stroke
Control signal Y	on/off
Operating range	2 to 10 VDC
Maximum stroke	¾" [20mm]
Plunger	
NVF...24 US	spring up
NVF...24-E US	spring down
Force	
NVFD24(-E) US	90 lbf [400 N]
NVF24(-E) US	180 lbf [800 N]
Position indication	stroke indicator on bracket
Manual override	3/16" hex, 5mm hex or phillips screwdriver
Running time	motor spring
motor	150 seconds, independent of load
spring	30 seconds at ¾" [20mm] stroke
Humidity	5 to 95% RH non-condensing
Ambient temperature	32°F to 122°F [0°C to 50°C]
Storage temperature	20°F to 176°F [-7°C to 80°C]
Housing	NEMA 2/IP54 with cable entry down
Housing material	UL94-5V (flammability rating)
Agency listings†	cULus to UL 60730-1A/UL60730-2-14 and CAN/CSA E60730-1/CSA C22.2 No. 24-93 CE acc. to 2004/108/EC & 2006/95/EC, tested to 1EC/EN 60730-1 and 1EC/EN 60370-2-14
Noise level	<35 dB(A)
Quality standard	ISO 9001

## Dimensions with G2... Series 2-Way Valve

Assembly using UNV-001 Bracket

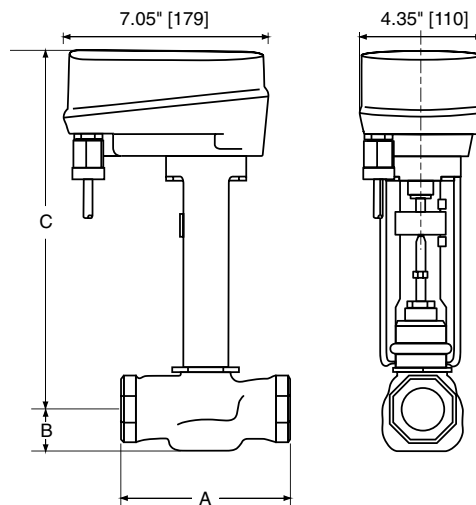


D031

Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2	½"	15	3.00" [76]	1.06" [27]	9.75" [248]
G2	¾"	20	3.62" [92]	1.06" [27]	9.75" [248]
G2	1"	25	4.62" [117]	1.12" [29]	10.43" [265]
G2	1¼"	32	4.62" [117]	1.37" [35]	10.43" [265]
G2	1½"	40	5.37" [137]	1.50" [38]	10.50" [267]
G2	2"	50	6.12" [156]	1.56" [40]	10.81" [275]

## Dimensions with G2...S Series 2-Way Valve

Assembly using UNV-035 Bracket (Bracket is 1.563" longer than UNV-001)

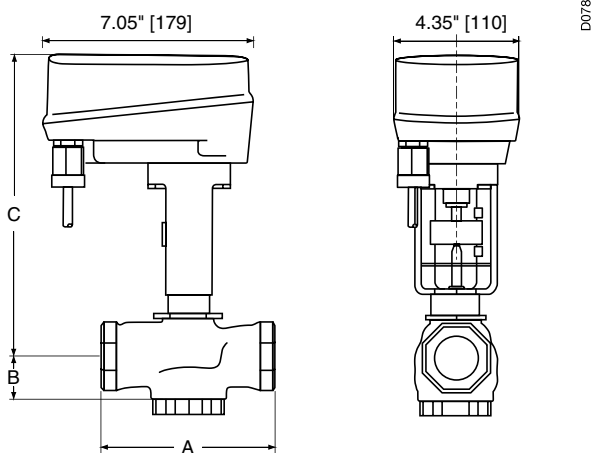


D056

Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2S	½"	15	3.00" [76]	1.06" [27]	11.31" [287]
G2S	¾"	20	3.62" [92]	1.06" [27]	11.31" [287]
G2S	1"	25	4.62" [117]	1.12" [29]	12.00" [305]
G2S	1¼"	32	4.62" [117]	1.37" [35]	12.00" [305]
G2S	1½"	40	5.37" [137]	1.50" [38]	12.06" [306]
G2S	2"	50	6.12" [156]	1.56" [40]	12.37" [314]

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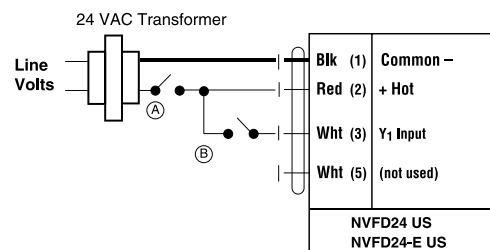
### Dimensions with G3...(D) Series 3-Way Valve



Valve Nominal Size      Dimensions (Inches [mm])

Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G3(D)	½"	15	3.00" [76]	1.37" [35]	9.75" [248]
G3(D)	½"	15	3.00" [76]	1.37" [35]	9.75" [248]
G3(D)	¾"	20	3.62" [92]	1.68" [43]	9.75" [248]
G3(D)	1"	25	4.62" [117]	1.56" [40]	9.81" [249]
G3(D)	1¼"	32	4.62" [117]	1.62" [41]	10.06" [256]
G3(D)	1½"	40	5.37" [137]	1.62" [41]	9.18" [234]
G3(D)	2"	50	6.12" [156]	1.87" [48]	9.25" [235]

### Wiring Diagrams

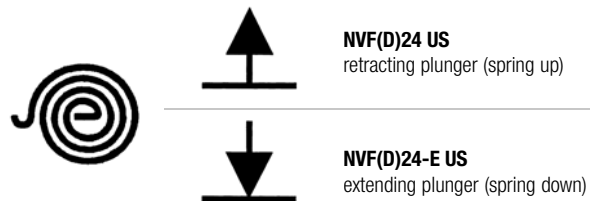


	Actuator		Control Switch Location	Correct LED Indication
	"Open" (Switch Selectable)	"Closed" (Switch Selectable)		
OFF/ON Drive "open" Spring "closed"	150 sec. (MFT selectable)	30 sec. Spring return	(A)	Flashing Red
OFF/ON Drive "open" Drive "closed"	150 sec. (MFT selectable)	150 sec. (MFT selectable)	(B)	Steady Green

If the switch location "A" is selected, the switch in location "B" is not required.  
If the switch location "B" is selected, the switch in location "A" is not required.

### On/Off control

### Spring Return Actuators Model Designation



# NVF(D)24-MFT(-E) US Actuators, Multi-Function Technology



## Models

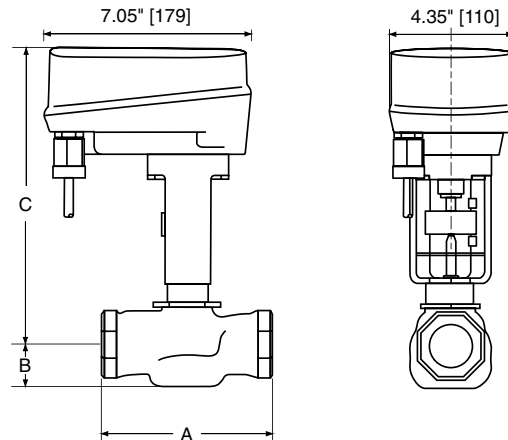
NVF24-MFT US	Spring Up
NVF24-MFT-E US	Spring Down
NVFD24-MFT US	Spring Up
NVFD24-MFT-E US	Spring Down

## Technical Data

Power supply	24 VAC ± 20% 50/60 Hz, 24 VDC ± 10%
Nominal voltage range	19.2...28.8 VAC, 21.6...28.8 VDC
Power consumption	5.5 W
Transformer sizing	10 VA (Class 2 power source)
Electrical connection	3 ft, 18 GA plenum rated cable ½" conduit connector
Overload protection	electronic throughout stroke
Control signal Y	2 to 10 VDC (V-10001 default), PWM available
Operating range	2 to 10 VDC 4 to 20 mA (w/500 Ω, ¼ W resistor) ZG-R01
Input impedance	100 kΩ for 2 to 10 VDC (0.1 mA) 500 Ω for 4 to 20 mA 1500 Ω for PWM, on/off and floating point
Operating range	2 to 10 VDC
Maximum stroke	¾" [20mm]
Plunger	
NVF...24-MFT US	spring up
NVF...24-MFT-E US	spring down
Force	
NVFD24-MFT(-E) US	90 lbf [400 N]
NVF24-MFT(-E) US	180 lbf [800 N]
Position indication	stroke indicator on bracket
Manual override	3/16" hex, 5mm hex or phillips screwdriver
Running time	motor spring
	150 seconds, independent of load and stroke 30 seconds at ¾" [20mm] stroke
Humidity	5 to 95% RH non-condensing
Ambient temperature	32°F to 122°F [0°C to 50°C]
Storage temperature	20°F to 176°F [-7°C to 80°C]
Housing	NEMA 2/IP54 with cable entry down
Housing material	UL94-5V (flammability rating)
Agency listings†	cULus to UL 60730-1/UL60730-2-14 and CAN/CSA E60730-1/CSA C22.2 No. 24-93 CE acc. to 2004/108/EC & 2006/95/EC, tested to 1EC/EN 60730-1 and 1EC/EN 60370-2-14
Noise level	<35 dB(A)
Quality standard	ISO 9001

## Dimensions with G2... Series 2-Way Valve

Assembly using UNV-001 Bracket



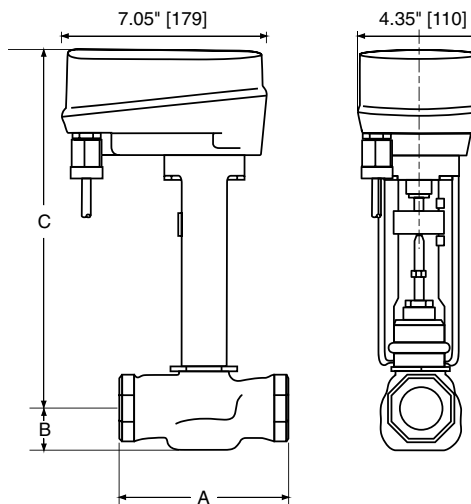
D031

### Valve Nominal Size

Valve Body	Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2	½"	15	3.00" [76]	1.06" [27]	9.75" [248]
G2	¾"	20	3.62" [92]	1.06" [27]	9.75" [248]
G2	1"	25	4.62" [117]	1.12" [29]	10.43" [265]
G2	1¼"	32	4.62" [117]	1.37" [35]	10.43" [265]
G2	1½"	40	5.37" [137]	1.50" [38]	10.50" [267]
G2	2"	50	6.12" [156]	1.56" [40]	10.81" [275]

## Dimensions with G2...S Series 2-Way Valve

Assembly using UNV-035 Bracket (Bracket is 1.563" longer than UNV-001)



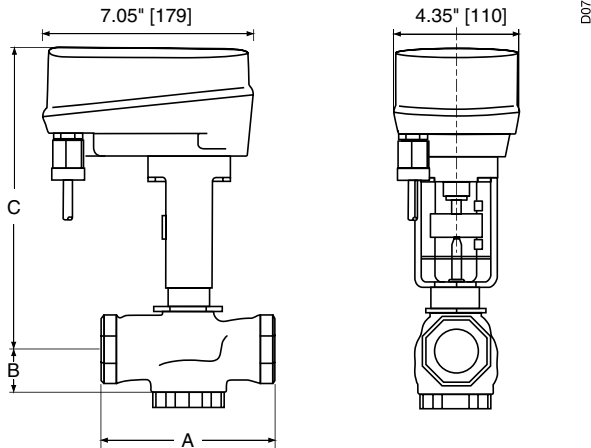
D056

### Valve Nominal Size

Valve Body	Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2S	½"	15	3.00" [76]	1.06" [27]	11.31" [287]
G2S	¾"	20	3.62" [92]	1.06" [27]	11.31" [287]
G2S	1"	25	4.62" [117]	1.12" [29]	12.00" [305]
G2S	1¼"	32	4.62" [117]	1.37" [35]	12.00" [305]
G2S	1½"	40	5.37" [137]	1.50" [38]	12.06" [306]
G2S	2"	50	6.12" [156]	1.56" [40]	12.37" [314]

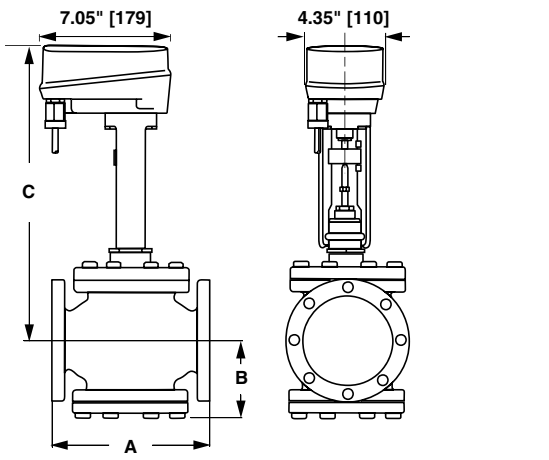
N400021 - 06/11 - Subject to change. © Belimo Aircontrols (USA), Inc.

### Dimensions with G3...(D) Series 3-Way Valve



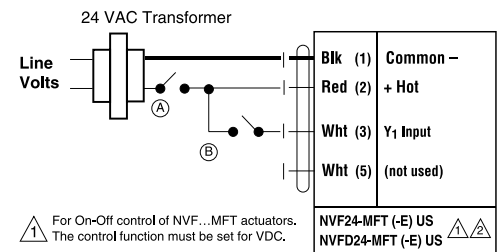
Valve Nominal Size			Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	A	B	C
G3(D)	½"	15	3.00" [76]	1.37" [35]	9.75" [248]
G3(D)	½"	15	3.00" [76]	1.37" [35]	9.75" [248]
G3(D)	¾"	20	3.62" [92]	1.68" [43]	9.75" [248]
G3(D)	1"	25	4.62" [117]	1.56" [40]	9.81" [249]
G3(D)	1¼"	32	4.62" [117]	1.62" [41]	10.06" [256]
G3(D)	1½"	40	5.37" [137]	1.62" [41]	9.18" [234]
G3(D)	2"	50	6.12" [156]	1.87" [48]	9.25" [235]

### Dimensions with G6...C Series 2-Way Valve



Valve Nominal Size			Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	A	B	C
G6C ANSI 125	2½"	65	9.00" [229]	4.75" [120]	15.00" [381]
G6C ANSI 125	3"	80	10.00" [254]	5.37" [137]	15.43" [392]

### Wiring Diagrams



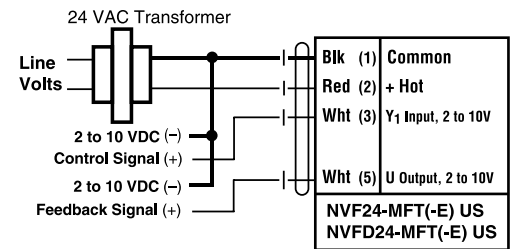
⚠ For On-Off control of NVF...MFT actuators. The control function must be set for VDC.

⚠ V-40... configurations do not require programming.

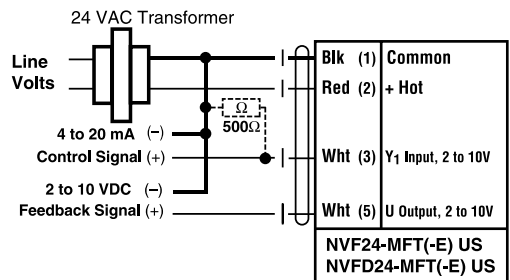
	Actuator		Control Switch Location	Correct LED Indication
	"Open" (Switch Selectable)	"Closed" (Switch Selectable)		
OFF/ON Drive "open" Spring "closed"	150 sec. (MFT selectable)	30 sec. Spring return	(A)	Flashing Red
OFF/ON Drive "open" Drive "closed"	150 sec. (MFT selectable)	150 sec. (MFT selectable)	(B)	Steady Green

If the switch location "A" is selected, the switch in location "B" is not required. If the switch location "B" is selected, the switch in location "A" is not required.

### On/Off Control

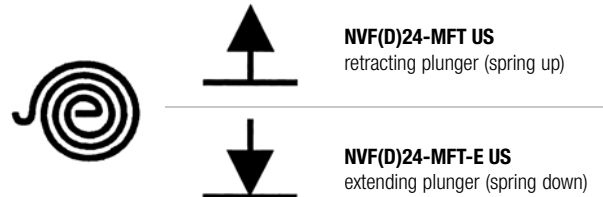


### 2 to 10 VDC

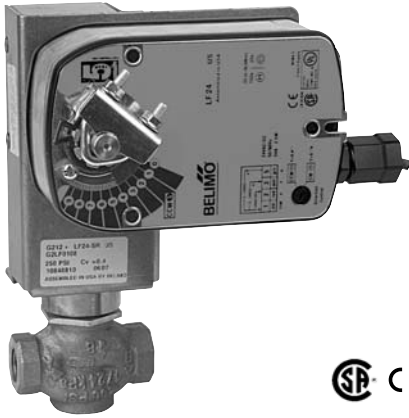


### 4 to 20 mA

### Spring Return Actuators Model Designation



# LF24 US Actuators, On/Off



## Models

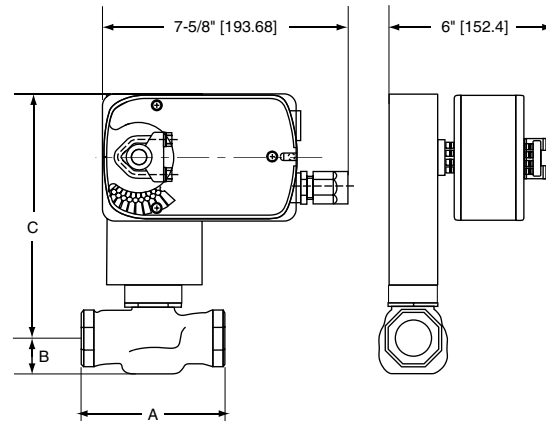
LF24 US	
LF24-S US	w/built-in Aux. Switch
LF120 US	
LF120-S US	w/built-in Aux. Switch

Technical Data	
Control	on/off, floating point
Power supply	
LF24(-S) US	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
LF120(-S) US	120 VAC ± 10% 50/60 Hz
Power consumption	
LF24(-S) US	running 5 W holding 2.5 W
LF120(-S) US	running 5.5 W holding 3.5 W
Transformer sizing	
LF24(-S) US	7 VA, class 2 power source
LF120(-S) US	7.5 VA, class 2 power source
Electrical connection	3 ft, 18 GA appliance cable (-S models have 2 cables) ½" conduit connector
Electrical protection	120V actuators double insulated
Overload protection	electronic throughout rotation
Angle of rotation	95°
Spring return direction	reversible with CW/CCW mounting
Position indication	visual indicator 0° to 90°
Running time	<40 to 75 sec. (on-off)
	spring <25 sec. @-4°F to 122°F [-20°C to 50°C] <60 sec. @-22°F [-30°C]
Ambient temperature	-22° F to 122° F [-30° C to 50° C]
Housing	NEMA 2
Agency listings†	UL 873, CSA C22.2 No. 24 certified, CE
Quality standard	ISO 9001
Noise level	max. 62 dB(A)

LF...-S US	
Auxiliary switch	1 x SPDT, 6A (1.5A) @ 250 VAC, UL Listed, adjustable 0° to 95° (double insulated)

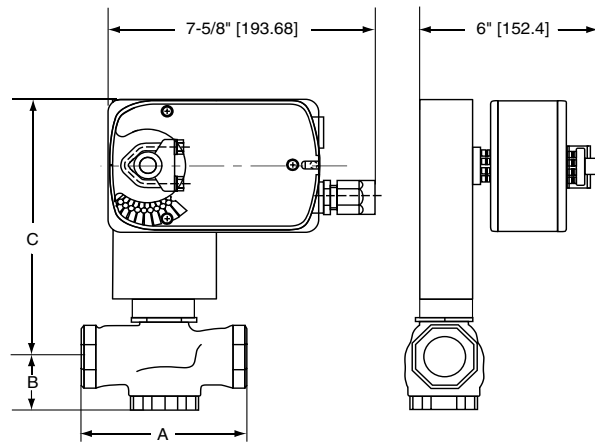
† Rated impulse voltage 800V (4kV for 120V model), Control pollution degree 3, Type of action 1.AA (1.AA.B for -S models)

## Dimensions with G2...(S) Series 2-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2(S)	½"	15	3.00" [76]	1.06" [27]	7.56" [192]
G2(S)	¾"	20	3.62" [92]	1.06" [27]	7.56" [192]

## Dimensions with G3...(D) Series 3-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G3(D)	½"	15	3.00" [76]	1.37" [35]	7.87" [200]
G3(D)	¾"	20	3.62" [92]	1.68" [43]	8.18" [208]

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### Wiring Diagrams



#### INSTALLATION NOTES



#### CAUTION Equipment damage!

Actuators may be connected in parallel.  
Power consumption must be observed.



Actuator may also be powered by 24 VDC.



For end position indication, interlock control, fan startup, etc.,  
LF24-S US and LF120-S US incorporates a built-in auxiliary switch:  
1 x SPDT, 6A (1.5A) @ 250 VAC, UL listed, adjustable 0° to 95°.



#### APPLICATION NOTES

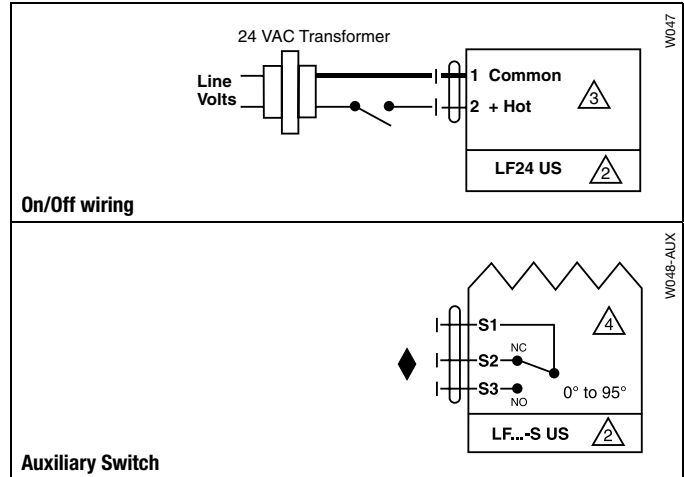


Meets cULus or UL and CSA requirements without the  
need of an electrical ground connection.

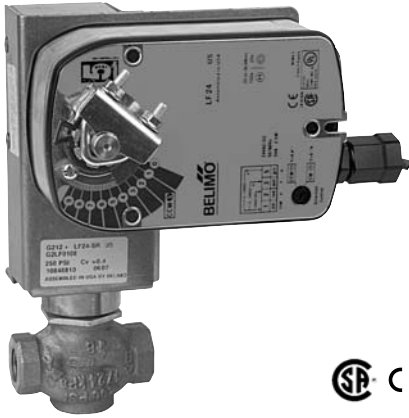


#### WARNING Live Electrical Components!

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.



# LF24-3 US Actuators, Floating Point

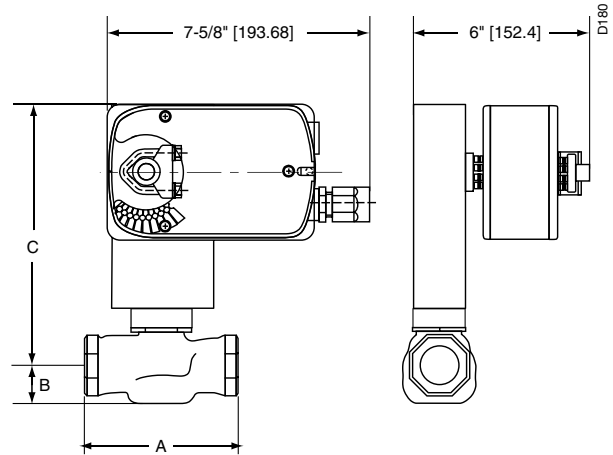


## Models

LF24-3 US  
LF24-3-S US w/built-in Aux. Switch

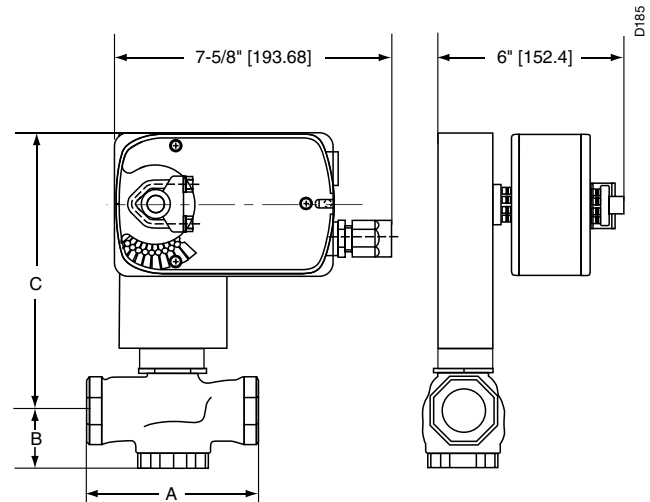
Technical Data	
Power supply	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Power consumption	running 2.5 W holding 1W
Transformer sizing	5 VA (class 2 power source)
Electrical connection	3 ft, 18 GA appliance cables (-S model has 2 cables) ½" conduit connector
Overload protection	electronic throughout 0° to 95° rotation
Input impedance	1000 Ω (0.6w) control inputs
Angle of rotation	95°
Torque	35 in-lb [Nm]
Direction of rotation	spring reversible with CW/CCW mounting motor reversible with built-in  switch
Position indication	visual indicator 0° to 90°
Running time	motor 150 sec. constant independent of load spring <25 sec. @ -4°F to 122°F [-20°C to 50°C] <60 sec. @ -22°F [-30°C]
Humidity	5 to 95% RH non-condensing
Ambient temperature	-22° F to 122° F [-30° C to 50° C]
Storage temperature	-40° F to 176° F [-40° C to 80° C]
Housing	NEMA type 2/IP54
Housing material	zinc coated metal
Agency listings	UL 873 listed, CSA C22.2 No. 24 certified, CE
Noise level (max)	running <30 db(A) spring return 62 db(A)
Servicing	maintenance free
Quality standard	ISO 9001
<b>LF24-3-S US</b>	
Auxiliary switch	1 x SPDT, 6A (1.5A) @ 250 VAC, UL Listed, adjustable 0° to 95° (double insulated)

## Dimensions with G2...(S) Series 2-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2(S)	½"	15	3.06" [78]	1.06" [27]	7.56" [192]
G2(S)	¾"	20	3.62" [92]	1.06" [27]	7.56" [192]

## Dimensions with G3...(D) Series 3-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G3(D)	½"	(15)	3.00" [76]	1.37" [35]	7.87" [200]
G3(D)	¾"	(20)	3.62" [92]	1.68" [43]	8.18" [208]

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### Wiring Diagrams

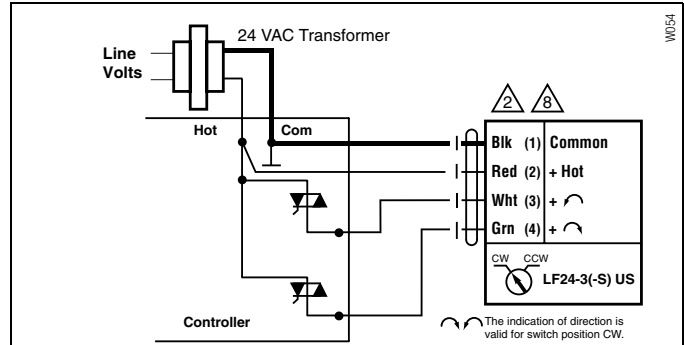
#### INSTALLATION NOTES

- CAUTION Equipment damage!**
- 2 Actuators may be connected in parallel. Power consumption must be observed.
- 3 Actuators may also be powered by 24 VDC.
- 4 The common connection from the actuator must be connected to the Hot connection of the controller.
- 5 The actuator Hot must be connected to the control board common.
- For end position indication, interlock control, fan startup, etc., LF24-3-S US incorporates one built-in auxiliary switch: 1 x SPDT, 6A (1.5A) @ 250 VAC, UL listed, adjustable 0° to 95°.
- 6
- 8 Actuators with plenum rated cable do not have numbers on wires; use color coded instead. Actuators with appliance rated cable use numbers.

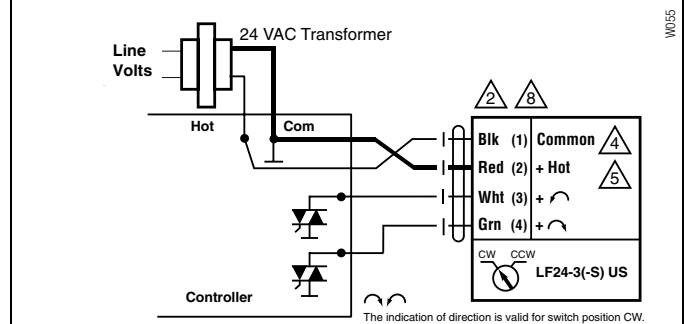
#### APPLICATION NOTES

- ◆ Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

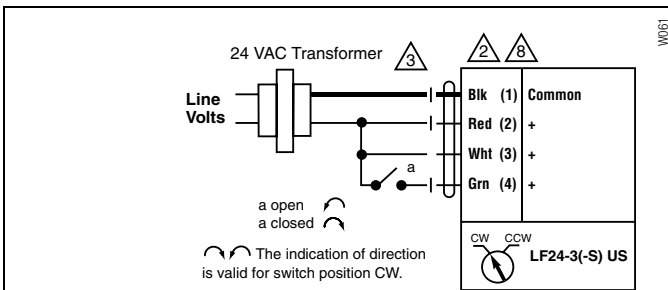
**WARNING Live Electrical Components!** During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components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



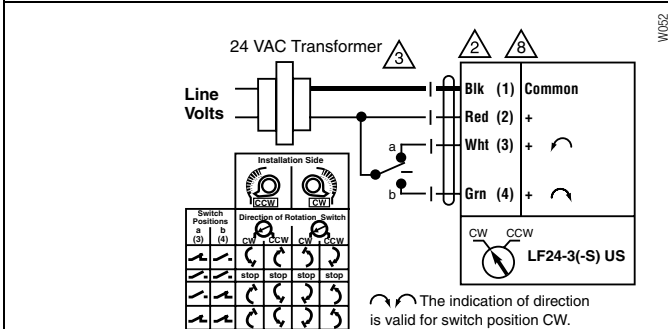
Triac source



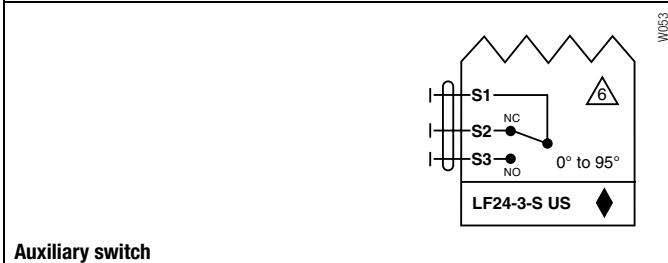
Triac sink



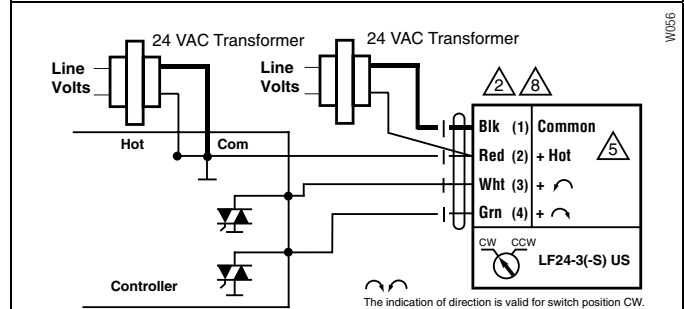
On/Off control



Floating Point control



Auxiliary switch



Triac sink with separate transformers



# LF24-SR US Actuators, Proportional

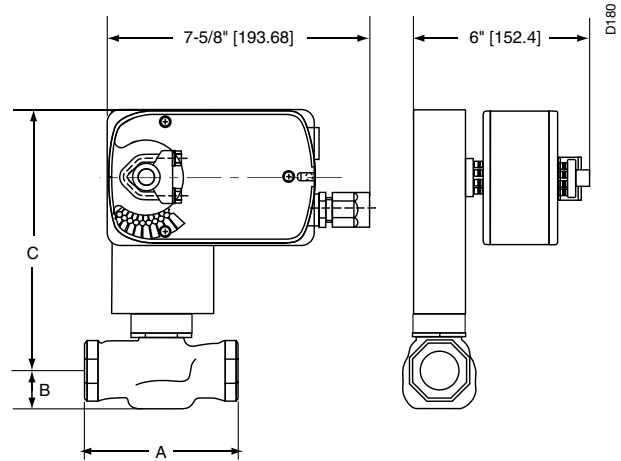


## Models

LF24-SR US  
LF24-SR-S US w/built-in Aux. Switch

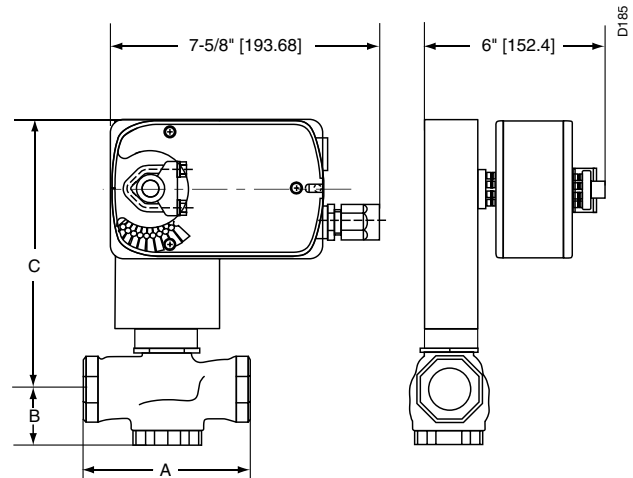
Technical Data	
Control	proportional
Control signal	2 to 10 VDC 4 to 20 mA (with 500 Ω resistor)
Power consumption	running 2.5 W holding 1 W
Transformer sizing	5 VA (Class 2 power)
Electrical connection	3 ft, 18 GA appliance cables (-S model has 2 cables) ½" conduit connector
Overload protection	electronic throughout 0° to 95° rotation
Input impedance	100 kΩ
Feedback output	2 to 10 VDC
Angle of rotation	95°
Direction of rotation	spring reversible with CW/CCW mounting motor reversible with built-in switch
Position indication	visual indicator
Running time	motor <40 to 75 sec. (on/off) 150 sec. independent of load (proportional) spring <25 sec. @ -4°F to 122°F [-20°C to 50°C] <60 sec. @ -22°F [-30°C]
Ambient temperature	-22° F to 122° F [-30° C to 50° C]
Housing	NEMA 2
Agency listings	UL 873, CSA C22.2 No. 24 certified, CE
Quality standard	ISO 9001
Noise level	max. 62 dB(A)
LF24-SR-S US	
Auxiliary switch	1 x SPDT, 6A (1.5A) @ 250 VAC, UL Listed, adjustable 0° to 95° (double insulated)

## Dimensions with G2...(S) Series 2-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2(S)	½"	(15)	3.00" [76]	1.06" [27]	7.56" [192]
G2(S)	¾"	(20)	3.62" [92]	1.06" [27]	7.56" [192]

## Dimensions with G3...(D) Series 3-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G3(D)	½"	15	3.00" [76]	1.37" [35]	7.87" [200]
G3(D)	¾"	20	3.62" [92]	1.68" [43]	8.18" [208]

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### Wiring Diagrams



#### INSTALLATION NOTES



#### CAUTION Equipment damage!

Actuators may be connected in parallel. Up to 4 actuators may be connected in parallel. With 4 actuators wired to one 500 Ω resistor, a +2% shift of control signal may be required. Power consumption must be observed.



Actuators may also be powered by 24 VDC.



Actuators with plenum rated cable do not have numbers on wires; use color codes instead.



Only connect common to neg. (-) leg of control circuits.



For end position indication, interlock control, fan startup, etc., LF24-SR-S US incorporates one built-in auxiliary switch: 1 x SPDT, 6A (1.5A) @ 250 VAC, UL listed, adjustable 0° to 95°.



The LF24-SR-S US wire 5 is white.



#### 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.

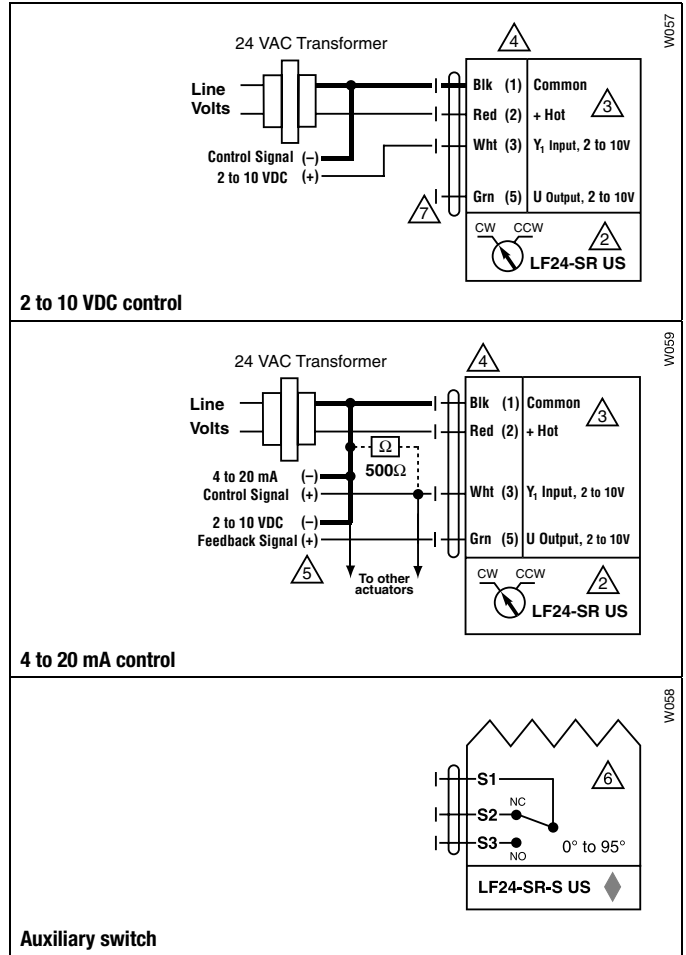


Meets cULus or UL and CSA requirements without the need of an electrical ground connection.



#### 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.



# LF24-MFT US Actuators, Multi-Function Technology



**MFT**



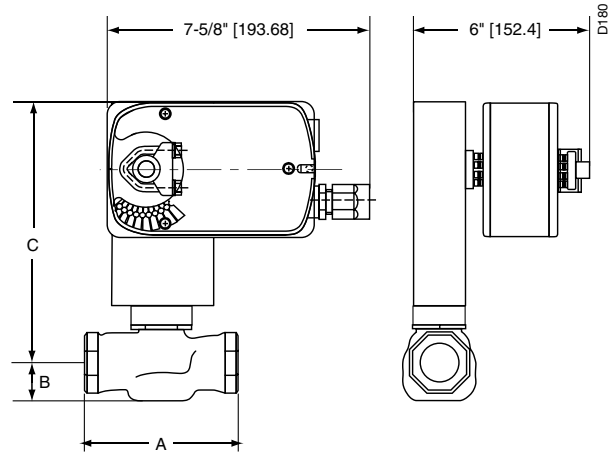
## Models

LF24-MFT US  
LF24-MFT-S US w/built-in Aux. Switch

Technical Data		
Control	MFT	
Control signal	2 to 10 VDC	
Power consumption	running	2.5 W
	holding	1 W
Transformer sizing	5 VA (Class 2 power source)	
Electrical connection	½" conduit connector	
(-S models have 2 cables)	3 ft [1m], 18 GA appliance cable	
Overload protection	electronic throughout 0° to 95° rotation	
Feedback output	2 to 10 VDC, 0.5 mA max	
Input impedance	100 kΩ for 2 to 10 VDC (0.1 mA)	
	500 Ω for 4 to 20mA	
	750 Ω for PWM	
	500 Ω for on/off and floating point	
Angle of rotation	95°	
Direction of rotation	spring	reversible with CW/CCW mounting
	motor	reversible with built-in  switch
Position indication	visual indicator	
Running time	motor	150 sec. independent of load (proportional, default)
	spring	<25 sec. @ -4°F to 122°F [-20°C to 50°C] <60 sec. @ -22°F [-30°C]
Ambient temperature	-22° F to 122° F [-30° C to 50° C]	
Housing	NEMA 2	
Agency listings	cULus according to UL 873 and CAN/CSA C22.2 No. 24-93	
Noise level (max)	running	<30 db(A)
	spring return	62 db(A)
Quality standard	ISO 9001	

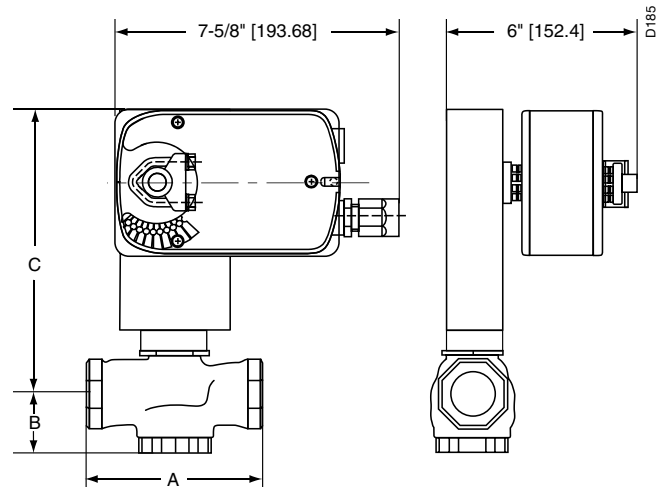
LF24-MFT-S US	
Auxiliary switch	1 x SPDT, 6A (1.5A) @ 250 VAC, UL Listed, adjustable 0° to 95° (double insulated)

## Dimensions with G2...(S) Series 2-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2(S)	½"	15	3.00" [76]	1.06" [27]	7.56" [192]
G2(S)	¾"	20	3.62" [92]	1.06" [27]	7.56" [192]

## Dimensions with G3...(D) Series 3-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G3(D)	½"	15	3.00" [76]	1.37" [35]	7.87" [200]
G3(D)	¾"	20	3.62" [92]	1.68" [43]	8.18" [208]

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### Wiring Diagrams

#### INSTALLATION NOTES



#### 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.



Actuators may also be powered by 24 VDC.



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



Triac A and B can also be contact closures.



Control signal may be pulsed from either the Hot (Source) or Common (Sink) 24 VAC line.



Position feedback cannot be used with Triac sink controller. The actuators internal common reference is not compatible.



#### APPLICATION NOTES

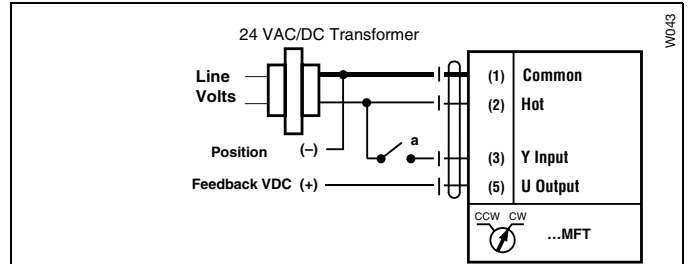


The ZG-R01 500 Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC, up to 2 actuators may be connected in parallel.



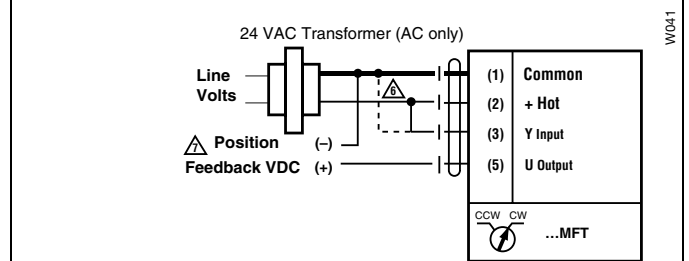
#### WARNING Live Electrical Components!

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.



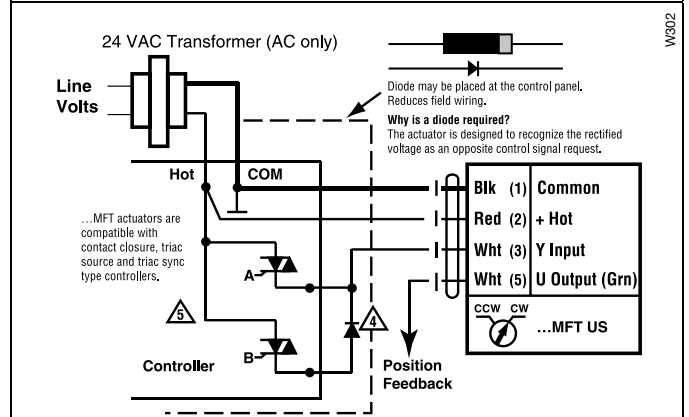
On/Off control

W043



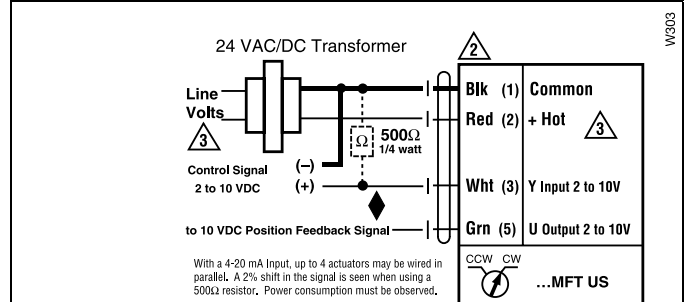
PWM, triac source and sink

W041



Floating Point control

W002



Proportional 2 to 10 or 4 to 20 mA control signal

W303



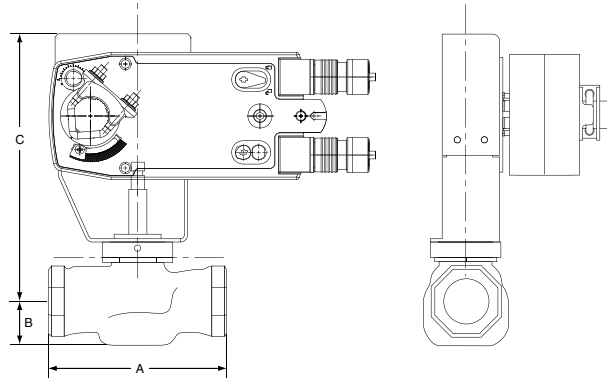
## Models

NFBUP-X1  
NFBUP-S-X1 w/built-in Aux. Switch



Technical Data	
Power supply	24...240 VAC -20% / +10%, 50/60 Hz 24...125 VDC ±10%
Power consumption	running 6 W holding 2.5 W
Transformer sizing	9.5 VA (Class 2 power source)
Electrical connection	3 ft, 18 GA appliance cable, ½" conduit connector -S models: two 3 ft, 18 gauge appliance cables with ½" conduit connectors
Overload protection	electronic throughout 0 to 95° rotation
Control	on/off
Torque	90 in-lb [10 Nm] minimum
Direction of rotation	spring reversible with CW/CCW mounting
Mechanical angle of rotation	95° (adjustable with mechanical end stop, 35° to 95°)
Running time	motor <75 sec spring 20 sec @ -4°F to 122°F [-20°C to 50°C]; <60 sec @ -22°F [-30°C]
Position indication	visual indicator, 0° to 95° (0° is full spring return position)
Manual override	5 mm hex crank (¾" Allen), supplied
Humidity	max. 95% RH non-condensing
Ambient temperature	-22°F to 122°F [-30°C to 50°C]
Housing	Nema 2, IP54, Enclosure Type2
Housing material	Zinc coated metal and plastic casing
Agency listings †	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EC & 2006/95/EC
Noise level	<50dB(A) motor @ 75 seconds ≤62dB(A) spring return
Quality standard	ISO 9001
Weight	4.15 lbs (1.9 kg), 4.25 lbs (1.9 kg) with switches
† Rated Impulse Voltage 4kV, Type of action 1.AA (1.AA.B for -S version), Control Pollution Degree 3.	
<b>NFBUP-S-X1</b>	
Auxiliary switches	2 x SPDT 3A (0.5A) @ 250 VAC, UL approved one set at +10°, one adjustable 10° to 90°

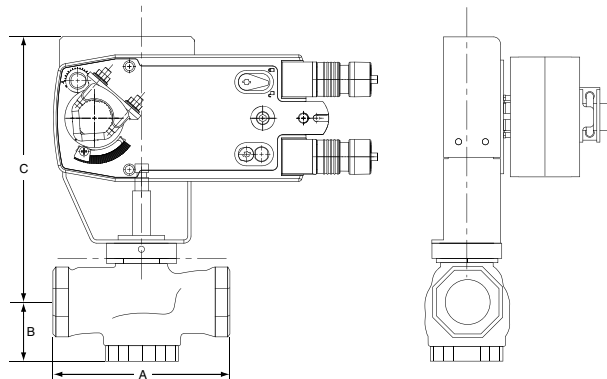
## Dimensions with G2...(S) Series 2-Way Valve



D180

Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2(S)	1"	32	4.62" [117]	1.12" [29]	8.12" [206]
G2(S)	1¼"	40	4.62" [117]	1.37" [35]	8.37" [213]

## Dimensions with G3...(D) Series 3-Way Valve



D185

Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G3(D)	1"	25	4.62" [117]	1.56" [40]	8.56" [217]
G3(D)	1¼"	32	4.62" [117]	1.62" [41]	8.62" [219]

### Wiring Diagrams

#### INSTALLATION NOTES

1 Provide overload protection and disconnect as required.

2 **CAUTION Equipment Damage!**  
Actuators may be connected in parallel.  
Power consumption and input impedance must be observed.

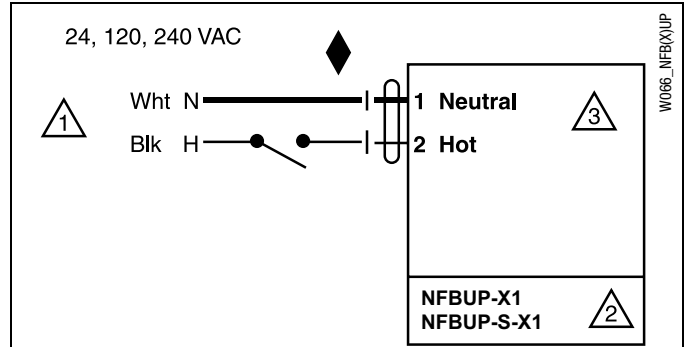
3 No ground connection is required.

4 For end position indication, interlock control, fan startup, etc., NFBUP-S-X1 incorporates two built-in auxiliary switches: 2 x SPDT, 3A (0.5A) @250 VAC, UL Approved, one switch is fixed at +10°, one is adjustable 10° to 90°.

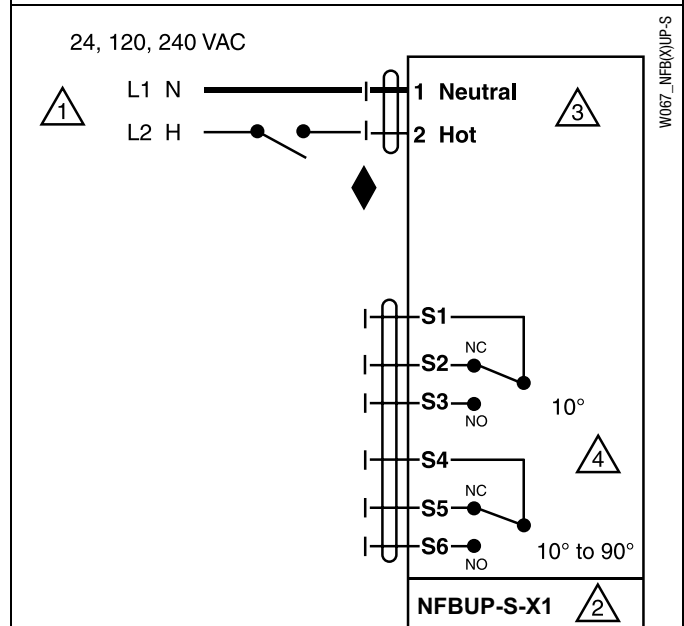
#### APPLICATION NOTES

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.



On/Off wiring for NFBUP-X1



Auxiliary Switches for NFBUP-S-X1

# NFB24-SR-X1 Actuators, Proportional



## Models

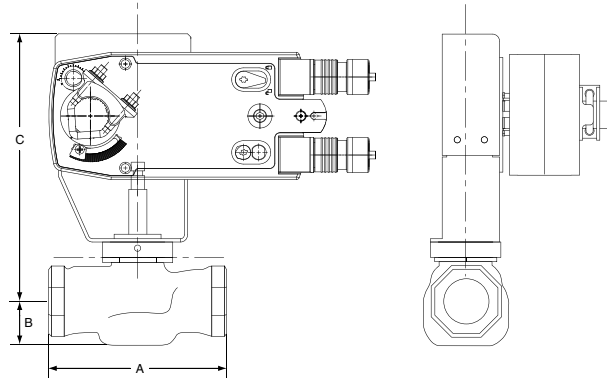
NFB24-SR-X1  
NFB24-SR-S-X1 w/built-in Aux. Switch



Technical Data	
Power supply	24 VAC $\pm$ 20%, 50/60 Hz 24 VDC +20% / -10%
Power consumption	running 3.5 W holding 2.5 W
Transformer sizing	6 VA (Class 2 power source)
Electrical connection	3 ft, 18 GA appliance cable, 1/2" conduit connector <b>-S models:</b> Two 3 ft, 18 GA appliance cables with 1/2" conduit connectors
Overload protection	electronic throughout 0 to 95° rotation
Operating range Y	2 to 10 VDC, 4 to 20mA
Input impedance	100 k $\Omega$ for 2 to 10 VDC (0.1 mA) 500 $\Omega$ for 4 to 20 mA
Feedback output U	2 to 10 VDC (max. 0.5 mA)
Torque	90 in-lb [10 Nm] minimum
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 95 sec
Position indication	visual indicator, 0° to 95° (0° is full spring return position)
Manual override	5 mm hex crank (3/16 Allen), supplied
Humidity	max. 95% RH non-condensing
Ambient temperature	-22°F to 122°F [-30°C to 50°C]
Housing	Nema 2, IP54, Enclosure Type2
Housing material	Zinc coated metal and plastic casing
Agency listings†	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EC & 2006/95/EC
Noise level	$\leq$ 40dB(A) motor @ 95 seconds $\leq$ 62dB(A) spring return
Quality standard	ISO 9001
Weight	4.15 lbs (1.9 kg); 4.25 lbs (1.9 kg) with switches
† Rated Impulse Voltage 800V, Type of action 1.AA (1.AA.B for -S version), Control Pollution Degree 3.	
<b>NFB24-SR-S-X1</b>	
Auxiliary switches	2 x SPDT 3A (0.5A) @ 250 VAC, UL approved one set at +10°, one adjustable 10° to 90°

## Dimensions with G2...(S) Series 2-Way Valve

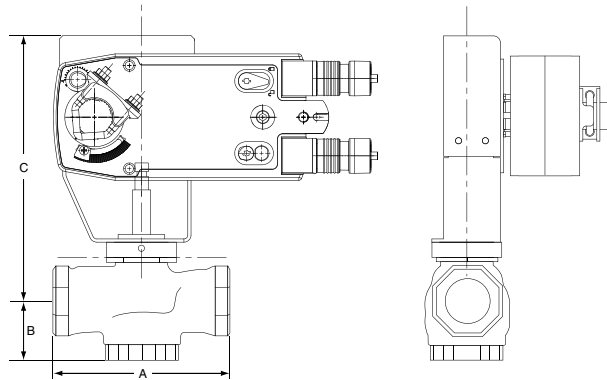
D180



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2(S)	1"	32	4.62" [117]	1.12" [29]	8.12" [206]
G2(S)	1 1/4"	40	4.62" [117]	1.37" [35]	8.37" [213]

## Dimensions with G3...(D) Series 3-Way Valve

D185



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G3(D)	1"	25	4.62" [117]	1.56" [40]	8.56" [217]
G3(D)	1 1/4"	32	4.62" [117]	1.62" [41]	8.62" [219]

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### Wiring Diagrams

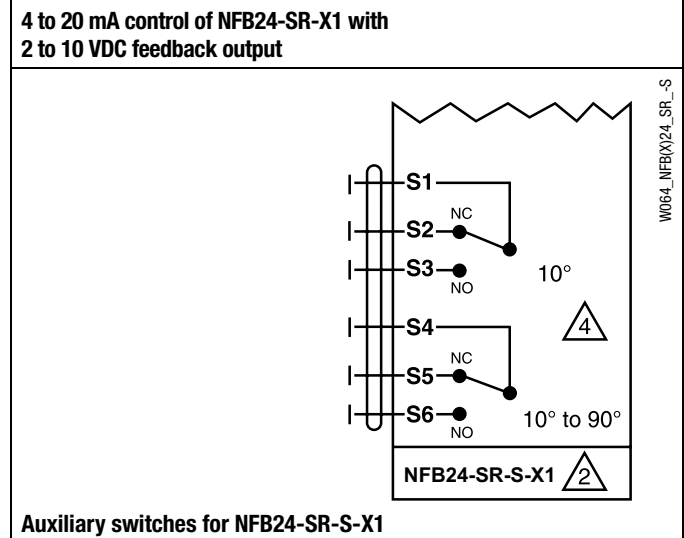
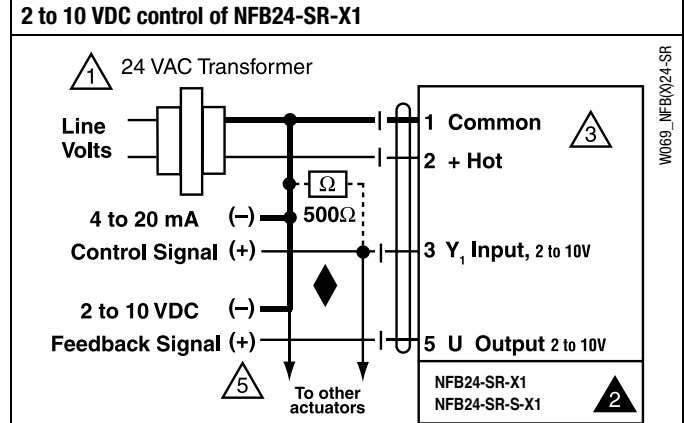
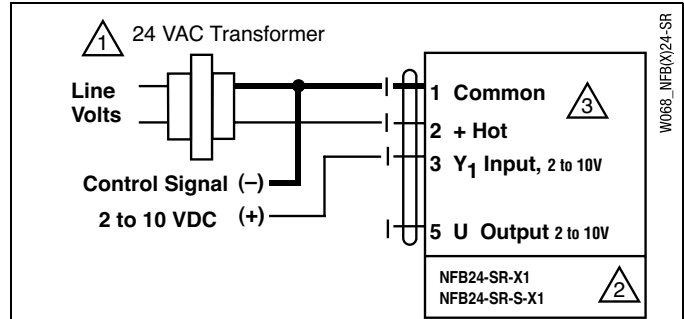
#### INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
- 2 **CAUTION Equipment Damage!**  
Actuators may be connected in parallel.  
Power consumption and input impedance must be observed.
- 3 Up to 4 actuators may be connected in parallel. With 4 actuators wired to one 500 Ω resistor. Power consumption must be observed.
- 4 Actuator may also be powered by 24 VDC.
- 5 For end position indication, interlock control, fan startup, etc., NFB24-SR-S-X1 incorporates two built-in auxiliary switches: 2 x SPDT, 3A (0.5A) @250 VAC, UL Approved, one switch is fixed at +10°, one is adjustable 10° to 90°.
- 5 Only connect common to neg. (-) leg of control circuits

#### APPLICATION NOTES

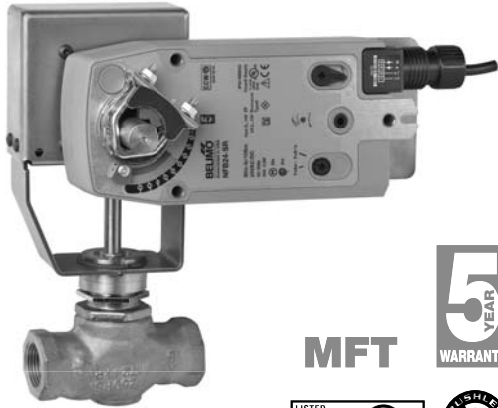
- ◆ The ZG-R01 500 Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC.

- ⚠ **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.





# NFX24-MFT-X1 Actuators, Multi-Function Technology



## Models

NFX24-MFT-X1  
NFX24-MFT-S-X1

**MFT**



Technical Data	
Power supply	24 VAC ±20%, 50/60 Hz 24 VDC +20% / -10%
Power consumption ♦	running 6.5 W holding 3 W
Transformer sizing ♦	9 VA (Class 2 power source)
Electrical connection	3 ft [1m], 10 ft [3m] or 16 ft [5m] 18 GA appliance or plenum cables, with or without ½" conduit connector <b>-S models:</b> two 3 ft [1m], 10 ft [3m] or 16 ft [5m] appliance cables with or without ½" conduit connectors
Overload protection	electronic throughout 0 to 95° rotation
Operating range Y*	2 to 10 VDC, 4 to 20mA (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, on/off
Feedback output U*	2 to 10 VDC (max. 0.5 mA)
Torque	90 in-lb [10 Nm] minimum
Direction of rotation*	spring motor 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 seconds @ -4°F to 122°F [-20°C to 50°C]; <60 seconds @ -22°F [-30°C] motor* 150 seconds (default), variable (40 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 full spring return position)
Manual override	5 mm hex crank (⅜" Allen), supplied
Humidity	max. 95% RH non-condensing
Ambient temperature	-22°F to 122°F [-30°C to 50°C]
Housing	Nema 2, IP54, Enclosure Type2
Housing material	Zinc coated metal and plastic casing
Agency listings†	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EC & 2006/95/EC
Noise level	≤40dB(A) motor @ 150 secs, run time dependent ≤62dB(A) spring return
Quality standard	ISO 9001
Weight	4.2 lbs (1.9 kg), 4.3 lbs (2.0 kg) with switches

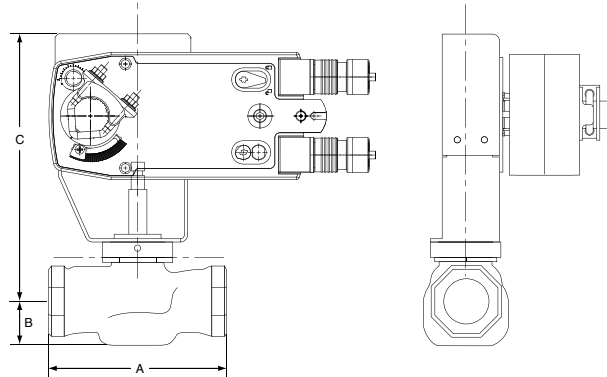
\*Variable when configured with MFT options.

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

♦ Programmed for 40 sec motor run time. At 150 sec motor run time, transformer sizing is 6.5 VA and power consumption is 4.5 W running / 3 W holding.

NFX24-MFT-S-X1	
Auxiliary switches	2 x SPDT 3A (0.5A) @ 250 VAC, UL Approved one set at +10°, one adjustable 10° to 90°

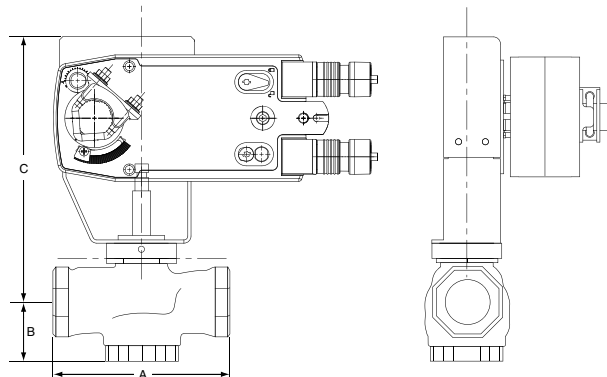
## Dimensions with G2...(S) Series 2-Way Valve



D180

Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2(S)	1"	32	4.62" [117]	1.12" [29]	8.12" [206]
G2(S)	1¼"	40	4.62" [117]	1.37" [35]	8.37" [213]

## Dimensions with G3...(D) Series 3-Way Valve



D185

Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G3(D)	1"	25	4.62" [117]	1.56" [40]	8.56" [217]
G3(D)	1¼"	32	4.62" [117]	1.62" [41]	8.62" [219]

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### Wiring Diagrams

#### INSTALLATION NOTES

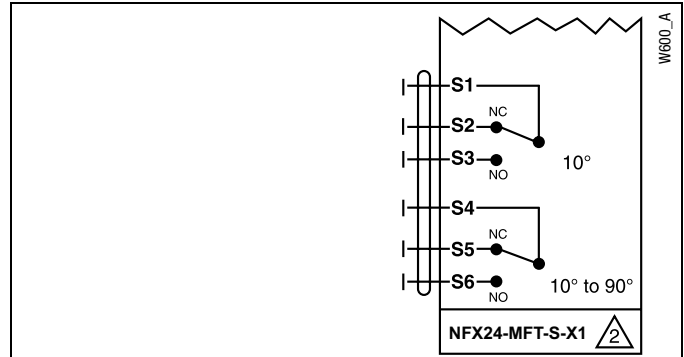
- 1 Provide overload protection and disconnect as required.
- 2 **CAUTION Equipment Damage!**  
Actuators may be connected in parallel if not mechanically mounted to the same shaft. Power consumption and input impedance must be observed.
- 3 Actuators may also be powered by 24 VDC.
- 4 Position feedback cannot be used with Triac sink controller.
- 4 The actuator internal common reference is not compatible.
- 5 Control signal may be pulsed from either the Hot (source) or the Common (sink) 24 VAC line.
- 8 Contact closures A & B also can be triacs.
- 8 A & B should both be closed for triac source and open for triac sink.
- 9 For triac sink the common connection from the actuator must be connected to the hot connection of the controller.

#### APPLICATION NOTES

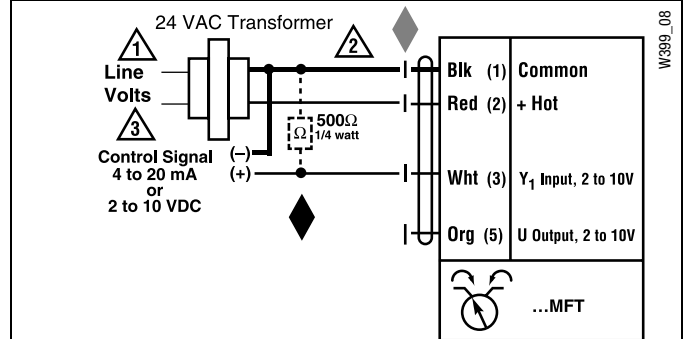
Meets UL requirements without the need of an electrical ground connection.

The ZG-R01 500 Ω resistor may be used.

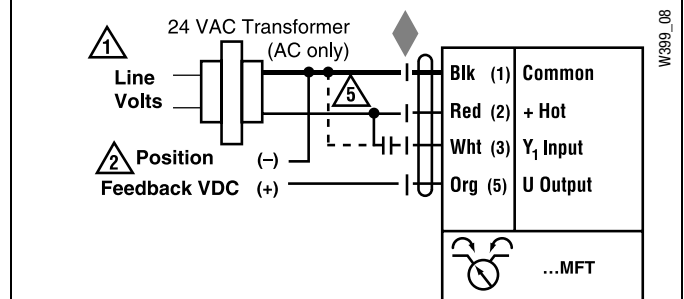
**WARNING Live Electrical Components!**  
During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components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



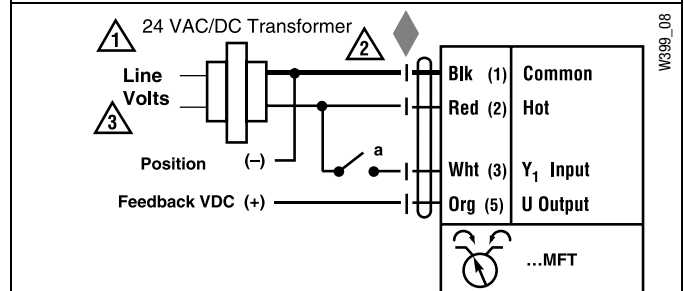
Auxiliary Switches for NFX24-MFT-S-X1



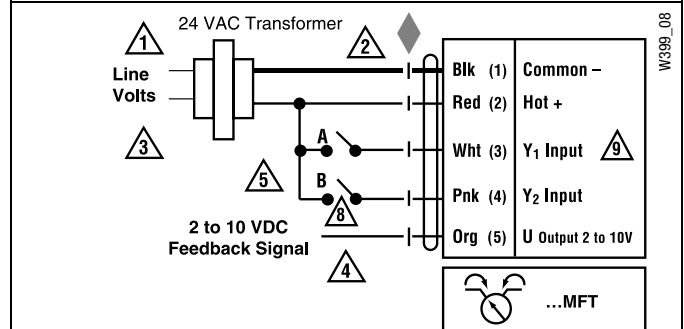
VDC/4-20 mA



PWM



On/Off control



Floating Point control

# AF24(-S) US Actuators, On/Off



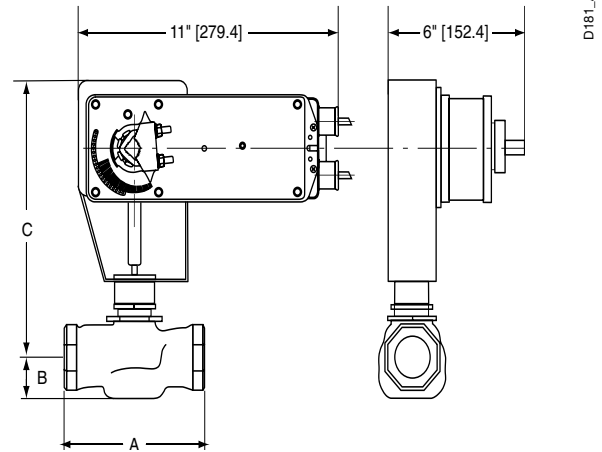
## Models

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

Technical Data		
Control		on/off
Power supply		24 VAC $\pm$ 20% 50/60 Hz 24 VDC $\pm$ 10%
Power consumption	running	5 W
	holding	1.5 W
Transformer sizing		10 VA (Class 2 power)
Electrical connection		3 ft, 18 GA appliance cables (-S model has 2 cables) 1/2" conduit connector
Electrical protection		auxiliary switches are double insulated
Overload protection		electronic throughout 0° to 95° rotation
Angle of rotation		95°
Position indication		visual indicator, 0° to 95°
Manual override		hex crank
Running time	control	150 seconds independent of load
	spring	< 20 seconds
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)

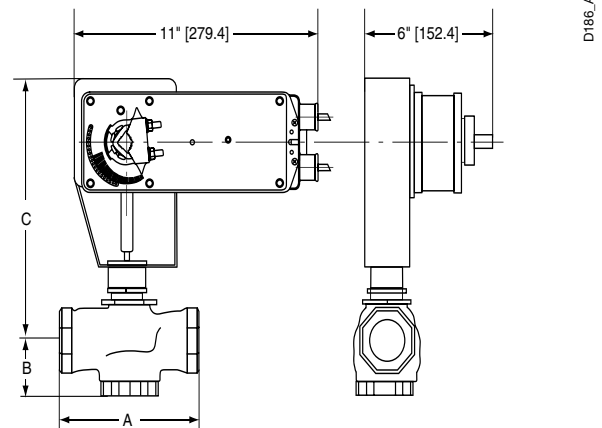
AF24-S US		
Auxiliary switches		2 x SPDT, 7A (2.5A) @ 250 VAC, UL listed, one switch is fixed at +5°, one is adjustable 25° to 85° (double insulated)

## Dimensions with G2...(S) Series 2-Way Valve



Valve Nominal Size			Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	A	B	C
G2(S)	1 1/2"	40	5.37" [137]	1.50" [38]	8.50" [216]
G2(S)	2"	50	6.12" [156]	1.56" [40]	8.56" [217]

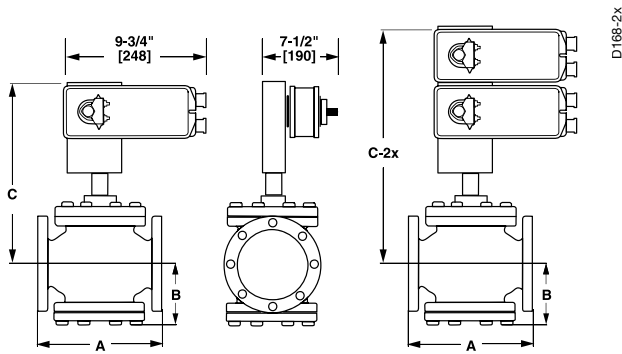
## Dimensions with G3...(D) Series 3-Way Valve



Valve Nominal Size			Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	A	B	C
G3(D)	1 1/2"	40	5.37" [137]	1.62" [41]	8.62" [219]
G3(D)	2"	50	6.12" [156]	1.87" [48]	8.87" [225]

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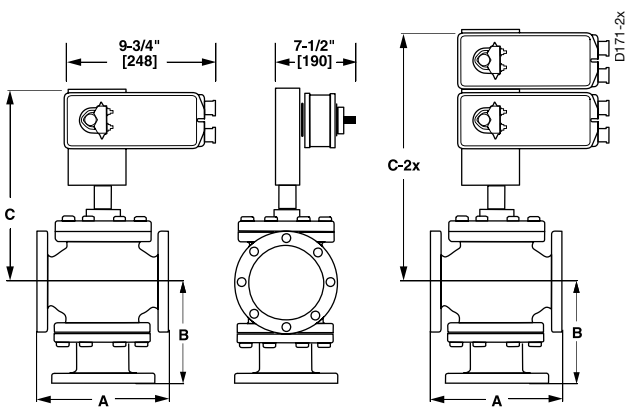
### Dimensions with G6/G6C ANSI 125 and G6 ANSI 250 Series 2-Way Valve



Valve Nominal Size			Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	A	B	C
G6 ANSI 125	2½"	65	9.00" [229]	4.75" [121]	13.50" [343]
G6 ANSI 125	3"	80	10.00" [254]	5.37" [136]	13.94" [354]
G6 ANSI 250	2½"	65	9.62" [244]	4.75" [121]	14.00" [356]
G6 ANSI 250	3"	80	10.75" [273]	5.37" [136]	14.12" [359]
G6C ANSI 125	2½"	65	9.00" [229]	4.75" [121]	13.50" [343]
G6C ANSI 125	3"	80	10.00" [254]	5.37" [136]	13.94" [354]

Valve Nominal Size			Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	A	B	C-2x
G6 ANSI 125	2½"	65	9.00" [229]	4.75" [121]	18.25" [464]
G6 ANSI 125	3"	80	10.00" [254]	5.37" [136]	19.18" [487]
G6 ANSI 250	2½"	65	9.62" [244]	4.75" [121]	18.75" [476]
G6 ANSI 250	3"	80	10.75" [273]	5.37" [136]	19.75" [502]
G6C ANSI 125	4"	100	13.00" [330.2]	6.87" [175]	20.25" [514]
G6C ANSI 125	5"	125	15.75" [400]	7.87" [200]	20.87" [530]
G6C ANSI 125	6"	150	17.75" [451]	8.50" [216]	21.50" [546]

### Dimensions with G7/G7D ANSI 125/250 Series 3-Way Valve



Valve Nominal Size			Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	A	B	C
G7 & G7D ANSI 125	2½"	65	9.00" [229]	7.12" [181]	13.87" [352]
G7 & G7D ANSI 125	3"	80	10.00" [254]	8.00" [203]	14.44" [367]
G7D ANSI 125	4"	100	13.00" [330.2]	9.87" [251]	15.25" [387]
G7 & G7D ANSI 250	2½"	65	9.62" [244]	7.37" [187]	14.00" [356]
G7 & G7D ANSI 250	3"	80	10.75" [273]	8.37" [213]	14.62" [371]
G7D ANSI 250	4"	100	13.62" [346]	10.25" [260]	15.25" [387]

### Dimensions with G7/G7D ANSI 125/250 Series 3-Way Valve

Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C-2x
G7 ANSI 125	2½"	65	9.00" [229]	7.12" [181]	18.37" [467]
G7 ANSI 125	3"	80	10.00" [254]	8.00" [203]	19.18" [487]
G7D ANSI 125	5"	125	12.00" [305]	10.50" [267]	20.56" [522]
G7D ANSI 125	6"	150	14.12" [359]	11.12" [282]	21.25" [540]
G7 ANSI 250	2½"	65	9.62" [244]	7.37" [187]	18.75" [476]
G7 ANSI 250	3"	80	10.75" [273]	8.37" [213]	19.37" [492]
G7D ANSI 250	5"	125	12.87" [327]	11.00" [279]	20.56" [522]
G7D ANSI 250	6"	150	14.50" [368]	11.50" [292]	21.25" [540]

## Wiring Diagrams

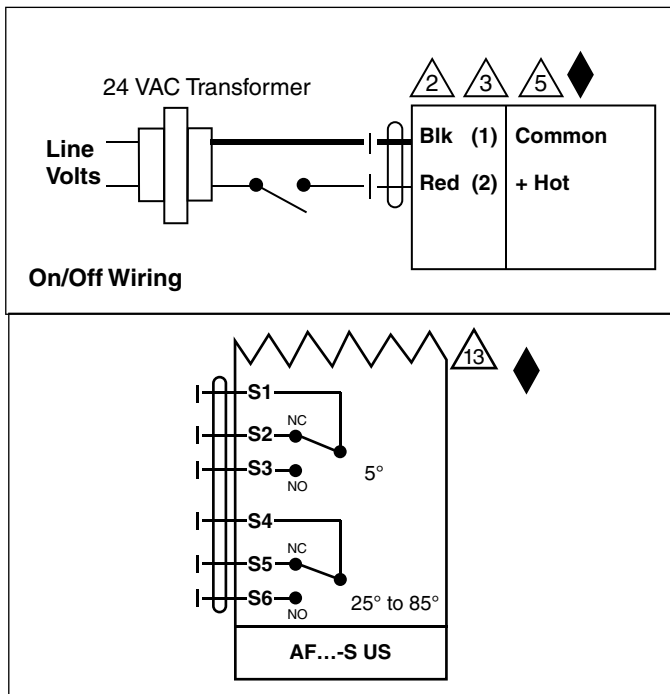
### ✂️ INSTALLATION NOTES

- ⚠️ **CAUTION Equipment damage!**  
Actuators may be connected in parallel. Power consumption must be observed.
- ⚠️ Actuators may also be powered by 24 VDC.
- ⚠️ Actuators with plenum rated cable do not have numbers on wires; use color codes instead. Actuators with appliance cables are numbered.

### 📄 APPLICATION NOTES

- ◆ Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

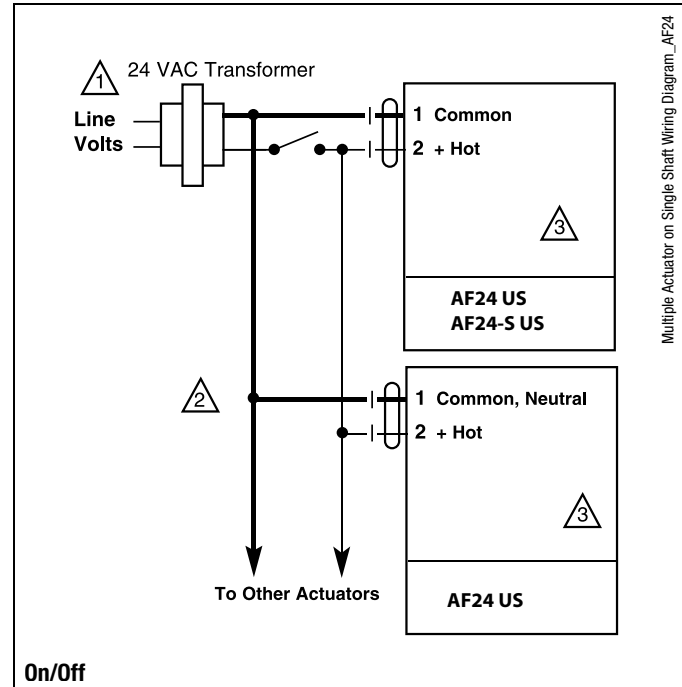
⚠️ **WARNING Live Electrical Components!**  
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Auxiliary Switch Wiring for AF... -S US

## Wiring Diagrams for Multiple On/Off Actuators

- ⚠️ Provide overload protection and disconnect as required..
- ⚠️ Actuators may be connected in parallel. Power consumption must be observed.
- ⚠️ Actuators may also be powered by 24 VDC.
- ⚠️ Same model numbers must be used when mounted on one shaft..



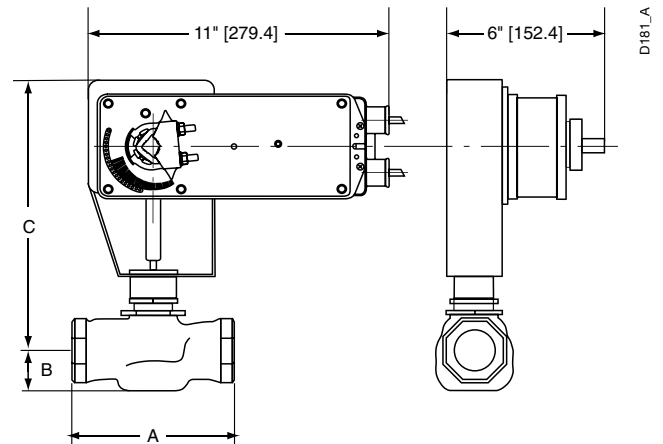


### Models

AF120 US  
AF120-S US w/built-in Aux. Switches

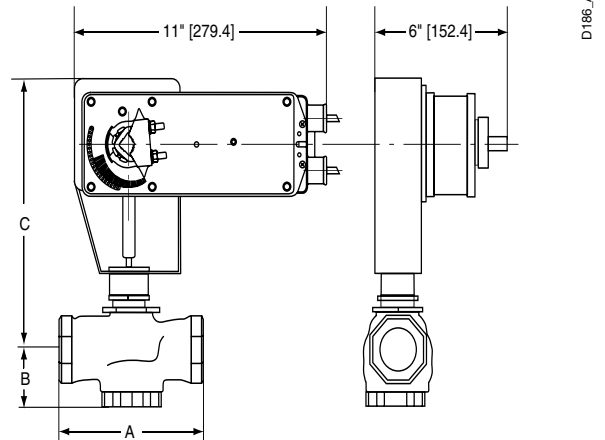
Technical Data	
Control	on/off
Power consumption	running 6 W holding 2.3 W
Transformer sizing	10 VA (Class 2 power)
Electrical connection	3 ft, 18 GA appliance cables (-S model has 2 cables) ½" conduit connector
Electrical protection	120 V actuators double insulated
Overload protection	electronic throughout 0° to 95° rotation
Angle of rotation	95°
Position indication	visual indicator
Manual override	hex crank
Running time	control 150 seconds independent of load spring < 20 seconds
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)
AF120-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)

### Dimensions with G2...(S) Series 2-Way Valve



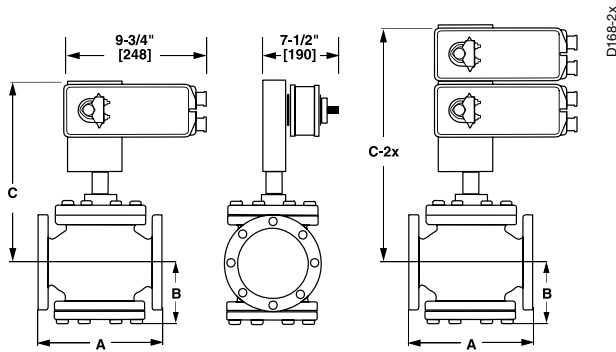
Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2(S)	1½"	40	5.37" [137]	1.50" [38]	8.50" [216]
G2(S)	2"	50	6.12" [156]	1.56" [40]	8.56" [217]

### Dimensions with G3...(D) Series 3-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G3(D)	1½"	40	5.37" [137]	1.62" [41]	8.62" [219]
G3(D)	2"	50	6.12" [156]	1.87" [48]	8.87" [225]

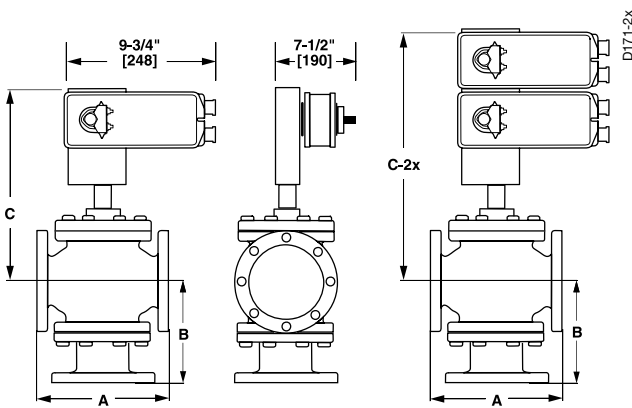
### Dimensions with G6/G6C ANSI 125 and G6 ANSI 250 Series 2-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G6 ANSI 125	2½"	65	9.00" [229]	4.75" [121]	13.50" [343]
G6 ANSI 125	3"	80	10.00" [254]	5.37" [136]	13.94" [354]
G6 ANSI 250	2½"	65	9.62" [244]	4.75" [121]	14.00" [356]
G6 ANSI 250	3"	80	10.75" [273]	5.37" [136]	14.12" [359]
G6C ANSI 125	2½"	65	9.00" [229]	4.75" [121]	13.50" [343]
G6C ANSI 125	3"	80	10.00" [254]	5.37" [136]	13.94" [354]

Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C-2x
G6C ANSI 125	4"	100	13.00" [330.2]	6.87" [175]	20.25" [514]
G6C ANSI 125	5"	125	15.75" [400]	7.87" [200]	20.87" [530]
G6C ANSI 125	6"	150	17.75" [451]	8.50" [216]	21.50" [546]
G6 ANSI 125	2½"	65	9.00" [229]	4.75" [121]	18.25" [464]
G6 ANSI 125	3"	80	10.00" [254]	5.37" [136]	19.18" [487]
G6 ANSI 250	2½"	65	9.62" [244]	4.75" [121]	18.75" [476]
G6 ANSI 250	3"	80	10.75" [273]	5.37" [136]	19.75" [502]

### Dimensions with G7/G7D ANSI 125/250 Series 3-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G7 & G7D ANSI 125	2½"	65	9.00" [229]	7.12" [181]	13.87" [352]
G7 & G7D ANSI 125	3"	80	10.00" [254]	8.00" [203]	14.44" [367]
G7D ANSI 125	4"	100	13.00" [330]	9.87" [251]	15.25" [387]
G7 & G7D ANSI 250	2½"	65	9.62" [244]	7.37" [187]	14.00" [356]
G7 & G7D ANSI 250	3"	80	10.75" [273]	8.37" [213]	14.62" [371]
G7D ANSI 250	4"	100	13.62" [346]	10.25" [260]	15.25" [387]

### Dimensions with G7/G7D ANSI 125/250 Series 3-Way Valve

Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C-2x
G7 ANSI 125	2½"	65	9.00" [229]	7.12" [181]	18.37" [467]
G7 ANSI 125	3"	80	10.00" [254]	8.00" [203]	19.18" [487]
G7D ANSI 125	5"	125	12.00" [305]	10.50" [267]	20.56" [522]
G7D ANSI 125	6"	150	14.12" [359]	11.12" [282]	21.25" [540]
G7 ANSI 250	2½"	65	9.62" [244]	7.37" [187]	18.75" [476]
G7 ANSI 250	3"	80	10.75" [273]	8.37" [213]	19.37" [492]
G7D ANSI 250	5"	125	12.87" [327]	11.00" [279]	20.56" [522]
G7D ANSI 250	6"	150	14.50" [368]	11.50" [292]	21.25" [540]

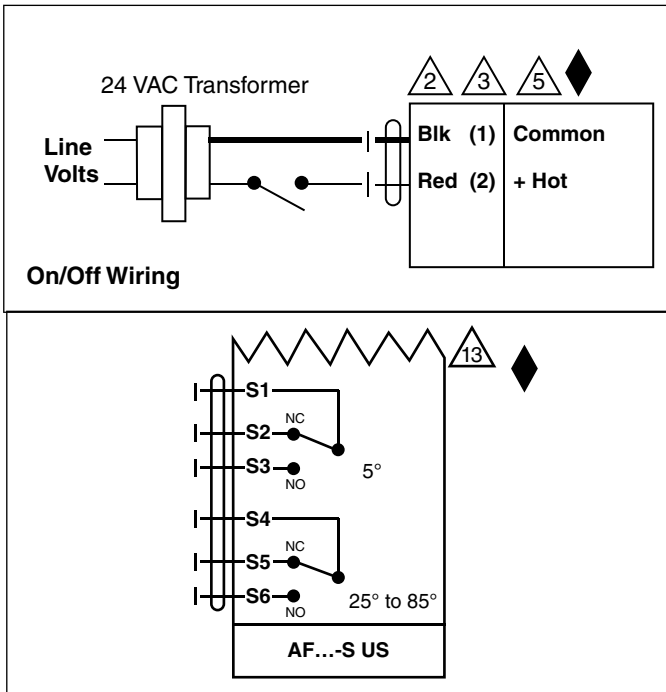
### Wiring Diagrams

#### ✂️ INSTALLATION NOTES

- ⚠️ **CAUTION Equipment damage!**  
Actuators may be connected in parallel.  
Power consumption must be observed.
- ⚠️ **3** Actuators may also be powered by 24 VDC.
- ⚠️ **5** Actuators with plenum rated cable do not have numbers on wires; use color codes instead. Actuators with appliance cables are numbered.

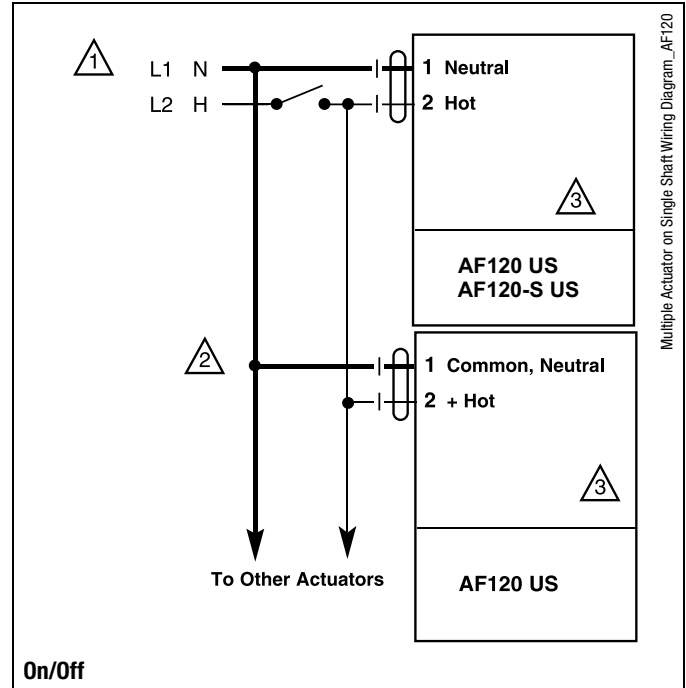
#### 📄 APPLICATION NOTES

- ◆ 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.



### Wiring Diagrams for Multiple On/Off Actuators

- ⚠️ **1** Provide overload protection and disconnect as required..
- ⚠️ **2** Actuators may be connected in parallel.  
Power consumption must be observed.
- ⚠️ **3** Actuators may also be powered by 24 VDC.
- ⚠️ **!** Same model numbers must be used when mounted on one shaft..





# AF24-SR US Actuators, Proportional

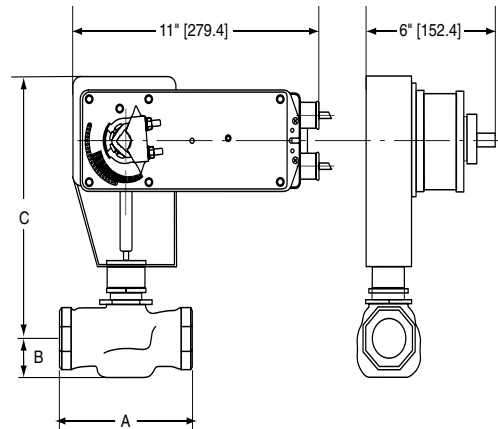


## Models

AF24-SR US

Technical Data	
Power supply	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Feedback output	2 to 10 VDC, 0.5 mA max
Control	proportional
Power consumption	running 6 W holding 2 W
Transformer sizing	10 VA, class 2 power
Electrical connection	3 ft, 18 GA appliance cable ½" conduit connector
Overload protection	electronic throughout 0° to 95° rotation
Angle of rotation	95°
Direction of rotation	spring motor reversible with CW/CCW mounting reversible with built-in  switch
Position indication	visual indicator
Manual override	hex crank
Running time	control 150 seconds independent of load spring < 20 seconds
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)

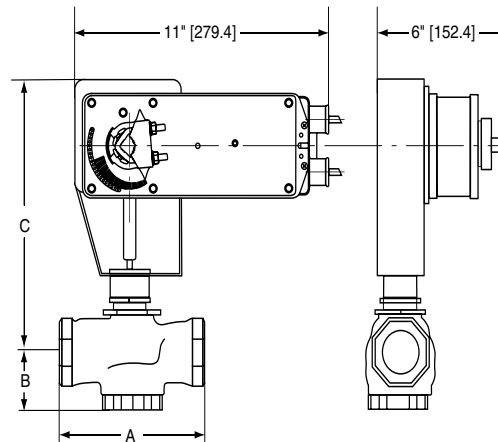
## Dimensions with G2...(S) Series 2-Way Valve



D181\_LA

Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2(S)	1½"	40	5.37" [137]	1.50" [38]	8.50" [216]
G2(S)	2"	50	6.12" [156]	1.56" [40]	8.56" [217]

## Dimensions with G3...(D) Series 3-Way Valve

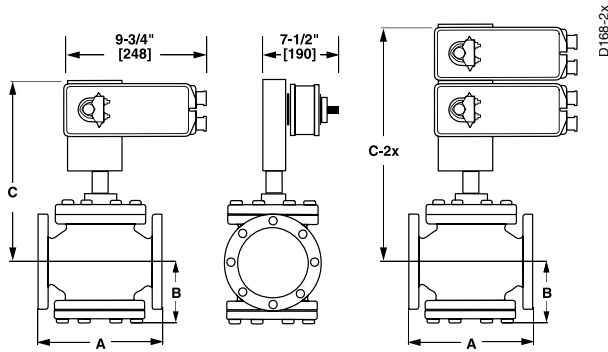


D186\_A

Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G3(D)	1½"	40	5.37" [137]	1.62" [41]	8.62" [219]
G3(D)	2"	50	6.12" [156]	1.87" [48]	8.87" [225]

N40021 - 06/11 - Subject to change. © Belimo Aircontrols (USA), Inc.

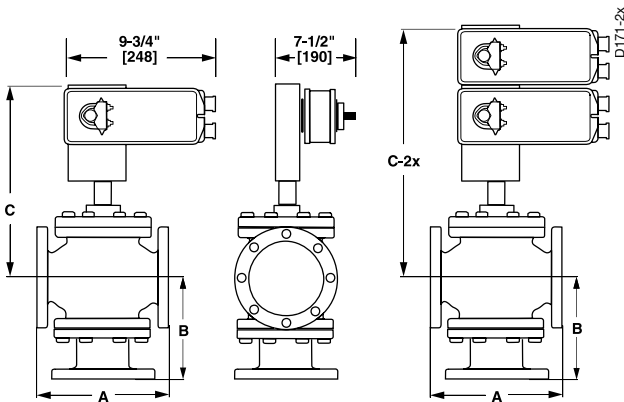
### Dimensions with G6/G6C ANSI 125 and G6 ANSI 250 Series 2-Way Valve



Valve Nominal Size			Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	A	B	C
G6 ANSI 125	2½"	65	9.00" [229]	4.75" [121]	13.50" [343]
G6 ANSI 125	3"	80	10.00" [254]	5.37" [136]	13.94" [354]
G6 ANSI 250	2½"	65	9.62" [244]	4.75" [121]	14.00" [356]
G6 ANSI 250	3"	80	10.75" [273]	5.37" [136]	14.12" [359]
G6C ANSI 125	2½"	65	9.00" [229]	4.75" [121]	13.50" [343]
G6C ANSI 125	3"	80	10.00" [254]	5.37" [136]	13.94" [354]

Valve Nominal Size			Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	A	B	C-2x
G6C ANSI 125	4"	100	13.00" [330.2]	6.87" [175]	20.25" [514]
G6C ANSI 125	5"	125	15.75" [400]	7.87" [200]	20.87" [530]
G6C ANSI 125	6"	150	17.75" [451]	8.50" [216]	21.50" [546]
G6 ANSI 125	2½"	65	9.00" [229]	4.75" [121]	18.25" [464]
G6 ANSI 125	3"	80	10.00" [254]	5.37" [136]	19.18" [487]
G6 ANSI 250	2½"	65	9.62" [244]	4.75" [121]	18.75" [476]
G6 ANSI 250	3"	80	10.75" [273]	5.37" [136]	19.75" [502]

### Dimensions with G7/G7D ANSI 125/250 Series 3-Way Valve



Valve Nominal Size			Dimensions (Inches [mm])		
Valve Body	Inches	DN [mm]	A	B	C
G7 & G7D ANSI 125	2½"	65	9.00" [229]	7.12" [181]	13.87" [352]
G7 & G7D ANSI 125	3"	80	10.00" [254]	8.00" [203]	14.44" [367]
G7D ANSI 125	4"	100	13.00" [330.2]	9.87" [251]	15.25" [387]
G7 & G7D ANSI 250	2½"	65	9.62" [244]	7.37" [187]	14.00" [356]
G7 & G7D ANSI 250	3"	80	10.75" [273]	8.37" [213]	14.62" [371]
G7D ANSI 250	4"	100	13.62" [346]	10.25" [260]	15.25" [387]

### Dimensions with G7/G7D ANSI 125/250 Series 3-Way Valve

Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C-2x
G7 ANSI 125	2½"	65	9.00" [229]	7.12" [181]	18.37" [467]
G7 ANSI 125	3"	80	10.00" [254]	8.00" [203]	19.18" [487]
G7D ANSI 125	5"	125	12.00" [305]	10.50" [267]	20.56" [522]
G7D ANSI 125	6"	150	14.12" [359]	11.12" [282]	21.25" [540]
G7 ANSI 250	2½"	65	9.62" [244]	7.37" [187]	18.75" [476]
G7 ANSI 250	3"	80	10.75" [273]	8.37" [213]	19.37" [492]
G7D ANSI 250	5"	125	12.87" [327]	11.00" [279]	20.56" [522]
G7D ANSI 250	6"	150	14.50" [368]	11.50" [292]	21.25" [540]

## Wiring Diagrams

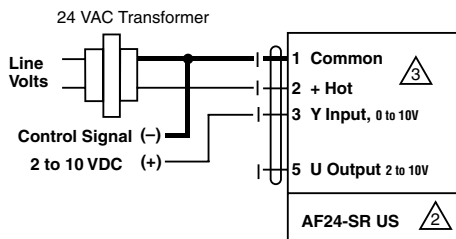
### INSTALLATION NOTES

- CAUTION Equipment damage!**  
Actuators may be connected in parallel. Power consumption must be observed.
- Actuators may also be powered by 24 VDC.
- Actuators with plenum rated cable do not have numbers on wires; use color codes instead. Actuators with appliance cables are numbered.

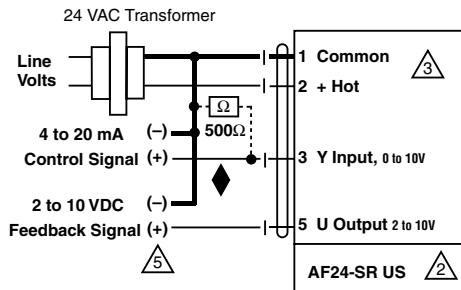
### APPLICATION NOTES

- 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.



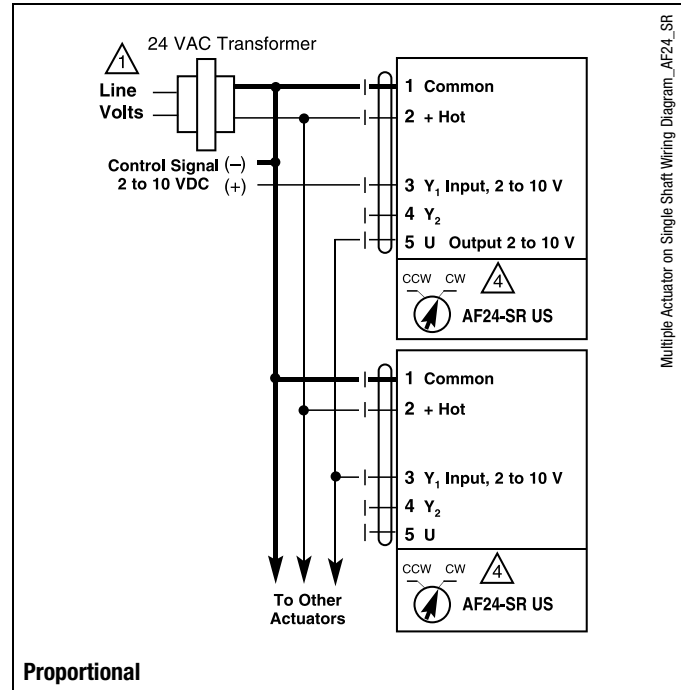
Proportional 2 to 10 VDC control signal



Proportional 4 to 20 mA control signal

## Wiring Diagrams for Multiple Proportional Actuators

- Provide overload protection and disconnect as required..
- Set reversing switch (CCW-CW) (A-B) as required by control logic and control range.
- Same model numbers must be used when mounted on one shaft.



Proportional

Multiple Actuator on Single Shaft Wiring Diagram\_AF24\_SR



**MFT**



### Models

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

### Technical Data

Power supply	24 VAC, +/- 20%, 50/60 Hz 24 VDC, +20% / -10%
Power consumption♦	running 7.5 W holding 3 W
Transformer sizing♦	10 VA (Class 2 power source)
Electrical connection	3 ft [1m], 10 ft [3m] or 16 ft [5m] 18 GA appliance or plenum cables, with or without ½" conduit connector <b>-S models:</b> two 3 ft [1m], 10 ft [3m] or 16 ft [5m] appliance cables with or without ½" 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 seconds @ -4°F to 122°F [-20° C to 50° C]; <60 seconds @ -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 (9/16" Allen), supplied
Humidity	max. 95% RH, non-condensing
Ambient temperature	-22 to 122° F (-30 to 50° 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
Weight	4.2 lbs. (1.9 kg), 4.3 lbs. (2 kg) with switch

\* Variable when configured with MFT options

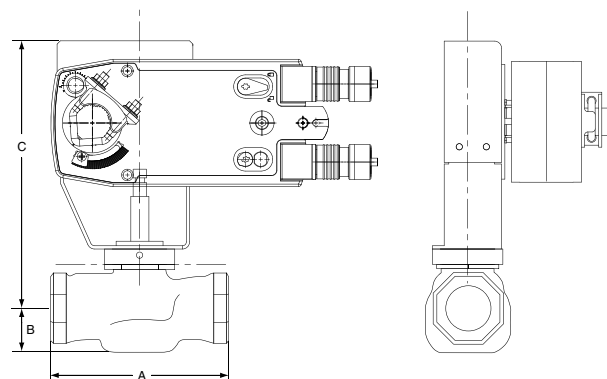
† Rated Impulse Voltage 800V, Type of action 1.AA (1.AA.B for -S version), Control Pollution Degree 3.

♦ 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

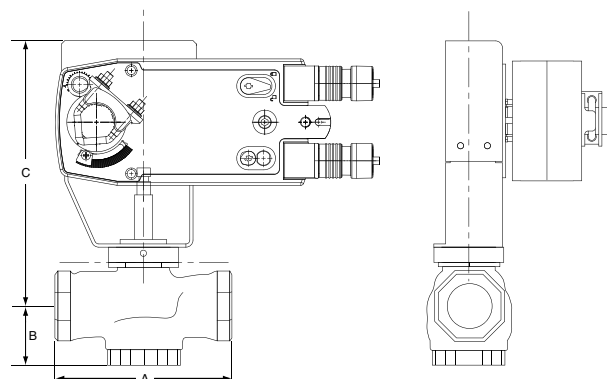
Auxiliary switches	2 x SPDT 3A (0.5A) @ 250 VAC, UL approved one set at +10°, one adjustable 10° to 90°
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### Dimensions with G2...(S) Series 2-Way Valve



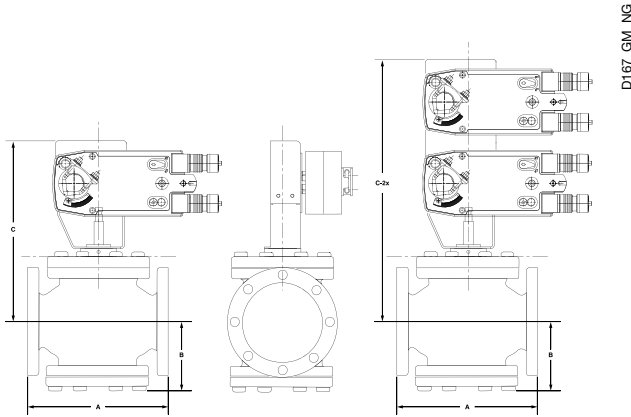
Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2(S)	1½"	40	5.37" [137]	1.50" [38]	8.50" [216]
G2(S)	2"	50	6.12" [156]	1.56" [40]	8.56" [217]

### Dimensions with G3...(D) Series 3-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G3(D)	1½"	40	5.37" [137]	1.62" [41]	8.62" [219]
G3(D)	2"	50	6.12" [156]	1.87" [48]	8.87" [225]

### Dimensions with G6/G6C ANSI 125 and G6 ANSI 250 Series 2-Way Valve



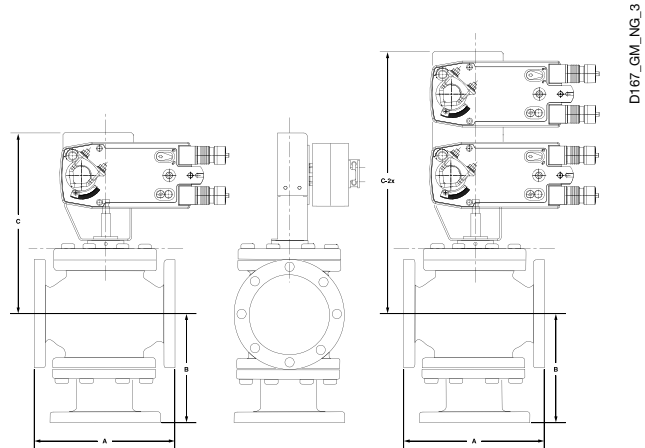
Valve Nominal Size Dimensions (Inches [mm])

Valve Body	Inches	DN [mm]	A	B	C
G6 ANSI 125	2½"	65	9.00" [229]	4.75" [121]	13.50" [343]
G6 ANSI 125	3"	80	10.00" [254]	5.37" [136]	13.94" [354]
G6 ANSI 250	2½"	65	9.62" [244]	4.75" [121]	14.00" [356]
G6 ANSI 250	3"	80	10.75" [273]	5.37" [136]	14.12" [359]
G6C ANSI 125	2½"	65	9.00" [220]	4.75" [121]	13.50" [343]
G6C ANSI 125	3"	80	10.00" [254]	5.37" [136]	13.94" [354]
G6C ANSI 250	2½"	65	9.62" [244]	4.75" [121]	13.50" [343]
G6C ANSI 250	3"	80	10.75" [254]	5.37" [136]	13.94" [354]

Valve Nominal Size Dimensions (Inches [mm])

Valve Body	Inches	DN [mm]	A	B	C-2x
G6 ANSI 125	2½"	65	9.00" [229]	4.75" [121]	18.25" [464]
G6 ANSI 125	3"	80	10.00" [254]	5.37" [136]	19.18" [487]
G6 ANSI 250	2½"	65	9.62" [244]	4.75" [121]	18.25" [464]
G6 ANSI 250	3"	80	10.75" [273]	5.37" [136]	19.18" [487]
G6C ANSI 125	4"	100	13.00" [330]	6.87" [175]	20.25" [514]
G6C ANSI 125	5"	125	15.75" [400]	7.87" [200]	20.87" [530]
G6C ANSI 125	6"	150	17.75" [451]	8.50" [216]	21.50" [546]
G6C ANSI 250	4"	100	13.62" [346]	6.87" [175]	20.25" [514]
G6C ANSI 250	5"	125	16.62" [422]	7.87" [200]	20.87" [530]
G6C ANSI 250	6"	150	18.62" [473]	8.50" [216]	21.50" [546]

### Dimensions with G7 and G7D ANSI 125/250 Series 3-Way Valve



Valve Nominal Size Dimensions (Inches [mm])

Valve Body	Inches	DN [mm]	A	B	C
G7 & G7D ANSI 125	2½"	65	9.00" [229]	7.12" [181]	13.87" [352]
G7 & G7D ANSI 125	3"	80	10.00" [254]	8.00" [203]	14.43" [367]
G7D ANSI 125	4"	100	13.00" [330]	9.87" [251]	15.25" [387]
G7 & G7D ANSI 250	2½"	65	9.62" [244]	7.37" [187]	14.00" [356]
G7 & G7D ANSI 250	3"	80	10.75" [273]	8.37" [213]	14.62" [371]
G7D ANSI 250	4"	100	13.62" [346]	10.25" [260]	15.25" [387]

Valve Nominal Size Dimensions (Inches [mm])

Valve Body	Inches	DN [mm]	A	B	C-2x
G7 ANSI 125	2½"	65	9.00" [229]	7.12" [181]	18.25" [464]
G7 ANSI 125	3"	80	10.00" [254]	8.00" [203]	19.18" [487]
G7 ANSI 125	4"	100	13.00" [330.2]	9.87" [251]	20.00" [508]
G7D ANSI 125	5"	125	12.00" [305]	10.50" [267]	18.37" [467]
G7D ANSI 125	6"	150	14.12" [359]	11.12" [282]	19.18" [487]
G7 ANSI 250	2½"	65	9.62" [244]	7.37" [187]	18.75" [476]
G7 ANSI 250	3"	80	10.75" [273]	8.37" [213]	19.37" [492]
G7 ANSI 250	4"	100	13.62" [346]	10.25" [260]	20.37" [517]
G7D ANSI 250	5"	125	12.87" [327]	11.00" [279]	20.56" [522]
G7D ANSI 250	6"	150	14.50" [368]	11.50" [292]	21.25" [540]

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### Wiring Diagrams

#### INSTALLATION NOTES

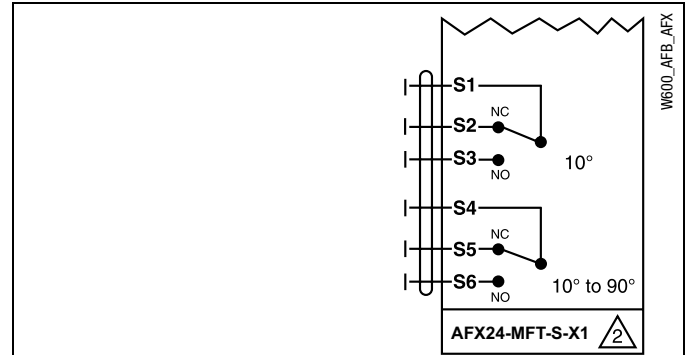
- 1 Provide overload protection and disconnect as required.
- 2 **CAUTION Equipment Damage!**  
Actuators may be connected in parallel if not mechanically mounted to the same shaft. Power consumption and input impedance must be observed.
- 3 Actuators may also be powered by 24 VDC.
- 4 Position feedback cannot be used with Triac sink controller.
- 4 The actuator internal common reference is not compatible.
- 5 Control signal may be pulsed from either the Hot (source) or the Common (sink) 24 VAC line.
- 8 Contact closures A & B also can be triacs.
- 8 A & B should both be closed for triac source and open for triac sink.
- 9 For triac sink the common connection from the actuator must be connected to the hot connection of the controller.

#### APPLICATION NOTES

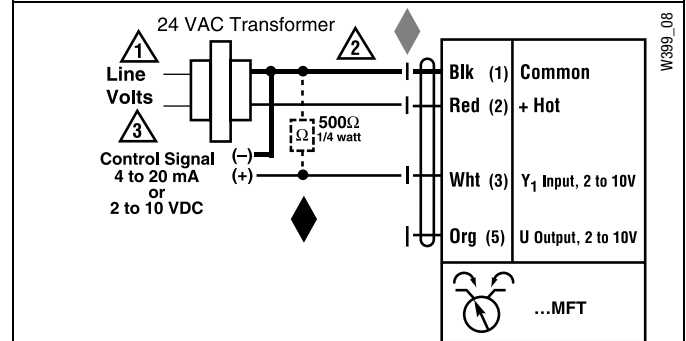
Meets UL requirements without the need of an electrical ground connection.

The ZG-R01 500 Ω resistor may be used.

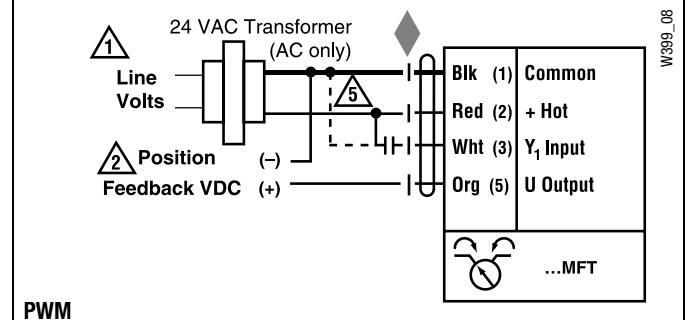
**WARNING Live Electrical Components!**  
During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components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



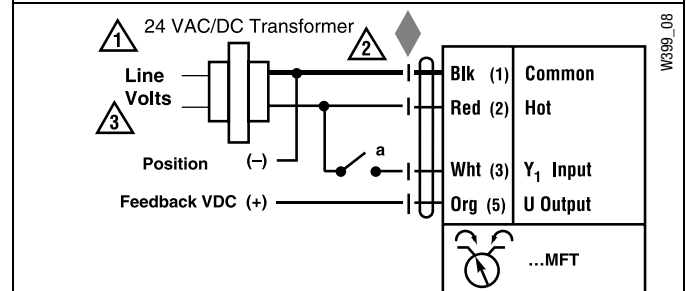
Auxiliary Switches for AFX24-MFT-S-X1



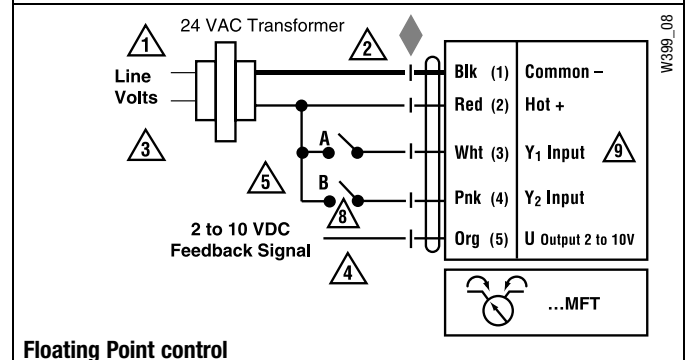
VDC/4-20 mA



PWM



On/Off control



Floating Point control

## Wiring Diagrams for Multiple MFT Actuators

### INSTALLATION NOTES

**3** Actuators may also be powered by 24 VDC

**5** Actuators with plenum rated cable do not have numbers on wires; use color codes instead. Actuators with appliance cable are numbered.

**WARNING Live Electrical Components!**

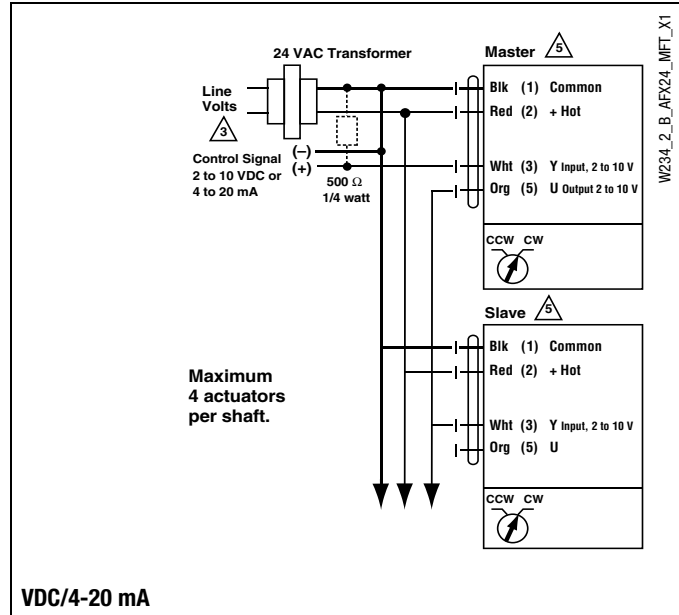
During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow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

Wiring multiple ...MFT actuators to a single shaft and/or on valves. All MFT actuators are wired in master-slave configuration.

MFT actuator configurations should also coordinate with each other. Meaning the master input = controllers output. Master output = slave output. Slave output = controller input.

Example

Controller Output	Master Feedback	Slave Input	Slave Feedback
2 to 10 VDC	2 to 10 VDC	2 to 10 VDC	0 to 5 VDC



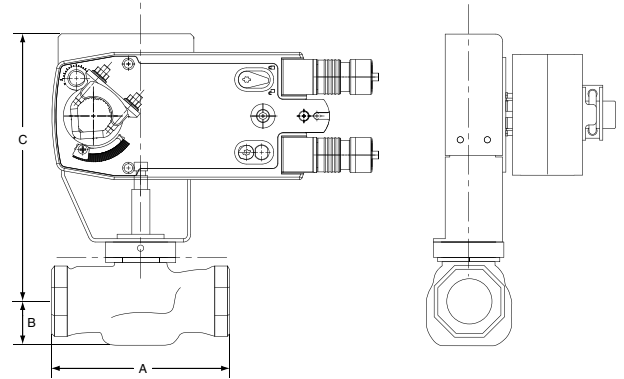


**MFT**



D180

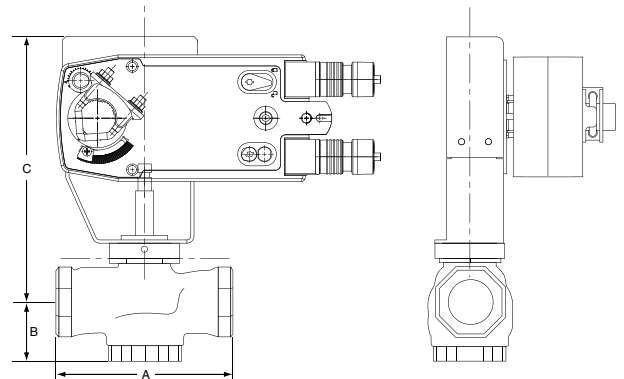
### Dimensions with G2...(S) Series 2-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G2(S)	1½"	40	5.37" [137]	1.50" [38]	8.50" [216]
G2(S)	2"	50	6.12" [156]	1.56" [40]	8.56" [217]

D185

### Dimensions with G3...(D) Series 3-Way Valve



Valve Body	Valve Nominal Size		Dimensions (Inches [mm])		
	Inches	DN [mm]	A	B	C
G3(D)	1½"	40	5.37" [137]	1.62" [41]	8.62" [219]
G3(D)	2"	50	6.12" [156]	1.87" [48]	8.87" [225]

### Models

AFX24-MFT95-X1



### Technical Data

Power supply	24 VAC, +/- 20%, 50/60 Hz 24 VDC, +20% / -10%
Power consumption♦	running 7.5 W holding 3 W
Transformer sizing♦	10 VA (Class 2 power source)
Electrical connection	3 ft [1m], 18 GA plenum cable, with or without ½" conduit connector
Overload protection	electronic throughout 0 to 95° rotation
Operating range Y	0 to 135 Ω Honeywell Electronic Series 90, 0 to 135 Ω input
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)
Position indication	visual indicator, 0° to 95° (0° is spring return position)
Manual override	5 mm hex crank (⅜" Allen), supplied
Humidity	max. 95% RH, non-condensing
Ambient temperature	-22 to 122° F (-30 to 50° 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 dependant ≤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
Weight	4.2 lbs. (1.9 kg)

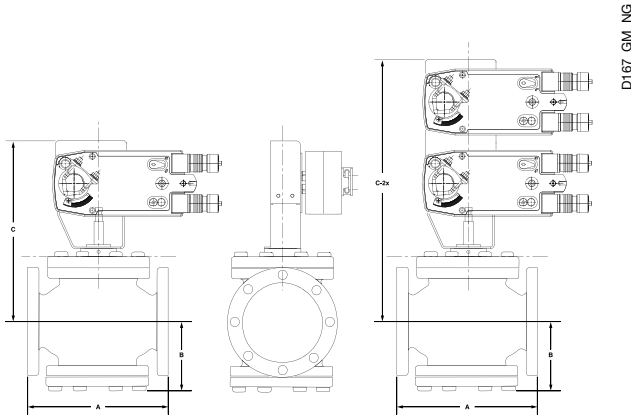
\* Variable when configured with MFT options

† 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.



**Dimensions with G6/G6C ANSI 125 and G6 ANSI 250 Series 2-Way Valve**



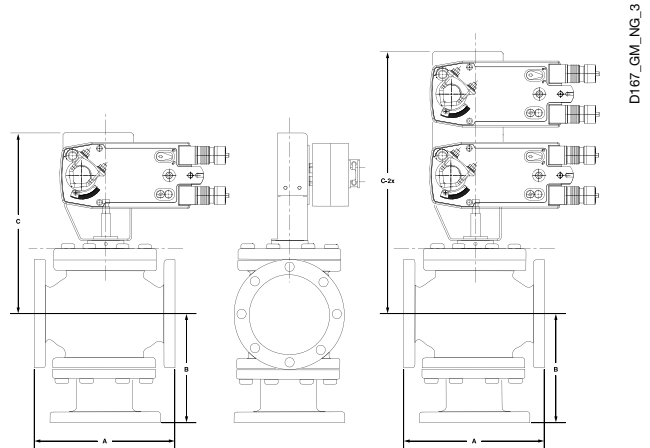
**Valve Nominal Size Dimensions (Inches [mm])**

Valve Body	Inches	DN [mm]	A	B	C
G6 ANSI 125	2½"	65	9.00" [229]	4.75" [121]	13.50" [343]
G6 ANSI 125	3"	80	10.00" [254]	5.37" [136]	13.94" [354]
G6 ANSI 250	2½"	65	9.62" [244]	4.75" [121]	14.00" [356]
G6 ANSI 250	3"	80	10.75" [273]	5.37" [136]	14.12" [359]
G6C ANSI 125	2½"	65	9.00" [229]	4.75" [121]	13.50" [343]
G6C ANSI 125	3"	80	10.00" [254]	5.37" [136]	13.94" [354]

**Valve Nominal Size Dimensions (Inches [mm])**

Valve Body	Inches	DN [mm]	A	B	C-2x
G6 ANSI 125	2½"	65	9.00" [229]	4.75" [121]	18.25" [464]
G6 ANSI 125	3"	80	10.00" [254]	5.37" [136]	19.18" [487]
G6 ANSI 250	2½"	65	9.62" [244]	4.75" [121]	18.25" [464]
G6 ANSI 250	3"	80	10.75" [273]	5.37" [136]	19.18" [487]
G6C ANSI 125	4"	100	13.00" [330.2]	6.87" [175]	20.25" [514]
G6C ANSI 125	5"	125	15.75" [400]	7.87" [200]	20.87" [530]
G6C ANSI 125	6"	150	17.75" [451]	8.50" [216]	21.50" [546]

**Dimensions with G7 and G7D ANSI 125/250 Series 3-Way Valve**



**Valve Nominal Size Dimensions (Inches [mm])**

Valve Body	Inches	DN [mm]	A	B	C
G7 & G7D ANSI 125	2½"	65	9.00" [229]	7.12" [181]	13.87" [352]
G7 & G7D ANSI 125	3"	80	10.00" [254]	8.00" [203]	14.43" [367]
G7D ANSI 125	4"	100	13.00" [330]	9.87" [251]	15.25" [387]
G7 & G7D ANSI 250	2½"	65	9.62" [244]	7.37" [187]	14.00" [356]
G7 & G7D ANSI 250	3"	80	10.75" [273]	8.37" [213]	14.62" [371]
G7D ANSI 250	4"	100	13.62" [346]	10.25" [260]	15.25" [387]

**Valve Nominal Size Dimensions (Inches [mm])**

Valve Body	Inches	DN [mm]	A	B	C-2x
G7 ANSI 125	2½"	65	9.00" [229]	7.12" [181]	18.25" [464]
G7 ANSI 125	3"	80	10.00" [254]	8.00" [203]	19.18" [487]
G7 ANSI 125	4"	100	13.00" [330.2]	9.87" [251]	20.00" [508]
G7D ANSI 125	5"	125	12.00" [305]	10.50" [267]	18.37" [467]
G7D ANSI 125	6"	150	14.12" [359]	11.12" [282]	19.18" [487]
G7 ANSI 250	2½"	65	9.62" [244]	7.37" [187]	18.75" [476]
G7 ANSI 250	3"	80	10.75" [273]	8.37" [213]	19.37" [492]
G7 ANSI 250	4"	100	13.62" [346]	10.25" [260]	20.37" [517]
G7D ANSI 250	5"	125	12.87" [327]	11.00" [279]	20.56" [522]
G7D ANSI 250	6"	150	14.50" [368]	11.50" [292]	21.25" [540]

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## Proportional Potentiometric Control - Wiring Diagrams

### INSTALLATION NOTES

- 5 Actuators with plenum rated cable do not have numbers on wires; use color codes instead. Actuators with appliance cables are numbered.
- 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. No resistor is used for one actuator. Honeywell® resistor kits may also be used.
- 25 To reverse control rotation, use the reversing switch.

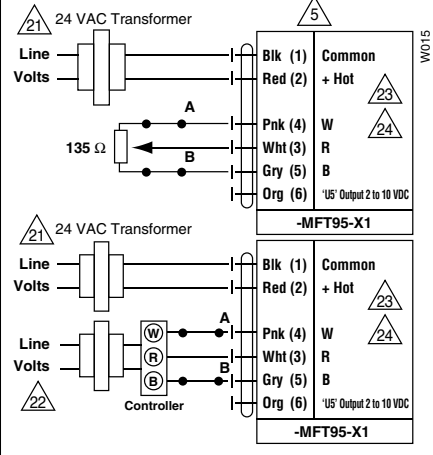
#### Wire Colors

1 = Black	3 = White	5 = Gray
2 = Red	4 = Pink	6 = Orange

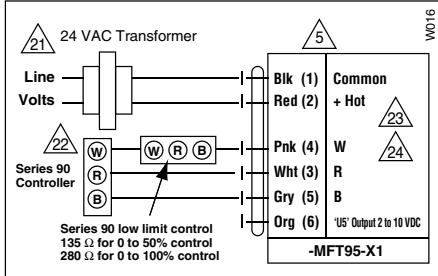
#### Override

Switch A	Switch B	Damper Position
		Damper Open
		Damper Closed

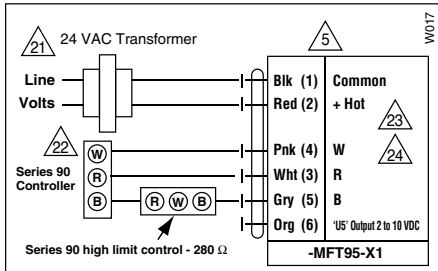
The direction of rotation switch is set so that the fail safe position and the position of the damper is closed with no signal at wire R.



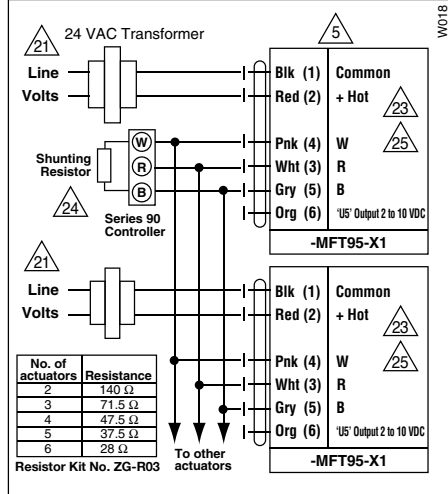
#### Low Limit Control



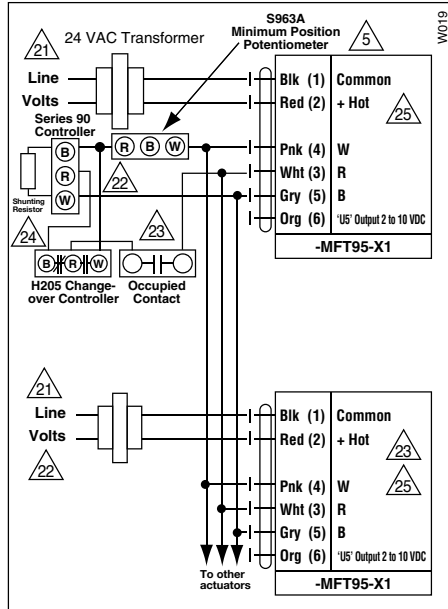
#### High Limit Control



#### Wiring Multiple Actuators to a Series 90 Controller



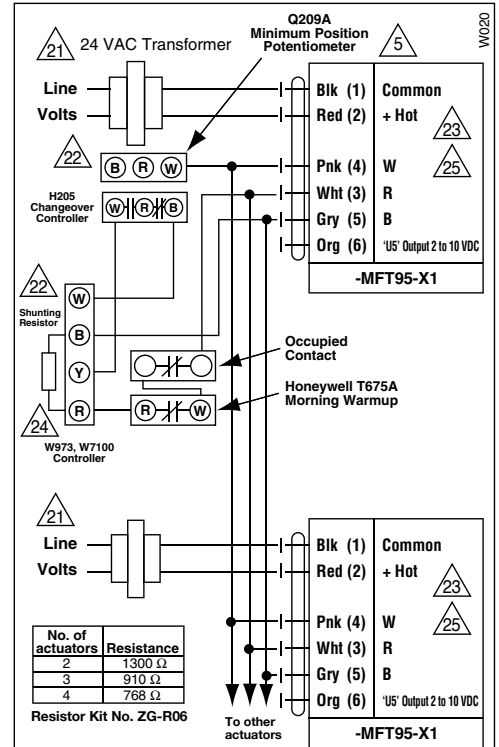
#### Wiring Multiple Actuators to a Series 90 Controller using a Minimum Position Potentiometer



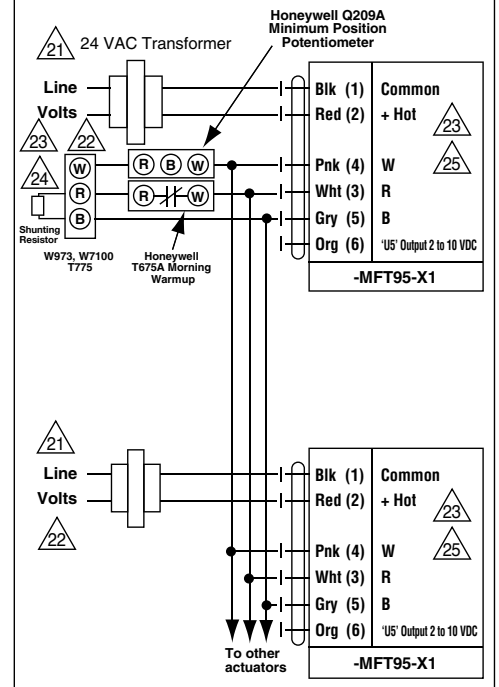
### WARNING Live Electrical Components!

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.

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



#### Used with the W973 and W7100 controllers



## Wiring Diagrams for Multiple MFT95 Actuators

### INSTALLATION NOTES

- Actuators may also be powered by 24 VDC
- Actuators with plenum rated cable do not have numbers on wires; use color codes instead. Actuators with appliance cable are numbered.
- Provide overload protection and disconnect as required.
- Consult controller instruction data for more detailed information.
- To reverse control rotation, use reversing switch.

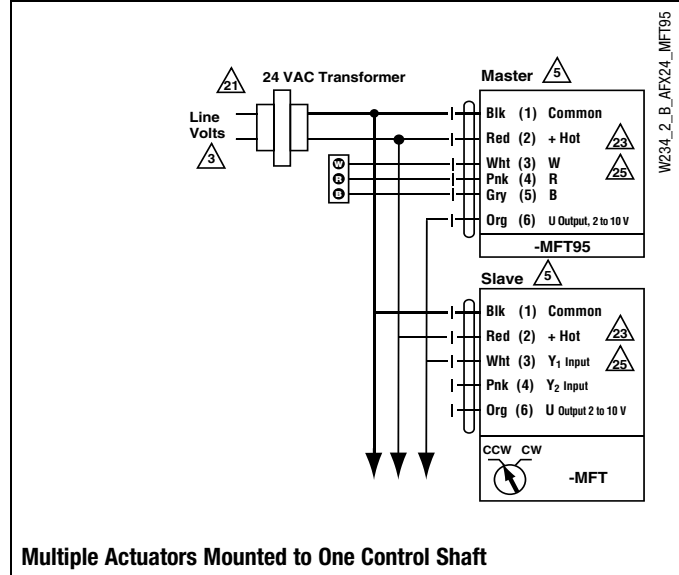
**WARNING Live Electrical Components!**  
 During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components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

Wiring multiple ...MFT actuators to a single shaft and/or on valves. All MFT actuators are wired in master-slave configuration.

MFT actuator configurations should also coordinate with each other. Meaning the master input = controllers output. Master output = slave output. Slave output = controller input.

Example

Controller Output	Master Feedback	Slave Input	Slave Feedback
0 to 135 Ω	2 to 10 VDC	2 to 10 VDC	2 to 10 VDC



	Non-Spring Return						Spring Return					
	NVD	NV	NVG	LM	NM	AM	NVFD	NVF	LF	NF	AF	AFX
<b>2-way</b>												
G212(S)	250			250			250		250			
G213(S)	250			250			250		250			
G214(S)	250			250			250		250			
G215(S)	250			250			250		250			
G219(S)	250			242			250		185			
G220(S)	250			242			250		185			
G224(S)		250			250			207		250		
G225(S)		250			250			207		250		
G232(S)		162			158			130		158		
G240(S)		110	160			230		88			169	230
G250(S)		58	190			127		47			93	127
<b>3-way Mixing</b>												
G314	250			250			250		250			
G315	250			250			250		250			
G320	250			242			250		185			
G325		250			250			207		250		
G332		162			158			130		158		
G340		110				230		88			169	230
G350		58				127		47			93	127
<b>3-way Diverting</b>												
G315D	250			250			250		250			
G320D	250			250			250		250			
G325D	250				250		250			250		
G332D		250			250			250		250		
G340D		250				250		250			250	250
G350D		250				250		250			250	250