

Ball Valve

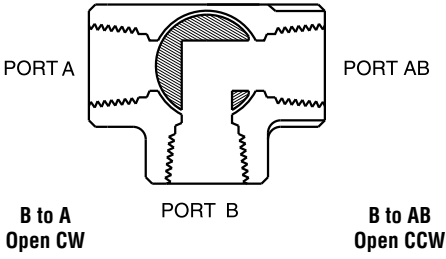
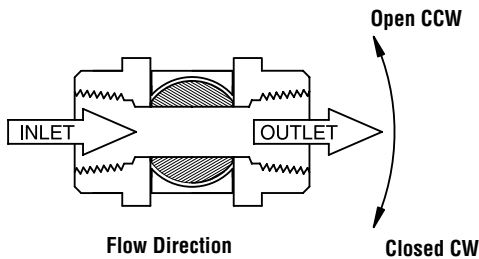
Features and Benefits

B2...VS/VSS, B3...L, B6...VS



- 2-way and 3-way configuration
- Bronze with stainless steel trim (2-way)
- Nickel plated brass body (3-way)
- Reduced and full port capacities
- Two piece construction
- Electronic actuation
- NPT and flanged connections
- Wide C_v range
- Air gap for use with hot water and steam systems
- Live load low maintenance stem packing
- 2 year warranty

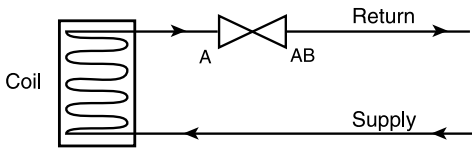
FLOW PATTERN



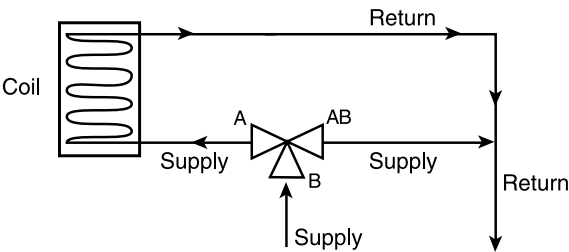
NOTE: B3...L are piped differently than B3 CCV Valves.

VS SERIES BALL VALVE PIPING DIAGRAMS

2-way Valve Piping Diagram



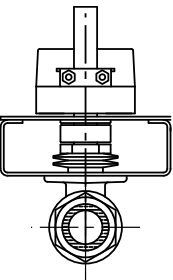
3-way Diverting Valve Piping Diagram



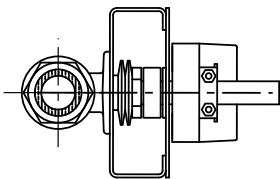
NOTE:
To avoid torque increase during off season shut down, or other periods of inactivity longer than 1 month - the valve should be exercised (actuator or manually driven full open-closed cycle) at least once per month. This is necessary to avoid any application problems after an off season shut down.

PIPING/MOUNTING ORIENTATION

Assembly can be mounted horizontally or vertically for water applications. For steam applications the valve can be mounted vertically but if mounted horizontally the valve must be 90° off center of the pipe. Do not install with actuator below pipe.



(Water application only)



(Steam or water application)



VALVE SIZE	C _v	TYPE	MODEL #	LINE SIZE											
				¾" Fp Cv	1" Fp Cv	1¼" Fp Cv	1½" Fp Cv	2" Fp Cv	2½" Fp Cv	3" Fp Cv	4" Fp Cv	5" Fp Cv	6" Fp Cv	8" Fp Cv	10" Fp Cv
½"	1	2W NPT	B2050VS-01	1.0	1.0	—	—	—	—	—	—	—	—	—	—
½"	2	2W NPT	B2050VS-02	2.0	1.9	—	—	—	—	—	—	—	—	—	—
½"	4	2W NPT	B2050VS-04	3.8	3.6	—	—	—	—	—	—	—	—	—	—
½"	15	2W NPT	B2050VS-15	8.9	7.2	—	—	—	—	—	—	—	—	—	—
¾"	30	2W NPT	B219VS/VSS	30.0	21.6	17.4	15.6	—	—	—	—	—	—	—	—
¾"	51	2W NPT	B220VS	51.0	26.5	19.9	17.3	—	—	—	—	—	—	—	—
1"	43	2W NPT	B224VS/VSS	—	43.0	36.1	30.5	25.8	—	—	—	—	—	—	—
1"	68	2W NPT	B225VS	—	68.0	48.3	36.7	29.2	—	—	—	—	—	—	—
1¼"	48	2W NPT	B232VS/VSS	—	—	48.0	44.6	37.9	35.0	—	—	—	—	—	—
1½"	84	2W NPT	B239VS/VSS	—	—	—	84.0	69.7	59.6	55.4	—	—	—	—	—
1½"	177	2W NPT	B240VS	—	—	—	177.0	102.7	77.9	67.3	—	—	—	—	—
2"	108	2W NPT	B249VS/VSS	—	—	—	—	108.0	100.4	91.8	83.2	—	—	—	—
2"	389	2W NPT	B250VS	—	—	—	—	389.0	221.7	159.5	124.5	—	—	—	—
2½"	503	2W NPT	B265VS/VSS	—	—	—	—	—	503.0	352.1	221.3	186.1	—	—	—
3"	370	2W NPT	B280VS/VSS	—	—	—	—	—	—	370.0	296.0	251.6	229.4	—	—
½"	6.4	3W NPT	B315L	5.5	5.0	4.8	—	—	—	—	—	—	—	—	—
¾"	12.8	3W NPT	B320L	12.8	11.8	11.0	10.5	—	—	—	—	—	—	—	—
1"	11	3W NPT	B325L	—	11.0	10.9	10.7	10.4	—	—	—	—	—	—	—
1¼"	34	3W NPT	B332L	—	—	34.0	32.8	29.9	28.2	—	—	—	—	—	—
1½"	57	3W NPT	B340L	—	—	—	57.0	51.9	47.4	44.9	—	—	—	—	—
2"	87	3W NPT	B350L	—	—	—	—	87.0	82.8	77.9	72.3	—	—	—	—
2"	330	2W FLG	B650VS	—	—	—	—	330.0	207.9	155.1	122.1	—	—	—	—
2½"	420	2W FLG	B665VS	—	—	—	—	—	420.0	319.2	214.2	184.8	—	—	—
3"	600	2W FLG	B680VS	—	—	—	—	—	—	600.0	384.0	300.0	264.0	—	—
4"	1200	2W FLG	B6100VS	—	—	—	—	—	—	—	1200.0	804.0	600.0	480.0	—
6"	3300	2W FLG	B6150VS	—	—	—	—	—	—	—	—	—	3300.0	1716.0	1254.0
8"	9000	2W FLG	B6200VS	—	—	—	—	—	—	—	—	—	—	9000.0	3870.0
10"	12400	2W FLG	B6250VS	—	—	—	—	—	—	—	—	—	—	—	12400.0

GENERAL WIRING INSTRUCTIONS

WARNING The wiring technician must be trained and experienced with electronic circuits. Disconnect power supply before attempting any wiring connections or changes. Make all connections in accordance with wiring diagrams and follow all applicable local and national codes. Provide disconnect and overload protection as required. Use copper, twisted pair, conductors only. If using electrical conduit, the attachment to the actuator must be made with flexible conduit.

Always read the controller manufacturer's installation literature carefully before making any connections. Follow all instructions in this literature. If you have any questions, contact the controller manufacturer and/or Belimo.

Transformer(s)

Typically actuators require a 24 VAC class 2 transformer and draw a maximum of 10 VA per actuator. The actuator enclosure cannot be opened in the field, there are no parts or components to be replaced or repaired.

- EMC directive: 89/336/EEC
- Software class A: Mode of operation type 1
- Low voltage directive: 73/23/EEC

Typical transformer sizing		
Actuator Series	Voltage	Max. VA Per Actuator
AF	24	10
LF	24	6
AR	24	6
NR	24	4
LR	24	3

CAUTION It is good practice to power electronic or digital controllers from a separate power transformer than that used for actuators or other end devices. The power supply design in our actuators and other end devices use half wave rectification. Some controllers use full wave rectification. When these two different types of power supplies are connected to the same power transformer and the DC commons are connected together, a short circuit is created across one of the diodes in the full wave power supply, damaging the controller. Only use a single power transformer to power the controller and actuator if you know the controller power supply uses half wave rectification.

Multiple actuators, one transformer

Multiple actuators may be powered from one transformer provided the following rules are followed:

1. The TOTAL current draw of the actuators (VA rating) is less than or equal to the rating of the transformer.
2. Polarity on the secondary of the transformer is strictly followed. This means that all No. 1 wires from all actuators are connected to the common leg on the transformer and all No. 2 wires from all actuators are connected to the hotleg. Mixing wire No. 1 & 2 on one leg of the transformer will result in erratic operation or failure of the actuator and/or controls.

Multiple actuators, multiple transformers

Multiple actuators positioned by the same control signal may be powered from multiple transformers provided the following rules are followed:

1. The transformers are properly sized.
2. All No. 1 wires from all actuators are tied together and tied to the negative leg of the control signal. See wiring diagram.

Wire type and wire installation tips

For most installations, 18 or 16 Ga. cable works well with Belimo actuators. Use code-approved wire nuts, terminal strips or solderless connectors where wires are joined. It is good practice to run control wires unspliced from the actuator to the controller. If splices are unavoidable, make sure the splice can be reached for possible maintenance. Tape and/or wire-tie the splice to reduce the possibility of the splice being inadvertently pulled apart.

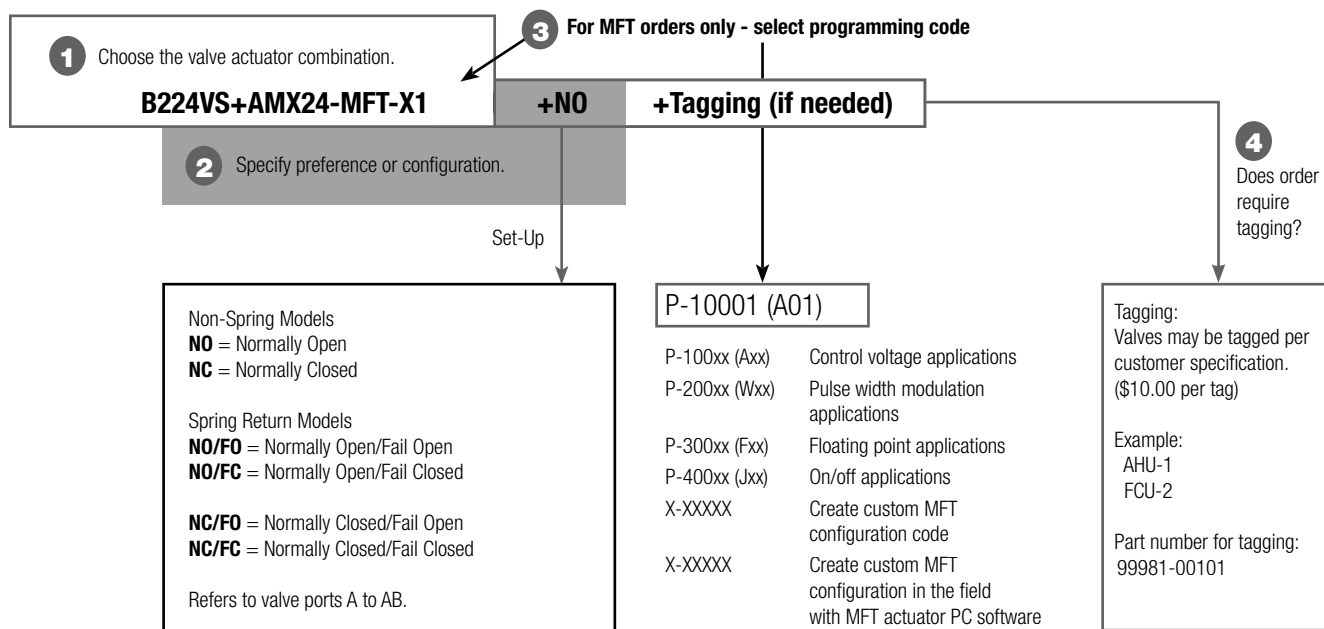
Wire length for actuator installation

Keep power wire runs below the lengths listed in the following tables. If more than one actuator is powered from the same wire run, divide the allowable wire length by the number of actuators to determine the maximum run to any single actuator. See section 1 for specific transformer sizing information for the actuator selected.

Example: 3 actuators, 16 Ga wire
 $350 \text{ Ft} \div 3 \text{ Actuators} = 117 \text{ Ft}$. Maximum wire run

B2	24	VS		AMX	24	-MFT-X1	
Valve B2 = 2-way B3 = 3-way B6 = 2-way Flanged	Valve Size 15-80 = ½" to 3" 50-250 = 2" to 10" (Flanged)	Industrial Construction/Material VS = Bronze Body, Stainless Steel Ball and Stem VSS = Stainless Steel Body, Ball and Stem L = Nickel Plated Brass Body, Chrome Plated Brass Ball and Stem	Cv 1-370	Actuator Type Non-Spring Return LM... NM... AM... GM... SY... SY...P Spring Return LF... NF... AF... Electronic Fail-Safe GK...	Power Supply 24 = 24 VAC/DC 120 = 120 VAC 230 = 230 VAC	Control -3-X1 = On/Off, Floating Point -MFT-X1 = Multi-Function Technology -MFT95-X1 = 0-135 Ω	-S = Built-in Auxiliary Switch

Ordering Example



B2...VS Series, 2-way, Ball Valve

Bronze Body, Stainless Steel Ball and Stem



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

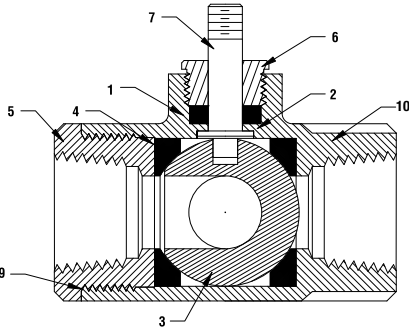
Application

This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV Box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.

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

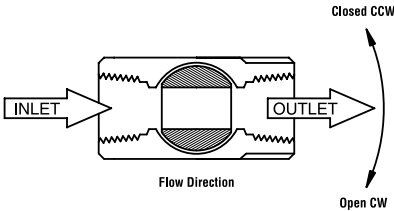
- Up to 35 psi steam
 - ½" - 600 PSIG WOG, Cold Non-Shock.
 - Federal Specification: WW-V-35C, Type II
- Composition: BZ
Style: 3

Technical Data	
Media	chilled or hot water, glycol, 35# steam
Flow characteristic	modified equal percentage
Action	90° rotation valve open CW, valve closed CCW
Sizes	½", ¾", 1", 1¼", 1½", 2", 2½", 3"
Type of end fitting	SAE NPT (female connections)
Materials:	
1 Stem packing	reinforced PTFE
2 Stem bearing	reinforced PTFE
3 Ball	316 stainless steel
4 Seat (x2)	reinforced PTFE w/ Durafill
5 Retainer	B16 (¾" - 1") stainless steel B584 (1¼" - 3") stainless steel
6 Gland	B16 brass
7 Stem	316 stainless steel
8 Jam nut	stainless steel
9 Body seal	PTFE (1-1/4" to 3")
10 Body	B584-C84400 bronze



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

Flow Patterns



Valve Nominal Size			Type	Suitable Actuators	
C _v	Inches	DN [mm]	2-way NPT	Spring Return	Non-Spring Return
1	½	15	B2050VS-01	LF Series	LM Series
2	½	15	B2050VS-02		
4	½	15	B2050VS-04		
15	½	15	B2050VS-15	NF	NM
30	¾	20	B219VS		
51	¾	20	B220VS		
43	1	25	B224VS	AF Series	AM Series
68	1	25	B225VS		
48	1¼	32	B232VS		
84	1½	40	B239VS		
177	1½	40	B240VS		
108	2	50	B249VS	GM Series	SY Series
389	2	50	B250VS		
503	2½	65	B265VS		
370	3	80	B280VS		



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

Application

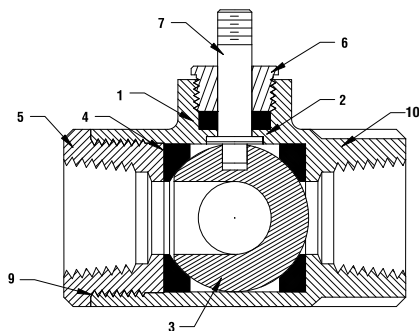
These threaded valves are designed to provide modulating or two position control of hot or chilled water and saturated steam systems under 50 psi.

Typical applications include reheat coils, vav terminal control, unit ventilators, and air handlers, especially in areas which have minimum profile requirements.

- Up to 50 psi steam
- ½" - 2000 PSIG WOG, Cold Non-Shock.
- Federal Specification: WW-V-35C, Type II,
Composition: SS
Style: 3

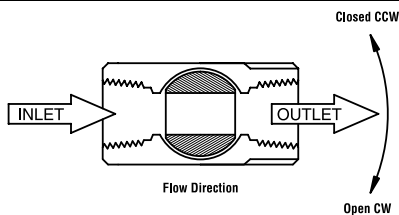
Technical Data	
Media	chilled or hot water, glycol, 50# steam
Flow characteristic	modified equal percentage
Action	90° rotation valve open CW, valve closed CCW
Sizes	½", ¾", 1", 1¼", 1½", 2", 2½"
Type of end fitting	SAE NPT (female connections)
Materials:	
1 Stem packing	reinforced PTFE
2 Stem bearing	reinforced PTFE
3 Ball	316 stainless steel
4 Seat (x2)	reinforced PTFE w/ Durafill
5 Retainer	B16 (¾" - 1") stainless steel B584 (1¼" - 3") stainless steel
6 Gland	A276-316
7 Stem	316 stainless steel
8 Jam nut	stainless steel
9 Body seal	PTFE (1¼" to 3")
10 Body	A351-CF8M 316 stainless steel

Valve Nominal Size			Type	Suitable Actuators		
C _v	Inches	DN [mm]	2-way NPT	Spring Return	Non- Spring Return	
15	½	15	B2050VSS-15	LF Series	NM Series	SY Series
30	¾	20	B219VSS			
43	1	25	B224VSS		AF Series	
48	1¼	32	B232VSS			
84	1½	40	B239VSS	GM Series		
108	2	50	B249VSS			
503	2½	65	B265VSS			



Pressure rating	2000 psig WOG (½" - 1")
Media temp. range	-22°F to +298°F (-30°C to +148°C)
Close-off pressure	600 psig @ 100°F
Maximum differential pressure (ΔP)	<600 psig

Flow Patterns

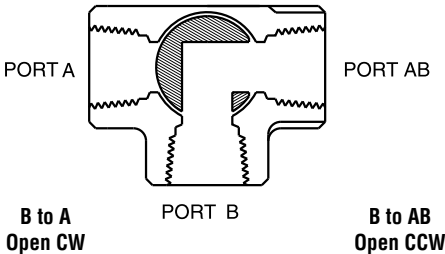


B3...L Series, 3-way, Ball Valve
Chrome Plated Brass Ball and Nickel Plated Stem



Technical Data table with 2 columns: Specification and Value. Rows include Media, Flow characteristic, Action, Sizes, Type of end fitting, Materials (Body, Ball, Stem, Stem seal, Valve seat), Leakage, Pressure rating, Media temp. range, Close-off pressure, and Maximum differential pressure.

Flow Patterns

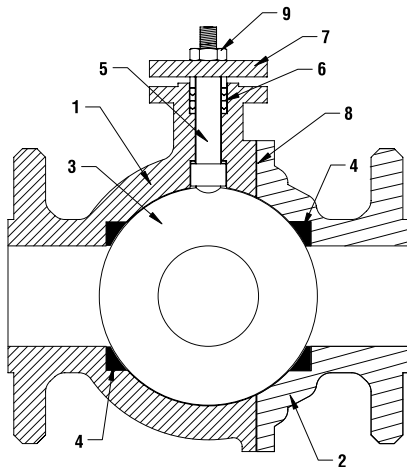


Application
This valve is typically used in air handling and fan coil units on heating or cooling coils, unit ventilators, VAV box re-heat coils, and bypass loops. This valve is suitable for use as a diverting valve only.

Table with 7 columns: Cv, Inches, DN [mm], Type, Spring Return, Non-Spring Return, and Electronic Fail-Safe. It lists various valve models (B315L, B320L, B325L, B332L, B340L, B350L) and their corresponding actuator series (LF, LR, AF, AR, NR).



Technical Data	
Media	chilled or hot water, glycol, 50# steam
Flow characteristic	modified equal percentage
Action	90° rotation valve open CW, valve closed CCW
Sizes	2", 2½", 3", 4", 6", 8", 10"
Type of end fittings	flanged 125# ANSI bolt pattern
Materials:	
1 Body	cast iron - ASTM A126 Class B
2 End cap	cast iron - ASTM A126 Class B
3 Ball	304 stainless steel - ASTM A351
4 Seats	PTFE
5 Stem	304 stainless steel - AISI 304
6 Packing	PTFE
7 Gland	cast iron - ASTM A126 Class B
8 Gasket	PTFE
9 Nut	steel - ASTM A6



Pressure rating	200 psig WOG
Media temp. range	-22°F to +298°F (-30°C to +148°C)
Close-off pressure	200 psig @ 140°F
Maximum differential pressure (ΔP)	<200 psi

- Same end to end dimension as conventional flanged iron gate valve
- Fast quarter turn open or closed operation
- Stainless steel ball and stem
- Positive shut-off
- Two-piece body construction

Application

- Ideal for water service where a non-corrosive, clean cosmetic appearance is required.
- Optional FDA approval, suitable for potable water and food contact.
- Sizes: 2"-10" (50-250mm)
- 200 psi CWP (cold water pressure) (non-shock)

Approved valves shall comply with the American Standard for face-to-face dimensions (ANSI B16.10) for Class 125 cast iron flanged gate valves.

The dimensions and drilling of end flanges conform to the American cast iron flange standard, Class 125 (ANSI B16.1).

Valve Nominal Size			Type	Suitable Actuators
C _v	Inches	DN [mm]	2-way NPT	Non-Spring Return
330	2	50	B650VS	SY Series
420	2½	65	B665VS	
600	3	80	B680VS	
1200	4	100	B6100VS	
3300	6	150	B6150VS	
9000	8	203	B6200VS	
12400	10	254	B6250VS	

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	Valve Nominal Size		Type			Suitable Actuators					
C _v	Inches	DN [mm]	2-way NPT	3-way NPT	2-Way Flanged	Non-Spring Return	Spring Return	Electronic Fail-Safe			
1	½	15	B2050VS-01			LM Series	LF Series				
2	½	15	B2050VS-02								
4	½	15	B2050VS-04								
15	½	15	B2050VS-15								
30	¾	20	B219VS			NM Series	NF Series				
51	¾	20	B220VS			AM Series	AF Series				
43	1	25	B224VS								
68	1	25	B225VS								
48	1¼	32	B232VS								
84	1½	40	B239VS			GM Series		GK			
177	1½	40	B240VS								
108	2	50	B249VS								
389	2	50	B250VS								
190	2½	65	B265VS			GM Series		GK			
370	3	80	B280VS								
15	½	15	B2050VSS-15						NM Series	LF	
30	¾	20	B219VSS						AM Series	NF	
43	1	25	B224VSS			GM Series	AF Series				
48	1¼	32	B232VSS								
84	1½	40	B239VSS								
108	2	50	B249VSS								
190	2½	65	B265VSS			GM Series		GK			
370	3	80	B280VSS								
6.4	½	15		B315L					LR Series	LFR Series	
12.8	¾	20		B320L							
11	1	25		B325L							
34	1¼	32		B332L		NR	AFR Series				
57	1½	40		B340L		AR Series					
87	2	50		B350L							
330	2	50			B650VS	SY Series					
420	2½	65			B665VS						
600	3	80			B680VS						
1200	4	100			B6100VS						
3300	6	150			B6150VS						
9000	8	200			B6200VS						
12400	10	250			B6250VS						



Mode of Operation

The control valve is operated by an electronic actuator that responds to a standard voltage for on/off control, by a proportional VDC/4...20 mA, or 3-point control system. The actuator will then move the ball of the valve to the position dictated by the control signal thus changing the flow.

Product Features

Modified equal percentage of flow for B2, B3 and B6. Modified linear flow for B3.

Actuator Specifications

Control type	on/off, floating point, proportional, 2-10 VDC multi-function technology (MFT)
Manual override	LM, NM, GM, AM, SY, AF, NF, GK
Electrical connection	3 ft [1m] cable with ½" conduit fitting

Valve Specifications

Service	chilled or hot water, (60% glycol), steam
Flow characteristic	modified equal percentage (2-way), modified linear (3-way)
Sizes	½" to 10"
End fitting	NPT (B2...VS & B3.. L) flanged (B6...VS)
Materials	
Body	bronze (B2..VS), stainless steel (B2..VSS), nickel plated brass (B3...L), cast iron (B6..VS)
Ball	stainless steel, bronze (½") chrome plated brass (B3...L)
Stem	stainless steel, bronze (½") nickel plated brass (B3...L)
Seats	2-way MPTFE 3-way LPTFE
Packing	2-way NPT RPTFE 2-way flanged PTFE
Media temp range	
B2..VS, B6..VS	-22°F to +280°F [-30°C to +138°C]
B2..VSS	-22°F to +298°F [-30°C to +148°C]
B3...L	0°F to 250°F [-18°C to +120°C]
Body pressure rating	up to 2000 psig WOG
3-way	600 psi DN 15-25 (B3...L) 400 psi DN 32-50 (B3...L)
Maximum inlet pressure	
Steam	35 psi B2..VS 50 psi B2..VSS, B6..VS
Water	50 psi B3...L
Leakage	ANSI class VI

LF Actuators, On/Off



2
YEAR
WARRANTY



Models

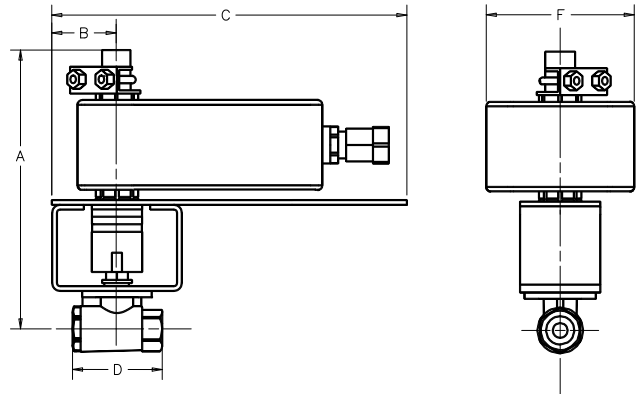
LF24 US	
LF24-S US	w/built-in Aux. Switch
LF120 US	
LF120-S US	w/built-in Aux. Switch

Technical Data	
Control	on/off, floating point
Power supply	
LF24(-S) US	24 VAC $\pm$ 20% 50/60 Hz
LF120(-S) US	24 VDC $\pm$ 10%
Power consumption	
LF24(-S) US	running 5 W
LF24(-S) US	holding 2.5 W
LF120(-S) US	running 5.5 W
LF120(-S) US	holding 3.5 W
Transformer sizing	7 VA, class 2 power source
Electrical connection	1/2" conduit connector
(-S models have 2 cables)	3 ft. [1m], 18 GA appliance cable
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)

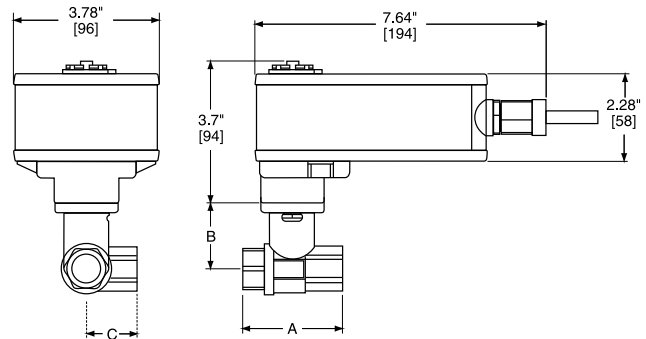
† Rated impulse voltage 800V (4kV for 120V model), Control pollution degree 3, Type of action 1.AA (1.AA.B for -S models)

Dimensions with 2-Way Valve



Valve Nominal Size				Dimensions (Inches)				
Valve Body	COP	Inches	DN [mm]	A	B	C	D	F
B2050VS-01	50	1/2	15	6.75	2.00	6.75	2.25	4.00
B2050VS-02	50	1/2	15	6.75	2.00	6.75	2.25	4.00
B2050VS-04	50	1/2	15	6.75	2.00	6.75	2.25	4.00
B2050VS-15	50	1/2	15	6.70	2.00	8.00	2.25	6.25
B2050VSS-15	1000	1/2	15	6.70	2.00	8.00	2.25	6.25

Dimensions with 3-Way Valve



Valve Nominal Size				Dimensions (mm)		
Valve Body	COP	Inches	DN [mm]	A	B	C
B315L	50	1/2	15	2.63" [67]	1.73" [44]	1.42" [36]
B320L	50	3/4	20	3.01" [78]	1.81" [46]	1.63" [42]
B325L	50	1	25	3.42" [87]	1.81" [46]	1.77" [45]

Wiring Diagrams

✂ INSTALLATION NOTES

1 Provide overload protection and disconnect as required.

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

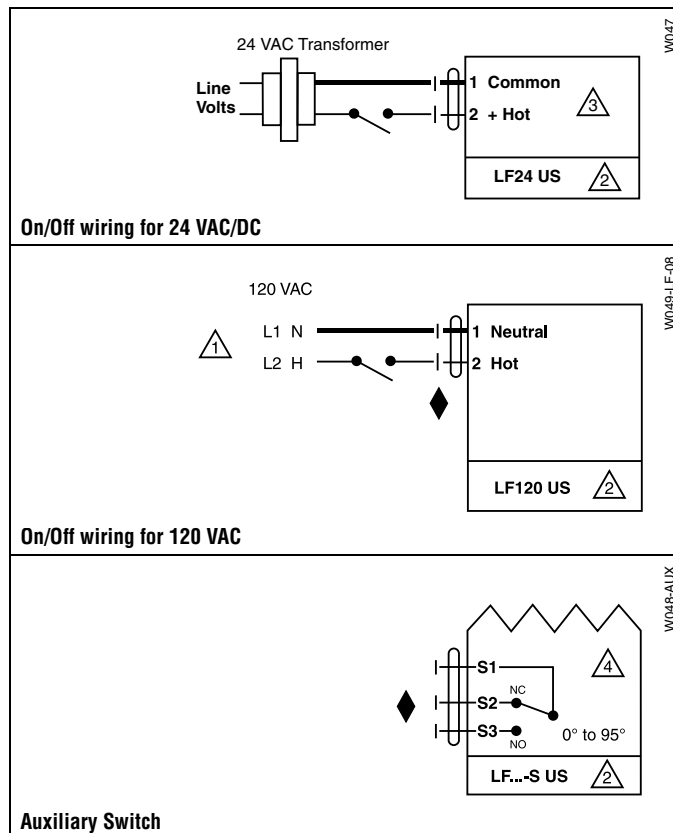
3 Actuator may also be powered by 24 VDC.

4 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.





MFT



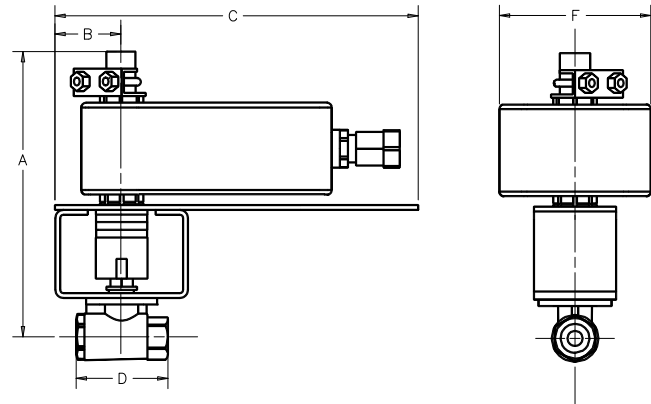
Models

LF24-MFT US

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

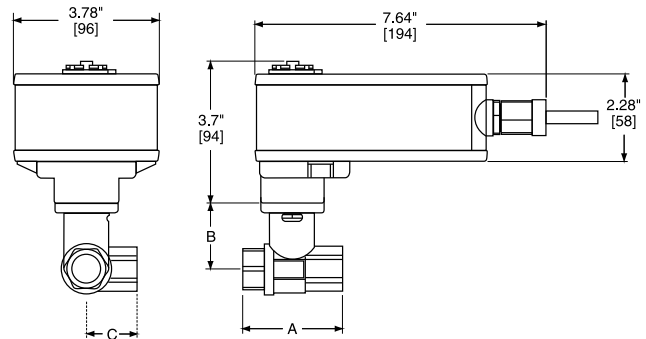
Technical Data	
Control	MFT
Control signal	2 to 10 VDC (4-20mA with 500 Ω resistor)
Power consumption	running 2.5 W
	holding 1 W
Transformer sizing	5 VA (class 2 power source)
Electrical connection (-S models have 2 cables)	1/2" conduit connector
	3 ft. [1m], 18 GA appliance cable
Overload protection	electronic throughout 0° to 95° rotation
Input impedance	100 k Ω 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
Feedback	2 to 10 VDC, 0.5 mA max
Angle of rotation	95°
Direction of rotation	spring reversible with CW/CCW mounting
	motor reversible with built-in switch
Position indication	visual indicator
Running time	<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
Noise level	max. 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 2-Way Valve



Valve Nominal Size				Dimensions (Inches)				
Valve Body	COP	Inches	DN [mm]	A	B	C	D	F
B2050VS-01	50	1/2	15	6.75	2.00	6.75	2.25	4.00
B2050VS-02	50	1/2	15	6.75	2.00	6.75	2.25	4.00
B2050VS-04	50	1/2	15	6.75	2.00	6.75	2.25	4.00
B2050VS-15	50	1/2	15	6.70	2.00	8.00	2.25	6.25
B2050VSS-15	1000	1/2	15	6.70	2.00	8.00	2.25	6.25

Dimensions with 3-Way Valve



Valve Nominal Size				Dimensions (mm)		
Valve Body	COP	Inches	DN [mm]	A	B	C
B315L	50	1/2	15	2.63" [67]	1.73" [44]	1.42" [36]
B320L	50	3/4	20	3.01" [78]	1.81" [46]	1.63" [42]
B325L	50	1	25	3.42" [87]	1.81" [46]	1.77" [45]

Wiring Diagrams

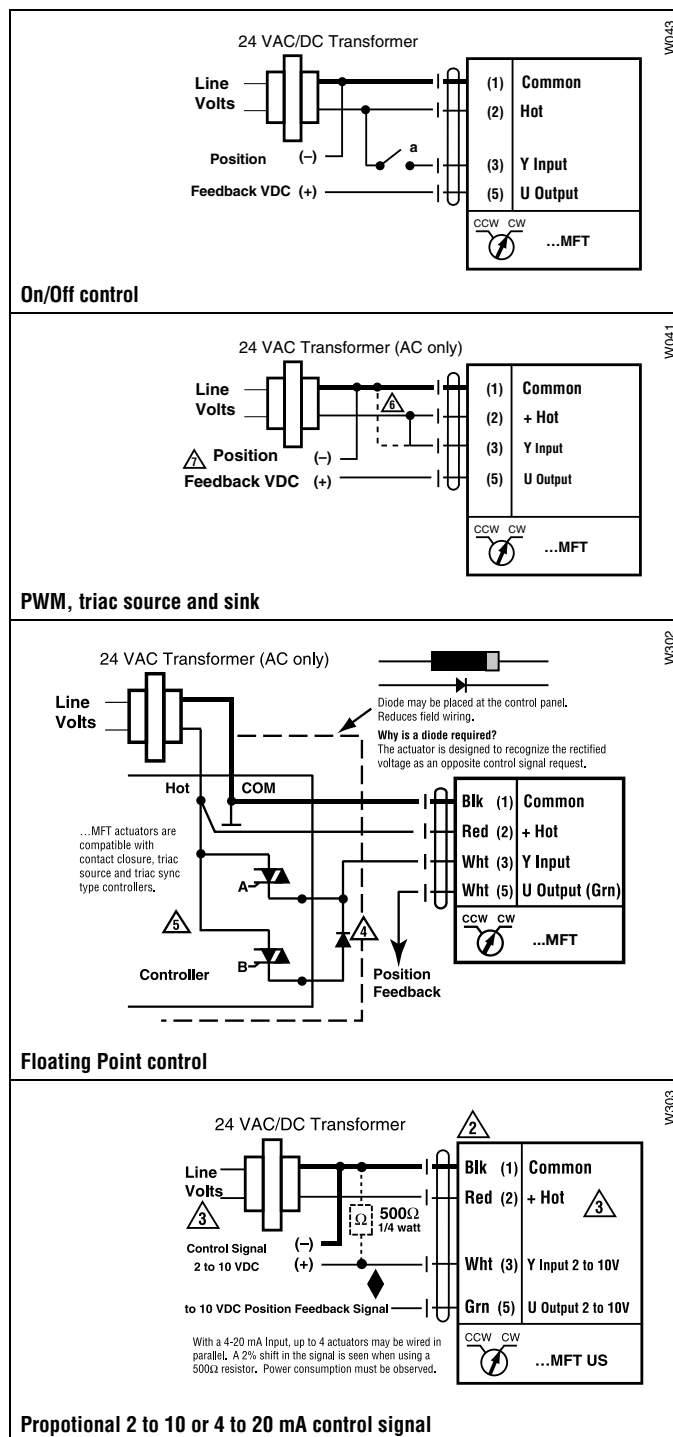
✂ INSTALLATION NOTES

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

📄 APPLICATION NOTES

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

⚠ WARNING Live Electrical Components!
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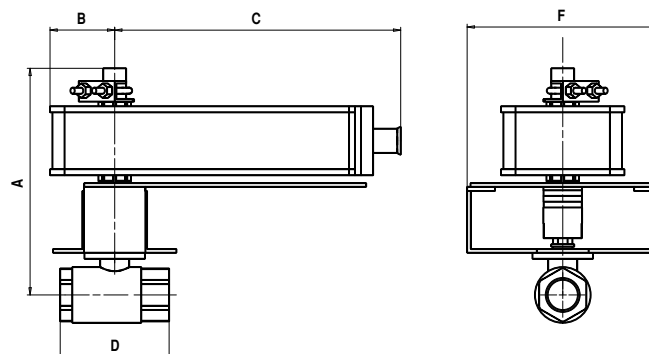


Models

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

Technical Data		
Control		on/off
Power consumption		
NFB24-X1	running	6 W
	holding	2.5 W
NFBUP-X1	running	6 W
	holding	2.5 W
Transformer sizing	NFB24-X1	8.5 VA (class 2 power source)
	NFBUP(-S)-X1	6 VA @ 24 VAC (class 2 power source)
		6.5 VA @ 120 VAC
		9.5 VA @ 240 VAC
Electrical connection		½" conduit connector
(-S model has 2 cables)		3 ft. [1m], 18 GA appliance cables
Electrical protection		120V actuators double insulated
Overload protection		electronic throughout 0° to 95° rotation
Angle of rotation		95°
Position indication		visual indicator
Running time	control	<75 seconds
	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)
NFBUP-S-X1		
Auxiliary switch		2 x SPDT, 3A (0.5A inductive) @ 250 V

Dimensions with 2-Way Valve



Valve Body	COP	Valve Nominal Size			Dimensions (Inches)				
		Inches	DN [mm]	A	B	C	D	F	
B219VS	400	¾	20	7.00	2.00	8.00	3.37	6.25	
B220VS	200	¾	20	7.00	2.00	8.00	3.37	6.25	
B219VSS	1000	¾	20	7.00	2.00	8.00	3.37	6.25	

Wiring Diagrams

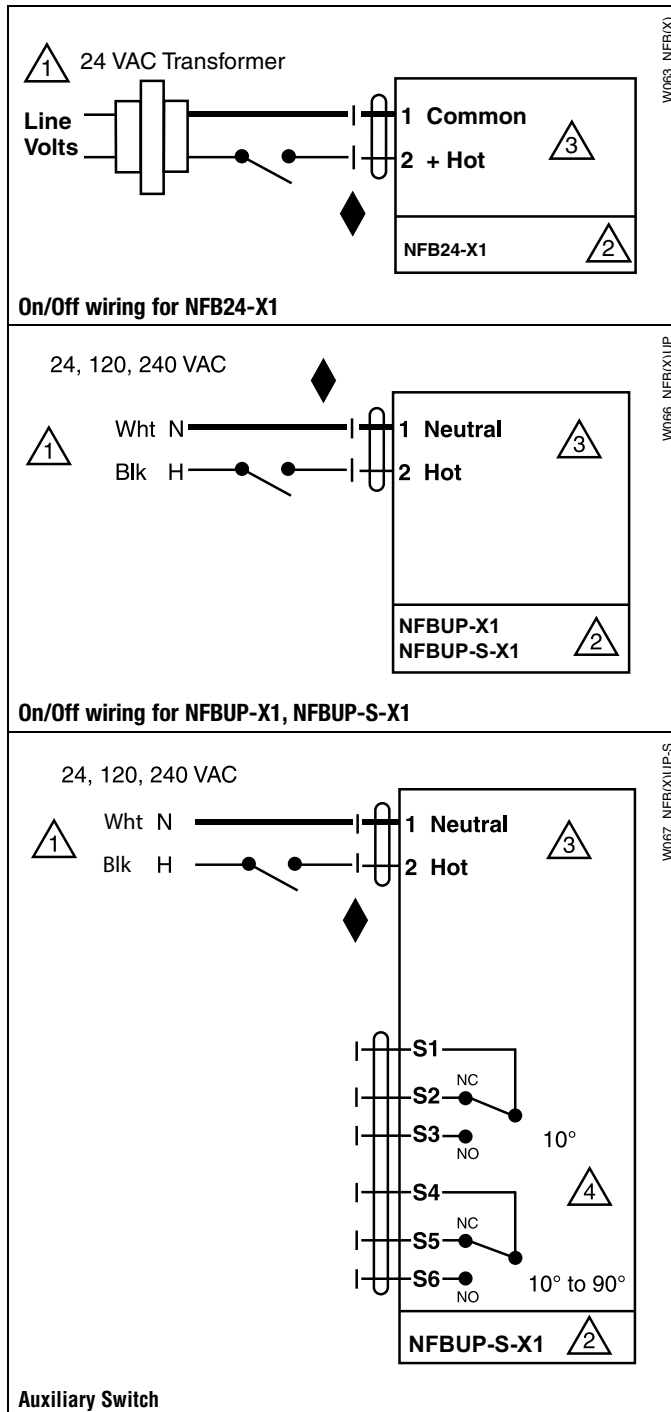
✂ INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
- 2 **CAUTION Equipment damage!**
Actuators may be connected in parallel.
Power consumption must be observed.
- 3 Actuators may also be powered by 24 VDC.
- 4 For end position indication, interlock control, fan startup, etc.,
NF24-S US incorporates a built-in auxiliary switch: 1 x SPDT, 7A (2.5A)
@ 250 VAC, UL listed, adjustable 5° to 85°.

📄 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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MFT



Models

NFX24-MFT-X1

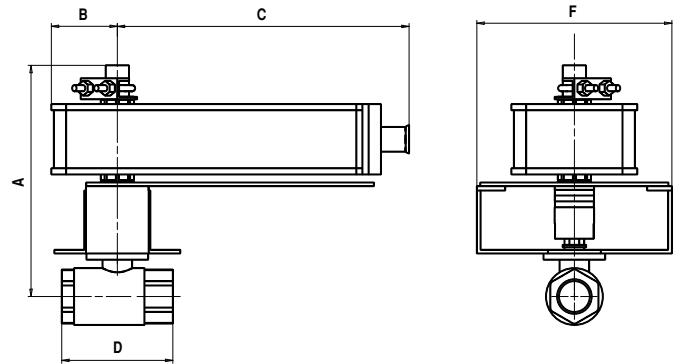
NFX24-MFT-S-X1

Technical Data	
Control	MFT
Control signal	2 to 10 VDC, (4 to 20 mA with 500 Ω resistor)
Power supply	24 VAC $\pm$ 20% 50/60 Hz 24 VDC $\pm$ 20% / -10%
Power consumption	running 6.5 W holding 3 W
Transformer sizing	9 VA, (class 2 power source)
Electrical connection	1/2" conduit connector 3 ft. [1m], 18 GA appliance cable
Overload protection	electronic throughout 0 to 95° rotation
Input impedance	100 k Ω for 2 to 10 VDC (0.1 mA) 500 Ω for 4 to 20 mA 1500 Ω for on/off and floating point
Feedback output	2 to 10 VDC, 0.5 mA max
Angle of rotation	95°
Direction of rotation	spring reversible with CW/CCW mounting motor reversible with built-in switch
Position indication	visual indicator, 0° to 95°
Running time	motor 150 seconds (default), variable (40 to 220 seconds) spring <20 sec @ -4°F to +122°F [-20°C to +50°C]; <60 sec @ -22°F [-30°F]
Ambient temperature	-22°F to +122°F [-30°C to +50°C]
Housing	NEMA 2 / IP54, Enclosure Type 2
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	<40 dB(A) motor @ 150 seconds, run time dependent <62 dB(A) spring return

NFX24-MFT-S-X1

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

Dimensions with 2-Way Valve



Valve Body	COP	Valve Nominal Size		A	Dimensions (Inches)			
		Inches	DN [mm]		B	C	D	F
B219VS	400	3/4	20	7.00	2.00	8.00	3.37	6.25
B220VS	200	3/4	20	7.00	2.00	8.00	3.37	6.25
B219VSS	1000	3/4	20	7.00	2.00	8.00	3.37	6.25

Wiring Diagrams

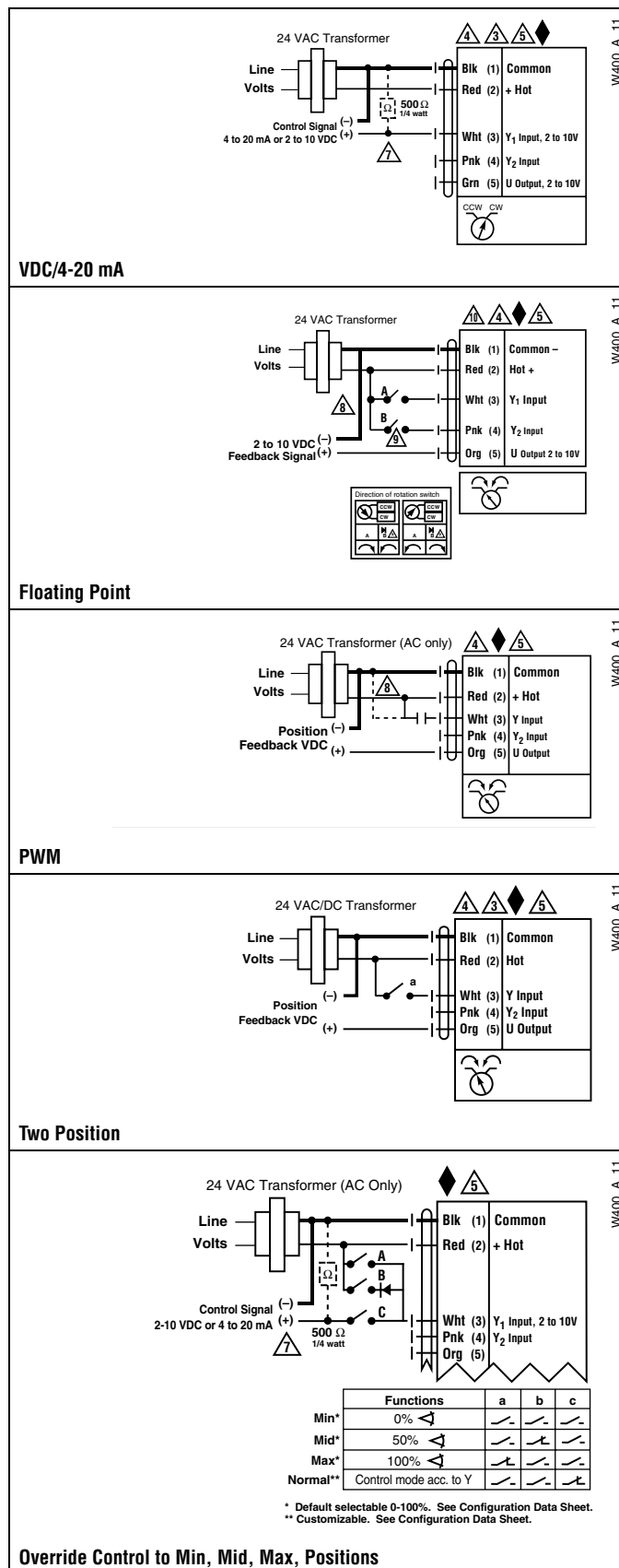
INSTALLATION NOTES

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

APPLICATION NOTES

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

WARNING Live Electrical Components!
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MFT

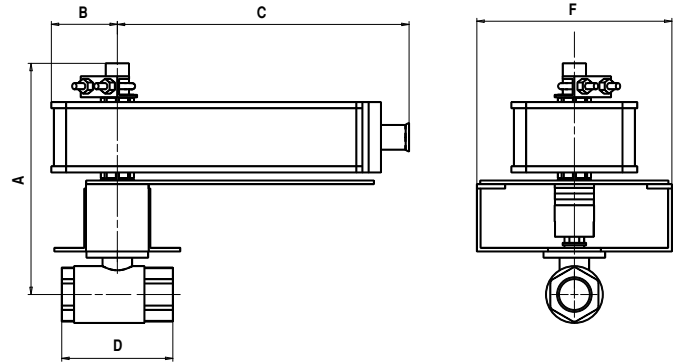


Models

NFX24-MFT95-X1

Technical Data	
Control	MFT
Control signal	0-135 Ω
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	½" conduit connector 3 ft. [1m], 18 GA appliance cable
Overload protection	electronic throughout 0 to 95° rotation
Input impedance	100 kΩ for 2 to 10 VDC (0.1 mA) 500 Ω for 4 to 20 mA 1500 Ω for on/off and floating point
Feedback output	2 to 10 VDC, 0.5 mA max
Angle of rotation	95° (adjustable with mechanical end stop, 35° to 95°)
Direction of rotation	spring reversible with CW/CCW mounting motor reversible with built-in switch
Position indication	visual indicator, 0° to 95°
Running time	control 150 seconds (default), variable (40 to 220 seconds) spring <20 sec @ -4°F to +122°F [-20°C to +50°C]; <60 sec @ -22°F [-30°F]
Ambient temperature	-22°F to +122°F [-30°C to +50°C]
Housing	NEMA 2 / IP54, Enclosure Type 2
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	<40 dB(A) motor @ 150 seconds, run time dependent, <62 dB(A) spring return

Dimensions with 2-Way Valve



Valve Body	COP	Valve Nominal Size		A	Dimensions (Inches)			
		Inches	DN [mm]		B	C	D	F
B219VS	400	¾	20	7.00	2.00	8.00	3.37	6.25
B220VS	200	¾	20	7.00	2.00	8.00	3.37	6.25
B219VSS	1000	¾	20	7.00	2.00	8.00	2.25	6.25



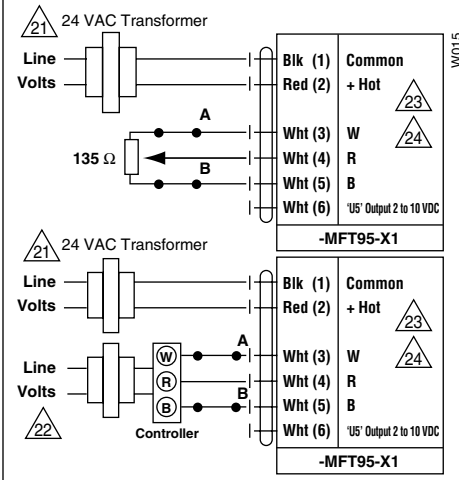
INSTALLATION NOTES

- 21 Provide overload protection and disconnect as required.
- 22 Actuators and controller must have separate transformers.
- 23 Consult controller instruction data for more detailed information.
- 24 Resistor value depends on the type of controller and the number of actuators. No resistor is used for one actuator. Honeywell® resistor kits may also be used.
- 25 To reverse control rotation, use the reversing switch.

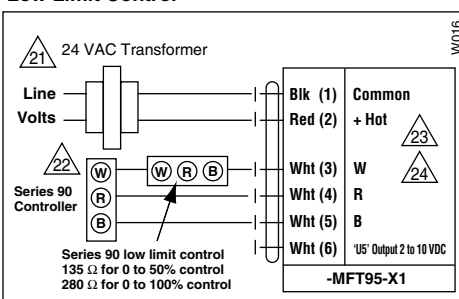
Override

Switch A	Switch B	Damper Position
		Damper Open
		Damper Closed

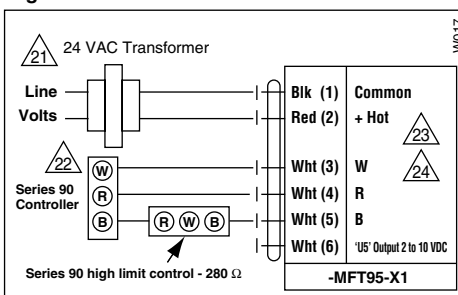
The direction of rotation switch is set so that the fail safe position and the position of the damper is closed with no signal at wire R.



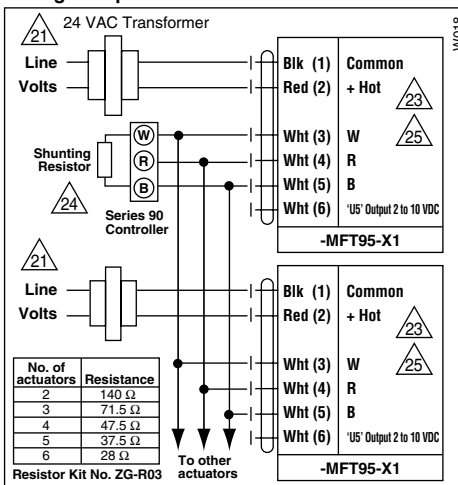
Low Limit Control



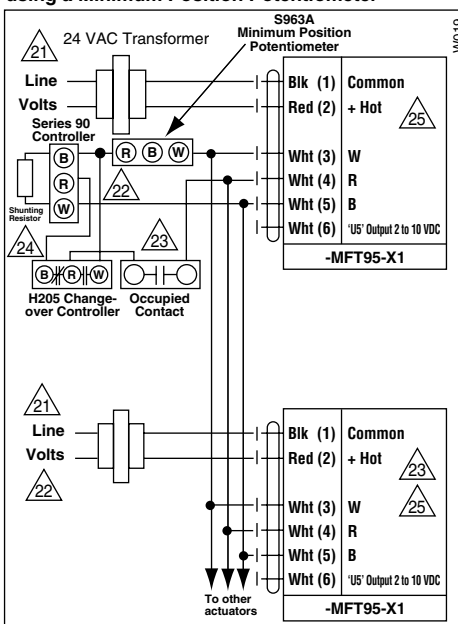
High Limit Control



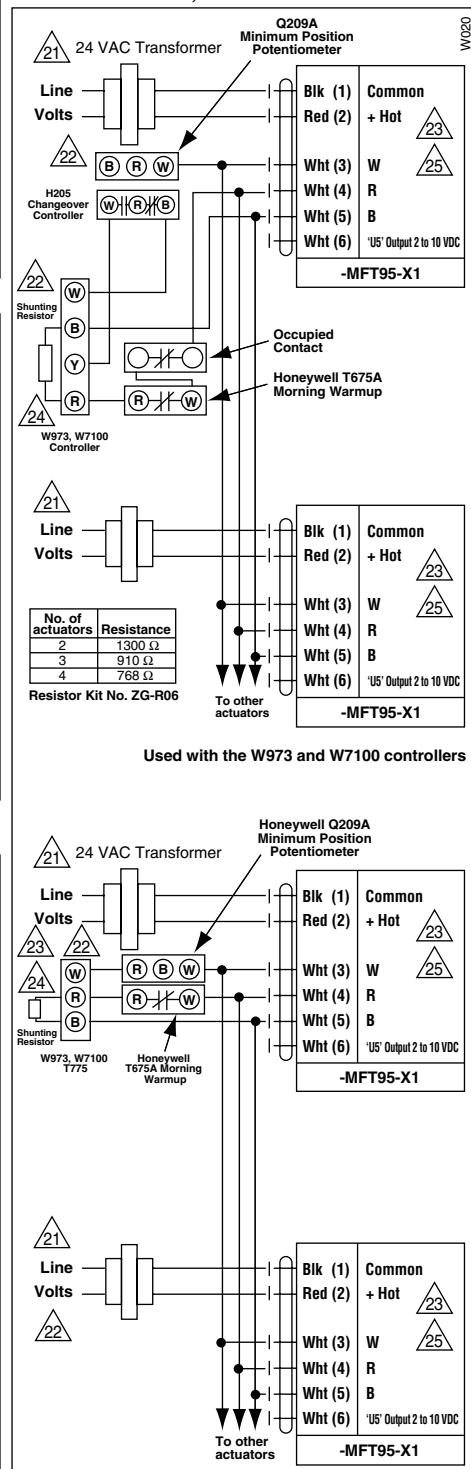
Wiring Multiple Actuators to a Series 90 Controller

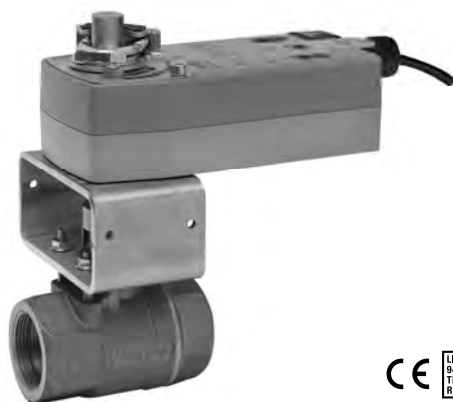


Wiring Multiple Actuators to a Series 90 Controller using a Minimum Position Potentiometer



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





Models

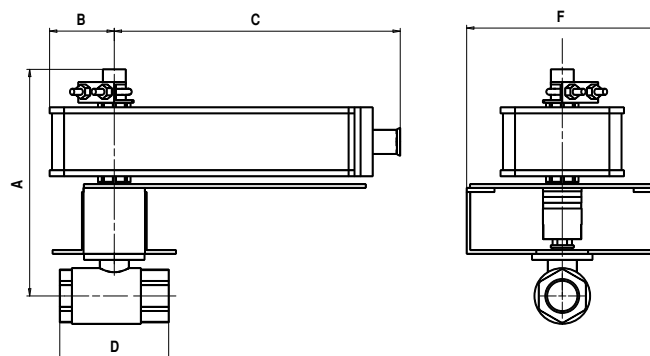
AFB24-X1
AFBUP-X1
AFBUP-S-X1 w/built-in Aux. Switches

Technical Data		
Control		on/off
Power consumption		
AFBUP-X1	running	5 W
	holding	2.5 W
AFBUP-S-X1	running	7 W
	holding	3.5 W
Transformer sizing	AFB24-X1	7.5 VA (class 2 power source)
	AFBUP(-S)-X1	7 VA @ 24 VAC (class 2 power source)
		8.5 VA @ 120 VAC
		18 VA @ 240 VAC
Electrical connection		1/2" conduit connector
(-S model has 2 cables)		3 ft. [1m], 18 GA appliance cables
Electrical protection		120V 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)

AFBUP-S-X1		
Auxiliary switches		2 x SPDT, 7A (2.5A) @ 250 VAC, UL listed, one switch is fixed at +5°, one is adjustable 25° to 85° (double insulated)

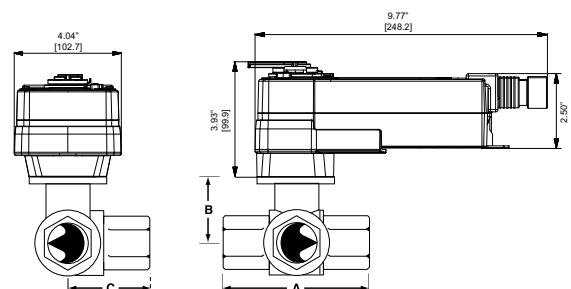
* Dual Mounted Actuators

Dimensions with 2-Way Valve



Valve Body	COP	Valve Nominal Size		Dimensions (Inches)					
		Inches	DN [mm]	A	B	C	D	F	
B224VS	400	1	25	7.00	2.00	8.00	3.37	6.25	
B225VS	200	1	25	7.00	2.00	8.00	3.62	6.25	
B232VS	200	1 1/4	32	7.25	2.00	8.00	3.97	6.25	
*B239VS	600	1 1/2	40	15.00	3.00	8.00	4.37	6.25	
*B240VS	600	1 1/2	40	15.00	3.00	8.00	4.75	6.25	
*B249VS	600	2	50	15.00	3.00	8.00	4.68	6.25	
B224VSS	1000	1	25	7.00	2.00	8.00	3.37	6.25	
B232VSS	1000	1 1/4	32	7.25	2.00	8.00	3.97	6.25	
*B239VSS	1000	1 1/2	40	15.00	3.00	8.00	4.37	6.25	
*B249VSS	600	2	50	15.00	3.00	8.00	4.68	6.25	

Dimensions with 3-Way Valve



Valve Body	COP	Valve Nominal Size		Dimensions (mm)		
		Inches	DN [mm]	A	B	C
B332L	50	1 1/4	32	4.13" [105]	2.00" [51]	2.19" [56]
B340L	50	1 1/2	40	4.80" [122]	2.44" [62]	2.61" [67]
B350L	50	2	50	5.60" [142]	2.67" [68]	3.11" [79]

Wiring Diagrams

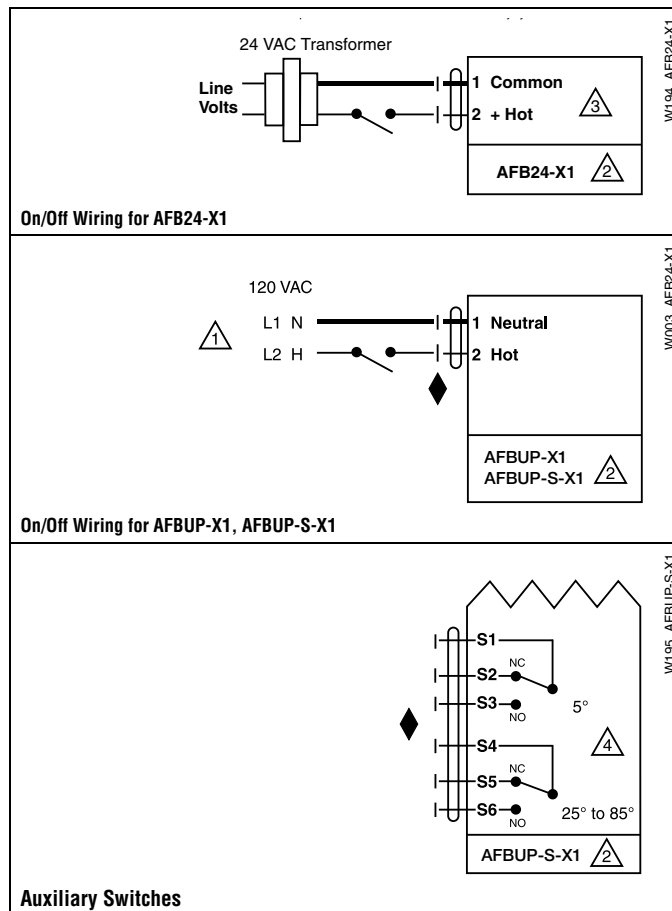
✂️ INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
- 2 **CAUTION Equipment damage!**
Actuators may be connected in parallel.
Power consumption must be observed.
- 3 Actuators may also be powered by 24 VDC.
- 4 For end position indication, interlock control, fan startup, etc., AF24-S US incorporates two built-in auxiliary switches: 2 x SPDT, 7A (2.5A) @ 250 VAC, UL listed, one switch is fixed at +5°, one is adjustable 25° to 85°.

📄 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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MFT

2
YEAR
WARRANTY



Models

AFX24-MFT-X1
AFX24-MFT-S-X1 w/built-in Aux. Switches
AFX24-MFT95-X1

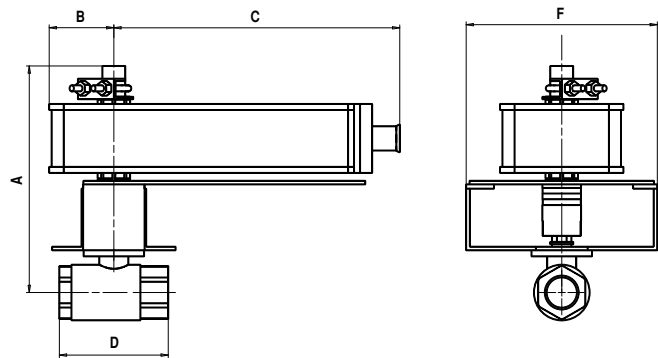
Technical Data	
Control	MFT
Control signal	2 to 10 VDC, (4 to 20 mA with 500 Ω resistor) 0-135 Ω (MFT95)
Power supply	24 VAC $\pm$ 20% 50/60 Hz 24 VDC $\pm$ 10%
Power consumption	running 7.5 W holding 3 W
Transformer sizing	10 VA (class 2 power source)
Electrical connection (-S model has 2 cables)	1/2" conduit connector 3 ft. [1m], 18 GA appliance cable
Overload protection	electronic throughout rotation
Input impedance	100 k Ω for 2 to 10 VDC (0.1 mA) 500 Ω for 4 to 20 mA 750 Ω for PWM 1500 Ω for on/off and floating point
Feedback output	2 to 10 VDC, 0.5 mA max
Angle of rotation	95°
Direction of rotation	spring reversible with CW/CCW mounting motor reversible with built-in switch
Position indication	visual indicator
Manual override	hex crank
Running time	control 150 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)

AFX24-MFT-S-X1

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

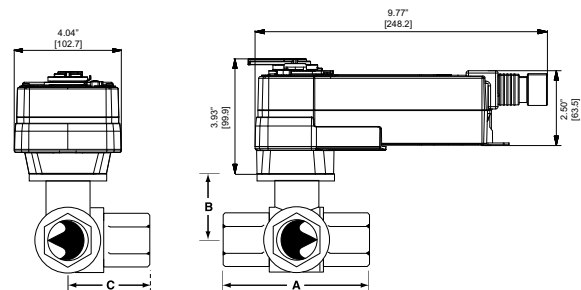
* Dual Mounted Actuators

Dimensions with 2-Way Valve



		Valve Nominal Size		Dimensions (Inches)					
Valve Body	COP	Inches	DN [mm]	A	B	C	D	F	
B224VS	400	1	25	7.00	2.00	8.00	3.37	6.25	
B225VS	50	1	25	7.00	2.00	8.00	3.62	6.25	
B232VS	200	1 1/4	32	7.25	2.00	8.00	3.97	6.25	
*B239VS	400	1 1/2	40	7.50	2.00	8.00	4.37	6.25	
*B240VS	50	1 1/2	40	7.50	2.00	8.00	4.75	6.25	
*B249VS	200	2	50	8.00	2.00	8.00	4.68	6.25	
B224VSS	1000	1	25	7.00	2.00	8.00	3.37	6.25	
B232VSS	1000	1 1/4	32	7.25	2.00	8.00	3.97	6.25	
*B232VSS	1000	1 1/4	32	7.25	2.00	8.00	3.97	6.25	
*B239VSS	1000	1 1/2	40	6.70	2.00	8.00	4.37	6.25	
*B249VSS	400	2	50	8.00	2.00	8.00	4.68	6.25	

Dimensions with 3-Way Valve



		Valve Nominal Size		Dimensions (mm)		
Valve Body	COP	Inches	DN [mm]	A	B	C
B332L	50	1 1/4	32	4.13" [105]	2.00" [51]	2.19" [56]
B340L	50	1 1/2	40	4.80" [122]	2.44" [62]	2.61" [67]
B350L	50	2	50	5.60" [142]	2.67" [68]	3.11" [79]

Wiring Diagrams

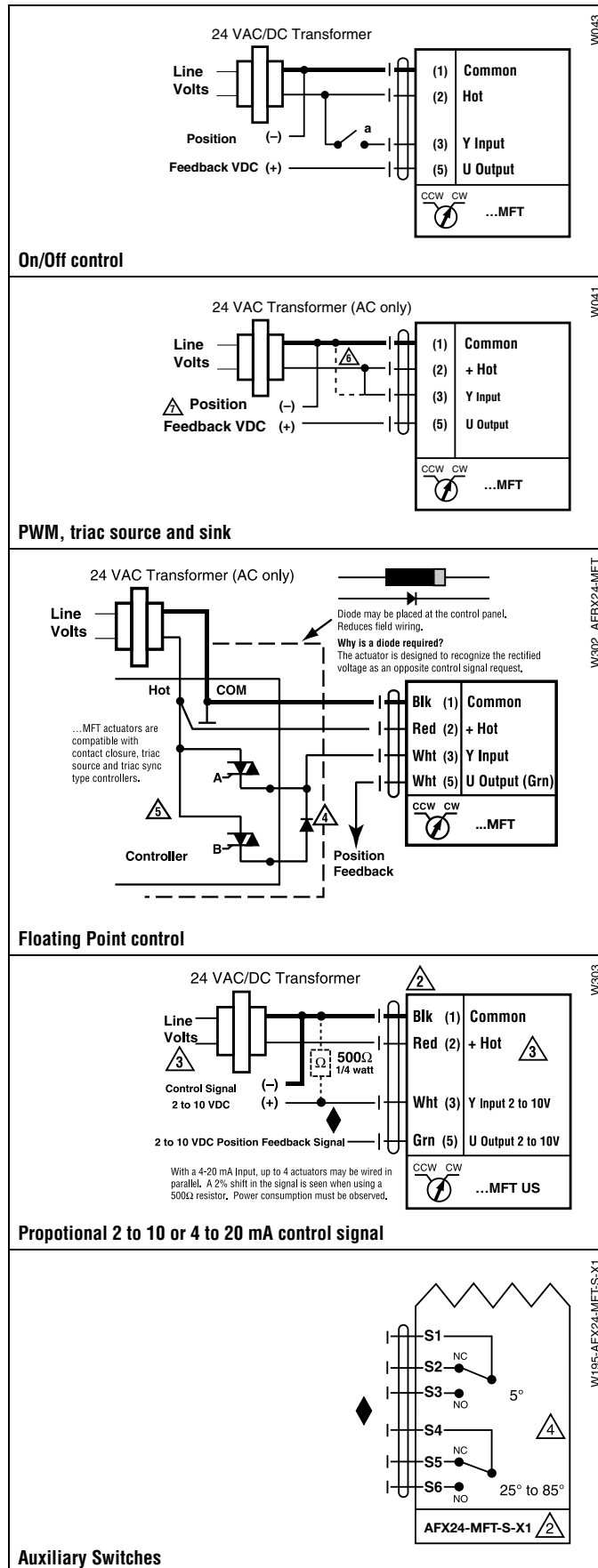
INSTALLATION NOTES

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

APPLICATION NOTES

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

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



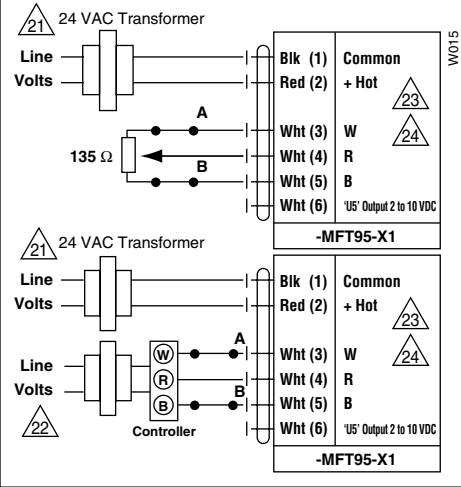
INSTALLATION NOTES

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

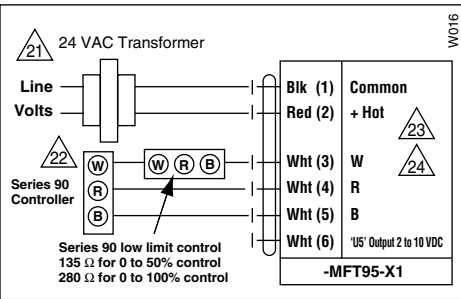
Override

Switch A	Switch B	Damper Position
		Damper Open
		Damper Closed

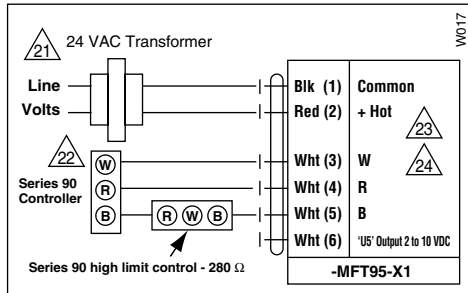
The direction of rotation switch is set so that the fail safe position and the position of the damper is closed with no signal at wire R.



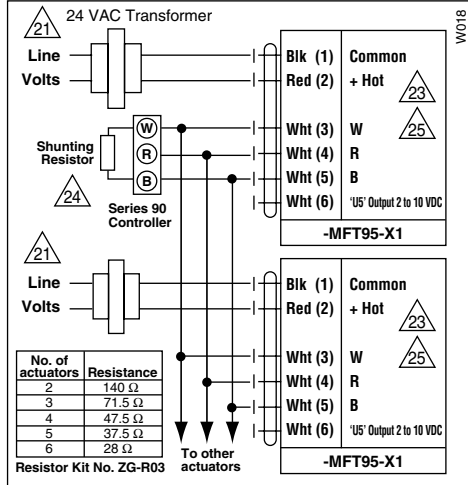
Low Limit Control



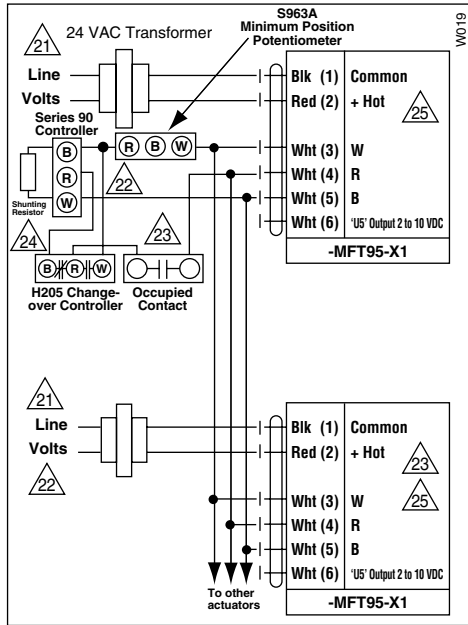
High Limit Control



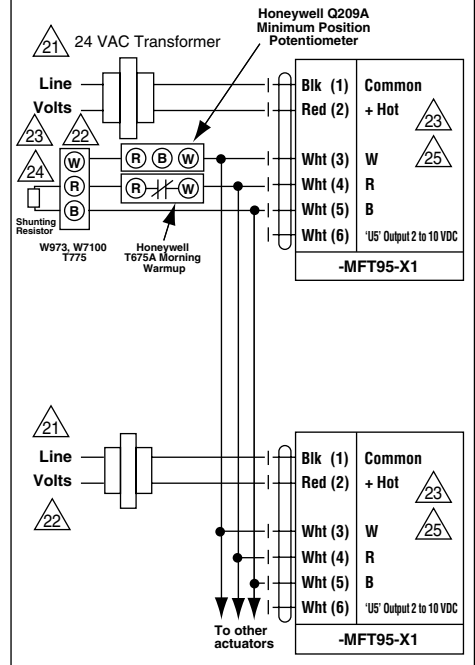
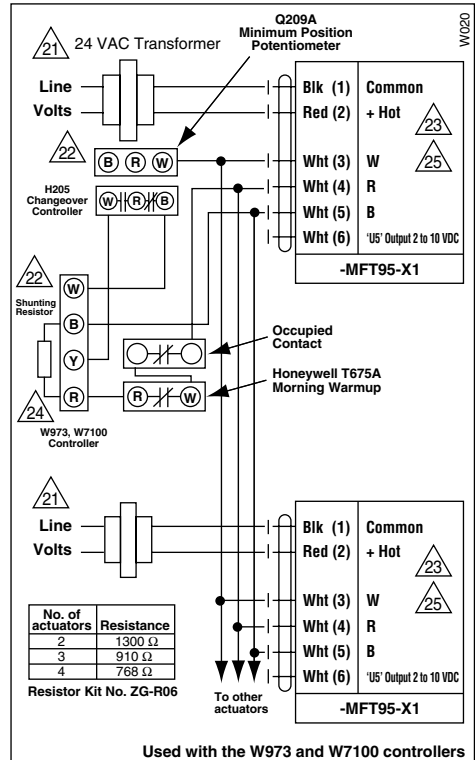
Wiring Multiple Actuators to a Series 90 Controller

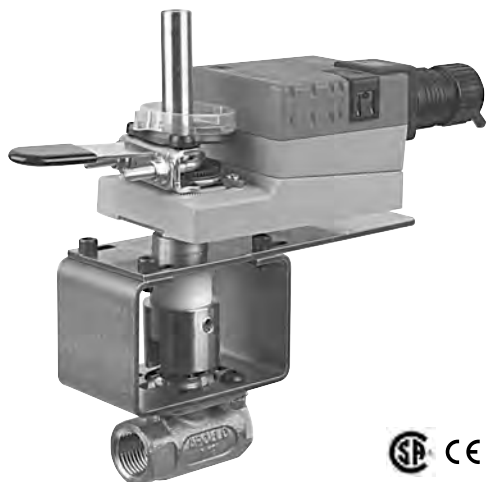


Wiring Multiple Actuators to a Series 90 Controller using a Minimum Position Potentiometer



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



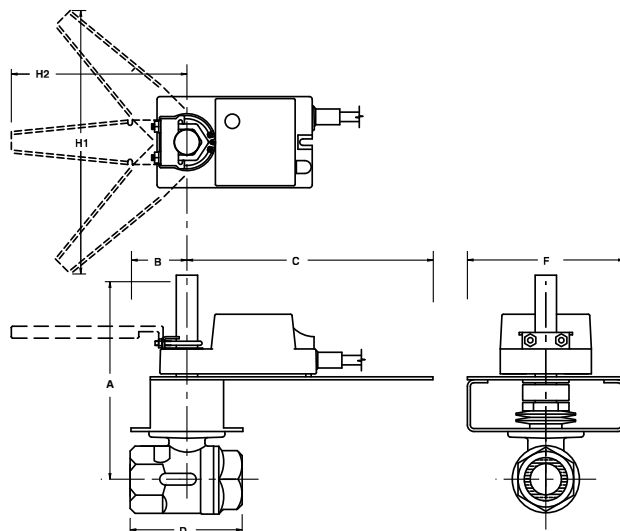


Models

LMB24-3-X1
LMX24-3-X1
LRX24-3

Technical Data	
Control	on/off, floating point
Power supply	24 VAC $\pm$ 20% 50/60 Hz 24 VDC $\pm$ 10%
Power consumption	running 1.5 W holding 0.2 W
Transformer sizing	3 VA (class 2 power source)
Electrical connection	1/2" conduit connector LMB24-3-X1 3 ft., 18 GA plenum rated cables
Overload protection	electronic throughout 0° to 95° rotation
Input impedance	600 Ω
Angle of rotation	95°
Torque	45 in-lbs [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)
Servicing	maintenance free
Quality standard	ISO 9001

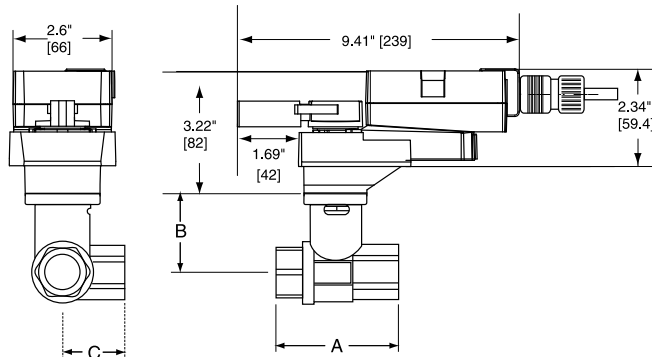
Dimensions with 2-Way Valve



PAGE7

Valve Nominal Size				Dimensions (Inches)						
Valve Body	COP	Inches	DN [mm]	A	B	C	D	F	H1	H2
B2050VS-01	50	½	15	6.75	2.00	6.75	2.25	4.00	9.75	8.50
B2050VS-02	50	½	15	6.75	2.00	6.75	2.25	4.00	9.75	8.50
B2050VS-04	50	½	15	6.75	2.00	6.75	2.25	4.00	9.75	8.50
B2050VS-15	50	½	15	6.75	2.00	6.75	2.25	4.00	9.75	8.50

Dimensions with 3-Way Valve



Valve Nominal Size				Dimensions (mm)		
Valve Body	COP	Inches	DN [mm]	A	B	C
B315L	50	1/2	15	2.63" [67]	1.73" [44]	1.42" [36]
B320L	50	3/4	20	3.01" [78]	1.81" [46]	1.63" [42]
B325L	50	1	25	3.42" [87]	1.81" [46]	1.77" [45]

INSTALLATION NOTES

3 Actuators may also be powered by 24 VDC.

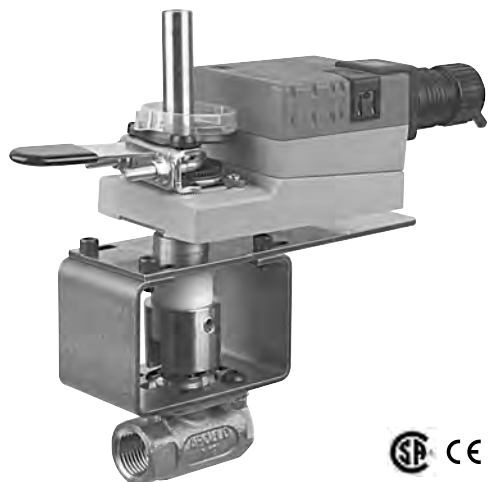
 APPLICATION NOTES

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

WARNING *Live Electrical Components!*



The valve 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. Allow 6" for cover removal and 12" for complete actuator removal. The assembly can be mounted with the actuator 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.

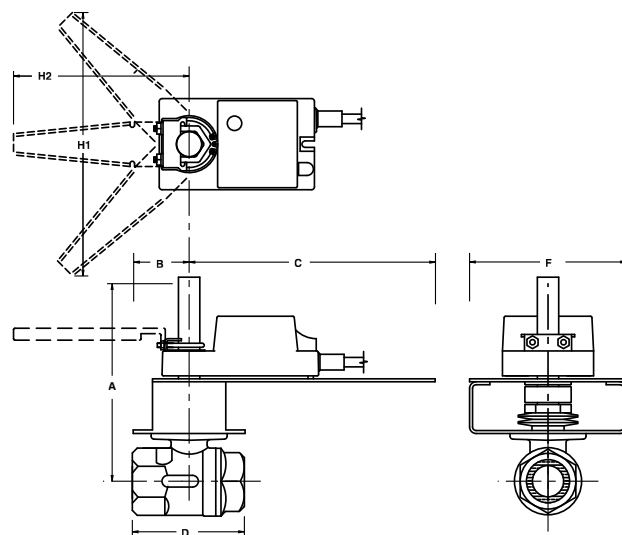


Models

LMX24-MFT-X1
LRX24-MFT

Technical Data	
Power supply	24 VAC $\pm$ 20% 50/60 Hz 24 VDC $\pm$ 10%
Power consumption	2 W
Transformer sizing	3.5 VA (class 2 power source)
Electrical connection	3 ft. [1m], 10 ft. [3m], 16 ft. [5m] 18 GA plenum rated cable 1/2" conduit connector
Overload protection	electronic throughout 0° to 95° rotation
Input impedance	100k Ω for 2 to 10 VDC (0.1 mA) 500 Ω for 4 to 20 mA 750 Ω for PWM 1500 Ω for on/off and floating point
Feedback	2 to 10 VDC, 0.5 mA max VDC variable
Angle of rotation	95°
Torque	45 in-lbs [5 Nm]
Direction of rotation	reversible with switch
Position indication	reflective visual indicator (snap-on)
Manual override	external push button
Running time	150 seconds (default) 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 60730-1/-2-14, CAN/CSA E60730-1, CSA C22.2 No. 24-93, CE acc. to 89/336/EEC
Noise level	<35 db(A)
Servicing	maintenance free
Quality standard	ISO 9001

Dimensions with 2-Way Valve



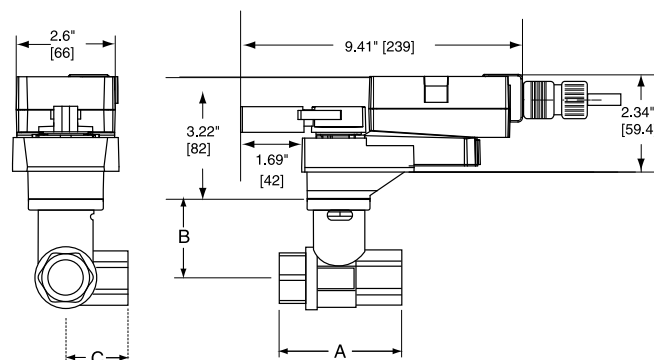
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Valve Nominal Size

Dimensions (Inches)

Valve Body	COP	Inches	DN [mm]	A	B	C	D	F	H1	H2
B2050VS-01	50	1/2	15	6.75	2.00	6.75	2.25	4.00	9.75	8.50
B2050VS-02	50	1/2	15	6.75	2.00	6.75	2.25	4.00	9.75	8.50
B2050VS-04	50	1/2	15	6.75	2.00	6.75	2.25	4.00	9.75	8.50
B2050VS-15	50	1/2	15	6.75	2.00	6.75	2.25	4.00	9.75	8.50

Dimensions with 3-Way Valve



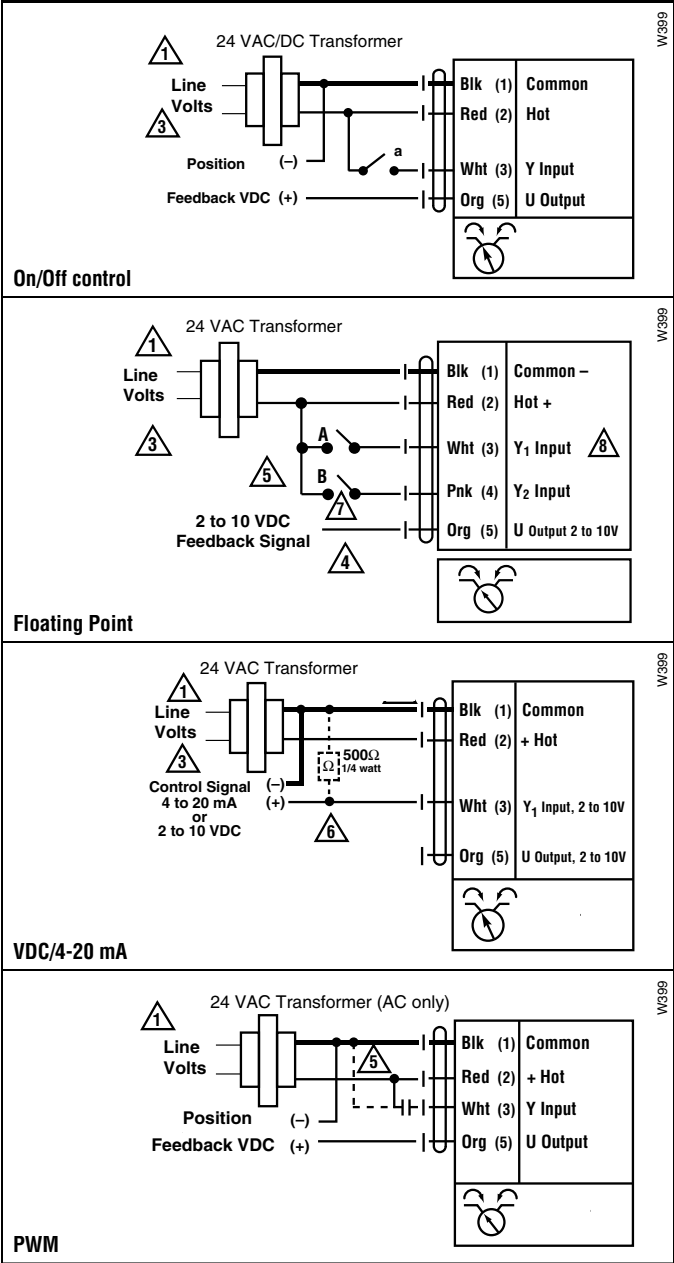
Valve Nominal Size

Dimensions (mm)

Valve Body	COP	Inches	DN [mm]	A	B	C
B315L	50	1/2	15	2.63" [67]	1.73" [44]	1.42" [36]
B320L	50	3/4	20	3.01" [78]	1.81" [46]	1.63" [42]
B325L	50	1	25	3.42" [87]	1.81" [46]	1.77" [45]

Wiring Diagrams

- 1 Provide overload protection and disconnect as required.
- 3 Actuators may also be powered by 24 VDC.
- 4 Position feedback cannot be used with Triac sink controller. 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.
- 6 ZG-R01 may be used.
- 7 Contact closures A & B also can be triacs.
- 8 For triac sink the common connection from the actuator must be connected to the hot connection of the controller.



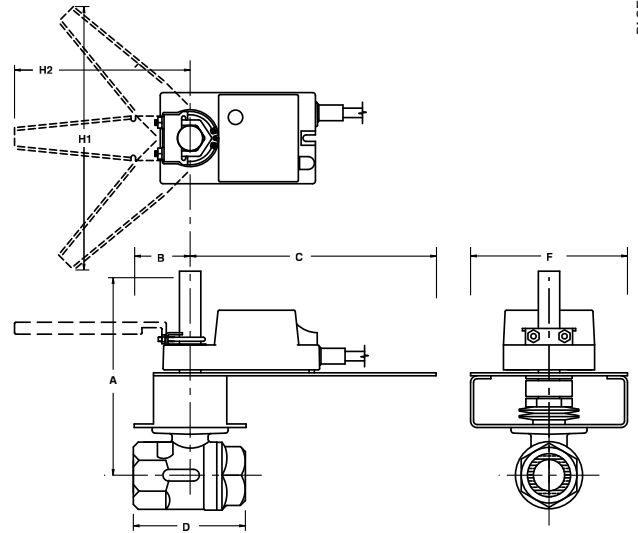


Models

NMB24-3-X1
NMX24-3-X1
NRB24-3

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 NMB24-3-X1 1/2" conduit connector
Overload protection	electronic throughout 0° to 95° rotation
Input impedance	600 Ω
Angle of rotation	max 95°, adjustable with mechanical stop
Torque	90 in-lbs [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/CSA C22.2 No. 24 certified, CE acc. to 73/23/EEC
Noise level	<45 db(A)
Servicing	maintenance free
Quality standard	ISO 9001

Dimensions with 2-Way Valve



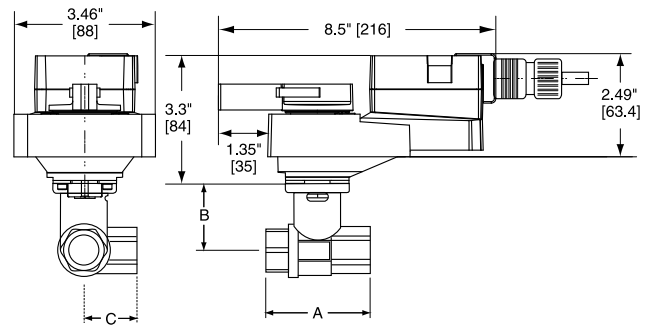
PAGE 7

Valve Nominal Size

Dimensions (Inches)

Valve Body	COP	Inches	DN [mm]	A	B	C	D	F	H1	H2
B219VS	400	3/4	20	6.70	2.00	8.00	3.00	6.25	9.75	8.50
B220VS	400	3/4	20	6.70	2.00	8.00	3.12	6.25	9.75	8.50
B2050VSS-15	1000	1/2	15	6.70	2.00	8.00	2.25	6.25	9.75	8.50
B219VSS	1000	3/4	20	6.70	2.00	8.00	3.00	6.25	9.75	8.50

Dimensions with 3-Way Valve



Valve Nominal Size

Dimensions (mm)

Valve Body	COP	Inches	DN [mm]	A	B	C
B332L	50	1 1/4	32	4.13" [105]	2.00" [51]	2.19" [56]

Wiring Diagrams

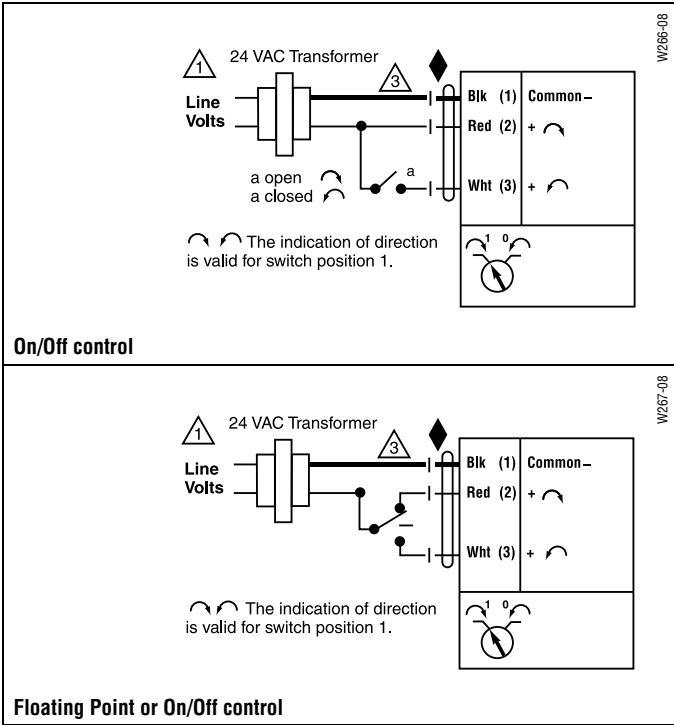
✂️ **INSTALLATION NOTES**

- 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.



Piping

The valve 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. Allow 6" for cover removal and 12" for complete actuator removal. The assembly can be mounted with the actuator 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.

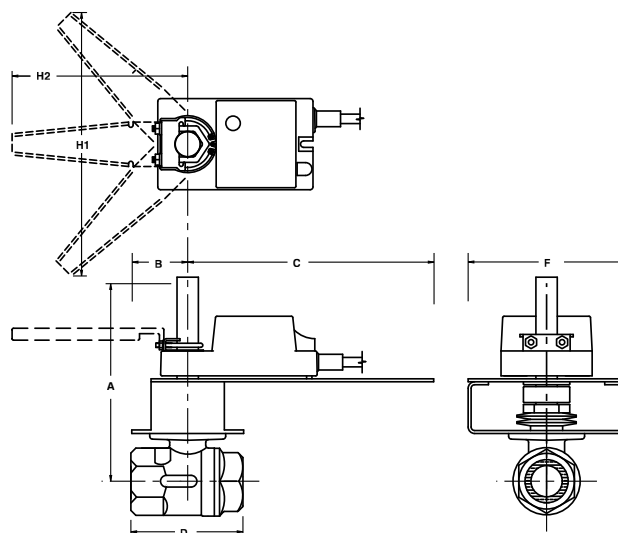


Models

NMX24-MFT-X1
NRX24-MFT

Technical Data	
Power supply	24 VAC $\pm$ 20% 50/60 Hz 24 VDC $\pm$ 10%
Power consumption	3.5 W (1.25 W)
Transformer sizing	5.5 VA (class 2 power source)
Electrical connection	3 ft. [1m], 10 ft. [3m], 16 ft. [5m] 18 GA plenum rated cable ½" conduit connector
Overload protection	electronic throughout 0° to 95° rotation
Input impedance	100 k Ω for 2 to 10 VDC (0.1 mA) 500 Ω for 4 to 20 mA 750 Ω for PWM 1500 Ω for on/off and floating point
Feedback	2 to 10 VDC, 0.5 mA max VDC variable
Angle of rotation	max 95°, adjust. with mechanical stop electronically variable
Torque	90 in-lbs [10 Nm]
Direction of rotation	reversible with switch
Position indication	reflective visual indicator (snap-on)
Manual override	external push button
Running time	150 seconds (default) 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 60730-1/-2-14, CAN/CSA E60730-1, CSA C22.2 No. 24-93, CE acc. to 89/336/EEC
Noise level	<45 db(A)
Servicing	maintenance free
Quality standard	ISO 9001

Dimensions with 2-Way Valve



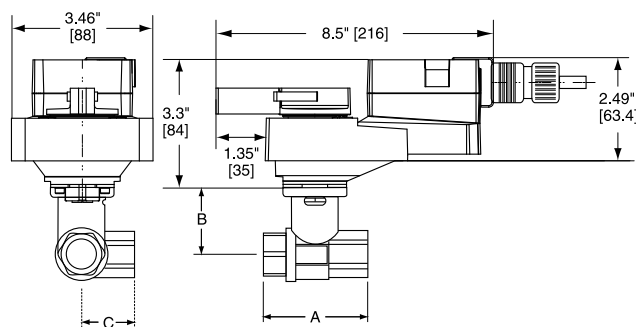
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Valve Nominal Size

Dimensions (Inches)

Valve Body	COP	Inches	DN [mm]	A	B	C	D	F	H1	H2
B219VS	400	¾	20	6.70	2.00	8.00	3.00	6.25	9.75	8.50
B220VS	400	¾	20	6.70	2.00	8.00	3.12	6.25	9.75	8.50
B2050VSS-15	1000	½	15	6.70	2.00	8.00	2.25	6.25	9.75	8.50
B219VSS	1000	¾	20	6.70	2.00	8.00	3.00	6.25	9.75	8.50

Dimensions with 3-Way Valve



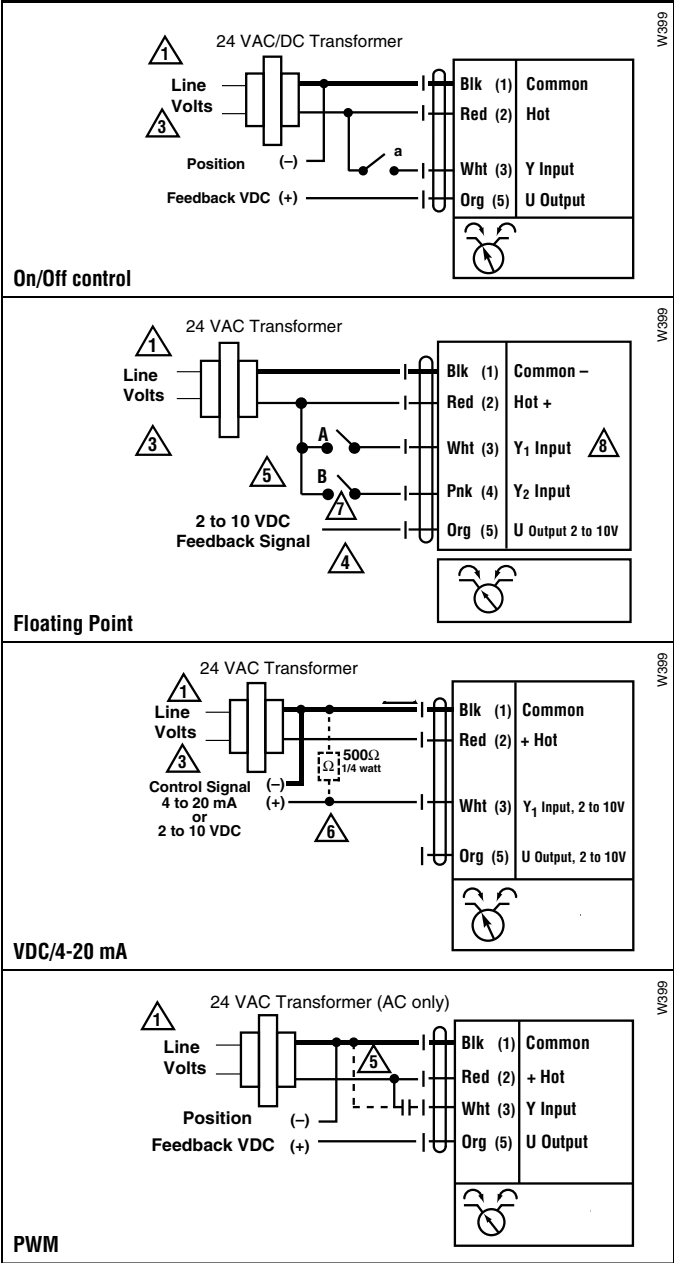
Valve Nominal Size

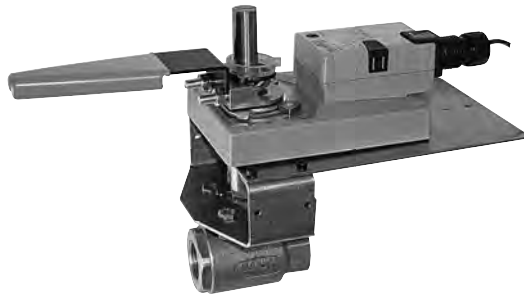
Dimensions (mm)

Valve Body	COP	Inches	DN [mm]	A	B	C
B332L	50	1¼	32	4.13" [105]	2.00" [51]	2.19" [56]

Wiring Diagrams

- 1
- Provide overload protection and disconnect as required.
- 3
- Actuators may also be powered by 24 VDC.
- 4
- Position feedback cannot be used with Triac sink controller. 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.
- 6
- ZG-R01 may be used.
- 7
- Contact closures A & B also can be triacs.
- A & B should both be closed for triac source and open for triac sink.
- 8
- For triac sink the common connection from the actuator must be connected to the hot connection of the controller.



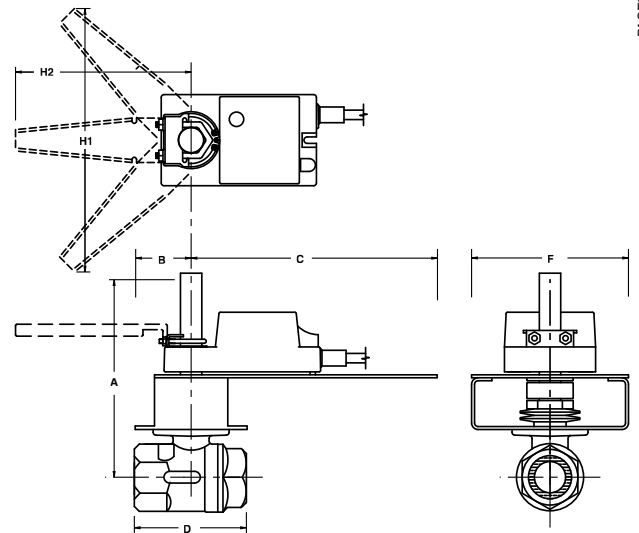


Models

AMB24-3-X1
AMX24-3-X1
ARX24-3

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
Overload protection	electronic throughout 0° to 95° rotation
Input impedance	600 Ω
Angle of rotation	max 95°, adjustable with mechanical stop
Torque	180 in-lbs [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/CSA C22.2 No. 24 certified, CE acc. to 73/23/EEC
Noise level	<45 db(A)
Servicing	maintenance free
Quality standard	ISO 9001

Dimensions with 2-Way Valve



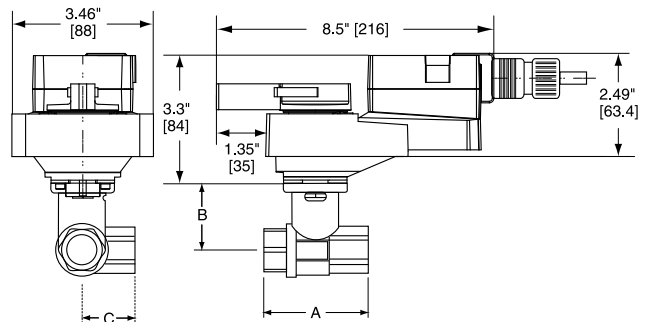
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Valve Nominal Size

Dimensions (Inches)

Valve Body	COP	Inches	DN [mm]	A	B	C	D	F	H1	H2
B224VS	400	1	25	7.00	2.00	8.00	3.37	6.25	9.75	8.50
B225VS	200	1	25	7.00	2.00	8.00	3.62	6.25	9.75	8.50
B232VS	400	1 1/4	32	7.25	2.00	8.00	3.97	6.25	9.75	8.50
B224VSS	1000	1	25	7.00	2.00	8.00	3.37	6.25	9.75	8.50
B232VSS	1000	1 1/4	32	7.25	2.00	8.00	3.97	6.25	9.75	8.50

Dimensions with 3-Way Valve



Valve Nominal Size

Dimensions (mm)

Valve Body	COP	Inches	DN [mm]	A	B	C
B340L	50	1 1/2	40	4.80" [122]	2.44" [62]	2.61" [65]
B350L	50	2	50	5.60" [142]	2.67" [68]	3.11" [79]

Wiring Diagrams

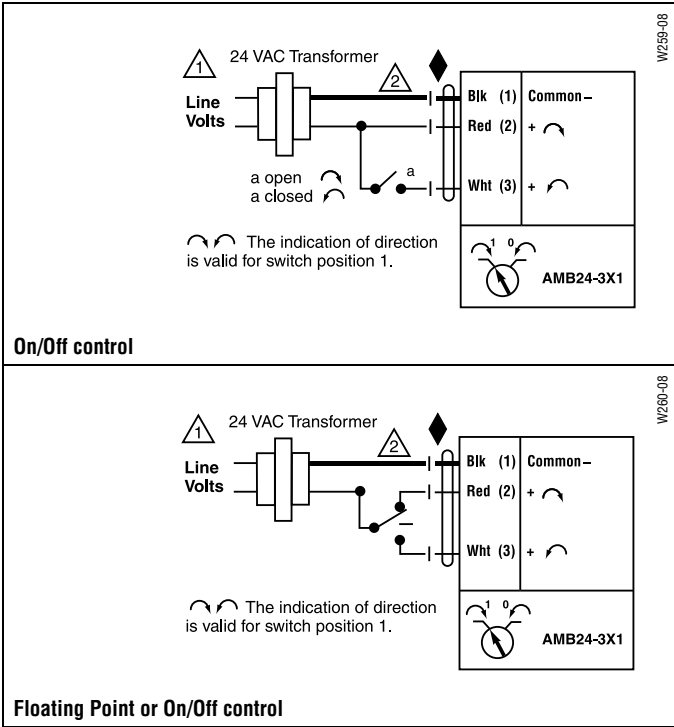
✂️ **INSTALLATION NOTES**

- 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.



Piping

The valve 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. Allow 6" for cover removal and 12" for complete actuator removal. The assembly can be mounted with the actuator 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.

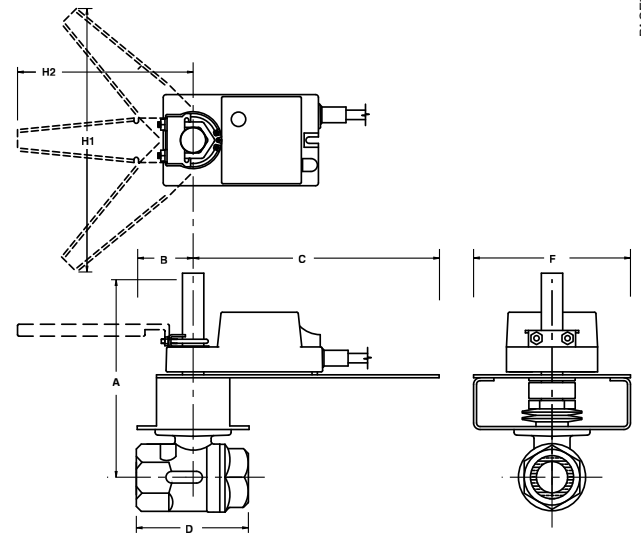


Models

AMX24-MFT-X1
AMX24-MFT95-X1
ARX24-MFT

Technical Data	
Power supply	24 VAC $\pm$ 20% 50/60 Hz 24 VDC $\pm$ 10%
Power consumption	4 W (1.25 W)
Transformer sizing	6 VA (class 2 power source)
Electrical connection	3 ft. [1m], 10 ft. [3m], 16 ft. [5m] 18 GA plenum rated cable ½" conduit connector
Overload protection	electronic throughout 0° to 95° rotation
Input impedance	100 k Ω for 2 to 10 VDC (0.1 mA) 500 Ω for 4 to 20 mA 750 Ω for PWM 1500 Ω for on/off and floating point
Feedback	2 to 10 VDC, 0.5 mA max VDC variable
Angle of rotation	max 95°, adjust. with mechanical stop electronically variable
Torque	180 in-lbs [20 Nm]
Direction of rotation	reversible with switch
Position indication	reflective visual indicator (snap-on)
Manual override	external push button
Running time	150 seconds (default) 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 60730-1/-2-14, CAN/CSA E60730-1, CSA C22.2 No. 24-93, CE acc. to 89/336/EEC
Noise level	<45 db(A)
Servicing	maintenance free
Quality standard	ISO 9001

Dimensions with 2-Way Valve



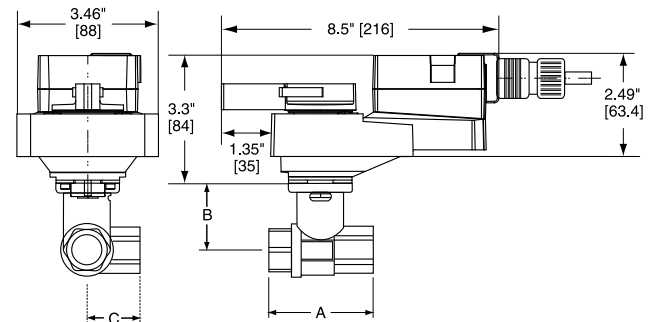
PAGE 7

Valve Nominal Size

Dimensions (Inches)

Valve Body	COP	Inches	DN [mm]	A	B	C	D	F	H1	H2
B224VS	400	1	25	7.00	2.00	8.00	3.37	6.25	9.75	8.50
B225VS	200	1	25	7.00	2.00	8.00	3.62	6.25	9.75	8.50
B232VS	400	1¼	32	7.25	2.00	8.00	3.97	6.25	9.75	8.50
B224VSS	1000	1	25	7.00	2.00	8.00	3.37	6.25	9.75	8.50
B232VSS	1000	1¼	32	7.25	2.00	8.00	3.97	6.25	9.75	8.50

Dimensions with 3-Way Valve



Valve Nominal Size

Dimensions (mm)

Valve Body	COP	Inches	DN [mm]	A	B	C
B340L	50	1½	40	4.80" [122]	2.44" [62]	2.61" [65]
B350L	50	2	50	5.60" [142]	2.67" [68]	3.11" [79]

Wiring Diagrams

- 1

Provide overload protection and disconnect as required.
- 3

Actuators may also be powered by 24 VDC.
- 4

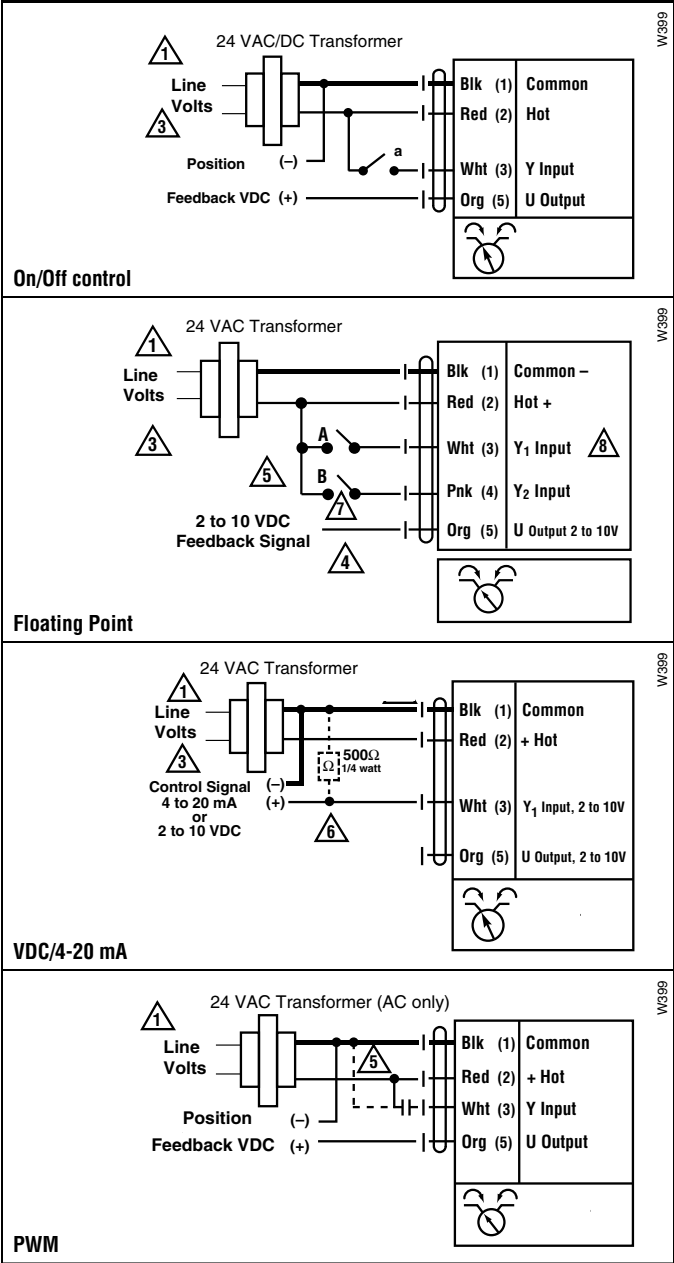
Position feedback cannot be used with Triac sink controller. The actuator internal common reference is not compatible.
- 5

Control signal may be pulsed from either the Hot (source) or the Common (sink) 24 VAC line.
- 6

ZG-R01 may be used.
- 7

Contact closures A & B also can be triacs.
- 8

A& B should both be closed for triac source and open for triac sink. For triac sink the common connection from the actuator must be connected to the hot connection of the controller.





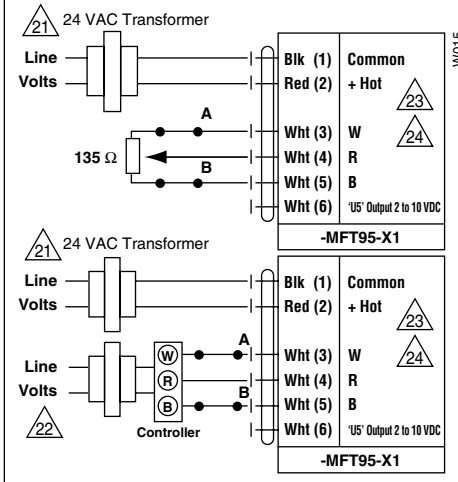
INSTALLATION NOTES

- 21 Provide overload protection and disconnect as required.
- 22 Actuators and controller must have separate transformers.
- 23 Consult controller instruction data for more detailed information.
- 24 Resistor value depends on the type of controller and the number of actuators. No resistor is used for one actuator. Honeywell® resistor kits may also be used.
- 25 To reverse control rotation, use the reversing switch.

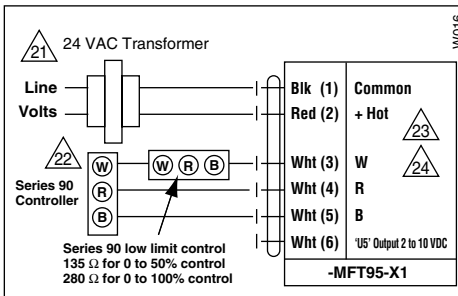
Override

Switch A	Switch B	Damper Position
		Damper Open
		Damper Closed

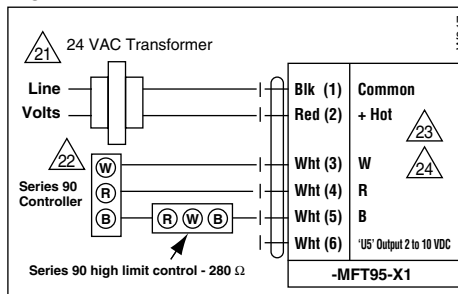
The direction of rotation switch is set so that the fail safe position and the position of the damper is closed with no signal at wire R.



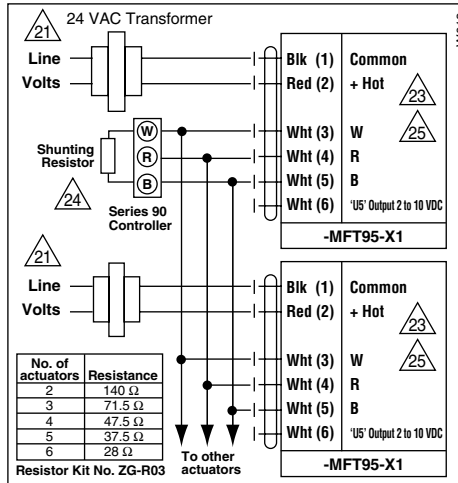
Low Limit Control



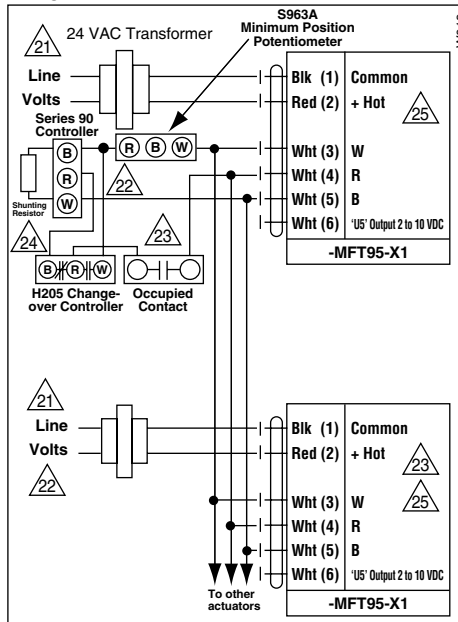
High Limit Control



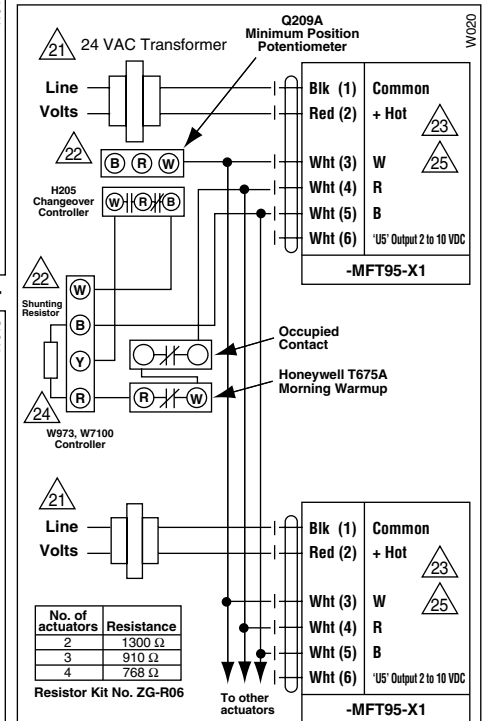
Wiring Multiple Actuators to a Series 90 Controller



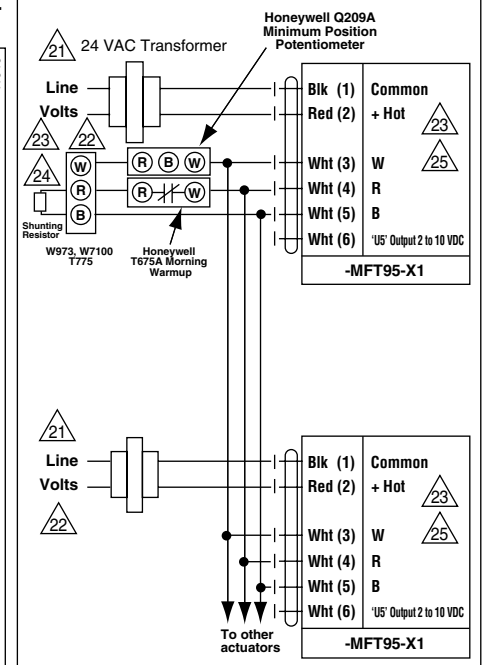
Wiring Multiple Actuators to a Series 90 Controller using a Minimum Position Potentiometer



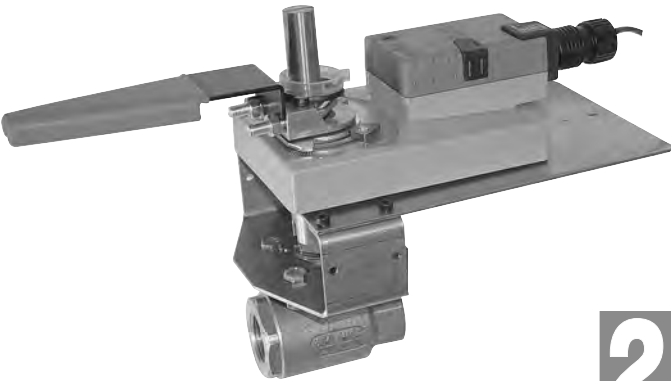
Typical wiring diagrams for multiple actuators used with the W973, W7100 and T775 controllers



Used with the W973 and W7100 controllers



GMB24-3-X1 Actuators, On/Off, Floating Point



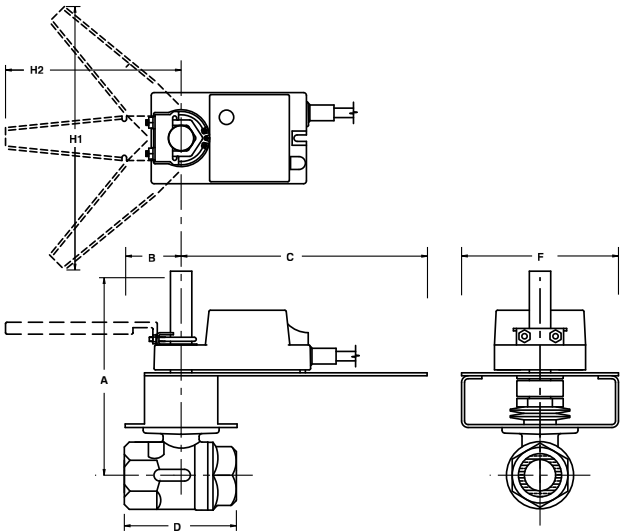
Models

GMB24-3-X1
2*GMB24-3-X1

Technical Data	
Control	on/off, floating point
Power supply	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Power consumption	running 4 W holding 2 W
Transformer sizing	6 VA (class 2 power source)
Electrical connection	3 ft. [1m] 18 GA plenum rated cable ½" conduit connector
Overload protection	electronic throughout stroke
Angle of rotation	95°
Direction of rotation	reversible with switch
Position indication	reflective visual indicator (snap-on)
Running time	150 seconds, constant independent of load
Humidity	5 to 95% RH non-condensing
Ambient temperature	-22°F to +122°F [-30°C to +50°C]
Housing	NEMA 2/IP54 with cable entry down
Housing material	UL94-5V (flammability rating)
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 2-Way Valve

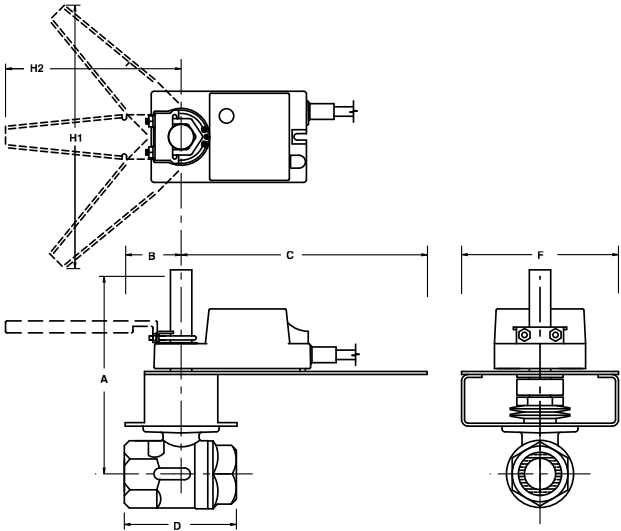
PAGE7



Valve Nominal Size				Dimensions (Inches)						
Valve Body	COP	Inches	DN [mm]	A	B	C	D	F	H1	H2
B239VS	400	1½	40	7.50	3.00	8.00	4.37	6.25	9.75	8.50
B249VS	200	2	50	7.50	3.00	8.00	4.68	6.25	9.75	8.50
B239VSS	1000	1½	40	7.50	3.00	8.00	4.37	6.25	9.75	8.50
B249VSS	400	2	50	7.50	3.00	8.00	4.68	6.25	9.75	8.50

Dimensions with 2*GM... and 2-Way Valve

PAGE7



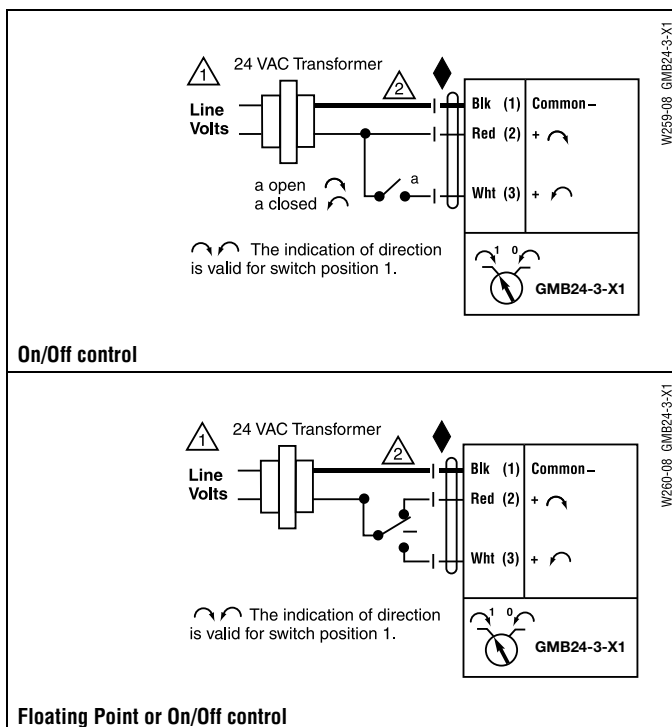
Valve Nominal Size				Dimensions (Inches)						
Valve Body	COP	Inches	DN [mm]	A	B	C	D	F	H1*	H2*
B240VS	400	1½	40	7.50	3.00	8.00	4.75	6.25	9.75	8.50
B250VS	200	2	50	15.00	3.00	8.00	5.37	6.25	9.75	8.50
B265VS	100	2½	65	15.00	3.00	8.00	6.25	6.25	9.75	8.50
B280VS	50	3	80	15.00	3.00	8.00	6.75	6.25	9.75	8.50
B249VSS	1000	2	50	7.50	3.00	8.00	4.68	6.25	9.75	8.50
B265VSS	200	2½	65	15.00	3.00	8.00	6.25	6.25	9.75	8.50

*Handles not available on spring return series or dual mounted actuators

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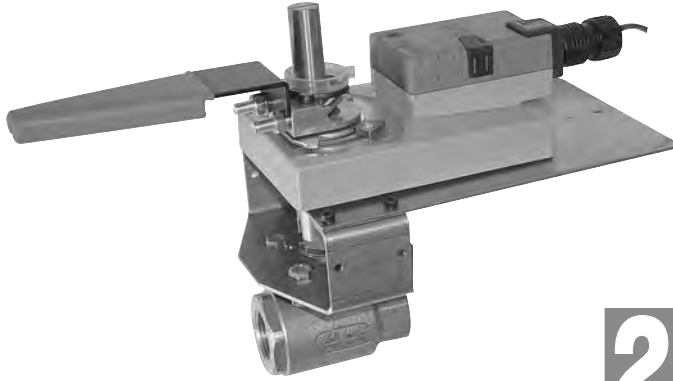
Wiring Diagrams

- 1 Provide overload protection and disconnect as required.
- 2 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. 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.
- 7 Contact closures A & B also can be triacs.
- 8 For triac sink the common connection from the actuator must be connected to the hot connection of the controller.



Piping

The valve 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. Allow 6" for cover removal and 12" for complete actuator removal. The assembly can be mounted with the actuator 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.

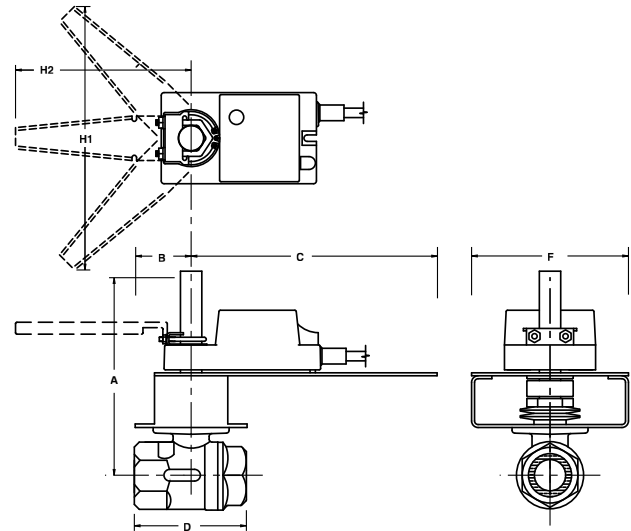


Models

GMX24-MFT-X1
 *2xGMX24-MFT-X1
 GMX24-MFT95-X1

Technical Data	
Control	on/off, floating point, 2 to 10 VDC
Power supply	24 VAC $\pm$ 20% 50/60 Hz 24 VDC $\pm$ 10%
Power consumption	running 4.5 W holding 3 W
Transformer sizing	7 VA (class 2 power source)
Electrical connection	3 ft. [1m] 18 GA plenum rated cable 1/2" conduit connector
Overload protection	electronic throughout stroke
Input impedance	100 k Ω for 2 to 10 VDC (0.1 mA) 500 Ω for 4 to 20 mA 750 Ω for PWM 1500 Ω for on/off and floating point
Feedback	2 to 10 VDC, 0.5 mA max VDC variable
Angle of rotation	95°
Direction of rotation	reversible with switch
Position indication	reflective visual indicator (snap-on)
Running time	150 seconds, constant independent of load
Humidity	5 to 95% RH non-condensing
Ambient temperature	-22°F to +122°F [-30°C to +50°C]
Housing	NEMA 2/IP54 with cable entry down
Housing material	UL94-5V (flammability rating)
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 2-Way Valve



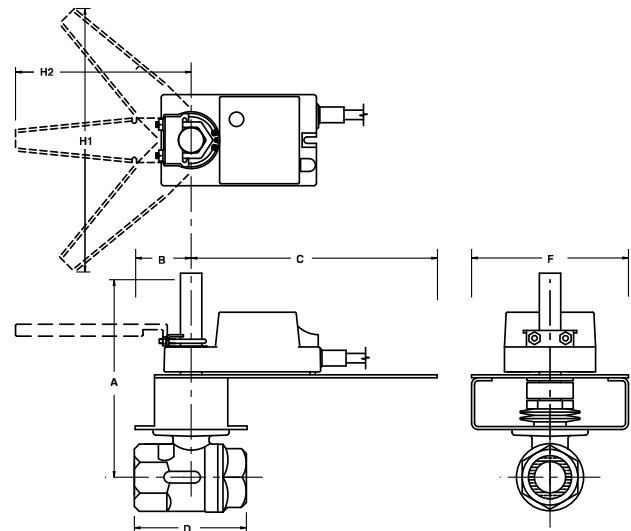
PAGE 7

Valve Nominal Size

Dimensions (Inches)

Valve Body	COP	Inches	DN [mm]	A	B	C	D	F	H1	H2
B239VS	400	1½	40	7.50	3.00	8.00	4.37	6.25	9.75	8.50
B249VS	200	2	50	7.50	3.00	8.00	4.68	6.25	9.75	8.50
B239VSS	1000	1½	40	7.50	3.00	8.00	4.37	6.25	9.75	8.50
B249VSS	400	2	50	7.50	3.00	8.00	4.68	6.25	9.75	8.50

Dimensions with 2xGM... and 2-Way Valve



PAGE 7

Valve Nominal Size

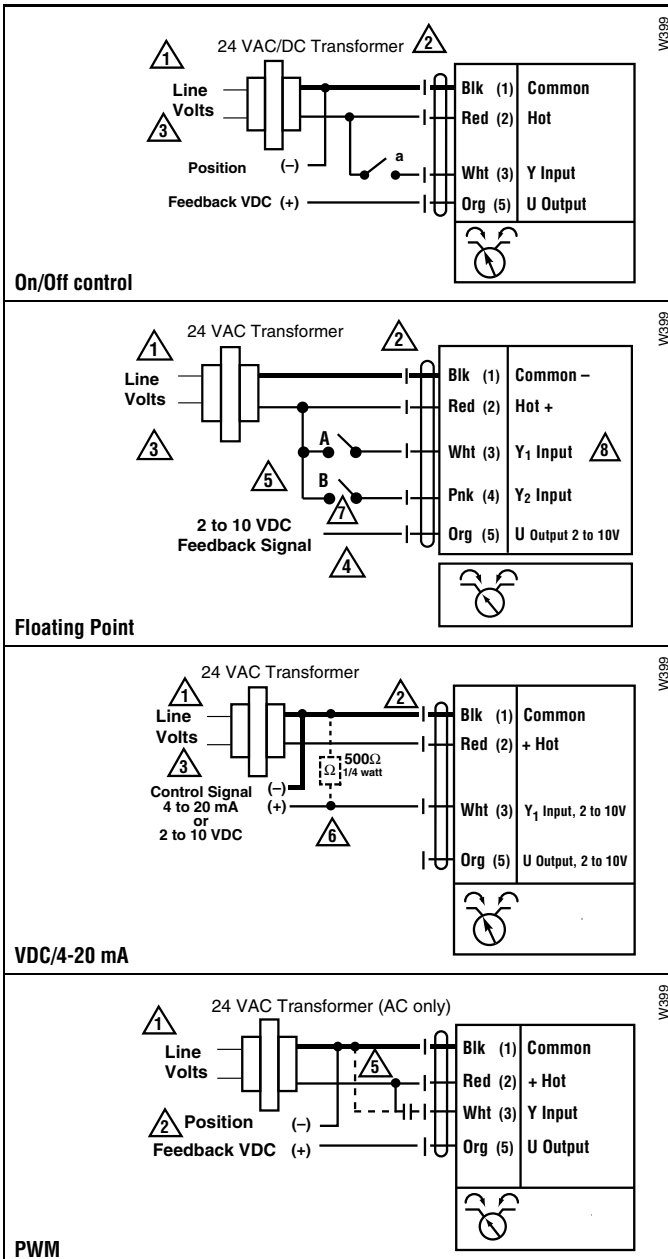
Dimensions (Inches)

Valve Body	COP	Inches	DN [mm]	A	B	C	D	F	H1*	H2*
B240VS	400	1½	40	7.50	3.00	8.00	4.75	6.25	9.75	8.50
B250VS	200	2	50	15.00	3.00	8.00	5.37	6.25	9.75	8.50
B265VS	100	2½	65	15.00	3.00	8.00	6.25	6.25	9.75	8.50
B280VS	50	3	80	15.00	3.00	8.00	6.75	6.25	9.75	8.50
B265VSS	200	2½	65	15.00	3.00	8.00	6.25	6.25	9.75	8.50
B280VSS	100	3	80	15.00	3.00	8.00	6.75	6.25	9.75	8.50

*Handles not available on spring return series or dual mounted actuators

Wiring Diagrams

- 1 Provide overload protection and disconnect as required.
- 2 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. 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.
- 6 ZG-R01 may be used.
- 7 Contact closures A & B also can be triacs.
- 8 For triac sink the common connection from the actuator must be connected to the hot connection of the controller.



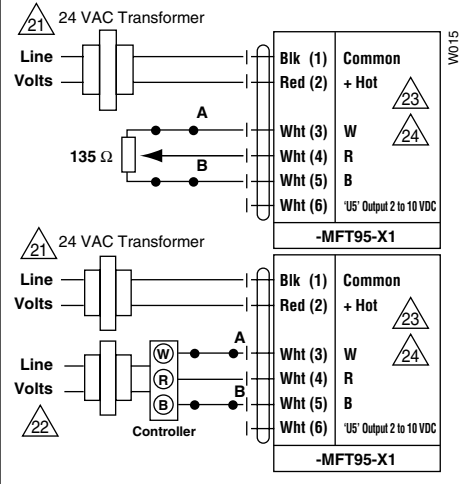
INSTALLATION NOTES

- 21 Provide overload protection and disconnect as required.
- 22 Actuators and controller must have separate transformers.
- 23 Consult controller instruction data for more detailed information.
- 24 Resistor value depends on the type of controller and the number of actuators. No resistor is used for one actuator. Honeywell® resistor kits may also be used.
- 25 To reverse control rotation, use the reversing switch.

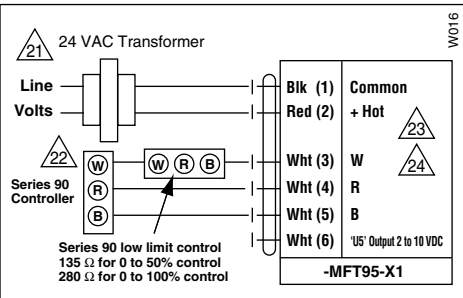
Override

Switch A	Switch B	Damper Position
		Damper Open
		Damper Closed

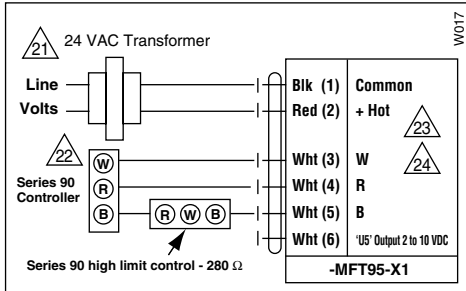
The direction of rotation switch is set so that the fail safe position and the position of the damper is closed with no signal at wire R.



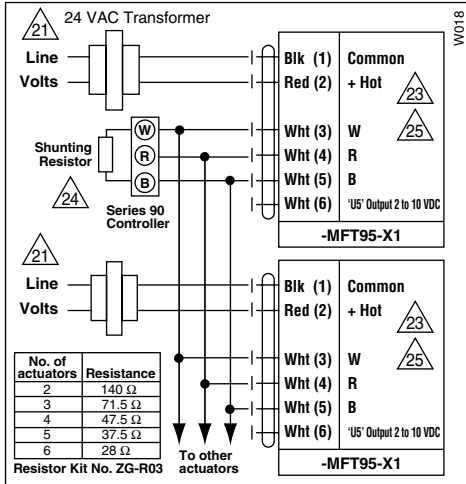
Low Limit Control



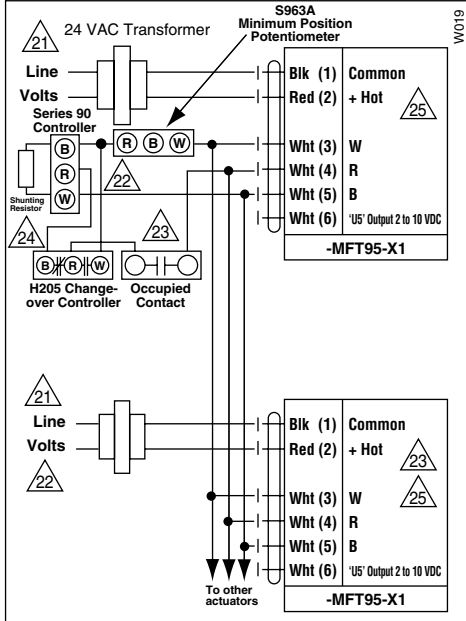
High Limit Control



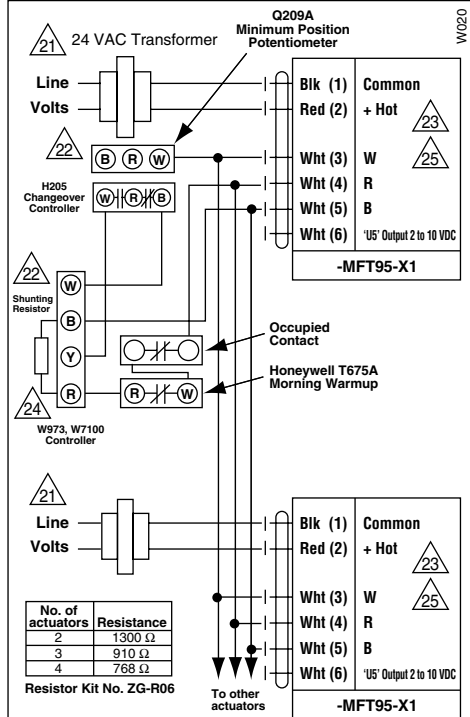
Wiring Multiple Actuators to a Series 90 Controller



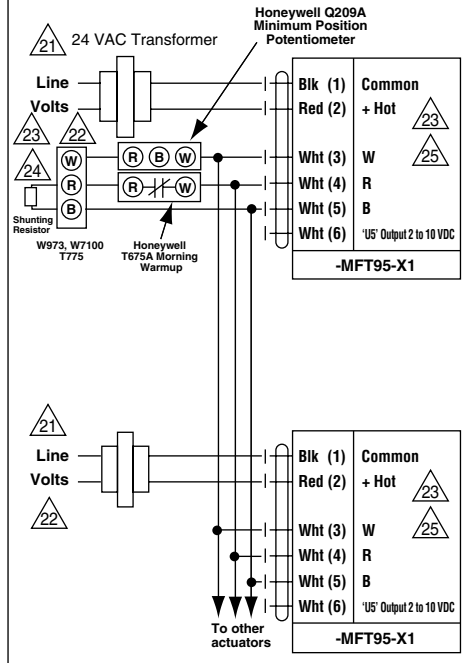
Wiring Multiple Actuators to a Series 90 Controller using a Minimum Position Potentiometer



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



Used with the W973 and W7100 controllers





Models

SY1-24(P)
SY2-24MFT
SY3-24MFT
SY4-24MFT
SY5-24MFT

Technical Data	
Power supply	24 VAC 50/60Hz, single phase
Electrical connection	½" conduit connector, screw terminals
Overload protection	thermally protected 135°C cut-out
Motor protection	SY1 H class insulation SY2... - SY5... F class insulation
Geartrain	high alloy steel gear sets, self locking
Operating range	SY...-24 on/off SY...-24MFT 2-10 VDC, 4-20mA, 1-5 VDC
Sensitivity	SY...-24MFT 0.2mA / 100mV
Feedback	SY...-24MFT 2-10 VDC, 4-20mA
Angle of rotation	mechanically limited to 95°
Direction of rotation	reversible
Position indication	top mounted domed indicator
Internal humidity control	resistive heating element
Auxiliary switches	(2) SPDT, 10A 250VAC factory set for 3° and 87° change of state
Ambient temperature	-22°F to +150°F [-30°C to +65°C]
Humidity range	up to 95%
Housing type	IP67, NEMA 4X
Housing material	die cast aluminum alloy
Agency listings	ISO, CE, cCSAus

Attention

SY Series actuators are fractional horsepower devices, and utilize **full-wave power supplies**. Observe wire sizing and transformer sizing requirements. Proportional models CANNOT be connected to Belimo direct coupled (AF, AM, GM...etc) actuator power supplies or any type of half-wave device. You **MUST** use a separate, dedicated transformer or power supply to power the SY actuator. Please do not connect other automation equipment to the dedicated SY supply source. You **MUST** use four wires (plus a ground) to control a proportional control SY actuator (**See SY Wiring Section**).

Technical Data - continued

Power Consumption	
SY1-24(P)	1.8A
SY2-24MFT	3.0A
SY3-24MFT	3.0A
SY4-24MFT	6.0A
SY5-24MFT	6.5A
Torque	
SY1-24(P)	35 Nm / 310 in-lbs
SY2-24MFT	90 Nm / 801 in-lbs
SY3-24MFT	150 Nm / 1335 in-lbs
SY4-24MFT	400 Nm / 3560 in-lbs
SY5-24MFT	500 Nm / 4450 in-lbs
Manual Override	
SY1-24(P)	8mm wrench
SY2-24 - SY5-24	hand wheel
Running Time	
SY1-24(P)	15 seconds
SY2-24MFT	15 seconds
SY3-24MFT	22 seconds
SY4-24MFT	16 seconds
SY5-24MFT	22 seconds



2

3

4



⚠ 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.



2

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Models

SY1-110(P)
SY2-120MFT
SY3-120MFT
SY4-120MFT
SY5-120MFT
SY6-120MFT
SY7-120MFT
SY8-120MFT

Technical Data	
Power supply	120 VAC 50/60Hz, single phase
Electrical connection	½" conduit connector, screw terminals
Overload protection	thermally protected 135°C cut-out
Motor protection	SY1 H class insulation SY2... - SY8... F class insulation
Geartrain	high alloy steel gear sets, self locking
Operating range	SY...-110 on/off, floating point SY...-120MFT 2-10 VDC 4-20mA, 1-5 VDC
Sensitivity	SY...-120MFT 0.2mA / 100mV
Feedback	SY...120MFT 2-10 VDC, 4-20mA
Angle of rotation	mechanically limited to 95°
Direction of rotation	reversible
Position indication	top mounted domed indicator
Internal humidity control	resistive heating element
Auxiliary switches	(2) SPDT, 5A 250 VAC factory set for 5° and 85° change of state
Ambient temperature	-22°F to +150°F [-30°C to +65°C]
Humidity range	up to 95%
Housing type	IP67, NEMA 4X
Housing material	die cast aluminum alloy
Agency listings	ISO, CE, cCSAus

Application:

The SY actuators are NEMA 4X rated and designed to meet the needs of HVAC and Commercial applications. Offered on the HSU and HS butterfly valve series, these actuators are available for on/off and modulating applications. Depending on the application, they are available in 24 VAC, 120 VAC and 230 VAC.

Technical Data - <i>continued</i>		
Power Consumption		
SY1-110(P)	0.5A	
SY2-120MFT	1.0A	
SY3-120MFT	1.0A	
SY4-120MFT	1.3A	
SY5-120MFT	1.5A	
SY6-120MFT	1.8A	
SY7-120MFT	3.2A	
SY8-120MFT	4.0A	
Torque		
SY1-110(P)	35 Nm / 310 in-lbs	
SY2-120MFT	90 Nm / 801 in-lbs	
SY3-120MFT	150 Nm / 1335 in-lbs	
SY4-120MFT	400 Nm / 3560 in-lbs	
SY5-120MFT	500 Nm / 4450 in-lbs	
SY6-120MFT	650 Nm / 5785 in-lbs	
SY7-120MFT	1000 Nm / 8900 in-lbs	
SY8-120MFT	1500 Nm / 13350 in-lbs	
Manual Override		
SY1-110(P)	8mm wrench	
SY2-120MFT – SY8-120MFT	hand wheel	
Running Time	50hz	60hz
SY1-110(P)	13 seconds	12 seconds
SY2-120MFT	17 seconds	15 seconds
SY3-120MFT	26 seconds	22 seconds
SY4-120MFT	18 seconds	16 seconds
SY5-120MFT	25 seconds	22 seconds
SY6-120MFT	31 seconds	28 seconds
SY7-120MFT	55 seconds	46 seconds
SY8-120MFT	55 seconds	46 seconds

Wiring Diagrams

Hazard Identification

Warnings and Cautions appear at appropriate sections throughout this manual. Read these carefully.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

Indicates an action or condition that may cause irreversible damage to the actuator(s) or associated equipment.

Equipment damage!
Power consumption and input impedance must be observed.



INSTALLATION NOTES

Observe class 1 and class 2 wiring restrictions.



APPLICATION NOTES



Recommended twisted shielded pair for control wiring. Ground shielded wire at control panel chassis. Tape back ground at actuator.



Use of feedback is optional.



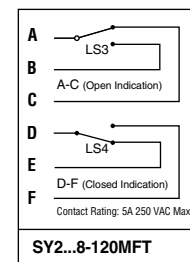
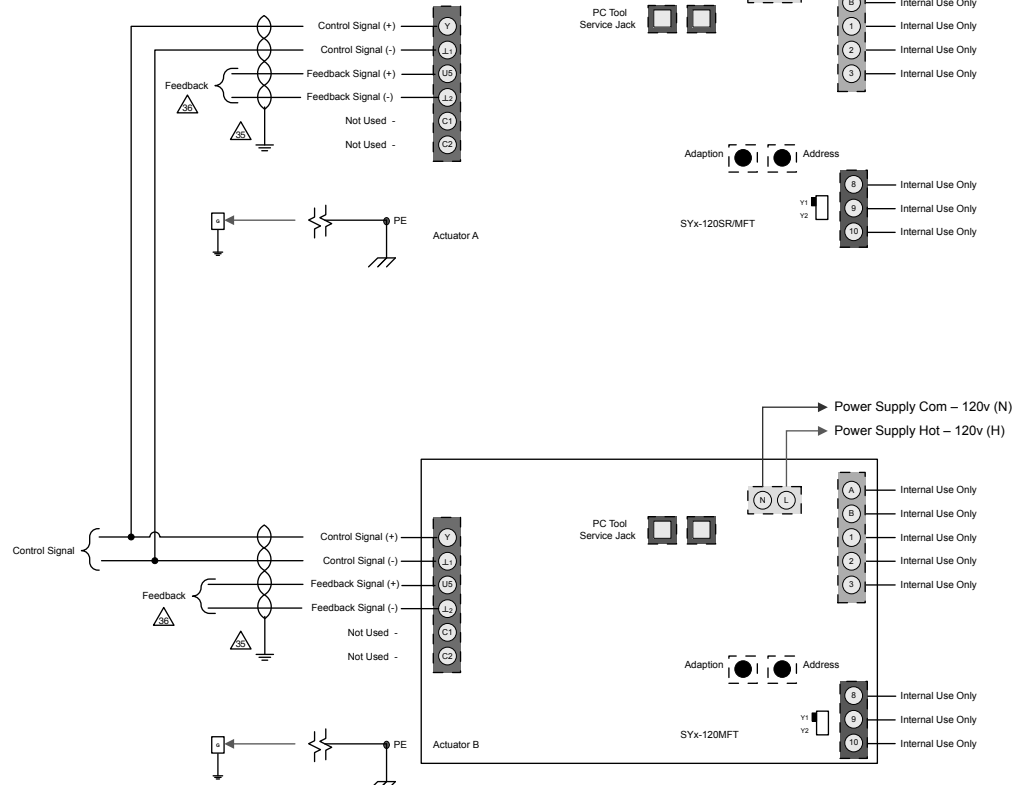
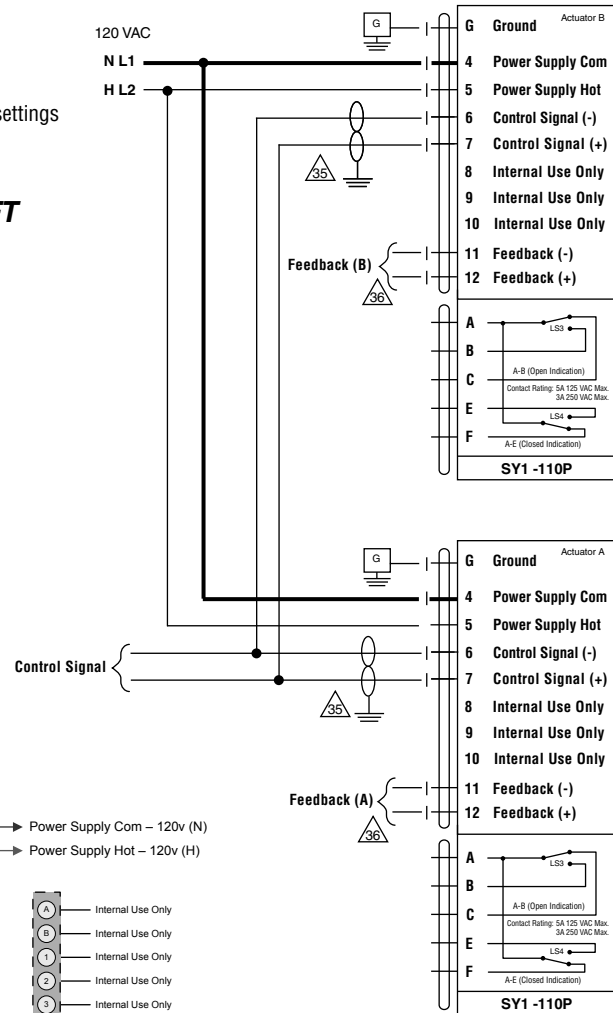
NOTES SY1-110P

- **Caution:** Power supply voltage.
- Do not change sensitivity or dip switch settings with power applied.



NOTES SY2...8-120MFT

- **Caution:** Power supply voltage.





Models

SY1-220(P)
SY2-230MFT
SY3-230MFT
SY4-230MFT
SY5-230MFT
SY6-230MFT

Technical Data	
Power supply	230 VAC 50/60Hz, single phase
Electrical connection	½" conduit connector, screw terminals
Overload protection	thermally protected 135°C cut-out
Motor protection	SY1 H class insulation SY2... - SY6... F class insulation
Geartrain	high alloy steel gear sets, self locking
Operating range	SY...-220 on/off, floating point SY...-230MFT 2-10 VDC, 4-20mA, 1-5 VDC
Sensitivity	SY...-230MFT 0.2mA / 200mV
Feedback	SY...-230MFT 2-10 VDC, 4-20mA
Angle of rotation	mechanically limited to 95°
Direction of rotation	reversible
Position indication	top mounted domed indicator
Internal humidity control	resistive heating element
Auxiliary switches	(2) SPDT, 5A 250VAC factory set for 5° and 85° change of state
Ambient temperature	-22°F to +150°F [-30°C to +65°C]
Humidity range	up to 95%
Housing type	IP67, NEMA 4X
Housing material	die cast aluminum alloy
Agency listings	ISO, CE, cCSAus

Attention

SY Series actuators are fractional horsepower devices, and utilize **full-wave power supplies**. Observe wire sizing and transformer sizing requirements. Proportional models CANNOT be connected to Belimo direct coupled (AF, AM, GM...etc) actuator power supplies or any type of half-wave device. You **MUST** use a separate, dedicated transformer or power supply to power the SY actuator. Please do not connect other automation equipment to the dedicated SY supply source. You **MUST** use four wires (plus a ground) to control a proportional control SY actuator (**See SY Wiring Section**).

Technical Data - Continued		
Power consumption		
SY1-220(P)	0.3A	
SY2-230MFT	0.5A	
SY3-230MFT	0.5A	
SY4-230MFT	0.6A	
SY5-230MFT	0.7A	
SY6-230MFT	0.8A	
Torque		
SY1-220(P)	35 Nm / 310 in-lbs	
SY2-230MFT	90 Nm / 801 in-lbs	
SY3-230MFT	150 Nm / 1335 in-lbs	
SY4-230MFT	400 Nm / 3560 in-lbs	
SY5-230MFT	500 Nm / 4450 in-lbs	
SY6-230MFT	650 Nm / 5785 in-lbs	
Manual Override		
SY1-220(P)	8mm wrench	
SY2-230MFT – SY6-230MFT	hand wheel	
Running Time	50hz	60hz
SY1-220(P)	13 seconds	12 seconds
SY2-230MFT	17 seconds	15 seconds
SY3-230MFT	26 seconds	22 seconds
SY4-230MFT	18 seconds	16 seconds
SY5-230MFT	25 seconds	22 seconds
SY6-230MFT	31 seconds	28 seconds

Wiring Diagrams

Hazard Identification

Warnings and Cautions appear at appropriate sections throughout this manual. Read these carefully.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

Indicates an action or condition that may cause irreversible damage to the actuator(s) or associated equipment.

Equipment damage!
Power consumption and input impedance must be observed.



INSTALLATION NOTES

Observe class 1 and class 2 wiring restrictions.



APPLICATION NOTES



Recommended twisted shielded pair for control wiring. Ground shielded wire at control panel chassis. Tape back ground at actuator.



Use of feedback is optional.



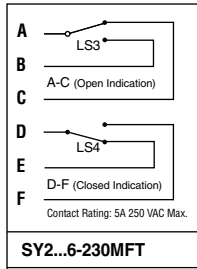
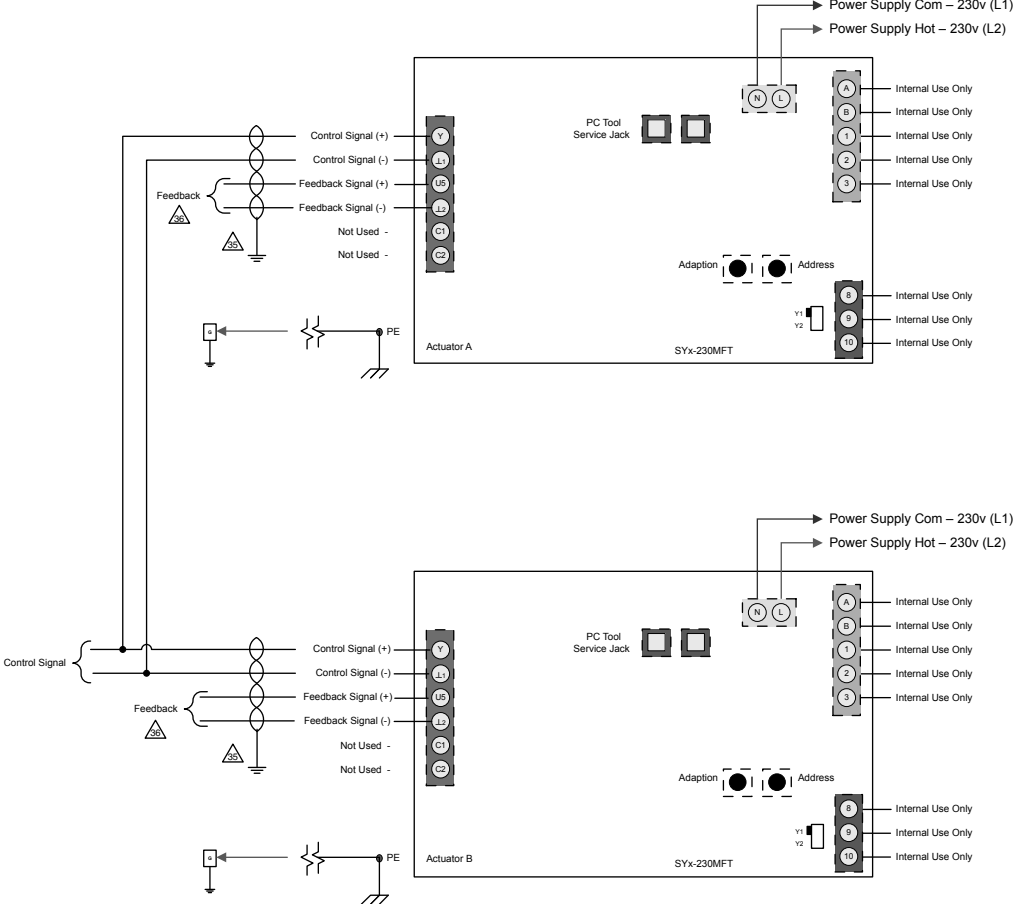
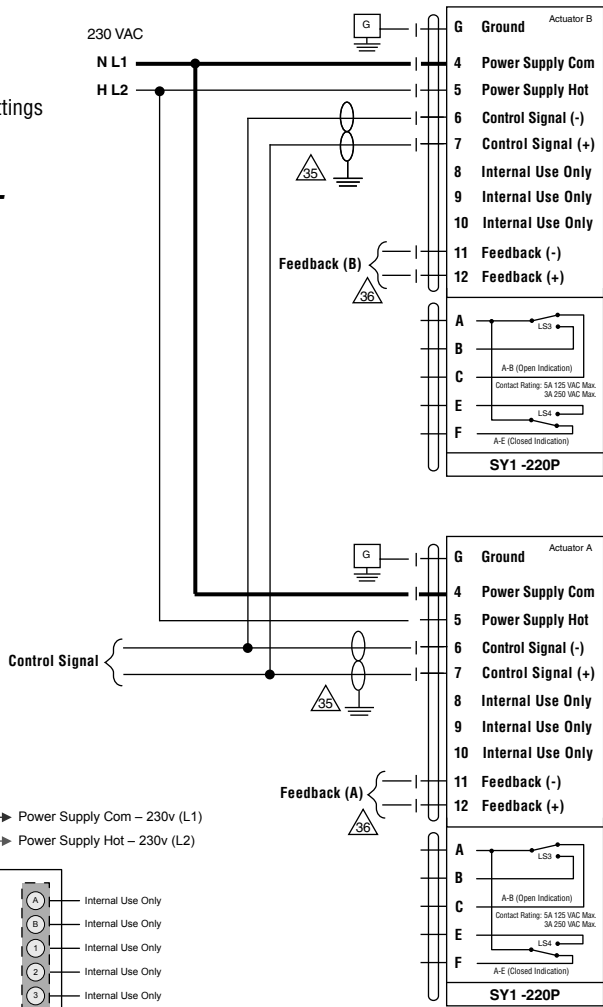
NOTES SY1-220P

- **Caution:** Power supply voltage.
- Do not change sensitivity or dip switch settings with power applied.

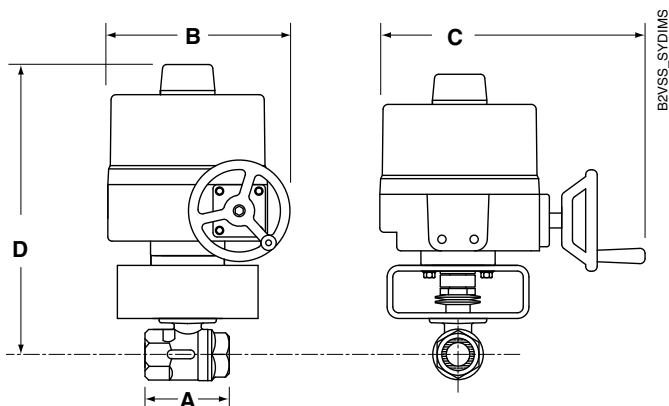


NOTES SY2...6-230MFT

- **Caution:** Power supply voltage.



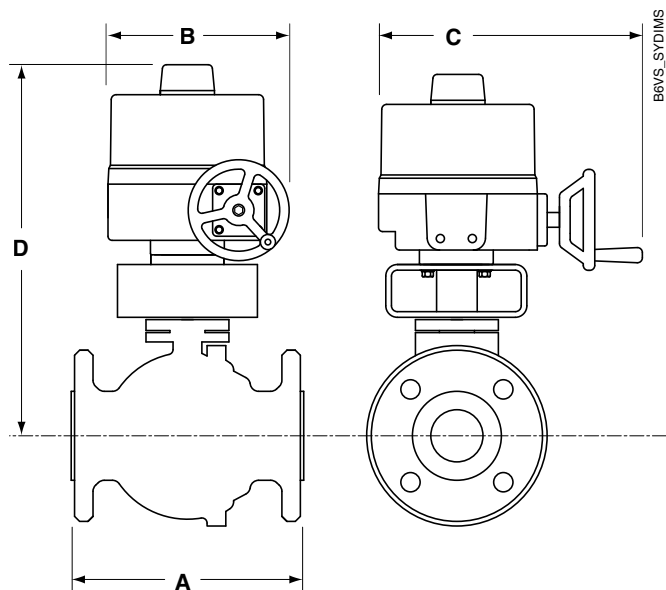
Dimensions with 2-Way Valves



Valve Nominal Size Dimensions (Inches)

	Valve Body	COP	Inches	DN [mm]	A	B	C	D
SY1	B2050VS-01	600	½"	15	2.25	4.00	6.25	8.00
	B2050VS-02	600	½"	15	2.25	4.00	6.25	8.00
	B2050VS-04	600	½"	15	2.25	4.00	6.25	8.00
	B2050VS-15	600	½"	15	2.25	4.00	6.25	8.00
SY1 & SY2	B219VS	600	¾"	20	3.00	4.00	6.25	8.00
	B220VS	600	¾"	20	3.12	4.00	6.25	3.12
	B224VS	600	1"	25	3.37	4.00	6.25	16.00
	B225VS	600	1"	25	3.62	4.00	6.25	9.00
	B232VS	600	1¼"	32	3.97	4.00	6.25	9.50
SY2	B239VS	600	1½"	40	4.37	4.00	6.25	17.50
	B240VS	600	1½"	40	4.75	8.00	13.00	19.00
	B249VS	600	2"	50	4.68	8.00	13.00	19.50
	B250VS	600	2"	50	5.37	8.00	13.00	20.00
	B265VS	600	2½"	65	6.25	8.00	13.00	20.00
SY3	B280VS	600	3"	80	6.75	8.00	13.00	21.00
SY1	B2050VSS-15	1000	½"	15	2.25	8.00	13.00	16.00
SY2	B219VSS	1000	¾"	20	3.00	8.00	13.00	18.00
	B224VSS	1000	1"	25	3.37	8.00	13.00	17.00
SY1 & SY2	B232VSS	1000	1¼"	32	3.97	8.00	13.00	3.97
	B239VSS	1000	1½"	40	4.37	8.00	13.00	18.50
SY2	B249VSS	1000	2"	50	4.68	8.00	13.00	19.50
SY3	B265VSS	1000	2½"	65	6.25	8.00	13.00	20.00
	B280VSS	600	3"	80	6.75	8.00	13.00	21.00

Dimensions with Flanged Valves



Valve Nominal Size Dimensions (Inches)

	Valve Body	COP	Inches	DN [mm]	A	B	C	D
SY2	B650VS	200	2"	50	7.00	8.00	13.00	22.00
	B665VS	200	2½"	65	7.50	8.00	13.00	22.00
SY3	B680VS	200	3"	80	8.00	8.00	13.00	23.00
SY4	B6100VS	200	4"	100	9.00	12.00	15.00	27.00
SY5	B6150VS	200	6"	150	10.50	12.00	15.00	29.00
SY8	B6200VS	200	8"	203	11.50	14.00	21.00	39.00
	B6250VS	200	10"	254	13.00	14.00	21.00	43.00

MFT Standard Configuration



	Configuration (Substitute 'V' for 'P' for NV actuators)	Code	Control		Motion		
			Input Range	Position Feedback	Running Time†	Torque %	Adaptation
Voltage	P-10001	A01	2.0 to 10.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10002	A02	0.0 to 10.0 VDC	0.0 to 10.0 VDC	150	100	Manual
	P-10003	A03	2.0 to 10.0 VDC	0.0 to 5.0 VDC	150	100	Manual
	P-10004	A04	4.0 to 7.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10005	A05	6.0 to 9.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10006	A06	10.5 to 13.5 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10007	A07	0.0 to 5.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10009	A09	5.0 to 10.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10010	A10	5.0 to 10.0 VDC	0.0 to 10.0 VDC	150	100	Manual
	P-10013	A13	0.0 to 10.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10015	A15	2.0 to 5.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10016	A16	2.0 to 6.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10017	A17	6.0 to 10.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10018	A18	14.0 to 17.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10020	A20	9.0 to 12.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10028	A28	0.0 to 10.0 VDC	0.0 to 10.0 VDC	100	100	Manual
	P-10031	A31	0.0 to 4.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10063	A63	0.5 to 4.5 VDC	0.5 to 4.5 VDC	150	100	Manual
	P-10064	A64	5.5 to 10.0 VDC	5.5 to 10.0 VDC	150	100	Manual
PWM	P-20001	W01	0.59 to 2.93 seconds	2.0 to 10.0 VDC	150	100	Manual
	P-20002	W02	0.02 to 5.00 seconds	2.0 to 10.0 VDC	150	100	Manual
	P-20003	W03	0.10 to 25.50 seconds	2.0 to 10.0 VDC	150	100	Manual
	P-20004	W04	0.10 to 25.60 seconds	2.0 to 10.0 VDC	150	100	Manual
	P-20005	W05	0.10 to 5.20 seconds	0.0 to 5.0 VDC	150	100	Manual
Floating Point	P-30001	F01	Floating Point	2.0 to 10.0 VDC	150	100	Manual
	P-30002	F02	Floating Point	0.0 to 10.0 VDC	150	100	Manual
	P-30003	F03	Floating Point	2.0 to 10.0 VDC	100	100	Manual
	P-30004	F04	Floating Point	0.0 to 5.0 VDC	100	100	Manual
	P-30005	F05	Floating Point	0.0 to 10.0 VDC	100	100	Manual
	P-30006	F06	Floating Point	0.0 to 5.0 VDC	150	100	Manual
On/Off	P-40001	J01	On/Off	2.0 to 10.0 VDC	75	100	Manual
	P-40002	J02	On/Off	2.0 to 10.0 VDC	150	100	Manual
	P-40003	J03	On/Off	2.0 to 10.0 VDC	75	100	Manual
	P-40004	J04	On/Off	0.0 to 5.0 VDC	100	100	Manual
	P-40005	J05	On/Off	0.0 to 10.0 VDC	100	100	Manual

*P-10001 is the default configuration.

Example: AF24-MFT US is the basic model. Add the P... pre-set MFT configuration number and list price to the actuator when ordering, as needed.

Note: V-codes used for NV...Series actuator. All other MFT actuators use P-codes.

Note: Most popular configurations available at no additional cost.

Note: If the configuration needed is not listed, please fill in pg 54 or call Customer Service.

Note: For Non-Spring Return Actuators the 3-digit code can be used in place of the P... pre-set MFT configuration number.

SY MULTI-FUNCTION TECHNOLOGY						
Description	Code	Control Input	Built-in Feedback	Loss of Signal	Running Time	
MFT	ACE	2-10 VDC	2-10 VDC	stop	actuator(s) constant	
MFT	ACF	0.5-10 VDC	0.5-10 VDC	stop	actuator(s) constant	
MFT	ACH	4-20 mA	2-10 VDC	stop	actuator(s) constant	
MFT	ACJ	2-10 VDC	2-10 VDC	open	actuator(s) constant	
MFT	ACK	0.5-10 VDC	0.5-10 VDC	open	actuator(s) constant	
MFT	ACM	4-20 mA	2-10 VDC	open	actuator(s) constant	
MFT	ACN	2-10 VDC	2-10 VDC	close	actuator(s) constant	
MFT	ACP	0.5-10 VDC	0.5-10 VDC	close	actuator(s) constant	
MFT	ACS	4-20 mA	2-10 VDC	close	actuator(s) constant	

PRODUCTS

MODEL	Base Actuator Codes	Torque	Control Input	Feedback	Running Time	Angle of Rotation/Stroke	Power Supply	VA Rating	Weight (lbs)
LMX24-3-X1	LX000	45 in-lbs [5 Nm]	On/Off, Floating Point	—	95 (Default)	95 deg	24 VAC/DC	2	1.10
LMX24-MFT-X1	LX100	45 in-lbs [5 Nm]	2-10 VDC (Default)	2-10 VDC	150 (Default)	95 deg	24 VAC/DC	5	1.50
NMX24-3-X1	NX000	90 in-lbs [10 Nm]	On/Off, Floating Point	—	95 (Default)	95 deg	24 VAC/DC	4	1.70
NMX24-MFT-X1	NX100	90 in-lbs [10 Nm]	2-10 VDC (Default)	2-10 VDC	150 (Default)	95 deg	24 VAC/DC	6	2.10
AMX24-3-X1	AX000	180 in-lbs [20 Nm]	On/Off, Floating Point	—	95 (Default)	95 deg	24 VAC/DC	5.5	2.20
AMX24-MFT-X1	AX100	180 in-lbs [20 Nm]	2-10 VDC (Default)	2-10 VDC	150 (Default)	95 deg	24 VAC/DC	6	2.60
GMX24-3-X1	GX000	360 in-lbs [40 Nm]	On/Off, Floating Point	—	95 (Default)	95 deg	24 VAC/DC	6	3.40
GMX24-MFT-X1	GX100	360 in-lbs [40 Nm]	2-10 VDC (Default)	2-10 VDC	150 (Default)	95 deg	24 VAC/DC	7	3.40

	Configuration (Substitute 'V' for 'P' for NV(F) actuators)	Code	Control		Motion		
			Input Range	Position Feedback	Running Time†	Torque %	Adaptation
Voltage	P-10001	A01	2.0 to 10.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10002	A02	0.0 to 10.0 VDC	0.0 to 10.0 VDC	150	100	Manual
	P-10003	A03	2.0 to 10.0 VDC	0.0 to 5.0 VDC	150	100	Manual
	P-10004	A04	4.0 to 7.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10005	A05	6.0 to 9.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10006	A06	10.5 to 13.5 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10007	A07	0.0 to 5.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10009	A09	5.0 to 10.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10010	A10	5.0 to 10.0 VDC	0.0 to 10.0 VDC	150	100	Manual
	P-10013	A13	0.0 to 10.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10015	A15	2.0 to 5.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10016	A16	2.0 to 6.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10017	A17	6.0 to 10.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10018	A18	14.0 to 17.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10020	A20	9.0 to 12.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10028	A28	0.0 to 10.0 VDC	0.0 to 10.0 VDC	100	100	Manual
	P-10031	A31	0.0 to 4.0 VDC	2.0 to 10.0 VDC	150	100	Manual
	P-10063	A63	0.5 to 4.5 VDC	0.5 to 4.5 VDC	150	100	Manual
	P-10064	A64	5.5 to 10.0 VDC	5.5 to 10.0 VDC	150	100	Manual
PWM	P-20001	W01	0.59 to 2.93 seconds	2.0 to 10.0 VDC	150	100	Manual
	P-20002	W02	0.02 to 5.00 seconds	2.0 to 10.0 VDC	150	100	Manual
	P-20003	W03	0.10 to 25.50 seconds	2.0 to 10.0 VDC	150	100	Manual
	P-20004	W04	0.10 to 25.60 seconds	2.0 to 10.0 VDC	150	100	Manual
	P-20005	W05	0.10 to 5.20 seconds	0.0 to 5.0 VDC	150	100	Manual
Floating Point	P-30001	F01	Floating Point	2.0 to 10.0 VDC	150	100	Manual
	P-30002	F02	Floating Point	0.0 to 10.0 VDC	150	100	Manual
	P-30003	F03	Floating Point	2.0 to 10.0 VDC	100	100	Manual
	P-30004	F04	Floating Point	0.0 to 5.0 VDC	100	100	Manual
	P-30005	F05	Floating Point	0.0 to 10.0 VDC	100	100	Manual
	P-30006	F06	Floating Point	0.0 to 5.0 VDC	150	100	Manual
On/Off	P-40001	J01	On/Off	None	75	100	Manual
	P-40002	J02	On/Off	2.0 to 10.0 VDC	150	100	Manual
	P-40003	J03	On/Off	None	75	100	Manual
	P-40004	J04	On/Off	0.0 to 5.0 VDC	100	100	Manual
	P-40005	J05	On/Off	0.0 to 10.0 VDC	100	100	Manual

*P-10001 is the default configuration.

Custom MFT Configuration Order Form

FAX: USA Toll Free 1-800-228-8283



#1 Select an Actuator

(use one sheet for each unique actuator/configuration)

	Quantity		Quantity
☐ AF24-MFT US	_____	☐ AMX24-MFT	_____
☐ AF24-MFT-S US	_____	☐ AMX24-MFTX1	_____
☐ NF24-MFT US	_____	☐ NMX24-MFT	_____
☐ LF24-MFT US	_____	☐ NMX24-MFTX1	_____
☐ LF24-MFT-S US	_____	☐ LMX24-MFT	_____
☐ AF24-MFT95 US	_____	☐ LMX24-MFTX1	_____
☐ NV24-MFT US	_____	☐ LRX24-MFT	_____
☐ NVF24-MFT US	_____	☐ GMX24-MFT95	_____
☐ NVF24-MFT-E US	_____	☐ AMX24-MFT95	_____
☐ NVFD24-MFT US	_____	☐ NMX24-MFT95	_____
☐ NVFD24-MFT-E US	_____	☐ LMX24-MFT95	_____
☐ GMX24-MFT	_____	☐ LHX24-MFT	_____
☐ GMX24-MFTX1	_____	☐ LUX24-MFT	_____

(-S=Auxiliary Switch)

Name _____

Company _____

Address _____

City _____ State _____ Zip _____

Phone _____ Fax _____

Email _____

FIELD LABELING: LBL-MFT

- ☐ Custom configuration labels required
1-3/8" X 1-1/4" orange labels preprinted to your specifications 12 label sets per sheet.
Includes configuration code and wiring labels.

#2 Create a Custom Configuration

1 Angle of rotation setting

☐ Deactivated (Default) The following settings ② - ⑤ refer to the full angle of rotation of 95°.

☐ Activated The following settings ② - ⑤ are automatically adapted to the effective mechanical angle of rotation.

☐ Manual triggering by pressing the push button twice.

☐ Automatic triggering each time the unit is powered up or by pressing the push button twice.

2 Control Types

VDC	PWM	Floating Point	On/Off
☐ 2 - 10	☐ 0.2 to 5.0 seconds	☐	☐
☐ 0 - 10	☐ 0.1 to 25.5 seconds		
☐ Variable	☐ 0.59 to 2.93 seconds		
Start ☐ ☐ ☐ · ☐	☐ Variable		
Stop ☐ ☐ · ☐	Start ☐ ☐ · ☐		
	Stop ☐ ☐ · ☐		

3 Feedback Signals U₅

☐ Position Feedback U DC 2...10 V (Default)

☐ Position Feedback U DC 0...10 V

☐ Position Feedback U Start DC ☐ · ☐ V (0...8 V) The finish must be at least 2 V above the start!

Finish DC ☐☐ · ☐ V (2...10 V)

4 Running Time

☐ 150 seconds (Default)

☐ Running time ☐☐☐ seconds (75...300 seconds) (in 5 second increments)

Note: The sound power level [dB(A)] increases when the running time is below 150 seconds.

LM	35...150 seconds
NM	45...170 seconds
AM	90...300 seconds
GM	90...300 seconds
Others	75...300 seconds

5 Override control and electronic angle of rotation limiting

☐ Min. (min. position) = ☐☐☐ % (0...100%) <→ (beginning of working range) default 0

ZS (intermediate position) = ☐☐☐ % (0...100%) (0% = Min.; 100% = Max.) default 50

Max. (max. position) = ☐☐☐ % (0...100%) <→ (end of working range) default 100