



- 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

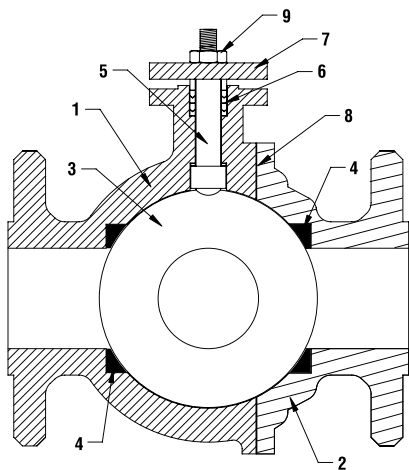
- Ideal for water service where a non-corrosive, clean cosmetic appearance is required.
- Optional FDA approval, suitable for potable water and food contact.
- Sizes: 2"-10" (50-250mm)
- 200 psi CWP (cold water pressure) (non-shock)

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).

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

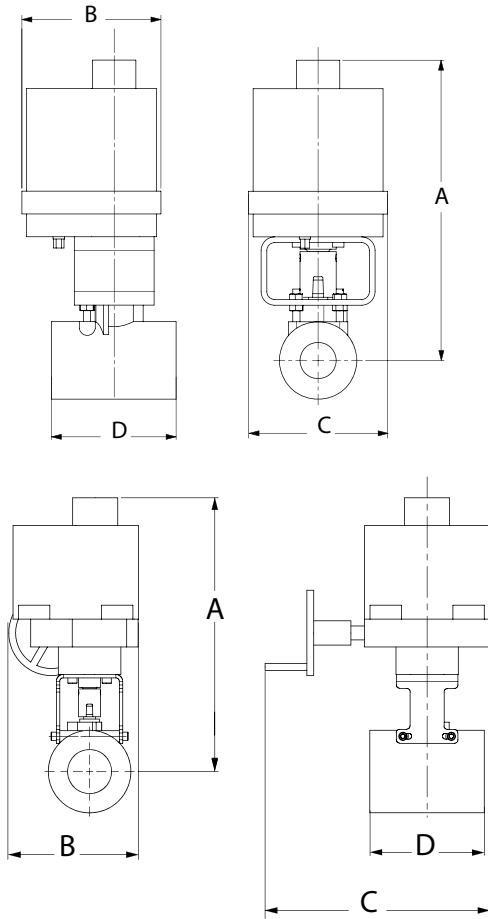
C _v	Valve Nominal Size		Type	Suitable Return Actuators
	Inches	DN [mm]	2-way NPT	Non-Spring
330	2	50	B650VS	SY Series
420	2½	65	B665VS	
600	3	80	B680VS	
1200	4	100	B6100VS	
3300	6	150	B6150VS	
9000	8	203	B6200VS	
12400	10	254	B6250VS	



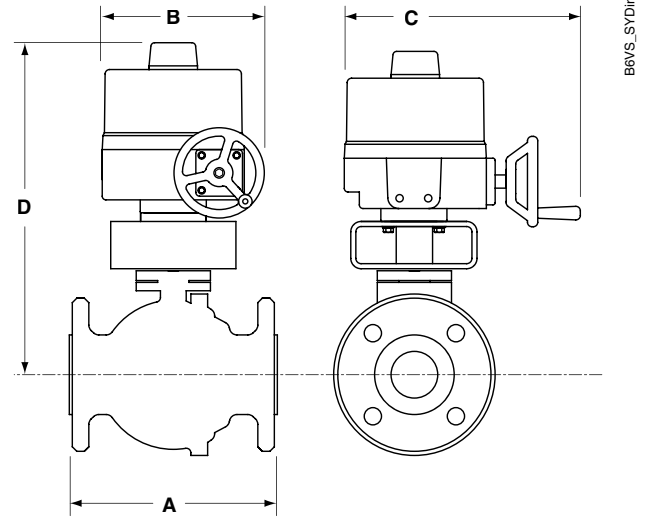
Pressure rating	200 psig WOG
Media temp. range	-22°F to 298°F (-30°C to 148°C)
Close-off pressure	200 psig @ 140°F
Maximum differential pressure (ΔP)	<200 psi

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Dimensions with 2-Way Valves



Dimensions with Flanged Valves



Valve Nominal Size Dimensions (Inches)

	Valve Body	COP	Inches	DN [mm]	A	B	C	D
SY1	B2050VS-01	600	½	15	9.51	4.80	-	2.20
	B2050VS-02	600	½	15	9.51	4.80	-	2.20
	B2050VS-04	600	½	15	9.51	4.80	-	2.20
	B2050VS-15	600	½	15	9.51	4.80	-	2.20
	B2075VS-30	600	¾	20	9.80	4.80	-	3.00
	B2075VS-51	600	¾	20	9.80	4.80	-	3.20
	B2100VS-43	600	1	25	9.91	4.80	-	3.40
	B2100VS-68	600	1	25	10.04	4.80	-	3.60
	B2125VS-48	600	1¼	32	10.04	4.80	-	4.00
	B2150VS-84	600	1½	40	10.51	4.80	-	4.40
	B2150VS-177	600	1½	40	10.51	4.80	-	4.80
	B2200VS-108	600	2	50	10.69	4.80	-	4.70
	B2200VS-389	600	2	50	10.69	4.80	-	5.40
	B2050VSS-15	1000	½	15	9.51	4.80	-	2.30
	B2075VSS-30	1000	¾	30	9.80	4.80	-	3.00
	B2100VSS-43	1000	1	25	9.91	4.80	-	3.40
B2125VSS-48	1000	1¼	32	10.04	4.80	-	4.00	
B2150VSS-84	1000	1½	40	10.51	4.80	-	4.40	
B2200VSS-108	1000	2	50	10.69	4.80	-	5.50	
SY2	B2250VS-503	600	2½	65	15.47	7.36	12.76	6.50
	B2300VS-370	600	3	80	15.47	7.36	12.76	6.80
	B2250VSS-503	1000	2½	65	15.47	7.36	12.76	6.80
	B2300VSS-370	1000	3	80	15.47	7.36	12.76	6.80

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

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Models

SY1-24(P)
SY2-24MFT

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
Torque	
SY1-24(P)	35 Nm / 310 in-lb
SY2-24MFT	90 Nm / 801 in-lb
Manual Override	
SY1-24(P)	8mm Wrench
SY2-24	Hand Wheel
Running Time	
SY1-24(P)	15 seconds
SY2-24MFT	15 seconds

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 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 2-10vdc, 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 250 VAC 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

Wiring Diagrams

✂️ INSTALLATION NOTES

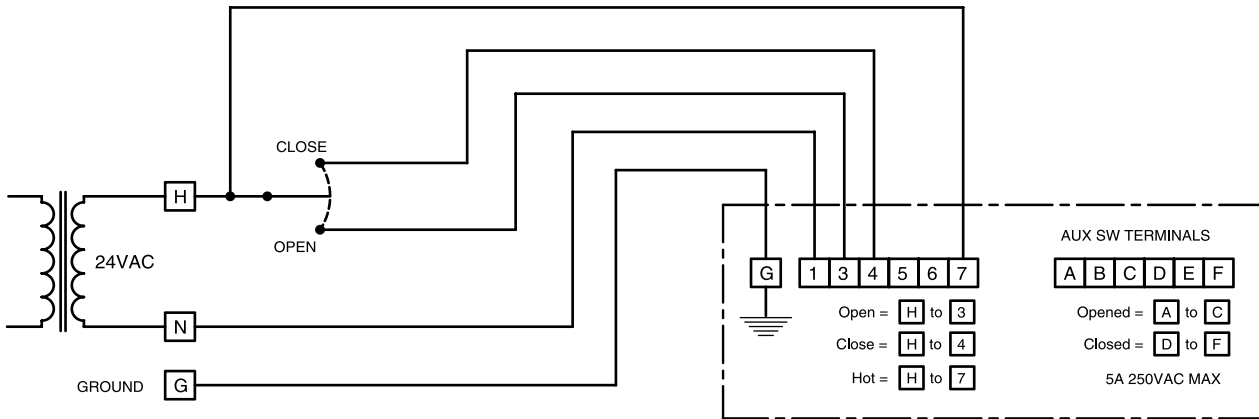
- Transformer sizing = SY actuator draw X 1.25 (safety margin)
EXAMPLE: SY2-24 requires 3.0A x 1.25 = 3.75A, 3.75A X 24 VAC = 90VA Transformer.
- There can be no connection (internal to automation controller, external wiring, or otherwise) between actuator supply neutral & control signal reference. These actuators are full wave devices. Any connection to half wave equipment will result in equipment damage.
- Do not change sensitivity or dip switch settings with power applied.

Terminals 6 & 11 can be common when control and feedback signals are both set for 2-10VDC operation.

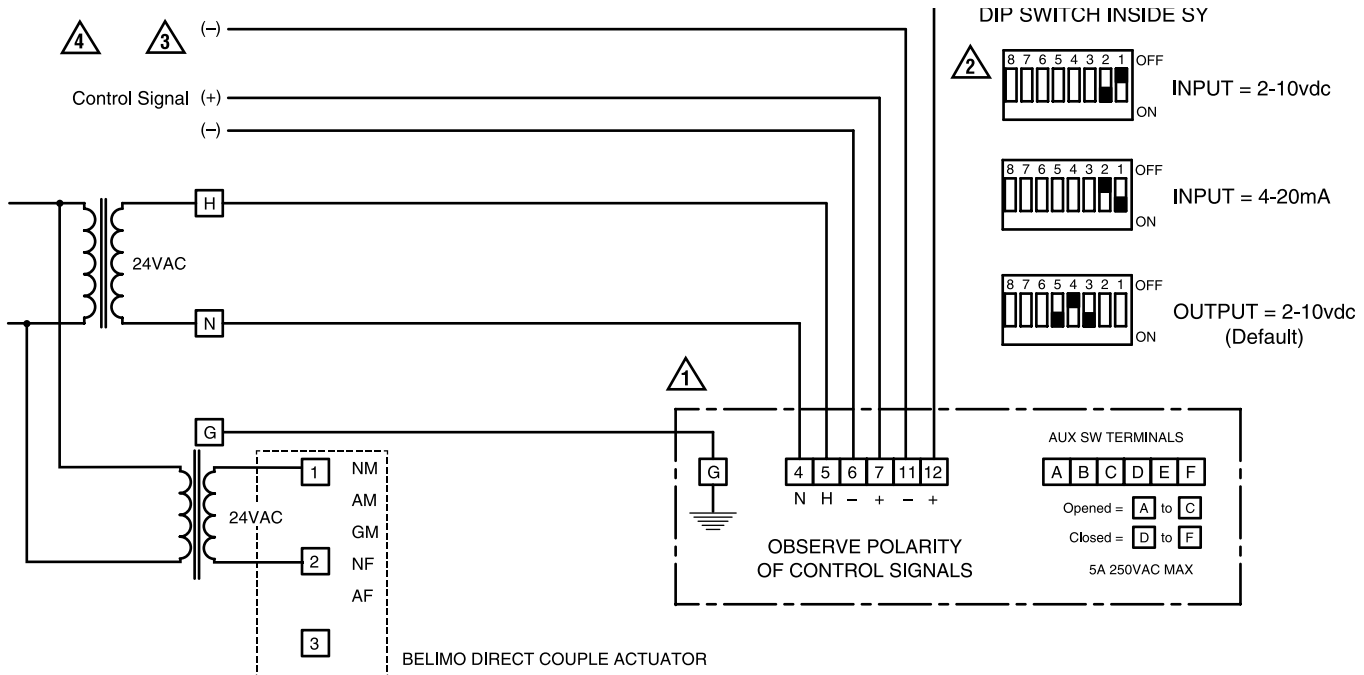
Use of feedback is optional.

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.

OBSERVE WIRE SIZING GUIDELINES FOR 24VAC OPERATION OVER DISTANCES.



On/Off control for SY(2-5)-24



2 to 10 vdc or 4 to 20 mA control signal for SY1-24P

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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	
Torque		
SY1-110(P)	35 Nm / 310 in-lb	
SY2-120MFT	90 Nm / 801 in-lb	
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

Models

SY1-110(P)
SY2-120MFT

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	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	

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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.



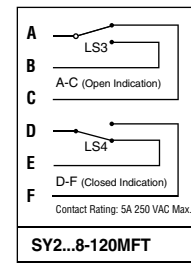
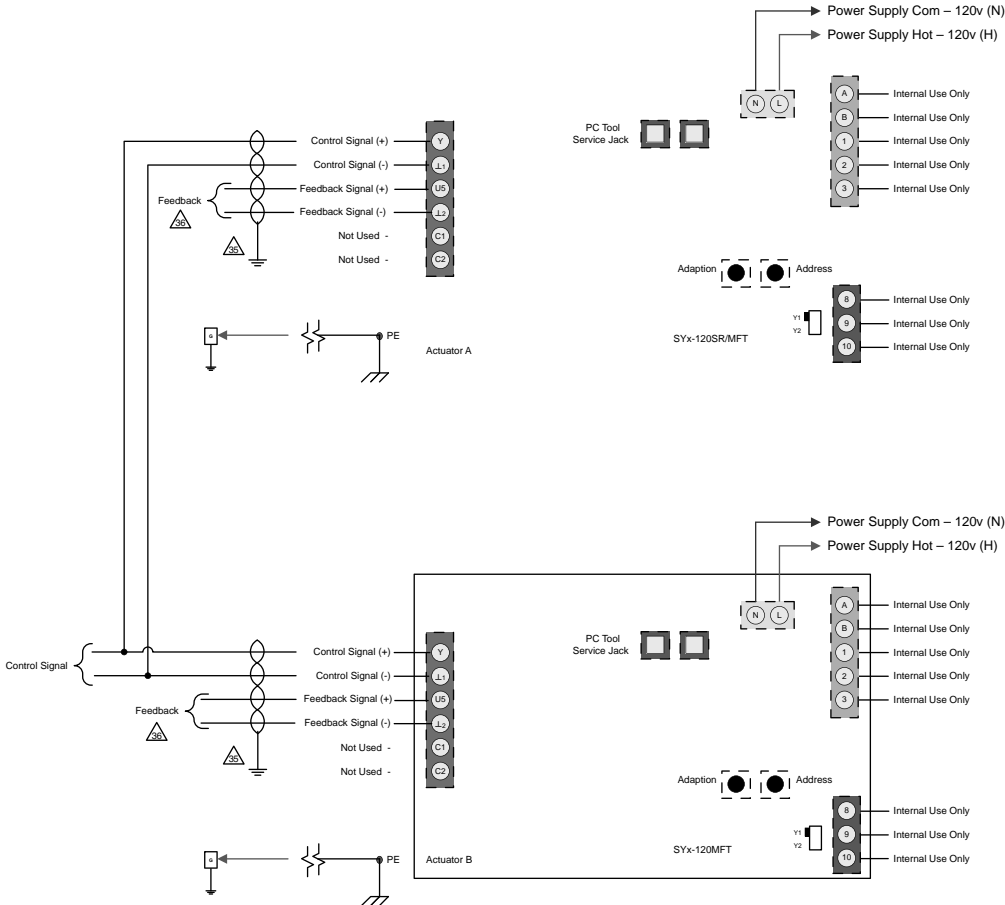
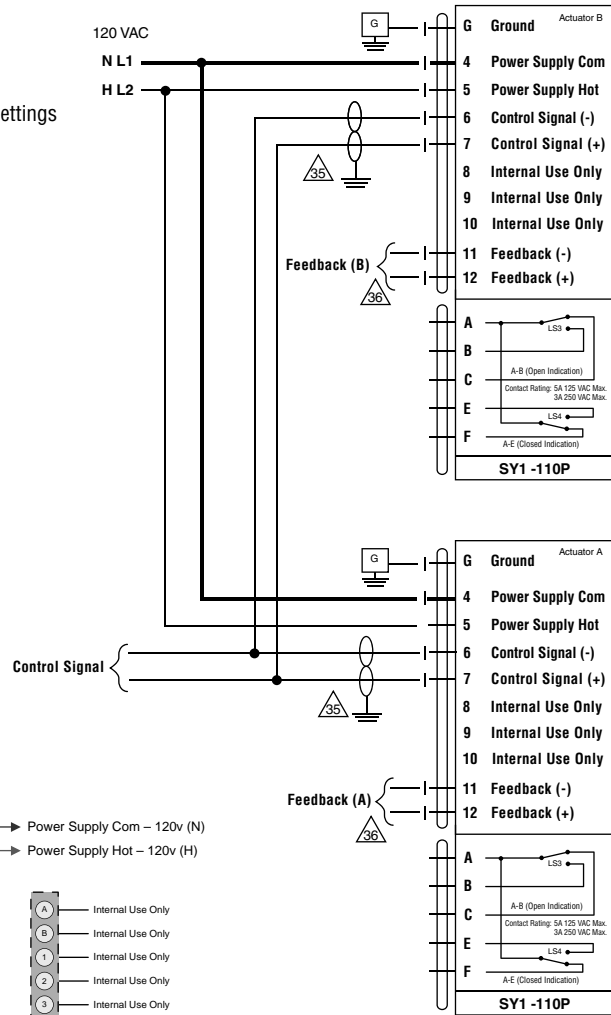
Use of feedback is optional.

NOTES SY1-110P

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

NOTES SY2

- **Caution:** Power supply voltage.





Models

SY1-220(P)
SY2-230MFT

Technical Data	
Power supply	230 VAC 50/60Hz, single phase
Electrical connection	1/2" conduit connector, screw terminals
Overload protection	thermally protected 135°C cut-out
Motor protection	SY1 H class insulation SY2 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 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

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	
Torque		
SY1-220(P)	35 Nm / 310 in-lb	
SY2-230MFT	90 Nm / 801 in-lb	
Manual Override		
SY1-220(P)	8mm Wrench	
SY2-230MFT	Hand Wheel	
Running Time	50hz	60hz
SY1-220(P)	13 seconds	12 seconds
SY2-230MFT	17 seconds	15 seconds

Wiring Diagrams

Hazard Identification

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

CAUTION

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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

- **Caution:** Power supply voltage.

