High Performance for a Wide Range of Applications

VIC Series Actuators for Butterfly Valves

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BELIMO

Butterfly Valve Nomenclature

F6	50	VIC	+AMB	24	-3-X1		
Valve F6 = 2-way F7 = 3-way	**Valve Size** 50 = 2” 65 = 2½” 80 = 3” 100 = 4” 125 = 5” 150 = 6” 200 = 8” 250 = 10” 300 = 12”	**Trim Material** **VIC** = Ductile Iron Grooved End Body, Nickel Coated Ductile Iron Disc, 0% Leakage up to 200 psi	**Actuator Type** **Non Fail-Safe** AMB, AMX GMB, GMX GRB, GRX GR/GM... N4 DRB, DRX DR... N4 PRB, PRX SY **Fail-Safe Electronic** GKB, GKX PKRX **Spring Return** AFB, AFX AFRB, AFRX	**Power Supply** -24 = 24 VAC/DC -110 = 110/120 VAC -120 = 120 VAC -230 = 230 VAC UP = 24-240 VAC or 24-125 VDC	**Control** -3-X1 = On/Off, Floating Point -SR = Modulating Input = 2-10 VDC -MFT or -MFT-X1 = Multi-Function Technology	-S = Built-in Auxiliary Switch N4 = NEMA 4/4X -T = Terminal Block	-200 = 8” -250 = 10”

Ordering Example

1 Choose the valve actuator combination.

F650VIC+AMB24-3-X1

2 Specify preference or configuration.

NO

3 **For MFT orders only - select programming code (consult factory)**

Tagging (if needed)

4 Does order require tagging?

Tagging:
Valves may be tagged per customer specification. ($12.00 per tag)

Example:
Chiller 1
3rd Floor East

Part number for tagging: 99981-00101

2-way Configuration

Non Fail-Safe	2 Pos.		Set Up Required Field Logic Determines Normal Position
	Modulating	NC	(Normally Closed) 0.5 VDC/2 VDC/4mA = Closed
		NO	(Normally Open) 0.5 VDC/2 VDC/4mA = Open
Fail-Safe	2 Pos.	NO/FO	(Normally Open/Fail Open) Field Logic Determines Normal Position Valve Fails OPEN
		NC/FC	(Normally Closed/Fail Closed) Field Logic Determines Normal Position Valve Fails CLOSED
	Modulating	NO/FO	(Normally Open/Fail Closed) 0.5 VDC/2 VDC/4mA = Open Valve Fails CLOSED
		NC/FO	(Normally Closed/Fail Open) 0.5 VDC/2 VDC/4mA = Closed Valve Fails OPEN
		NO/FO	(Normally Open/Fail Open) 0.5 VDC/2 VDC/4mA = Master Valve Open Master (Actuated) Valve Fails OPEN
		NC/FC	(Normally Closed/Fail Closed) 0.5 VDC/2 VDC/4mA = Master Valve Closed Master (Actuated) Valve Fails CLOSED

Set-Up **3-way Configuration**

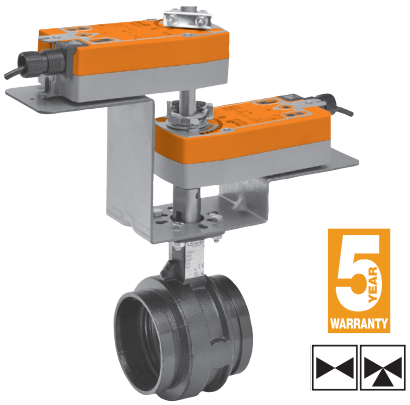
Non Fail-Safe	2 Pos.			No Set Up Required Field Logic Determines Normal Position
	Modulating	NC	Specify Flow Pattern	Master (Actuated) Valve (Normally Closed) 0.5 VDC/2 VDC/4mA = Closed
		NO		Master (Actuated) Valve (Normally Open) 0.5 VDC/2 VDC/4mA = Open
Fail-Safe	2 Pos.	NO/FO	Specify Flow Pattern	(Normally Open/Fail Open) Field Logic Determines Normal Position Master (Actuated) Valve Fails OPEN
		NC/FC		(Normally Closed/Fail Closed) Field Logic Determines Normal Position Master (Actuated) Valve Fails CLOSED
	Modulating	NO/FO		(Normally Open/Fail Open) 0.5 VDC/2 VDC/4mA = Master Valve Open Master (Actuated) Valve Fails OPEN
		NO/FC		(Normally Open/Fail Closed) 0.5 VDC/2 VDC/4mA = Maser Valve Open Master (Actuated) Valve Fails CLOSED
		NC/FO		(Normally Closed/Fail Open) 0.5 VDC/2 VDC/4mA = Master Valve Closed Master (Actuated) Valve Fails OPEN
		NC/FC		(Normally Closed/Fail Closed) 0.5 VDC/2 VDC/4mA = Master Valve Closed Master (Actuated) Valve Fails CLOSED

5 Complete Ordering Example: F650VIC+AMB24-3-X1
Configuration: NO
Programming: X10

Grooved Butterfly Valve Product Range

		2-way			Suitable Actuators				
		Valve Nominal Size		Type	Non Fail-Safe			Fail-Safe	
C_V 90°	C_V 60°	IN	DN [mm]	2-way				Spring Return	Electronic
115	36	2	50	F650VIC	AM Series			AF Series	
260	80	2½	65	F665VIC		GM/GR Series			
440	140	3	80	F680VIC					
820	250	4	100	F6100VIC			DR Series		GK
1200	370	5	125	F6125VIC					PKR Series
1800	560	6	150	F6150VIC					
3400	1050	8	200	F6200VIC					
5800	1800	10	250	F6250VIC					
9000	2790	12	300	F6300VIC			PR / PKR Series		
							SY (2 Year Warranty)		

		3-way			Suitable Actuators				
		Valve Nominal Size		Type	Non Fail-Safe			Fail-Safe	
C_V 90°	C_V 60°	IN	DN [mm]	3-way				Spring Return	Electronic
115	36	2	50	F750VIC	AM			AF	
260	80	2½	65	F765VIC		GM Series			
440	140	3	80	F780VIC					
820	250	4	100	F7100VIC					
1200	370	5	125	F7125VIC					
1800	560	6	150	F7150VIC					
3400	1050	8	200	F7200VIC					
5800	1800	10	250	F7250VIC					
9000	2790	12	300	F7300VIC			PR / PKR Series		PKR Series
							SY Series (2 Year Warranty)		



Mode of Operation

Grooved butterfly valves are designed for body pressures ranging from full vacuum to 300 psi and for bi-directional, dead end services to full body pressure. The valve patented seat design ensures full 360° sealing. The pressure-enhanced seat compresses to form a larger seating area as the pressure increases. Valve construction and performance meet and exceed MSS-SP-67 requirements.

Product Features

The unique single offset disc and seat design ensures positive valve seating while maintaining low seating torque.

Actuator Specifications

Control type	on/off, floating point, modulating, 2-10 VDC, multi-function technology (MFT)
Manual override	all models
Electrical connection	3 ft. [1 m] cable terminal block (-T models)
Communication (PR)	BACnet MS/TP, NFC, listed by BTL, Modbus

Valve Specifications

Service	chilled, hot water, 60% glycol
Flow characteristic	F6 modified equal percentage F7 modified linear
Sizes	2" to 12"
End fitting	grooved ANSI/AWWA (C606)
Materials*	
Body	ductile iron ASTM A536, grade 65-45-12
Body finish	black alkyd enamel
Disc	electrolysis nickel coated ductile iron
Shaft	416 stainless steel
Seat	EPDM
Bearings	fiberglass with TFE lining
Media temp. range	-22°F to +250°F [-30°C to +120°C]
Body pressure rating	300 psi
Close-off pressure	200 psi (for most combinations)
Rangeability	100:1
Maximum velocity	20 FPS
Leakage	0%

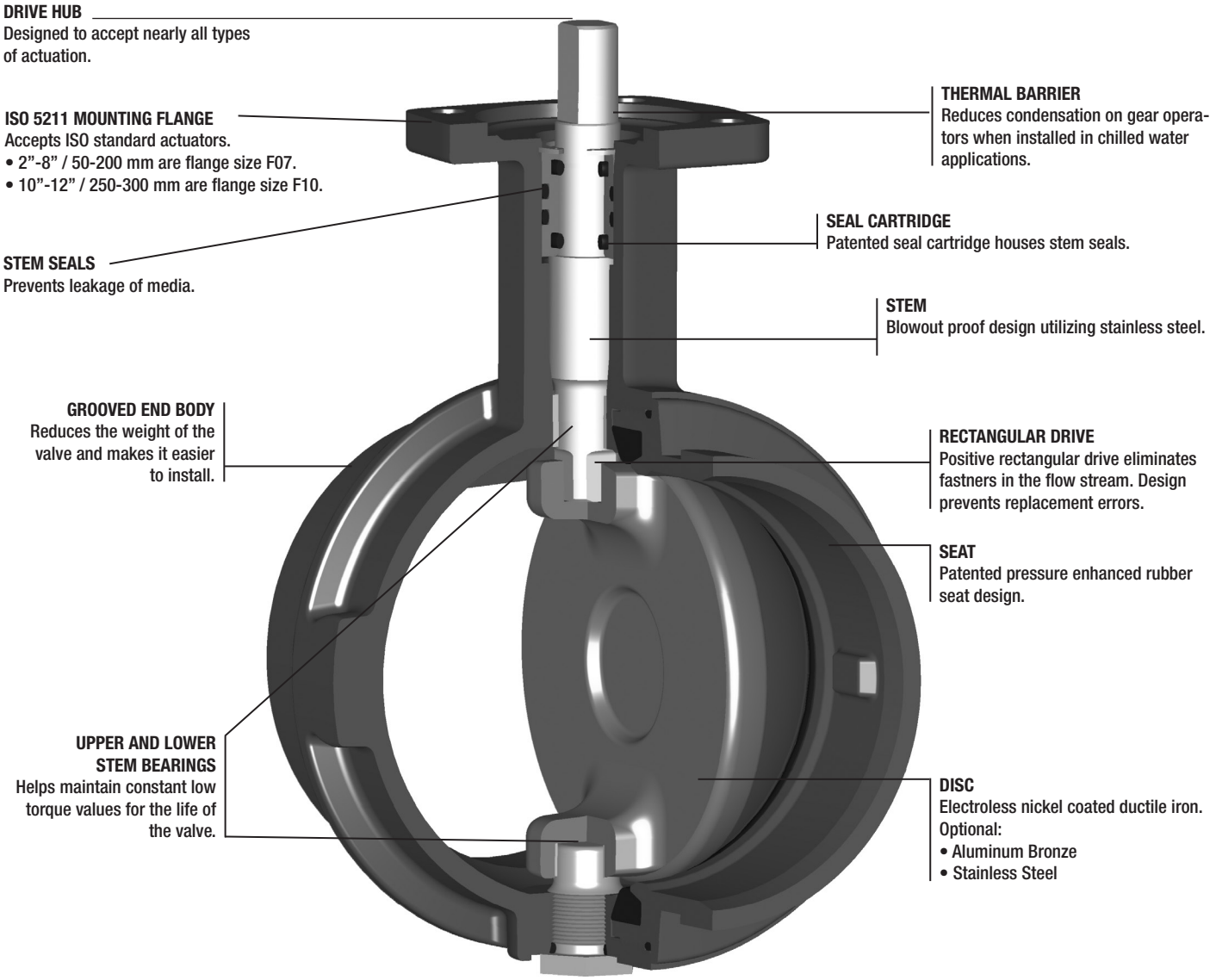
*VIC® 300 Masterseal™ is manufactured by Victaulic Company

VIC.. Victaulic Butterfly Valves

Belimo VIC.. Series Victaulic® Butterfly Valves are designed for pressure ranging from vacuum to 300psi and for dead end services to full working pressure. All Victaulic valves are supplied in grooved style body design.

Valve Design Features

- The valve features a patented seat design that assures full 360° sealing.
- The pressure enhanced seat compresses to form a larger seating area as the pressure increases.
- The seat design also contributes to low breakaway torque of the valve.
- Valves have EPDM seats that are DL classified to ANSI/NSF 61.
- The disc is ductile iron, conforming to ASTM A-536, grade 65-45-12 with electrolysis nickel coating conforming to ASTM B-733.
- Stem is 416 stainless steel conforming to ASTM A-582.



Standard Actuation (Average Assembly Weights)

					NON-SPRING RETURN			SPRING RETURN		ELECTRONIC FAIL-SAFE
	Size	Valve	Max GPM	COP	AMB(X)	GMB(X)	2*GMB(X)	AF...	2*AF...	2*GK...
2-WAY	2”	F650VIC	118	200	14 lbs.			14 lbs.		
	2.5”	F665VIC	184	50/200	14 lbs.	14 lbs.			24 lbs.	
	3”	F680VIC	264	200		16 lbs.			25 lbs.	
	4”	F6100VIC	470	200			32 lbs.			51 lbs.
3-WAY	2”	F750VIC	118	50/200	46 lbs.	53 lbs.		46 lbs.		
	2.5”	F765VIC	184	50/200		55 lbs.			65 lbs.	
	3”	F780VIC	264	50		70 lbs.	72 lbs.			

Industrial Actuation (Average Assembly Weights)

					ACTUATOR					
					NON-SPRING RETURN					
	Size	Valve	Max GPM	COP	GR	PR/PKR	SY4…	SY5…	SY6…	SY7…
2-WAY	2”	F650VIC	118	200	15 lbs.					
	2.5”	F665VIC	184	200	15 lbs.					
	3”	F680VIC	264	50/200	16 lbs.	40 lbs.				
	4”	F6100VIC	470	200		40 lbs.				
	5”	F6125VIC	734	50		46 lbs.				
	6”	F6150VIC	1058	200		50 lbs.				
	8”	F6200VIC	1880	200			64 lbs.			
	10”	F6250VIC	2938	200				81 lbs.		
	12”	F6300VIC	4230	200				101 lbs.		
3-WAY	2”	F750VIC	118	200	47 lbs					
	2.5”	F765VIC	184	50/200	57 lbs.	72 lbs.				
	3”	F780VIC	264	200		80 lbs.				
	4”	F7100VIC	470	200		130 lbs.				
	5”	F7125VIC	734	200		160 lbs.				
	6”	F7150VIC	1058	200			210 lbs.			
	8”	F7200VIC	1880	200			276 lbs.			
	10”	F7250VIC	2938	50					456 lbs.	
	12”	F7300VIC	4230	200						645 lbs.

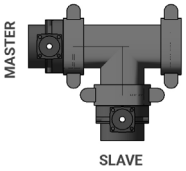
Max GPM = Maximum US gallons of water (gpm) per minute, at room temperature, that will flow through the fully open valve without exceeding design velocity limits.

COP = Close-Off Pressure stated in psi. This is the maximum differential pressure the valve will close-off against while maintaining a bubble tight seal.

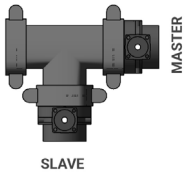
All SY and PR/PKR series actuators are NEMA 4X rated and include 2 auxiliary switches and a heater.

VIC Series Valves

X1x



X2x



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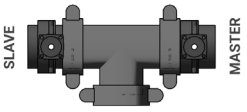


CONFIG CODE	ON/OFF OR MOD@2 VDC MASTER VALVE IS	MASTER VALVE @ FAIL
X10	OPEN	FAIL IN PLACE
X11	OPEN	OPEN
X12	OPEN	CLOSED
X13	CLOSED	FAIL IN PLACE
X14	CLOSED	OPEN
X15	CLOSED	CLOSED

CONFIG CODE	ON/OFF OR MOD@2 VDC MASTER VALVE IS	MASTER VALVE @ FAIL
X20	OPEN	FAIL IN PLACE
X21	OPEN	OPEN
X22	OPEN	CLOSED
X23	CLOSED	FAIL IN PLACE
X24	CLOSED	OPEN
X25	CLOSED	CLOSED

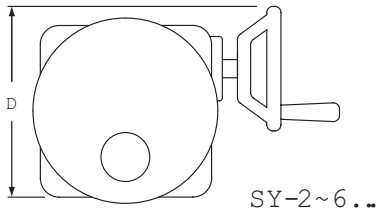
CONFIG CODE	ON/OFF OR MOD@2 VDC MASTER VALVE IS	MASTER VALVE @ FAIL
X30	OPEN	FAIL IN PLACE
X31	OPEN	OPEN
X32	OPEN	CLOSED
X33	CLOSED	FAIL IN PLACE
X34	CLOSED	OPEN
X35	CLOSED	CLOSED

X Specifies Bi-Directional Flow Capability

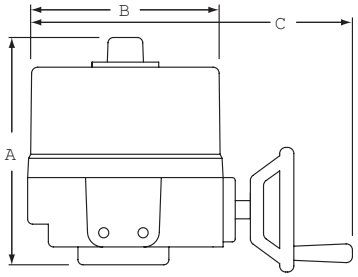
Notes:
1. Slave Valve operates inversely of the Master Valve.
2. The Master Valve is always located on the run.
3. The Slave Valve may also have an actuator if required (Direct Coupled).
4. On/Off actuator normal position is a function of field logic.
5. Modulating actuator normal position (i.e., fully CW or fully CCW) is set by the direction control switch or field programming via NFC app.
6. All 3-way assemblies are designed for 90 degree actuator rotation.
7. **Actuators installed default over Master Valve.**

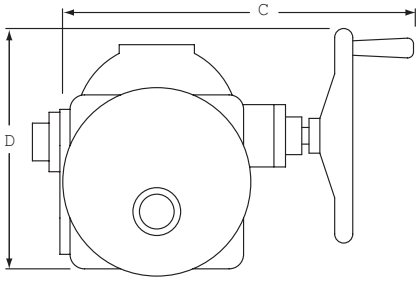
VIC Flow in Schedule 40 Pipe (Fluid Velocity in GPM). Use with Grooved Series Butterfly Valves.

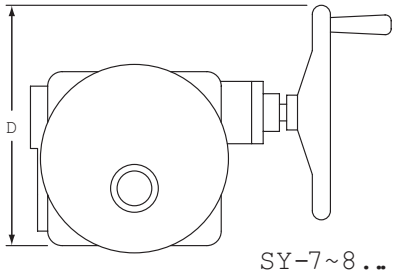
SIZE	1 FPS	3 FPS	5 FPS	8 FPS	10 FPS	12 FPS	15 FPS	16 FPS	20 FPS
2”	10	31	52	84	105	126	157	167	209
2½”	15	45	75	119	149	179	224	239	298
3”	23	69	115	184	230	277	346	369	461
4”	40	119	198	317	397	476	595	635	794
5”	62	187	312	499	624	748	935	998	1247
6”	90	270	450	720	900	1081	1351	1441	1801
8”	156	468	780	1247	1559	1871	2339	2495	3119
10”	246	737	1229	1966	2458	2949	3687	3932	4916
12”	353	1058	1763	2820	3525	4230	5288	5640	7050



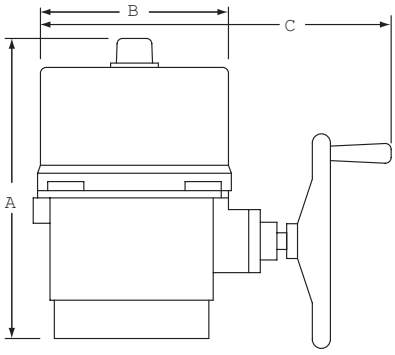
SY-2~6..

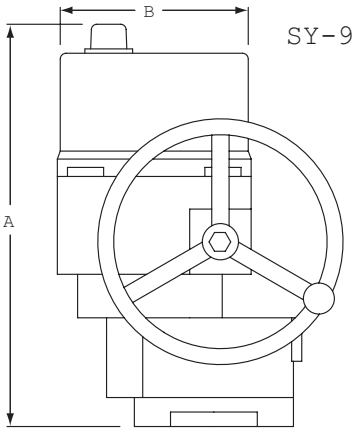






SY-7~8..





SY-9~12..

MODEL	DIM A (MAX)	Add to Dim A for cover removal	DIM B	DIM C (MAX)	DIM D
	Inches [mm]	Inches [mm]	Inches [mm]	Inches [mm]	Inches [mm]
SY4~6	12.40 [315]	8.86 [225]	9.21 [234]	14.96 [380]	11.81 [300]
SY7~8	16.54 [420]	8.86 [225]	9.21 [234]	17.72 [450]	13.39 [340]
SY9~12	23.23 [590]	8.86 [225]	10.24 [260]	18.50 [470]	13.78 [350]

Note: ~ indicates range of actuator i.e., SY4~6 = SY-4 and SY-5 and SY-6

800-543-9038 USA
866-805-7089 CANADA
203-791-8396 LATIN AMERICA / CARIBBEAN

Wire Size vs. Length of Run for SY Series Actuators On/Off

24 VAC	SY1	SY2	SY3	SY4	SY5
	[A]	[A]	[A]	[A]	[A]
current	1.6	3.4	3.1	9.4	8.9
wire gauge	MAX distance between actuator and supply [feet]				
18	97	45	50		
16	153	72	79	26	28
14	244	115	126	42	44
12	387	182	200	66	70
10	616	290	318	105	111
8	980	461	506	167	176

120 VAC	SY1	SY2	SY3	SY4	SY5	SY6	SY7	SY8	SY9	SY10	SY11	SY12
	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]
current	0.7	1.2	1.2	2.1	2	2.4	4.2	4.2	3	3.2	3.6	3.8
wire gauge	MAX distance between actuator and supply [feet]											
18	1,103	644	644	368	386	322	184	184	257	241	215	203
16	1,750	1,021	1,021	583	613	510	292	292	408	383	340	322
14	2,788	1,626	1,626	929	976	813	465	465	651	610	542	514
12	4,428	2,583	2,583	1,476	1,550	1,292	738	738	1,033	969	861	816
10	7,044	4,109	4,109	2,348	2,465	2,054	1,174	1,174	1,644	1,541	1,370	1,298
8	11,204	6,536	6,536	3,735	3,922	3,268	1,867	1,867	2,614	2,451	2,179	2,064

230 VAC	SY1	SY2	SY3	SY4	SY5	SY6	SY7	SY8	SY9	SY10	SY11	SY12
	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]
current	0.4	0.6	0.6	1.1	1	1.1	2	2	2.5	2.6	2.7	2.5
wire gauge	MAX distance between actuator and supply [feet]											
18	3,701	2,467	2,467	1,346	1,480	1,346	740	740	592	569	548	592
16	5,871	3,914	3,914	2,135	2,348	2,135	1,174	1,174	939	903	870	939
14	9,352	6,234	6,234	3,401	3,741	3,401	1,870	1,870	1,496	1,439	1,385	1,496
12	14,854	9,903	9,903	5,401	5,942	5,401	2,971	2,971	2,377	2,285	2,201	2,377
10	23,626	15,751	15,751	8,591	9,450	8,591	4,725	4,725	3,780	3,635	3,500	3,780
8	37,581	25,054	25,054	13,666	15,033	13,666	7,516	7,516	6,013	5,782	5,568	6,013

The NEC mandates that 24 VAC over 100 VA power requires CLASS 1 wiring conduit. Local codes may vary. Do NOT mix CLASS 1 & CLASS 2 circuits in the same conduit. Generally, 24 VAC actuators over 100 VA should be changed to 120 VAC models.

Wire Size vs. Length of Run for SY Series Actuators Modulating

24 VAC	SY1	SY2	SY3	SY4	SY5
	[A]	[A]	[A]	[A]	[A]
current	2.8	3.4	3.1	9.4	8.9
wire gauge	MAX distance between actuator and supply [feet]				
18	55	45	50		
16	88	72	79	26	28
14	139	115	126	42	44
12	221	182	200	66	70
10	352	290	318	105	111
8	560	461	506	167	176

120 VAC	SY1	SY2	SY3	SY4	SY5	SY6	SY7	SY8	SY9	SY10	SY11	SY12
	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]
current	0.6	0.8	0.7	2.1	1.9	2	2	2.8	2.7	3	4.3	4.5
wire gauge	MAX distance between actuator and supply [feet]											
18	1,287	966	1,103	368	407	386	386	276	286	257	180	172
16	2,042	1,531	1,750	583	645	613	613	438	454	408	285	272
14	3,253	2,440	2,788	929	1,027	976	976	697	723	651	454	434
12	5,167	3,875	4,428	1,476	1,632	1,550	1,550	1,107	1,148	1,033	721	689
10	8,218	6,163	7,044	2,348	2,595	2,465	2,465	1,761	1,826	1,644	1,147	1,096
8	13,072	9,804	11,204	3,735	4,128	3,922	3,922	2,801	2,905	2,614	1,824	1,743

230 VAC	SY1	SY2	SY3	SY4	SY5	SY6	SY7	SY8	SY9	SY10	SY11	SY12
	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[A]
current	0.4	0.4	0.4	1.1	1	1	1.2	1.6	1.1	1.4	2.2	2.5
wire gauge	MAX distance between actuator and supply [feet]											
18	3,701	3,701	3,701	1,346	1,480	1,480	1,234	925	1,346	1,057	673	592
16	5,871	5,871	5,871	2,135	2,348	2,348	1,957	1,468	2,135	1,677	1,067	939
14	9,352	9,352	9,352	3,401	3,741	3,741	3,117	2,338	3,401	2,672	1,700	1,496
12	14,854	14,854	14,854	5,401	5,942	5,942	4,951	3,713	5,401	4,244	2,701	2,377
10	23,626	23,626	23,626	8,591	9,450	9,450	7,875	5,906	8,591	6,750	4,296	3,780
8	37,581	37,581	37,581	13,666	15,033	15,033	12,527	9,395	13,666	10,738	6,833	6,013

The NEC mandates that 24 VAC over 100 VA power requires CLASS 1 wiring conduit. Local codes may vary. Do NOT mix CLASS 1 & CLASS 2 circuits in the same conduit. Generally, 24 VAC actuators over 100 VA should be changed to 120 VAC models.

Power Supply 24 VAC/VDC Single Phase

Model #	Torque	Speed 50 Hz/60 Hz	Current Draw (60 Hz)	VA (60 Hz)	Override	Weight
PRBUP-3-T*	1400 in-lbs/ 160 Nm	35 seconds	0.8 A	20	Manual override crank	5.8 kg/12.8 lbs.
PRXUP-3-T*	1400 in-lbs/ 160 Nm	35, 30-120 seconds	0.8 A	20	Manual override crank	5.8 kg/12.8 lbs.
SY4-24	3540 in-lbs/ 400 Nm	16 seconds	9.5 A	228	Hand wheel	22 kg/48.5 lbs.
SY5-24	4430 in-lbs/ 500 Nm	35 seconds	9.4 A	227	Hand wheel	22 kg/48.5 lbs.

Power Supply 120 VAC Single Phase

Model #	Torque	Speed 60 Hz	Current Draw (60 Hz)	VA (60 Hz)	Override	Weight
PRBUP-3-T*	1400 in-lbs/ 160 Nm	35 seconds	0.2 A	23	Manual override crank	5.8 kg/12.8 lbs.
PRXUP-3-T*	1400 in-lbs/ 160 Nm	35, 30-120 seconds	0.2 A	23	Manual override crank	5.8 kg/12.8 lbs.
SY4-110	3540 in-lbs/ 400 Nm	18 seconds	1.8 A	216	Hand wheel	22 kg/48.5 lbs.
SY5-110	4430 in-lbs/ 500 Nm	25 seconds	1.8 A	216	Hand wheel	22 kg/48.5 lbs.
SY6-110	5750 in-lbs/ 650 Nm	32 seconds	1.8 A	216	Hand wheel	22 kg/48.5 lbs.
SY7-110	8850 in-lbs/ 1000 Nm	49 seconds	3.5 A	420	Hand wheel	36 kg/79.5 lbs.
SY8-110	13280 in-lbs/ 1500 Nm	50 seconds	4.8 A	576	Hand wheel	36 kg/79.5 lbs.
SY9-110	17700 in-lbs/ 2000 Nm	57 seconds	2.8 A	336	Hand wheel	72 kg/176.4 lbs.
SY10-110	22130 in-lbs/ 2500 Nm	62 seconds	2.9 A	348	Hand wheel	72 kg/176.4 lbs.
SY11-110	26550 in-lbs/ 3000 Nm	69 seconds	3.6 A	432	Hand wheel	72 kg/176.4 lbs.
SY12-110	30980 in-lbs/ 3500 Nm	60 seconds	3.8 A	456	Hand wheel	72 kg/176.4 lbs.

Power Supply 230 VAC Single Phase

Model #	Torque	Speed 60 Hz	Current Draw (60 Hz)	VA (60 Hz)	Override	Weight
PRBUP-3-T*	1400 in-lbs/ 160 Nm	35 sec.	0.2 A	52	Manual override crank	5.8 kg/12.8 lbs.
PRXUP-3-T*	1400 in-lbs/ 160 Nm	35, 30-120 sec.	0.2 A	52	Manual override crank	5.8 kg/12.8 lbs.
SY4-220	3540 in-lbs/ 400 Nm	18 seconds	0.9 A	207	Hand wheel	22 kg/48.5 lbs.
SY5-220	4430 in-lbs/ 500 Nm	25 seconds	0.9 A	207	Hand wheel	22 kg/48.5 lbs.
SY6-220	5750 in-lbs/ 650 Nm	31 seconds	0.9 A	207	Hand wheel	22 kg/48.5 lbs.

*-200 and -250 versions have the same ratings.

Power Supply 24 VAC/VDC Single Phase

Model #	Torque	Speed 50 Hz/60 Hz	Current Draw (60 Hz)	VA (60 Hz)	Override	Weight
PRBUP-MFT-T*	1400 in-lbs/160 Nm	30-120 sec.	0.9 A	20	Manual override crank	5.8 kg/12.8 lbs.
PRXUP-MFT-T*	1400 in-lbs/160 Nm	30-120 sec.	0.9 A	20	Manual override crank	5.8 kg/12.8 lbs.
PKRXUP-MFT-T*	1400 in-lbs/160 Nm	30-120 sec.	2.2 A	55	Manual override crank	6.4 kg/14.1 lbs.
SY4-24MFT	3540 in-lbs/ 400 Nm	16 seconds	11.0 A	264	Hand wheel	22 kg/48.5 lbs.
SY5-24MFT	4430 in-lbs/ 500 Nm	30 seconds	10.2 A	245	Hand wheel	22 kg/48.5 lbs.

Power Supply 120 VAC Single Phase

Model #	Torque	Speed 60 Hz	Current Draw (60 Hz)	VA (60 Hz)	Override	Weight
PRBUP-MFT-T*	1400 in-lbs/160 Nm	30-120 sec.	0.2 A	23	Manual override crank	5.8 kg/12.8 lbs.
PRXUP-MFT-T*	1400 in-lbs/160 Nm	30-120 sec.	0.2 A	23	Manual override crank	5.8 kg/12.8 lbs.
PKRXUP-MFT-T*	1400 in-lbs/160 Nm	30-120 sec.	0.3 A	43	Manual override crank	6.4 kg/14.1 lbs.
SY4-120MFT	3540 in-lbs/ 400 Nm	17 seconds	2.4 A	288	Hand wheel	22 kg/48.5 lbs.
SY5-120MFT	4430 in-lbs/ 500 Nm	21 seconds	2.3 A	276	Hand wheel	22 kg/48.5 lbs.
SY6-120MFT	5750 in-lbs/ 650 Nm	29 seconds	2.2 A	264	Hand wheel	22 kg/48.5 lbs.
SY7-120MFT	8850 in-lbs/ 1000 Nm	44 seconds	1.7 A	204	Hand wheel	36 kg/79.5 lbs.
SY8-120MFT	13280 in-lbs/ 1500 Nm	48 seconds	2.6 A	312	Hand wheel	36 kg/79.5 lbs.
SY9-120MFT	17700 in-lbs/ 2000 Nm	47 seconds	3.4 A	408	Hand wheel	72 kg/176.4 lbs.
SY10-120MFT	22130 in-lbs/ 2500 Nm	51 seconds	4.0 A	480	Hand wheel	72 kg/176.4 lbs.
SY11-120MFT	26550 in-lbs/ 3000 Nm	56 seconds	3.0 A	360	Hand wheel	72 kg/176.4 lbs.
SY12-120MFT	30980 in-lbs/ 3500 Nm	62 seconds	3.4 A	408	Hand wheel	72 kg/176.4 lbs.

Power Supply 230 VAC Single Phase

Model #	Torque	Speed 60 Hz	Current Draw (60 Hz)	VA (60 Hz)	Override	Weight
PRBUP-MFT-T*	1400 in-lbs/160 Nm	30-120 sec.	0.1 A	52	Manual override crank	5.8 kg/12.8 lbs.
PRXUP-MFT-T*	1400 in-lbs/160 Nm	30-120 sec.	0.1 A	52	Manual override crank	5.8 kg/12.8 lbs.
PKRXUP-MFT-T*	1400 in-lbs/160 Nm	30-120 sec.	0.2 A	68	Manual override crank	6.4 kg/14.1 lbs.
SY4-230MFT	3540 in-lbs/ 400 Nm	17 seconds	1.1 A	253	Hand wheel	22 kg/48.5 lbs.
SY5-230MFT	4430 in-lbs/ 500 Nm	22 seconds	1.0 A	230	Hand wheel	22 kg/48.5 lbs.
SY6-230MFT	5750 in-lbs/ 650 Nm	32 seconds	1.1 A	253	Hand wheel	22 kg/48.5 lbs.
SY7-230MFT	8850 in-lbs/ 1000 Nm	44 seconds	0.8 A	184	Hand wheel	36 kg/79.5 lbs.
SY8-230MFT	13280 in-lbs/ 1500 Nm	57 seconds	1.4 A	322	Hand wheel	36 kg/79.5 lbs.
SY9-230MFT	17700 in-lbs/ 2000 Nm	61 seconds	1.1 A	253	Hand wheel	72 kg/176.4 lbs.
SY10-230MFT	22130 in-lbs/ 2500 Nm	70 seconds	1.4 A	322	Hand wheel	72 kg/176.4 lbs.
SY11-230MFT	26550 in-lbs/ 3000 Nm	48 seconds	1.9 A	437	Hand wheel	72 kg/176.4 lbs.
SY12-230MFT	30980 in-lbs/ 3500 Nm	51 seconds	2.0 A	460	Hand wheel	72 kg/176.4 lbs.

*-200 and -250 versions have the same ratings.

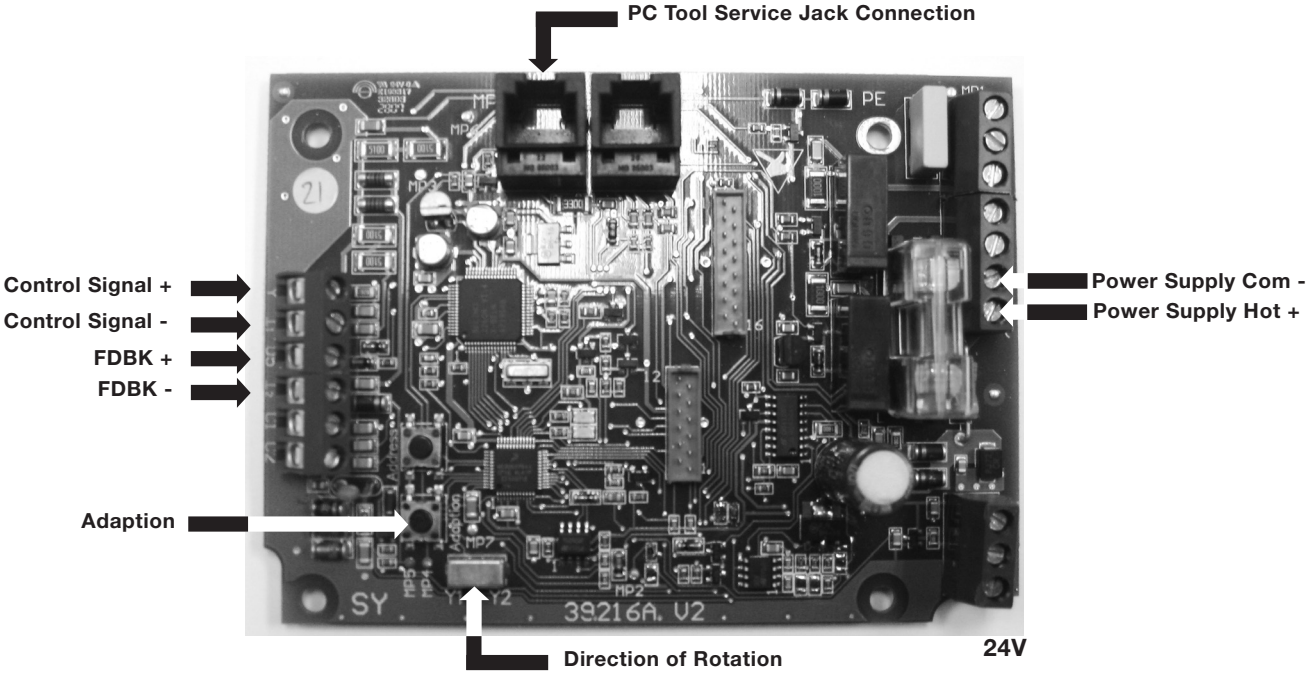
Interface Wiring Detail
SYx-MFT, 24V, 120/230V

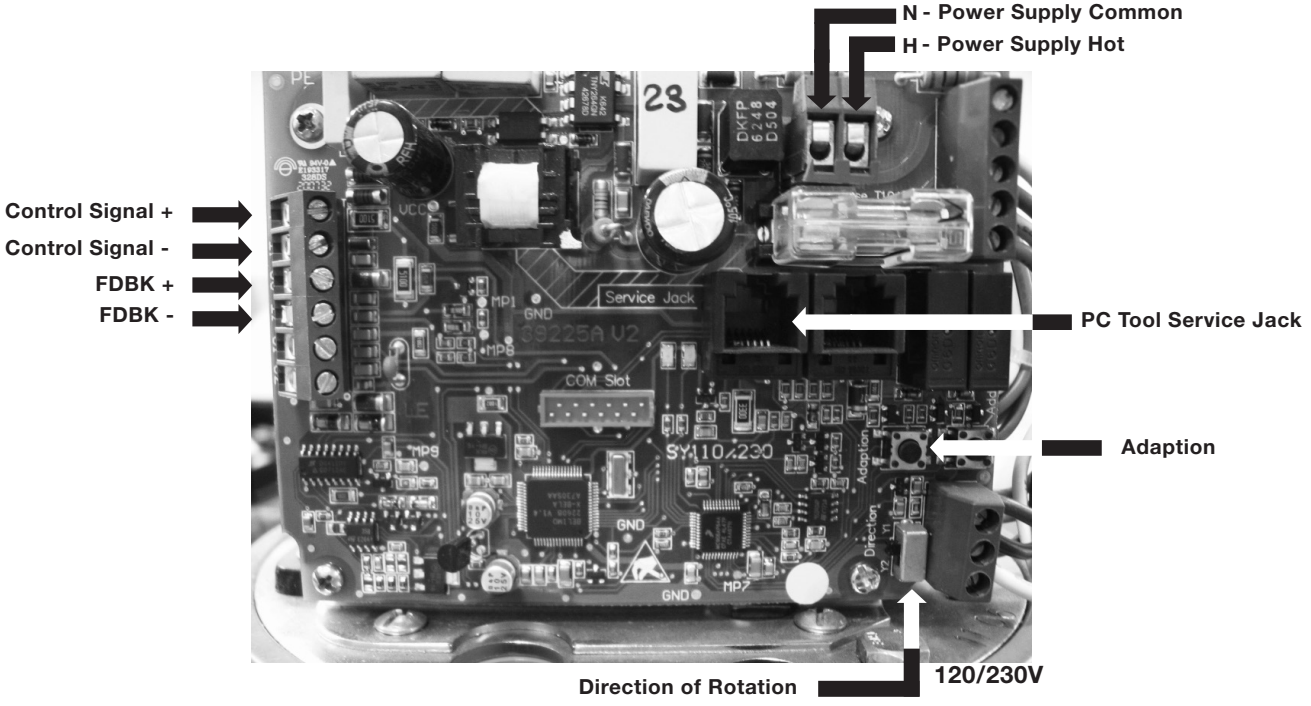
Actuators: SYx-MFT

INSTALLATION NOTES

CAUTION

Notes:
1. Motor CAMS have been factory calibrated and should not be moved.
2. An adaption must be performed if any limit switch is adjusted. This will calibrate the beginning and end stopping points. Press the adaption button for 3 seconds and release.
3. New SY actuators must have an adaption performed before operation.

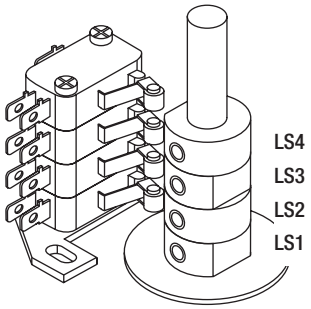




CAUTION

Electrical Travel Adjustment

SY4-12



Factory pre-set see chart below. Field adjustable if required

LS4
Auxiliary Switch for Closed Indication

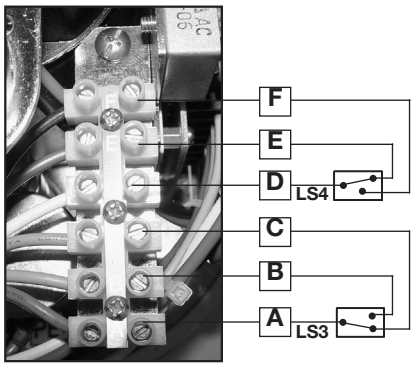
LS3
Auxiliary Switch for Opened Indication

Factory pre-set and calibrated. Do not adjust without consulting factory. This will void the warranty

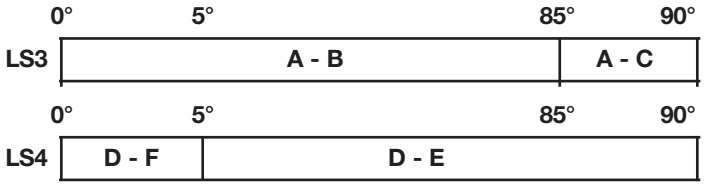
LS2
"CLOSE"
Clockwise Decrease Closed Angle
Counter-clockwise Increase Closed Angle

LS1
"OPEN"
Clockwise Increase Opening Angle
Counter-clockwise Decrease Opening Angle

WARNING



Switches at left are shown with actuator fully open.



INSTALLATION NOTES

CAUTION

Notes:

1. An adaption must be performed when the limit switches are adjusted. For the SYx-MFT actuators. This will calibrate the beginning and end stopping points. Press the adaption button for 3 seconds and release.
2. Contact Technical Support if travel adjustment is required.

Actuators: SY4...12-110 SY4...12-220

W546

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.

⚠ *NOTES* SY4...5-24

33 Each actuator should be powered by a single, isolated control transformer.

- Isolation relays must be used in parallel connection of multiple actuators using a common control signal input.
- "H" cannot be connected to terminal #3 and #4 simultaneously.
- **Required:** Terminal #7 needs to be field wired to enable heater circuit.

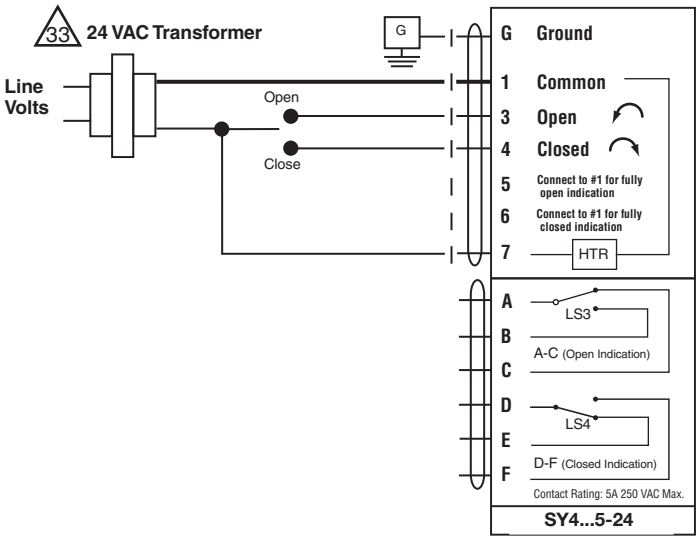
INSTALLATION NOTES

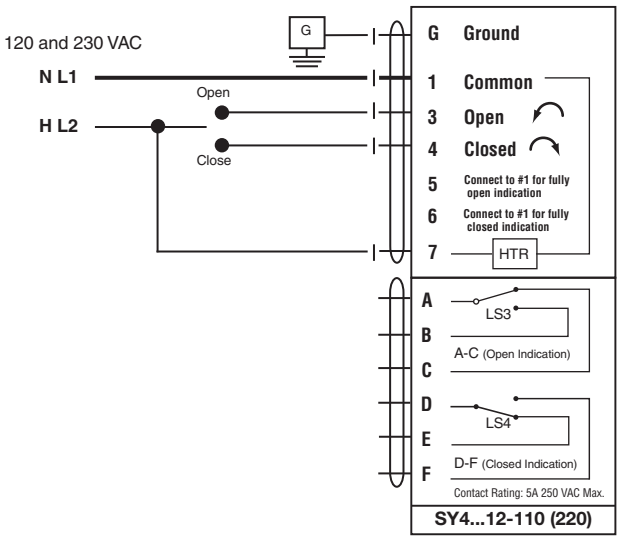
Observe class 1 and class 2 wiring restrictions.

Transformer sizing = SY actuator draw X 1.25 (safety margin)
(Ex. SY2-24 requires 3.0A x 1.25 = 3.75A,
3.75A X 24 VAC = 90VA Transformer).

⚠ *NOTES* SY4...12-110 (220)

- **Caution:** Power Supply Voltage
- Isolation relays must be used in parallel connection of multiple actuators using a common control signal input.
- "H" (L2) cannot be connected to terminal #3 and #4 simultaneously.
- **Required:** Terminal #7 needs to be field wired to enable heater circuit.





Actuators: SY4...5-24 SY4...12-110 SY4...12-220

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.

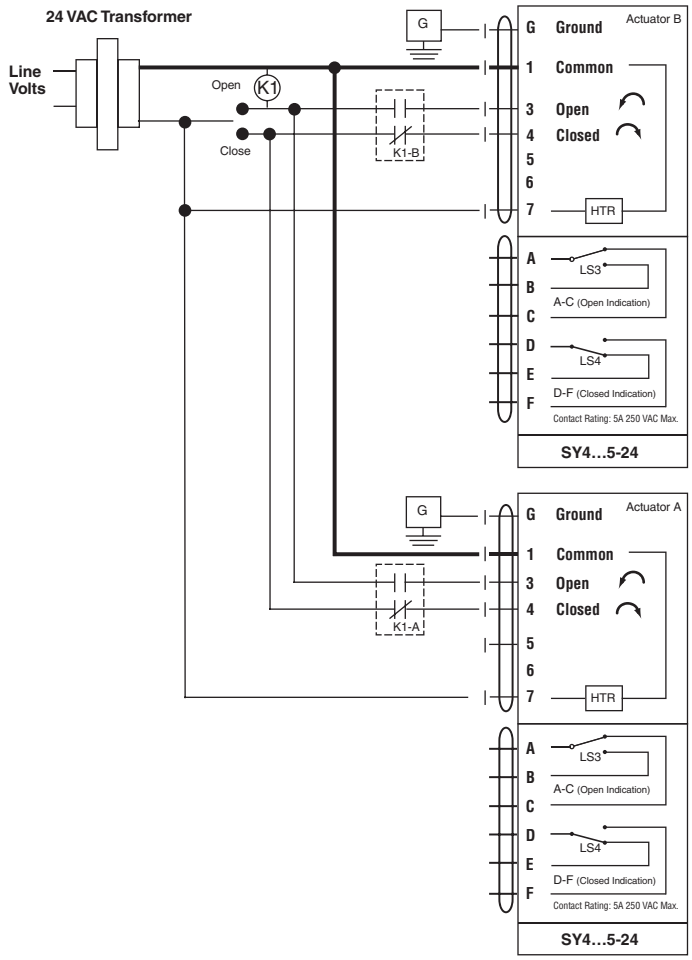
INSTALLATION NOTES

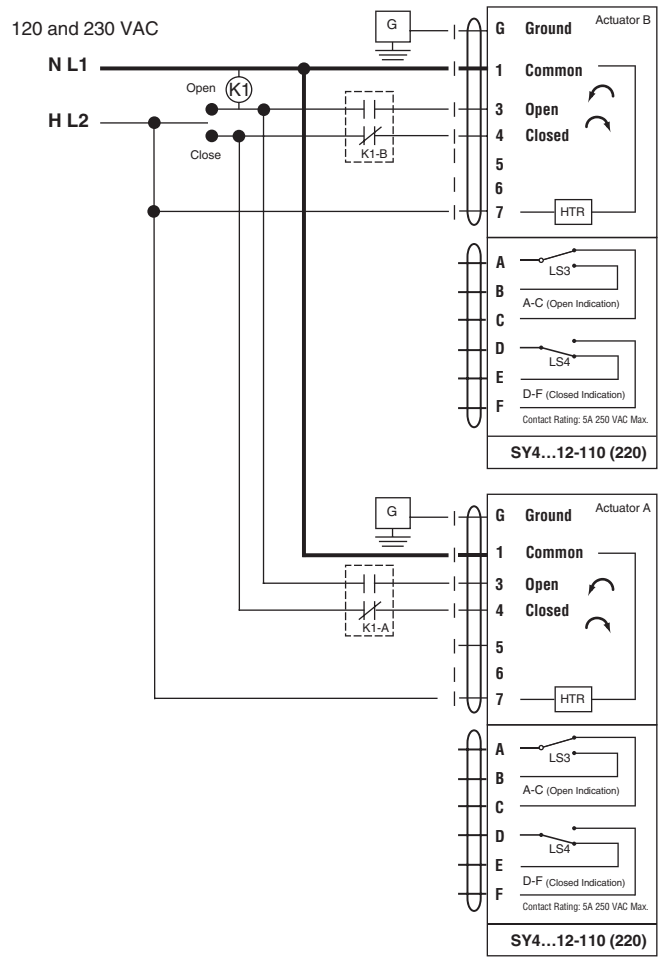
Observe class 1 and class 2 wiring restrictions.

Transformer sizing = SY actuator draw X 1.25 (safety margin)
(Ex. SY2-24 requires 3.0A x 1.25 = 3.75A,
3.75A X 24 VAC = 90VA Transformer).

NOTES

- **Caution:** Power Supply Voltage.
- Isolation relays must be used in parallel connection of multiple actuators using a common control signal input.
- "H" (L2) cannot be connected to terminal #3 and #4 simultaneously.
- **Required:** Terminal #7 needs to be field wired to enable heater circuit.





Actuators: SY4...5-24MFT SY4...12-120MFT SY4...12-230MFT

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.

Transformer sizing = SY actuator draw X 1.25 (safety margin)
(Ex. SY2-24 requires 3.0A x 1.25 = 3.75A, 3.75A X 24 VAC = 90VA Transformer)

W547-2

APPLICATION NOTES

34 Ground shielded wire at control panel chassis. Tape back ground at actuator.

36 Use of feedback is optional.

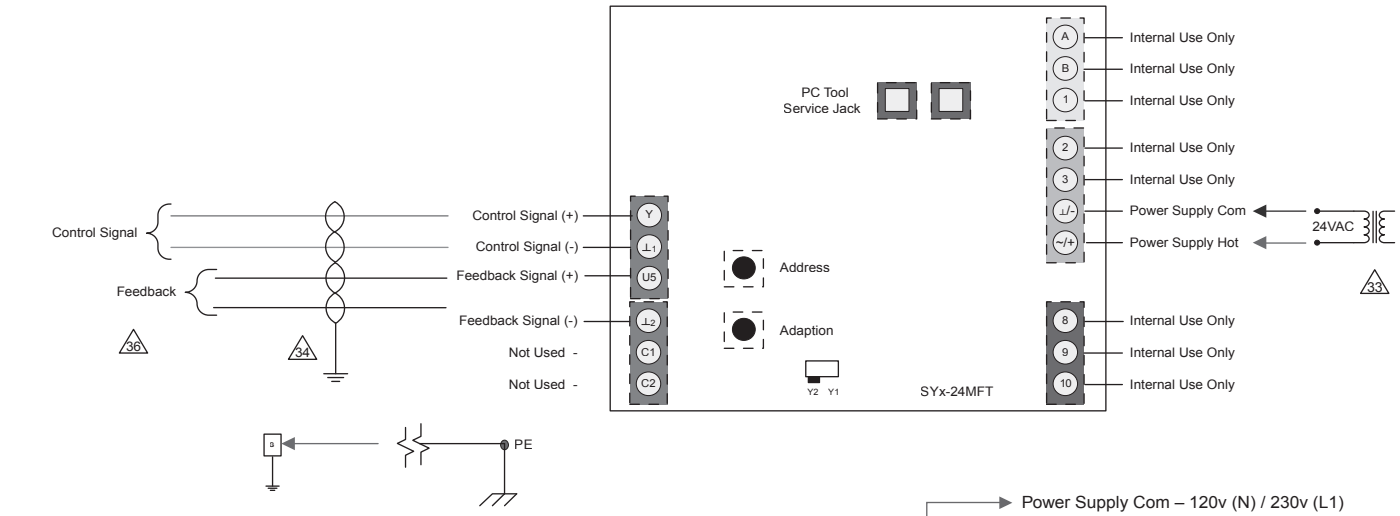
NOTES SY4...5-24MFT

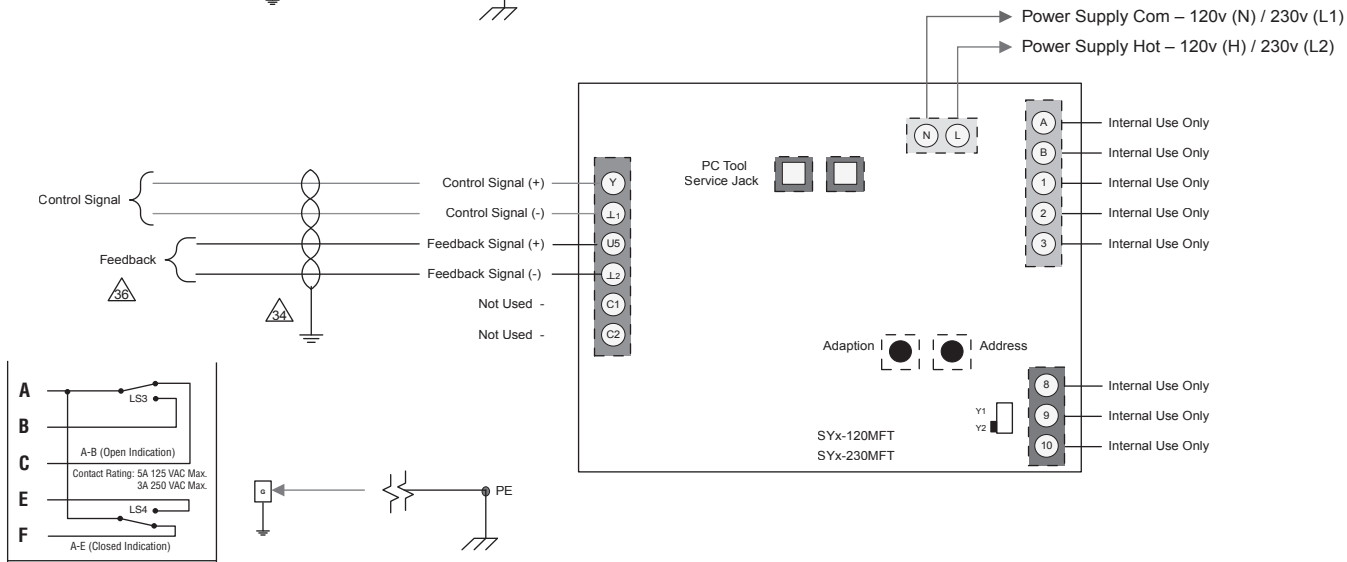
33 Each actuator should be powered by a single, isolated control transformer.

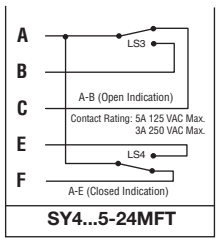
- Power supply Com/Neutral and Control Signal "–" wiring to a common is prohibited.

NOTES SY4...12-120 (230MFT)

- **Caution:** Power supply voltage.







SY4...12-120 (230MFT)

Actuators: SY4...5-24MFT

W550-2

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.

Transformer sizing = SY actuator draw X 1.25 (safety margin)
(Ex. SY2-24 requires 3.0A x 1.25 = 3.75A,
3.75A X 24 VAC = 90VA Transformer).

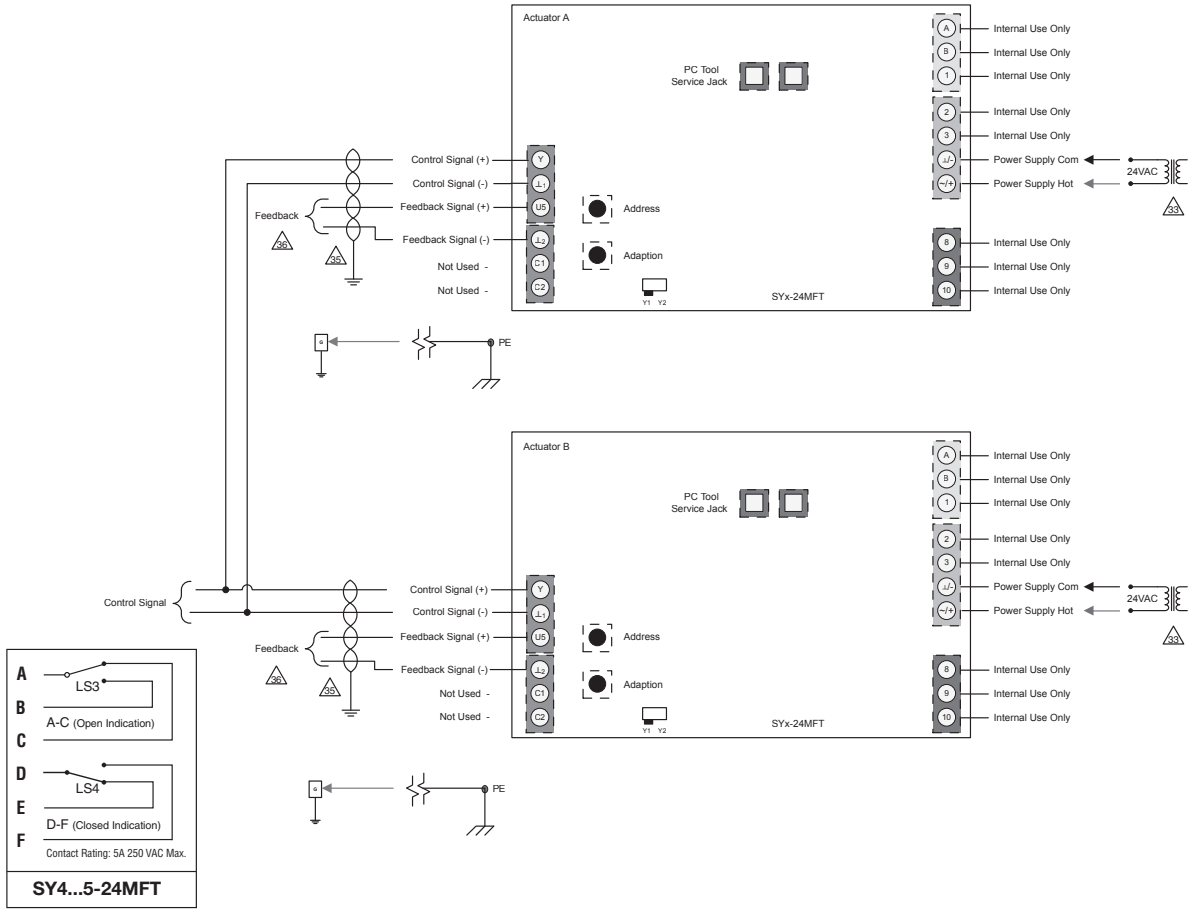
NOTES SY4...5-24MFT

33 Each actuator should be powered by a single, isolated control transformer.

APPLICATION NOTES

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

36 Use of feedback is optional.



Wiring for Multiple SY
Proportional, Multiple Wiring, 120/230V

Actuators: SY4...12-120MFT SY4...12-230MFT

W552-2

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.

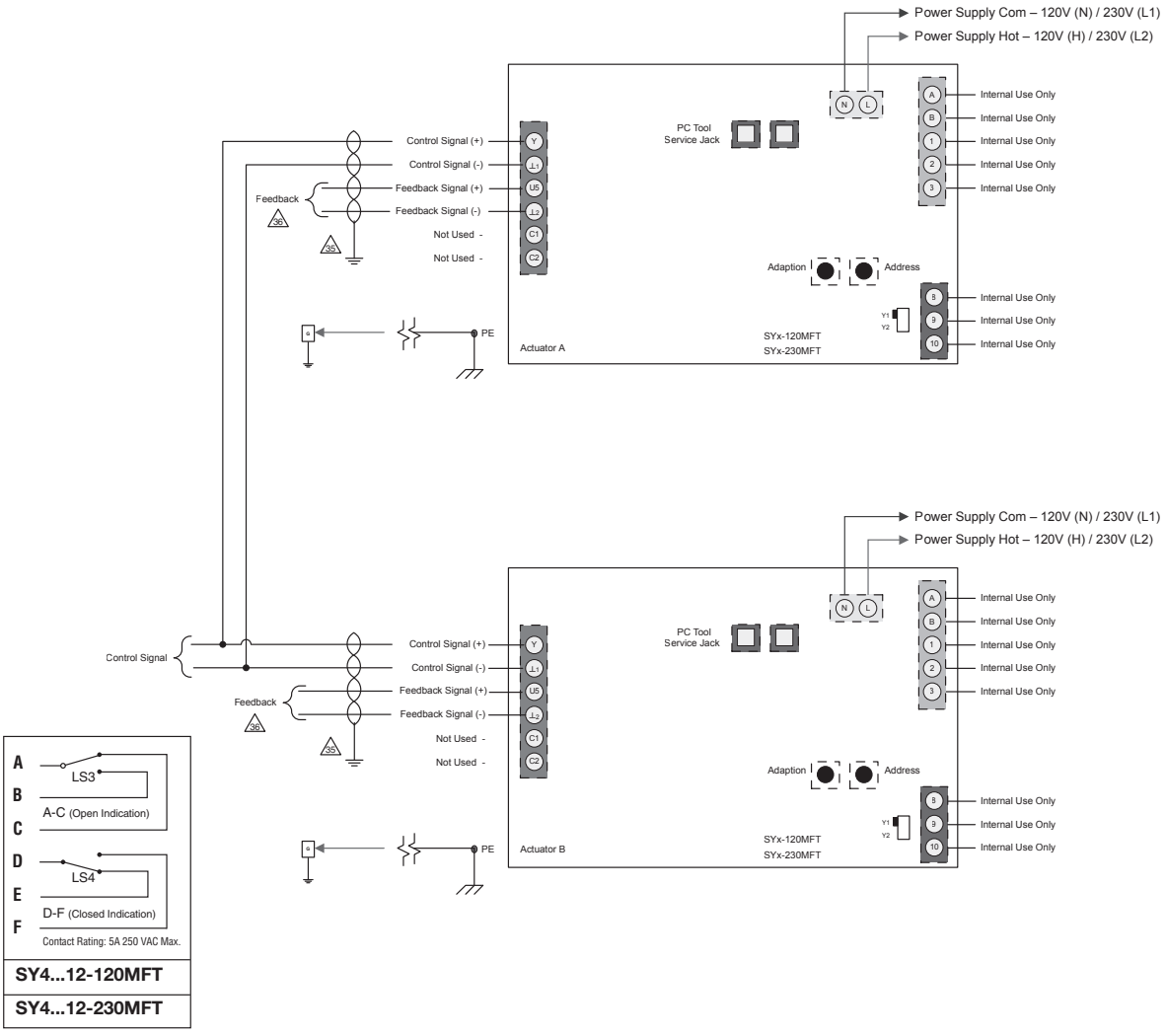
APPLICATION NOTES

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

36 Use of feedback is optional.

NOTES SY4...12-120 (230MFT)

- **Caution:** Power supply voltage.



Verify that Control Signal and Power are present at the actuator.

- Measure between Control Signal + and – and power + and – on control board. (See photo of control boards below for locations).
- Check fuses on both boards. If fuses are blown, replace before proceeding.

Verify that the green LED is lit on the control board – this indicates power is present.

If yes:

- Push the button labelled “Adaption”, hold for 3-5 seconds then release. (see left photo for 24V, right photo for 120V)
- The LED next to green LED should light up (amber in color)
- Actuator should click. Drive fully in one direction. It will stop there for 5-10 seconds. Click and drive fully in the opposite direction.
- The amber light should go out.

If the sequence does not happen as above, please have the tech make a note of what does happen.

Possibilities include

- Amber light goes on, actuator clicks but does not move at all.
- Amber light goes on, actuator clicks and drives in one direction, and clicks but does not drive in the other direction.
- Amber light does not light, and the actuator does nothing at all.

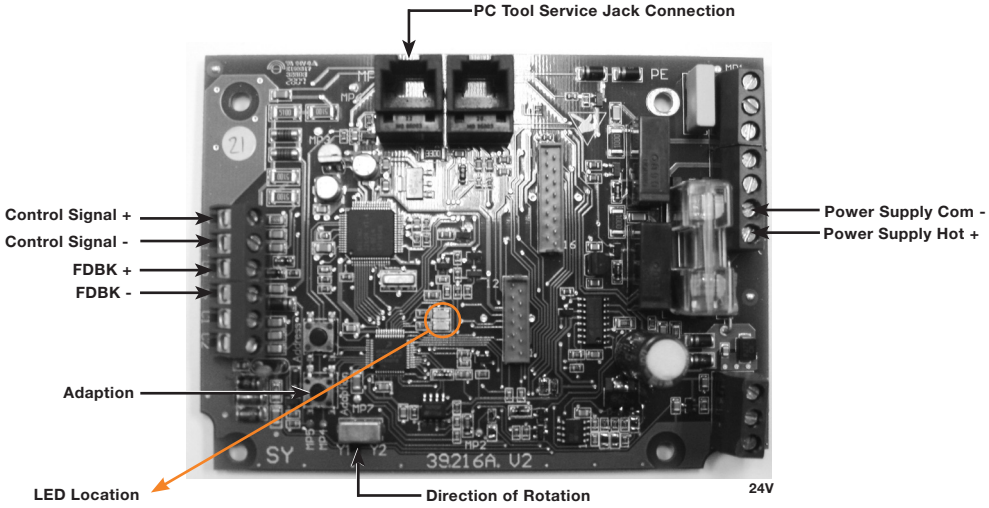
If something else occurs, please make a note and communicate to a Belimo Technical Support Representative as the actuator most likely will need to be replaced.

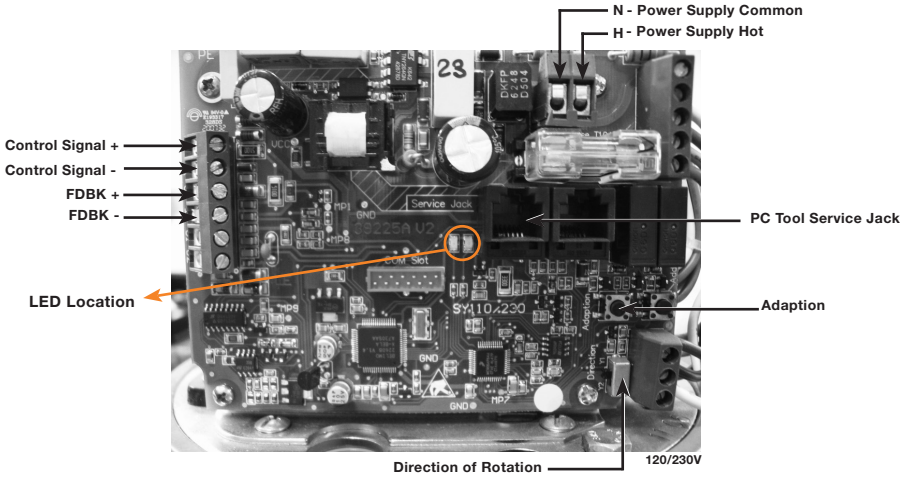
If the actuator adapts correctly:

1. Verify correct wiring of control signal (confirm correct polarity of field wiring and meter). Must have “Control +” and “Control –” and not share the “Control –” with the 24V common, or 120V Neutral (4 wires are required, 2 for power and 2 for Control Signal).
2. Provide a DC control signal other than minimum or maximum (suggest 6 VDC or 50% command).
3. Measure with DC voltmeter on “Control +” and “Control –” at actuator and verify that a voltage other than 0(2) or 10V is present on those terminals. If actuator does not drive to approximately the mid position and voltage is present, the actuator most likely will need to be replaced.

The following information is helpful to determine warranty coverage and additional steps that might need to be taken:

1. PO# or Belimo SO# or ID# (ID is located on actuator cover under the model #).
2. Is this a retrofit or was it factory assembled to a valve?
3. Has this actuator ever worked on this site (brand new install that did not work, or has been working correctly for a certain period of time).
4. Proper transformer sizing (see PGPL for current VA requirements).
5. Confirm correct wire size vs. length or run for SY actuators.





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