

SHP Series Actuators for Butterfly Valves

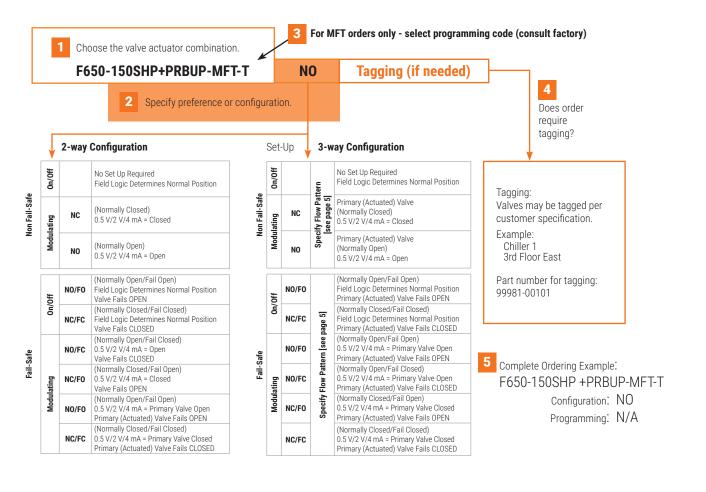




Butterfly Valve Nomenclature

F6	50	-150SHP	+PRB	UP	-MFT	-Т	
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" 350 = 14" 400 = 16" 450 = 18" 500 = 20" 600 = 24"	Trim Material -150SHP = ANSI Class 150, Stainless Disc, Steel Body, RPTFE Seat, 0% Leakage up to 285 psid -300SHP = ANSI Class 300, Stainless Disc, Steel Body, RPTFE Seat, 0% Leakage up to 600 psid	Actuator Type Non Fail-Safe GMB, GMX GRB, GRX GR/GM N4 PRB, PRX JRB, JRX SY Fail-Safe Electronic GKB, GKX GKN4 PKRB, PKRX Spring Return AFB, AFX AFRB, AFRX	Power Supply -24 = AC/DC 24 V -110 = AC 110/120 V -120 = AC 120 V -220 = AC 230 V UP = AC 24240 V or DC 24125 V	Control -3-X1 = On/Off, Floating Point -MFT or -MFT-X1 = Multi-Function Technology	-S = Built-in Auxiliary Switch N4 = NEMA 4X -T = Terminal Block	-200 = 8" -250 = 10"

Ordering Example



High Performance Butterfly Valve Product Range

2-way Valves				Suitable Actuators													
		Valve										Fail-	Safe				
		Nominal Size	Ту	pe		Non	Fail-	Safe			ring turn		Elect	ronic	;		
C _V	C _V 60°	IN	ANSI 150 2-way	ANSI 300 2-way		150	300		300		300		300	1	50	30	00
102	56	2	F650-150SHP	F650-300SHP	S			Si		s	S	s		s			
146	80	2½	F665-150SHP	F665-300SHP	Series	2		erie	S	Series	erie	erie		erie			
228	125	3	F680-150SHP	F680-300SHP	GM S	7		GM Series	erie	AF S	AF Series	GK Series	ries	GK Series	Series		
451	248	4	F6100-150SHP	F6100-300SHP	٠			٠	PR Series				PKR Series		Sel		
714	392	5	F6125-150SHP	F6125-300SHP					_				PKR		PKR		
1103	607	6	F6150-150SHP	F6150-300SHP		PR											
2064	1135	8	F6200-150SHP	F6200-300SHP					3								
3517	1934	10	F6250-150SHP	F6250-300SHP			2		rant					J			
4837	2660	12	F6300-150SHP	F6300-300SHP			rant		Year Warranty)								
6857	3592	14*	F6350-150SHP	F6350-300SHP			Nari		ear								
9287	4865	16*	F6400-150SHP				Year Warranty)		2								
11400	6270	18*	F6450-150SHP				2		SY								
14420	7590	20*	F6500-150SHP				SΥ										
22050	11550	24*	F6600-150SHP														

Note: C_V values listed for ANSI Class 150 Butterfly Valves. Please consult the technical documentation for ANSI Class 300 C_V values and configurations.

			3-way Valves			Suitable Actuators							
Valve Nominal Size		Туре		Non Fail-Safe				Electronic Fail-Safe					
C _V 90°	C _V 60°	Inches	ANSI 150 3-way	ANSI 300 3-way		150		300		50	30	00	
102	56	2	F750-150SHP	F750-300SHP	Si	s		s	s		<u>se</u>	s	
146	80	21/2	F765-150SHP	F765-300SHP	Series	JR Series	₩	erie	erie		GK Series	erie	
228	125	3	F780-150SHP	F780-300SHP	GM S			PR Series	GK Series	es	务	PK Series	
451	248	4	F7100-150SHP	F7100-300SHP						Series			
714	392	5	F7125-150SHP	F7125-300SHP		PR Series				¥			
1103	607	6	F7150-150SHP	F7150-300SHP		Sel		mty)					
2064	1135	8	F7200-150SHP	F7200-300SHP		4 2		eries Varra					
3517	1934	10	F7250-150SHP	F7250-300SHP		Series (2 Warranty		SY Series (2 Year Warranty)					
4837	2660	12	F7300-150SHP	F7300-300SHP		SY Series (2 Year Warranty)		(2 Y					
6857	3592	14*	F7350-150SHP			ς ×							

Note: C_V values listed for ANSI Class 150 Butterfly Valves. Please consult the technical documentation for ANSI Class 300 C_V values and configurations.



MODE OF OPERATION

High performance butterfly valves are designed for modulating and isolation service and feature a machined seat design and blow out proof solid shaft, providing better torque consistency, which offers longer actuator life and reduced risk of leakage. Available for a variety of high temperature and pressure ratings i.e., ASME/ANSI Class 300 or 150. Valve sizes range from 2...24 inches, with rangeabilities of 100:1, 0% leakage ratings, and a maximum valve velocity of 32 FPS.

PRODUCT FEATURES

Unique body seat and double offset disc design ensures positive valve sealing to help assure leak free performance in water applications while maintaining low seating torque.

ACTUATOR SPECIFICATIONS

Control type	on/off, floating point, modulating, 210 V, 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, (BTL certified), Modbus

VALVE SPECIFICATIONS

Fluid	chilled or hot water, up to 60% glycol max, steam to 50 psi
Flow characteristic	F6 modified equal percentage, unidirectional F7 modified linear, unidirectional
Sizes	224"
End fitting	ASME/ANSI Class 150 or 300
Materials	
Body	carbon steel full lug
Disc	316 stainless steel
Shaft	17-4 PH stainless
Seat	RTFE
Gland Seal	TFE
Bearings	glass backed PTFE
Body pressure rating	150 SHP: ASME/ANSI Class 150 300 SHP: ASME/ANSI Class 300
Fluid temperature range	-22+400°F [-30+204°C]
Close-off pressure	150 SHP: 285 psid 300 SHP: 600 psid max.
Maximum velocity	32 FPS
Leakage	0%

Double Dead End Service: Utilizes larger retainer ring set screws to allow the valve to be placed at the end of the line without a down stream flange in either flow direction while still holding full pressure.

The SHP series are Flowseal $\!\!\!^{\circledcirc}$ valves manufactured by the CRANE company.

800-543-9038 USA **866-805-7089** CANADA **905-712-3118** LATIN AMERICA

^{*}Call Customer Service at 1-800-543-9038 for product availability. Longer lead times may apply.

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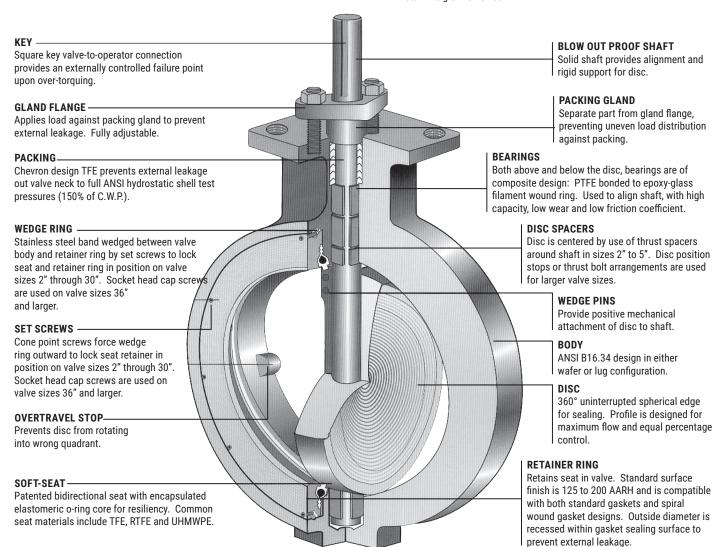
SHP... Series High Performance Butterfly Valves



Belimo SHP... Series Butterfly Valves are designed for use in ANSI Class 150 and ANSI Class 300 piping systems and are supplied in standard lug style body designs.

Valve Design Features

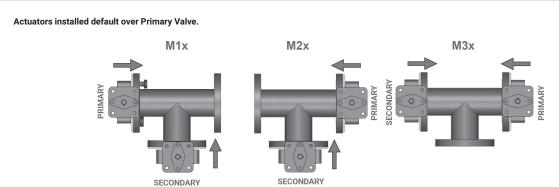
- Unique seat and disc design provides Bi-Directional bubble tight shutoff at rated pressure/temperatures
- The Soft Seat design creates a self-energized seal in vacuum-to-low pressure applications
- Under high pressure conditions, the seat is also designed to permit, confine and direct movement of the seat against the disc edge, up to the full ANSI Class 150 or 300 Cold Working Pressures
- The Soft Seat is designed for high services with minimal wear and low torque
- Seat replacement is a simple operation, requiring no special tools
- Valve Body is Full Lug type cast in Carbon Steel
- Disc is cast in CF8M Stainless Steel
- · Shaft is 17-4pH Stainless for superior strength
- · Soft Seat is RPTFE for increased wear resistance and low torque
- Top Mounted Gland Flange easily accessible without removing actuator or mounting brackets
- Double Dead End Service: Utilizes larger retainer ring set screws to allow the valve to be placed at the end of the line without a down stream flange in either flow direction while still holding full pressure.
- · Metal ID tag on valve neck





MIXING

SHP Series Valves are Flow Direction Specific.



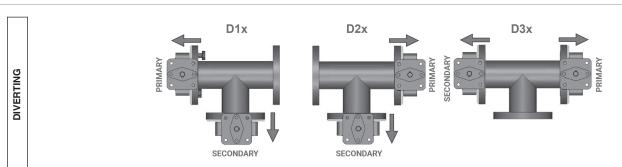
CONFIG CODE	ON/OFF OR MOD@2VDC PRIMARY VALVE IS	PRIMARY VALVE @ FAIL
M10	OPEN	FAIL IN PLACE
M11	OPEN	OPEN
M12	OPEN	CLOSED
M13	CLOSED	FAIL IN PLACE
M14	CLOSED	OPEN
M15	CLOSED	CLOSED

CONFIG CODE	ON/OFF OR MOD@2VDC PRIMARY VALVE IS	PRIMARY VALVE @ FAIL
M20	OPEN	FAIL IN PLACE
M21	OPEN	OPEN
M22	OPEN	CLOSED
M23	CLOSED	FAIL IN PLACE
M24	CLOSED	OPEN
M25	CLOSED	CLOSED

	CONFIG CODE	ON/OFF OR MOD@2VDC PRIMARY VALVE IS	PRIMARY VALVE @ FAIL
ĺ	M30	OPEN	FAIL IN PLACE
	M31	OPEN	OPEN
ĺ	M32	OPEN	CLOSED
	M33	CLOSED	FAIL IN PLACE
	M34	CLOSED	OPEN
	M35	CLOSED	CLOSED

Notes:

- 1. Secondary Valve operates inversely of the Primary Valve.
- 2. The Primary Valve is always located on the run.
- 3. The Secondary 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 Belimo Assistant app.
- 6. All 3-way assemblies are designed for 90 degree actuator rotation.



CONFIG CODE	ON/OFF OR MOD@2VDC PRIMARY VALVE IS	PRIMARY VALVE @ FAIL
D10	OPEN	FAIL IN PLACE
D11	OPEN	OPEN
D12	OPEN	CLOSED
D13	CLOSED	FAIL IN PLACE
D14	CLOSED	OPEN
D15	CLOSED	CLOSED

CONFIG CODE	ON/OFF OR MOD@2VDC PRIMARY VALVE IS	PRIMARY VALVE @ FAIL
D20	OPEN	FAIL IN PLACE
D21	OPEN	OPEN
D22	OPEN	CLOSED
D23	CLOSED	FAIL IN PLACE
D24	CLOSED	OPEN
D25	CLOSED	CLOSED

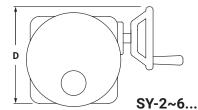
CONFIG CODE	ON/OFF OR MOD@2VDC PRIMARY VALVE IS	PRIMARY VALVE @ FAIL
D30	OPEN	FAIL IN PLACE
D31	OPEN	OPEN
D32	OPEN	CLOSED
D33	CLOSED	FAIL IN PLACE
D34	CLOSED	OPEN
D35	CLOSED	CLOSED

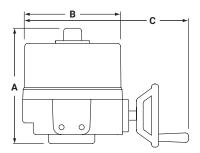
Notes:

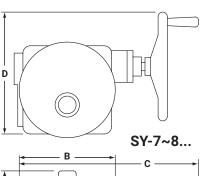
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- 2. The Primary Valve is always located on the run.
- 3. The Secondary Valve may also have an actuator if required (Direct Coupled).
- 4. On/Off actuator normal position is a function of field logic.
- 5. Modulating actuator normal position (i.e., fully CW or fully CCW) is set by the direction control switch, PC-Tool or field programming via Belimo Assistant app.
- 6. All 3-way assemblies are designed for 90 degree actuator rotation.

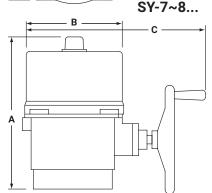
SY... Series Non-Spring Return Actuator Dimensions

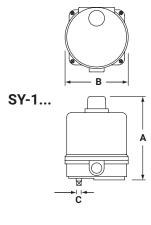


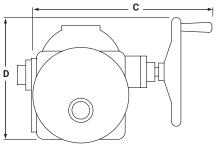


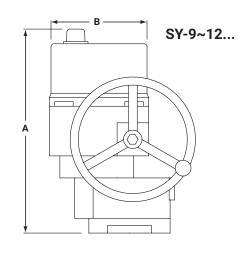












MODEL	DIM A (MAX)	Add to Dim A for cover removal	DIM B	DIM C (MAX)	DIM D
	Inches [mm]	Inches [mm]	Inches [mm]	Inches [mm]	Inches [mm]
SY4~6	12.40 [315]	8.86 [225]	9.21 [234]	14.96 [380]	11.81 [300]
SY7~8	16.54 [420]	8.86 [225]	9.21 [234]	17.72 [450]	13.39 [340]
SY9~12	23.23 [590]	8.86 [225]	10.24 [260]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

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



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			0	ΑV	77	;								
		current	wire gauge	18	16	14	12	10	8				current	wire gauge
									<u> </u>		SY1	[A]	2.0	
SY1	[A]	1.6		26	153	244	387	616	086		SY2	[A]	1.2	
											SY3	[A]	1.2	
SY2	[A]	3.4	MA	45	72	115	182	290	461		SY4	[A]	2.1	
			XX distance be								SY5	[A]	2	MAX distar
SY3	[A]	3.1	MAX distance between actuator and supply [feet	20	79	126	200	318	206		SY6	[A]	2.4	nce between actuator and supply ffee
			or and supply								SY7	[A]	4.2	ctuator and s
SY4	[A]	9.4	[feet]		26	42	99	105	167		SY8	[A]	4.2	upply [feet]
											SY9	[A]	3	
0,											SY10	[A]	3.2	
SY5	[A]	8.9			28	44	70	111	176		SY11	[A]	3.6	
										1	SY12	[A]	3.8	

SY12	[A]	3.8		203	322	514	816	1,298	2,064
SY11	[A]	3.6		215	340	542	861	1,370	2,179
01YS	[A]	3.2		241	283	610	696	1,541	2,451
6AS	[A]	3		257	408	651	1,033	1,644	2,614
SY8	[A]	4.2	upply [feet]	184	292	465	738	1,174	1,867
2AS	[A]	4.2	etuator and s	184	267	465	738	1,174	1,867
9AS	[A]	2.4	ice between a	322	210	813	1,292	2,054	3,268
SY5	[A]	2	MAX distar	386	613	976	1,550	2,465	3,922
8Y4	[A]	2.1		368	283	929	1,476	2,348	3,735
SY3	[A]	1.2		644	1,021	1,626	2,583	4,109	6,536
SY2	[A]	1.2		644	1,021	1,626	2,583	4,109	982'9
SY1	[A]	2.0		1,103	1,750	2,788	4,428	7,044	11,204
		current	wire gauge	18	16	14	12	10	8
			(DΑV	50	L			

SY12	[A]	2.5		592	686	1,496	2,377	3,780	6,013	
SY11	[A]	2.7		548	870	1,385	2,201	3,500	5,568	
SY10	[V]	5.6		699	806	1,439	2,285	3,635	5,782	
8Y9	[A]	2.5		592	636	1,496	2,377	3,780	6,013	
SY8	[A]	2	upply [feet]	740	1,174	1,870	2,971	4,725	7,516	
SY7	[A]	2	ctuator and supply [feet	740	1,174	1,870	2,971	4,725	7,516	
SY6	[A]	1.1	MAX distance between a	1,346	2,135	3,401	5,401	8,591	13,666	
SY5	[A]	1	MAX distan	1,480	2,348	3,741	5,942	9,450	15,033	
SY4	[A]	1.1		1,346	2,135	3,401	5,401	8,591	13,666	
SY3	[A]	9.0		2,467	3,914	6,234	6,903	15,751	25,054	
SY2	[A]	9.0		2,467	3,914	6,234	6,903	15,751	25,054	
SY1	[A]	0.4		3,701	5,871	9,352	14,854	23,626	37,581	
		current	wire gauge	18	16	14	12	10	8	

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.

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



SY5	[A]	6.8			28	44	70	111	176
SY4	[A]	9.4	pply [feet]		26	42	99	105	167
SY3	[A]	3.1	ance between actuator and su	20	62	126	200	318	206
SY2	[A]	3.4	MAX dista	45	72	115	182	290	461
SY1	[A]	2.8		55	88	139	221	352	560
		current	wire gauge	18	16	14	12	10	8
			0	ΑV	77	;			

SY12	[A]	4.5		172	272	434	689	1,096	1,743
SY11	[A]	4.3		180	285	454	721	1,147	1,824
SY10	[A]	3		257	408	651	1,033	1,644	2,614
SY9	[V]	2.7		786	424	723	1,148	1,826	2,905
SY8	[A]	2.8	upply [feet]	276	438	269	1,107	1,761	2,801
SY7	[A]	2	ctuator and s	386	613	926	1,550	2,465	3,922
SY6	[A]	2	MAX distance between a	386	613	926	1,550	2,465	3,922
SY5	[A]	1.9	MAX distar	407	645	1,027	1,632	2,595	4,128
SY4	[∀]	1.2		898	283	676	1,476	2,348	3,735
SY3	[∀]	2.0		1,103	1,750	2,788	4,428	7,044	11,204
SY2	[A]	8.0		996	1,531	2,440	3,875	6,163	9,804
SY1	[∀]	9.0		1,287	2,042	3,253	2,167	8,218	13,072
		current	wire gauge	18	16	14	12	10	8
			0	ΑV	50	L			

SY1 SY2 SY3 SY4	[A] [A] [A]	current 0.4 0.4 0.4	wire gauge	18 3,701 3,701 3,701	16 5,871 5,871 5,871	14 9,352 9,352 9,352	12 14,854 14,854 14,854	10 23,626 23,626 23,626	8 37,581 37,581 37,581
SY2 SY3		0.4		3,701	5,871	9,352	14,854	23,626	37,581
SY3	[A]								
		0.4		3,701	5,871	9,352	14,854	23,626	37,581
SY4	[A]								
	[A]	1.1		1,346	2,135	3,401	5,401	8,591	13,666
SY5	[A]	1	MAX distar	1,480	2,348	3,741	5,942	9,450	15,033
SY6	[A]	_	MAX distance between a	1,480	2,348	3,741	5,942	9,450	15,033
SY7	[A]	1.2	actuator and supply [feet]	1,234	1,957	3,117	4,951	7,875	12,527
SY8	[A]	1.6	supply [feet]	925	1,468	2,338	3,713	906′9	6,395
SY9	[A]	1.1		1,346	2,135	3,401	5,401	8,591	13,666
SY10	[A]	1.4		1,057	1,677	2,672	4,244	6,750	10,738
SY11	[A]	2.2		673	1,067	1,700	2,701	4,296	6,833
SY12	[A]	2.5		265	686	1,496	2,377	3,780	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.

Tech.Doc - 03/22 - Subject to change. © Belimo Aircontrols (USA), Inc.



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

SIZE	4 FPS	8 FPS	12 FPS	16 FPS	20 FPS	24 FPS	28 FPS	32 FPS
2"	39	78	118	157	196	235	274	313
2½"	61	122	184	245	306	367	428	490
3"	88	176	264	353	441	529	617	705
4"	157	313	470	627	783	940	1097	1253
5"	245	490	734	979	1224	1469	1714	1958
6"	352	705	1058	1410	1763	2115	2468	2820
8"	627	1253	1880	2507	3133	3760	4387	5013
10"	979	1958	2738	3917	4896	5875	6854	7834
12"	1410	2820	4230	5640	7050	8460	9870	11280
14"	1919	3838	5758	7677	9596	11515	13435	15354
16"	2507	5013	7520	10027	12534	15040	17547	20054
18"	3173	6345	9518	12690	15863	19036	22208	25381
20"	3917	7834	11750	15667	19584	23501	27418	31334
24"	5640	11280	16921	22561	28201	33841	39481	45121

It is not recommended to exceed 32 feet per second through high performance butterfly valves. Velocities greater than 32 fps may damage the valve.

Max GPM = Maximum US gallons of water (gpm) per minute, at room temperature that will flow through the fully 90° open valve without exceeding design velocity limits.

Power Supply AC/DC 24 V Single Phase

Model #	Torque	Current Draw (60 Hz)	VA (60 Hz)	Override
JRBUP-3-T	800 in-lb / 90 Nm	0.8 A	20	Manual override crank
JRXUP-3-T	800 in-lb / 90 Nm	0.8 A	20	Manual override crank
PRBUP-3-T*	1400 in-lb / 160 Nm	0.8 A	20	Manual override crank
PRXUP-3-T*	1400 in-lb / 160 Nm	0.8 A	20	Manual override crank
SY4-24	3540 in-lb / 400 Nm	9.4 A	226	Hand wheel
SY5-24	4430 in-lb / 500 Nm	8.9 A	214	Hand wheel

Power Supply AC 120 V Single Phase

Model #	Torque	Current Draw (60 Hz)	VA (60 Hz)	Override
JRBUP-3-T	800 in-lb / 90 Nm	0.2 A	23	Manual override crank
JRXUP-3-T	800 in-lb / 90 Nm	0.2 A	23	Manual override crank
PRBUP-3-T*	1400 in-lb / 160 Nm	0.2 A	23	Manual override crank
PRXUP-3-T*	1400 in-lb / 160 Nm	0.2 A	23	Manual override crank
SY4-110	3540 in-lb / 400 Nm	2.1 A	252	Hand wheel
SY5-110	4430 in-lb / 500 Nm	2 A	240	Hand wheel
SY6-110	5750 in-lb / 650 Nm	2.4 A	288	Hand wheel
SY7-110	8850 in-lb / 1000 Nm	4.2 A	504	Hand wheel
SY8-110	13280 in-lb / 1500 Nm	4.2 A	504	Hand wheel
SY9-110	17700 in-lb / 2000 Nm	3 A	360	Hand wheel
SY10-110	22130 in-lb / 2500 Nm	3.2 A	384	Hand wheel
SY11-110	26550 in-lb / 3000 Nm	3.6 A	432	Hand wheel
SY12-110	30980 in-lb / 3500 Nm	3.8 A	456	Hand wheel

Power Supply AC 230 V Single Phase

Model #	Torque	Current Draw (60 Hz)	VA (60 Hz)	Override
JRBUP-3-T	800 in-lb / 90 Nm	0.2 A	52	Manual override crank
JRXUP-3-T	800 in-lb / 90 Nm	0.2 A	52	Manual override crank
PRBUP-3-T*	1400 in-lb / 160 Nm	0.2 A	52	Manual override crank
PRXUP-3-T*	1400 in-lb / 160 Nm	0.2 A	52	Manual override crank
SY4-220	3540 in-lb / 400 Nm	1.1 A	253	Hand wheel

Butterfly Valve Actuators



Power Supply AC/DC 24 V Single Phase

Model #	Torque	Current Draw (60 Hz)	VA (60 Hz)	Override
JRBUP-MFT-T	800 in-lb / 90 Nm	0.9 A	20	Manual override crank
JRXUP-MFT-T	800 in-lb / 90 Nm	0.9 A	20	Manual override crank
PRBUP-MFT-T*	1400 in-lb / 160 Nm	0.9 A	20	Manual override crank
PRXUP-MFT-T*	1400 in-lb / 160 Nm	0.9 A	20	Manual override crank
PKRXUP-MFT-T*	1400 in-lb / 160 Nm	2.2 A	55	Manual override crank
SY4-24MFT	3540 in-lb / 400 Nm	9.4 A	226	Hand wheel
SY5-24MFT	4430 in-lb / 500 Nm	8.9 A	214	Hand wheel

Power Supply AC 120 V Single Phase

Model #	Torque	Current Draw (60 Hz)	VA (60 Hz)	Override	
JRBUP-MFT-T	800 in-lb / 90 Nm	0.2 A	23	Manual override crank	
JRXUP-MFT-T	800 in-lb / 90 Nm	0.2 A	23	Manual override crank	
PRBUP-MFT-T*	1400 in-lb / 160 Nm	0.2 A	23	Manual override crank	
PRXUP-MFT-T*	1400 in-lb / 160 Nm	0.2 A	23	Manual override crank	
PKRXUP-MFT-T*	1400 in-lb / 160 Nm	0.3 A	43	Manual override crank	
SY4-120MFT	3540 in-lb / 400 Nm	2.1 A	252	Hand wheel	
SY5-120MFT	4430 in-lb / 500 Nm	1.9 A	228	Hand wheel	
SY6-120MFT	5750 in-lb / 650 Nm	2 A	240	Hand wheel	
SY7-120MFT	8850 in-lb / 1000 Nm	2 A	240	Hand wheel	
SY8-120MFT	13280 in-lb / 1500 Nm	2.8 A	336	Hand wheel	
SY9-120MFT	17700 in-lb / 2000 Nm	2.7 A	324	Hand wheel	
SY10-120MFT	22130 in-lb / 2500 Nm	3 A	360	Hand wheel	
SY11-120MFT	26550 in-lb / 3000 Nm	4.3 A	516	Hand wheel	
SY12-120MFT	30980 in-lb / 3500 Nm	4.5 A	540	Hand wheel	

Power Supply AC 230 V Single Phase

Model #	Torque	Current Draw (60 Hz)	VA (60 Hz)	Override
JRBUP-MFT-T	800 in-lb / 90 Nm	0.1 A	52	Manual override crank
JRXUP-MFT-T	800 in-lb / 90 Nm	0.1 A	52	Manual override crank
PRBUP-MFT-T*	1400 in-lb / 160 Nm	0.1 A	52	Manual override crank
PRXUP-MFT-T*	1400 in-lb / 160 Nm	0.1 A	52	Manual override crank
PKRXUP-MFT-T*	1400 in-lb / 160 Nm	0.2 A	68	Manual override crank
SY4-230MFT	3540 in-lb / 400 Nm	1.1 A	253	Hand wheel
SY7-230MFT	8850 in-lb / 1000 Nm	1.2 A	276	Hand wheel
SY9-230MFT	17700 in-lb / 2000 Nm	1.1 A	253	Hand wheel
SY12-230MFT	30980 in-lb / 3500 Nm	2.5 A	575	Hand wheel

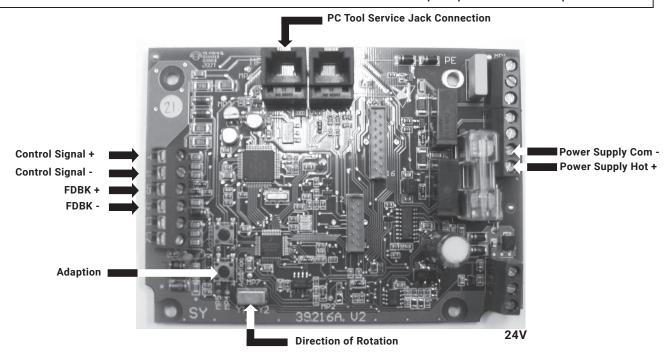


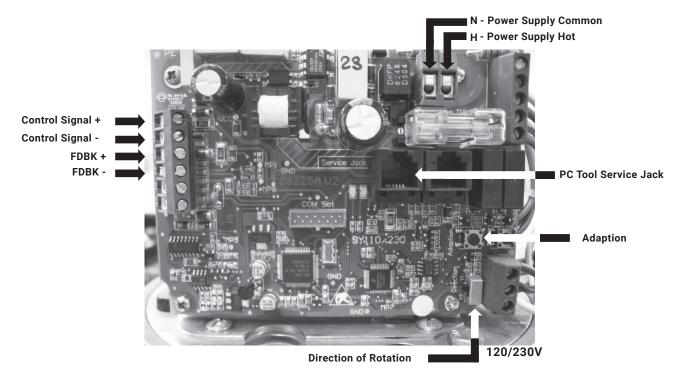
Actuators: SYx-MFT



Notes:

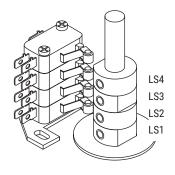
- 1. Motor CAMS have been factory calibrated and should not be moved.
- 2. An adaption must be performed if any limit switch is adjusted. This will calibrate the beginning and end stopping points. Press the adaption button for 3 seconds and release.
- 3. New SY actuators must have an adaption performed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



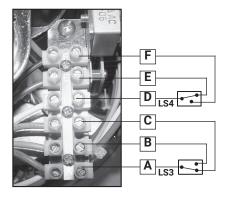


CAUTION Electrical Travel Adjustment

SY4-12



WARNING





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

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



"CLOSE"

Clockwise Decrease Closed Angle

Counter-clockwise Increase Closed Angle



Clockwise Increase Opening Angle

Counter-clockwise Decrease Opening Angle

Switches at left are shown with actuator fully open.

0)°	3°			87°	90°
LS3			A - B			A - C
0)°	3°			87°	90°
LS4	D-F			D - E		

- 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

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



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.



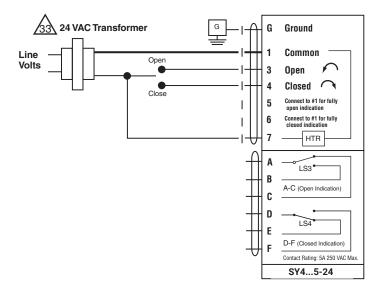
Observe class 1 and class 2 wiring restrictions.

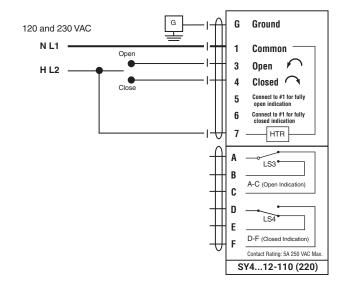
Transformer sizing = SY actuator draw X 1.25 (safety margin) (Ex. SY2-24 requires $3.0A \times 1.25 = 3.75A$, $3.75A \times 24 \text{ VAC} = 90\text{VA Transformer}$).



/!\ 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

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.

24 VAC Transformer Actuator B G Ground Common **K1** 3 Open Closed 5 HTR LS3° A-C (Open Indi D 1.54 D-F (Closed India SY4...5-24 Ground Open Closed HTR A-C (Open Indication) Contact Rating: 5A 250 VAC Ma SY4...5-24

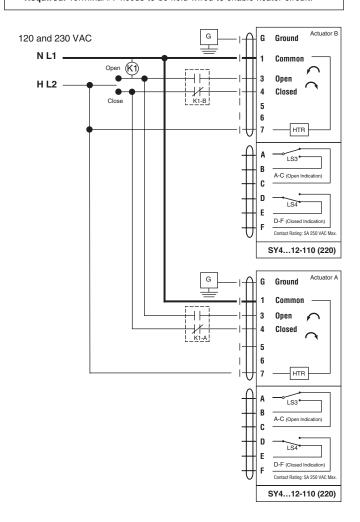
INSTALLATION NOTES

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.





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

Hazard Identification

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

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.



Tech. Doc - 03/22 - Subject to change. @ Belimo Aircontrols (USA), Inc.

NOTES SY4...5-24MFT

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

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



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)



APPLICATION NOTES



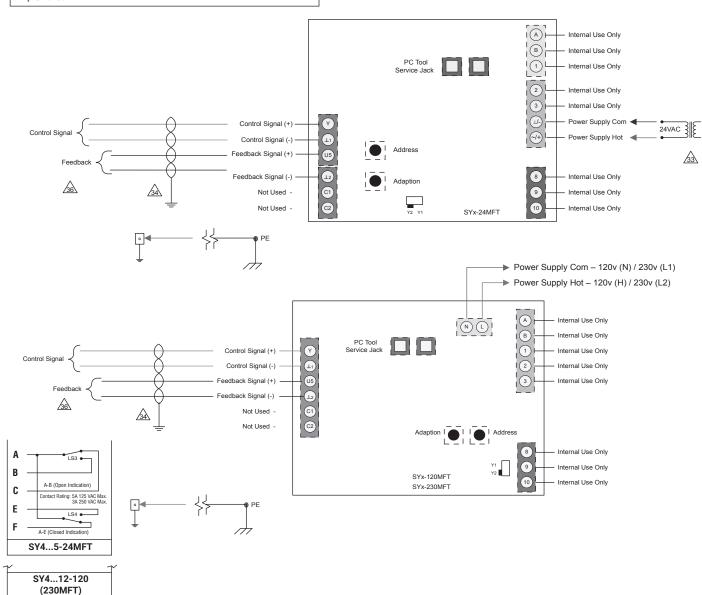
Ground shielded wire at control panel chassis. Tape back ground at actuator.

Use of feedback is optional.



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

· Caution: Power supply voltage.



Actuators: SY4...5-24MFT

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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.



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

 $\overline{\wedge}$

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



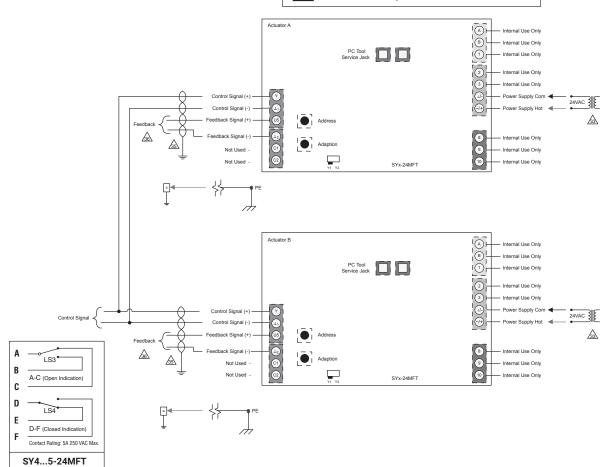
APPLICATION NOTES

35

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



Use of feedback is optional.



Actuators: 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.



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.

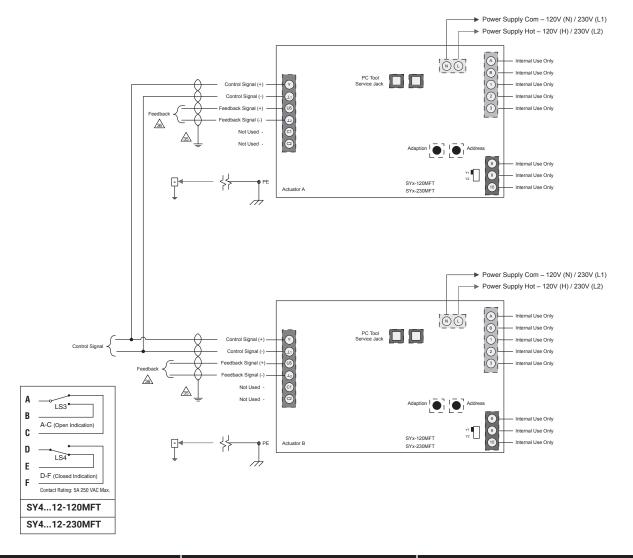


Use of feedback is optional.



/!\ NOTES SY4...12-120 (230MFT)

· Caution: Power supply voltage.



Tech.Doc - 03/22 - Subject to change. © Belimo Aircontrols (USA), Inc.

Installation Recommendations SHP Series Butterfly Valves



Valve Design

- 1. The SHP Series High Performance Butterfly Valve features a double offset (or, double eccentric) shaft design to minimize seat abrasion and lower torque. This double offset design allows the disc to lift off and "cam" away from the seat as it rotates open.
- The SHP valve always rotates clockwise to close (when viewed from above) and counterclockwise to open.
- 3. The valve body has an Overtravel Stop which prevents the disc from over rotating into the wrong quadrant. This stop is not to be used as a disc position stop; if the disc contacts the Overtravel Stop, this means it has rotated beyond the seat.
- 4. The SHP valve is bidirectional, but the preferred installation position is with the seat in the upstream position (SUS). Note the arrow on the metal tag attached to the valve body.

Safety Precautions

- 1. Be sure the line is depressurized and drained.
- Be sure of the pipeline media. Proper care should be taken for protection against toxic and/or flammable fluids.
- 3. Never install the valve without an Operator (Manual or Automatic) already attached to the valve shaft.
- Never remove the Operator from the valve while the valve is in the pipeline under pressure.
- Always be sure that the disc is in the full-closed position before installing the valve.
- Take care in handling the valve. Treat this valve as a piece of machinery.

Flange Compatibility

The SHP valve is designed to fit between flanges as follows:

ANSI Class 150	2" to 24"
MSS SP-44 Class 150	30" to 48"
ANSI B16.47 Class 150 A Flanges	
ANSI Class 300	2" to 24"
MSS SP-44 Class 300	30"
ANSI B16.47 Class 200 A Flanges	

Gasket Compatibility

The SHP valve is designed to accommodate the use of standard fiber gaskets (such as non-asbestos, flexible graphite, asbestos or equivalent gasket materials) of 1/16" or less, meeting the dimensional requirements of ANSI B16.21-1978. Thick elastomeric gaskets are not recommended. Metallic wound (Flexitallic) gaskets may also be used.

Pipe Schedule Compatibility

The SHP valve is designed to allow the disc edge to rotate into the open position without interference with the pipeline I.D. in the following pipe schedules:

SIZE	ANSI 150	ANSI 300
2" - 12"	SCH 80	SCH 80
14" - 24"	SCH 40	SCH 80
30"	SCH 30	SCH 80
36" - 42"	STD WT	
48"	XS	

Product Identification

- Every SHP valve has a metal identification tag attached to the valve body. Information includes the Figure Number, the Size and Pressure Class, the Materials of Construction, and the Operating Pressures and Temperatures.
- 2. Every SHP valve is hydrostatically tested before it is shipped. The metal tag also includes a Serial Number; this number, unique for each valve, is recorded by the Belimo Quality Control Department along with the test results and material certification data, for individual traceability and verification of every valve produced.



UNPACKING AND STORAGE INSTRUCTIONS

- Check the packing list against the valve received to verify that the quantities, sizes and materials are correct.
- Check to make sure that the valve and operator were not damaged during shipment.
- If the valve is to be stored before being installed, it should be protected from harsh environmental conditions.
- 4. Store the valve with the disc in the closed position to protect the sealing edge and the seat.
- Keep the valve in a clean location, away from dirt, debris and corrosive materials.
- 6. Keep the valve in a dry area with the flange protectors attached.
- 7. Keep the valve in a cool location if possible, out of direct sunlight.
- 8. If not in use, exercise the butterfly valve (full open and close) at least once a month.





SHP Series Butterfly Valves

Storage of Butterfly Valve Assemblies

- Assemblies must be stored indoors, protected from the elements.
- Materials received on job sites that have long installation lead times should receive extra protection from construction damage.
- Valve faces must be protected from abrasion, cutting and nicking, as this will damage the face and may cause flange area leaks.
- Electric actuators cannot be stored in wet, damp or caustic areas.
- Do not store construction material on top of valve assemblies.

Installation Practices

- SHP series butterfly valves are designed to be installed between ANSI 125/150 flat-faced or raised face, slip-on weld neck flanges.
- Valve should be installed a minimum of 6 pipe diameters from upstream or downstream elbows, strainers, pumps, etc.
- For chilled water, condenser water or hot water applications, the valve should be installed with the stem in a vertical orientation, with the actuator mounted above the valve.
- For applications in which there is a possibility of sediment in the flow, the valve should be installed with the stem in a horizontal position and the bottom of the disc should close FROM the downstream side, rather than from the upstream side.
- Flange gaskets must be used on SHP series BF valves.
- Make sure the flange faces are clean and free of rust, scale and debris to prevent damage to the flange gasket.
- Follow the recommended flange bolting sequence found in the "Installation Recommendations" section of this guide.

Installation using Welded Flanges

- Mount flanges on both sides of valve body and install bolts to properly align valve body and both flanges.
- Make sure the valve I.D. and flange internal diameters are in alignment.
- Take valve body / flange pair assembly and align with piping ends.
- TACK weld the flanges to the piping in several places.
 Do NOT seam weld at this time!
- Remove the lug bolts and carefully remove the valve body from the flanges.
- Seam weld the entire flange / piping connection for both flanges.
- Let the piping components cool completely before re-inserting the valve body.
- WARNING! Seam welding with the valve body installed between the flanges can damage the valve seats due to heat migration through the flange to the valve body.

Butterfly Sizing and Selection

CONSULT CHART ON PAGE 9

(Flow in Standard Weight Pipe-Fluid Velocity in GPM).

For SHP Series Butterfly Valves, the 32 ft/second column is applied.

For example: Application requires a 2-way, 600 GPM Butterfly valve, a valve of 3" minimum would be selected. The 3" valve at 32 ft/second would be able to withstand a capacity of 705 GPM, without damage to the seat.

Notes

- Most Butterflies are line size and piping geometry is not considered. If valve size must be reduced, a recommendation is to select a valve only one size less than the pipe. (Do not exceed velocity limit)
- 2. For a modulating Butterfly valve, the Cv rating is determined at 60° open. For a 2-position Butterfly valve, the Cv is determined at 90° open.

Consult Belimo Technical Support for applications involving steam, high velocity requirements, etc.

Installation Recommendations SHP Series Butterfly Valves

BELIMO

Pre-Installation Procedure

- 1. Remove the protective face covers from the valve.
- Inspect the valve to be certain the waterway is free from dirt and foreign matter. Be certain the adjoining pipeline is free from any foreign material such as rust and pipe scale or welding slag that could damage the seat and disc sealing surfaces.
- 3. Actuators should be mounted on the valve prior to installation to facilitate proper alignment of the disc in the valve seat.
- 4. The valve should be in the closed position. Make sure the open and closed positions of the actuator correspond to the counterclockwise to open direction of rotation of the valve.
- Cycle the valve to the fully open position, then back to the fully closed position, checking the actuator travel stop settings for proper disc alignment.
- 6. Check the valve identification tag for valve class, materials, and operating pressure to be sure they are correct for the application.

WARNING! Personal injury or property damage may result if the valve is installed where service conditions could exceed the valve ratings.

7. Check the flange bolts or studs for proper size, threading, and length.

REMEMBER: Install the valve with the disc in the full-closed position using the appropriate flange gaskets on BOTH valve flange faces.

Valve Installation Procedure

The SHP High Performance Butterfly Valve can be installed in the pipeline with the shaft in the vertical, horizontal, or other intermediate position. Based on applications experience, however, in media with concentrations of solid or abrasive particles or media subject to solidification buildup, valve performance and service life will be enhanced by mounting the valve with the shaft in the horizontal position.

All SHP valves are bidirectional and can be mounted in the pipeline in either flow direction; however, the preferred flow direction for all seat styles and materials is with the seat retainer ring located upstream (sus) to provide maximum seat protection.

For SHP Series valves

- a. Noting the flow direction arrow on the tag, place the valve between the flanges, making sure the arrow on the tag points in the direction of the flow.
- Install the lower flange bolts loosely, leaving space for the flange gaskets.
- c. After inserting the flange gaskets, install the remaining bolts.
- 3. Using the sequence shown to the right, tighten the flange bolts evenly to assure uniform gasket compression.

CAUTION: The SHP valve should be centered between the flanges and gaskets to prevent damage to the disc edge and shaft as a result of the disc striking the flange, gasket, or pipe.

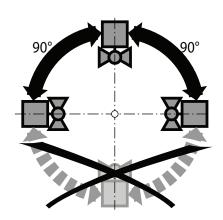
- 4. Electricity should be connected to the unit as specified by the actuator manufacturer.
- 5. The valve is now ready for operation.

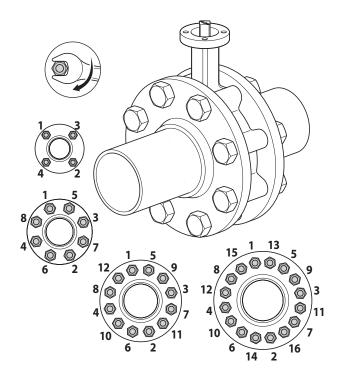
Safety Notes

WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to www.P65Warnings.ca.gov

NOTE Actuator must be mounted at or above pipe center line for

all actuator types.



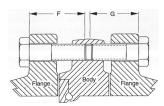




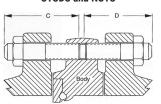
FLANGE BOLTING RECOMMENDATIONS

Lug Valves, 2"- 30", ANSI 125/150 Bolt Pattern										
			STUDS	& NUTS		MACHINE BOLTS				
Valve Size	Thread Size	C QTY	LENGTH	D QТҮ	LENGTH	F QTY	LENGTH	G QTY	LENGTH	
2"	5/8-11	4	2.50	4	2.50	4	1.63	4	1.63	
2-1/2"	5/8-11	4	2.75	4	2.75	4	1.85	4	1.85	
3"	5/8-11	4	3.25	4	2.50	4	2.25	4	1.63	
4"	5/8-11	8	3.00	8	2.75	8	2.12	8	1.88	
5"	3/4-10	8	3.00	8	3.00	8	2.00	8	2.00	
6"	3/4-10	8	3.50	8	3.00	8	2.50	8	1.88	
8"	3/4-10	8	3.75	8	3.25	8	2.70	8	2.13	
10"	7/8-9	12	4.25	12	3.50	12	3.00	12	2.25	
12"	7/8-9	12	4.75	12	3.50	12	3.45	12	2.35	
14"	1-8	12	5.00	12	4.00	12	3.75	12	2.70	
16"	1-8	16	5.50	16	4.25	16	4.12	16	2.75	
18"	1-1/8-8	16	5.75	16	4.75	16	4.38	16	3.25	
20"	1-1/8-8	16	6.75	16	4.75	16	5.12	16	3.25	
20	1-1/8-8	4**	5.50	4**	4.75	4*	4.12	4**	3.25	
24"	1-1/4-8	20	7.25	20	5.75	20	5.63	20	4.25	
30"	1-1/4-8	24	7.75	24	7.75	24	6.25	24	6.25	
30	1-1/4-8	4**	6.50	4**	6.25	4*	5.00	4**	4.63	

LUG BODY HEX HEAD MACHINE BOLTS



LUG BODY STUDS and NUTS



Bolting and torque recommendations are made without warranty, and apply only to steel weld-neck or slip-on flanges.

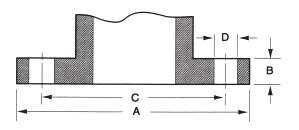
The use of lock washers and/or lubrication with the bolting will affect stated torque values.

Length of machine bolts based on:

- 1. Gasket thickness of 0.06 inches.
- 2. Minimum flange thickness of weld-neck flanges per ANSI B16.5 and B16.47 Series A.
- * Variation to specified bolting length may result in improper installation.

FLANGE BOLTING RECOMMENDATIONS

Flange Detail for ANSI 150 B16.5 Pipe Flanges 150 SHP Series Butterfly Valves										
	FLAN	NGES	DRIL	LING	BOLTING					
Nominal Pipe Size	A Flange Diameter	B Flange Thickness	C Diameter of Bolt Circle	D Diameter of Bolt Holes	Number of Bolts	Diameter of Bolts				
2"	6"	3/4"	4-3/4"	3/4"	4	5/8"				
2-1/2"	7"	7/8"	5-1/2"	3/4"	4	5/8"				
3"	7-1/2"	15/16"	6"	3/4"	4	5/8"				
4"	9"	15/16"	7-1/2"	3/4"	8	5/8"				
5"	10"	15/16"	8-1/2"	7/8"	8	3/4"				
6"	11"	1"	9-1/2"	7/8"	8	3/4"				
8"	13-1/2"	1-1/8"	11-3/4"	7/8"	8	3/4"				
10"	16"	1-3/16"	14-1/4"	1"	12	7/8"				
12"	19"	1-1/4"	17"	1"	12	7/8"				
14"	21"	1-3/8"	18-3/4"	1-1/8"	12	1"				
16"	23-1/2"	1-7/16"	21-1/4"	1-1/8"	16	1"				
18"	25"	1-5/8"	22-3/4"	1-1/4"	16	1-1/8"				
20"	27-1/2"	1-11/16"	25"	1-1/4"	20	1-1/8"				
24"	32"	1-7/8	29-1/2"	1-3/8"	20	1-1/4"				



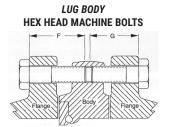
Every effort is made to provide accurate information, but no liability for claims arising from erroneous data will be accepted by Belimo.

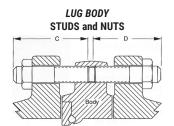
Installation Recommendations SHP Series Butterfly Valves



FLANGE BOLTING RECOMMENDATIONS

Lug Valves, 2"-24", ANSI 250/300 Bolt Pattern													
	_	BOLT	ENGAGEN	IENT IN VA	LVE*		STUDS	& NUTS			MACHIN	IE BOLTS	
Valve Size	Thread Size	А оту	LENGTH	В отч	LENGTH	C QT	LENGTH	D QTY	LENGTH	F QT	LENGTH	G QTY	LENGTH
2"	5/8-11	8	.94	8	.57	8	2.25	8	2.62	8	1.50	8	2.00
2-1/2"	5/8-11	8	.97	8	.67	8	2.75	8	3.00	8	1.75	8	2.00
3"	3/4-10	8	1.03	8	.82	8	3.00	8	3.00	8	2.12	8	2.00
4"	3/4-10	8	1.19	8	.87	8	3.50	8	3.25	8	2.50	8	2.00
5"	3/4-10	8	1.22	8	.79	8	5.25	8	3.62	8	2.25	8	2.75
6"	3/4-10	12	1.30	12	.92	12	3.75	12	3.50	12	2.75	12	2.25
8"	7/8-9	12	1.70	12	1.12	12	4.50	12	4.00	12	3.25	12	2.75
10"	1-8	16	1.86	16	1.30	16	5.00	16	4.50	16	3.25	16	3.12
12"	1-1/8-8	16	2.05	16	1.47	16	5.50	16	5.00	16	4.00	16	3.38
14"	1-1/8-8	16	2.44	16	2.11	16	6.00	16	5.75	16	4.62	16	4.25
14	1-1/8-8	4**	1.60	4**	1.26	4*	5.25	4**	4.75	4**	3.75	4**	3.44
16"	1-1/4-8	16	2.56	16	2.62	16	6.50	16	6.50	16	4.88	16	4.88
10	1-1/4-8	4**	1.53	4**	1.58	4*	5.25	4**	5.25	4**	3.88	4**	4.25
18"	1-1/4-8	20	2.87	20	2.89	20	7.00	20	7.00	20	5.25	20	5.25
10	1-1/4-8	4**	1.65	4**	1.43	4*	5.50	4**	5.50	4**	4.00	4**	3.88
20"	1-1/4-8	20	3.18	20	3.00	20	7.50	20	7.25	20	5.69	20	5.69
20	1-1/4-8	4**	1.68	4**	1.75	4*	5.75	4**	5.50	4**	4.19	4**	4.00
24"	1-1/2-8	20	3.56	20	3.51	20	8.25	20	8.25	20	6.31	20	6.25
Z4	1-1/2-8	4**	1.80	4**	1.75	4*	6.25	4**	6.25	4**	4.56	4**	4.50

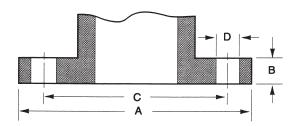




- * Bolt lengths "A" & "B" are from face of valve body to minimum depth in lug. Flange & gasket thickness must be added to calculate minimum bolt length.
- **Special length required for tapped blind holes on either side of the valve shaft at the top and bottom ends of the valve body.

FLANGE BOLTING RECOMMENDATIONS

Flange Detail for ANSI 300 B16.5 Pipe Flanges 300 SHP Series Butterfly Valves										
	FLAN	NGES	DRIL	LING	BOLT	ΓING				
Nominal Pipe Size	A Flange Diameter	B Flange Thickness	C Diameter of Bolt Circle	D Diameter of Bolt Holes	Number of Bolts	Diameter of Bolts				
2"	6.50	.88	5.00	.75	8	5/8"				
2-1/2"	7.50	1.00	5.88	.88	8	3/4"				
3"	8.25	1.12	6.63	.88	8	3/4"				
4"	10.00	1.25	7.88	.88	8	3/4"				
5"	11.00	1.38	9.25	.88	8	3/4"				
6"	12.50	1.44	10.63	.88	12	3/4"				
8"	15.00	1.62	13.00	1.00	12	7/8"				
10"	17.50	1.88	15.25	1.12	16	1"				
12"	20.50	2.00	17.75	1.25	16	1-1/8"				
14"	23.00	2.12	20.25	1.25	20	1-1/8"				
16"	25.50	2.25	22.50	1.37	20	1-1/4"				
18"	28.00	2.38	24.75	1.37	24	1-1/4"				
20"	30.50	2.50	27.00	1.37	24	1-1/4"				
24"	36.00	2.75	32.00	1.62	24	1-1/2"				





SY MFT Actuators Quick Troubleshooting Guide

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:

- 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).
- Provide a DC control signal other than minimum or maximum (suggest 6 VDC or 50% command).
- 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:

- 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?
- 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).
- Proper transformer sizing (see PGPL for current VA requirements).
- Confirm correct wire size vs. length or run for SY actuators.

