



- 50 psi bubble tight shut-off
- Long stem design allows for 2" insulation
- Valve face-to-face dimensions comply with API 609 & MSS-SP-67
- Completely assembled and tested, ready for installation

### Application

These valves are designed to meet the needs of HVAC and commercial applications requiring bubble tight shut-off for liquids. Typical applications include chiller isolation, cooling tower isolation, change-over systems, large air handler coil control, bypass and process control applications. The large  $C_v$  values provide for an economical control valve solution for larger flow applications. Designed for use in Victaulic piping systems when mated to Victaulic 41 series flange nipples.

### Jobsite Note

Valves should be stored in a weather protected area prior to construction. Complete installation recommendations can be found in Belimo's Installation and Maintenance Instructions for F6/F7...HD/HDU Butterfly Valves.

Technical Data	
Service	chilled, hot water, 60% glycol
Flow characteristic	modified equal percentage
Action	90° rotation
Sizes	2" to 12"
Type of end fitting	for use with ANSI Class 125/150 flanges
Materials	
Body	ductile iron ASTM A536
Body finish	epoxy powder coated
Disc	304 stainless steel
Seat	EPDM
Shaft	416 stainless steel
O-ring	EPDM
Upper bushing	RPTFE
Middle bushings	RPTFE
Lower bushing	RPTFE
Media temperature range	-22°F to 250°F [-30°C to 120°C]
Operation ambient temperature range	-22°F to 122°F [-30°C to 50°C]
Body pressure rating	ASME/ANSI Class 125/150 (200 psi at -30°F to 275°F)
Close-off pressure	50 psi
Rangeability	10:1 (for 30° to 70° range)
Maximum velocity	12 FPS

$C_v$ 90°	$C_v$ 60°	Valve Nominal Size		Type	Suitable Actuators		SY Series
		IN	DN [mm]		2-way	Spring	
115	44	2"	50	F650HDU	AF Series	AM Series	
196	75	2½"	65	F665HDU			
302	116	3"	80	F680HDU	GM		
600	230	4"	100	F6100HDU			
1022	392	5"	125	F6125HDU			
1579	605	6"	150	F6150HDU			
3136	1202	8"	200	F6200HDU			
5340	2047	10"	250	F6250HDU			
8250	3062	12"	300	F6300HDU			

Valve	Size	$C_v$	MOD								ON/OFF	
			10°	20°	30°	40°	50°	60°	70°	80°	90°	
F650HDU	2"	115	.06	3	7	15	27	44	70	105	115	
F665HDU	2½"	196	.10	6	12	25	45	75	119	178	196	
F680HDU	3"	302	.20	9	18	39	70	116	183	275	302	
F6100HDU	4"	600	.30	17	36	78	139	230	364	546	600	
F6125HDU	5"	1022	.50	29	61	133	237	392	620	930	1022	
F6150HDU	6"	1579	.80	45	95	205	366	605	958	1437	1579	
F6200HDU	8"	3136	2	89	188	408	727	1202	1903	2854	3136	
F6250HDU	10"	5340	3	151	320	694	1237	2047	3240	4859	5340	
F6300HDU	12"	8250	4	234	495	1072	1911	3062	5005	7507	8250	

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# F6...HDU Butterfly Valves 2"-12" Ductile Iron Lug Body Resilient Seat, 304 Stainless Disc



## Maximum Dimensions (Inches)

Valve	Size	C <sub>v</sub> 90°	C <sub>v</sub> 60°	A	B	C	D(Max)	BHC	No. of Holes	Lug Bolt	Actuator	Close-Off (PSI)		
F650HDU	2"	115	44	1.65	9.00	9.00	19.50	4.75	4	5/8-11UNC	AF	50	Fail Safe	
F665HDU	2½"	196	75	1.76	9.00	9.00	20.00	5.50	4	5/8-11UNC		50		
F680HDU	3"	302	116	1.78	9.00	9.00	20.50	6.00	4	5/8-11UNC		50		
F6100HDU	4"	600	230	2.05	9.00	9.00	21.00	7.50	8	5/8-11UNC	2*AF	50		
F6125HDU	5"	1022	392	2.14	9.00	9.00	22.00	8.50	8	3/4-10UNC		50		
F650HDU	2"	115	44	1.65	7.00	7.00	15.00	4.75	4	5/8-11UNC	AMB(X)	50		
F665HDU	2½"	196	75	1.76	7.00	7.00	15.50	5.50	4	5/8-11UNC		50		
F680HDU	3"	302	116	1.78	7.00	7.00	16.00	6.00	4	5/8-11UNC		50		
F6100HDU	4"	600	230	2.05	8.00	8.00	17.00	7.50	8	5/8-11UNC	GMB(X)	50		
F6125HDU	5"	1022	392	2.14	8.00	8.00	17.50	8.50	8	3/4-10UNC		50		
F6150HDU	6"	1579	605	2.19	8.00	8.00	22.50	9.50	8	3/4-10UNC	GMB(X)	50	Non-Fail Safe	
F650HDU	2"	115	44	1.65	4.25	4.25	15.50	4.75	4	5/8-11UNC	SY1...	50		
F665HDU	2½"	196	75	1.76	4.25	4.25	16.00	5.50	4	5/8-11UNC		50		
F680HDU	3"	302	116	1.78	4.25	4.25	16.25	6.00	4	5/8-11UNC		50		
F6100HDU	4"	600	230	2.05	8.00	13.00	22.00	7.50	8	5/8-11UNC	SY2...	50		
F6125HDU	5"	1022	392	2.14	8.00	13.00	22.50	8.50	8	3/4-10UNC		50		
F6150HDU	6"	1579	605	2.19	8.00	13.00	23.00	9.50	8	3/4-10UNC		50		
F6200HDU	8"	3136	1202	2.37	8.00	13.00	24.25	11.75	8	3/4-10UNC	SY3...	50		
F6250HDU	10"	5340	2047	2.58	8.00	13.00	25.50	14.25	12	7/8-9UNC		50		
F6300HDU	12"	8250	3062	3.01	8.00	13.00	27.25	17.00	12	7/8-9UNC		50		

Dimension "A" is compressed, add .125" for relaxed state.

AF, AM and GM maximum actuator ambient temperature is 122°F.

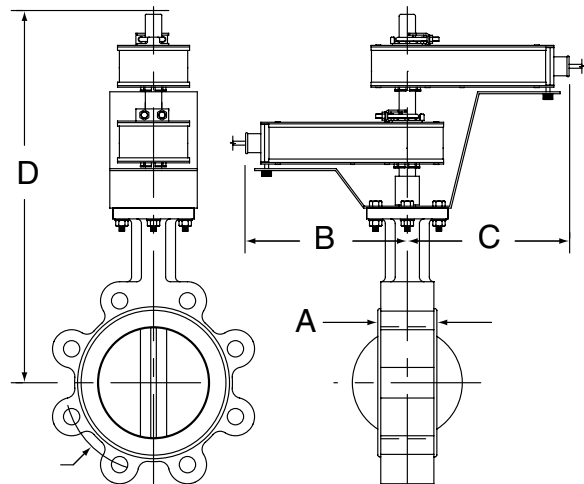
SY maximum actuator ambient temperature is 150°F.

Model SY1... does not have handwheel - override is via 8mm wrench on bottom side of actuator.

### Application Notes

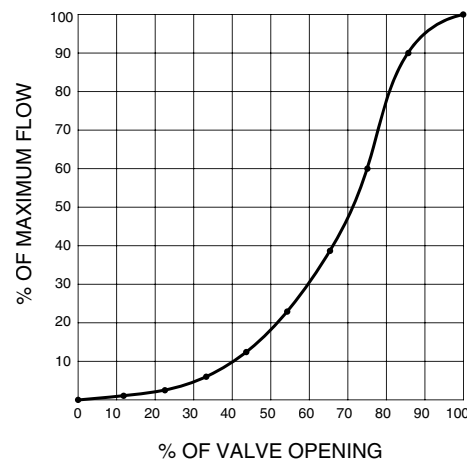
1. Valves are rated at 50 psi differential pressure in the closed position.
2. Valves are furnished with lugs tapped for use with ANSI Class 125/150 flanges. Installation flanges and hardware are not included.
3. 2-way assemblies are furnished assembled and tested, ready for installation.
4. Dimension "D" allows for actuator removal without the need to remove the valve from the pipe.
5. Weather shields are available, dimensional data upon request.
6. Dual actuated valves have actuators mounted on a common valve shaft.
7. Belimo SY Series actuators are NEMA 4X rated.

### Dimensions



BF2WUDIM

### Flow Pattern



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# SY...24 Series Non-Spring Return Actuator



## Technical Data - 24 VAC



### Application:

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

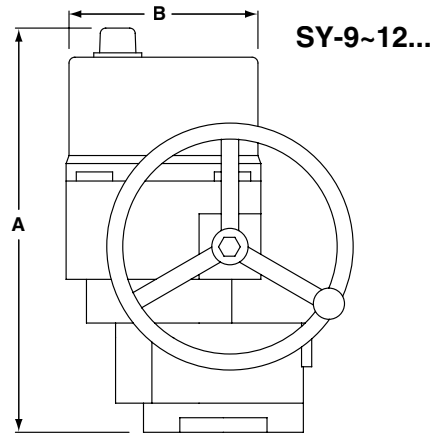
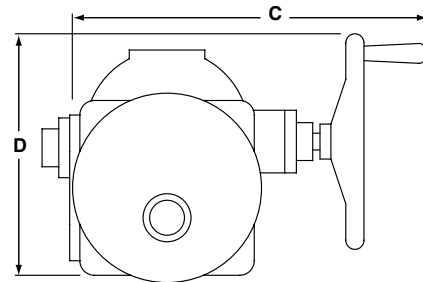
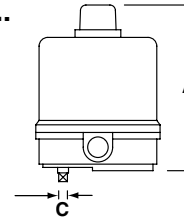
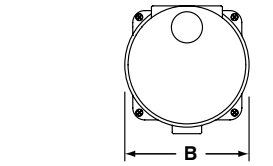
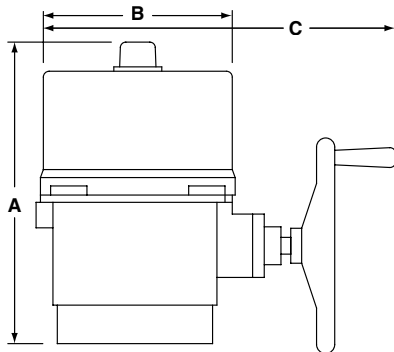
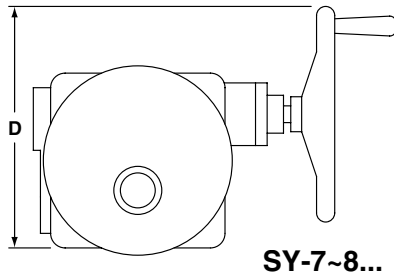
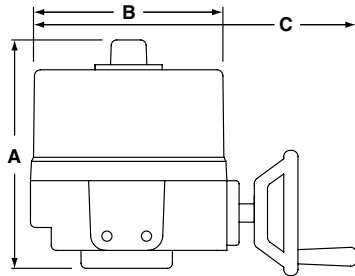
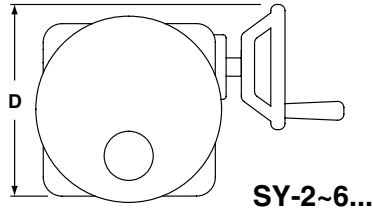
Technical Data	
Electrical connection	½" conduit connector, screw terminals
Overload protection	thermally protected 135°C cut-out
Motor protection	H Class insulation (SY-1), F Class (SY-2...5)
Gear train	high alloy steel gear sets, self locking
Operating range	(SY...-24) on/off, floating point (SY...24MFT) 2-10 VDC, 4-20mA, 0-10 VDC
Sensitivity	(SY...24MFT) 0.4mA/200mV
Reversal hysteresis	(SY...24MFT) 1.0mA/500mV
Feedback	(SY...24MFT) 2-10 VDC
Angle of rotation	90°
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 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

### Power Supply

24 VAC/VDC 50/60Hz, single phase

Model	Torque	Speed	Power Consumption	Duty Cycle		Override	Weight
				On/Off	MFT		
SY1-24(P)	35Nm/310 in-lbs	15s	1.8A	30%	75%	8mm Wrench	2.0kg/4.9 lb.
SY2-24(MFT)	90Nm/801 in-lbs	15s	3.0A	30%	75%	Hand Wheel	11kg/24.5 lb.
SY3-24(MFT)	150Nm/1335 in-lbs	22s	3.0A	30%	75%	Hand Wheel	11kg/24.5 lb.
SY4-24(MFT)	400Nm/3560 in-lbs	16s	6.0A	30%	75%	Hand Wheel	22kg/48.5 lb.
SY5-24(MFT)	500Nm/4450 in-lbs	22s	6.5A	30%	75%	Hand Wheel	22kg/48.5 lb.

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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]
SY1	6.10 [155]	3.94 [100]	4.25 [108]	8mm	-
SY2~3	10.04 [255]	7.48 [190]	7.87 [200]	12.99 [330]	7.87 [200]
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., SY2~3 = SY-2 and SY-3