



- 200 psi (2" to 12") and 150 psi (14"-30") 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 30"
Type of end fitting	for use with ANSI 125/150 flanges
Materials	
Body	ductile iron ASTM A536
Body finish	epoxy powder coated
Disc	304 stainless steel
Seat	EPDM standard
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	200 psi (2"-12"), 150 psi (14"-30")
Rangeability	10:1 (for 30° to 70° range)
Maximum velocity	12 FPS

Valve		Nominal Size		Type	Suitable Actuators		
$C_v$ 90°	$C_v$ 60°	IN	DN [mm]	2-way	Spring	Non-Spring	
115	44	2"	50	F650HD	AF Series	AM	SY Series
196	75	2½"	65	F665HD			
302	116	3"	80	F680HD		GM	
600	230	4"	100	F6100HD			
1022	392	5"	125	F6125HD			
1579	605	6"	150	F6150HD			
3136	1202	8"	200	F6200HD			
5340	2047	10"	250	F6250HD			
8250	3062	12"	300	F6300HD			
11917	4568	14"	350	F6350HD			
16388	6282	16"	400	F6400HD			
21705	8320	18"	450	F6450HD			
27908	10698	20"	500	F6500HD			
43116	16528	24"	600	F6600HD			
73426	28146	30"	750	F6750HD			

Valve	Size	$C_v$	MOD									ON/OFF
			10°	20°	30°	40°	50°	60°	70°	80°	90°	
F650HD	2"	115	.06	3	7	15	27	44	70	105	115	115
F665HD	2-1/2"	196	.10	6	12	25	45	75	119	178	196	196
F680HD	3"	302	.20	9	18	39	70	116	183	275	302	302
F6100HD	4"	600	.30	17	36	78	139	230	364	546	600	600
F6125HD	5"	1022	.50	29	61	133	237	392	620	930	1022	1022
F6150HD	6"	1579	.80	45	95	205	366	605	958	1437	1579	1579
F6200HD	8"	3136	2	89	188	408	727	1202	1903	2854	3136	3136
F6250HD	10"	5340	3	151	320	694	1237	2047	3240	4859	5340	5340
F6300HD	12"	8250	4	234	495	1072	1911	3062	5005	7507	8250	8250
F6350HD	14"	11917	6	338	715	1549	2761	4568	7230	10844	11917	11917
F6400HD	16"	16388	8	464	983	2130	3797	6282	9942	14913	16388	16388
F6450HD	18"	21705	11	615	1302	2822	5028	8320	13168	19752	21705	21705
F6500HD	20"	27908	14	791	1674	3628	6465	10698	16931	25396	27908	27908
F6600HD	24"	43116	22	1222	2587	5605	9989	16528	26157	39236	43116	43116
F6750HD	30"	73426	37	2081	4405	9545	17011	28146	44545	66818	73426	73426

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# F6...HD Butterfly Valves 2"-30" 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)	
F650HD	2"	115	44	1.65	9.00	9.00	19.50	4.75	4	5/8-11UNC	AF	200	Fail Safe
F665HD	2½"	196	75	1.76	9.00	9.00	20.00	5.50	4	5/8-11UNC	2*AF	200	
F680HD	3"	302	116	1.78	9.00	9.00	20.50	6.00	4	5/8-11UNC	2*AF	200	
F650HD	2"	115	44	1.65	7.00	7.00	15.00	4.75	4	5/8-11UNC	AMB(X)	200	Non-Fail Safe
F665HD	2½"	196	75	1.76	7.00	7.00	15.50	5.50	4	5/8-11UNC	AMB(X)	200	
F680HD	3"	302	116	1.78	8.00	8.00	16.00	6.00	4	5/8-11UNC	GMB(X)	200	
F6100HD	4"	600	230	2.05	8.00	8.00	21.00	7.50	8	5/8-11UNC	2*GMB(X)	200	Non-Fail Safe
Valve	Size	C <sub>v</sub> 90°	C <sub>v</sub> 60°	A(Max)	B (Max)	C (Max)	D(Max)	BHC	No. of Holes	Lug Bolt	Actuator	Close-Off (PSI)	
F650HD	2"	115	44	1.65	8.00	13.00	20.25	4.75	4	5/8-11UNC	SY2...	200	Non-Fail Safe
F665HD	2½"	196	75	1.76	8.00	13.00	20.75	5.50	4	5/8-11UNC		200	
F680HD	3"	302	116	1.78	8.00	13.00	21.00	6.00	4	5/8-11UNC		200	
F6100HD	4"	600	230	2.05	8.00	13.00	21.75	7.50	8	5/8-11UNC	200		
F6125HD	5"	1022	392	2.14	8.00	13.00	22.25	8.50	8	3/4-10UNC	200		
F6150HD	6"	1579	605	2.19	8.00	13.00	22.75	9.50	8	3/4-10UNC	SY3...	200	
F6200HD	8"	3136	1202	2.37	12.00	15.00	29.00	11.75	8	3/4-10UNC	SY4...	200	
F6250HD	10"	5340	2047	2.58	12.00	15.00	30.00	14.25	12	7/8-9UNC		200	
F6300HD	12"	8250	3062	3.01	12.00	15.00	32.00	17.00	12	7/8-9UNC		200	
F6350HD	14"	11917	4568	3.02	12.00	15.00	33.00	18.75	12	1-8UNC	SY5...	150	
F6400HD	16"	16388	6282	3.39	12.00	15.00	34.50	21.25	16	1-8UNC	SY6...†	150	
F6450HD	18"	21705	8320	4.13	14.00	21.00	39.25	22.75	16	1 1/8-7UNC	SY8...†	150	
F6500HD	20"	27908	10698	5.00	14.00	21.00	41.50	25.00	20	1 1/8-7UNC		150	
F6600HD	24"	43116	16528	5.94	14.00	22.00	53.25	29.50	20	1 1/4-7UNC		SY11...†	150
F6750HD	30"	73426	28146	6.57	14.00	22.00	57.50	36.00	28	1 1/4-7UNC	SY12...†	150	

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

†SY6 and larger available in 110/220 VAC versions only.

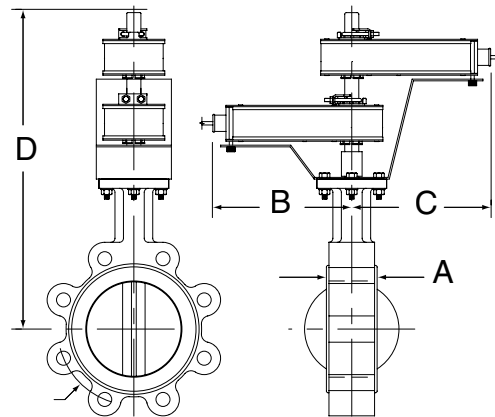
AF, AM and GM maximum actuator ambient temperature is 122°F.

SY... maximum actuator ambient temperature is 150°F.

### Application Notes

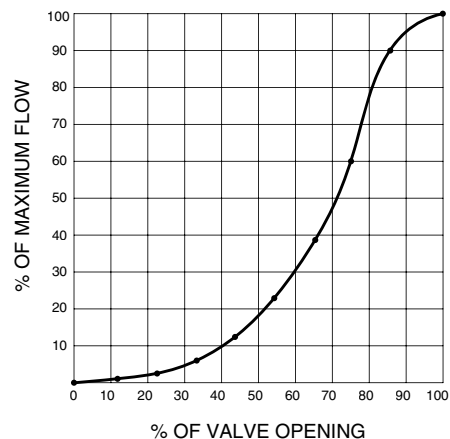
1. Valves are rated at 200 psi differential pressure in the closed position (SY... 150 psi 14"+).
2. Valves are furnished with lugs tapped for use with ANSI Class 125/150 flanges. Installation flanges and hardware are not included.
3. 2-way assemblies are furnished assembled and tested, ready for installation.
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



BF2MUDIM

### Flow Pattern

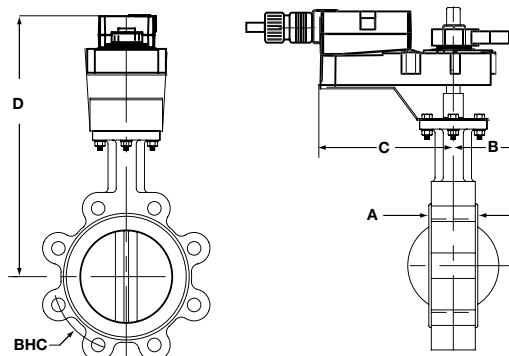


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Technical Data	GKX24-MFT-X1
Power supply	24VAC ±20% 50/60Hz 24VDC ±10%
Power consumption	12W (3W)
Transformer sizing	21VA (class 2 power source)
Electrical connection	18 GA plenum rated cable ½" conduit connector protected NEMA 2 (IP54) 3 ft [1m] 10 ft [3m] 16 ft [5m]
Overload protection	electronic throughout 0 to 95 rotation
Operation range Y	2 to 10 VDC, 4 to 20mA (default) variable (VDC,PWM, floating point, on/off)
Input impedance	100kΩ (0.1 mA), 500Ω 1500Ω (PWM, floating point, on/off)
Feedback output U	2 to 10VDC, 0.5mA max, VDC variable
Angle of rotation	max. 95°, adjustable with mechanical stop electronically variable
Direction of rotation	reversible with  switch
Fail-safe position	adjustable with dial or tool 0 to 100% in 10% increments
Position indication	reflective visual indicator (snap-on)
Manual override	external push button
Running time	normal operation 95 seconds (default), variable 90 to 150 seconds fail-safe 35 seconds
Humidity	5 to 95% RH non-condensing (EN 60730-1)
Ambient temperature	-22°F to +122°F [-30°C to +50°C]
Storage temperature	-40°F to +176°F [-40°C to +80°C]
Housing	NEMA2, IP54, UL enclosure type 2
Housing material	UL94-5VA
Agency list	cULus acc. to UL 60730-1A/-2-14 CAN/CSA E60730-1:02 CE acc. to 2004/108/EEC and 2006/95/EC
Noise level	< 45dB(A)
Servicing	maintenance free
Quality standard	ISO 9001

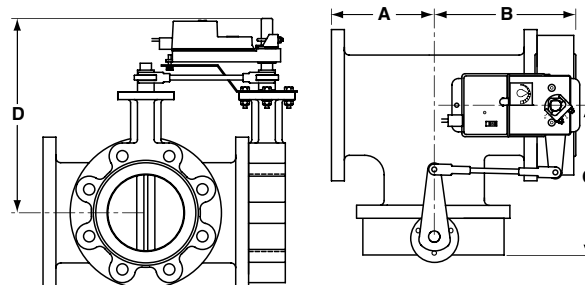
## Dimensions with 2-Way Valve



AM\_GM\_LineRevised

Valve	Size	Dimensions (Inches)					Non-Fail Safe (psi)	
		A	B	C	D(Max)	BHC	GK	
F680HD	3"	1.69	9.00	9.00	21.03	6.00	200	
F6100HDU	4"	1.92	9.00	9.00	21.53	7.50	50	
F6125HDU	5"	2.08	9.00	9.00	22.53	8.50	50	
F650-150SHP	2"	1.75	9.00	9.00	20.03	4.75	285	
F665-150SHP	2½"	1.88	9.00	9.00	20.53	5.50	285	
F680-150SHP	3"	1.92	9.00	9.00	21.03	6.00	285	
F6100-150SHP	4"	2.13	9.00	9.00	21.53	7.50	150	
F650-300SHP	2"	1.75	9.00	9.00	20.03	5.00	285	
F665-300SHP	2½"	1.88	9.00	9.00	20.53	5.88	285	
F680-300SHP	3"	1.92	9.00	9.00	21.03	6.63	285	
F6100-300SHP	4"	2.13	9.00	9.00	21.53	7.88	150	

## Dimensions with 3-Way Valve



Single\_Butterfly

Valve	Size	Dimensions (Inches)				Non-Fail Safe (psi)	
		A	B	C	D(Max)	BHC	GK
F780HDU	3"	5.50	7.20	7.20	16.78	6.00	200
F750-150SHP	2"	4.50	6.25	6.25	17.03	4.75	150
F765-150SHP	2½"	5.00	6.88	6.88	17.53	5.50	150
F780-150SHP	3"	5.50	7.42	7.42	18.03	6.00	150

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### Wiring Diagrams

#### INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
- 3 Actuators may also be powered by 24 VDC.
- 4 Position feedback cannot be used with Triac sink controller. The actuator internal common reference is not compatible.
- 5 Control signal may be pulsed from either the Hot (source) or the Common (sink) 24 VAC line.
- 8 Contact closures A & B also can be triacs.
- 8 A & B should both be closed for triac source and open for triac sink.
- 9 For triac sink the common connection from the actuator must be connected to the hot connection of the controller.

#### APPLICATION NOTES

◆ Meets UL requirements without the need of an electrical ground connection.

◆ The ZG-R01 500 Ω resistor may be used.

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

**NOTE: Wiring diagrams shown are for single actuator mounted solutions**

