



- 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 (232 psi at -30°F to 275°F)
Close-off pressure	50 psi
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	F650HDU	AF Series	AM Series	SY 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	

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



Maximum Dimensions (Inches)

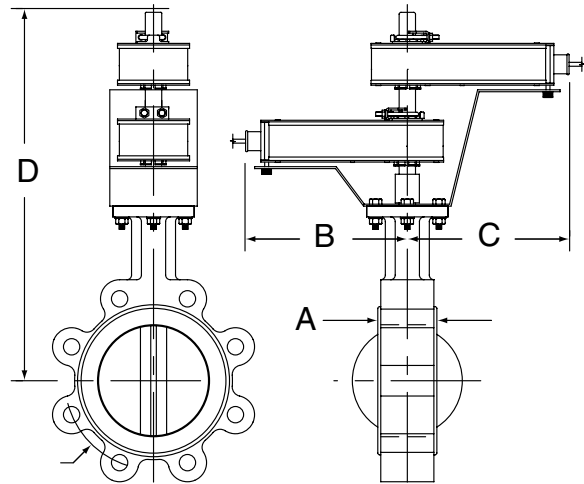
Valve	Size	C _v 90°	C _v 60°	A	B	C	D(Max)	BHC	No. of Holes	Lug Bolt	Actuator	Close-Off (PSI)	
F650HDU	2"	115	44	1.65	9.00	9.00	19.50	4.75	4	5/8-11UNC	AF	50	Fail Safe
F665HDU	2½"	196	75	1.76	9.00	9.00	20.00	5.50	4	5/8-11UNC		50	
F680HDU	3"	302	116	1.78	9.00	9.00	20.50	6.00	4	5/8-11UNC	2*AF	50	
F6100HDU	4"	600	230	2.05	9.00	9.00	21.00	7.50	8	5/8-11UNC		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	
F650HDU	2"	115	44	1.65	4.25	4.25	15.50	4.75	4	5/8-11UNC	SY1...	50	Non-Fail Safe
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

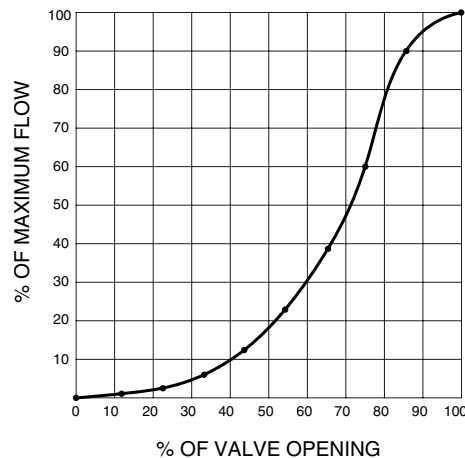
1. Valves are rated at 50 psi differential pressure in the closed position.
2. Valves are furnished with lugs tapped for use with ANSI Class 125/150 flanges. Installation flanges and hardware are not included.
3. 2-way assemblies are furnished assembled and tested, ready for installation.
4. Dimension "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



IN40019 - 03/11 - Subject to change. © Belimo Aircontrols (USA), Inc.



- 232 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 (232 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

C _v 90°	C _v 60°	Valve Nominal Size		Type	Suitable Actuators	
		IN	DN [mm]		Spring	Non-Spring
115	44	2"	50	F650HD	AF Series	AM
196	75	2½"	65	F665HD		
302	116	3"	80	F680HD		GM
600	230	4"	100	F6100HD		
1022	392	5"	125	F6125HD		SY Series
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		

IV40016 - 03/11 - Subject to change. © Belimo Aircontrols (USA), Inc.

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

F6...HD Butterfly Valves 2"-30" Ductile Iron Lug Body Resilient Seat, 304 Stainless Disc



Maximum Dimensions (Inches)

Valve	Size	C _v 90°	C _v 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 _v 90°	C _v 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.

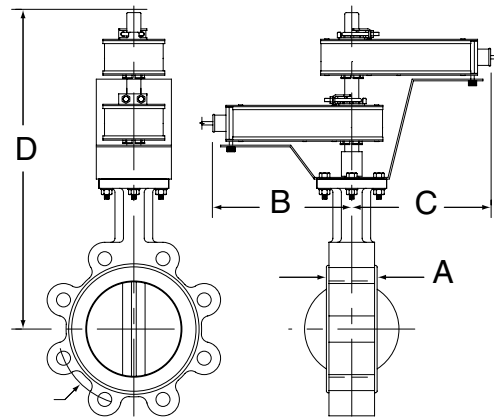
AF, AM and GM maximum actuator ambient temperature is 122°F.

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

Application Notes

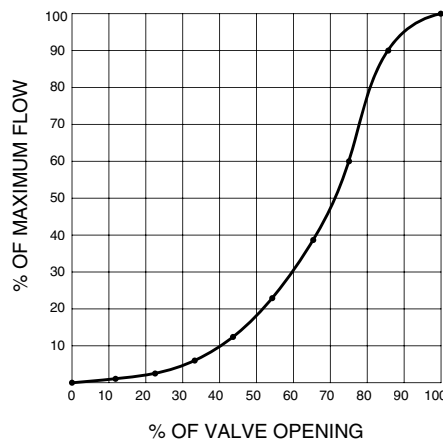
1. Valves are rated at 200 psi differential pressure in the closed position (SY... 150 psi 14"+).
2. Valves are furnished with lugs tapped for use with ANSI Class 125/150 flanges. Installation flanges and hardware are not included.
3. 2-way assemblies are furnished assembled and tested, ready for installation.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



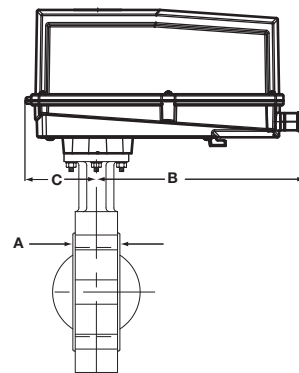
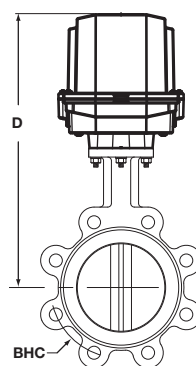
I40019 - 03/11 - Subject to change. © Belimo Aircontrols (USA), Inc.



MFT



Dimensions with 2-Way Valve



GP_NEMA_4_LineDrawing

Models

GRX24-MFT-T N4 w/terminal block

Technical Data

Control	2 to 10 VDC, 4 to 20 mA (default) variable (VDC, floating point, on/off)
Power supply	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Power consumption	running 8 W holding 2.5 W
Transformer sizing	11 VA (class 2 power source)
Electrical connection	screw terminal (for 22 to 12 AWG wire)
Overload protection	electronic throughout 0° to 90° rotation
Input impedance	100 kΩ for 2 to 10 VDC (0.1 mA) 500 Ω for 4 to 20 mA 1000 Ω for floating point and on-off control
Angle of rotation	90°, adjustable with mechanical stop electronically variable
Position indication	visual pointer
Manual override	internal push button (UL Type 4)
Running time	150 seconds (default) variable (75 to 290 seconds)
Humidity	5 to 100% RH (UL Type 4)
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 type	UL Type 4/NEMA 4/IP66
Housing material	Polycarbonate
Agency listings	cULus according to UL 60730-1A, UL 60730-2-14 and CAN/CSA E60730-1; Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14
EMC	CE according to 2004/108/EC
Quality standard	ISO 9001

Valve Nominal Size

Dimensions (Inches [mm])

Valve Body	Inches	DN [mm]	A	B	C	D	FLG
F650HD/HDU	2"	50	1.65 [41.9]	10.49 [266]	3.62 [92]	18.94 [481]	F05
F665HD/HDU	2.5"	65	1.76 [44.7]	10.49 [266]	3.62 [92]	19.49 [495]	F05
F680HD/HDU	3"	80	1.78 [45.2]	10.49 [266]	3.62 [92]	19.73 [501]	F05
F6100HDU	4"	100	2.05 [52.1]	10.49 [266]	3.62 [92]	20.47 [520]	F07
F6125HDU	5"	125	2.14 [54.4]	10.49 [266]	3.62 [92]	20.99 [533]	F07

Wiring Diagrams

INSTALLATION NOTES

- 2** **CAUTION Equipment damage!**
Actuators may be connected in parallel.
Power consumption and input impedance must be observed.
- 3** Actuators may also be powered by 24 VDC.
- 5** Actuators with plenum rated cable do not have numbers on wires; use color codes instead. Actuators with appliance cables are numbered.
- 8** Control signal may be pulsed from either the Hot (source) or the Common (sink) 24 VAC line.
- 9** Contact closures A & B also can be triacs.
- 10** A & B should both be closed for triac source and open for triac sink. For triac sink the Common connection from the actuator must be connected to the Hot connection of the controller. Position feedback cannot be used with a Triac sink controller. The actuator internal common reference is not compatible.
- 12** IN4004 or IN4007 diode. (IN4007 supplied, Belimo part number 40155).

APPLICATION NOTES

- ◆ The ZG-R01 500 Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC, up to 2 actuators may be connected in parallel.

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.

WARNING Mechanical Precautions

The mechanical end stops cannot be moved or repositioned. Doing so will adversely effect the operation of the valve.
The directional switch cannot be moved. Maintain Factory Settings

