



- 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
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		

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

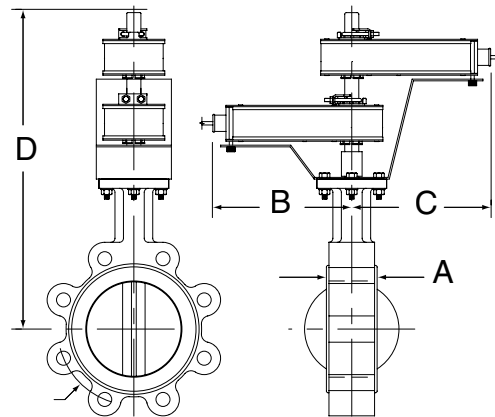
AF, AM and GM maximum actuator ambient temperature is 122°F.

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

### Application Notes

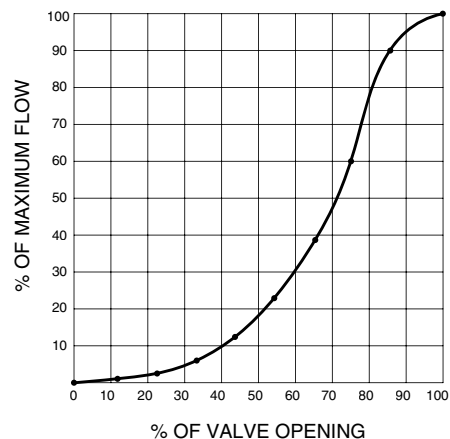
1. Valves are rated at 200 psi differential pressure in the closed position (SY... 150 psi 14"+).
2. Valves are furnished with lugs tapped for use with ANSI Class 125/150 flanges. Installation flanges and hardware are not included.
3. 2-way assemblies are furnished assembled and tested, ready for installation.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



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### Flow Pattern



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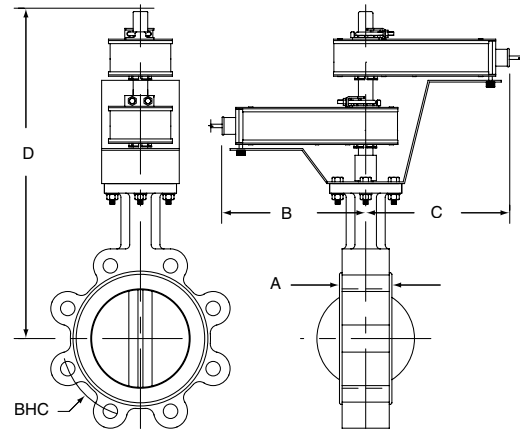
## Models

AF24 US	
AF24-S US	w/built-in Aux. Switches
AF120 US	
AF120-S US	w/built-in Aux. Switches

Technical Data	
Control	on/off
Power consumption	
AF24(-S) US	running 5 W
	holding 1.5 W
AF120(-S) US	running 6 W
	holding 2.3 W
Transformer sizing	10 VA, class 2 power
Electrical connection	3 ft, 18 GA appliance cables (-S model has 2 cables) 1/2" conduit connector
Electrical protection	120 V actuators double insulated
Overload protection	electronic throughout 0° to 95° rotation
Angle of rotation	95°
Position indication	visual indicator
Manual override	hex crank
Running time	control 150 sec. independent of load
	spring < 20 sec.
Ambient temperature	-22° F to 122° F [-30° C to 50° C]
Housing	NEMA 2 / IP54
Agency listings	UL 873, CSA C22.2 No. 24 certified, CE
Noise level	max. 45 dB(A)

AF...-S US	
Auxiliary switches	2 x SPDT, 7A (2.5A) @ 250 VAC, UL listed, one switch is fixed at +5°, one is adjustable 25° to 85° (double insulated)

## Dimensions with 2-Way Valve

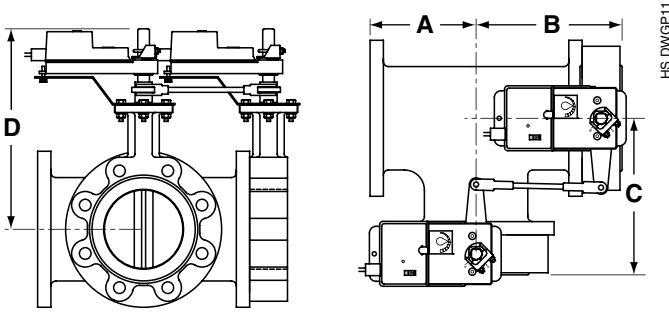


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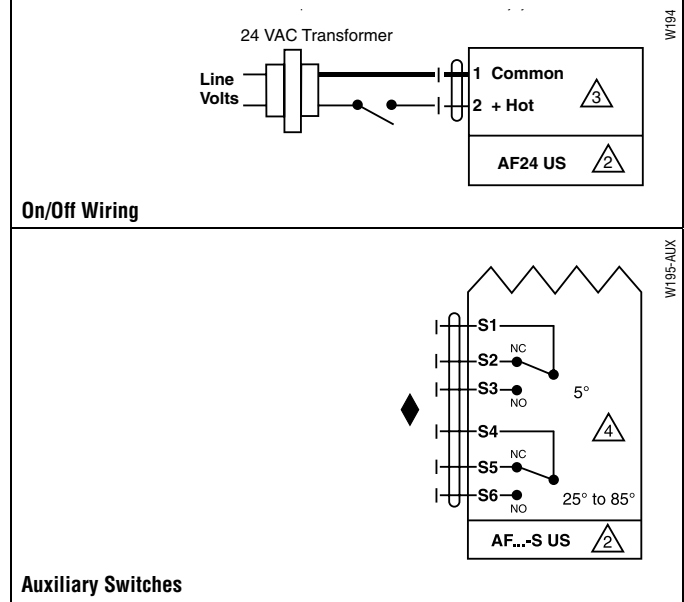
Valve	Size	Dimensions (Inches)				Fail Safe (psi)		
		A	B	C	D(Max)	BHC	AF	2*AF
F650HD	2"	1.65	9.00	9.00	19.50	4.75	200	
F650HDU	2"	1.65	9.00	9.00	19.50	4.75	50	
F665HD	2½"	1.76	9.00	9.00	20.00	5.50		200
F665HDU	2½"	1.76	9.00	9.00	20.00	5.50	50	
F680HD	3"	1.78	9.00	9.00	20.50	6.00		200
F680HDU	3"	1.78	9.00	9.00	20.50	6.00		50
F6100HDU	4"	2.05	9.00	9.00	21.00	7.50		50
F6125HDU	5"	2.14	9.00	9.00	22.00	8.50		50
F650-150SHP	2"	1.75	9.00	9.00	19.50	4.75		150
F665-150SHP	2½"	1.88	9.00	9.00	20.00	5.50		150
F680-150SHP	3"	1.92	9.00	9.00	20.50	6.00		150
F6100-150SHP	4"	2.13	9.00	9.00	21.00	7.50		150
F650-300SHP	2"	1.75	9.00	9.00	19.50	5.00		150
F665-300SHP	2½"	1.88	9.00	9.00	20.00	5.88		150
F680-300SHP	3"	1.92	9.00	9.00	20.50	6.63		150
F6100-300SHP	4"	2.13	9.00	9.00	21.00	7.88		150

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### Dimensions with 3-Way Valve



Valve	Size	Dimensions (Inches)				Fail Safe (psi)		
		A	B	C	D(Max)	BHC	AF	2*AF
F750HD	2"	4.50	6.15	6.15	15.50	4.75	200	
F750HDU	2"	4.50	6.15	6.15	15.50	4.75	50	
F765HD	2½"	5.00	6.76	6.76	16.00	5.50		200
F765HDU	2½"	5.00	6.76	6.76	16.00	5.50		50
F780HDU	3"	5.50	7.28	7.28	16.25	6.00		50



### Wiring Diagrams

#### ✂️ INSTALLATION NOTES

**CAUTION Equipment damage!**  
 2 Actuators may be connected in parallel.  
 Power consumption must be observed.

3 Actuators may also be powered by 24 VDC.

4 For end position indication, interlock control, fan startup, etc., AF24-S US incorporates two built-in auxiliary switches: 2 x SPDT, 7A (2.5A) @ 250 VAC, UL listed, one switch is fixed at +5°, one is adjustable 25° to 85°.

#### 📄 APPLICATION NOTES

◆ Meets cULus or UL and CSA requirements without the need of an electrical ground connection.

**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.