

# F7 Series 3-Way, ANSI Class 150 Butterfly Valve Reinforced Teflon Seat, 316 Stainless Disc



- Bubble tight shut-off to ANSI Class 150 Standards
- Long stem design allows for 2" insulation minimum
- Valve Face-to-face dimensions comply with API 609 & MSS-SP-68
- Designed to be installed between ASME/ANSI B16.5 Flanges
- Completely assembled and tested, ready for installation
- Tees comply with ASME/ANSI B16.1 Class 125 Flanges

## Application

These valves are designed to meet the needs of HVAC and Commercial applications requiring positive shut-off for liquids at higher pressures and temperatures. Typical applications include chiller isolation, cooling tower isolation, change-over systems, large air handler coil control, bypass and process control applications. The large C<sub>v</sub> values provide for an economical control valve solution for larger flow applications.

## Dead End Service

Follow all described pre-installation and installation procedures. Valves are capable of bubble tight, dead end closure with either the upstream or downstream flange removed.

Technical Data	
Service	chilled, hot water, 60% glycol, steam to 50 psi
Flow characteristic	modified equal percentage, unidirectional
Controllable flow range	82°
Sizes	2" to 24"
Type of end fitting	for use with ASME/class 125/150 flanges
Materials	
Body	carbon steel full lug
Disc	316 stainless steel
Seat	RPTFE
Shaft	17-4 PH stainless
Gland seal	PTFE
Bushings	glass backed PTFE
Media temperature range	-20°F to 400°F [-30°C to 204°C]
Body pressure rating	ANSI Class 150
Close-off pressure	285 psi
Rangeability	100:1 (for 30 deg to 70 deg range)
Maximum velocity	32 FPS
Leakage	bubble tight

Valve Nominal Size		Type	Suitable Actuators			Electronic Fail-Safe
C <sub>v</sub> 90°	C <sub>v</sub> 60°	3-way	Spring	Non-Spring		
102	56	2"	F750-150SHP	AF Series	GM Series	GK Series
146	80	2½"	F765-150SHP			
228	125	3"	F780-150SHP			
451	248	4"	F7100-150SHP			
714	392	5"	F7125-150SHP			
1103	607	6"	F7150-150SHP			
2064	1135	8"	F7200-150SHP			
3517	1934	10"	F7250-150SHP			
4837	2660	12"	F7300-150SHP			
6857	3592	14"	F7350-150SHP			
9287	4865	16"	F7400-150SHP			
11500	3270	18"	F7450-150SHP			
14420	7590	20"	F7500-150SHP			
22050	11550	24"	F7600-150SHP			

Valve	Size	C <sub>v</sub>	MOD									ON/OFF	
			10°	20°	30°	40°	50°	60°	70°	80°	90°	90°	90°
F750-150SHP	2"	102	1.50	6.10	14	26	39	56	77	99	102	102	102
F765-150SHP	2½"	146	2.20	8.80	20	37	55	80	110	142	146	146	146
F780-150SHP	3"	228	3.40	14	32	57	87	125	171	221	228	228	228
F7100-150SHP	4"	451	6.80	27	63	114	171	248	338	437	451	451	451
F7125-150SHP	5"	714	11	43	100	180	271	393	536	693	714	714	714
F7150-150SHP	6"	1103	17	66	154	278	419	607	827	1070	1103	1103	1103
F7200-150SHP	8"	2064	31	124	289	520	784	1135	1548	2002	2064	2064	2064
F7250-150SHP	10"	3517	53	211	492	886	1336	1934	2638	3411	3517	3517	3517
F7300-150SHP	12"	4837	73	290	677	1219	1838	2660	3628	4692	4837	4837	4837
F7350-150SHP	14"	6857	103	411	960	1728	2606	3771	5143	6651	6857	6857	6857
F7400-150SHP	16"	9287	139	557	1300	2340	3529	5108	6965	9008	9287	9287	9287
F7450-150SHP	18"	11400	171	684	1596	2873	4332	6270	8550	11058	11400	11400	11400
F7500-150SHP	20"	14420	216	865	2019	3634	5480	7931	10815	13987	14420	14420	14420
F7600-150SHP	24"	22050	331	1323	3087	5557	8379	12128	16538	21389	22050	22050	22050

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### Maximum Dimensions (Inches)

Valve	Size	C <sub>v</sub> 90°	A	B	C	D(Max)	BHC	No. of Holes	Lug Bolt	Actuator	Close-Off (PSI)	
F750-150SHP	2"	102	4.50	6.38	6.38	16.50	4.75	4	5/8-11 UNC	GK	150	Electronic Fail-Safe
F765-150SHP	2½"	146	5.00	6.88	6.88	17.00	5.50	4	5/8-11 UNC		150	
F780-150SHP	3"	228	5.50	7.56	7.56	17.50	6.00	4	5/8-11 UNC		150	
F750-150SHP	2"	102	4.50	6.38	6.38	16.50	4.75	4	5/8-11 UNC	2*GK	285	
F765-150SHP	2½"	146	5.00	6.88	6.88	17.00	5.50	4	5/8-11 UNC		285	
F780-150SHP	3"	228	5.50	7.56	7.56	17.50	6.00	4	5/8-11 UNC		285	
F750-150SHP	2"	102	4.50	6.38	6.38	16.50	4.75	4	5/8-11 UNC	GM	150	
F765-150SHP	2½"	146	5.00	6.88	6.88	17.00	5.50	4	5/8-11 UNC		150	
F780-150SHP	3"	228	5.50	7.56	7.56	17.50	6.00	4	5/8-11 UNC		150	
F7100-150SHP	4"	451	6.50	8.63	8.63	18.00	7.50	8	5/8-11 UNC		150	
F750-150SHP	2"	102	4.50	6.38	6.38	16.50	4.75	4	5/8-11 UNC	2*GM	285	
F765-150SHP	2½"	146	5.00	6.88	6.88	17.00	5.50	4	5/8-11 UNC		285	
F780-150SHP	3"	228	5.50	7.56	7.56	17.50	6.00	4	5/8-11 UNC		285	
F750-150SHP	2"	102	4.50	6.38	6.38	22.25	4.75	4	5/8-11 UNC	SY2...	285	Non-Spring Return
F765-150SHP	2½"	146	5.00	6.88	6.88	22.75	5.50	4	5/8-11 UNC		285	
F780-150SHP	3"	228	5.50	7.56	7.56	23.00	6.00	4	5/8-11 UNC		285	
F7100-150SHP	4"	451	6.50	8.63	8.63	23.75	7.50	8	5/8-11 UNC		285	
F7125-150SHP	5"	714	7.50	9.75	9.75	24.25	8.50	8	3/4-10 UNC	SY3...	285	
F7150-150SHP	6"	1103	8.00	10.25	10.25	24.75	9.50	8	3/4-10 UNC		285	
F7200-150SHP	8"	2064	9.00	11.50	11.50	32.00	11.75	8	3/4-10 UNC		150	
F7250-150SHP	10"	3517	11.00	13.81	13.81	33.00	14.25	12	7/8-9 UNC	SY4...	150	
										SY4...	285	
F7300-150SHP	12"	4837	12.00	15.81	15.81	35.00	17.00	12	7/8-9 UNC	SY5...	150	
										SY7...	285	
F7350-150SHP	14"	6857	14.00	17.62	17.62	36.00	18.75	12	1-8 UNC	SY7...	285	
F7400-150SHP	16"	9287	15.00	19.00	19.00	37.50	21.25	16	1-8 UNC	SY7...	150	
										SY9...	285	
F7450-150SHP	18"	11400	16.50	21.00	21.00	42.25	22.75	16	1 1/8-8 UNC	SY8...	150	
										SY10...	285	
F7500-150SHP	20"	14420	18.00	23.00	23.00	49.50	25.00	20	1 1/8-8 UNC	SY9...	150	
										SY11...	285	
F7600-150SHP	24"	22050	22.00	28.06	28.06	56.25	29.50	20	1 1/4-8 UNC	SY12...	150	

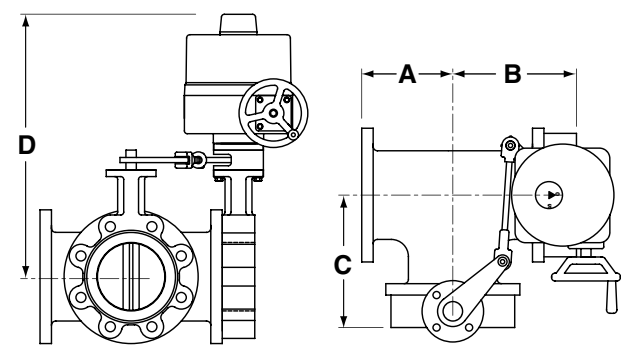
Dimensions "A, B and C" do not include flange gaskets. (3 required per valve)

### Application Notes

- Valves are rated at 285 psi differential pressure in the closed position @ 100°F media temperature.
- Valves are furnished with lugs tapped for use between ANSI Class 125/150 flanges conforming to ANSI B16.5 Standards.
- 3-way assemblies are furnished assembled with Tee, calibrated and tested, ready for installation. All 3-way assemblies require the customer to specify the 3-way configuration code prior to order entry to guarantee correct placement of valves and actuator(s) on the assembly.
- Dimension "D" allows for actuator(s) removal without the need to remove the valve from the pipe.
- Weather shields are available, dimensional data furnished upon request.
- Dual actuated valves have single actuators mounted on each valve shaft.
- Flange gaskets (3 required, not provided with valve) MUST be used between valve and ANSI flange.
- Flange bolts are not included with the valve. These are furnished by others.

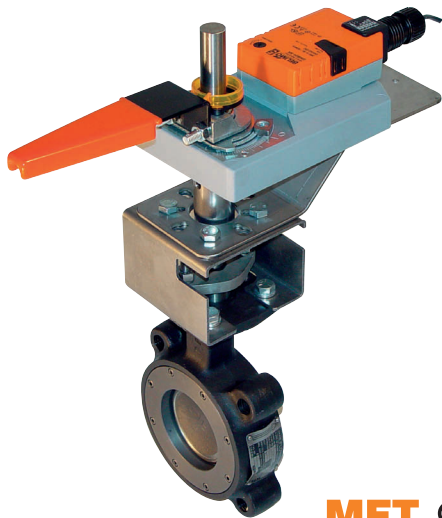
**Note:** For tee configuration, please refer to page 5.

### Dimensions



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**SHP series valves have a preferred flow direction.**

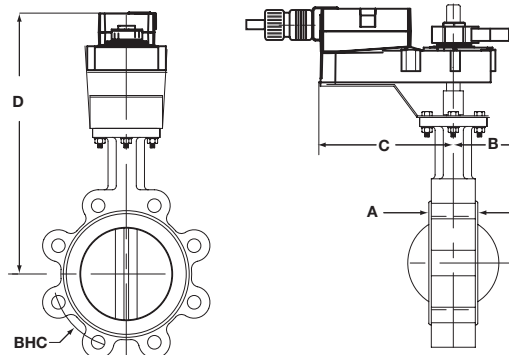


## Models

GMX24-MFT-X1

Technical Data	
Power supply	24 VAC ± 20% 50/60 Hz 24 VDC ± 10%
Power consumption	running 4.5 W holding 2 W
Transformer sizing	7 VA (class 2 power source)
Electrical connection	3 ft, 18 GA appliance cable, 1/2" conduit connector
Overload protection	electronic throughout 0 to 95° rotation
Control signal	2 to 10 VDC, 4 to 20 mA (with 500 Ω, 1/4 W resistor) ZG-R01
Input impedance	100 k Ω for 2 to 10VDC (0.1 mA) 500 Ω for 4 to 20 mA 750 Ω for PWM 1500 Ω for on/off and floating point
Angle of rotation	mechanically limited to 95°
Direction of rotation	reversible with switch A/B
Position indication	0 to 1 and reversible indicator
Running time	150 sec.
Humidity	5 to 95% RH non-condensing
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	NEMA 2/IP54
Housing material	UL94-5VA (flammability rating)
Agency listings	cULus according to UL60730-1A/-2-14, CAN/CSA E60730-1, CSA C22.2 No.24-93, CE according to 89/336/EEC
Noise level	max. 45 dB (A)
Servicing	maintenance free
Quality standard	ISO 9001

### Dimensions with 2-Way Valve

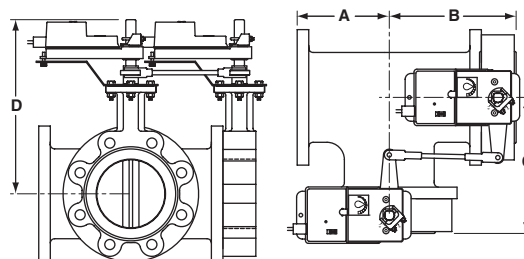


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### Dimensions (Inches) Non-Fail Safe (psi)

Valve	Size	A	B	C	D(Max)	BHC	GM	2*GM
F680HD	3"	1.69	9.00	9.00	20.50	6.00	200	
F6100HD	4"	1.92	9.00	9.00	21.00	7.50		200
F6100HDU	4"	1.92	9.00	9.00	21.00	7.50	50	
F6125HDU	5"	2.08	9.00	9.00	22.00	8.50	50	
F6150HDU	6"	2.08	9.00	9.00	22.50	9.50		50
F650-150SHP	2"	1.75	9.00	9.00	19.50	4.75	285	
F665-150SHP	2½"	1.88	9.00	9.00	20.00	5.50	285	
F680-150SHP	3"	1.92	9.00	9.00	20.50	6.00	285	
F6100-150SHP	4"	2.13	9.00	9.00	21.00	7.50	150	285
F650-300SHP	2"	1.75	9.00	9.00	19.50	5.00	285	400
F665-300SHP	2½"	1.88	9.00	9.00	20.00	5.88	285	400
F680-300SHP	3"	1.92	9.00	9.00	20.50	6.63	285	400
F6100-300SHP	4"	2.13	9.00	9.00	21.00	7.88	150	285

### Dimensions with 3-Way Valve



D101

### Dimensions (Inches) Non-Fail Safe (psi)

Valve	Size	A	B	C	D(Max)	BHC	GM	2*GM
F765HD	2½"	5.00	6.70	6.70	16.00	5.50	200	
F780HD	3"	5.50	7.20	7.20	16.25	6.00		200
F780HDU	3"	5.50	7.20	7.20	16.25	6.00	50	
F7100HD	4"	6.50	8.45	8.45	17.00	7.50		200
F7100HDU	4"	6.50	8.45	8.45	17.00	7.50		50
F7125HDU	5"	7.50	9.60	9.60	17.50	8.50		50
F7150HDU	6"	8.00	10.08	10.08	18.00	9.50		50
F750-150SHP	2"	4.50	6.25	6.25	16.50	4.75	150	285
F765-150SHP	2½"	5.00	6.88	6.88	17.00	5.50	150	285
F780-150SHP	3"	5.50	7.42	7.42	17.50	6.00	150	285
F7100-150SHP	4"	6.50	8.63	8.63	18.00	7.50	150	
F750-300SHP	2"	5.00	6.75	6.75	15.50	5.00		285
F765-300SHP	2½"	5.50	7.38	7.38	16.00	5.88		285
F780-300SHP	3"	6.00	7.92	7.92	16.25	6.63		285
F7100-300SHP	4"	7.00	9.13	9.13	18.00	7.88		150

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### Wiring Diagrams

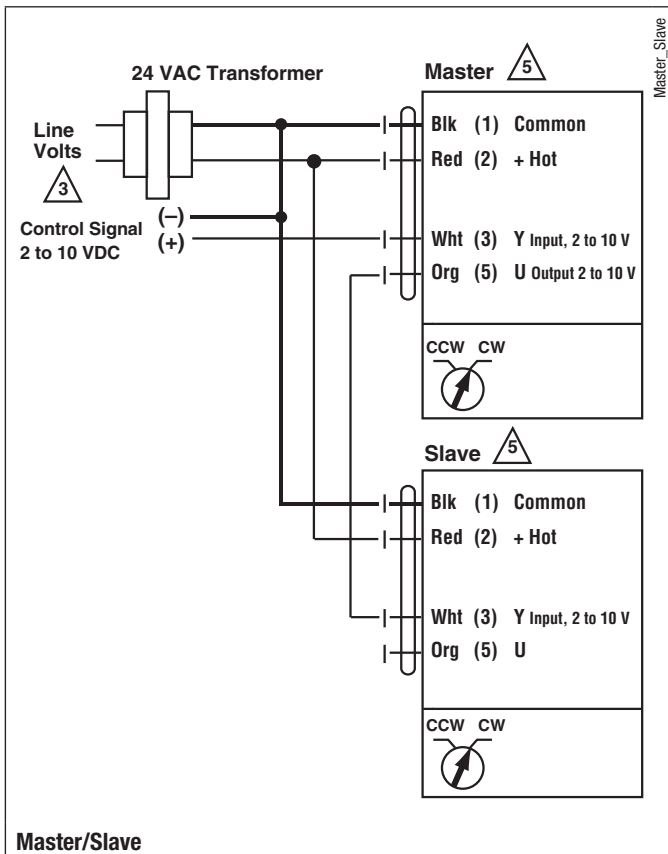
#### ✂️ INSTALLATION NOTES

- ⚠️ 3 Actuators may also be powered by 24 VDC.
- ⚠️ 5 Actuators with plenum rated cable do not have numbers on wires; use color coded instead. Actuators with appliance rated cable use numbers.
- ⚠️ 8 Control signal may be pulsed from either the Hot (Source) or Common (Sink) 24 VAC line.
- ⚠️ 10 For triac sink the Common connection from the actuator must be connected to the Hot connection of the controller.

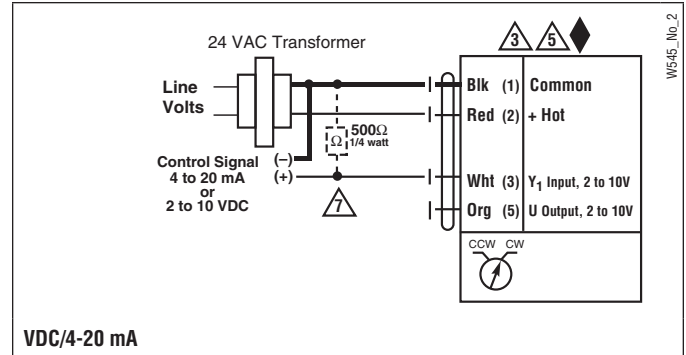
#### 📄 APPLICATION NOTES

- ◆ Meets cULus or UL and CSA requirements without the need of an electrical ground connection.
- ⚠️ 9 Contact closures A & B also can be triacs. A & B should both be closed for triac source and open for triac sink.
- ⚠️ 11 Position feedback cannot be used with a Triac sink controller. The actuator internal common reference is not compatible.

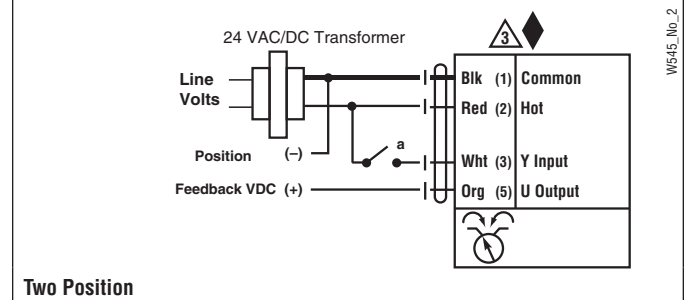
**⚠️ WARNING Live Electrical Components!**  
 During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components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



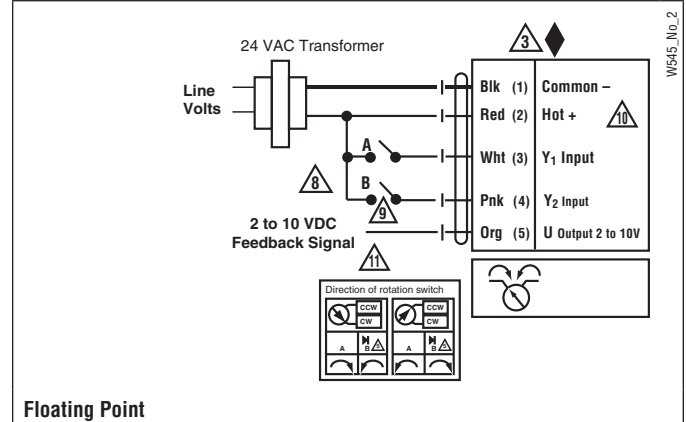
Master/Slave



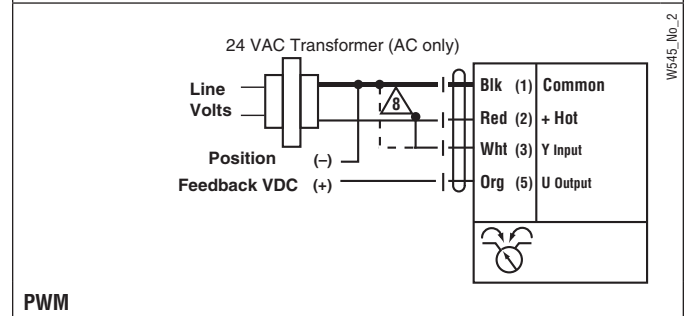
VDC/4-20 mA



Two Position



Floating Point



PWM