

# F6 Series 2-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

## 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  $C_v$  values provide for an economical control valve solution for larger flow applications.

## Dead End Service

Utilizes larger retainer ring set screws to allow the valve to be placed at the end of the line without a down stream flange in either flow direction while still holding full pressure.

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 flange
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

$C_v$ 90°	$C_v$ 60°	2-way Valves		Suitable Actuators						
		Inches	Type	Non Fail-Safe		Fail-Safe				
				150		Spring Return		Electronic		
			ANSI 150 2-way	150		150		150		
102	56	2	F650-150SHP	GM Series				AF Series		GK Series
146	80	2½	F665-150SHP							
228	125	3	F680-150SHP							
451	248	4	F6100-150SHP	PR Series						
714	392	5	F6125-150SHP							
1103	607	6	F6150-150SHP	SY Series (2 Year Warranty)						PKR
2064	1135	8	F6200-150SHP							
3517	1934	10	F6250-150SHP							
4837	2660	12	F6300-150SHP							
6857	3592	14*	F6350-150SHP							
9287	4865	16*	F6400-150SHP							
11400	6270	18*	F6450-150SHP							
14420	7590	20*	F6500-150SHP							
22050	11550	24*	F6600-150SHP							

Valve	Size	$C_v$	MOD									ON/OFF
			10°	20°	30°	40°	50°	60°	70°	80°	90°	
F650-150SHP	2"	102	1.50	6.10	14	26	39	56	77	99	102	
F665-150SHP	2½"	146	2.20	8.80	20	37	55	80	110	142	146	
F680-150SHP	3"	228	3.40	14	32	57	87	125	171	221	228	
F6100-150SHP	4"	451	6.80	27	63	114	171	248	338	437	451	
F6125-150SHP	5"	714	11	43	100	180	271	393	536	693	714	
F6150-150SHP	6"	1103	17	66	154	278	419	607	827	1070	1103	
F6200-150SHP	8"	2064	31	124	289	520	784	1135	1548	2002	2064	
F6250-150SHP	10"	3517	53	211	492	886	1336	1934	2638	3411	3517	
F6300-150SHP	12"	4837	73	290	677	1219	1838	2660	3628	4692	4837	
F6350-150SHP	14"	6857	90	392	914	1646	2481	3592	4898	6530	6857	
F6400-150SHP	16"	9287	132	531	1230	2229	3361	4865	6634	8845	9287	
F6450-150SHP	18"	11400	171	684	1596	3873	4332	6270	8550	11270	11400	
F6500-150SHP	20"	14420	207	828	1932	3478	5244	7590	10350	13800	14420	
F6600-150SHP	24"	22050	315	1260	2940	5292	7890	11550	15750	21000	22050	

### Maximum Dimensions (Inches)

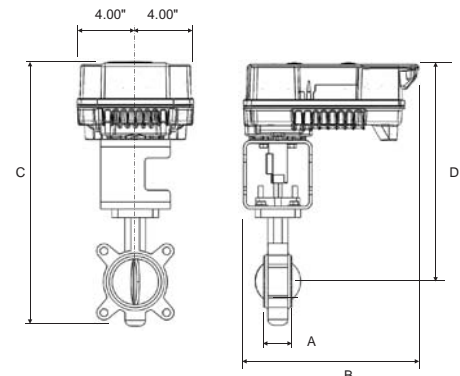
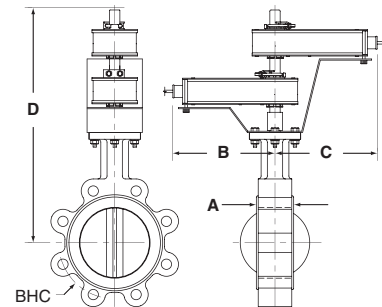
Valve	Size	C <sub>v</sub> 90°	A	B	C	D(Max)	BHC	No. of Holes	Lug Bolt	Actuator	Close-Off (PSI)	
F650-150SHP	2"	102	1.75	9.00	9.00	19.50	4.75	4	5/8-11 UNC	2*AF	150	Spring Return
F665-150SHP	2½"	146	1.88	9.00	9.00	20.00	5.50	4	5/8-11 UNC		150	
F680-150SHP	3"	228	1.92	9.00	9.00	20.50	6.00	4	5/8-11 UNC		150	
F6100-150SHP	4"	451	2.13	9.00	9.00	21.00	7.50	8	5/8-11 UNC	GK	150	Electronic Fail-Safe
F650-150SHP	2"	102	1.75	9.00	9.00	19.50	4.75	4	5/8-11 UNC		285	
F665-150SHP	2½"	146	1.88	9.00	9.00	20.00	5.50	4	5/8-11 UNC		285	
F680-150SHP	3"	228	1.92	9.00	9.00	20.50	6.00	4	5/8-11 UNC	2*GK	285	Electronic Fail-Safe
F6100-150SHP	4"	451	2.13	9.00	9.00	21.00	7.50	8	5/8-11 UNC		150	
F6100-150SHP	4"	451	2.13	9.00	9.00	21.00	7.50	8	5/8-11 UNC		285	
F650-150SHP	2"	102	1.75	9.00	9.00	19.50	4.75	4	5/8-11 UNC	GM	285	Electronic Fail-Safe
F665-150SHP	2½"	146	1.88	9.00	9.00	20.00	5.50	4	5/8-11 UNC		285	
F680-150SHP	3"	228	1.92	9.00	9.00	20.50	6.00	4	5/8-11 UNC		285	
F6100-150SHP	4"	451	2.13	9.00	9.00	21.00	7.50	8	5/8-11 UNC	2*GM	150	Electronic Fail-Safe
F6100-150SHP	4"	451	2.13	9.00	9.00	21.00	7.50	8	5/8-11 UNC		285	
F650-150SHP	2"	102	1.75	10.00	15.00	14.00	4.75	4	5/8-11 UNC		PR/PK	
F665-150SHP	2½"	146	1.88	10.00	16.00	14.00	5.50	4	5/8-11 UNC	285		
F680-150SHP	3"	228	1.92	10.00	17.00	15.00	6.00	4	5/8-11 UNC	285		
F6100-150SHP	4"	451	2.13	10.00	18.00	16.00	7.50	8	5/8-11 UNC	SY4...	285	Non-Spring Return
F6125-150SHP	5"	714	2.25	10.00	19.00	16.00	8.50	8	3/4-10 UNC		285	
F6150-150SHP	6"	1103	2.29	10.00	20.00	17.00	9.50	8	3/4-10 UNC		285	
F6200-150SHP	8"	2064	2.50	12.00	12.00	32.00	11.75	8	3/4-10 UNC	SY4...	285	Electronic Fail-Safe (K)
F6250-150SHP	10"	3517	2.81	12.00	12.00	33.00	14.25	12	7/8-9 UNC		150	
F6300-150SHP	12"	4837	3.23	12.00	12.00	35.00	17.00	12	7/8-9 UNC		285	
F6350-150SHP	14"	6857	3.62	14.00	14.00	36.00	18.75	12	1-8 UNC	SY5...	150	Electronic Fail-Safe (K)
										SY5...	150	
										SY7...	285	
F6400-150SHP	16"	9287	4.00	14.00	14.00	37.50	21.25	16	1-8 UNC	SY8...	285	Electronic Fail-Safe (K)
										SY8...	150	
F6450-150SHP	18"	11400	4.50	14.00	14.00	42.25	22.75	16	1 1/8-8 UNC	SY7...	150	Electronic Fail-Safe (K)
										SY8...	285	
F6500-150SHP	20"	14420	5.00	14.00	14.00	49.50	25.00	20	1 1/8-8 UNC	SY8...	150	Electronic Fail-Safe (K)
										SY10...	285	
F6600-150SHP	24"	22050	6.06	14.00	14.00	56.25	29.50	20	1 1/4-8 UNC	SY10...	150	Electronic Fail-Safe (K)

Dimension "A" does not include flange gaskets. (2 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.
- 2-way assemblies are furnished assembled, calibrated and tested, ready for installation.
- 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.
- Flange gaskets (2 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.

### Dimensions





5-year warranty



## Technical data

<b>Electrical data</b>	Nominal voltage	AC 24...240 V / DC 24...125 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	52 W
	Power consumption in rest position	9 W
	Transformer sizing	55 VA @ AC/DC 24 V (class 2 power source), 43 VA @ AC/DC 120 V, 68 VA @ AC 230 V
	Auxiliary switch	2 x SPDT, 3 A resistive (0.5 A inductive) @ AC 250 V, 1 x 10° / 1 x 0...90° (default setting 85°)
	Switching capacity auxiliary switch	3 A resistive (0.5 A inductive) @ AC 250 V
	Electrical Connection	Terminal blocks, (PE) Ground-Screw
	Overload Protection	electronic throughout 0...90° rotation
<b>Functional data</b>	Communicative control	BACnet MS/TP Modbus RTU MP-Bus
	Options positioning signal	variable (VDC, on/off, floating point)
	Position feedback U variable	VDC variable
	Setting fail-safe position	0...100%, adjustable with Belimo Assistant App (default setting 0%)
	Bridging time	programmable 0...10 s (2 s default) delay before fail-safe activates
	Pre-charging time	5...20 s
	Direction of motion motor	reversible with app
	Direction of motion fail-safe	reversible with app
	Manual override	7 mm hex crank, supplied
	Angle of rotation	90°
	Running Time (Motor)	default 35 s, variable 30...120 s
	Running time motor variable	30...120 s
	Running time fail-safe	<30 s
	Noise level, motor	68 dB(A)
	Noise level, fail-safe	62 dB(A)
	Position indication	top mounted domed indicator
	Passive sensor inputs	2x (Pt1000, Ni1000, NTC10k2)
<b>Safety data</b>	Degree of protection IEC/EN	IP66/67
	Degree of protection NEMA/UL	NEMA 4X
	Enclosure	UL Enclosure Type 4X
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]

<b>Safety data</b>	Ambient humidity	Max. 100% RH
	Servicing	maintenance-free
<b>Weight</b>	Weight	14 lb [6.4 kg]





**Product features**

<b>Default/Configuration</b>	Default parameters for DC 2...10 V applications of the PKR..-MFT actuator are assigned during manufacturing. If required, different parameters of the actuator can be ordered. These parameters are variable and can be modified by factory pre-set, the handheld ZTH US or using the Belimo App on a smart phone with Near Field Communications (NFC) programming.
<b>Application</b>	PR Series valve actuators are designed with an integrated linkage and visual position indicators. For outdoor applications, the installed valve must be mounted with the actuator at or above horizontal. For indoor applications the actuator can be in any location including directly under the valve.
<b>Operation</b>	<p>The PR series actuator provides 90° of rotation and a visual indicator shows the position of the valve. The PR Series actuator uses a low power consumption brushless DC motor and is electronically protected against overload. A universal power supply is furnished to connect supply voltage in the range of AC 24...240 V and DC 24...125 V. Included is a smart heater with thermostat to eliminate condensation. Two auxiliary switches are provided; one set at 10° open and the other is field adjustable. Running time is field adjustable from 30...120 seconds by using the Near Field Communication (NFC) app and a smart phone.</p> <p>†Use 60°C/75°C copper wire size range 12...28 AWG, stranded or solid. Use flexible metal conduit. Push the listed conduit fitting device over the actuator's cable to butt against the enclosure. Screw in conduit connector. Jacket the actuators input wiring with listed flexible conduit. Properly terminate the conduit in a suitable junction box. Rated impulse Voltage 4000 V. Type of action 1. Control pollution degree 3.</p>
<b>Factory settings</b>	Default parameters for DC 2...10 V applications of the PKR..-MFT actuator are assigned during manufacturing. If required, different parameters of the actuator can be ordered. These parameters are variable and can be modified by factory pre-set, the handheld ZTH US or using the Belimo App on a smart phone with Near Field Communications (NFC) programming.

**Accessories**

<b>Gateways</b>	<b>Description</b>	<b>Type</b>
	Gateway MP to BACnet MS/TP	UK24BAC
	Gateway MP to LonWorks	UK24LON
	Gateway MP to Modbus RTU	UK24MOD
<b>Electrical accessories</b>	<b>Description</b>	<b>Type</b>
	Service Tool, with ZIP-USB function, for programmable and communicative Belimo actuators, VAV controller and HVAC performance devices	ZTH US
<b>Mechanical accessories</b>	<b>Description</b>	<b>Type</b>
	Hand crank for PR, PKR, PM	ZG-HND PR
<b>Service tools</b>	<b>Description</b>	<b>Type</b>
	Connection cable 10 ft [3 m], A: RJ11 6/4 ZTH EU, B: 3-pin Weidmüller and supply connection	ZK4-GEN
	Service Tool, with ZIP-USB function, for programmable and communicative Belimo actuators, VAV controller and HVAC performance devices	ZTH US

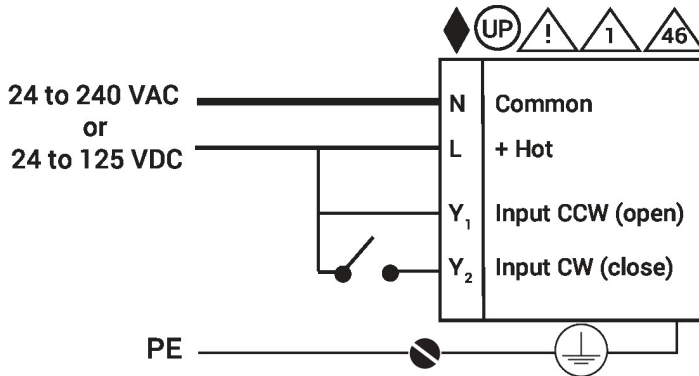
**Electrical installation**

-  Meets cULus requirements without the need of an electrical ground connection.
-  Universal Power Supply (UP) models can be supplied with 24 V up to 240 V.
-  Disconnect power.
-  Provide overload protection and disconnect as required.

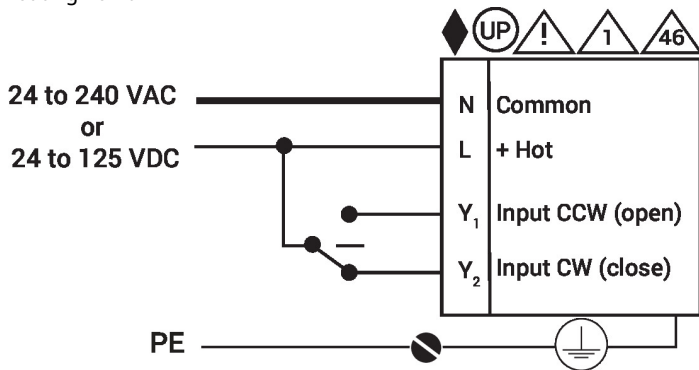
- ⚠️ 4 Two built-in auxiliary switches (2x SPDT), for end position indication, interlock control, fan startup, etc.
- ⚠️ 5 Only connect common to negative (-) leg of control circuits.
- ⚠️ 46 Actuators may be controlled in parallel. Current draw and input impedance must be observed.
- ⚠️ 1 **Warning! 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.

**Wiring diagrams**

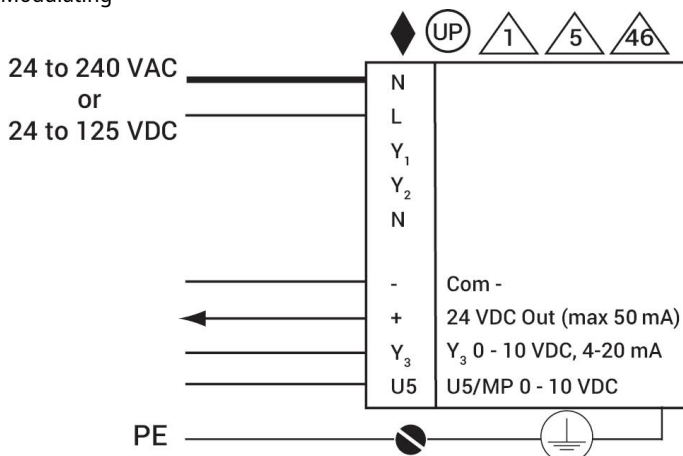
On/Off

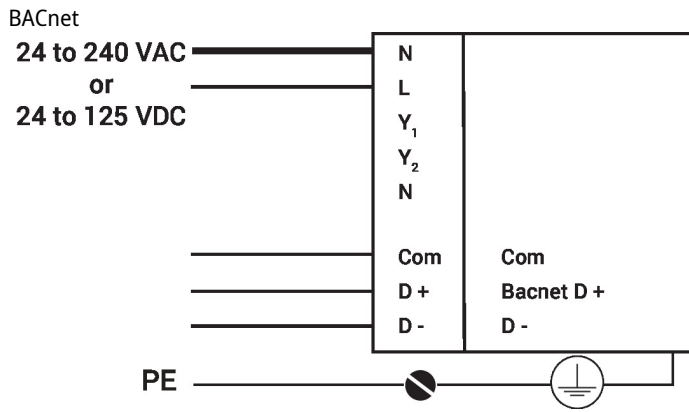


Floating Point



Modulating





**Dimensions**

**Dimensional drawings**

