

F7 Series 3-Way, Victaulic Butterfly Valve



- 200 psi (2" to 12") bubble tight shut-off
- Long stem design allows for 2" insulation
- 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.

Jobsite Note

Valves should be stored in a weather protected area prior to construction.

| Technical Data | |
|----------------------------|--|
| Service | chilled, hot water, 60% glycol |
| Flow characteristic | modified equal percentage |
| Controllable flow range | 82° |
| Sizes | 2" to 12" |
| Type of end fitting | grooved ANSI/AWWA (C606) |
| Valve materials* | |
| Body | ductile iron ASTM A536, grade 65-45-12 |
| Body finish | black alkyd enamel |
| Disc | electroless nickel coated ductile iron |
| Seat | EPDM |
| Shaft | 416 stainless steel |
| Bearing | fiberglass with TFE lining |
| Body pressure rating | 300 psi |
| Media temperature range | -30°F to 250°F [-34°C to 120°C] |
| Rangeability | 100:1 |
| Maximum close-off pressure | 200 psi |
| Maximum velocity | 20 FPS |

*VIC®300 Masterseal™ as manufactured by Victaulic Company

| C _v 90° | C _v 60° | 3-way | | Suitable Actuators | | | |
|-----------------------|-----------------------|--------------------|---------|--------------------|---------------|-------------------|-----------|
| | | Valve Nominal Size | | Type | Spring Return | Non-Spring Return | |
| | | IN | DN [mm] | 2-way | AF Series | AM | GM Series |
| 115 | 36 | 2" | 50 | F750VIC | AF Series | AM | GM Series |
| 260 | 80 | 2½" | 65 | F765VIC | | | |
| 440 | 140 | 3" | 80 | F780VIC | SY Series | | |
| 820 | 250 | 4" | 100 | F7100VIC | | | |
| 1200 | 370 | 5" | 125 | F7125VIC | | | |
| 1800 | 560 | 6" | 150 | F7150VIC | | | |
| 3400 | 1050 | 8" | 200 | F7200VIC | | | |
| 5800 | 1800 | 10" | 250 | F7250VIC | | | |
| 9000 | 2790 | 12" | 300 | F7300VIC | | | |

| Valve | Size | C _v | 30° | 40° | 50° | 60° | 70° | 90° |
|----------|------|----------------|-----|------|------|------|------|------|
| F750VIC | 2" | 115 | 7 | 14 | 23 | 36 | 60 | 115 |
| F765VIC | 2½" | 260 | 16 | 30 | 50 | 80 | 140 | 260 |
| F780VIC | 3" | 440 | 26 | 50 | 90 | 140 | 230 | 440 |
| F7100VIC | 4" | 820 | 50 | 100 | 160 | 250 | 430 | 820 |
| F7125VIC | 5" | 1200 | 70 | 140 | 240 | 370 | 620 | 1200 |
| F7150VIC | 6" | 1800 | 110 | 220 | 360 | 560 | 940 | 1800 |
| F7200VIC | 8" | 3400 | 200 | 410 | 670 | 1050 | 1770 | 3400 |
| F7250VIC | 10" | 5800 | 350 | 700 | 1150 | 1800 | 3020 | 5800 |
| F7300VIC | 12" | 9000 | 540 | 1080 | 1780 | 2790 | 4680 | 9000 |

| Maximum Dimensions (Inches) | | | | | | | | |
|-----------------------------|------|--------|--------|---------|---------|--------|----------|-----------------|
| Valve | Size | Cy 90° | A(Max) | B (Max) | C (Max) | D(Max) | Actuator | Close-Off (PSI) |
| F750VIC | 2" | 115 | 3.21 | 2.00 | 8.60 | 14.00 | AF... | 50 |
| F750VIC | 2" | 115 | 3.21 | 2.00 | 8.60 | 14.00 | 2*AF... | 200 |
| F765VIC | 2½" | 260 | 3.77 | 8.60 | 8.60 | 18.70 | | 50 |
| F750VIC | 2" | 115 | 3.20 | 6.50 | 13.10 | 13.20 | AM... | 50 |
| F750VIC | 2" | 115 | 3.20 | 6.50 | 13.60 | 13.60 | GM... | 200 |
| F765VIC | 2½" | 260 | 3.80 | 7.50 | 14.10 | 14.00 | | 50 |
| F765VIC | 2½" | 260 | 3.80 | 7.50 | 14.10 | 14.30 | 2*GM | 200 |
| F780VIC | 3" | 440 | 3.80 | 8.00 | 14.30 | 19.60 | | 50 |
| F750VIC | 2" | 115 | 3.20 | 6.50 | 15.70 | 15.70 | SY1... | 200 |
| F765VIC | 2½" | 260 | 3.80 | 7.50 | 16.20 | 16.20 | | 50 |
| F765VIC | 2½" | 260 | 3.80 | 7.50 | 25.70 | 16.40 | SY2... | 200 |
| F780VIC | 3" | 440 | 3.80 | 8.00 | 26.00 | 26.00 | | 200 |
| F7100VIC | 4" | 820 | 4.60 | 9.60 | 26.70 | 26.70 | | 200 |
| F7125VIC | 5" | 1200 | 5.90 | 11.40 | 27.70 | 27.70 | SY3... | 200 |
| F7150VIC | 6" | 1800 | 5.90 | 12.40 | 28.30 | 28.20 | | 50 |
| F7150VIC | 6" | 1800 | 5.90 | 12.40 | 32.10 | 33.30 | SY4... | 200 |
| F7200VIC | 8" | 3400 | 5.30 | 13.10 | 33.30 | 35.00 | | 200 |
| F7250VIC | 10" | 5800 | 6.40 | 15.40 | 35.10 | 35.10 | SY6... | 50 |
| F7250VIC | 10" | 5800 | 6.40 | 15.40 | 38.70 | 38.70 | | 200 |
| F7300VIC | 12" | 9000 | 6.50 | 16.50 | 39.70 | 39.70 | SY7... | 200 |

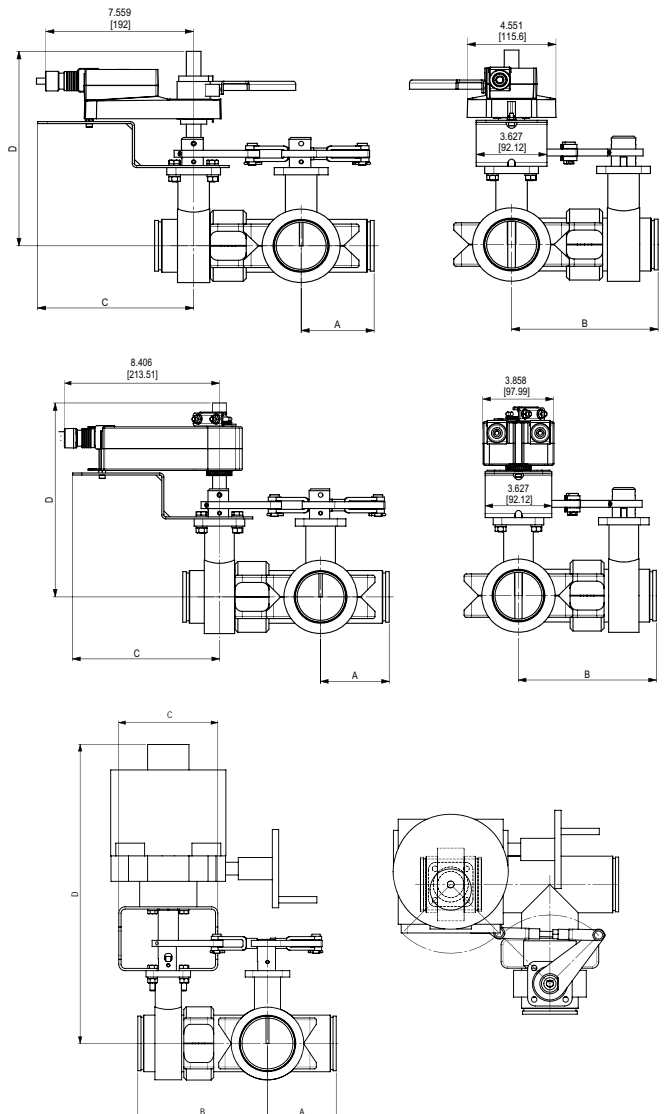
Spring Return
Non-Spring Return

†SY6 and larger available in 110/220 VAC versions only.
SY... maximum actuator ambient temperature is 150°F.

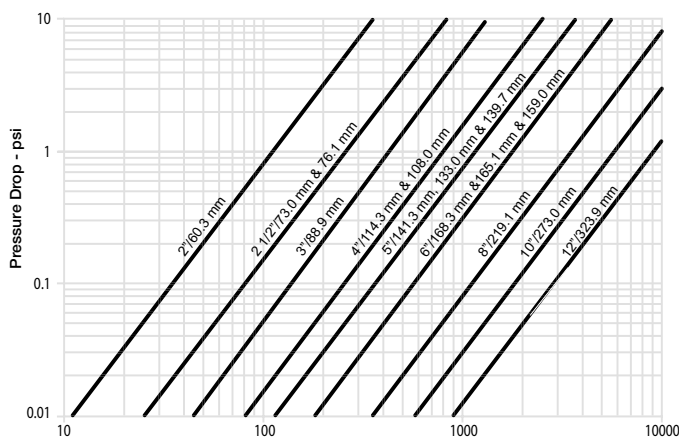
Application Notes

1. Valves are rated at 200 psi differential pressure in the closed position
2. 2-way assemblies are furnished assembled and tested, ready for installation.
3. Dimension "D" allows for actuator removal without the need to remove the valve from the pipe.
4. Belimo SY Series actuators are NEMA 4X rated.
5. Provide support for the actuator if it is mounted at any angle other than 90° vertical.
6. Installer is to use rigid type couplings for connecting the valve to the piping.

Dimensions



Flow Rate (GPM)



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AF Actuators, Multi-Function Technology



Models

- AFX24-MFT-X1
- AFX24-MFT-S-X1 w/built-in Aux. Switches
- 2* AFX24-MFT-X1
- 2* AFX24-MFT-S-X1

Technical Data

| | |
|-------------------------------|---|
| Power supply | 24 VAC, +/- 20%, 50/60 Hz 24 VDC, +20% / -10% |
| Power consumption | running 7.5 W holding 3 W |
| Transformer sizing | 10 VA (Class 2 power source) |
| Electrical connection AFX... | 3 ft [1m] default, 10 ft [3m] or 16 ft [5m] 18 GA appliance or plenum cables, with or without 1/2" conduit connector -S models: two 3 ft [1m] default, 10 ft [3m] or 16 ft [5m] appliance cables with or without 1/2" conduit connectors |
| Overload protection | electronic throughout 0 to 95° rotation |
| Operating range Y* | 2 to 10 VDC, 4 to 20 mA (default) variable (VDC, PWM, floating point, on/off) |
| Input impedance | 100 kΩ for 2 to 10 VDC (0.1 mA) 500 Ω for 4 to 20 mA 1500 Ω for PWM, floating point and on/off control |
| Feedback output U* | 2 to 10 VDC, 0.5 mA max |
| Torque | minimum 180 in-lb (20 Nm) |
| Direction of rotation* | spring reversible with cw/ccw mounting motor reversible with built-in switch |
| Mechanical angle of rotation* | 95° (adjustable with mechanical end stop, 35° to 95°) |
| Running time | spring <20 sec @ -4°F to 122°F [-20° C to 50° C]; <60 sec @ -22°F [-30° C] motor* 150 seconds (default), variable (70 to 220 seconds) |
| Angle of rotation adaptation | off (default) |
| Override control* | min position = 0% mid. position = 50% max. position = 100% |
| Position indication | visual indicator, 0° to 95° (0° is spring return position) |
| Manual override | 5 mm hex crank (3/16" Allen), supplied |
| Humidity | max. 95% RH, non-condensing |
| Ambient temperature | -22 to 122° F (-30 to 50° C) |
| Storage temperature | -40 to 176° F (-40 to 80° C) |
| Housing | NEMA 2, IP54, Enclosure Type 2 |
| Housing material | zinc coated metal and plastic casing |
| Noise level | ≤40dB(A) motor @ 150 seconds, run time dependent ≤62dB(A) spring return |
| Agency listings † | cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EC & 2006/95/EC |
| Quality standard | ISO 9001 |
| Servicing | maintenance free |
| Weight | 4.6 lbs. (1.9 kg), 4.9 lbs. (2 kg) with switch |

* Variable when configured with MFT options

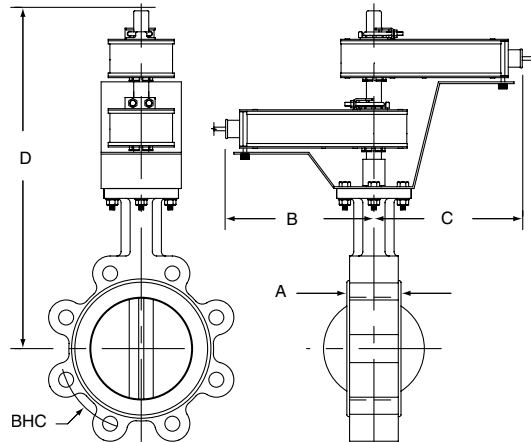
† Rated Impulse Voltage 800V, Type of action 1.AA (1.AA.B for -S version), Control Pollution Degree 3.

‡ Programmed for 70 sec motor run time. At 150 sec motor run time, transformer sizing is 8.5 VA and power consumption is 6 W running / 3 W holding.

AFX24-MFT-S-X1

| | |
|--------------------|---|
| Auxiliary switches | 2 x SPDT 3A (0.5A) @ 250 VAC, UL approved one set at +10°, one adjustable 10° to 90° |
|--------------------|---|

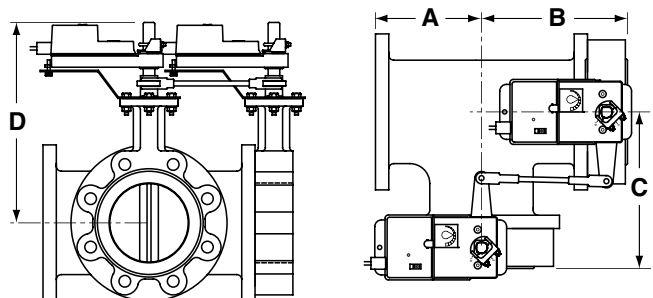
Dimensions with 2-Way Valve



BF2WUDIM_A

| 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 | | 500 |
| 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 | |
| F665VIC | 2½" | 3.77 | 8.60 | 8.60 | 18.70 | - | 200 | |
| F680VIC | 3" | 3.77 | 8.60 | 8.60 | 18.70 | - | 50 | |

Dimensions with 3-Way Valve



HS DWG P11

| 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 |

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Wiring Diagrams

INSTALLATION NOTES

- 3 Actuators may also be powered by 24 VDC.
- 4 IN4004 or IN4007 diode (IN4007 supplied, Belimo part number 40155).
- 5 Triac A and B can also be contact closures.
- 6 Control signal may be pulsed from either the Hot (Source) or Common (Sink) 24 VAC line.
- 7 Position feedback cannot be used with Triac sink controller. The actuators internal common reference is not compatible.

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.
- ◆ 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.

