

# F665HD, 2.5", 2-Way Butterfly Valve

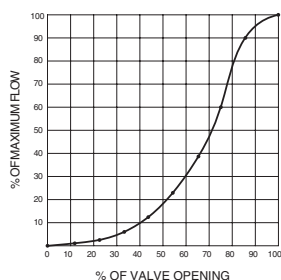
## Resilient Seat, 304 Stainless Steel Disc



### Technical Data

|                                 |   |
|---------------------------------|---|
| Service                         | chilled, hot water, up to 60% glycol    |
| Flow Characteristic             | modified equal percentage               |
| Controllable Flow Range         | 90° rotation                            |
| Size [mm]                       | 2.5" [65]                               |
| End Fitting                     | For use with ANSI Class 125/150 flanges |
| Body                            | ductile iron ASTM A536                  |
| Body Finish                     | epoxy powder coated                     |
| Stem Packing                    | EPDM (lubricated)                       |
| Seat                            | EPDM                                    |
| Shaft                           | 416 stainless steel                     |
| Bushings                        | RPTFE                                   |
| Disc                            | 304 stainless steel                     |
| Body Pressure Rating [psi]      | ANSI 125, standard class B              |
| Number of Bolt Holes            | 4                                       |
| Lug Threads                     | 5/8-11 UNC                              |
| Media Temperature Range (Water) | -22°F to 250°F [-30°C to 120°C]         |
| Close-Off Pressure              | 200 psi                                 |
| Rangeability                    | 10:1 (for 30° to 70° range)             |
| Maximum Velocity                | 12 FPS                                  |
| Cv                              | 196                                     |
| Weight                          | 6.2 lb [2.8 kg]                         |
| Leakage                         | 0%                                      |
| Servicing                       | maintenance free                        |

### Flow Pattern



### Application

Valve is designed for use in ANSI flanged piping systems to meet the needs of bi-directional high flow HVAC hydronic applications with 0% leakage. Typical applications include cooling tower bypass, primary flow change-over systems, and large air handler coil control.

### Jobsite Note

Valve assembly should be stored in a weather protected area prior to installation. Reference the butterfly valve installation instruction for additional information.

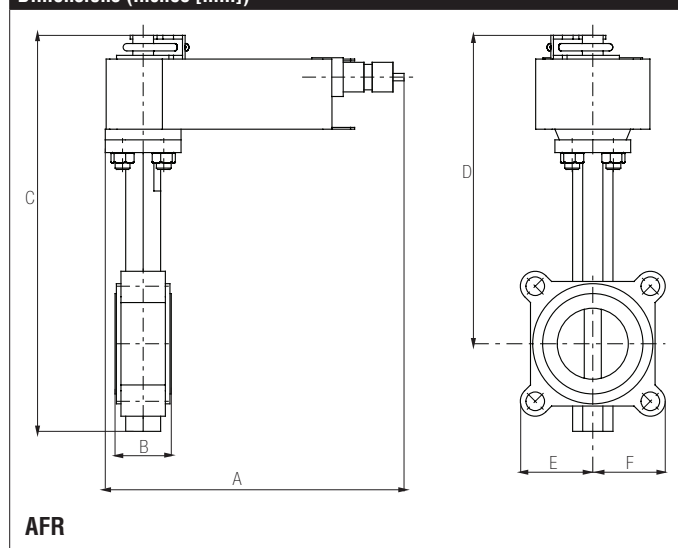
### Flow/Cv

| Cv 10° | Cv 20° | Cv 30° | Cv 40° | Cv 50° | Cv 60° | Cv 70° | Cv 80° | Cv 90° |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0.1    | 6      | 12     | 25     | 45     | 75     | 119    | 178    | 196    |

### Suitable Actuators

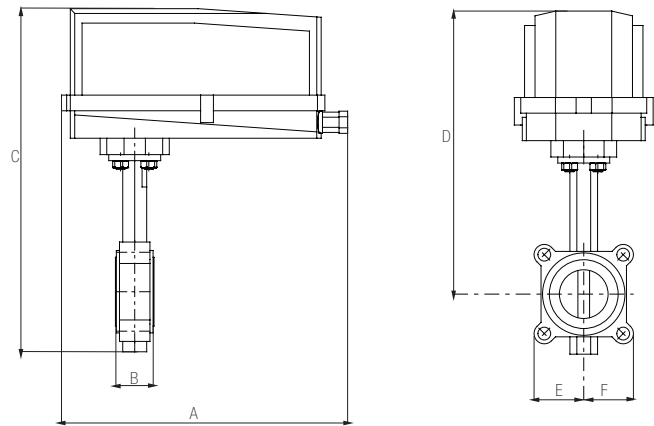
|        | Non-Spring     | Spring  |
|--------|----------------|---------|
| F665HD | ARB(X), GRB(X) | AFRB(X) |

### Dimensions (Inches [mm])



| A           | B          | C            | D            | E          | F |
|-------------|------------|--------------|--------------|------------|---|
| 10.6" [270] | 1.81" [46] | 13.47" [342] | 10.38" [264] | 3.34" [85] |   |

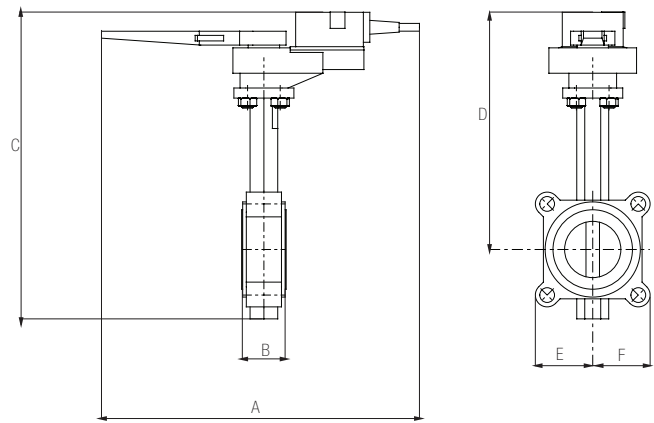
**Dimensions (Inches [mm])**



**GRB..N4(H)**

| A           | B          | C            | D            | E          | F |
|-------------|------------|--------------|--------------|------------|---|
| 14.1" [358] | 1.81" [46] | 17.03" [433] | 14.00" [356] | 3.34" [85] |   |

**Dimensions (Inches [mm])**



**ARB**

| A           | B          | C           | D            | E          | F |
|-------------|------------|-------------|--------------|------------|---|
| 12.7" [323] | 1.81" [46] | 13.1" [333] | 10.07" [256] | 3.34" [85] |   |

# AFX24-MFT-X1

Modulating, Spring Return, 24 V, Multi-Function Technology®



## Technical Data

|                                   |  |
|-----------------------------------|--|
| Power Supply                      | 24 VAC, ±20%, 50/60 Hz, 24 VDC, -10% / +20%  |
| Power Consumption Running         | 7.5 W  |
| Power Consumption Holding         | 3 W  |
| Transformer Sizing                | 10 VA (class 2 power source)   |
| Electrical Connection             | 18 GA appliance rated cable with 1/2" conduit connector protected NEMA 2 (IP54) 3ft [1m] 10ft [3m] and 16ft [5m] |
| Overload Protection               | electronic throughout 0° to 95° rotation   |
| Operating Range Y                 | 2 to 10 VDC, 4 to 20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor), variable (VDC, PWM, floating point, on/off)           |
| Operating range Y variable        | starting point DC 0.5...30 V<br>end point DC 2.5...32 V  |
| Feedback Output U                 | DC 2...10 V, Max. 0.5 mA, VDC variable   |
| Angle of Rotation                 | 95°, adjustable with mechanical end stop, 35° to 95°   |
| Torque motor                      | 180 in-lbs [20 Nm]   |
| Direction of Rotation (Motor)     | reversible with built-in switch  |
| Direction of Rotation (Fail-Safe) | reversible with CW/CCW mounting  |
| Position Indication               | visual indicator, 0° to 95° (0° is full spring return position)  |
| Manual Override                   | 5 mm hex crank (3/16" Allen), supplied   |
| Running Time (Motor)              | default 150 sec, variable 70...220 sec   |
| Running Time (Fail-Safe)          | <20 sec  |
| Override Control                  | min. position = 0% , mid. Position = 50% , max. position = 100% (Default)  |
| Ambient Humidity                  | max. 95% RH non-condensing   |
| Ambient Temperature Range         | -22°F to 122°F [-30°C to 50°C]   |
| Storage Temperature Range         | -40°F to 176°F [-40°C to 80°C]   |
| Housing                           | IP54, NEMA 2, UL Enclosure Type 2  |
| Housing Material                  | zinc coated metal and plastic casing   |
| Agency Listings†                  | cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EC                                      |
| Noise Level (Motor)               | <40 dB (A)   |
| Noise Level (Fail-Safe)           | <62 dB (A)   |
| Servicing                         | maintenance free   |
| Quality Standard                  | ISO 9001   |
| Weight                            | 4.6 lb [2.1 kg]  |
| Degree of Protection IEC/EN       | IP54   |

\*Variable when configured with MFT options.

†Rated Impulse Voltage 800V, Type of action 1.AA, Control Pollution Degree 3

Date created, 06/18/2018 - Subject to change. © Belimo Aircontrols (USA), Inc.

**Wiring Diagrams**

**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.



Meets cULus requirements without the need of an electrical ground connection.



Actuators with appliance cables are numbered.



Provide overload protection and disconnect as required.



Actuators may also be powered by 24 VDC.



Only connect common to negative (-) leg of control circuits.



A 500  $\Omega$  resistor (ZG-R01) converts the 4 to 20 mA control signal to 2 to 10 VDC.



Control signal may be pulsed from either the Hot (Source) or Common (Sink) 24 VAC line.



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.



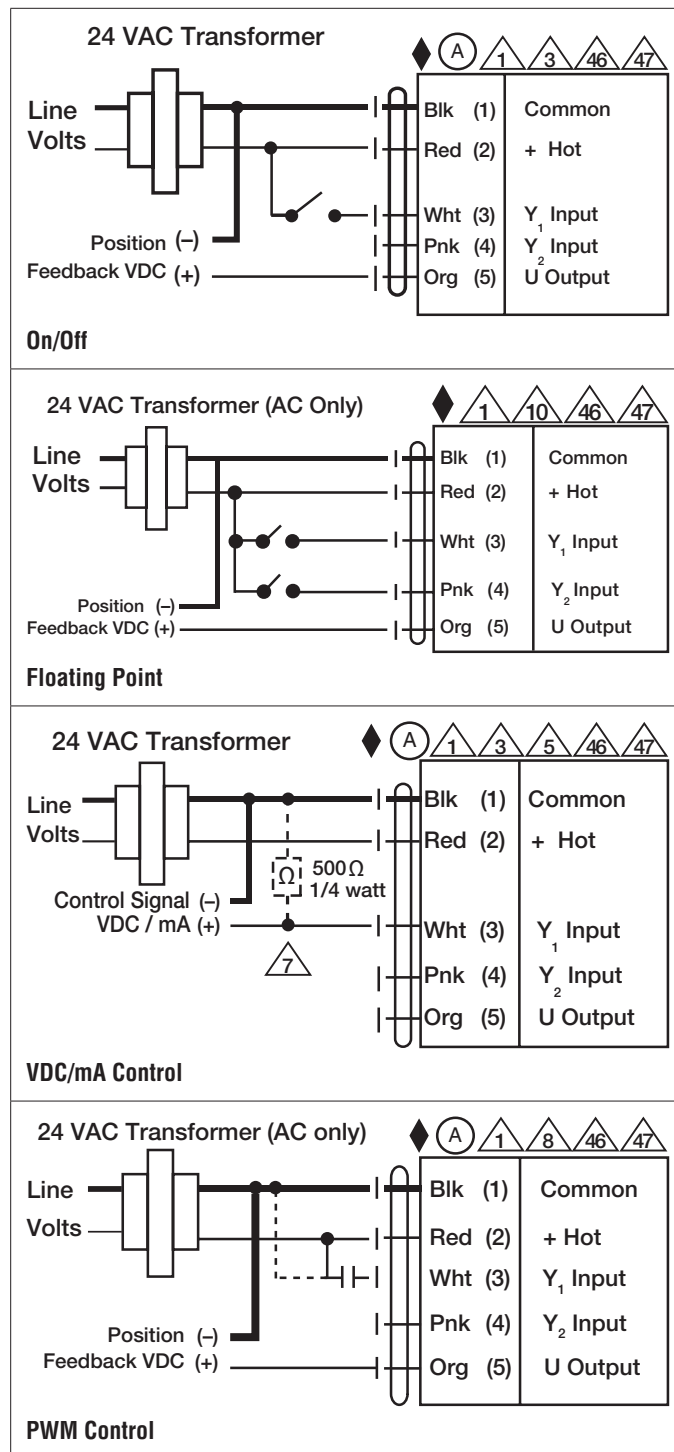
IN4004 or IN4007 diode. (IN4007 supplied, Belimo part number 40155).



Actuators may be controlled in parallel. Current draw and input impedance must be observed.



Master-Slave wiring required for piggy-back applications. Feedback from Master to control input(s) of Slave(s).



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