

F650HD, 2", 2-Way Butterfly Valve

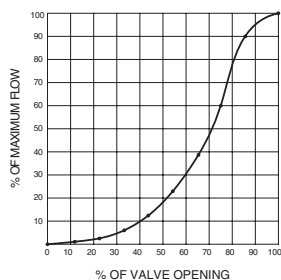
Resilient Seat, 304 Stainless Steel Disc



Technical Data

Media	chilled, hot water, up to 60% glycol
Flow characteristic	modified equal percentage
Controllable flow range	90° rotation
Valve Size	2 " [50]
Type of End Fitting	for use with ANSI class 125/150 flanges
Housing	ductile iron ASTM A536
Surface treatment	epoxy powder coated
Stem seal	EPDM (lubricated)
Seat	EPDM
Stem	416 stainless steel
Bearing	RPTFE
Disc	304 stainless steel
Body Pressure Rating	ANSI Class 125, standard class B
ANSI Class	125
Number of Bolt Holes	4
Lug threads	5/8-11 UNC
Closing pressure Δps	200 psi
Rangeability Sv	10:1 (for 30° to 70° range)
Maximum Velocity	12 FPS
kvs	115
Weight	5.3 lb [2.4 kg]
Leakage rate	0%
Maintenance	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. Valve face-to-face dimensions comply with API 609 & MSS-SP-67, Completely assembled and tested, Ready for installation.

Jobsite Note

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

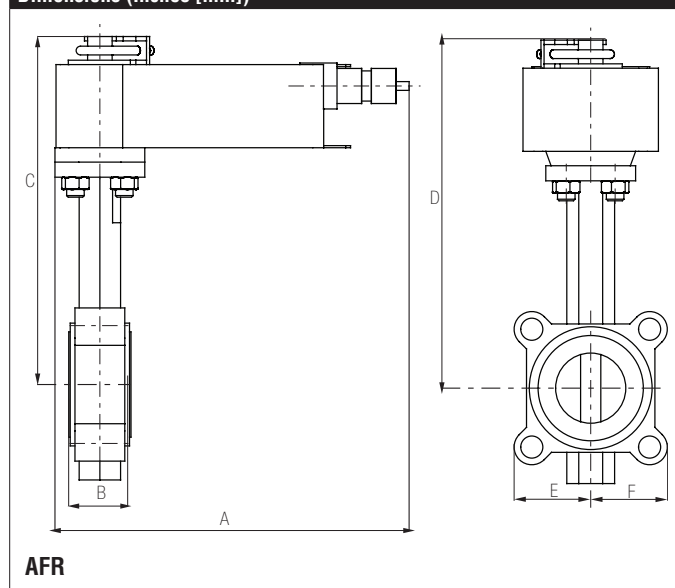
Flow/Cv

kv 10%	kv 20%	kv 30%	kv 40%	kv 50%	kv 60%	kv 70%	kv 80%	kv 90%
0.06	3	7	15	27	44	70	105	115

Suitable Actuators

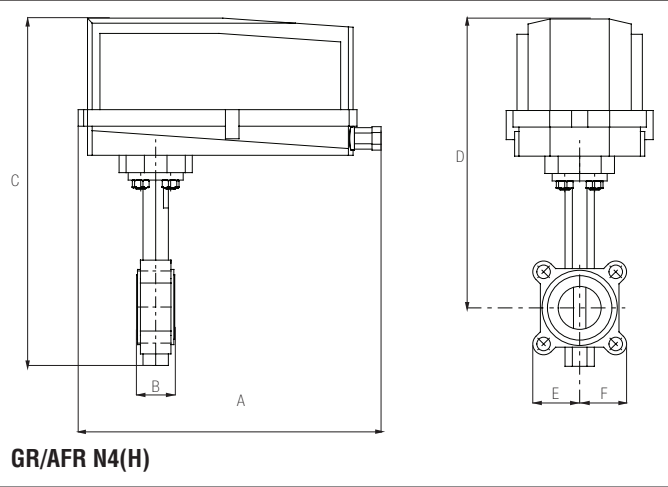
	Non-Spring	Spring
F650HD	ARB(X), GRB(X)	AFRB(X)

Dimensions (Inches [mm])



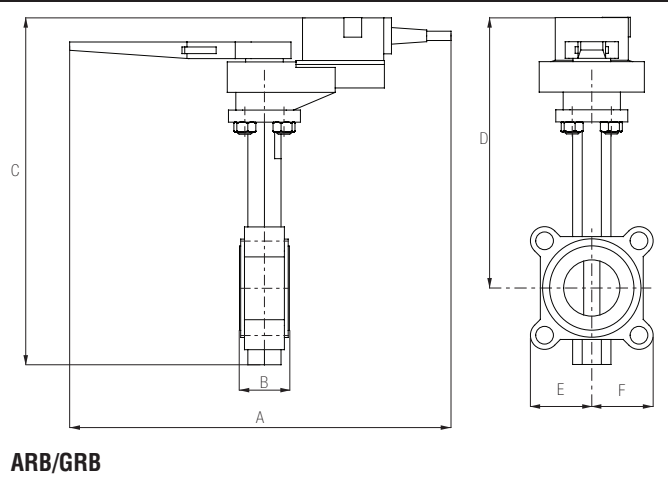
A	B	C	D	E	F
10.6" [270]	1.72" [43.7]	12.6" [320]	9.87" [251]	2.78" [71]	

Dimensions (Inches [mm])



A	B	C	D	E	F
14.1" [358]	1.72" [43.7]	16.1" [375]	13.60" [345]	2.78" [71]	

Dimensions (Inches [mm])



A	B	C	D	E	F
12.7" [323]	1.39" [35.3]	12.38" [314.4]	9.57" [243.1]	2.78" [71]	

AFRX24-MFT

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



Technical Data

Power Supply	24 VAC, $\pm 20\%$, 50/60 Hz, 24 VDC, $\pm 10\%$
Power consumption in operation	7.5 W
Power consumption in rest position	3 W
Transformer sizing	10 VA (class 2 power source)
Electrical Connection	3ft [1m], 18 GA appliance cable with 1/2" conduit connector
Overload Protection	electronic throughout 0° to 95° rotation
Operating Range	DC 2...10 V (default), 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 end point DC 2.5...32 V
Input Impedance	100 k Ω for 2 to 10 VDC (0.1 mA), 500 Ω for 4 to 20 mA, 1500 Ω for PWM, floating point and On/Off
Position Feedback	DC 2...10 V, Max. 0.5 mA, VDC variable
Angle of rotation	90°
direction of rotation motor	reversible with switch
direction of rotation spring-return	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 emergency control position	<20 sec
Angle Of Rotation Adaption	off (default)
Ambient humidity	5 to 95% RH non condensing (EN 60730-1)
Ambient temperature	-22...122 °F [-30...50 °C]
Non-operating temperature	-40...176 °F [-40...80 °C]
Degree of Protection	IP54, NEMA 2, UL Enclosure Type 2
Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2004/108/EC and 2006/95/EC
Noise level, motor	<45 dB (A)
Noise Level (Fail-Safe)	<62 dB (A)
Maintenance	maintenance free
Quality Standard	ISO 9001
Weight	0.000000000000000

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

Date created, 12/21/2018 - Subject to change. © Belimo Aircontrols (USA), Inc.

Wiring Diagrams

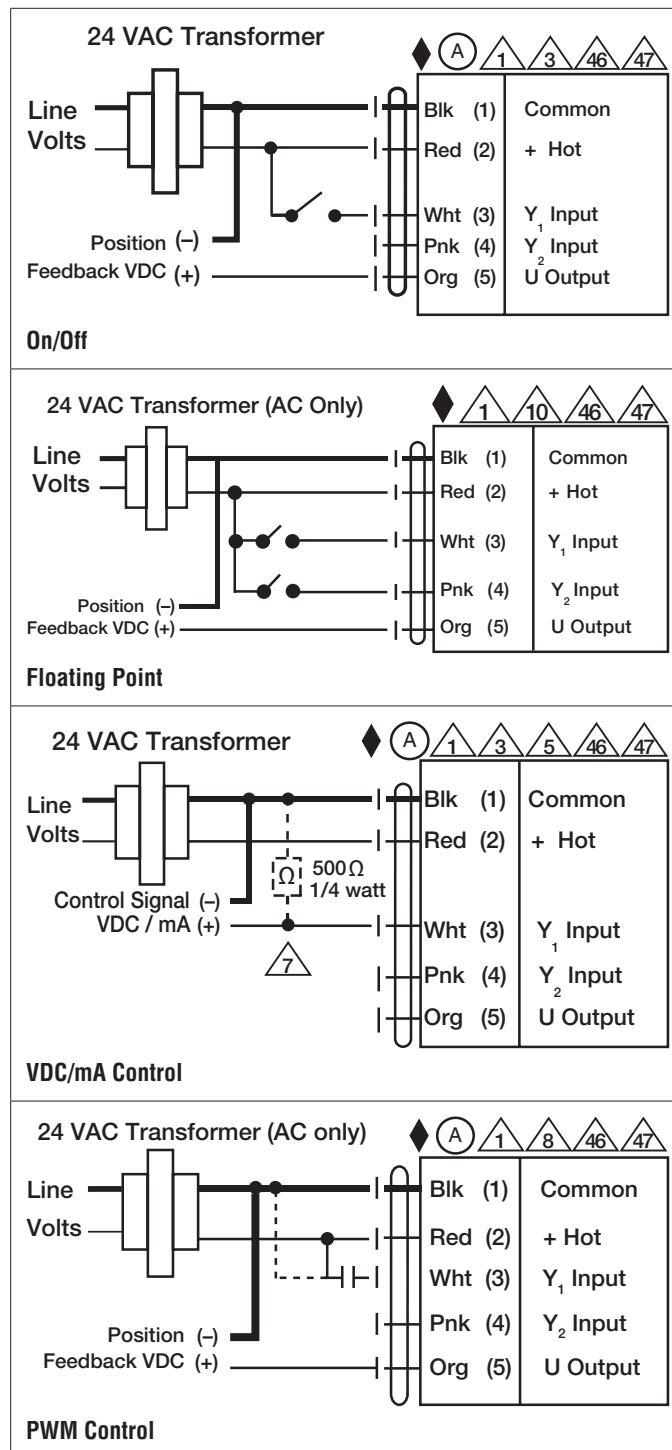
INSTALLATION NOTES

- (A) Actuators with appliance cables are numbered.
- 1 Provide overload protection and disconnect as required.
- 3 Actuators may also be powered by 24 VDC.
- 5 Only connect common to negative (-) leg of control circuits.
- 7 A 500 Ω resistor (ZG-R01) converts the 4 to 20 mA control signal to 2 to 10 VDC.
- 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. Position feedback cannot be used with a triac sink controller; the actuator internal common reference is not compatible.
- 12 IN4004 or IN4007 diode. (IN4007 supplied, Belimo part number 40155).
- 46 Actuators may be controlled in parallel. Current draw and input impedance must be observed.
- 47 Master-Slave wiring required for piggy-back applications. Feedback from Master to control input(s) of Slave(s).
- Meets cULus 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.



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