

Butterfly Valve with Lug types

- Disc 304 stainless steel
- Bubble tight shut-off
- Resilient seat
- Valve face-to-face dimensions comply with API 609 & MSS-SP-67
- Completely assembled and tested, ready for installation



5-year warranty

Type overview

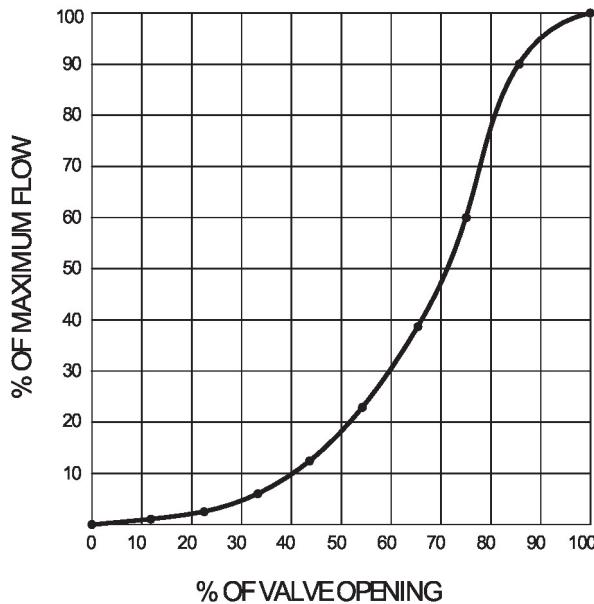
Type	DN
F650HD	50

Technical data

Functional data	
Valve size [mm]	2" [50]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	-22...250°F [-30...120°C]
Body Pressure Rating	ANSI Class Consistent with 125, 232 psi CWP
Close-off pressure Δ ps	200 psi
Flow characteristic	modified equal percentage
Leakage rate	0% leakage, leakage rate A
Servicing	maintenance-free
Flow Pattern	2-way
Controllable flow range	90° rotation
Cv	115
Maximum Velocity	12 FPS
Lug threads	5/8-11 UNC
Materials	
Valve body	Ductile cast iron ASTM A536
Body finish	epoxy powder coating (blue RAL 5002)
Stem	416 stainless steel
Stem seal	EPDM (lubricated)
Seat	EPDM
Pipe connection	for use with ANSI class 125/150 flanges
Bearing	RPTFE
Disc	304 stainless steel
Gear operator materials	Gears - hardened steel
Suitable actuators	
Non-Spring	ARB(X) GRB(X)
Spring	AFRB(X)

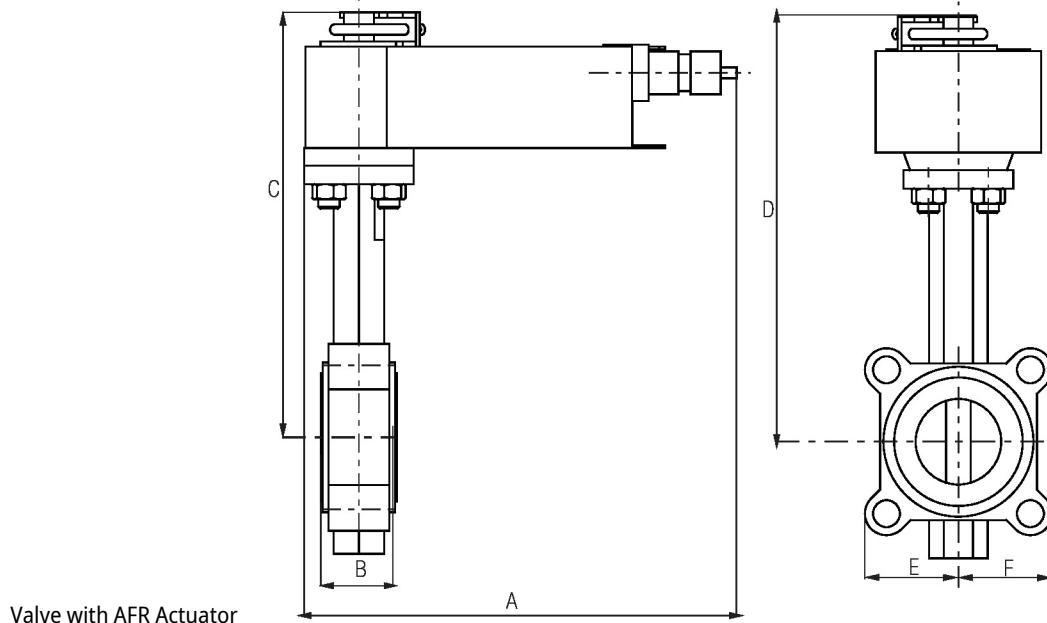
Product features

Flow/Mounting details

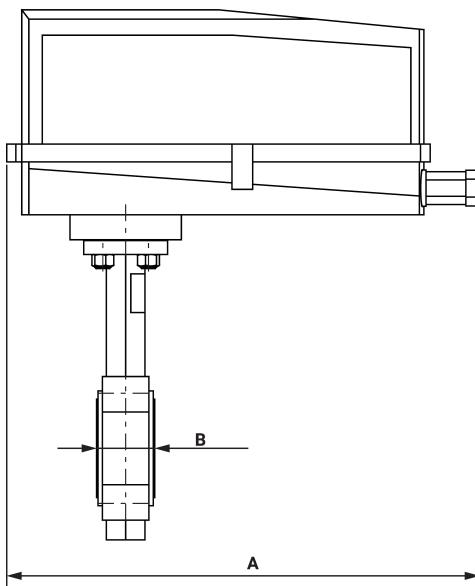


Dimensions

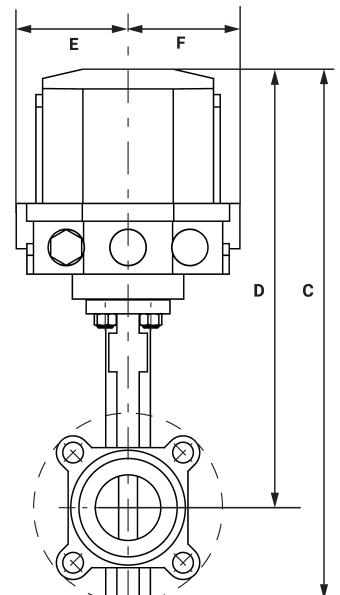
Type	DN	Weight
F650HD	50	5.3 lb [2.4 kg]



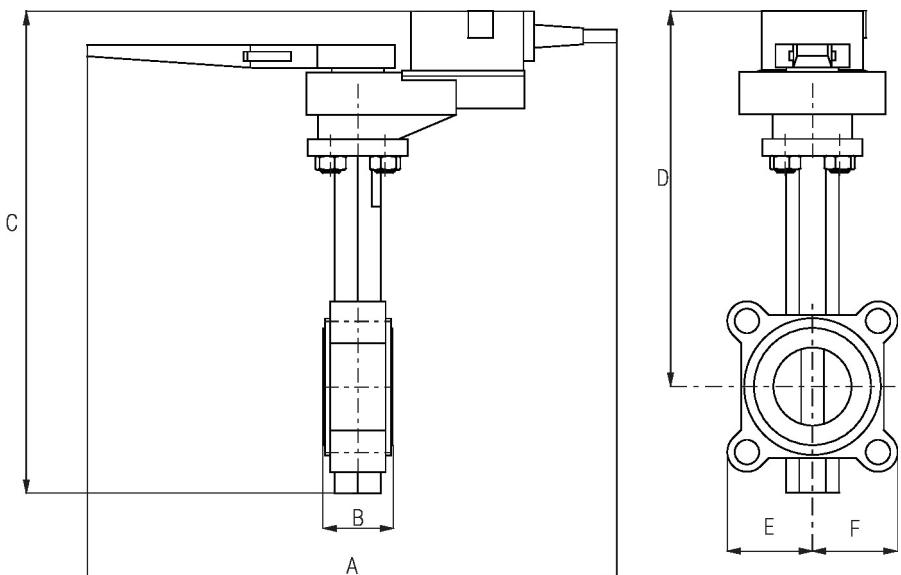
A	B	C	D	E	F	Number of Bolt Holes
10.1" [257]	1.8" [45]	12.3" [312]	9.5" [241]	2.9" [73]	2.9" [73]	4



Valve with AF/GR N4 Actuator

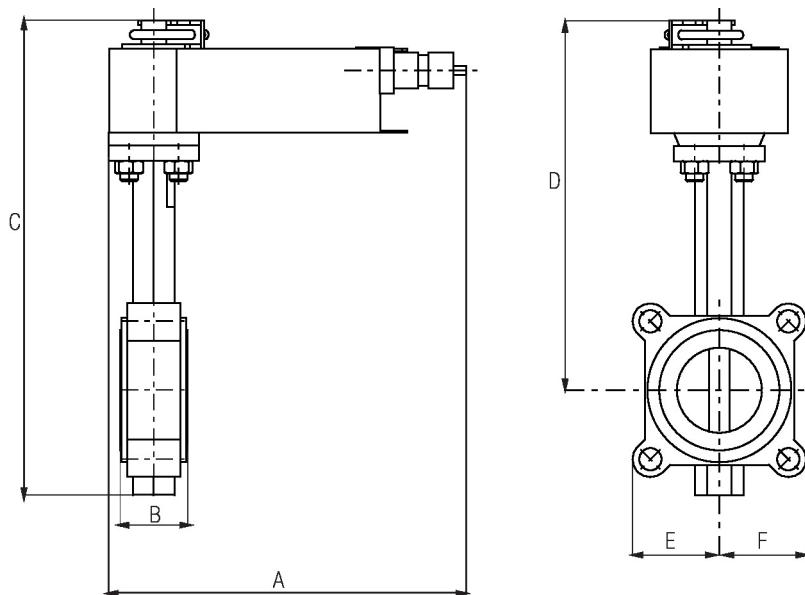


A	B	C	D	E	F	Number of Bolt Holes
14.5" [368]	1.8" [45]	16.1" [409]	13.3" [338]	3.4" [86]	3.4" [86]	4



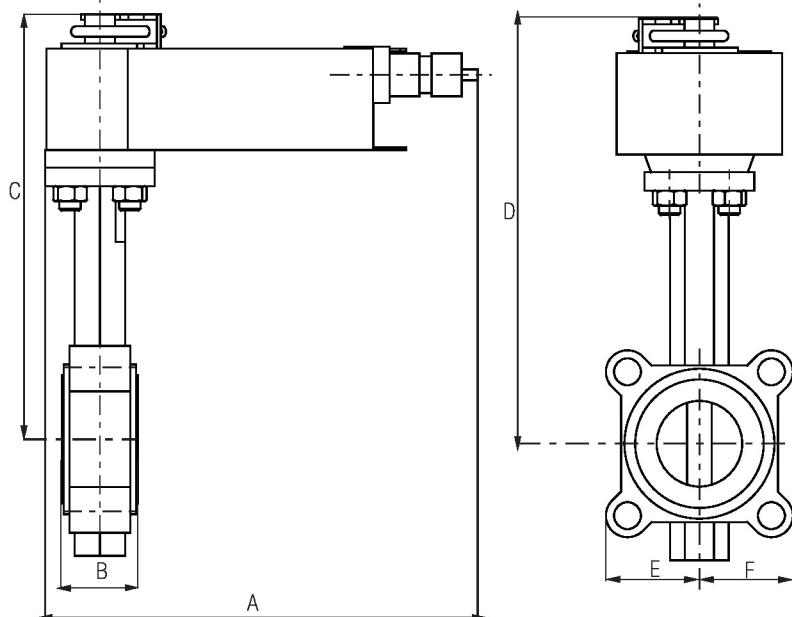
Valve with ARB/GRB Actuator

A	B	C	D	E	F	Number of Bolt Holes
14.6" [370]	1.8" [45]	12.4" [314]	9.7" [246]	2.9" [73]	2.9" [73]	4



Valve with AFB/AFX Actuator

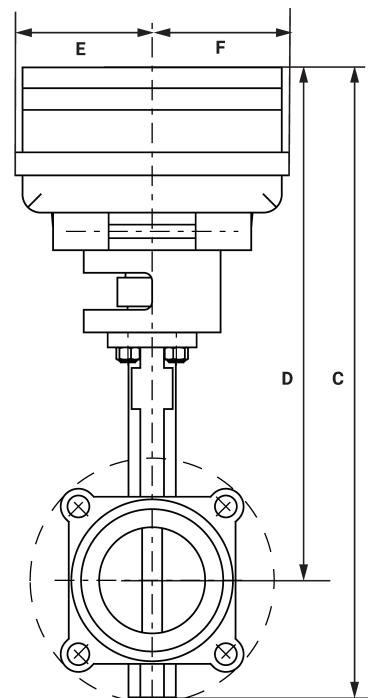
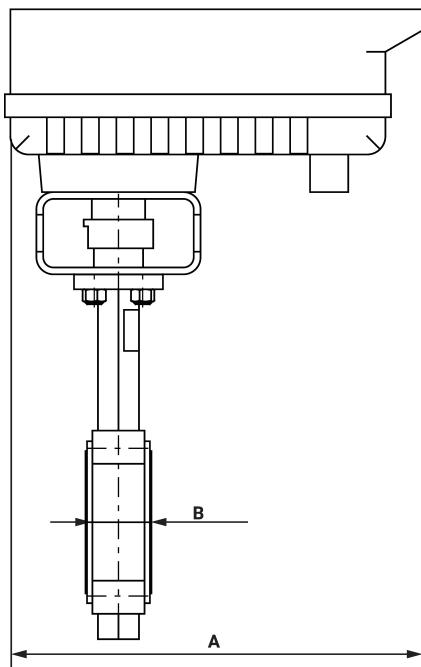
A	B	C	D	E	F	Number of Bolt Holes
10.1" [257]	1.8" [45]	15.1" [384]	12.4" [315]	2.9" [73]	2.9" [73]	4



Valve with AMB/AMX Actuator

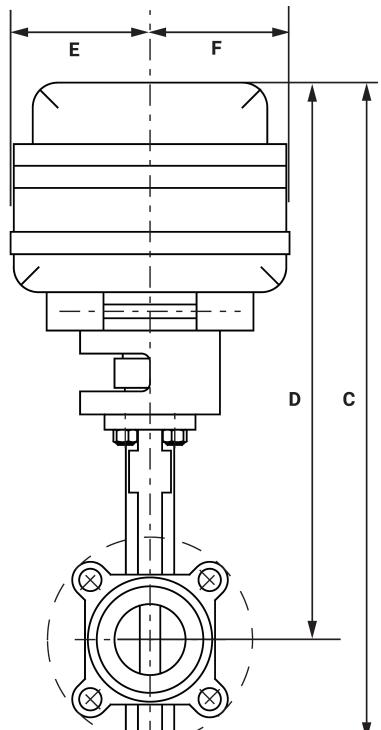
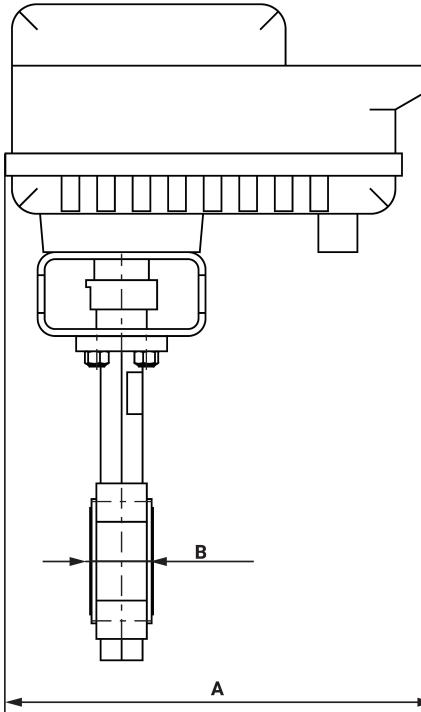
A	B	C	D	E	F	Number of Bolt Holes
8.3" [211]	1.8" [45]	15.1" [384]	12.4" [315]	2.9" [73]	2.9" [73]	4

Valve with PR Actuator



A	B	C	D	E	F	Number of Bolt Holes
12.0" [304]	1.8" [45]	16.7" [425]	13.9" [354]	3.9" [100]	3.9" [100]	4

Valve with PK Actuator



A	B	C	D	E	F	Number of Bolt Holes
12.0" [304]	1.8" [45]	18.5" [470]	15.7" [399]	3.9" [100]	3.9" [100]	4
A	B	C	D	E	F	Number of Bolt Holes
10.8" [275]	1.8" [45]	13.0" [330]	10.2" [260]	2.9" [73]	2.9" [73]	4



5-year warranty

**MFT****Technical data**

Electrical data	Nominal voltage	AC/DC 24 V
Nominal voltage frequency	50/60 Hz	
Nominal voltage range	AC 19.2...28.8 V / DC 21.6...28.8 V	
Power consumption in operation	7.5 W	
Power consumption in rest position	3 W	
Transformer sizing	10 VA	
Auxiliary switch	2x SPDT, 1 mA...3 A (0.5 A inductive), DC 5 V...AC 250 V, one set at 10°, one adjustable 10...90°	
Switching capacity auxiliary switch	1 mA...3 A (0.5 A inductive), DC 5 V...AC 250 V	
Electrical Connection	(2) 18 GA appliance cables, 1 m, 3 m or 5 m, with or without 1/2" NPT conduit connectors	
Overload Protection	electronic throughout 0...95° rotation	
Functional data		
Torque motor	20 Nm	
Operating range Y	2...10 V	
Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)	
Operating range Y variable	Start point 0.5...30 V End point 2.5...32 V	
Operating modes optional	variable (VDC, PWM, on/off, floating point)	
Position feedback U	2...10 V	
Position feedback U note	Max. 0.5 mA	
Position feedback U variable	VDC variable	
Direction of motion motor	selectable with switch 0/1	
Direction of motion fail-safe	reversible with cw/ccw mounting	
Manual override	5 mm hex crank (3/16" Allen), supplied	
Angle of rotation	95°	
Angle of rotation note	adjustable with mechanical end stop, 35...95°	
Running Time (Motor)	150 s / 90°	
Running time motor variable	70...220 s	
Running time fail-safe	<20 s	
Override control	MIN (minimum position) = 0% MID (intermediate position) = 50% MAX (maximum position) = 100%	
Noise level, motor	40 dB(A)	
Noise level, fail-safe	62 dB(A)	
Position indication	Mechanical	
Safety data		
Power source UL	Class 2 Supply	
Degree of protection IEC/EN	IP54	
Degree of protection NEMA/UL	NEMA 2	
Enclosure	UL Enclosure Type 2	

Safety data	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU
Quality Standard	ISO 9001	
UL 2043 Compliant	Suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC	
Ambient humidity	Max. 95% RH, non-condensing	
Ambient temperature	-22...122°F [-30...50°C]	
Storage temperature	-40...176°F [-40...80°C]	
Servicing	maintenance-free	
Weight	Weight	5.0 lb [2.3 kg]
Materials	Housing material	Galvanized steel and plastic housing

Footnotes *Variable when configured with MFT options.

Accessories

Electrical accessories	Description	Type
	Service tool, with ZIP-USB function, for programmable and communicative Belimo actuators, VAV controller and HVAC performance devices	ZTH US

Electrical installation



Warning! Live electrical components!

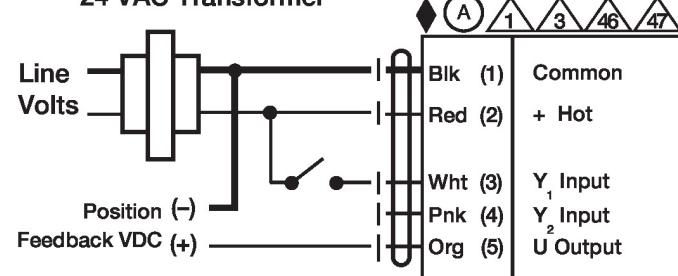
During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow 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.
- ⚡ Apply only AC line voltage or only UL-Class 2 voltage to the terminals of auxiliary switches. Mixed or combined operation of line voltage/safety extra low voltage is not allowed.
- 1 Provide overload protection and disconnect as required.
- 3 Actuators may also be powered by DC 24 V.
- 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.
- 7 A 500 Ω resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
- 8 Control signal may be pulsed from either the Hot (Source) or Common (Sink) 24 V 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).

Wiring diagrams

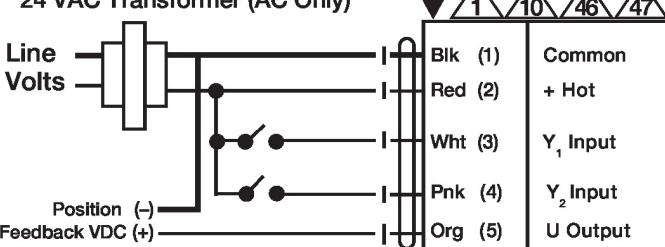
On/Off

24 VAC Transformer

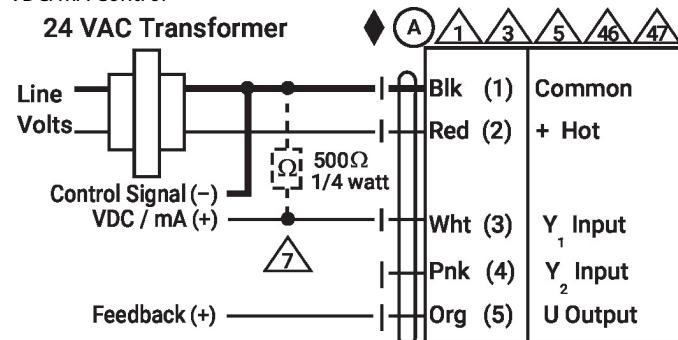


Floating Point

24 VAC Transformer (AC Only)

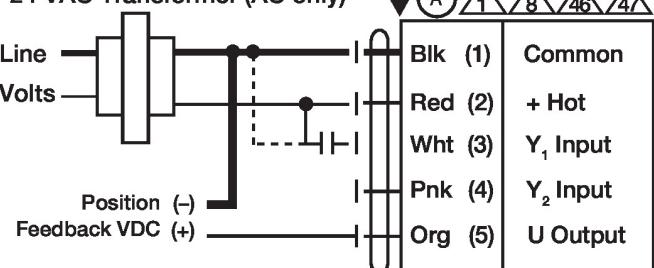


VDC/mA Control

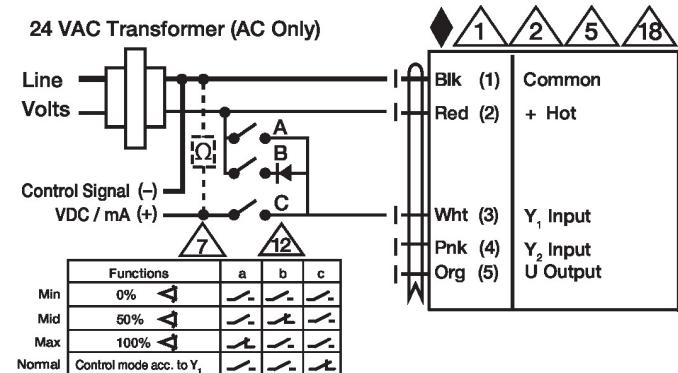


PWM Control

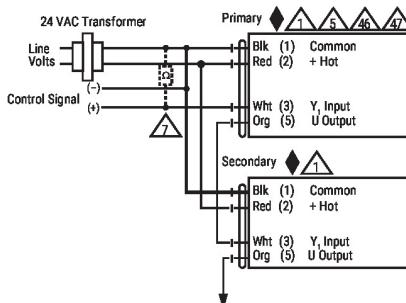
24 VAC Transformer (AC only)



Override Control



Primary - Secondary



PWM Control

