

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 Δps	200 psi
	Flow characteristic	modified equal percentage
	Leakage rate	0% leakage, leakage rateA
	Pipe connection	Flange for use with ASME/ANSI class 125/150
	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
	Bearing	RPTFE
	Disc	304 stainless steel
Suitable actuators	Non Fail-Safe	ARB(X) GRB(X)
	Spring	AFRB(X)

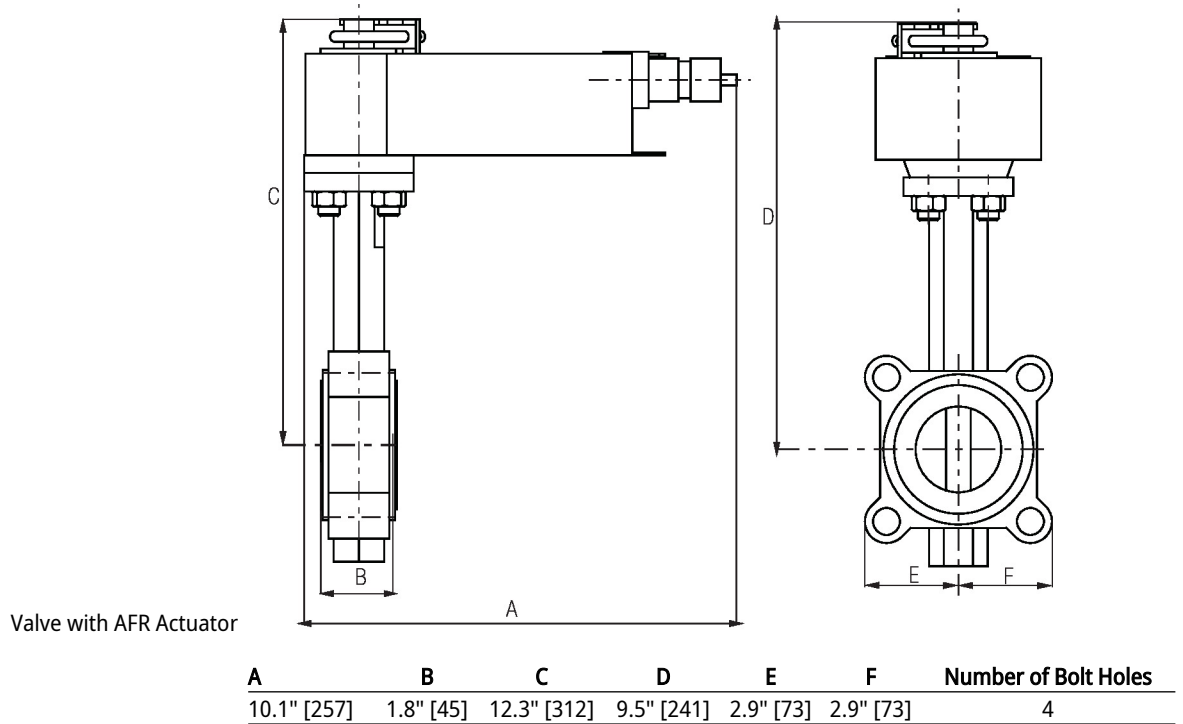
Product features

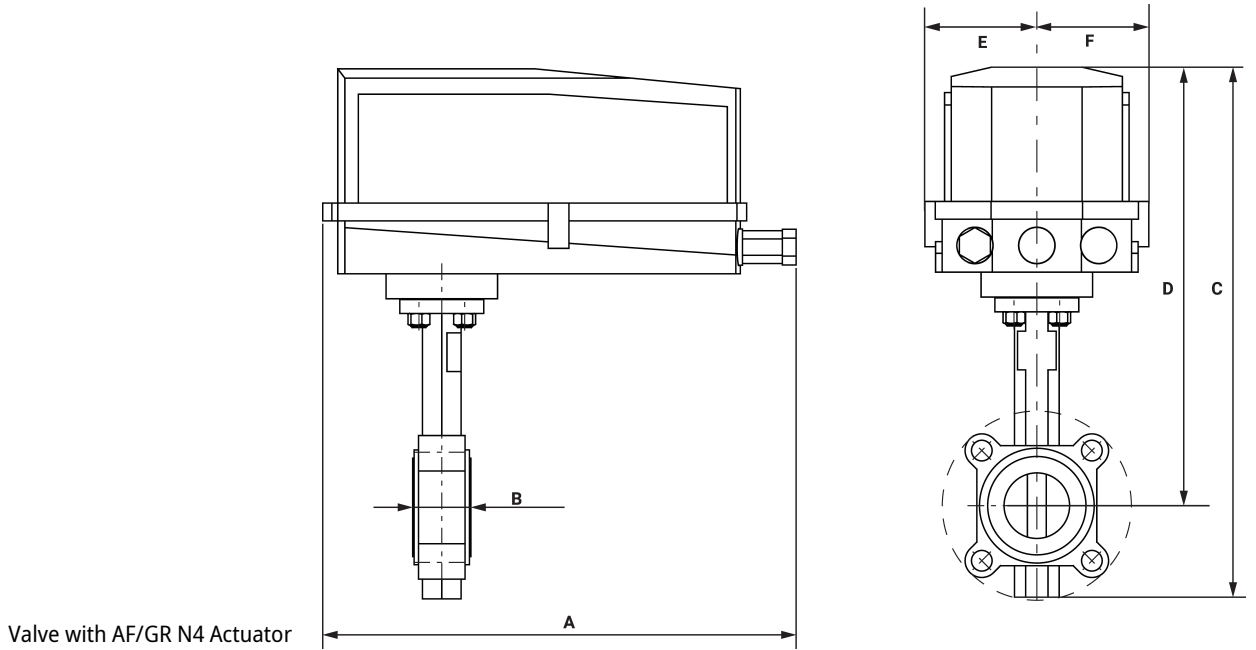
Flow/Mounting details



Dimensions

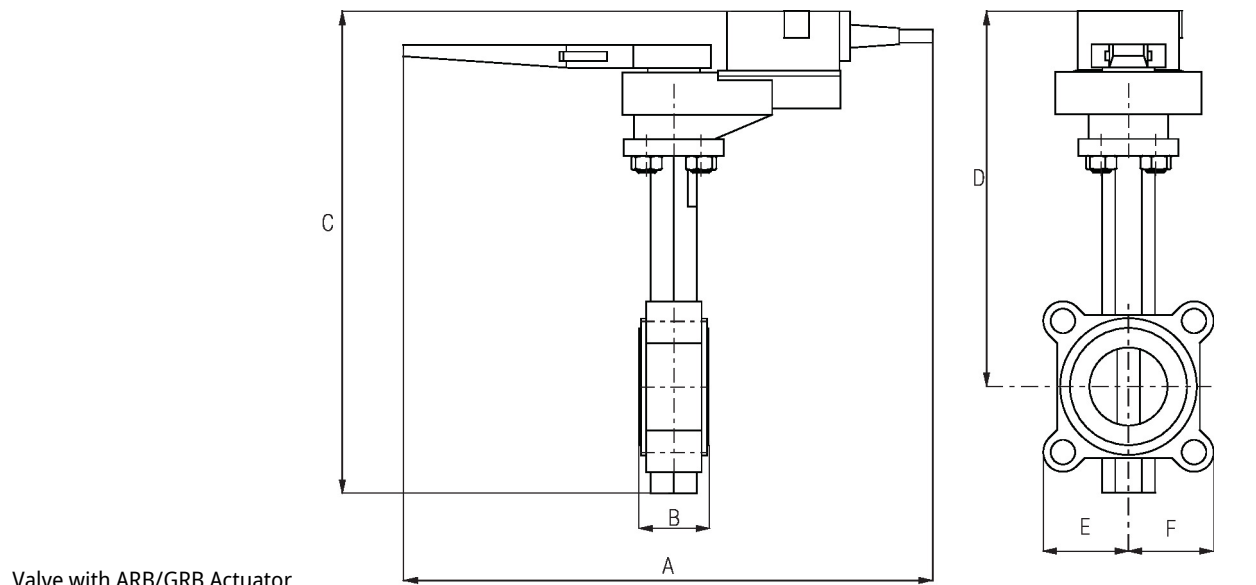
Type	DN	Weight
F650HD	50	12 lb [5.3 kg]





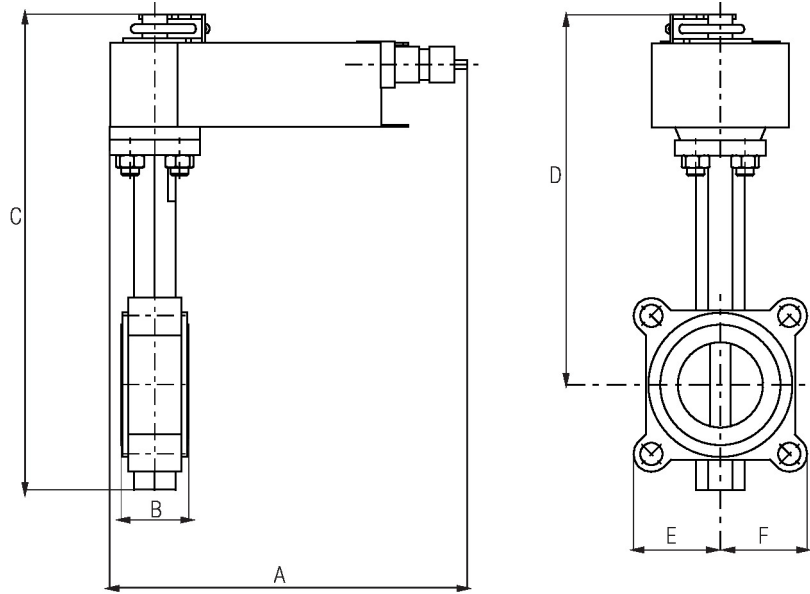
Valve with AF/GR N4 Actuator

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



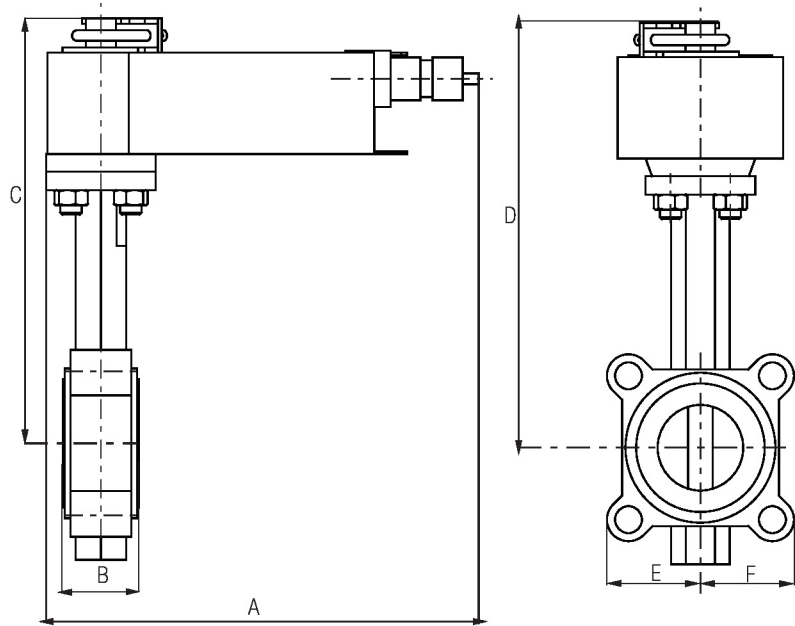
Valve with ARB/GRB Actuator

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

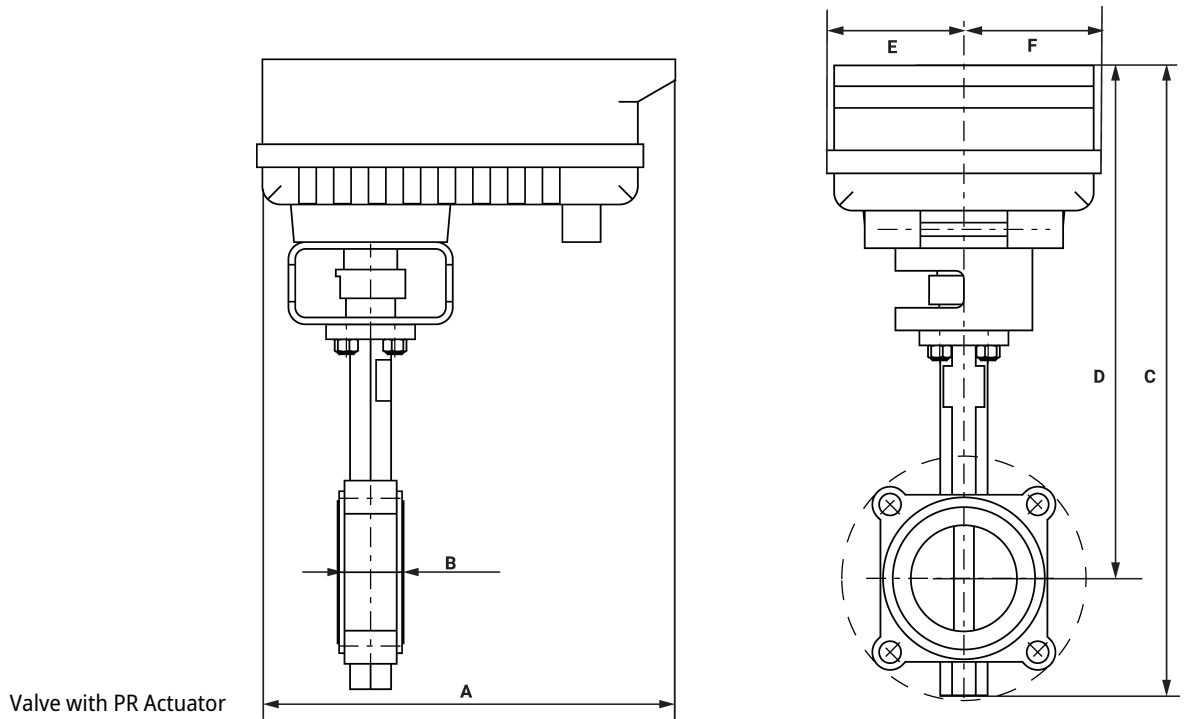
A	B	C	D	E	F	Number of Bolt Holes
10.1" [257]	1.8" [45]	15.1" [384]	12.4" [315]	2.9" [73]	2.9" [73]	4



Valve with AMB/AMX Actuator

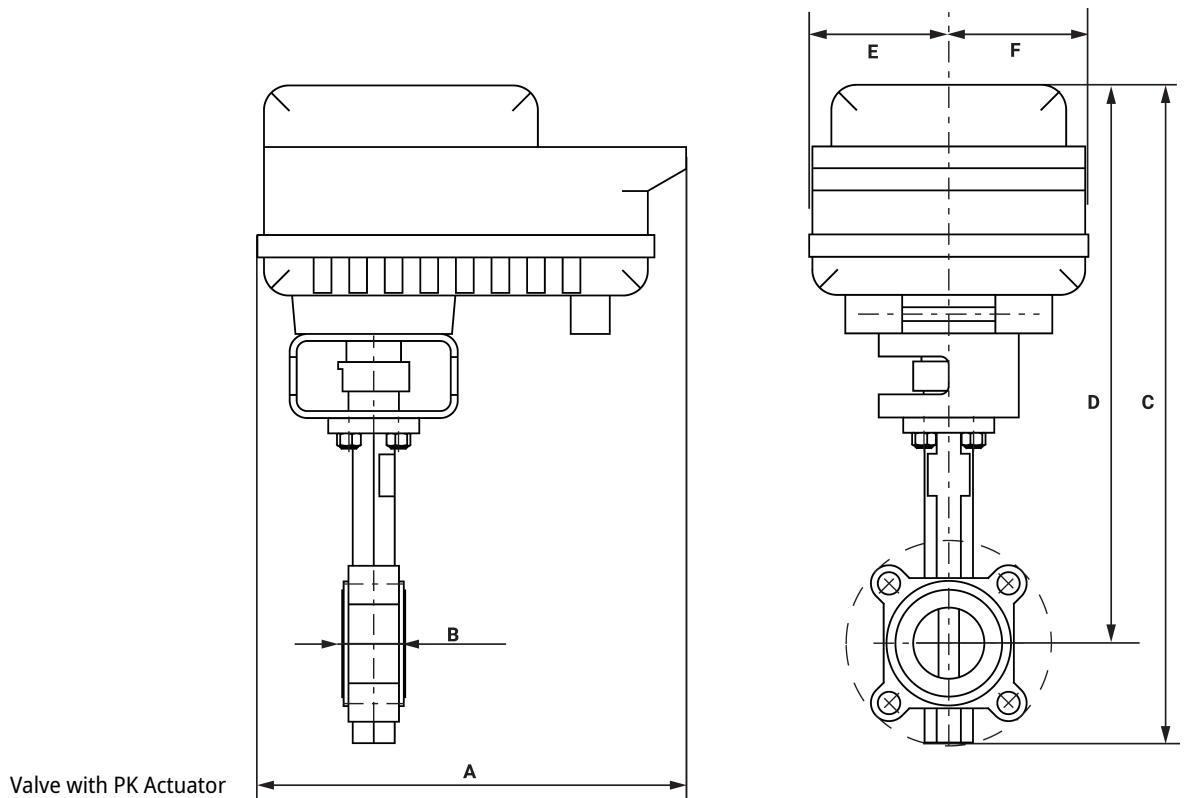
A	B	C	D	E	F	Number of Bolt Holes
8.3" [211]	1.8" [45]	15.1" [384]	12.4" [315]	2.9" [73]	2.9" [73]	4

Dimensions



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

MFT/programmable, Spring return, 24 V



5-year warranty




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
	Electrical Connection	18 GA appliance cable, 1 m, 3 m, or 5 m with 1/2" NPT conduit connector, degree of protection NEMA 2 / IP54
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

Technical data

Safety data	Enclosure	UL Enclosure Type 2
	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	4.6 lb [2.1 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

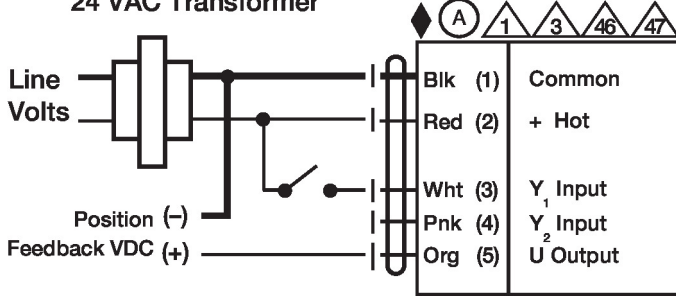
- Warning! Live electrical components!**
During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components 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.
- Provide overload protection and disconnect as required.
- Actuators may also be powered by DC 24 V.
- Only connect common to negative (-) leg of control circuits.
- A 500 Ω resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
- Control signal may be pulsed from either the Hot (Source) or Common (Sink) 24 V 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).

Electrical installation

Wiring diagrams

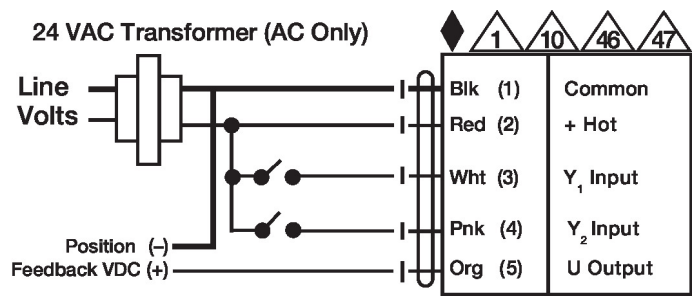
On/Off

24 VAC Transformer



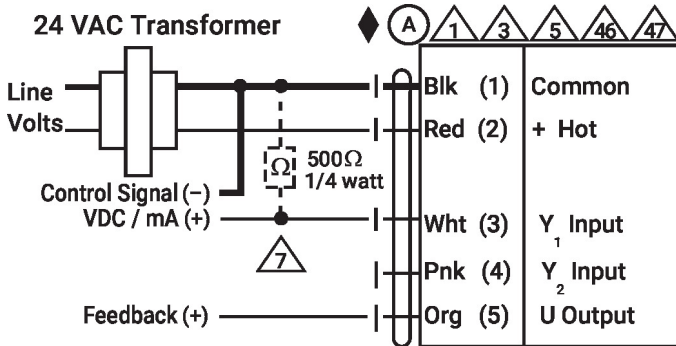
Floating Point

24 VAC Transformer (AC Only)



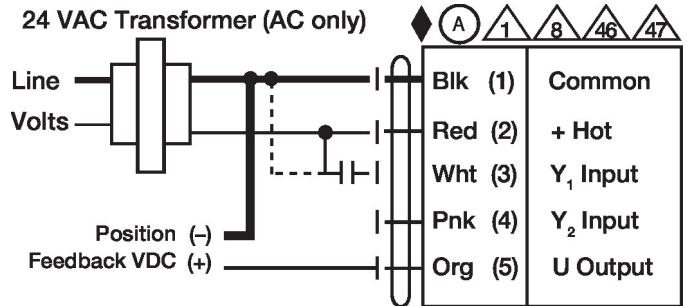
VDC/mA Control

24 VAC Transformer



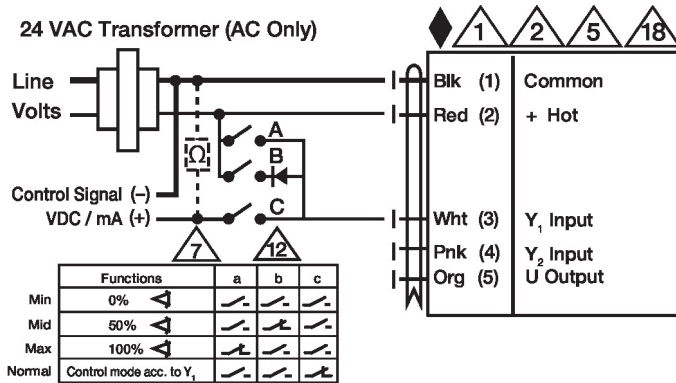
PWM Control

24 VAC Transformer (AC only)



Override Control

24 VAC Transformer (AC Only)



Primary - Secondary

