

# Technical Documentation Electronic Zone Valves

Effective April 2007

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## Electronic Pressure Independent Characterized Control Valves™ U.S. Patent



**PICCV**

## Electronic Characterized Control Valves™ U.S. Patent



**CCV**

## Electronic Zone Valves



**PICCV** Two-way

1/2" to 2"

<b>Service:</b>	Chilled/Hot Water, 60% glycol
<b>Flow Rate:</b>	0.5-80 GPM
<b>Material:</b>	Brass Body Brass/Stainless Trim
<b>Control:</b>	Floating Multi-Function Technology® Spring Return or Non-Spring Return

### Typical Application

**Air Handling Units:** – Heating Coils  
– Cooling Coils

**Unit Ventilators**

**VAV Box Re-heat Coils**

**B2... Series** Two-way  
**B3... Series** Three-way  
Mixing/Diverting  
**B6... Series** Two-way Flanged

1/2" to 3"

<b>Service:</b>	Chilled/Hot Water, 60% glycol
<b>C<sub>v</sub> Range:</b>	0.3-240
<b>Material:</b>	Stainless Trim or Brass Trim
<b>Control:</b>	On/Off, Floating, 2-10 VDC Multi-Function Technology® Spring Return or Non-Spring Return

### Typical Application

**Air Handling Units:** – Heating Coils  
– Cooling Coils

**Fan Coil Units:** – Heating Coils  
– Cooling Coils

**Unit Ventilators**

**VAV Box Re-heat Coils**

**Bypass Loops**

**ZONE2...N Series** Two-way NPT  
**ZONE2...S Series** Two-way Sweat  
**ZONE3...N Series** Three-way  
Diverting NPT  
**ZONE3...S Series** Three-way  
Diverting Sweat

1/2" to 1"

<b>Service:</b>	Chilled/Hot Water, 50% glycol
<b>C<sub>v</sub> Range:</b>	1.0 - 8.0
<b>Material:</b>	Brass Body
<b>Control:</b>	On/Off Spring Return

### Typical Application

**Fan Coil Units:** – Heating Coils  
– Cooling Coils

**Baseboard Radiation**

For detailed information and submittal data, see Technical Documentation at [www.belimo.com](http://www.belimo.com) or on CD-ROM.

## Electronic Globe Valves



<b>G2...(S) Series</b>	Two-way Screwed Bronze or Stainless Trim
<b>G6...C (S) Series</b>	Two-way Flanged ANSI 125 Bronze or Stainless Trim
<b>G6...(S) Series</b>	Two-way Flanged ANSI 125 Bronze or Stainless Trim
<b>G6...(S)-250 Series</b>	Two-way Flanged ANSI 250 Bronze or Stainless Trim
<b>G3...(D) Series</b>	Three-way Screwed Bronze Trim
<b>G7...D (S) Series</b>	Three-way Flanged ANSI 125 Bronze or Stainless Trim
<b>G7...D (S)-250 Series</b>	Three-way Flanged ANSI 250 Bronze or Stainless Trim

Three-way Valves available in Mixing or Diverting

1/2" to 6"

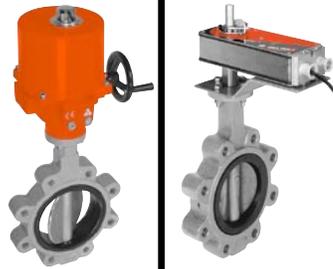
<b>Service:</b>	Chilled/Hot Water, 60% Glycol, Steam
<b>C<sub>v</sub> Range:</b>	0.4-344 (Two-way) 2.2-340 (Three-way Mix.) 4.4-248 (Three-way Div.)
<b>Material:</b>	Stainless Steel Stem, Bronze Trim or Stainless Trim
<b>Control:</b>	On/Off, Floating, 2-10 VDC Multi-Function Technology® Spring Return or Non-Spring Return

### Typical Application

- Air Handling Units:** – Heating Coils  
– Cooling Coils
- Fan Coil Units:** – Heating Coils  
– Cooling Coils
- Unit Ventilators**
- VAV Box Re-heat Coils**
- Bypass Loops**

For detailed information and submittal data, see Technical Documentation at [www.belimo.com](http://www.belimo.com) or on CD-ROM.

## Electronic Butterfly Valves



<b>F6... Series (HS,HSU)</b>	Two-way
<b>F7... Series (HS,HSU)</b>	Three-way Mixing/Diverting
<b>F6... SHP Series</b>	Two-way ANSI 150/300
<b>F7... SHP Series</b>	Three-way ANSI 150/300 Mixing/Diverting

2" to 30"

<b>Service:</b>	Chilled/Hot Water, 50% Glycol
<b>C<sub>v</sub> Range:</b>	115-73,426
<b>Material:</b>	Stainless Shaft Stainless Disc Cast Iron, Full Lug Body EPDM Liner
<b>Control:</b>	On/Off, Floating, 2-10 VDC On/Off, Floating 2-10 VDC, 1-5 VDC, 4-20mA (NEMA 4 Actuator) Multi-Function Technology® Spring Return or Non-Spring Return

### Typical Application

- Chiller and Cooling Tower Isolation**
- Change-over Systems**
- Large Air Handler Coil Control**
- Bypass Control Applications**

## Electronic Ball Valves – VS Series



<b>B2... VS Series</b>	Two-way Screwed Stainless Steel Trim
<b>B3... VS Series</b>	Three-way Mixing/Diverting Screwed Stainless Steel Trim
<b>B2... VSS Series</b>	Two-way Screwed Stainless Steel Body and Trim
<b>B6... VS Series</b>	Two-way Flanged Stainless Steel Trim

1/2" to 10"

<b>Service:</b>	Chilled/Hot Water, 50% Glycol, Steam
<b>C<sub>v</sub> Range:</b>	1 to 12,400
<b>Material:</b>	Bronze or Stainless Body Stainless Steel Trim RPTFE Seats
<b>Control:</b>	On/Off, Floating, 2-10 VDC On/Off, Floating 2-10 VDC, 1-5 VDC, 4-20mA (NEMA 4 Actuator) Multi-Function Technology® Spring Return or Non-Spring Return

### Typical Application

- Unit Ventilators**
- Humidifiers**
- Heating and Cooling Coils**

Call Customer Service to discuss your application.

## Base Product Nomenclature

ZONE215N-10 + ZONE24NC-S+FCU-I

### VALVE

ZONE2

15

N

-

10

+

#### VALVE SIZES

Valve	Designation	Sizes
Zone Valve	<u>15</u>	= 1/2"
	<u>20</u>	= 3/4"
	<u>25</u>	= 1"

<b>N</b>	= NPT Female Connection
<b>S</b>	= Sweat Connection

C <sub>v</sub> Value
10 = 1.0
25 = 2.5
35 = 3.5
50 = 5.0
80 = 8.0

#### TYPE OF VALVE

#### ZONE VALVES

ZONE2... Zone Valve 2-way  
 ZONE3... Zone Valve 3-way

## SET UP

## TAGGING

ZONE24

Voltage	
24	= 24 VAC
120	= 120 VAC

NC

<b>NC</b>	= Normally Closed
<b>NO</b>	= Normally Open

-S

**-S** = built-in auxiliary switch

FCU-1

**TAGGING**  
 Valves may be tagged per customer specifications.  
 Example: FCU-1

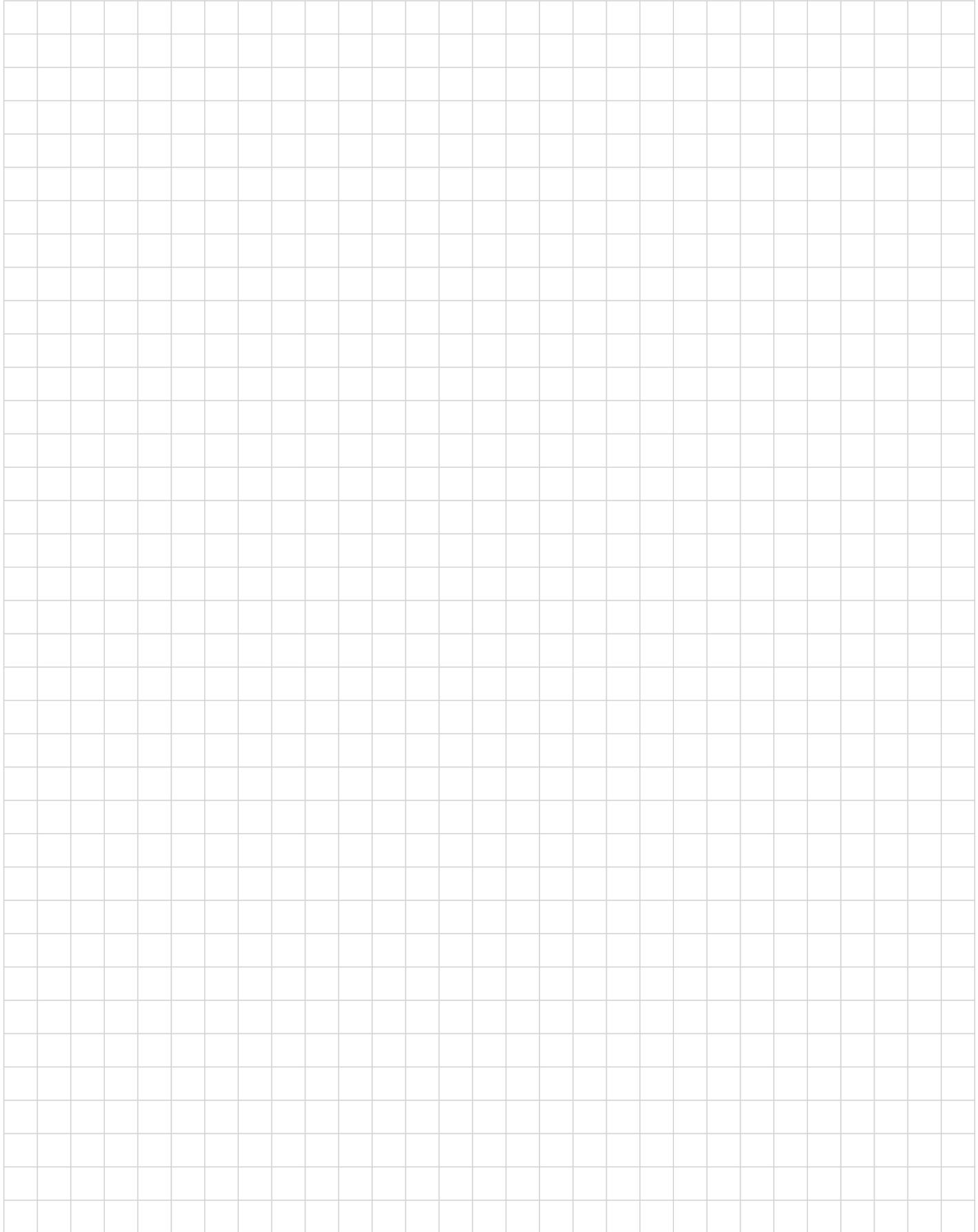
### ORDERING EXAMPLE

**ZONE215N-10+ZONE24NC-S**  
**Built-in auxiliary switch**  
**Tagging**

- 
- 
- 

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**Total** ● **List**



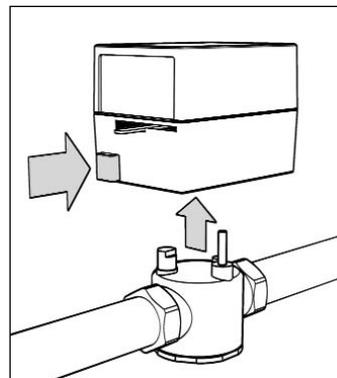
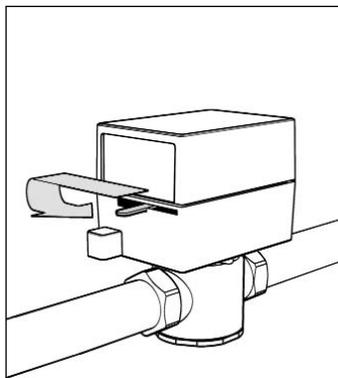


<b>ZONE 2...N</b>	Two-way (NPT)
<b>ZONE 2...S</b>	Two-way (Sweat)
<b>ZONE 3...N</b>	Three-way Diverting (NPT)
<b>ZONE 3...S</b>	Three-way Diverting (Sweat)
1/2" and 1"	
<b>Service:</b>	Chilled/hot water 50% glycol
<b>C<sub>v</sub> Range:</b>	1.0 – 8.0
<b>Material:</b>	Brass body
<b>Control:</b>	On/Off Spring Return

## Features

### Zone Valves – ZONE2... and ZONE3... Series

- Push button for quick removal of actuator
- Easy manual open lever with automatic return
- Up to 75 psi close-off
- Only 2-3/8" wide to fit most baseboards
- Spring return normally closed or normally open
- Quiet operation



# Electronic Zone Valves, Spring Return Actuator



Two-way and Three-way Valves with NPT or Sweat Ends



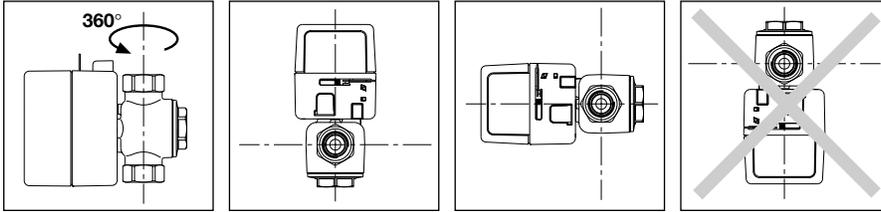
Model # Valve	Valve				Actuator			
	C <sub>v</sub> Rating	Nominal Size Inches mm	Close- off (psi)	24 V Normally Closed ZONE24NC	24 V Normally Open ZONE24NO	120 V Normally Closed ZONE120NC	120 V Normally Open ZONE120NO	
<b>Two-way with NPT Female Connection</b>								
ZONE215N-10	1.0	1/2"	15	75	☐ Pg 10	☐ Pg 10	☐ Pg 10	☐ Pg 10
ZONE215N-25	2.5	1/2"	15	50	☐ Pg 10	☐ Pg 10	☐ Pg 10	☐ Pg 10
ZONE215N-35	3.5	1/2"	15	30	☐ Pg 10	☐ Pg 10	☐ Pg 10	☐ Pg 10
ZONE220N-35	3.5	3/4"	20	30	☐ Pg 10	☐ Pg 10	☐ Pg 10	☐ Pg 10
ZONE220N-50	5.0	3/4"	20	25	☐ Pg 10	☐ Pg 10	☐ Pg 10	☐ Pg 10
ZONE225N-80	8.0	1"	35	20	☐ Pg 10	☐ Pg 10	☐ Pg 10	☐ Pg 10
<b>Three-way with NPT Female Connection</b>								
ZONE315N-10	1.0	1/2"	15	75	☐ Pg 10	†	☐ Pg 10	†
ZONE315N-25	2.5	1/2"	15	50	☐ Pg 10	†	☐ Pg 10	†
ZONE315N-35	3.5	1/2"	15	30	☐ Pg 10	†	☐ Pg 10	†
ZONE320N-35	3.5	3/4"	20	30	☐ Pg 10	†	☐ Pg 10	†
ZONE320N-50	5.0	3/4"	20	25	☐ Pg 10	†	☐ Pg 10	†
ZONE325N-80	8.0	1"	35	20	☐ Pg 10	†	☐ Pg 10	†
<b>Two-way with Sweat Connection</b>								
ZONE215S-10	1.0	1/2"	15	75	☐ Pg 10	☐ Pg 10	☐ Pg 10	☐ Pg 10
ZONE215S-25	2.5	1/2"	15	50	☐ Pg 10	☐ Pg 10	☐ Pg 10	☐ Pg 10
ZONE215S-35	3.5	1/2"	15	30	☐ Pg 10	☐ Pg 10	☐ Pg 10	☐ Pg 10
ZONE220S-35	3.5	3/4"	20	30	☐ Pg 10	☐ Pg 10	☐ Pg 10	☐ Pg 10
ZONE220S-50	5.0	3/4"	20	25	☐ Pg 10	☐ Pg 10	☐ Pg 10	☐ Pg 10
ZONE225S-80	8.0	1"	35	20	☐ Pg 10	☐ Pg 10	☐ Pg 10	☐ Pg 10
<b>Three-way with Sweat Connection</b>								
ZONE315S-10	1.0	1/2"	15	75	☐ Pg 10	†	☐ Pg 10	†
ZONE315S-25	2.5	1/2"	15	50	☐ Pg 10	†	☐ Pg 10	†
ZONE315S-35	3.5	1/2"	15	30	☐ Pg 10	†	☐ Pg 10	†
ZONE320S-35	3.5	3/4"	20	30	☐ Pg 10	†	☐ Pg 10	†
ZONE320S-50	5.0	3/4"	20	25	☐ Pg 10	†	☐ Pg 10	†
ZONE325S-80	8.0	1"	35	20	☐ Pg 10	†	☐ Pg 10	†
Built-in auxiliary switch ZONE215N-10+ZONE24NC-S					☐ Pg 10	☐ Pg 10	☐ Pg 10	☐ Pg 10

(add -S to model number)

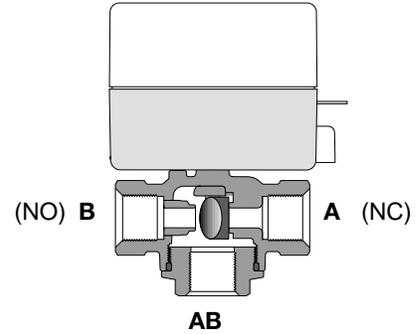
†Three-way valve can be NC or NO depending on installation always using the NC actuator. See technical literature for details.

### Installation

The valve can be installed vertically or horizontally, but not turned upside down.

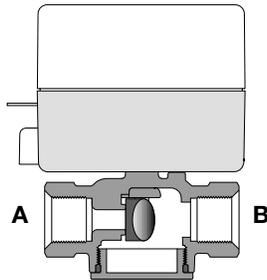


- A 3-way valve cannot be transformed into a 2-way valve and visa versa.
- The flow is from A to B (see diagram below) and must be installed so the paddle closes against the direction of flow as indicated in the following diagrams.
- The 2-way valves can be installed on the supply or on the return; for correct installation it is necessary to respect the direction of flow indicated from the arrow on the body valve.
- The NC versions have a override handle.
- 3-way zone valves can be fitted with NC actuator only (rotate 180° the valve body for NO application).

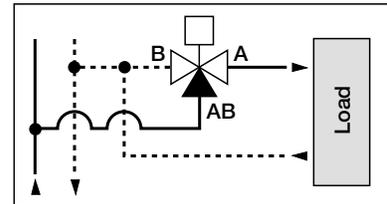


**3-way valve normally closed actuator**

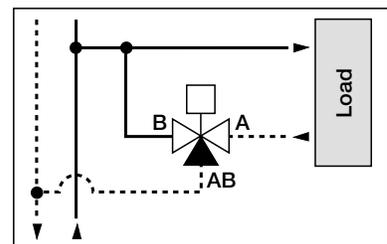
*(Note: 3-way uses only normally closed actuator)*



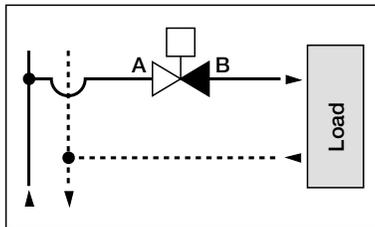
**2-way valve normally closed actuator**



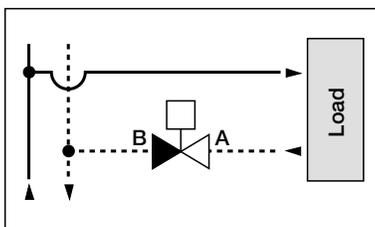
**3-way installed on the supply in diverting configuration**



**3-way installed on the return**



**2-way installed on the supply**



**2-way installed on the return**

	2-way	3-way
N.C. without power	Port "A" closed	Port "A" closed Port "B" open Port "AB" open
N.C. open with power	Port "A" open	Port "A" open Port "B" closed Port "AB" open
N.C. manually open	Port "A" open	Port "A" open Port "B" open Port "AB" open

# Electronic Zone Valves

ZONE... Series  
Technical Data/Submittal



## Valve Specifications

Service	chilled or hot water, 50% glycol
Flow characteristic	
Two-way	on/off
Three-way	on/off, diverting
Sizes	1/2", 3/4" and 1"
Type of end fitting	female, NPT or Sweat
Materials:	
Body	forged brass
Stem	stainless steel
Seals	EPDM
Pressure rating	300 psi
Media temp. range	32°F to 212°F [0°C to 100°C]
Close off pressure	20 – 75 psi
Leakage	Class III 0.1%
Cv rating	1.0 – 8.0

U.S. & Foreign Patent Pending

## Application

This valve is typically used on fan coil units, baseboards or other hydronic applications where fail safe operation or 2-wire control is required. This valve is suitable for use in a hydronic system with variable or constant flow.

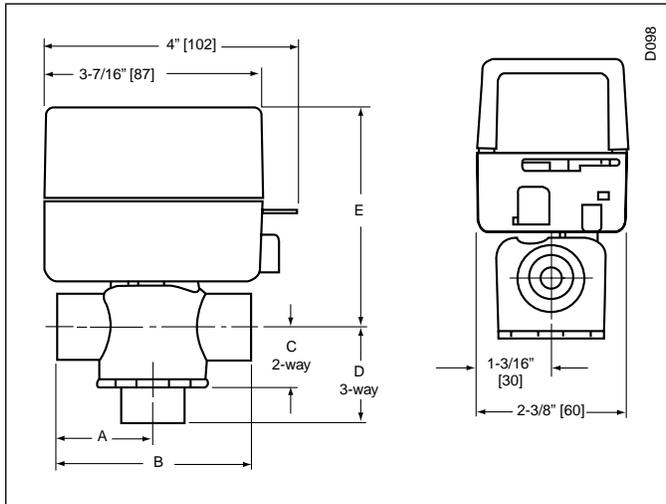
This valve is designed to fit in compact areas where on/off or control is required using 24 VAC or 120 VAC.

## Actuator Specifications

Control	On/off
Nominal voltage	24 VAC 50/60 Hz ± 10% or 120 VAC 50/60 Hz ± 10%
Power Consumption	6.5 W
Transformer Sizing	7VA (Class 2 power source)
Electrical Connection	Wire lead length, 120V 6" 24V 18"
Position Indication	Integrated into lever (NC only)
Running Time	Motor: 20-40 seconds Spring: 5 seconds
Humidity	5 to 95% non-condensing
Ambient Temperature	32°F to 104°F (0°C to + 40°C)
Storage Temperature	-40°F to 176°F (-40°C to +80°C)
Housing Rating	UL94-5V(B)
Agency Listing	CE, cULus
Noise Level	max. 35 db (A)
Quality Standard	ISO 9001
Built-in Auxiliary Switch (optional)	1 x SPST, 5A resistive (5A inductive) @ 24 VAC 1 x SPST, 5A resistive (5A inductive) @ 120 VAC

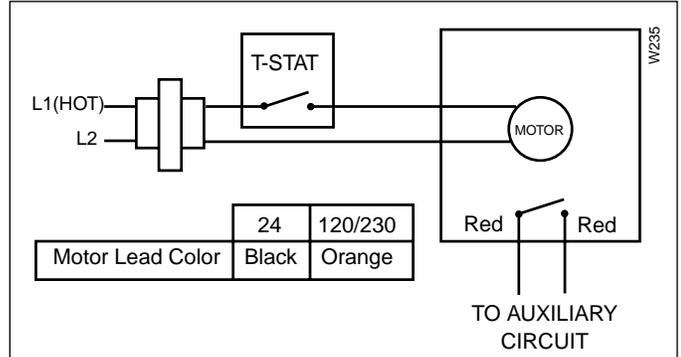


### Dimensions



Connection Size and type	A in. (mm)	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)
1/2" sweat	1-5/16" [34]	2-5/8" [38]	15/16" [24]	1-5/16" [34]	3-1/2" [89]
3/4" sweat	1-3/8" [35]	2-3/4" [70]	15/16" [24]	1-1/2" [38]	3-1/2" [89]
1" sweat	1-11/16" [43]	3-3/8" [86]	15/16" [24]	1-9/16" [39]	3-11/16" [93]
1/2" NPT	1-7/16" [36]	2-7/8" [72]	15/16" [24]	1-1/4" [32]	3-1/2" [89]
3/4" NPT	1-9/16" [39]	3-1/16" [92]	15/16" [24]	1-1/4" [43]	3-11/16" [93]
1" NPT	1-13/16" [46]	3-5/8" [92]	15/16" [24]	1-11/16" [43]	3-11/16" [93]

### Wiring Diagram



Built-in auxiliary switch (optional) (-S models)

## I. GENERAL

- A. Warranty all actuators for a period of two or five years from the production date as stated in the Terms and Conditions of Sale and Warranty.
- B. Electronic valve and damper actuators shall be as manufactured, brand labeled, or distributed by Belimo.
- C. Electronic control valves, as specified, shall be Belimo or other brands manufactured, brand labeled or distributed by Belimo.
- D. Other manufacturers must be approved, in writing, 10 days prior to the bid date.

## II. PRODUCTS

### A. Electronic Damper Actuators

1. Electronic actuators, less than 600 in-lb. of rated torque, shall have ISO 9001 quality certification and be cULus listed under standard 60730-1 or UL listed under standard 873, CSA C22.2 No. 24 and have CE certification.
2. Electronic actuators used on dampers shall be designed to directly couple and mount to a stem, shaft or ISO style-mounting pad. Actuator mounting clamps shall be a V-bolt with a toothed V-clamp creating a cold weld, positive grip effect. Single point, bolt, or single screw actuator type fastening techniques or direct-coupled actuators requiring field assembly of the universal clamp is not acceptable.
3. Actuators shall be fully modulating/proportional, pulse width, floating/tri-state, or two position as required and be factory or field selectable. Actuators shall have visual position indicators and shall operate in sequence with other devices if required.
4. Optional auxiliary switches shall be available.
5. Actuators shall have an operating range of  $-22^{\circ}$  to  $122^{\circ}$ F.
6. Proportional actuators shall accept a 0-10 VDC or 0-20 mA input signal and provide a 2-10 VDC or 4-20 mA (with a 500 W load resistor) operating range.
7. Actuators shall be capable of operating on 24, 120 or 230VAC, or 24VDC and Class 2 wiring as dictated by the application. Power consumption shall not exceed 10 VA for AC, including 120VAC actuators, and 8 watts per actuator for DC applications.
8. NEMA 2 rated actuators shall be provided with a three foot (minimum), pre-wired, electrical cable. Actuators requiring removal of the actuator cover for access to wiring terminals, exposing electronic, printed circuit boards to damage, are unacceptable.
9. Actuators shall have electronic overload protection or digital rotation sensing circuitry to prevent actuator damage throughout the entire rotation. End switches to deactivate the actuator at the end rotation or magnetic clutches are not acceptable.
10. For power-failure/safety applications, an internal mechanical spring return mechanism shall be built into the actuator housing. Spring return actuators shall be capable of CW or CCW mounting orientation. Spring return models > 60 in-lbs. and non-spring return models > 90 in-lbs. will be capable of mounting on shafts up to 1.05" in diameter. Spring return actuators with more than 60 in-lb. of torque shall have a metal, manual override crank.
11. Actuators using "on-board" chemical storage systems, capacitors, or other "on-board" non-mechanical forms of fail-safe operation are unacceptable.
12. Upon loss of control signal, a proportional actuator shall fail open or closed based on the minimum control signal. Upon loss of power, a non-spring return actuator shall maintain the last position.
13. Actuators shall be capable of being mechanically and electrically paralleled to increase torque if required. Valves and dampers requiring greater torque or higher close off may be assembled with multiple low torque actuators.
14. Dual mounted actuators using additional anti-rotation strap mechanical linkages, or special factory wiring to function are not acceptable. Actuators in a tandem pair must be "off the shelf," standard actuators ready for field wiring.
15. Damper and valve actuators will not produce more than 62 dB (A) when furnished with a mechanical fail-safe spring. Non-spring return actuators shall conform to a maximum noise rating of 45 dB(A) with power on or in the running or driving mode.
16. Proportional actuators shall be fully programmable. Control input, position feedback and running time shall be factory or field programmable. Diagnostic feedback shall provide indications of hunting or oscillation, mechanical overload, mechanical travel and mechanical load limit. The actuators shall also provide actuator service data, at minimum, number of hours powered and number of hours in motion.
17. Proportional actuators shall be capable of digital communication, as built.

### B. Smoke and Combination Fire and Smoke Actuators

In Section 15820 or equivalent

1. All smoke and combination fire and smoke dampers shall be provided with Belimo Aircontrols FSLF (30 in-#), FSNF (70 in-#), or FSAF (133 in-#) actuators.
2. Equals shall be approved 10 days prior to submission of bid.
3. Actuator shall carry a manufacturer's 5-year warranty and be manufactured under ISO 9001 quality control.
4. Actuator shall have microprocessor or electronic based motor controller providing:
  - a. Electronic cut off at full open so that no noise can be generated while holding open. Holding noise level shall be inaudible.
  - b. Protection so that actuator shall be incapable of burning out if stalled before full rotation is reached.
5. Housing shall be steel and gears shall be permanently lubricated.
6. The actuators shall be direct coupled and employ a steel toothed cold-weld clamp for connecting to damper or jack shafts. Aluminum clamps or set-screw attachment are not acceptable.
7. Actuator shall have UL555S Listing by the damper manufacturer for  $250^{\circ}$ F.
8. FSLF shall be applied on dampers up to 6 sq. ft. Current draw shall be no more than .15A at 120V running, or .06A holding at 120V (5 VA and 3.5 VA respectively for 24V power). FSNF shall be applied on dampers up to 16 sq.ft. Current draw shall be no more than .23A at 120V running, or .1A holding at 120V (27 VA and 10 VA respectively for 24V power).
9. FSAF shall be applied on dampers up to 20 sq.ft. Current draw shall be no more than .1A at 120V running, or .05A holding at 120V (10 VA and 3 VA respectively for 24V power).
10. Dampers shall be installed straight and true, level in all planes, and square in all dimensions. Dampers shall move freely without undue stress due to twisting, racking, bowing, or other installation error.
11. Do not install in area where moisture can penetrate damper or actuator nor where actuator temperature exceeds  $120^{\circ}$ F.

Note: FSLF and FSNF are  $350^{\circ}$ F actuators, 15 seconds open and close. UBC and UL555S  
FSAF is a  $250^{\circ}$ F actuator, 75 seconds open, 20 seconds close. UL555S.

### C. Electronic Valve Actuators

1. Electronic actuators, less than 600 in-lb. of rated torque, shall have ISO 9001 quality certification and be cULus listed under standard 60730-1 or UL listed under standard 873, CSA C22.2 No. 24 and have CE certification.
2. Electronic actuators used on valves shall be designed to directly couple and mount to a stem, shaft or ISO style-mounting pad.
3. Actuators shall be fully modulating/proportional, floating/tri-state, or two position as required and be factory or field selectable.
4. Optional auxiliary switches shall be available.
5. Actuators shall have an operating range of  $-22^{\circ}$  to  $122^{\circ}$ F.
6. Proportional actuators shall accept a 0-10 VDC or 0-20 mA input signal and provide a 2-10 VDC or 4-20 mA (with a load resistor) operating range.
7. Actuators shall be capable of operating on 24VAC, 120VAC or 230VAC, or 24VDC and Class 2 wiring as dictated by the application. Power consumption shall not exceed 10 VA for AC, including 120VAC actuators, and 8 watts per actuator for DC applications.
8. NEMA 2 rated actuators shall be provided with either a covered terminal strip, or a three, six, or ten foot pre-wired, electrical cable.
9. For power-failure/safety applications, an internal mechanical spring return mechanism shall be built into the actuator housing. Spring return actuators shall be capable of CW or CCW mounting orientation. Spring return actuators with more than 60 in-lb. of torque shall have a metal, manual override crank.
10. Actuators using "on-board" chemical storage systems, capacitors, or other "on-board" non-mechanical forms of fail-safe operation are unacceptable.
11. Upon loss of control signal, a proportional actuator shall fail open or closed based on the minimum control signal. Upon loss of power, a non-spring return actuator shall maintain the last position.
12. Actuators utilizing brushless DC technology shall be capable of being mechanically and electrically paralleled to increase torque if required. Valves requiring greater torque or higher close off may be assembled with two low torque actuators.

13. Dual mounted actuators using additional anti-rotation strap mechanical linkages, or special factory wiring to function are not acceptable. Actuators in a tandem pair must be "off the shelf," standard actuators ready for field wiring.
14. Valve actuators will not produce more than 62 dB (A) when furnished with a mechanical fail-safe spring. Non-spring return actuators shall conform to a maximum noise rating of 45 dB(A) with power on or in the running or driving mode.
15. Proportional actuators shall be fully programmable. Control input, position feedback and running time shall be factory or field programmable. Diagnostic feedback shall provide indications of hunting or oscillation, mechanical overload, mechanical travel and mechanical load limit. The actuators shall also provide actuator service data, at minimum, number of hours powered and number of hours in motion.
16. Proportional actuators shall be capable of digital communication, as built.

## D. Industrial Actuators

### 1. Belimo SY Series Industrial Electric Actuators

- a. The valve actuator shall consist of a thermally protected capacitor-type reversible electric motor, a patented planetary worm combination drive, heater, limit switches and wiring termination blocks, all contained in a die cast aluminum enclosure. The drive system will provide continuous, smooth torque transmission throughout a 90 degree travel. Adjustable stops provide mechanical adjustment of end-of-travel. The transmission shall allow continuous duty operation of a manual override handwheel without the need to remove power, or de-clutch the manual system.
- b. Enclosure shall be designed to meet NEMA 4, 4X (weatherproof) requirements, or CSA approved for non-hazardous locations.
- c. The actuator shall employ ISO5211 mounting standards to provide for a wide range of international applications.
- d. The enclosure will have an industrial quality coating.
- e. Actuator shall have a motor rated for a minimum of 25% duty cycle in modulating applications.
- f. Actuator shall be suitable for operation in ambient temperature ranging from -4°F to +150°F [-20°C to +65°C].
- g. The motor shall be fractional horsepower; permanent split capacitor type designed to operate on 24 VAC, 110 VAC or 220 VAC, 1 p.H., 50/60 Hz supply. A self resetting thermal switch shall be imbedded in the motor for overload protection.
- h. Internal terminal blocks shall be clearly marked for field wiring. A wiring diagram shall be permanently attached to the OUTSIDE of the actuator housing.
- i. Actuator will have a suitable sized NPT entry for external connections.
- j. Gears shall be hardened alloy steel, permanently lubricated. The worm drive system negates the need for a brake.
- k. Two adjustable cam actuated end travel limit switches shall be provided to control electrical movement of the actuator.
- l. 2 SPDT auxiliary switches, rated 10A at 250 VAC shall be included. The switches are factory pre-set at 3 degrees and 87 degrees rotation, and may be field adjusted.
- m. Actuator shall be equipped with a hand wheel or shaft for manual override to permit operation of the actuator in the event of electrical power failure or system malfunction. Hand wheel, where applicable, must be permanently attached to the actuator. (SY2 and larger)
- n. The handwheel override shall be continuously operational regardless of the powered state of the actuator, without the need to remove electrical power if present during the override phase. (SY2 and larger)
- o. The hand wheel will not rotate while the actuator is electrically driven.
- p. The actuator shall provide a visual indicator beacon on the top of the housing for position status of the actuator and attached devices.
- q. Actuator shall have an internal heater and thermostat to minimize the build-up of moisture inside the sealed enclosure.
- r. Modulating units shall operate under 2-10 VDC, 4-20mA, and 1-5 VDC control modes. The default shall be 2-10 VDC control.

## E. Electronic Control Valves

### 1. General

- a. The manufacturer shall be capable of providing individual valve identification tagging on each printed valve label. Valve tag identification shall be documented on the approved, submitted valve schedule.

- b. Valves shall be designed and provided with the proper actuators to provide the rated valve close-off.

## 2. Pressure Independent Characterized Control Valves

- a. Control valves shall be pressure independent. Balancing valves and associated balancing shall not be required on devices where pressure independent control valves are installed. Balancing valves and balancing are required if self-contained pressure independent control valves are not installed.
- b. The absolute flow accuracy through the valve shall be +/- 5 % due to system pressure fluctuations across the valve in the selected operating range, and +/- 5% variation due to manufacturing tolerances.
- c. The control valves shall be available with floating or proportional actuators. The actuator shall be directly coupled to the valve at the factory. Proportional actuators shall be Multi Function Technology as manufactured by Belimo. Multi-turn actuators are not acceptable.
- d. The valve shall have an equal percentage characteristic and shall accurately control the flow from 0 to 100% full rated flow.
- e. A minimum of 5 PSI shall be required to operate the valve pressure independently.
- f. Valves shall require no maintenance and shall not include replaceable cartridges.
- g. Valves shall be available with optional pressure/temperature ports to allow flow verification.
- h. Control valves shall be by Belimo.

## 3. Characterized Control Valves™

- a. Control valves shall be of the Characterized Control Valve™ type provided by Belimo.
- b. Characterized Control Valves™ shall be used for all water applications requiring equal percentage characteristics.
- c. A TEFZEL, flow-characterizing disc shall be installed in the inlet of Two-way characterized control valves and in the control port of Three-way valves. The valve trim shall utilize a stainless steel ball and stem for all water or glycol solutions up to 60%. For water applications, an optional chrome plated brass ball and brass stem may be used for sizes 3/4" and smaller.
- d. Valve bodies shall be nickel-plated, forged brass with female NPT threads. Bodies to 1-1/4" shall be rated at 600 psi and sizes 1-1/2" to 3" at 400 psi.
- e. Characterized Control Valves™ shall have a self-aligning, blowout proof, brass stem with a dual EPDM O-ring packing design. Fiberglass reinforced Teflon seats shall be used.
- f. The valves shall have a four bolt mounting flange to provide a 4 position, field changeable, electronic actuator mounting arrangement.
- g. A non-metallic coupling, constructed of high temperature, continual use material shall provide a direct, mechanical connection between the valve body and actuator. The coupling shall be designed to provide thermal isolation and eliminate lateral and rotational stem forces. Vent hole shall be provided to reduce condensation build-up.

## 4. Globe Valves

- a. Globe valves, as specified, shall be by Belimo.
- b. Two-way and Three-way globe valves may be used only if characterized control valves do not fit the sizing criteria or application.
- c. Globe valves may be used for chilled or hot water, steam, or glycol solutions to 60%. Screwed and flanged water valves shall have equal percentage or linear flow characteristics for Two-way or Three-way valves, respectively. All stems shall be stainless steel.
- d. Screwed globe valves 1/2" through 2" shall have bronze bodies rated at ANSI Class 250. For water up to 35 psi or steam up to 15 psi, trim shall include a brass plug, a spring-loaded TFE packing, and a bronze seat. The maximum differential shall be 35 psi for water and 15 psi for steam.
- e. Two-way and Three-way flanged globe valves 2-1/2" to 6" shall have cast iron bodies rated for ANSI Class 125 or ANSI 250. The maximum differential shall be 25 psi for water and 10 psi for steam. Trim shall include stainless steel stems, bronze plugs, bronze seats, and a TFE V-ring packing.
- f. For steam inlet pressures higher than those stated above, furnish globe valves with stainless steel trim specifically rated for the application.

## 5. Direct Coupled Globe Valve Actuator and Adaptor Bracket

- a. Actuator shall be designed with an integrated adaptor bracket that will direct mount to the valve.
- b. Actuator shall provide a linear force capable of fulfilling the required close-off of the valve.
- c. Actuator shall include an automatic valve coupling device that shall lock securely to the valve stem.
- d. Proportional and spring return actuators shall adapt upon powering the actuator. This adaptation will determine stroke length and enable the actuator to set the minimum and maximum limits of the supplied control signal, thereby utilizing the entire control signal range. Feedback, running time and other parameters are automatically adjusted to the effective stroke.
- e. Actuator shall have a manual override equipped with an interlocking device to protect the actuator from over-torque of the manual override.

## 6. Butterfly Valves – Resilient Seat

- a. Butterfly valves, as specified, shall be by Belimo.
- b. Butterfly valves 2" to 12" shall have a fully lugged, drilled and tapped, cast iron body, rated to 200 psi body pressure, with 14" and larger valves having a body pressure rating of 150 psi. Flanges shall meet ANSI 125/150 standards. The one-piece body shall feature an extended neck allowing sufficient clearance for flanges and 2" of piping insulation. The disc shall be 304 stainless steel and provide bi-directional bubble-tight close off in either direction for chilled or hot water or 50% glycol applications. The disc shall be polished and contoured to minimize torque and wear. Shaft shall be mechanically retained in valve body using split-thrust washer and internal retaining-ring design for ease of service. The valve body shall employ ISO5211 actuator mounting and shaft connection standards.
- c. The disc shall have full 360-degree concentric seating. Valves up through 12" shall utilize an internal spline for the disc-to-stem connection. External mechanical methods to achieve this mechanical connection, such as pins or screws, shall not be employed. Valves 14" and larger will utilize a dual-pin method to prevent the heavy disc from settling onto the liner, causing distortion. A phenolic backed, non-collapsing, EPDM seat shall be field replaceable and shall create a positive seal between flange face and valve body. No gaskets shall be required between the valve and flange faces. The shaft shall be supported at four locations by RPTFE bushings.
- d. The flow characteristic shall be modified equal percentage for Two-way valves and linear for Three-way valves. Valves 2" through 12" shall be rated for standard HVAC service of up to 50 psi close-off, or for heavy commercial service of up to 200 psi close-off. Valves 14" and larger shall be rated for up to 150 psi close-off.
- e. A permanent metal tag shall designate manufacturer, series number and materials of construction.
- f. Butterfly valves may be used in all two-position applications and modulating applications larger than 2", or where the close off rating of other valve styles does not meet the design requirements.
- g. Butterfly valves shall be sized primarily by using velocity calculations to prevent fluid velocities from exceeding 12 feet per second. For modulating applications, CV factors at sixty (60) degrees shall be used for determining delta P once size has been determined by the velocity calculations.
- h. High torque industrial valve actuators, >300 in-lb. of rated torque, may be used where low torque actuators are not suitable. High torque actuators shall be as manufactured or provided by Belimo.

## 7. Butterfly Valves – High Performance

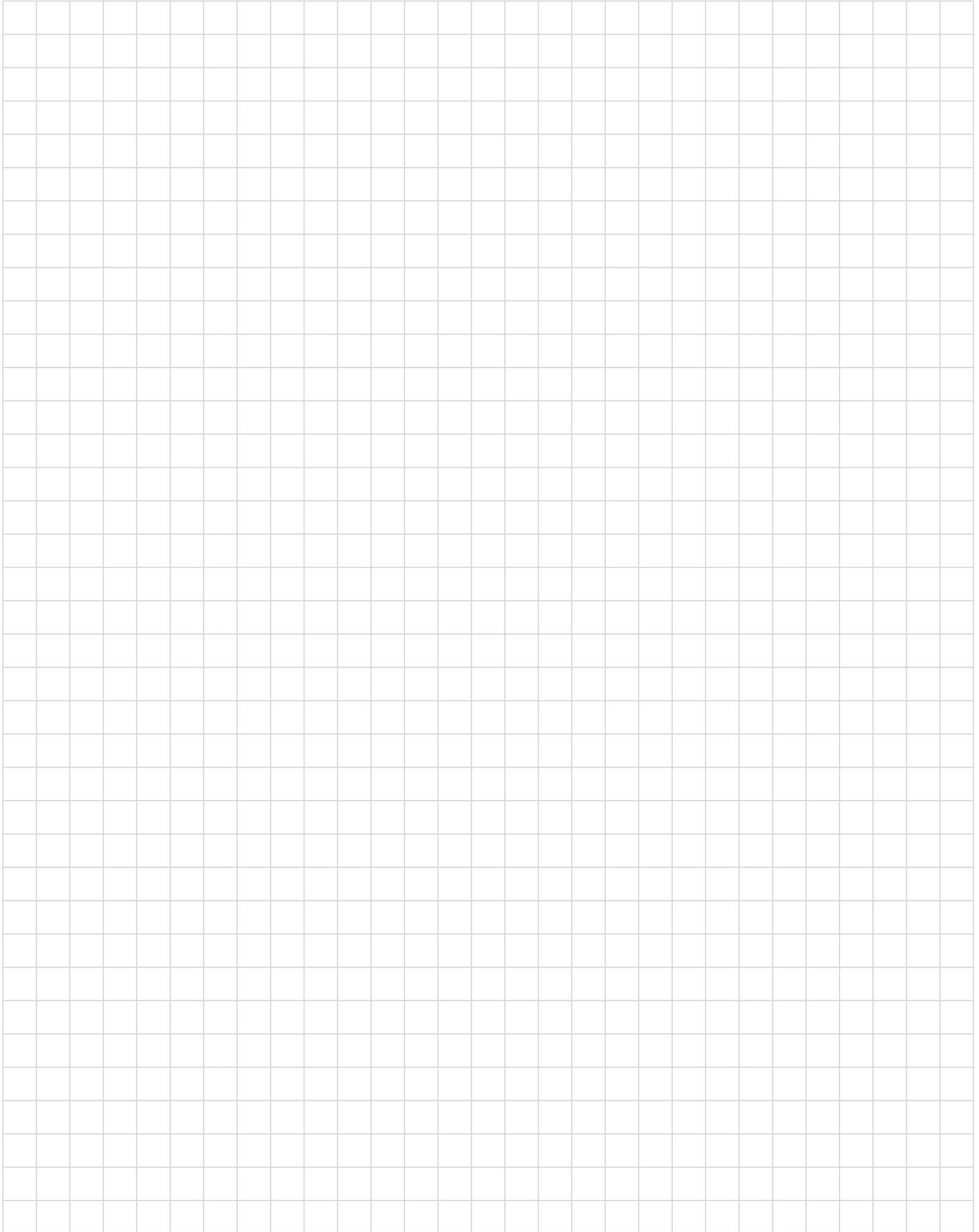
- a. Butterfly valves, as specified, shall be by Belimo.
- b. Butterfly valves 2" to 30" shall have a fully lugged, drilled and tapped, carbon steel body conforming to ANSI class 150 or class 300 standards. Flanges shall meet ANSI 150 or ANSI 300 standards. The one-piece body shall feature an extended neck allowing sufficient clearance for flanges and 2" of piping insulation.
- c. The disc shall be 316 stainless steel and provide bi-directional bubble-tight close off in either direction for chilled or hot water, 50% glycol applications or steam applications up to the ANSI class limits. The disc shall employ a 360 degree uninterrupted spherical edge for sealing. The disc profile shall be designed for maximum flow and equal percentage control.
- d. Shaft shall be mechanically retained in the valve body using an adjustable gland flange. This flange also serves to prevent leakage out the valve neck by applying a load against TFE Chevron design washers. These washers provide full ANSI hydrostatic seal to 150% of CWP rating.
- e. The RTFE bi-directional seat shall employ an encapsulated elastomeric o-ring core for resiliency. The seat is retained in the valve body by use of a retaining ring. The outside diameter of the retaining ring is recessed within the gasket sealing surface to prevent external leakage. The retaining ring is held in place by means of a stainless wedge ring.
- f. A permanent metal tag shall designate manufacturer, recommended flow direction, series number and materials of construction.
- g. Butterfly valves may be used in all two-position applications and modulating applications larger than 2", or where the close off rating of other valve styles does not meet the design requirements.
- h. Butterfly valves shall be sized primarily by using velocity calculations to prevent fluid velocities from exceeding 32 feet per second. For modulating applications, CV factors at sixty (60) degrees shall be used for determining delta P once size has been determined by the velocity calculations.
- i. High torque industrial valve actuators, >300 in-lb. of rated torque, may be used where low torque actuators are not suitable. High torque actuators shall be as manufactured or provided by Belimo.

## 8. Zone Valves

- a. Zone valves, as specified, shall be by Belimo.
- b. Zone valves shall be used in terminal unit water applications requiring a Two-way or Three-way diverting valve in sizes 1" and smaller.
- c. Zone valves shall have brass bodies with female NPT or sweat ends and a stainless steel stem.
- d. Zone valve actuators shall on/off and shall be available in 24VAC or 120VAC.
- e. Zone valve actuators shall have a minimum of 20 psi close-off rating.
- f. Zone valves shall have push button for quick removal of actuator.
- g. Zone valves shall have a leakage rate of 0.1% or lower

## 9. Industrial Ball Valves

- a. Ball valves, as specified, shall be by Belimo.
- b. Two-way and three-way ball valves may be used only if characterized control valves do not fit the sizing criteria or application.
- c. Ball valves may be used for chilled or hot water, steam, or glycol solutions to 50%. Screwed or flanged water valves shall have modified equal percentage or modified linear flow characteristics for two-way and three-way valves, respectively. The ball and stem shall be stainless steel, and seats will be RPTFE.
- d. VS Series screwed ball valves 1/2" through 3" shall have bronze bodies rated to at least 400 WOG. Flanged ball valves 2" through 10" shall have cast iron bodies rated to at least 200 WOG. The maximum differential rating will match the respective valve close-off rating.
- e. VSS Series screwed ball valves 1/2" through 3" shall have stainless steel bodies rated to at least 600 WOG. The maximum differential rating will match the respective valve close-off rating.
- f. VS and VSS series ball valves shall provide bubble-tight close-off capabilities on all ports up to the specified close-off rating.



## I. General

1.1. The following Terms and Conditions of Sale (“**Terms**”) apply to the sale of products described in this Product Guide (“**Products**”). As used herein, “**Seller**” or “**Belimo**” refers to Belimo Aircontrols (USA) Inc. or Belimo Aircontrols (CAN) Inc., as applicable, and “**Client**” refers to the individual or business entity that purchases the Products from Seller. These Terms shall apply unless the parties mutually agree to different terms and memorialize such agreement in a writing signed by both Client and Seller.

## II. Price

2.1. The Seller's price for Products (the “**Price**”) is net, F.O.B. Point of Origin, and is calculated in US currency for sales made by Belimo Aircontrols (USA), Inc. and calculated in Canadian currency for sales made by Belimo Aircontrols (CAN) Inc.

2.1. The Price, unless otherwise agreed upon, does not include freight and packaging (wooden crates, pallets, etc), the costs of which will be charged to Client at cost for each shipment and shall be payable with payment of the Price.

2.3. Orders for Products with a net value of less than US\$300 (CAN\$450) will be subject to a US\$20 (CAN\$35) handling fee (the “**Handling Fee**”). The Handling Fee will not be charged for orders of Products with a net value equal to or greater than US\$300 (CAN\$450) or for Products ordered through Seller's internet ordering system at: [www.belimo.com](http://www.belimo.com).

2.4. Seller reserves the right to make partial deliveries of orders of Products, each of which deliveries may be invoiced separately by Seller.

2.5. The Price does include charges for wiring diagrams, installation, and commissioning, which will be charged to Client separately and will be payable on demand.

## III. Payment

3.1. Invoices are payable in US currency for sales made by Belimo Aircontrols (USA), Inc. and in Canadian currency for sales made by Belimo Aircontrols (CAN) Inc. and are due no later than 30 days from the date of invoice, without any deductions.

3.2. If Client fails to pay the entire invoice balance within 60 days from the date of the invoice, Client will be subject to an interest charge of 2% per month (or the maximum rate permitted by law, whichever is less) on the outstanding unpaid balance due to Seller.

3.3. Clients who maintain outstanding balances for 45 days or more after the date of invoice may be subject to restricted shipments of Products or may be required to pay for all future deliveries of Products on a cash-on-delivery basis.

## IV. Title and Risk

4.1. Title to all Products shall remain with Seller and shall not pass to Client until Seller has received full payment for the Products.

## V. Damage or loss in Transit

5.1. Seller assumes no liability for damage or loss of shipment of Products, which risk shall at all times remain with the carrier. All shipments must be unpacked and examined by Client immediately upon receipt. Any external evidence of loss or damage must be noted on the freight bill accompanying the shipment of Products or carrier's receipt and signed by the carrier's agent at the time of delivery. Failure to do so will result in the carrier's refusal to honor any claim relating to damage of Products. Client must also notify Seller of such damage by providing Seller with a copy of the freight bill or damage report so that

Seller can file a claim for loss or damage in transit with the carrier. If the damage does not become apparent until the shipment is unpacked, customer must make a request for inspection by the carrier's agent and file with the carrier within 15 days after receipt of product and notify Seller of the same. Seller is not liable for consequential damage to Client's property or a third-party's property resulting from the installation of damaged Products.

## VI. Delivery

6.1. Seller undertakes to make every attempt to adhere to its stated delivery parameters and to make a timely delivery of the Products but does not guarantee any delivery specifications. Each contract entered into for the purchase of Products is not cancelable nor is Seller liable for any direct or indirect losses that may arise, for any reason whatsoever, due to Seller's failure to meet any stated or assumed delivery schedules.

## VII. Return of Goods

7.1. Products received by Client cannot be returned unless: (i) Client alerts Seller that it intends to return such Products, (ii) Seller agrees to accept the return of such Products, (iii) Client obtains a Return Material Authorization (“**RMA**”) number from Seller for the return of such Products, and (iv) Client follows all return instructions provided by the Seller. The RMA number must be clearly written on the outside of all packaging for any returned Products. Only Products returned to proper the location as instructed by Seller and identified with an RMA number will be considered for credit.

7.2. Only Products that are returned in original packaging may be accepted for return. Such returned Products must be received in good condition, adequate for resale as new Products to qualify for credit. Client will be responsible for payment of a restocking charge for all returned Products in an amount no less than 20% of the invoice value of the Products (“**Restocking Charges**”). All return Products must be shipped to Seller at Client's cost.

7.3. Returns that result from Seller errors will be credited in full and will not be subject to Restocking Charges.

## VIII. Warranty

### VIII.A 5-year warranty

8.1. Products that are listed in this Product Guide as carrying a 5-year warranty and shipped after May 1, 2000 to a location in the United States or Canada shall carry a 5-year warranty. The 5-year warranty is unconditional for the first two years from the date of production of the Products. After the first two years from the date of Production, the warranty shall be conditional and the warranty coverage shall not apply to damage to Products caused by ordinary wear and tear, negligence or improper use by Client, or other causes beyond the control of the Seller. Product -specific terms of warranty with regard to warranty period or conditions of warranty may apply to certain specified Products as stated in the documentation for those Products.

### VIII.B 2-year conditional warranty

8.2. Products that are listed in this Product Guide as carrying a 2-year warranty and shipped after May 1, 2005 to a location in the United States or Canada shall carry a 2-year warranty. The 2-year warranty is conditional and the warranty coverage shall not apply to damage to Products caused by ordinary wear and tear, negligence or improper use by Client, or other causes beyond the control of the Seller. Product -specific terms of warranty with regard to warranty period or conditions of warranty

may apply to certain specified Products as stated in the documentation for those Products.

## VIII.C General Warranty Terms

8.3. Seller's warranty may be null and void in the event of any: (a) modification or unauthorized repairs of Products by Client, (b) unauthorized incorporation or integration of Products into or with Client's equipment, (c) use of Products in an unauthorized manner, or (d) damage to Products not caused by Seller.

8.4. Client must promptly notify Seller of Products' alleged defect and provide Seller with other evidence and documentation reasonably requested by Seller. Before removing Products from service, Client should contact a Seller-authorized support technician by calling Belimo customer service. The contact information for Belimo customer service is listed on the back page of Belimo's Product Guide and Price List ("PGPL") or may be found at [www.belimo.com](http://www.belimo.com). Belimo customer service will work with field technicians to troubleshoot problems. Many problems can be resolved over the phone.

8.5. If a problem cannot be resolved over the phone, an RMA number will be issued by Seller for return of the Products. Prior to returning any Products under a warranty, Client must obtain an RMA number from Seller, along with shipping instructions for the return. The RMA number must be clearly written on the outside of the box containing the returned Products. Only Products returned to the proper location and identified with an RMA number will be accepted by the Seller.

8.6. All returned Products should be packaged appropriately to prevent further damage. Seller reserves the right to refuse any returned material if improperly packaged or labeled (without an RMA number). Products returned without proper RMA documentation will void Seller's warranty.

8.7. Products found to be defective for which a warranty is applicable will either be replaced or repaired at the Seller's discretion. Seller is not responsible for charges that Client may incur as a result of the removal or replacement of Products.

8.8. Repaired or replacement Products are shipped from Seller via ground shipment. Other shipping methods are available at the sole expense of the Client.

8.9. Repaired, replaced or exchanged Products will carry a warranty for a period of time equal to the greater of: (i) the remainder of the original 5-year warranty or 2-year warranty that was applicable to the repaired, replaced or exchanged Products, or (ii) six months, effective from the date the repaired, exchanged or replaced Products are shipped by Seller (the "**Replacement Warranty Period**").

8.10. Advanced replacement Products for Products covered under warranty may be obtained from Seller after the Belimo customer service troubleshooting process has been completed. For industrial products (such as butterfly valves), a purchase order is required. The purchase order will be credited upon the receipt and verification by Seller of the returned defective Products. For non-industrial products, an invoice will be issued and shall be due and payable is the returned Products are not received by Seller within 60 days from the date of that the replacement Products are shipped. Additional charges may apply if the nature of the problem has been misrepresented by Client.

8.11. Both the conditional and unconditional warranties cover the Products only, and do NOT cover labor associated with the troubleshooting, removal or replacement of such Products.

8.12. New Products ordered in an attempt to circumvent the warranty process may NOT be reimbursed if, upon receipt of returned Products, it is determined that the defect in the returned Products is actually field related, or the Products

have been returned for cosmetic reasons only.

8.13. Advanced replacement Products for butterfly valve actuators may not be new, but have been verified by the Seller for electrical and mechanical operation. Such Products carry the full warranty for the entire Replacement Warranty Period.

## IX. No warranty for non-HVAC application

9.1. All Seller warranties shall extend only to HVAC use of the Products. If Products are used in non-HVAC application (e.g., aircraft, industrial processes, etc.), Seller's warranties shall not cover such Products. Client will be solely responsible for any damage to or malfunction of Products or for any damage resulting from such use of Products.

## X. Liability disclaimer

10.1. These Terms constitute the entire understanding and agreement between Seller and Client regarding the warranties that cover Products and supersedes all previous understandings, agreements, communications and representations. Seller shall not be responsible for and Client does not have any right to make any claim for, damage that occurs to any property other than Products. Seller shall in no way be responsible for any costs incurred by Client in the determination of the causes of damage to any of Client's property, for expert opinions, or for any punitive or special, incidental or consequential damages of any kind whatsoever.

10.2. Seller shall not be liable for any damage resulting from or contributed by Client or third parties acting within the scope of responsibility of Client or such third party when:

1. Products are used for non-HVAC applications, such as in aircrafts, industrial processes, etc.;
2. Client uses the Products without complying with applicable law or institutional regulations or Belimo data and installation sheets or Client uses the Products without following good industry practice;
3. Products are used by personnel who have not received suitable instruction; or
4. Products are modified or repaired without the written approval of Seller.

When requested to do so, Client shall immediately release Seller in full from any possible third party claims resulting in connection with the circumstances listed above. This also applies to claims in connection with product liability.

10.3. If Client becomes aware that any third party has made or appears likely to make any claim regarding Products (including, without limitation, regarding Product defects or rights infringed by Products), then Client shall immediately inform Seller and afford to Seller all assistance that Seller may require to enforce its rights and defend such claim.

## XIII. Proper Law and Jurisdiction

11.1. All sales of Products under these Terms and the warranties described herein shall be governed by the laws of the State of Connecticut, and the parties agree to submit to the exclusive jurisdiction of the Federal and state courts located in the State of Connecticut with respect to any dispute arising from the subject matter hereof. The parties hereby waive all rights to a jury trial in connection with any claims relating to the subject matter hereof.



**USA****ACR Supply Company Inc.**

2719 Hillsborough Road  
Durham, NC 27705  
Phone: 919-286-2228

**Aireco Supply**

9120 Washington Blvd.  
Savage, MD 20763-0414  
Phone: 301-953-8800

**With branch in MD, VA**

**Amcon Controls, Inc.**

11906 Warfield  
San Antonio, TX 78216  
Phone: 210-349-6161

**Applied Automation**

A Wilson Mohr Company  
3186 South Washington Street, #230  
Salt Lake City, UT 84115  
Phone: 801-486-6454

**Boston Aircontrols, Inc.**

8 Blanchard Rd  
Burlington, MA 01803  
Phone: 781-272-5800

**Charles D. Jones Co.**

445 Bryant Street, Unit #1  
Denver, CO 80204-4800  
Phone: 800-777-0910

**With branches in CO, MO**

**Climatic Control Co., Inc.**

5061 W. State Street  
Milwaukee, WI 53208  
Phone: 800-242-1656

**With branches in WI**

**Cochrane Supply and Engineering, Inc.**

30303 Stephenson Highway  
Madison Heights, MI 48071-1633  
Phone: 800-482-4894

**With branches in MI**

**Columbus Temperature Control**

1053 E. 5th Ave.  
Columbus, OH 43201  
Phone: 800-837-1837

**Control Consultants & Supply Co.**

2330 Hampton Avenue  
St. Louis, MO 63139-2909  
Phone: 314-647-6680

**With branch in TN**

**Controlco**

5600 Imhoff Drive, Ste. G  
Concord, CA 94520  
Phone: 925-602-7728

**With branches in CA**

**Edward C. Smyers & Co.**

223 Fort Pitt Blvd.  
Pittsburgh, PA 15222-1505  
Phone: 412-471-3222

**First Source Distributors, LLC**

710 Peninsula Lane, Suite E  
Charlotte, NC 28273  
Phone: 800-670-5977

**G & O Thermal Supply**

5435 N. Northwest Highway  
Chicago, IL 60630  
Phone: 773-763-1300

**With branches in IL, WI**

**Industrial Controls Distributors LLC**

1776 Bloomsbury Avenue  
Wanamassa, NJ 07712  
Phone: 800-631-2112  
**With branches in KY, NC, NY, OH, PA, TN**

**Interstate Electric Equipment**

30 Vineland St.  
Brighton, MA 02135  
Phone: 617-782-9000

**Jackson Controls**

1708 E. 10th Street  
Indianapolis, IN 46201  
Phone: 317-231-2200

**M & M Controls**

9E West Aylesbury Road  
Timonium, MD 21093  
Phone: 410-252-1221

**MICONTROLS, Inc.**

6516 5th Place South  
Seattle, WA 98124  
Phone: 800-877-8026

**With branches in WA, OR**

**Minvalco, Inc.**

3340 Gorham Avenue  
Minneapolis, MN 55426-4267  
Phone: 952-920-0131

**RSD/Total Control**

26021 Atlantic Ocean Dr.  
Lake Forest, CA 92630  
Phone: 949-380-7878

**With branches in CA, NV, OR, AK,  
AZ, ID, UT, WA**

**Saint Louis Boiler Supply, Co.**

617 Hanley Industrial Court  
St. Louis, MO 63144  
Phone: 314-962-9242

**South Side Control Supply, Co.**

488 N. Milwaukee Avenue  
Chicago, IL 60610-3923  
Phone: 312-226-4900

**With branches in IL, IN**

**Stromquist and Company**

4620 Atlanta Rd.  
Smyrna, GA 30080  
Phone: 404-794-3440

**With branch in FL**

**Temperature Control Systems**

10315 Brockwood Road  
Dallas, TX 75238  
Phone: 214-343-1444

**With branches in OK, TX**

**Tower Equipment Co., Inc.**

1320 West Broad Street  
Stratford, CT 06615  
Phone: 800-346-4647

**Twinco Supply Corporation**

55 Craven Street  
Huntington Station, NY 11746-2143  
Phone: 800-794-3188

**With branches in NY**

**CANADA****Airex**

C - 5 Sandhill Crt.  
Brampton, ON, L6T 5J5  
Phone: 905-790-8667

**Baymar Supply Co.**

3200 Jefferson Blvd.  
Windsor, ON N8T 2W8  
Phone: 519-974-5800  
**With branch in London, ON**

**Gagnon & Associates Inc.**

2800 White St.  
Val Caron, ON  
P3N 1B2  
Phone: 800-363-3384  
Phone: 705-897-1942

**Le Groupe Master**

1675 de Montarville  
Boucherville, QC  
J4B 7W4

Phone: 514-527-2301

**With branches across Eastern Canada**

**O'Dell Associates Inc.**

#3 - 1038 Cooke Blvd.  
Burlington, ON L7T 4A8  
Phone: 905-681-3901

**Prokontrol**

1989 Michelin  
Laval, QC, H7L 5B7  
Phone: 450-973-7765

**With branches in Ville Vanier and Ontario**

**Refrigerative Supply**

3958 Myrtle Street, Burnaby, BC, V5C 4G2  
Phone: 604-435-7151

**With branches in British Columbia,  
Alberta, Saskatchewan, Manitoba**

**Regal Controls**

1156 Kingsway  
Vancouver, BC, V5V 3C8  
Phone: 604-879-6357

**With branch in Langley**

**Regulvar Laval**

1985 Boul Industriel Laval Q.C  
H7S-1P6  
Phone: 450-629-0435

**With branches in Sherbrooke,  
St. Hubert, Lachine, Quebec City**

**Regulvar Ottawa Inc.**

170 Laurier Ax West Suite 714  
Ottawa, Ontario, K1P-5V6  
Phone: 613-565-2129

**With branch in Hull**

**Sinclair Supply**

10914 - 120 Street  
Edmonton, AB, T5H 3P7  
Phone: 780-452-3110

**With branches in British Columbia,  
Alberta, Saskatchewan**

**SCI**

3311 Boul Industriel  
Laval, QC, H7L 4S3  
Phone: 450-668-8866

**Wiles & Legault**

#5 - 505 Industriel Avenue  
Ottawa, ON, K1G 0Z1  
Phone: 613-747-1867

**Yorkland Controls**

2689 Steeles Avenue, W.  
Downsview, ON, M3J 2Z8  
Phone: 416-661-3306

**With branch in Mississauga**

## *Together to the Top*

### **Belimo Americas**

#### **(USA) Locations / 1-800-543-9038**

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Danbury, CT 06810  
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(203) 791-9915  
Fax: (800) 228-8283  
(800-ACTUATE)  
(203) 791-9919

South Customer Service:  
888-829-3166  
Fax: 800-228-8283

Mid-West Customer Service:  
877-833-4647  
Fax: 800-228-8283

Latin America Customer Service:  
203-791-8396  
Fax: 203-791-9139

#### **Canada Locations**

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14/16 – 5716 Coopers Ave.  
Mississauga, Ontario  
L4Z 2E8  
Toll Free: (866) 805-7089  
(905) 712-3118  
Fax: (905) 712-3124

1675 East Prater Way  
Suite 101  
Sparks, NV 89434  
Toll Free: (800) 987-9042  
(775) 857-4243  
Fax: (800) 987-8875  
(775) 857-4255

Midwest Service Center  
(877) 833-1647

Quebec & Eastern Canada  
Service Center  
(866) 928-1440  
(450) 928-1440  
Fax: (450) 928-0050

#### **Belimo Worldwide**

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