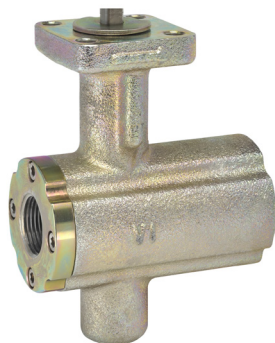


# B2100VB-024, 1", V Ball Control Valve

Hardened Chrome Plated Carbon Steel Body, Stainless Steel Ball and Stem



### Product Features

Fast quarter turn open or closed operation, Stainless steel ball and stem, Positive shut-off, Two piece body construction

### Application

Water-side control of air handling apparatus in ventilation and air-conditioning system.  
Water/Steam control in heating system.  
300:1 rangeability.

The dimensions and drilling of end flanges conform to the American cast iron flange standard, Class 150 (ANSI B16.1).

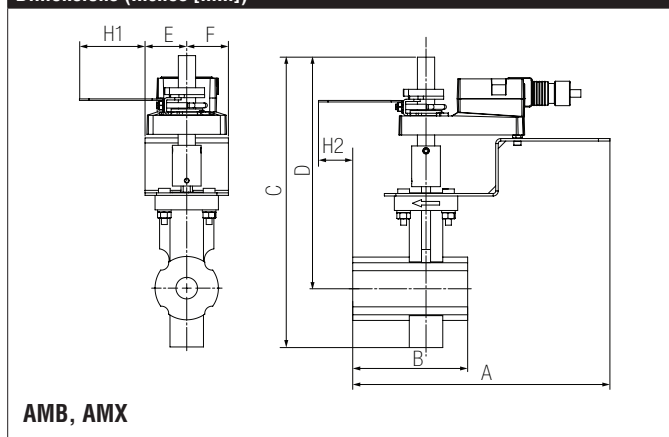
### Suitable Actuators

|             | Non-Spring       | Spring |
|-------------|------------------|--------|
| B2100VB-024 | SY1, SY2, AMB(X) | NFB(X) |

### Technical Data

|   |   |
|---|---|
| Service   | chilled or hot water, up to 60% glycol, steam     |
| Flow Characteristic                                   | equal percentage                                  |
| Controllable Flow Range                               | 75°   |
| Size [mm]   | 1" [25]   |
| End Fitting   | NPT female ends (1" to 2"); ISO flange (3" to 6") |
| Body  | WCC Grade Carbon steel                            |
| Ball  | stainless steel                                   |
| Stem  | stainless steel                                   |
| Stem Packing  | spring loaded Teflon® V-ring                      |
| Seat  | Teflon®   |
| Packing   | spring loaded Teflon® V-ring                      |
| Body Pressure Rating [psi]                            | ASME/ANSI Class 300                               |
| Max Inlet Pressure (Steam)                            | 200 psi   |
| Media Temperature Range (Water)                       | -22°F to 380°F [-30°C to 193°C]                   |
| Media Temperature Range (Steam)                       | -22°F to 380°F [-30°C to 193°C]                   |
| Maximum Differential Pressure (Steam)                 | 100 psi   |
| Max Differential Pressure (Water)                     | 150 psi   |
| Maximum Differential Pressure Steam (Rotary Actuator) | 100 psi   |
| Close-Off Pressure                                    | 150 psi   |
| Close-Off Pressure (Steam)                            | 200 psi   |
| Rangeability  | 300:1   |
| Cv  | 24  |
| Weight  | 9 lb [4.1 kg]                                     |
| Leakage   | ANSI Class IV                                     |

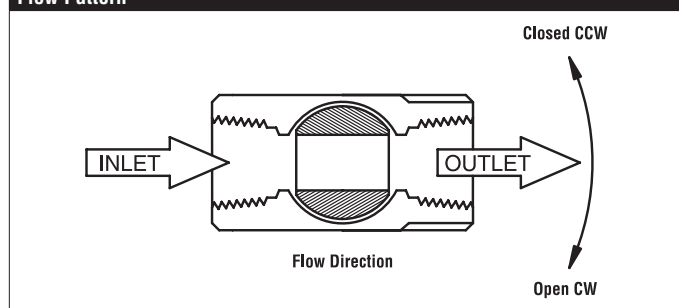
### Dimensions (Inches [mm])

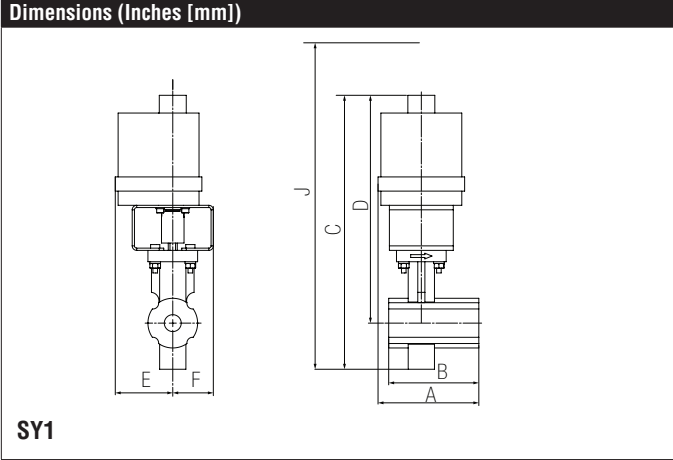


AMB, AMX

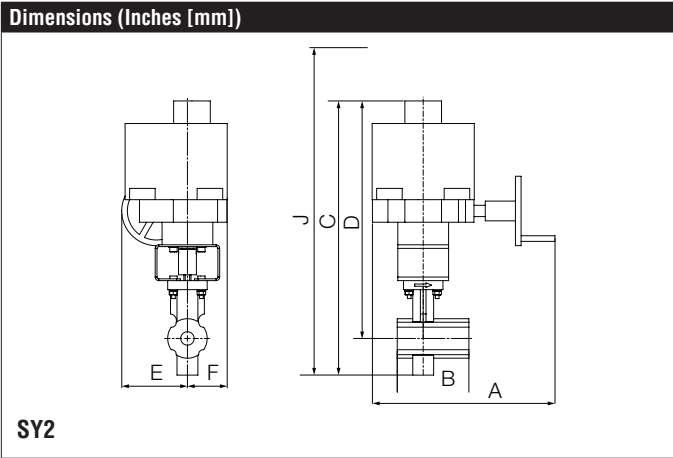
| A              | B        | C              | D               | E             | F             | H1            | H2           |
|----------------|----------|----------------|-----------------|---------------|---------------|---------------|--------------|
| 11.8"<br>[300] | 5" [127] | 12.6"<br>[320] | 10.07"<br>[256] | 1.81"<br>[46] | 1.18"<br>[30] | 1.18"<br>[30] | 0.5"<br>[15] |

### Flow Pattern





| A              | B        | C               | D               | E         | F | J               |
|----------------|----------|-----------------|-----------------|-----------|---|-----------------|
| 5.58"<br>[142] | 5" [127] | 14.94"<br>[380] | 12.64"<br>[321] | 2.4" [61] |   | 20.44"<br>[519] |

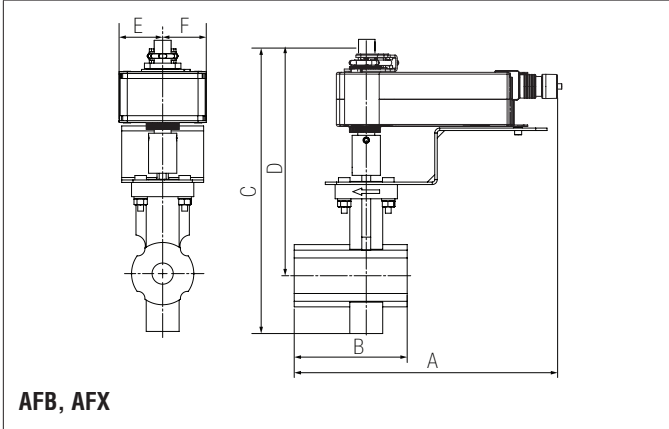


| A              | B        | C               | D               | E              | F          | J               |
|----------------|----------|-----------------|-----------------|----------------|------------|-----------------|
| 12.6"<br>[320] | 5" [127] | 19.17"<br>[487] | 16.57"<br>[421] | 4.48"<br>[114] | 3.56" [90] | 27.67"<br>[703] |

# B2100VB-024, 1", V Ball Control Valve

Hardened Chrome Plated Carbon Steel Body, Stainless Steel Ball and Stem

## Dimensions (Inches [mm])



AFB, AFX

| A               | B           | C              | D               | E             | F |
|-----------------|-------------|----------------|-----------------|---------------|---|
| 11.74"<br>[298] | 5"<br>[127] | 12.6"<br>[320] | 10.07"<br>[256] | 1.95"<br>[49] |   |

# SY1-24

## On/Off Floating Point, Non-Spring Return, 24 V



### Application

SY Series actuators are fractional horsepower devices, and utilize full-wave power supplies. Observe wire sizing and transformer sizing requirements. Proportional models CANNOT be connected to Belimo direct coupled (AF, AM, GM...etc) actuator power supplies or any type of half-wave device. You MUST use a separate, dedicated transformer or power supply to power the SY actuator. Please do not connect other automation equipment to the dedicated SY supply source. You MUST use four wires (plus a ground) to control a proportional control SY actuator (See SY Wiring Section).

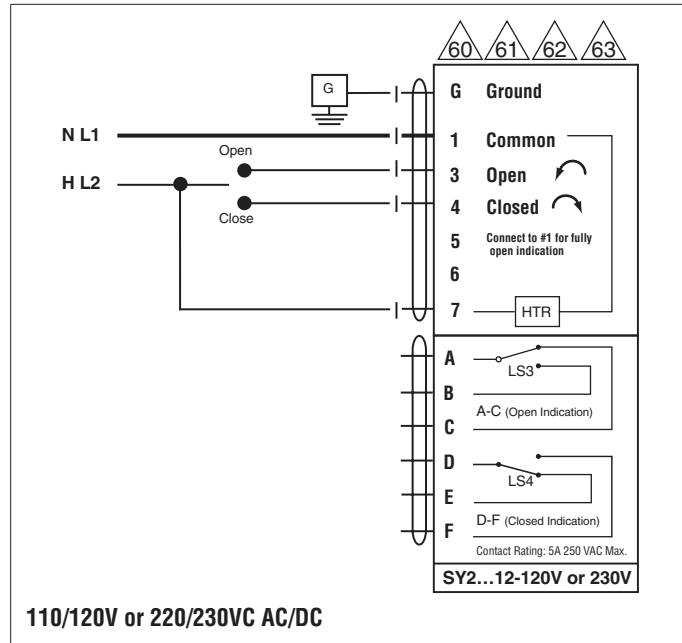
| Technical Data                |  |
|-------------------------------|--|
| Power Supply                  | 24 VAC $\pm$ 10%, 50/60 Hz, 24 VDC $\pm$ 10%   |
| Power Consumption Running     | 29 W   |
| Transformer Sizing            | 41 VA (class 2 power source)   |
| Electrical Connection         | terminal block   |
| Overload Protection           | thermally protected 135°C cut-out  |
| Operating Range Y             | on/off, floating point   |
| Angle of Rotation             | 90°  |
| Torque                        | 310 in-lbs [35 Nm] minimum   |
| Duty cycle                    | 30%  |
| Direction of Rotation (Motor) | reversible with built-in switch  |
| Position Indication           | top mounted domed indicator  |
| Manual Override               | use a 8mm wrench to override   |
| Running Time (Motor)          | 20 sec   |
| Internal Humidity Control     | resistive heating element  |
| Ambient Humidity              | 5 to 100% RH (UL Type 4)   |
| Ambient Temperature Range     | -22°F to 150°F [-30°C to 65°C]   |
| Storage Temperature Range     | -40°F to 176°F [-40°C to 80°C]   |
| Housing                       | NEMA 4X, IP66/67, UL Enclosure Type 4  |
| Housing Material              | die cast aluminum alloy  |
| Gear Train                    | high alloy steel gear sets, self locking   |
| Agency Listings†              | ISO, CE, cCSAus  |
| Noise Level (Motor)           | <45 dB (A)   |
| Servicing                     | maintenance free   |
| Quality Standard              | ISO 9001   |
| Weight                        | 4.2 lb [1.9 kg]  |
| Auxiliary Switch              | 2 x SPDT 3A resistive (0.5A inductive) @ 250 VAC, one set at +10° and one set at 85° |

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**Wiring Diagrams**
**INSTALLATION NOTES**

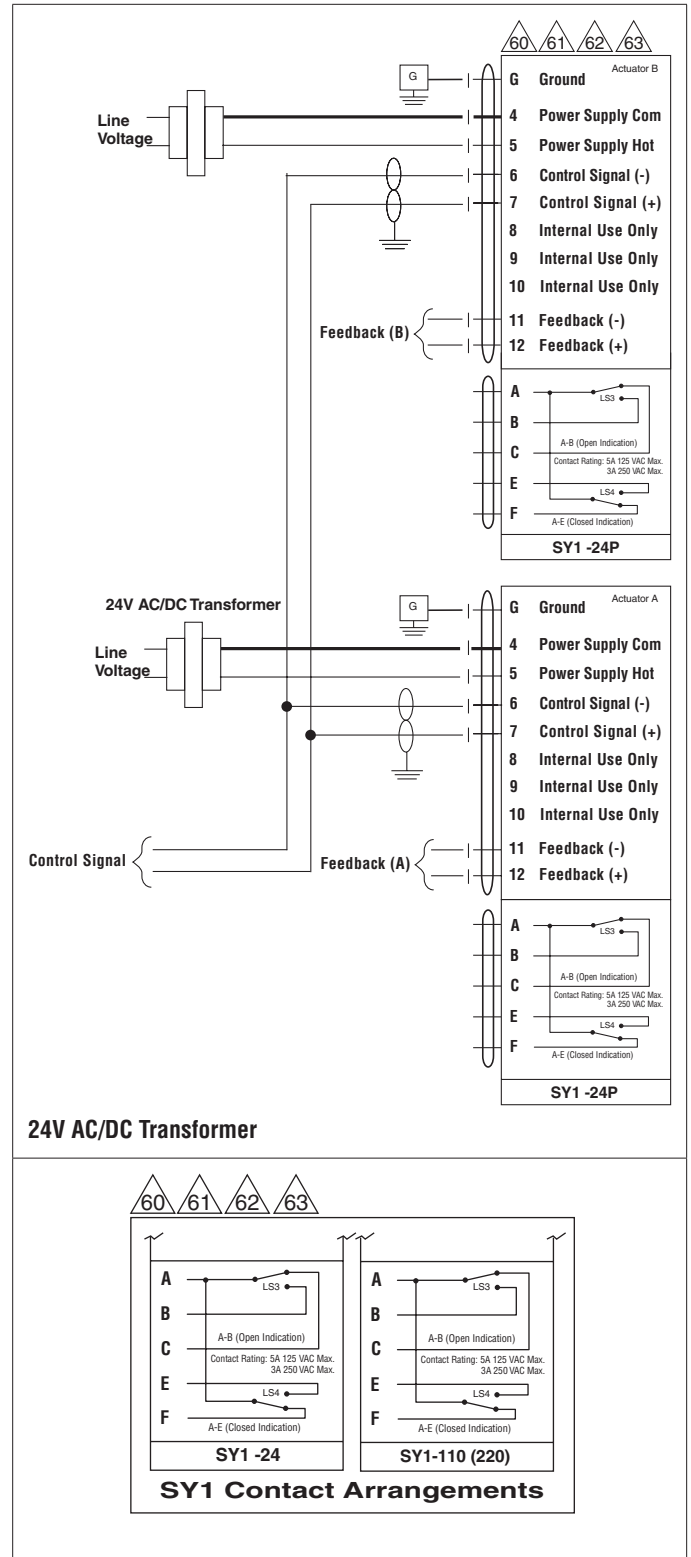
- Do not change sensitivity or dip switch setting with power applied.
- Power supply Common/Neutral and Control Signal "-"wiring to a common is prohibited. Terminals 4 and 6 need to be wired separately.
- Isolation relays must be used in parallel connection of multiple actuators using a common control signal inputs. The relays should be DPDT.
- Isolation relays are required in parallel applications. The reason parallel applications need isolation relays is that the motor uses two sets of windings, one for each direction. When one is energized to turn the actuator in a specific direction a voltage is generated in the other due to the magnetic field created from the first. It's called back EMF. This is not an issue with one actuator because the voltage generated in the second winding isn't connected to anything so there is no flow. On parallel applications without isolation, this EMF voltage energizes the winding it is connected to on the other actuators in the system, the actuators are trying to turn in both directions at once. The EMF voltage is always less than the supply voltage due to the resistance of the windings, so while the actuator still turns in the commanded direction, the drag from the other reduces the torque output and causes overheating.

**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.



# SY1-24

On/Off Floating Point, Non-Spring Return, 24 V



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