

VAL Series - Actuator — Installation Instructions

01/31/19

The VAL Series Electronic Valve Actuator requires a 24 Vac supply and receives a 0 to 10 Vdc or a 4 to 20 mA control signal to modulating control a valve.

Features

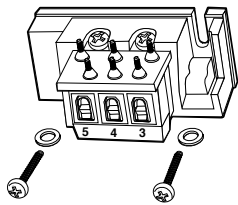
- Direct-coupled installation requires no special tools or adjustments
- Visual and electronic stroke indication
- Die-cast aluminum housing
- Manual override
- Spring return to fail-safe position
- Automatic stroke calibration
- Maintenance-free

Application

The VAL-SRS07 and VAL-SRS15P Spring Return Electro Hydraulic Actuators provide precise modulating control of Bray DG Series Globe Valves.

These actuators use electro hydraulic force to achieve superior close-off pressure ratings. The stroke of these actuators is up at the low input signal condition, and down in the high signal input condition.

A weather shield is available to offer a degree of protection against rain, sleet and damage from external ice formation.



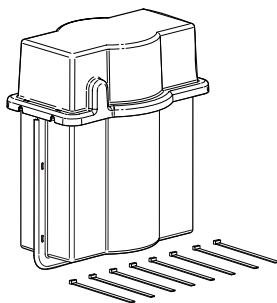
Auxiliary Switch

Accessories

Auxillary Switches

-A Auxiliary switch sends a signal to indicate the valve is in the 0% stroke position. Switching point is fixed at the 0% stroke position.

Switching Capacity	24 Vac
	4A resistive,
	2A inductive
Lowest recommended current	10 mA



Weather Shield

Weather Shield

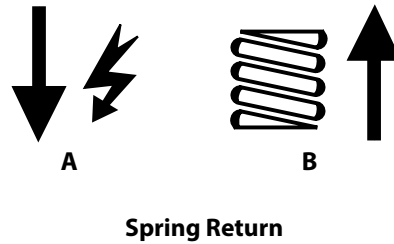
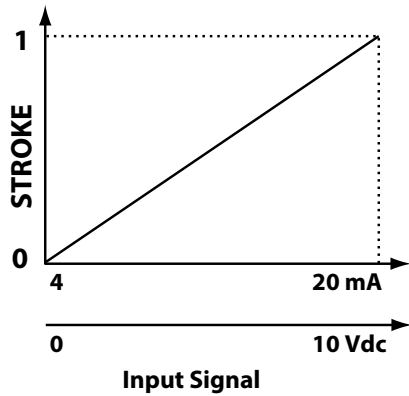
599-10065 The SKB/C actuator is UL listed to meet NEMA Type 3R requirements (a degree of protection against rain, sleet, and damage from external ice formation) when installed with Weather Shield and outdoor-rated conduit fittings in the vertical position. See Service Kits for replacement ultraviolet resistant cable ties.



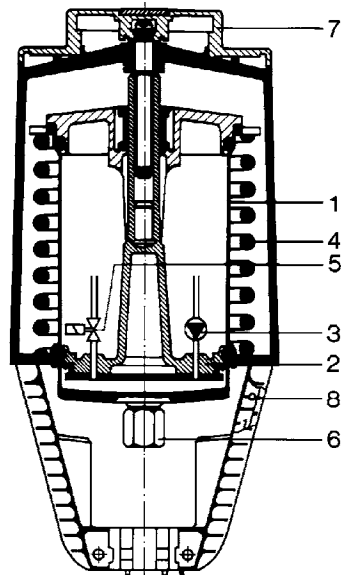
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Operation

A 0 to 10 Vdc or a 4 to 20 mA control signal controls the actuator. The actuator, mounted on a valve, produces a stroke proportional to the input signal. When power is turned off or in the event of a power failure, the actuator spring returns the valve to its normal position.



Details



Legend

1. Pressure cylinder
2. Piston
3. Oscillating pump
4. Return springs
5. Bypass valve
6. Coupling piece (stem nut)
7. Manual setting knob
8. Position indicator

Actuator Design

Mounting and Installation

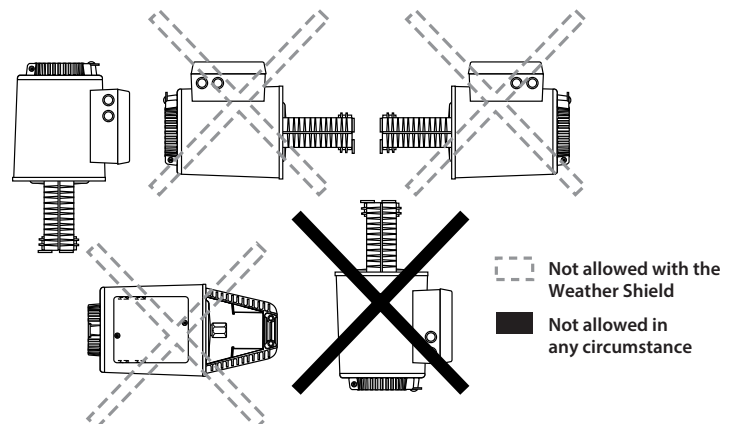
The vertical position is the required position for mounting and the only position for NEMA Type 3R rating with the Weather Shield. Acceptable mounting positions are shown below.

Allow four inches (100 mm) around the sides and back of the actuator and eight inches (200 mm) above and to the front of the actuator.

Detailed installation instructions for field mounting are shipped with the actuator.

CAUTION

Use care when removing the knockout. Do not damage the circuit board. Use the top knockout position, if possible.





START-UP

Check the wiring for proper connections.

NOTE: The valve body assembly determines the complete assembly action.

Override Control

The override control input (Z) has three modes of operation:

No Function	Override with 0 ... 1000 Ω
<p>Stroke</p> <p>100 % ↑ H_{max}</p> <p>H_{min} → Y</p> <ul style="list-style-type: none"> - Z-Contact not Wired - Valve Stroke Follows Control Signal Y 	<p>Stroke</p> <p>100 % ↑</p> <p>0 % ↓</p> <p>50 900 R [Ω]</p> <ul style="list-style-type: none"> - Z-Contact Connected to M Via Resistor R - Linear or Equal-Percentage Characteristic - Starting Position at 50 / End Position at 900 - Y-Input has No Effect
Actuator Fully Extended	Actuator Fully Retracted
<p>Flow</p> <p>100 % ↑</p> <p>0 % ↓</p> <p>V_{max}</p> <p>Y</p> <ul style="list-style-type: none"> - Z-Contact Connected Directly to G - Y-Input has No Effect 	<p>Flow</p> <p>100 % ↑</p> <p>0 % ↓</p> <p>V_{max}</p> <p>Y</p> <ul style="list-style-type: none"> - Z-Contact Connected Directly to G0 - Y-Input has No Effect

NOTE: The Z-modes have a direct acting factory setting.

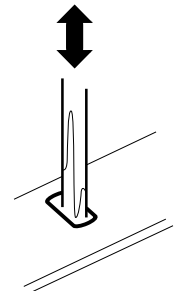
To determine the stroke positions 0% and 100% in the valve, calibration is required when the valve/actuator are commissioned for the first time. The actuator must be mechanically connected to a valve and must have a supply voltage of 24 Vac. Repeat the calibration procedure as often as necessary.

Stroke Calibration

The override control input (Z) has three modes of operation:

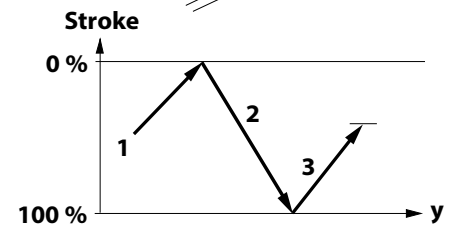
CAUTION

Before starting calibration, be sure that the manual adjuster is set to Automatic for the actual values to register. There is a slot on the printed circuit boards for the actuators. To initiate the calibration procedure, the contacts inside this slot must be short-circuited (possibly with a screwdriver)



Automatic Calibration proceeds as follows

- Actuator runs to the 0% stroke position (1), green LED flashes.
- Actuator then runs to the 100% stroke position (2), green LED flashes.
- Measured values are stored in the EPROM.
- The actuator now moves to the position defined by control signal Y or Z (3), and the green LED now glows steady (normal operation).
- Throughout this procedure, output U is inactive, meaning the values only represent actual positions when the green LED stops flashing and remains on continuously.

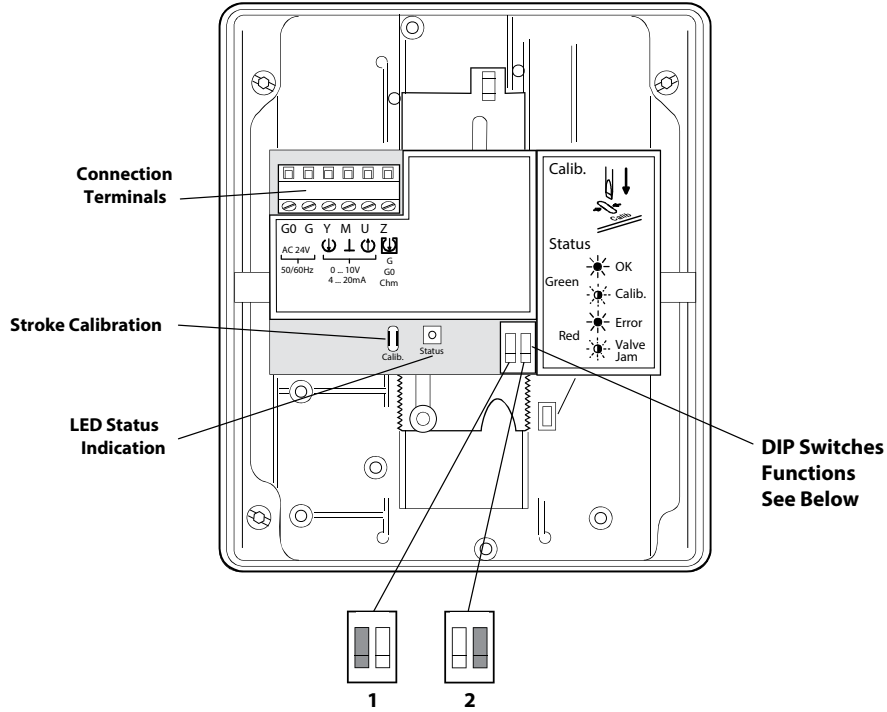


LED	Display	Function	Action
Green	ON	Normal Operation	Automatic operation
	Flashing	Stroke calibration In Progress	Wait for calibration to be completed (LED stops flashing)
Red	ON	Faulty stroke calibration	- Check mounting - Restart stroke calibration (by short-circuiting calibration slot)
	Flashing	Internal Error	- Replace electronics
	OFF	Inner valve jammed	Check the valve
		• No power supply • Faulty electronics	-Check mains -Replace electronics



VAL Series - Actuators — Installation Instructions Continued

Standard Features



DIP Switches (From Left to Right)	1 Selection of Control Signal	2 Selection of Flow Characteristic
ON	4 to 20 mA	Modified*
OFF (Factory Settings)	0 to 10 Vdc	Default

Start Up Continued

Normally Closed Valve

- Actuator pressure cylinder moves:
- Outward (0 to 1): Valve opens.
 - Inward (1 to 0): Valve closes.

Normally Open Valve

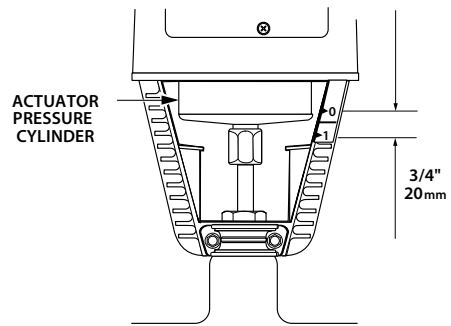
- Actuator pressure cylinder moves:
- Outward (0 to 1): Valve closes.
 - Inward (1 to 0): Valve opens.

Three-Way Valve

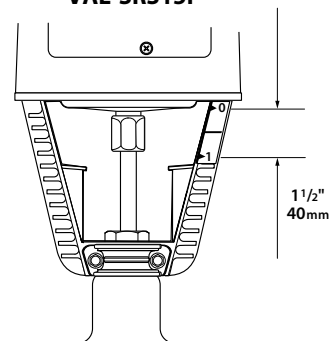
- Actuator pressure cylinder moves:
- Outward (0 to 1): Valve opens between ports NC and C.
 - Inward (1 to 0): Valve opens between ports NO and C.

Valve Stem Travel Indication

VAL-SRS07P



VAL-SRS15P





Start Up Continued-

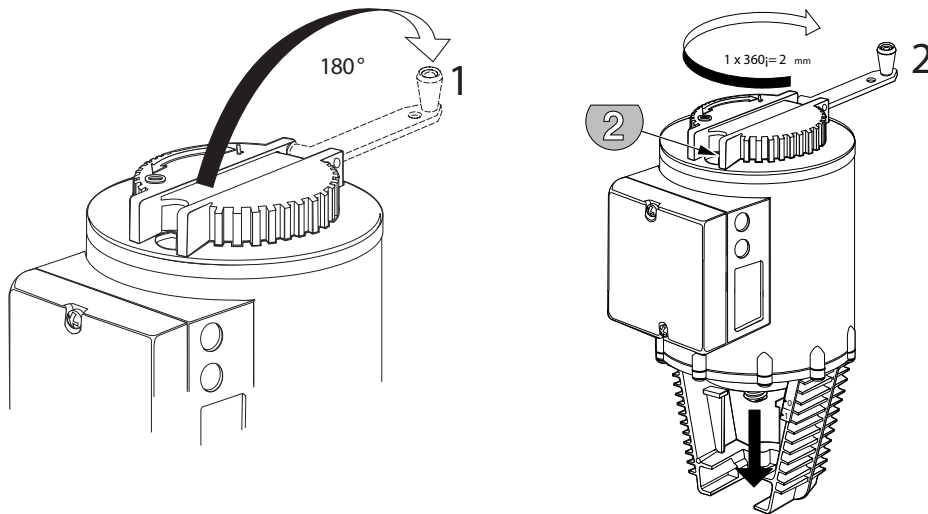
Release the crank arm of the manual setting knob located on the top of the actuator.

Manual Operation

A red scale appears in a window in the manual setting knob as you turn the crank clockwise. This scale indicates the effective valve stroke in millimeters.

Each complete revolution (360°) is equal to 2 mm of stroke. The numbers 2 to 20 or 2 to 40 are visible depending on the stroke of the actuator.

If a signal is sent to the actuator while it is in manual operation, the actuator will move but the control will not be accurate. The valve cannot be commanded to its 0% position while in manual operation.



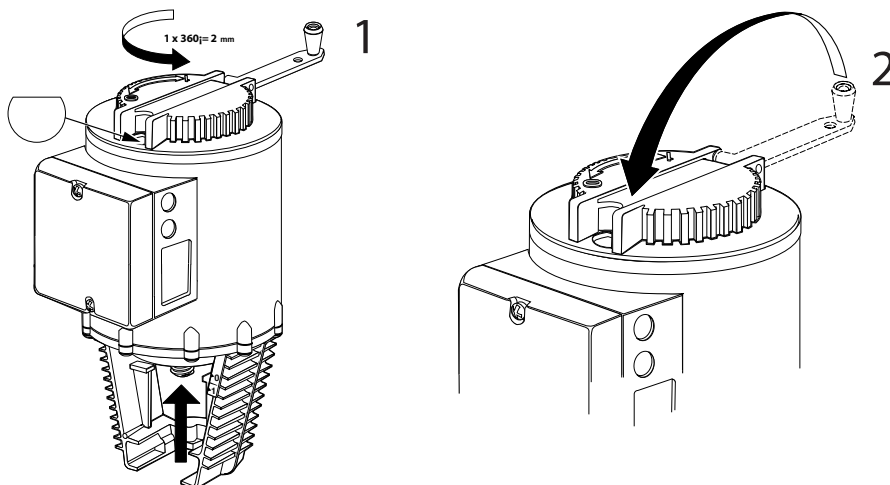
CAUTION

Do not attempt automatic operation of the actuator when the red scale is visible.

Automatic Operation

When returning to automatic control, turn the crank arm of the manual setting knob counterclockwise until the red numbers disappear. It is essential that the window is clear and the crank arm is snapped into position.

NOTE: It is possible to secure the manual override handle in place by inserting a # 8 x 1-1/4-inch or M5 x 30 mm thread-forming screw through the handle.

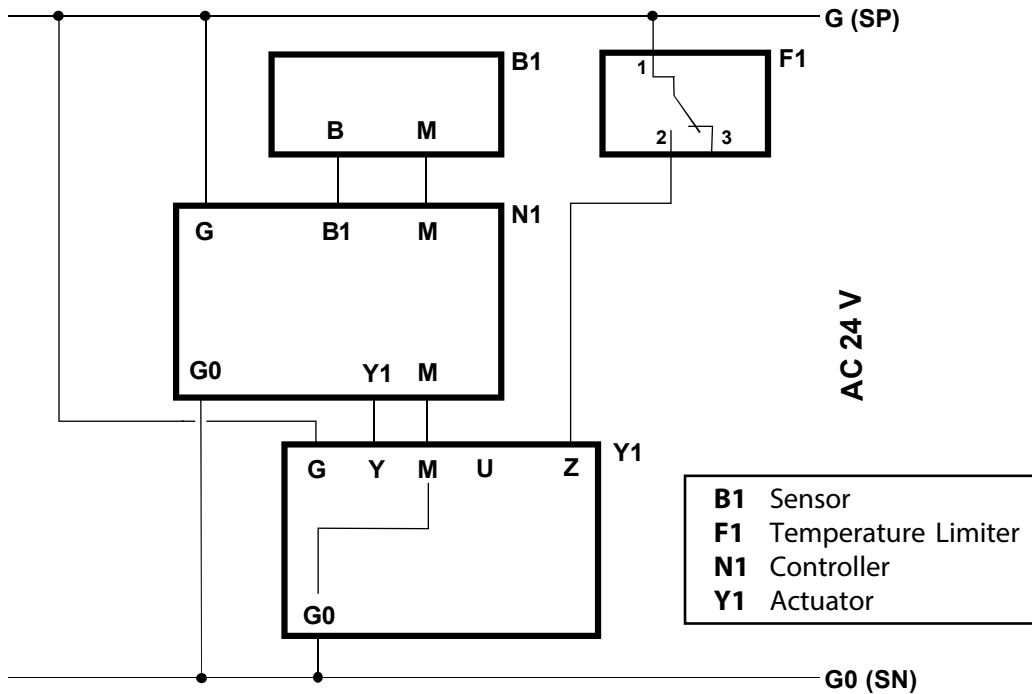




Actuator	Power Consumption	Actuators per Class 2 Supply Circuit* (80% of transformer VA)
VAL-SRS07P	17 VA	4
VAL-SRS15P	28 VA	2

Wiring Diagrams

The position output signal U will switch from 0 to 10 Vdc to 4 to 20 mA when a 4 to 20 mA input signal is selected and used on the Y terminal.



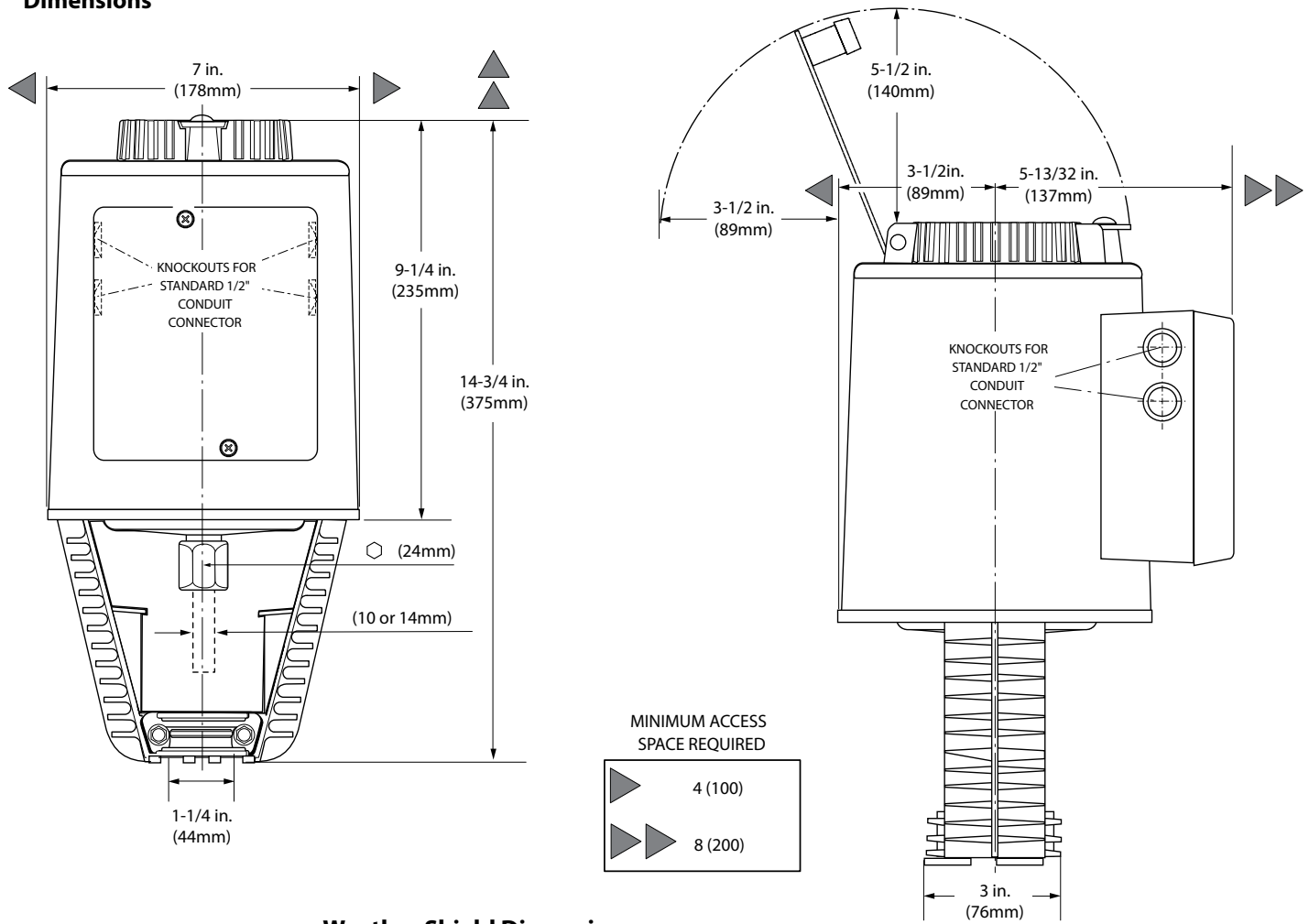
24 VAC Actuator - Connecting Terminals	
G	System potential (SP)
G0	System neutral (SN)
Y	Control input 0 to 10 Vdc or 4 to 20 mA (DIP switch selectable)
Z	Override control
M	Measuring neutral
U	Output for 0 to 10 Vdc or 4 to 20 mA measuring voltage. (see above)

Actuator Output Signal		
Actuator Input Signal	Receiving Impedance	
	Low (<500 Ohm)	High (>10 Ohm)
0 to 10 VDC	0 to 20 mA	0 to 10 VDC
4 to 20 mA	4 to 20 mA	2 to 10 VDC

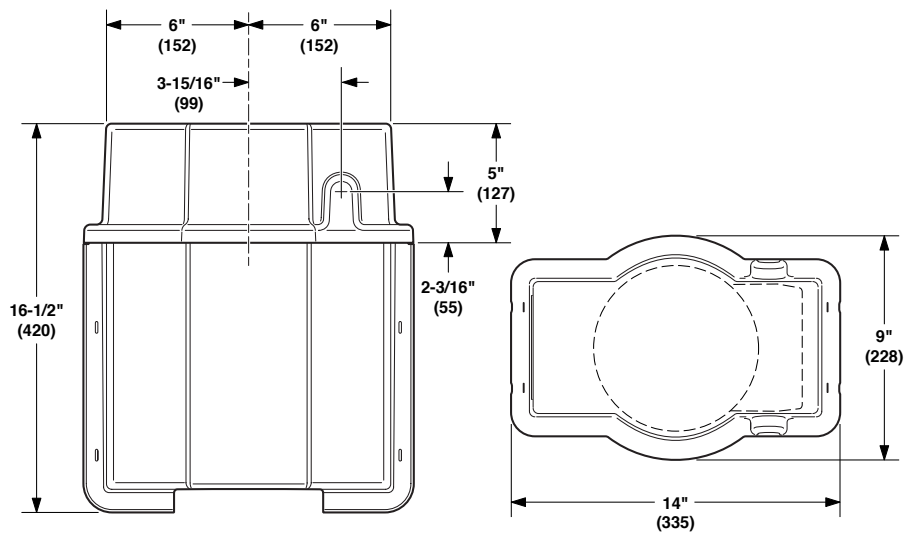


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Dimensions



Weather Shield Dimensions





VAL Series - Actuators — Installation Instructions Continued

Technical Specifications		
Model Number	VAL-SRS07P	2-1/2" to 3" valves
	VAL-SRS15P	4" to 6" valves
Power Requirements	24 VAC ($\pm 20\%$), 50/60 Hz	
	VAL-SRS07P	18 VA Nominal
	VAL-SRS15P	28 VA Nominal
Control Input Signal	Input Y	0 to 10 VDC
	Input R	4 to 20 mA
Input Impedance	Current	100,000 Ω
	Voltage	250 Ω
Feedback Signal	Current	0 to 10 VDC
	Voltage	4 to 20 mA
Mechanical Output	Stem Up	610 lb. (2684 N) (Spring return stroke)
	Stem Down	1000 lb. (4400 N) (Power stroke)
Stroke Range	VAL-SRS07P	3/4" (20 mm)
	VAL-SRS15P	1-1/2" (40 mm)
Nominal Stroke Timing	Power Stroke	120 seconds
	Return Stroke	15 seconds for VAL-SRS07P 20 seconds for VAL-SRS15P
Ambient Operating Conditions	5 to 130°F (-15 to 55°C), 10 to 90% RH, non-condensing, 86°F (30°C) maximum dew point	
Enclosure Rating	NEMA 1, Weather shield available	
Shipping Weight	VAL-SRS07P	18.5 lb. (8.4 kg)
	VAL-SRS15P	21.4 lb. (9.7 kg)
Agency Compliance	UL 873 Listed, C-UL C22.2 No. 24-93	

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Bray office. Bray Controls shall not be liable for damages resulting from misapplication or misuse of its products.