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 11/07/24

VAL Series — Spring Return - Globe Valve Actuators

IOM Manual

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VAL Series - Installation, Operation and Maintenance Manual

**FOR MORE INFORMATION ON THIS PRODUCT
AND OTHER BRAY PRODUCTS
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Technical Specifications - Actuator			
Model Number		**VAL-SRS07P**	**VAL-SRS15P**
		2-1/2" to 3" valves	4" to 6" valves
Power Requirements	24 VAC (±20%), 50/60 Hz	18 VA Nominal	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	640 lbs. (2800 N) (Spring return stroke)	
	Stem Down	1000 lbs. (4400 N) (Power stroke)	
Stroke Range		3/4" (20 mm)	1-1/2" (40 mm)
Nominal Stroke Timing	Power Stroke	120 seconds	
	Return Stroke	15 seconds	20 seconds
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		18.5 lb. (8.4 kg)	21.4 lb. (9.7 kg)
Agency Compliance	UL 873 Listed, C-UL C22.2 No. 24-93		
Warranty	5 Years limited from time of shipment.		

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.

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

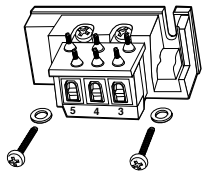
Application

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.

Accessories

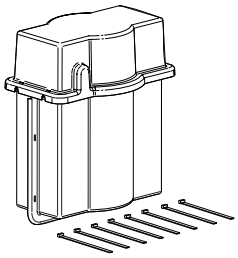


Auxiliary Switch

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



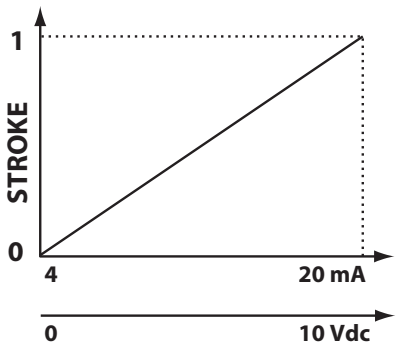
Weather Shield

Weather Shield

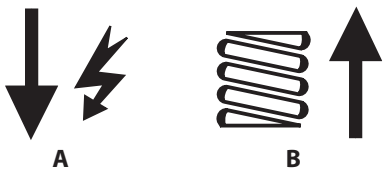
599-10065 The SKB/C actuator is UL listed to meet NEMA Type 3R requirements (a degree of protection against rain, sleet, and damage from external ice formation) when installed with Weather Shield and outdoor-rated conduit fittings in the vertical position. See Service Kits for replacement ultraviolet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

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.

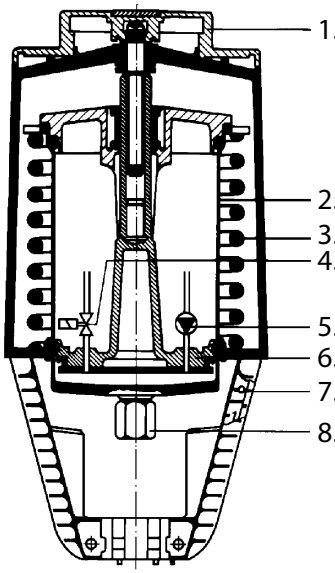


Input Signal



Spring Return

Details



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

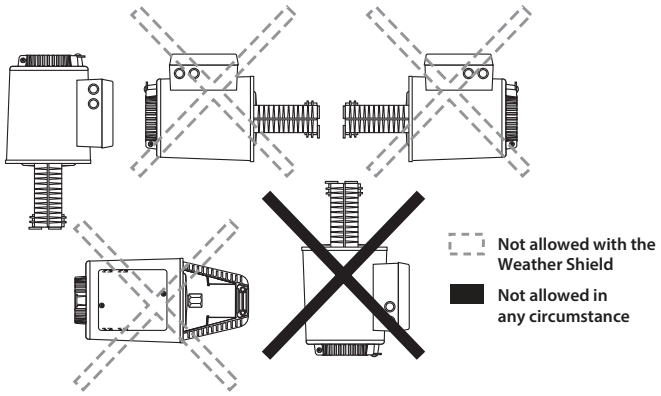
Mounting

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.



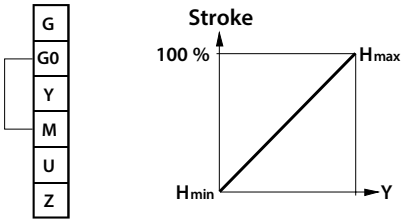
Installation

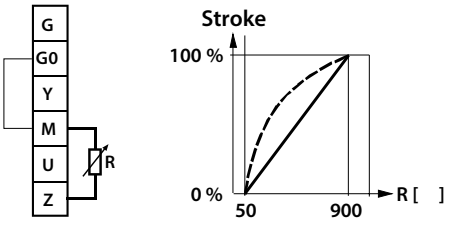
START-UP

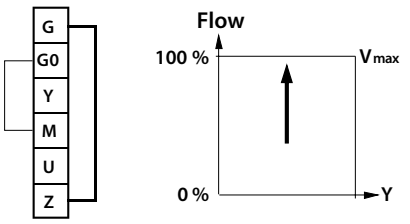
Check the wiring for proper connections.
NOTE: The valve body assembly determines the complete assembly action.

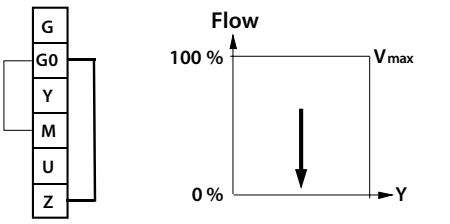
Override Control

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

<table>
<tr><th>No Function</th><th>Override with 0 ... 1000 Ω</th></tr>
<tr>
<td> 

– Z-Contact not Wired
– Valve Stroke Follows Control Signal Y</td>
<td> 

– 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</td>
</tr>
<tr><th>Actuator Fully Extended</th><th>Actuator Fully Retracted</th></tr>
<tr>
<td> 

– Z-Contact Connected Directly to G
– Y-Input has No Effect</td>
<td> 

– Z-Contact Connected Directly to G0
– Y-Input has No Effect</td>
</tr>
</table>

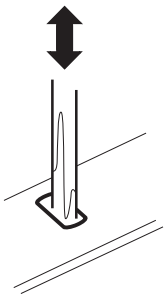
NOTE: The Z-modes have a direct acting factory setting.

Installation

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:

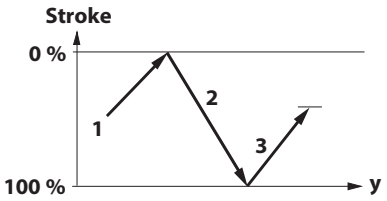


CAUTION

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).

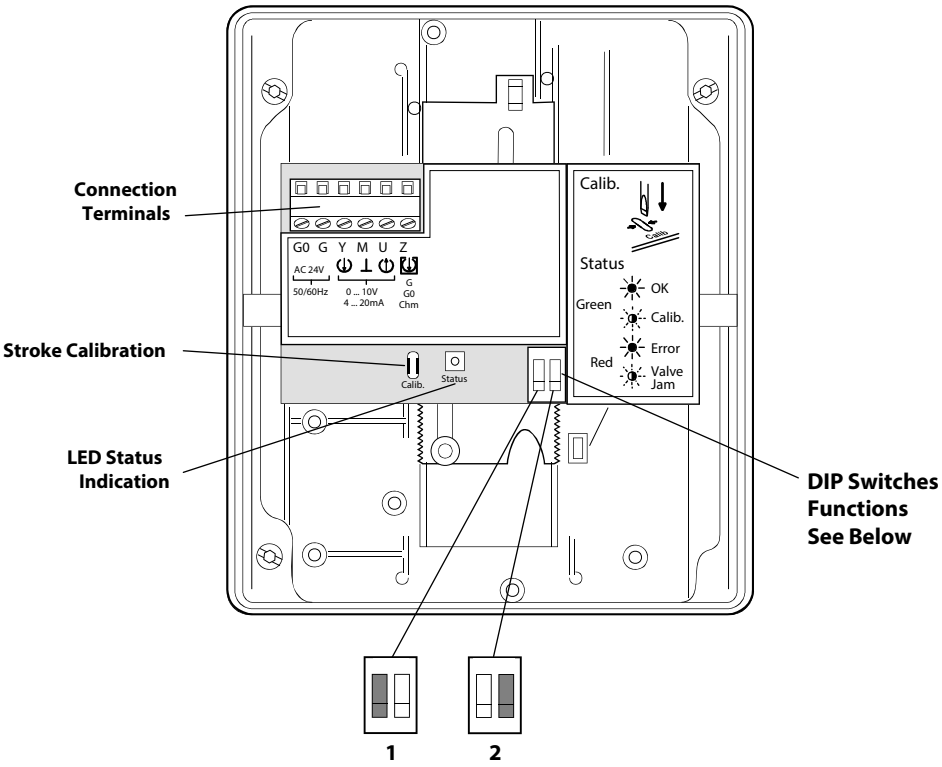
Automatic Calibration proceeds as follows

- 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 Internal Error	- Check mounting - Restart stroke calibration (by short-circuiting calibration slot) - Replace electronics
	Flashing	Inner valve jammed	Check the valve
	Off	No power supply Faulty electronics	-Check mains -Replace electronics

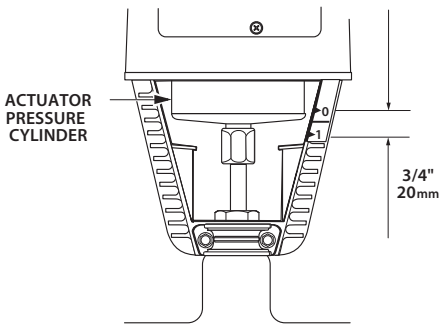
Standard Features



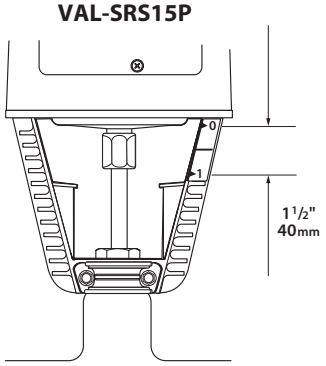
DIP Switches (From Left to Right)	1 Selection of Control Signal	2 Selection of Flow Characteristic
ON	4 to 20 mA	Modified*
OFF (Factory Settings)	0 to 10 VDC	Off

Valve Stem Travel Indication

VAL-SRS07P



VAL-SRS15P



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.

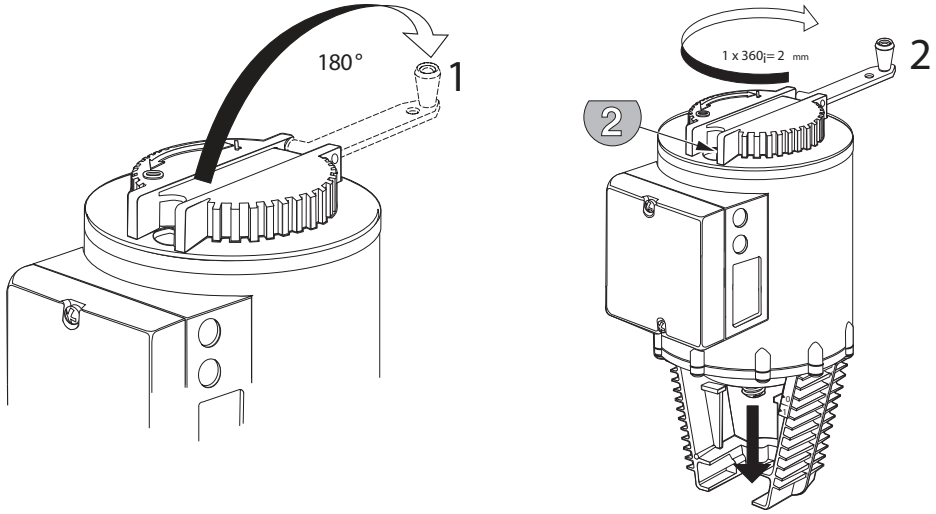
Start-Up Continued

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.

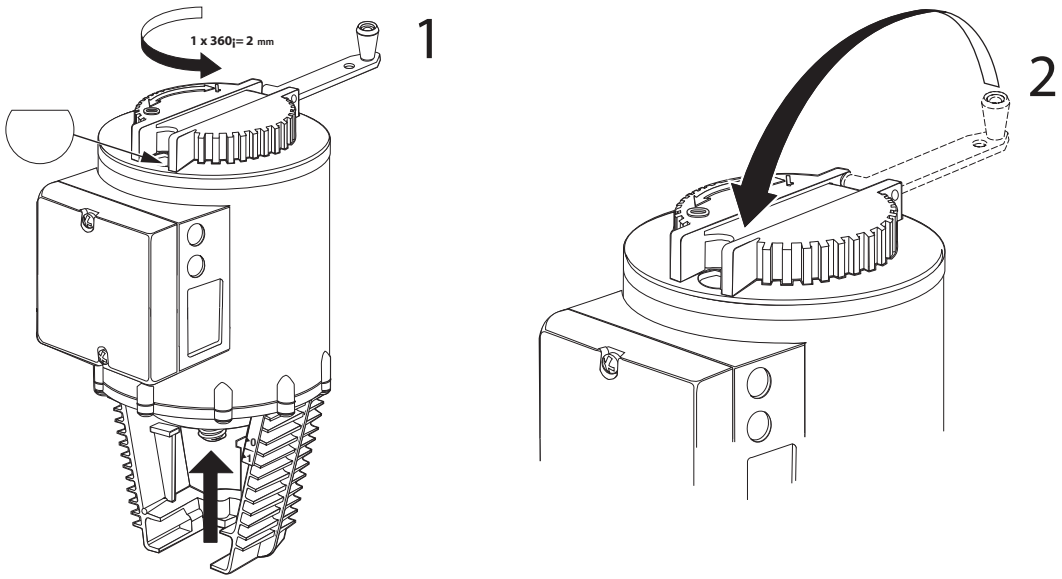
If a signal is sent to the actuator while it is in manual operation, the actuator will move but the control will not be accurate. The valve cannot be commanded to its 0% position while in manual operation.



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 ×1-1/4-inch or M5 × 30 mm thread-forming screw through the handle.



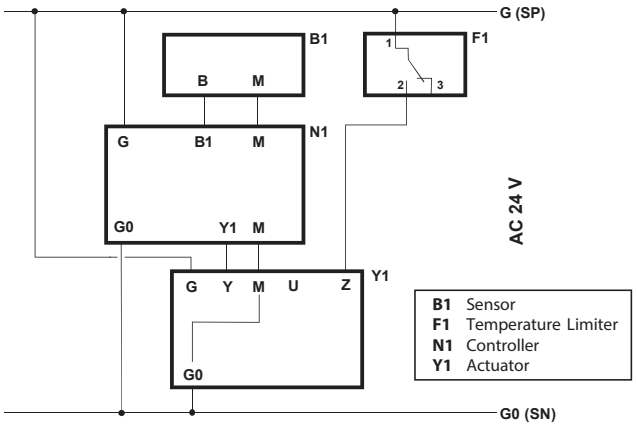
Wiring

Actuator	Power Consumption	Actuators per Class 2 Supply Circuit* (80% of transformer VA)
VAL-SRS07P	17 VA	4
VAL-SRS015P	28 VA	2

** Operating more actuators requires additional transformers or separate 100 VA power supplies.*

Do not use autotransformers. Use earth ground isolating step-down Class 2 transformers.

Determine supply transformer rating by summing total VA of all actuators used. The maximum rating for Class 2 step-down transformer is 100 VA.

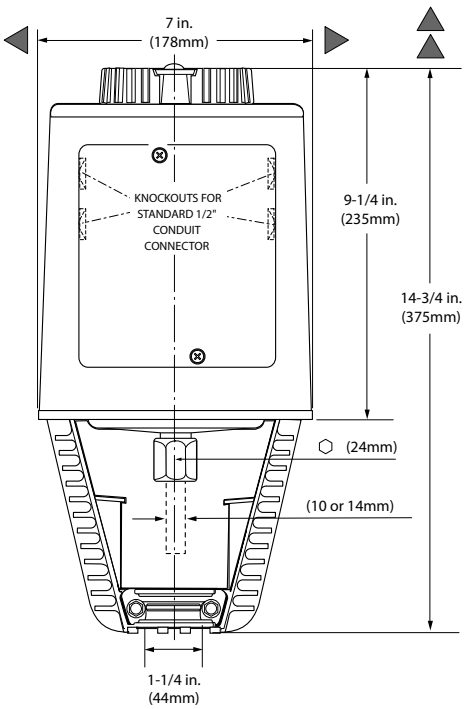


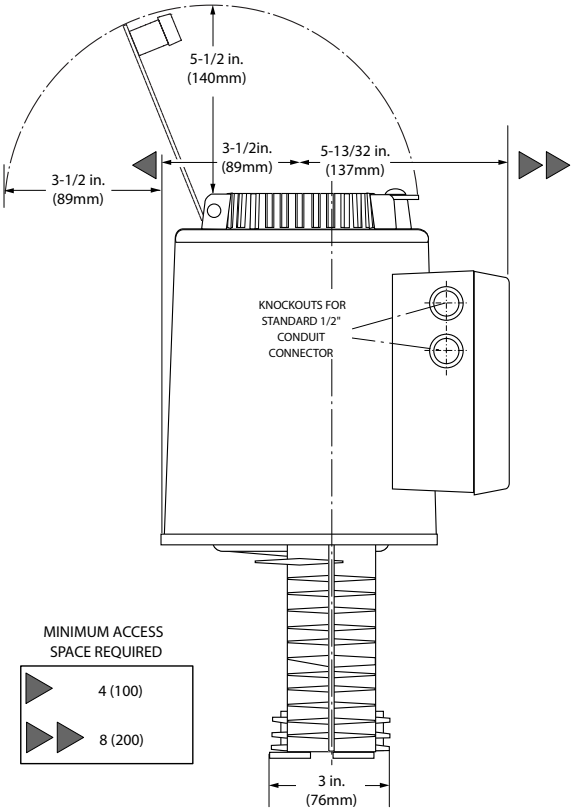
24 VAC Actuator - Connecting Terminals	
G	System potential (SP)
G0	System neutral (SN)
Y	Control input 0 to 10 Vdc or 4 to 20 mA (DIP switch selectable)
Z	Override control
M	Measuring neutral
U	Output for 0 to 10 Vdc or 4 to 20 mA measuring voltage. (see above)

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

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.

Dimensions





Weather Shield Dimensions