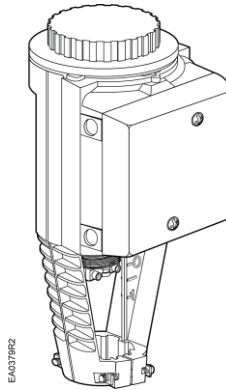


Flowrite™ 599 Series

SKD Electronic Valve Actuator 24 Vac 3-Position (Floating) Control



Description

The Flowrite 599 Series SKD electronic valve actuator requires a 24 Vac supply to provide three-position control. This actuator is designed to work with Flowrite 599 Series with a 3/4-inch (20 mm) stroke.

Features

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



Application

These electronic actuators are designed to be used with Flowrite 599 Series valves with a 3/4-inch (20 mm) stroke in liquid and steam service applications.

Product Numbers

Product Number	Action	Actuator Prefix Code
SKD82.50U	Non-spring Return	275
SKD82.51U	Spring Return	276

Warning/Caution Notations

WARNING:		Personal injury or loss of life may occur if you do not perform a procedure as specified.
CAUTION:		Equipment damage or loss of data may occur if you do not perform a procedure as specified.

Specifications	Operating voltage	24 Vac \pm 20%	
	Frequency	50/60 Hz	
Power supply	Power consumption	13 VA/8W	
	SKD82.50U	SKD82.51U 18 VA/11W	
	Control signal	3-position (floating)	
Equipment Rating	Rating	Class 2 according to UL, CSA	
Function	Nominal stroke	3/4-inch (20 mm)	
	Run time with control operation (full stroke)		
	SKD82.50U		
	Power stroke, 0 to 100%	120 seconds	
	Return stroke, 100 to 0%	120 seconds	
	Run time with control operation (full stroke)		
	SKD82.51U		
	Power stroke, 0 to 100%	120 seconds	
	Return stroke, 100 to 0%	120 seconds	
	Fail-safe	8 seconds	
Nominal Force		Stroke	Force
		0%	225 lb (1000 N)
		100%	258 lb (1150 N)
Housing		NEMA Rating NEMA 1 (interior only) See <i>Accessories</i> .	
Agency certification	C-UL	Certified to Canadian standard C22.2 No. 24-93	
Ambient conditions	Ambient temperature (Operation)	5°F to 122°F (-15°C to 50°C)	
	Media temperature	-13°F to 300°F (-25°C to 150°C)	
Miscellaneous	Dimensions	See Figure 14 and Figure 15.	
	Conduit opening	1/2-inch NPSM	
	Weight	7.5 lb (3.4 kg)	

Accessories

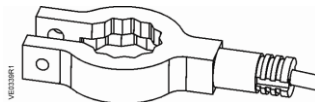


Figure 1. Stem Heating Element.

ASZ6.6 The stem heating element prevents the formation of ice on the stem when the medium temperature drops below 32°F (0°C). It is suited for universal use with valves having a stem or spindle diameter of 10 or 14 mm.

Operating voltage	24 Vac/dc \pm 20%
Power consumption	\leq 40 VA/30W

**Accessories,
 Continued**

NOTE: Installation instructions are included with each accessory.

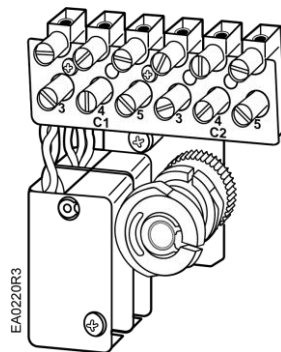


Figure 2. Double Auxiliary Switch.

ASC9.3DU Double auxiliary switch.

The switch has adjustable cams that can be set to give a signal at a desired position of the stroke.

Includes NEC Class I compliant wiring compartment cover.

Switching capacity max 250 Vac
 6 A resistive,
 2.5 A inductive

Lowest recommended current
 10 mA

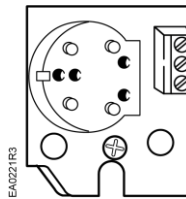


Figure 3. Potentiometer.

ASZ7.3 Potentiometer.

The potentiometer is used for remote indication of valve stem position.

Position Output 0 to 1000 ohms

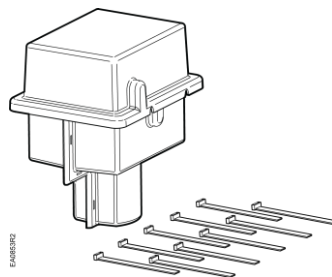


Figure 4. Weather Shield.

599-10071 Weather Shield. See *Service Kits* for replacement ultraviolet resistant cable ties.

Service Kits

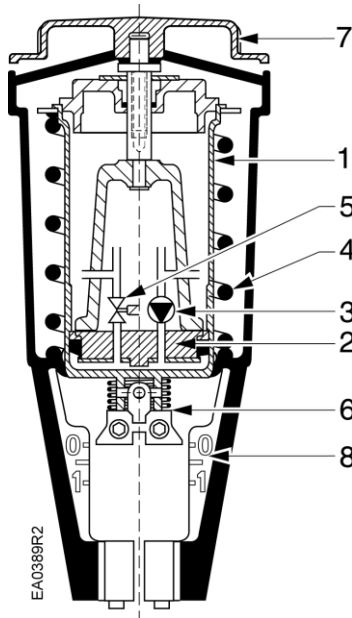
Plastic wiring compartment cover	4 104 5634 8
Manual override kit	4 268 5504 8
Ultraviolet (UV) resistant cable ties (pkg. of 10)	538-996



WARNING:

This product contains a spring under high compression. Do not attempt to disassemble the actuator.

SKD Details



Legend

1. Pressure cylinder
2. Piston
3. Oscillating pump
4. Return spring
5. Bypass valve
6. Valve stem retainer
7. Manual override knob
8. Position indicator

Figure 5. SKD Details.

Operation

A 24 Vac control signal to Y1 causes the pressure cylinder to move toward the valve.

A 24 Vac control signal to Y2 causes the pressure cylinder to move toward the actuator. The stroke travel is proportional to the length of time the signal is applied. The total time for full stroke opening and closing is two minutes.

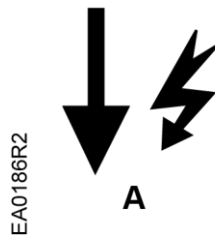


Figure 6. Spring Return.

Spring return: When power is turned off or in the event of a power failure, the actuator spring returns the valve to its normal position.

Fail-safe return time is 8 seconds.



Figure 7. Non-spring Return.

Non-spring return: When power is turned off or in the event of a power failure, the actuator maintains its position.

**Operation,
 Continued**

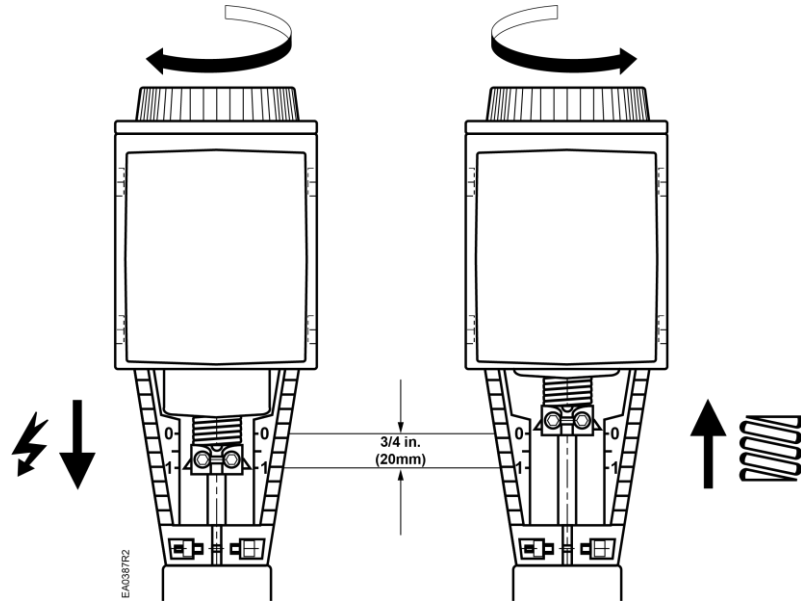


Figure 8. Valve Stem Travel Indication.

**Mounting and
 Installation**

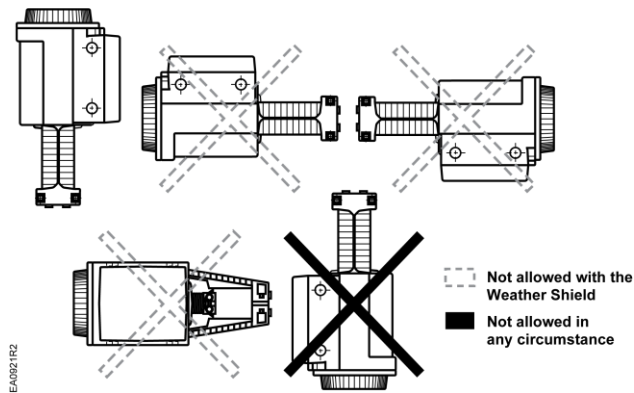


Figure 9. Mounting Positions.

- The vertical position is the recommended position for mounting. Figure 9 shows the acceptable mounting positions.
- Allow 4 inches (100 mm) around the sides and back of the actuator and 8 inches (200 mm) above and to the front of the actuator.
- See *Dimensions* in Figure 14 and Figure 15.
- Detailed installation instructions for field mounting are shipped with the actuator.

Start-Up

Check the wiring for proper connections.

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

Normally Closed Valve

Actuator pressure cylinder moves outward (**0** to **1**): Valve opens.

Actuator pressure cylinder moves inward (**1** to **0**): Valve closes.

Start-Up, Continued

Normally Open Valve

Actuator pressure cylinder moves outward (**0** to **1**): Valve closes.
 Actuator pressure cylinder moves inward (**1** to **0**): Valve opens.

Three-Way Valve

Actuator pressure cylinder moves outward (**0** to **1**): Valve opens between ports NC and C.
 Actuator pressure cylinder moves inward (**1** to **0**): Valve opens between ports NO and C.

Manual Operation

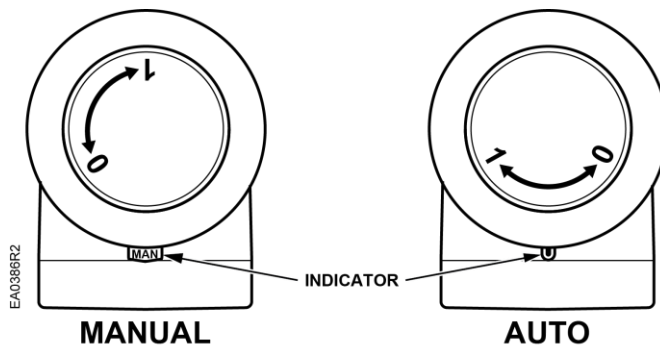


Figure 10. The Manual Setting Knob in Manual and Automatic Position.

Turn the manual setting knob clockwise for manual override. As you begin to turn, a red indicator becomes visible. Each complete revolution (360°) is equal to 3/32-inch (2.5 mm) stroke.

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.

Automatic Operation

For automatic operation the manual setting knob must be in the fully-closed position. Turn the manual setting knob counterclockwise until the red indicator disappears.

Wiring

Do not use auto transformers. 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 a Class 2 step-down transformer is 100 VA.

Actuator	Power Consumption	Actuators per Class 2 Supply Circuit* (80% of Transformer VA)
SKD82.50U	10 VA	8
SKD82.51U	15 VA	5

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

Wiring Diagrams

Non-spring Return
 SKD82.50U

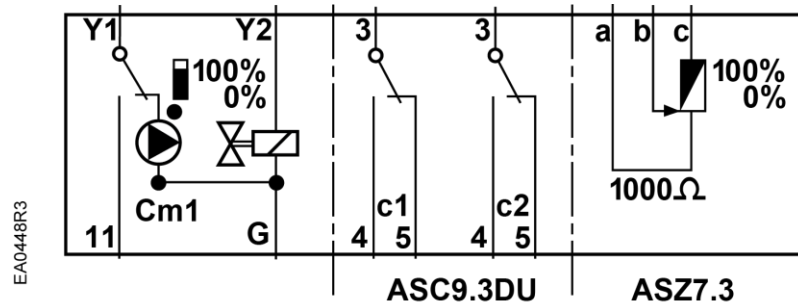
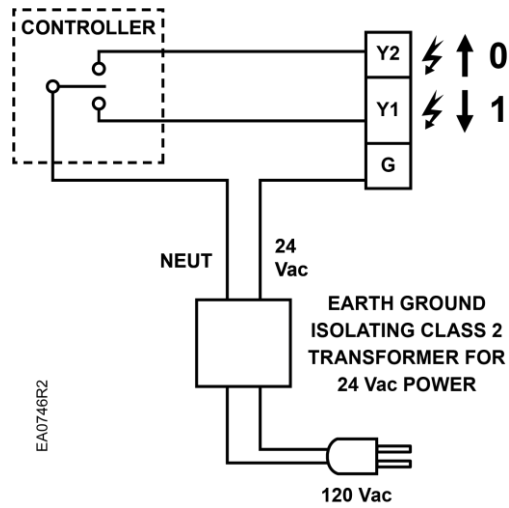


Figure 11. Non-spring Return Wiring Diagrams.

The diagram shows all possible connections. The application determines which connections are used.

Connecting Terminals

- G System Potential 24 Vac (+)
- Y1 Outward movement of the valve stem retainer (0 to 1)
- Y2 Inward movement of the valve stem retainer (1 to 0)
- Cm1 Limit switch for 100% stroke
- C1 ASC9.3DU double auxiliary switch
- C2 ASC9.3DU double auxiliary switch
- 1000 Ω ASZ7.3 potentiometer

**Wiring Diagrams,
 Continued**

Spring Return
 SKD82.51U

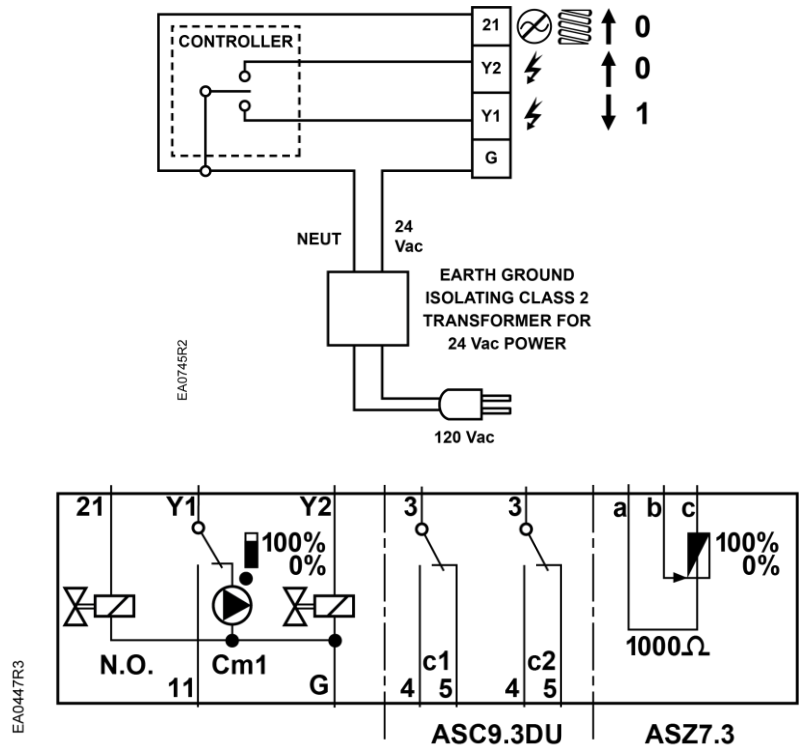


Figure 12. Spring Return Wiring Diagrams.

The diagram shows all possible connections. The application determines which connections are used.

Connecting Terminals

- G System Potential 24 Vac (+)
- 21 System Neutral (SN)
- Y1 Outward movement of the valve stem retainer (0 to 1)
- Y2 Inward movement of the valve stem retainer (1 to 0)
- Cm1 Limit switch for 100% stroke
- c1 ASC9.3DU double auxiliary switch
- c2 ASC9.3DU double auxiliary switch
- 1000 Ω ASZ7.3 potentiometer

Accessory

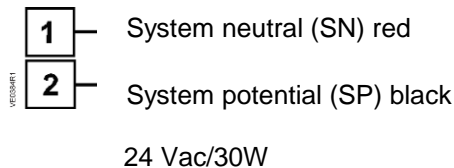


Figure 13. Heating Element ASZ6.6.

Troubleshooting

- Check that the wires are connected correctly and attached securely.
- Check for adequate power supply.
- Check that the actuator is set for automatic operation. See the *Start-up* section.

Dimensions

In inches (Millimeters)

NOTE: The top knockout position should be used when installing the Weather Shield.
See Figure 15.

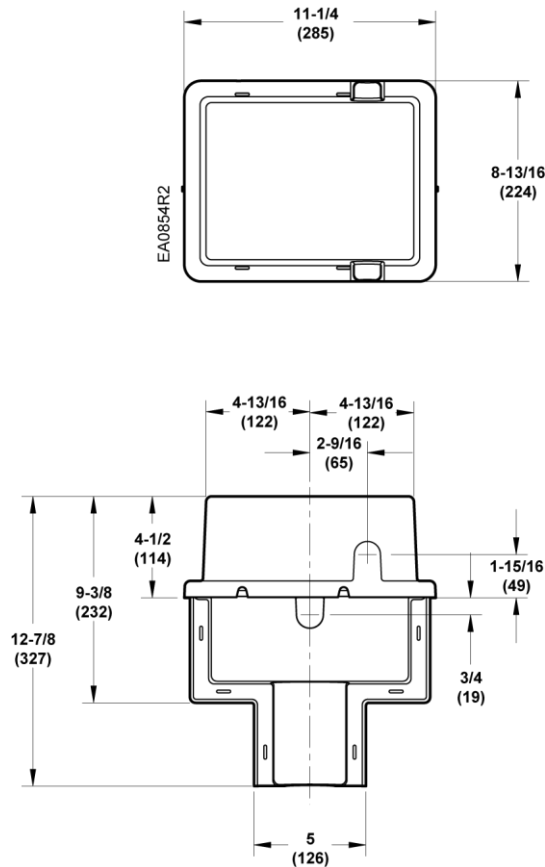


Figure 14 Dimensions of 599-10071 Weather Shield in Inches (Millimeters).

Dimensions, Continued

NOTE: The top knockout position should be used when installing the Weather Shield.

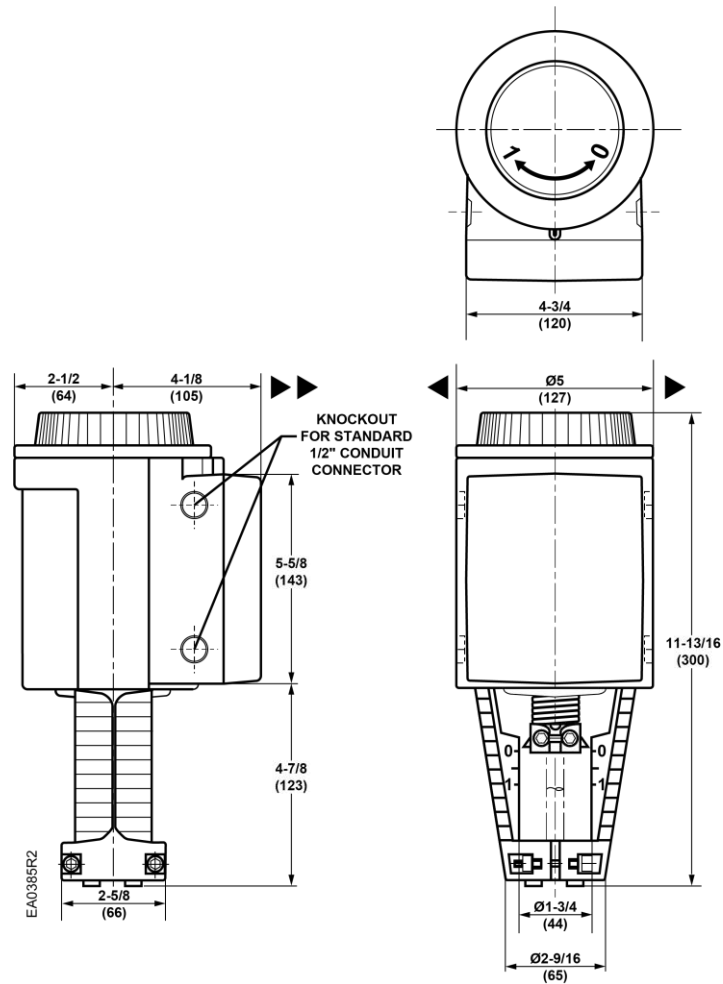
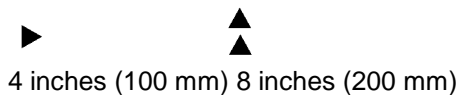


Figure 15. Dimensions of SKD82.50U and SKD82.51U in Inches (Millimeters).

Service Envelope

Minimum access space recommended



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