



Worcester Controls

WCAIM2051
(Part 19296)

10-45 39 End-Mounted Limit Switch and Proximity Sensor (Revisions R1 and R3) Installation, Operation and Maintenance Instructions

When shipped for field installation, the limit switch (proximity sensor) assembly will be broken down into subassemblies. The subassemblies are: (1) the switch (sensor) operator assembly, consisting of the switches (sensors), bracket, springs and bottoms; (2) the probes; and (3) the enclosure and cover. Hardware items and O-rings are packaged separately. Retaining rings and O-rings have to be assembled to the probes. Lubricate O-rings prior to assembly.

NOTE: Revision R3 End-Mounted Limit Switch and Proximity Sensor Kits fit Revision R2 and later 39 actuators. Included in the End-Mounted Limit Switch Kits is a Rebuild/Accessory Addition Label which is to be marked and applied to actuator after switch has been installed.

1. The End-Mounted Limit Switch (Proximity Sensor) assembly will be mounted on the left-hand (as viewed from actuator nameplate) end cap only, with conduit connection normally at the top of the enclosure.

NOTE: If it is necessary to have the conduit connection at the bottom of the enclosure, the switch enclosure can be inverted. See caution note in Step 2. Be sure that conduit connection will not interfere with piping.

The "standard" mounting configuration of the 39 Actuator to the valve is in-line, fail-closed. In this configuration, SW-1 (SEN-1), as described in the wiring diagram, will give indication when the actuator is in the open position, or CCW limit of rotation. SW-2 (SEN-2) gives indication of the closed position, or CW limit of rotation.

Actuator failure position may be changed by either inverting the actuator or mounting cross-line. In these cases, the limit switch (proximity sensor) must be mounted the same as described above, but SW-1 (SEN-1) and SW-2 (SEN-2) indication will be reversed from that above. If there is question as to which switch is going to indicate a given position, the actuator should be operated, and SW-1 (SEN-1) and SW-2 (SEN-2) checked to verify which switch (sensor) will give the desired indication.

2. Remove cover from enclosure. Carefully insert assembled probe assemblies through holes in bottom of enclosure.

CAUTION: The longer probe must go into the left-hand through-hole (looking at the housing with the conduit hole at top). If enclosure must be inverted to place the conduit connection at the bottom, the longer probe still must go into the left-hand port on the actuator end cap, as viewed with the actuator shaft in normal vertical position. (Both probes are the same length for the 1039 ELK only!)

3. Install O-rings into grooves in bottom side of enclosure. Assemble the enclosure, with probe assemblies, to the actuator. Secure with four cap screws and lockwashers. Check the probes for freedom of movement by moving them back and forth slightly.
4. With assembly complete to this point, it is convenient to make conduit connections and bring wiring through enclosure. It should be noted that the successful use of this device in hazardous atmospheres or other detrimental environments depends on proper conduit construction techniques.
5. When the switch (sensor) package is assembled, one of the probes will make contact with the switch (sensor) button. Simply press the switch (sensor) package until the mounting screws can be engaged. Tighten mounting screws until bracket is secure.
6. Switches (sensors) have been factory adjusted but should be rechecked after installation. Adjustment is as follows:

A. Limit Switches:

With actuator mounted in "standard" configuration (see Step 1), set actuator in closed position with the adjustment screw near its loose limit, adjust closed position switch SW-2 (see wiring diagram) by tightening the adjusting screw until switch contacts click. Then for SPDT switch, tighten adjustment screw two additional turns. For DPDT switch, tighten adjustment screw additional ¼ turn only. Change actuator to its full open position and adjust open position switch SW-1 in the same manner.

B. Proximity Sensors:

Sensors have to be wired per proximity wiring diagram for adjustment. With actuator mounted in "standard" configuration (see Step 1) and the adjustment screw near its loose limit, set actuator in closed position and adjust closed position sensor SEN-2 (see wiring diagram) by tightening the adjustment screw until load indication is observed; then tighten the adjustment screw an additional ½ turn. Change actuator to its full open position and adjust open position sensor SEN-1 in the same manner.

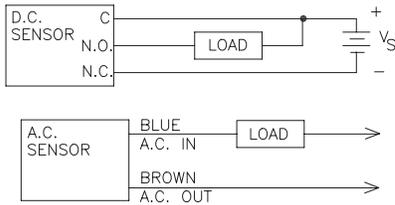
NOTE: If actuator is mounted in any configuration other than "standard," consult Step 1 of installation instructions to insure proper orientation of probes and switches (sensors).

7. Wiring instructions for limit switches and proximity sensors. Refer to Step 1 for any actuator-mounting configuration other than "standard."

A. Limit Switches:

Make electrical connections in accordance with the wiring diagram on inside of cover.

Wiring Diagram



B. Proximity Sensors:

See wiring diagrams above; diagrams are also on printed inside of the unit's cover.

▲ WARNING: A load must be used when power is applied to sensors. Wiring without a load will cause sensor failure.

- 1) Wiring of AC proximity sensors is as follows:
"AC in" connects to the blue lead; "AC out" connects to the brown lead.

The outside load is connected in series with either the blue or the brown lead.

Electrical Characteristics:

Supply Voltage - 20-140 VAC.

Load Current - 200 mA maximum continuous.

- 2) Wiring of DC proximity sensors is as follows:
The power supply positive (+) lead connects to the common (c) terminal; the negative (-) lead connects to the normally closed (n.c.) terminal.

The outside load is connected between the normally open (n.o.) terminal and the positive (+) lead.

Electrical Characteristics:

Supply Voltage - 9.6-55 VDC.

Load Current - 200 mA maximum continuous.

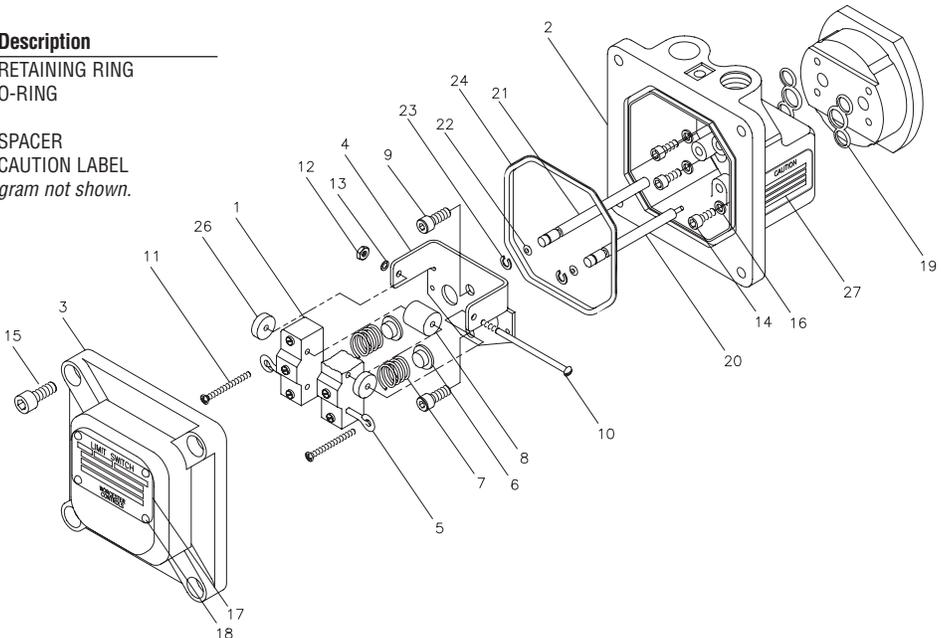
Current Consumption (excluding load) up to 10 mA.

8. Place the O-Ring in the groove in the housing flange first. Secure cover to enclosure with four cap screws. Cover must be assembled tightly for proper performance. The assembly is now complete.

Item	Qty	Description
1	2	SWITCH (SENSOR)
2	1	ENCLOSURE
3	1	COVER
4	1	BRACKET
5	2	PIVOT HOOK-SWITCH
6	2	BUTTON-SWITCH
7	2	SPRING-SWITCH
8	1	SPACER-SWITCH
9	2	SCREW-BRACKET MTG.
10	1	SCREW-SWITCH MTG.
11	2	SCREW-ADJUSTING
12	1	NUT
13	1	LOCKWASHER
14	4	SCREW-ENCLOSURE MTG.
15	4	SCREW-COVER
16	4	LOCKWASHER
17	1	NAMEPLATE
18	4	DRIVE SCREW
19	2	O-RING
20	1	ROD PROBE
21	1	PISTON PROBE
22	2	O-RING

Item	Qty	Description
23	2	RETAINING RING
24	1	O-RING
25*	1	
26	2	SPACER
27	1	CAUTION LABEL

* Wiring diagram not shown.



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For more information about Flowserve Corporation, contact www.flowserve.com or call USA 1-800-225-6989.

FLOWERVE CORPORATION
FLOW CONTROL DIVISION
 1978 Foreman Drive
 Cookeville, Tennessee 38501 USA
 Phone: 931 432 4021
 Facsimile: 931 432 3105
www.flowserve.com