Adjustable Dead Band
Pressure Switches

General Instructions

These instructions provide information for installation, process and electrical connections and field calibration of SOR® Adjustable Dead Band Pressure Switches.

The pressure sensing elements are a pair of force-balanced, piston-actuated assemblies sealed by flexible diaphragms and o-rings that are static. The only wetted parts in this arrangement are the single pressure port, two sensing assembly diaphragms and o-rings.

Media pressure on the area of the pistons counteracts the force of the range springs (adjustable by the adjusting nuts), which moves the piston shafts only a few thousandths of an inch to operate the lever assembly which actuates and deactuates the electrical switching element.

NOTE: If you suspect that a product is defective, contact the factory or the SOR Representative in your area for a return authorization number (RMA). This product should only be installed by trained and competent personnel.

Installation

Adjustable Dead Band Pressure Switches may be secured to bulkheads, panels or pipe stanchions with suitable bolts. When mounting the pressure switch to an irregular or uneven flat surface, install rubber washers on the mounting bolts between the housing and the mounting surface.

Line mounting by either the process connection or the electrical conduit connection is not recommended.

Failure to place washers between the housing and the mounting surface may result in torsional forces on the housing that could cause false trips or render the pressure switch inoperative.

Failure to mount the housing on a flat mounting surface may result in torsional forces on the housing that could cause false trips or render the pressure switch inoperative.

Design and specifications are subject to change without notice.
For latest revision, go to ***www.sorinc.com***

Safety Integrity Level (SIL) Installation Requirements

The SOR pressure switches have been evaluated as Type-A safety related hardware. To meet the necessary installation requirements for the SIL system, the following information must be utilized:

- Proof Test Interval shall be one year.
- Units may only be installed for use in Low Demand Mode.
- Products have a HFT (Hardware Fault Tolerance) of 0, and were evaluated in a 1oo1 (one out of one) configuration.

Process Connection

Securely connect the process line to the pressure port using two wrenches: one to hold the hexagonal flats on the pressure port, the other to tighten the process pipe or tube fitting.

Ensure that the process connection is tightened and positioned so that any binding and torsional forces imposed on the pressure switch are minimal. Do not loosen the pressure port from the body because leakage could result or the pressure switch could be rendered inoperative.

Electrical Connection

Ensure that wiring conforms to all applicable local and national electrical codes and install unit(s) according to relevant national and local safety codes.

V1 – Weathertight

SPDT: Screw terminal block with marked insulation.

Common	Normally Open	Normally Closed
C1	NO1	NC1

V3 – Explosion proof

DPDT (2-SPDT): Hermetically sealed switching element capsule has 18” - 18 AWG wire leads color coded and marked.

Common	Normally Open	Normally Closed
C1 - Blue	NO1 - Black	NC1 - Red
C2 - Yellow	NO2 - Brown	NC2 - Orange

GR - Ground (earth) green wire connected to each hermetically sealed switching element capsule.

Calibration

❶ Remove the housing cover.

❷ Connect a suitable variable pressure source with a calibrated reference gauge to the pressure port. Connect an ohmmeter or test lamp across the switching element contact terminals to monitor contact continuity. Use a 3/4” open-end wrench to turn the adjusting nuts.

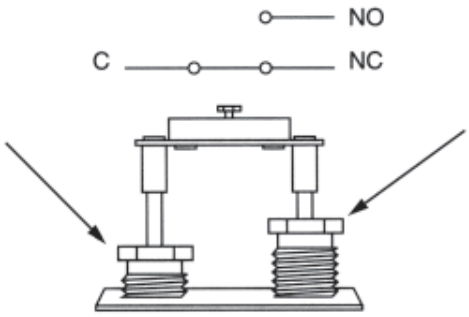
❸ Slowly increase pressure to the pressure port. The continuity tester will indicate that the contacts have changed state when increasing set point is reached. Note pressure at increasing set point. If increasing set point is too low, turn the left adjusting nut clockwise to raise the increasing set point. If increasing set point is too high, turn the left adjusting nut counterclockwise to lower the increasing set point.

❹ Slowly decrease pressure to the pressure port. The continuity tester will indicate that contacts have changed state when decreasing set point is reached. Note pressure at decreasing set point.If the decreasing set point is too low, turn the right adjusting nut clockwise to raise the decreasing set point. If the decreasing set point is too high, turn the right adjusting nut counterclockwise to lower the decreasing set point. The left adjusting nut must always be lower than the right adjusting nut when calibration is complete.

❺ Repeat Steps 3 and 4 until desired set points are obtained. If the pressure switch fails to respond to pressure change during calibration, increasing/decreasing set points may be too close together. See Form 281 for minimum/maximum dead band capabilities. Replace the housing cover.

Overtravel has been preset at the factory. The 3/16" overtravel adjustment screw on the lever assembly has been precisely positioned for optimum performance. Any inadvertent movement could render the device inoperative and void the warranty.

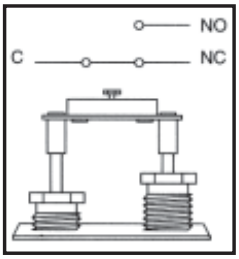
Increasing Set Point Adjustment
To raise the increasing set point, turn the left adjusting nut clockwise. To lower the increasing set point, turn the left adjusting nut counterclockwise.



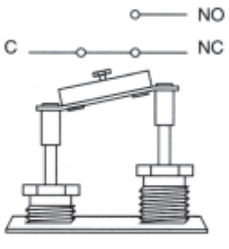
Decreasing Set Point Adjustment
To raise the decreasing set point, turn the right adjusting nut clockwise. To lower the decreasing set point, turn the right adjusting nut counterclockwise.

The left adjusting nut must always be lower than the right adjusting nut when calibration is complete.

Principle of Operation

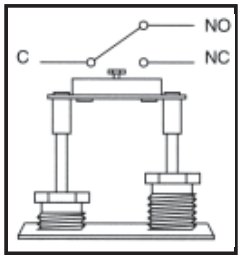


No pressure applied. Electrical switching element is **deactuated**.

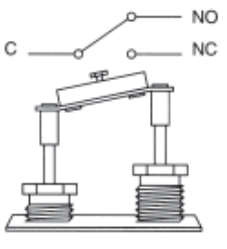


Pressure greater than decreasing set point but less than increasing set point: Electrical switching element remains **deactuated**.

Actuation

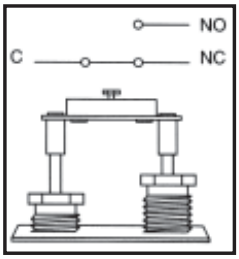


Pressure equal to or greater than increasing set point: Electrical switching element is **actuated**.



Pressure less than increasing set point but greater than decreasing set point: Electrical switching element remains **actuated**.

Deactuation



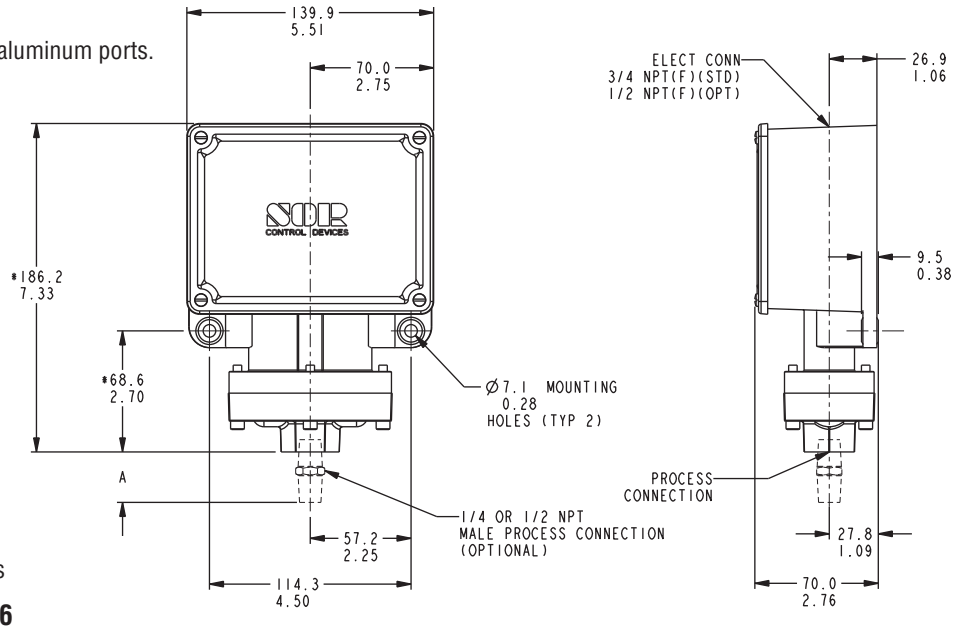
Pressure equal to or less than decreasing set point: Electrical switching element is **deactuated**.

Piston movement exaggerated for clarity in drawings above.

Dimensions

V1 Housing

*Add $\frac{6.4}{0.25}$ for non-aluminum ports.

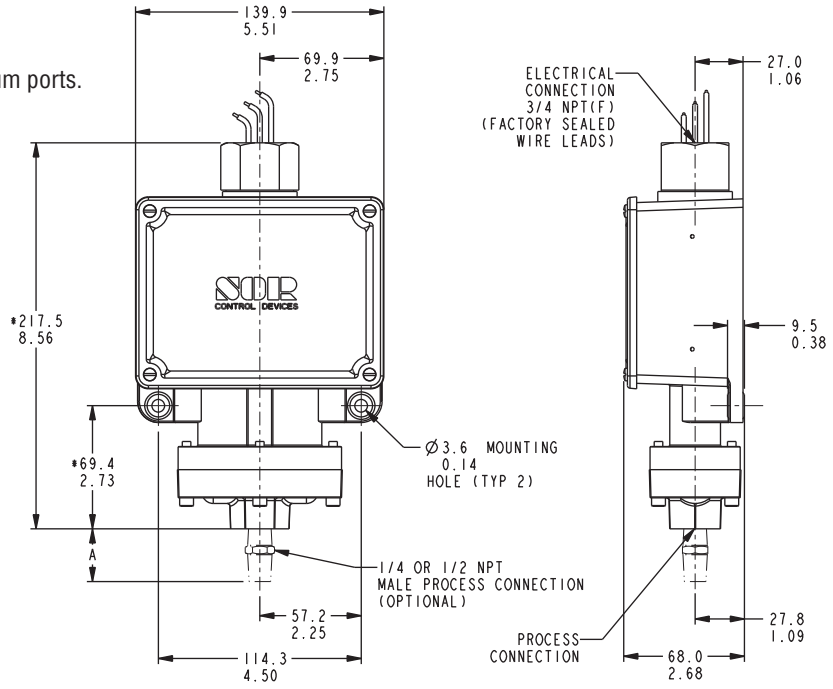


Linear = mm/inches

Drawing 0090236

V3 Housing

*Add $\frac{6.4}{0.25}$ for non-aluminum ports.



Linear = mm/inches

Drawing 0090325

Dimensions are for reference only. Contact the factory for certified drawings for a particular model number.