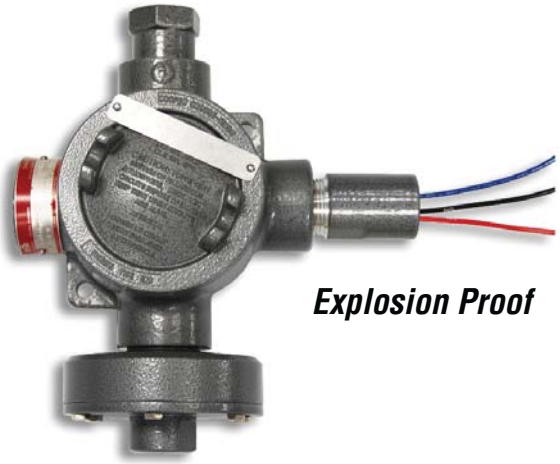
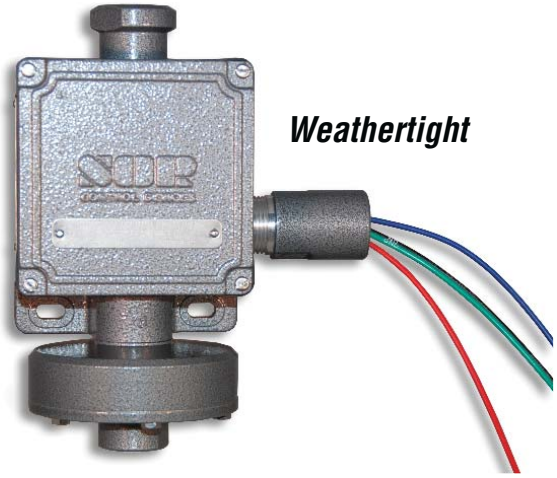
Series 20

Differential Pressure Detector

General Instructions



Explosion Proof



Weathertight

These instructions provide information for installation, electrical connection, process connection and calibration of SOR® Series 20 Differential Pressure Detectors.

Series 20 Differential Principle Basic construction is a Static "O" Ring diaphragm and piston pressure sensor. Process pressure acts on the diaphragm to produce force F_h against the piston. F_h is counteracted by two forces: F_l, which comes from the Lo side Pressure port through the electrical housing, and F_s which comes from the adjustable range spring. Since the Lo side process media pressurizes the electrical housing, Lo side process media is limited to clean, dry air or inert gas.

Design and specifications are subject to change without notice.

For latest revision, go to ***www.sorfinc.net***

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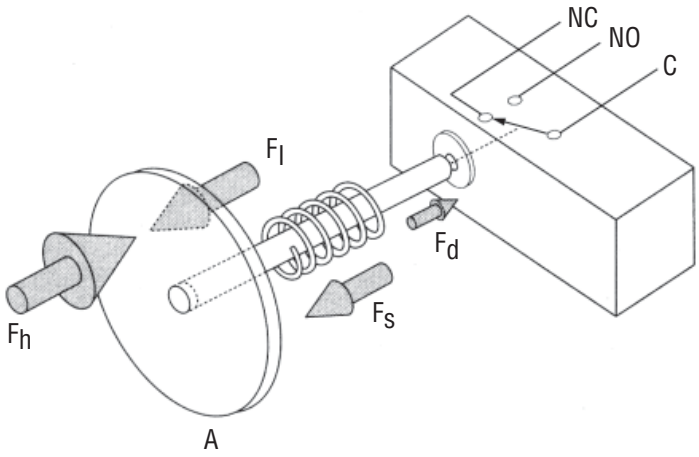
NOTE: If you suspect that a product is defective, contact the factory or the SOR Representative in your area for a return authorization number (RMA). This product should only be installed by trained and competent personnel.

When F_h exceeds the combination of F_I and F_S, the piston (and piston shaft) moves to actuate the electrical detecting element.

There are only three wetted parts on the Hi side process connection: pressure port, diaphragm and o-ring.

The force-balance system virtually eliminates friction and resultant wear while yielding excellent repeatability.



Series 20 Differential Pressure Detectors are well suited for a variety of process applications. They are not intended for high-pressure fluid power (hydraulic) applications where high-shock pressures and high-cycle rates are expected.

Installation

This type of differential pressure detector can be mounted in any position. Install low range models in the same orientation that they are calibrated.

Weathertight Housing Attach the device to a suitable surface or pipe stanchion bracket with two 1/4-inch diameter bolts. Line mounting by either process or electrical connection is not recommended.

Explosion Proof Housing The TA housing must be attached with 2-inch U-bolts over the housing hubs or two 1/4-inch diameter bolts. Line mounting by either process or electrical connection is not recommended.

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 detector finoperatfive.

When mounting to an irregular or uneven surface, install rubber washers on the bolts between the housing and the mounting surface (except in high-vibration applications) to prevent housing deformation, which could change the relative positions of internal parts and affect calibration or render the device inoperative.

Safety Integrity Level (SIL) Installation Requirements

The SOR pressure detectors 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.

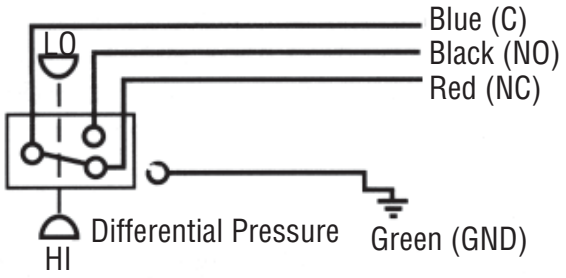
Electrical Connection

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

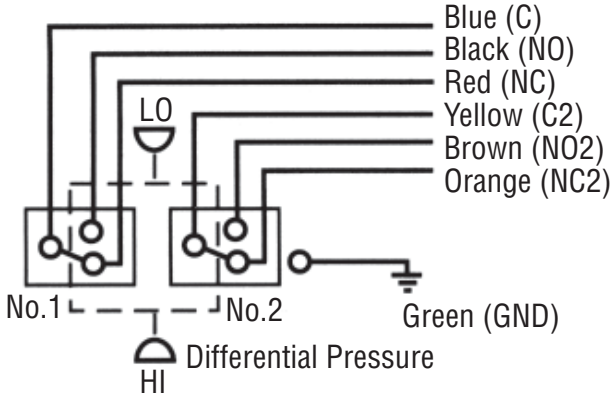
SOR Series 20 Differential Pressure Detectors have 18”, 18-AWG, color-coded wire leads which extend detecting element contact circuits through a glass-to-metal seal. The glass-to-metal seal assembly maintains Lo side pressure containment. Use two wrenches, one on the seal assembly and one on the conduit fitting to avoid movement of the seal assembly during installation.

Wiring Schematic

SPDT



2-SPDT



Calibration

Before removing the cover during test or while the unit is in service, relieve pressure inside the housing by venting Lo side pressure to atmosphere. When replacing the cover, tighten it securely. Pressurize the Lo side and apply a liquid leak test solution around the cover seal to make sure that pressure is not leaking

If a set point was specified for factory calibration, there may be no need to remove the pressurized electrical housing cover. Factory calibration can be verified on a test bench by connecting a continuity tester across the common (C) and normally open (NO) wire leads. Pressurize the Hi side pressure port and check actuation (deactuation) points on a calibrated reference gauge.

Units in Hazardous Locations: Prior to calibration, make sure that the work area is declassified before removing the explosion-proof cover to calibrate the unit. Failure to do so could result in severe personal injury or substantial property damage.

Disconnect electrical power before removing cover in hazardous area! Avoid movement of the electrical detecting element or its bracket. It has been precisely positioned for optimum performance at the factory. Even slight movement will affect performance; excessive movement can render device inoperative.

If no set point was specified for factory calibration, or if the set point specification has changed:

❶ Remove housing cover. Calibrate the device as a gauge pressure detector. Turn the set point adjusting nut clockwise to increase the set point, or counterclockwise to decrease the set point.

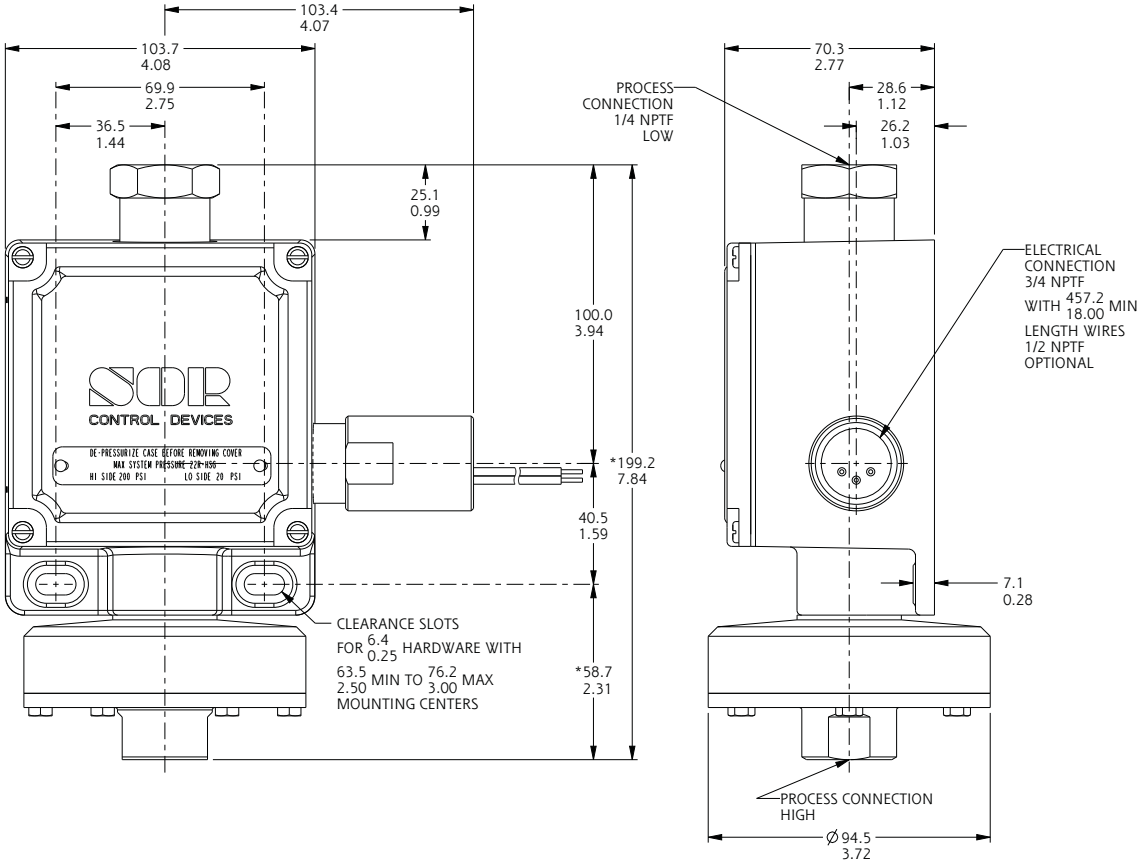
❷ To verify Series 20 operation under system operating conditions, install the cover and tighten it securely. Connect the HI and LO sides to suitable pressure sources and raise the pressures simultaneously to the expected system operating pressure. Apply a liquid leak test solution around the cover seal to make sure that Lo side pressure is not leaking. Vary Lo side pressure to verify actuation (deactuation) of the electrical detecting element at the desired Differential Pressure Set Point.

Dimensions

Dimensions in these instructions are for reference only. They may be changed without notice. Contact the factory for Certified Drawings for a particular model number.

Weathertight — NEMA 4, 4X, IP65
Designator: RB, RH

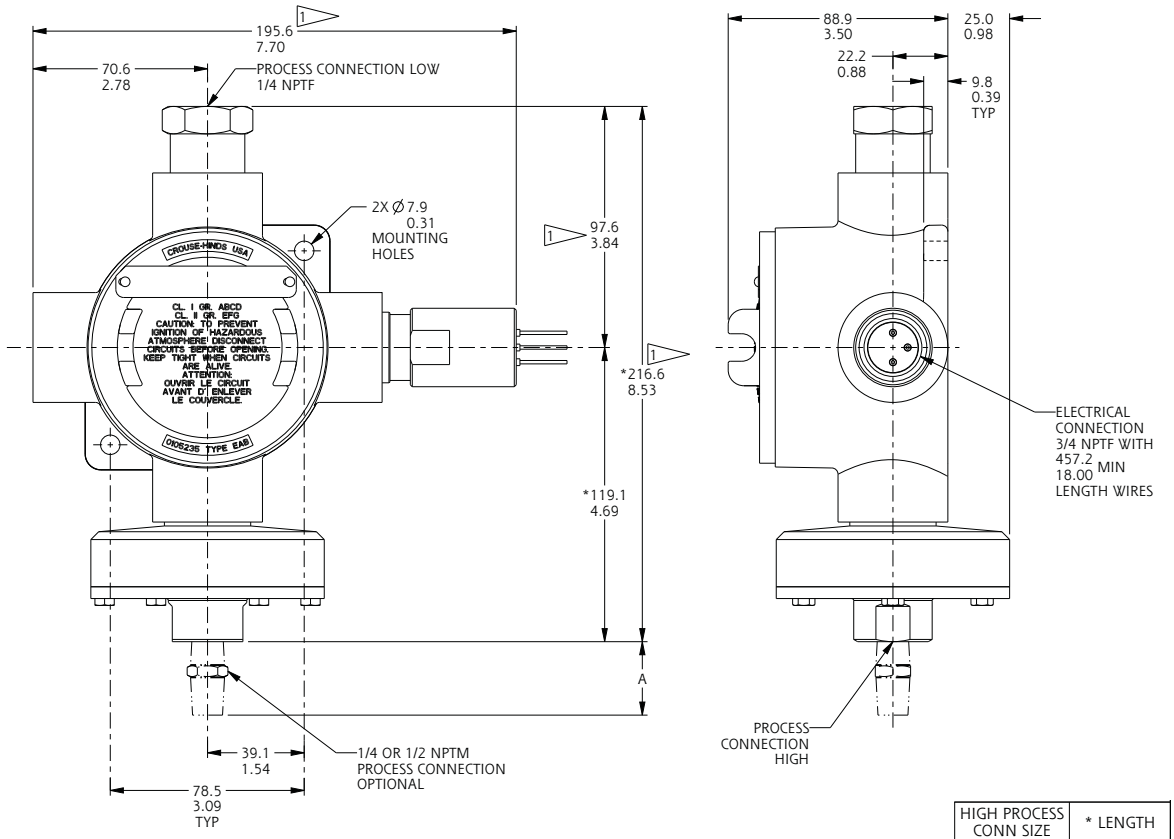
Piston Number 22



Linear = mm/inches

Drawing 0090446

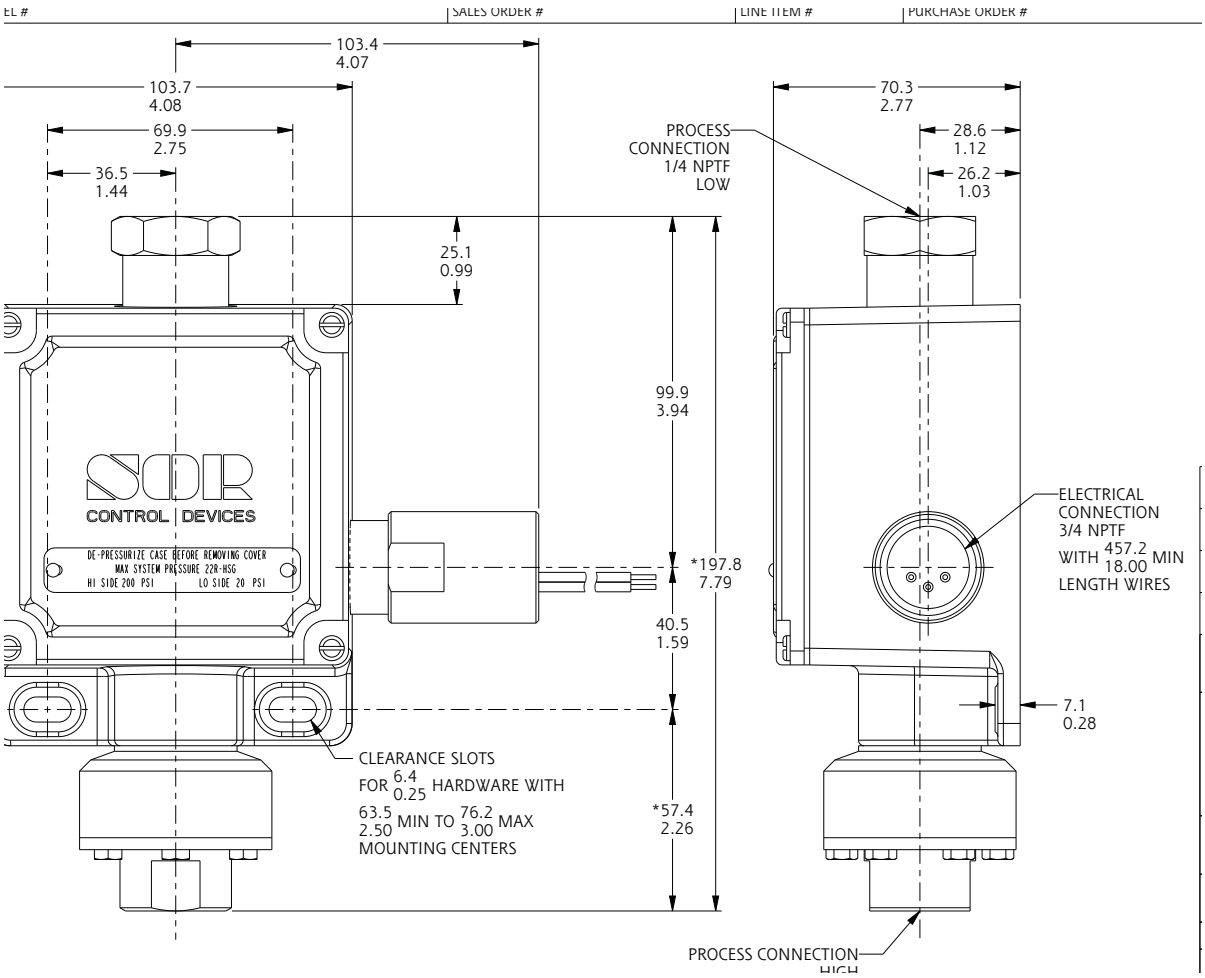
HIGH PROCESS CONNECTION SIZE	* LENGTH
1/4 NPTF 1/2 NPTF	SHOWN
1 NPTF	5.6 0.22
2 NPTF	25.4 1.00



HIGH PROCESS CONN SIZE	* LENGTH
1/4 NPTF 1/2 NPTF	SHOWN
1 NPTF	ADD 5.6 0.22
2 NPTF SEE DETAIL	ADD 25.4 1.00
LENGTH A	
1/4 NPTM SHOWN	29.7 1.17
1/2 NPTM	38.9 1.53
1 DIMENSION APPROXIMATE AND BASED ON A FIVE THREAD ENGAGEMENT	

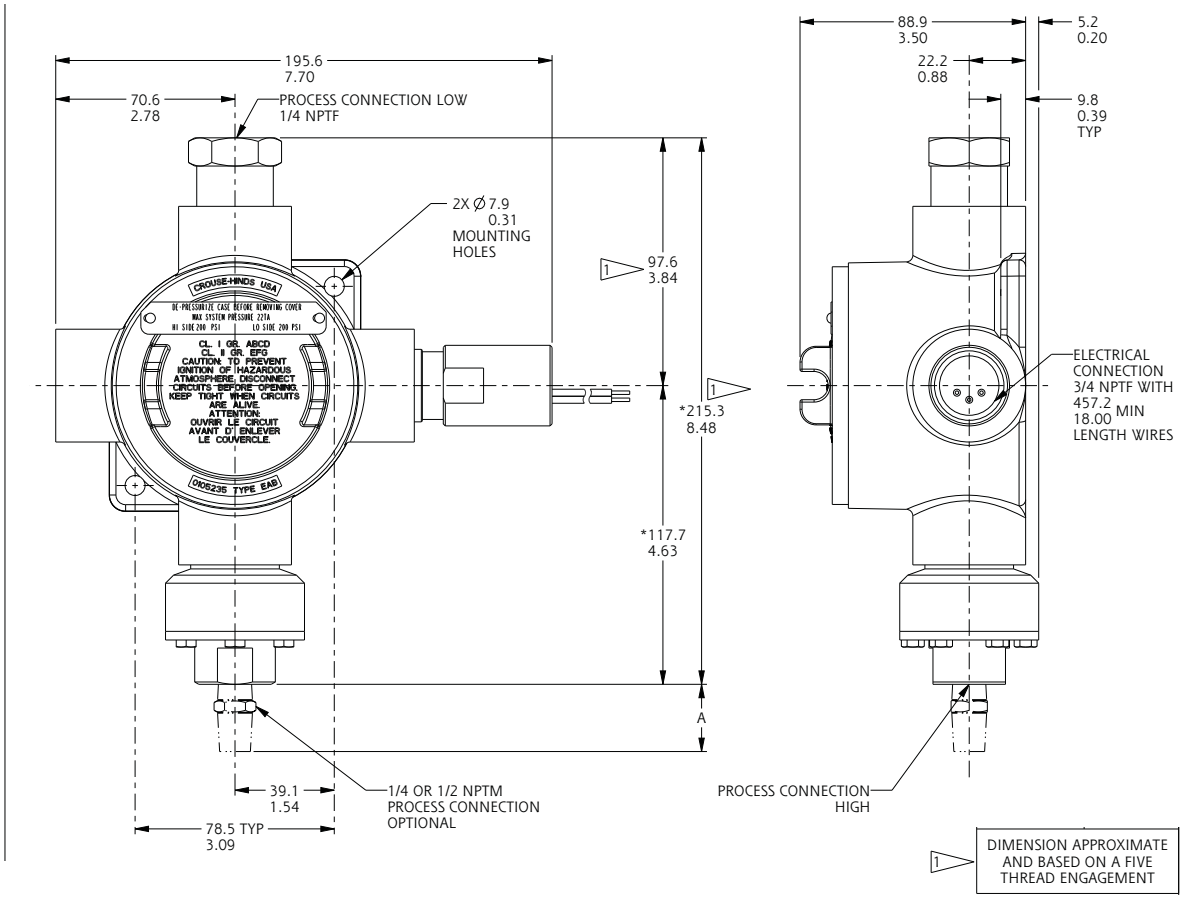
Linear = mm/inches

Drawing 0090118



Linear = mm/inches

Drawing 0091359



Linear = mm/inches

Drawing 0090176