



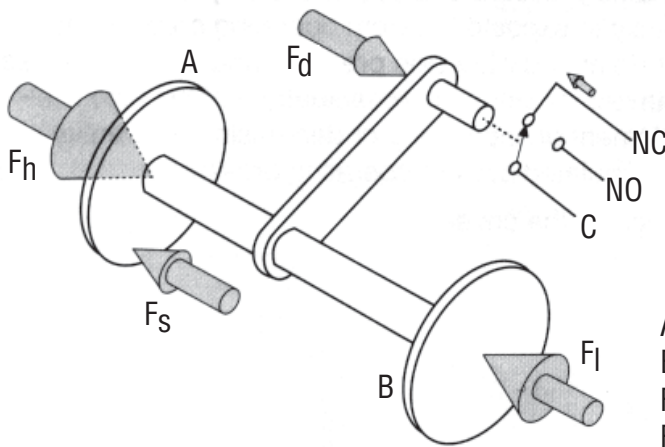
Opposed Piston Differential Pressure Switches

General Instructions

These instructions provide information for installation, electrical connection, process connection and calibration of SOR® Opposed Piston Differential Pressure Switches.

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.

Principles of Operation



- A = Hi Pressure Piston
- B = Lo Pressure Piston
- F_h = Force, Hi Pressure
- F_l = Force, Lo Pressure
- F_s = Force, Range Spring
- F_d = Force Resultant Differential (Hi-Lo)



Basic construction is opposing diaphragm sealed pistons connected by a common shaft. Hi side system pressure acts on Piston A to produce force F_h . It is counteracted by adjustable range spring force F_s . Lo side system pressure acts on Piston B to produce force F_l . The resultant force corresponds to the difference in pressure between the Hi and Lo system pressures plus the force of the adjustable range spring, and moves the trip lever to actuate and deactuate the SPDT electrical switching element.

Design and specifications are subject to change without notice.

For latest revision, go to www.sorinc.com

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There are only three wetted parts on the Hi and Lo process connections: pressure port, diaphragm and o-ring. A metal diaphragm may be welded to the pressure port for certain applications, thereby eliminating the o-ring.

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

These differential pressure switches 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 switch can be installed in any position.



If a breather drain is installed, the device should be mounted with the breather drain pointing downward (6 o'clock) so condensation will drain from the housing.

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

Attach the device to a suitable surface or pipe stanchion bracket with two 1/4-inch diameter bolts. The TA housing must be attached with 2-inch U-bolts over the housing hubs or two 1/4 in. diameter bolts. Line mounting by either process or electrical connection is not recommended.

NOTE: When mounting to an irregular or uneven surface, install rubber washers on the bolts between the housing and the mounting surface to prevent housing deformation.



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.

Process Connection

Pressure ports are marked HI and LO to indicate the high and low process pressure connections. Connect process piping accordingly. Use two wrenches—one to hold the hex pressure port to prevent it from moving, the other to tighten the process pipe or tube fitting.

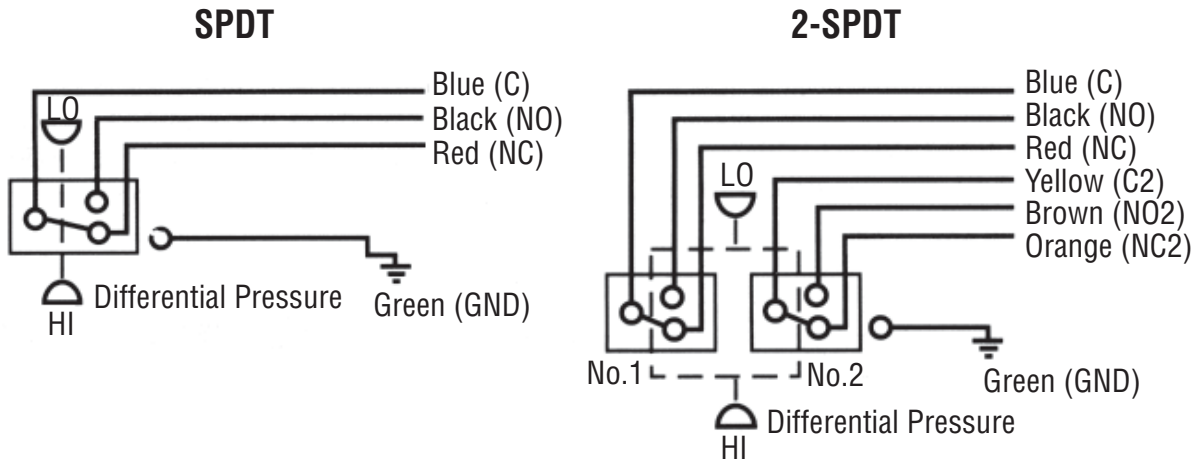


Care should be taken not to loosen the pressure port from the body or the body from the housing.

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 Opposed Piston Differential Pressure Switches in RB and RH housings have terminal blocks as standard. All other Opposed Piston Differential Pressure Switches have 18-inch 18 AWG color-coded wire leads. Storing excess wire or making wire lead splices inside the switch housing will interfere with switch operation.



Calibration



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.

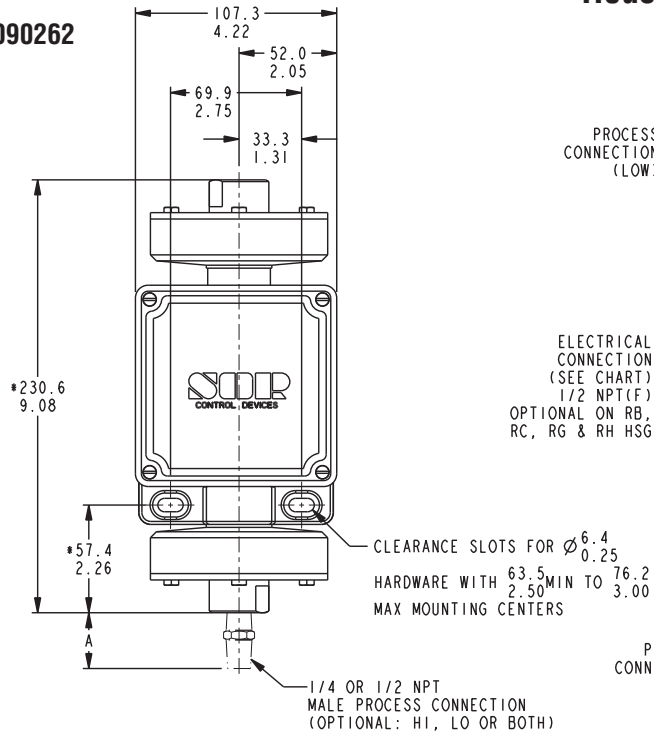
- 1 Remove housing cover. First, calibrate the device as a gauge pressure switch, i.e. Lo side vented to atmosphere. Turn the set point adjusting nut located on the Hi side piston clockwise to increase the set point, or counterclockwise to decrease the set point.
- 2 Calibrate to simulated system operating pressure conditions for optimum performance, i.e.: connect HI and LO sides to suitable pressure sources and raise pressures simultaneously to expected system operating pressure at desired Set Point. Vary LO side pressure and fine tune the set point adjustment for actuation (deactuation) of the electrical switching element on increasing or decreasing differential pressure at simulated system operating pressure.
- 3 Replace the cover.

Dimensions

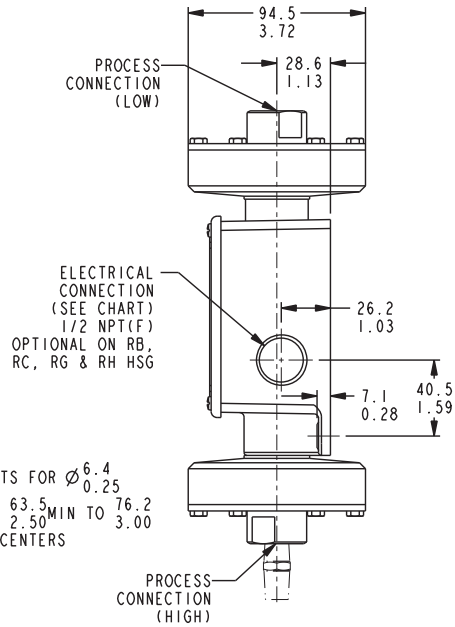
Weathertight-NEMA 4, 4X, IP65

Linear = mm/inches

Drawing 0090262



Housing Designator: RB, RH, RE
Piston Number: 18

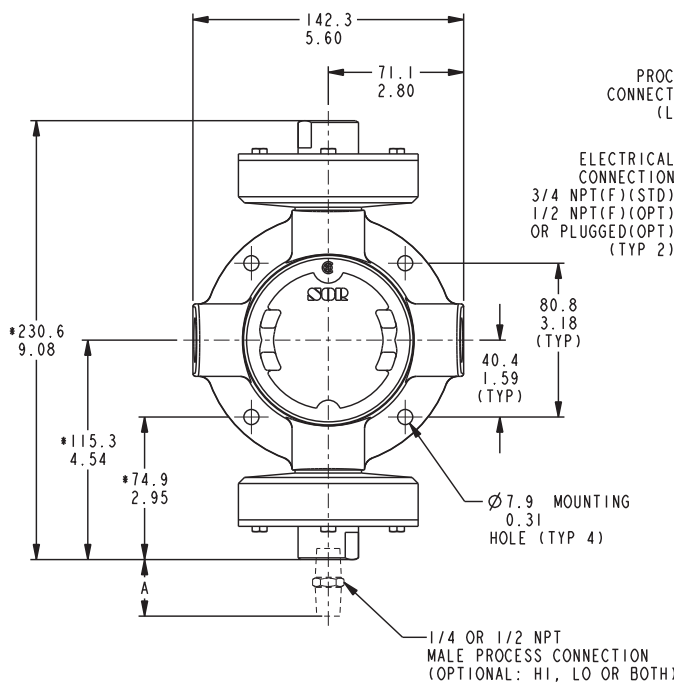


Dimensions are for reference only. Contact the factory for certified drawings for a particular model number.

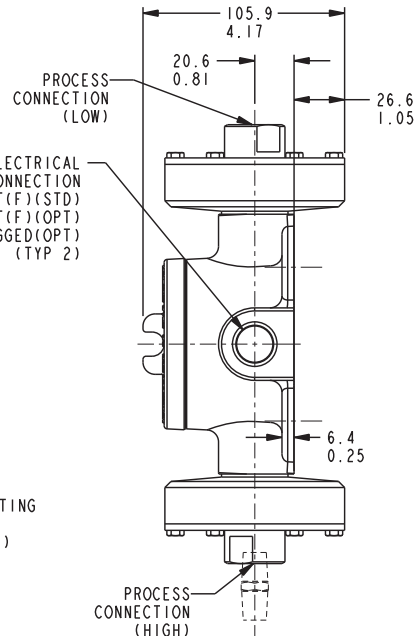
Conventional Explosion Proof

Linear = mm/inches

Drawing 0090152



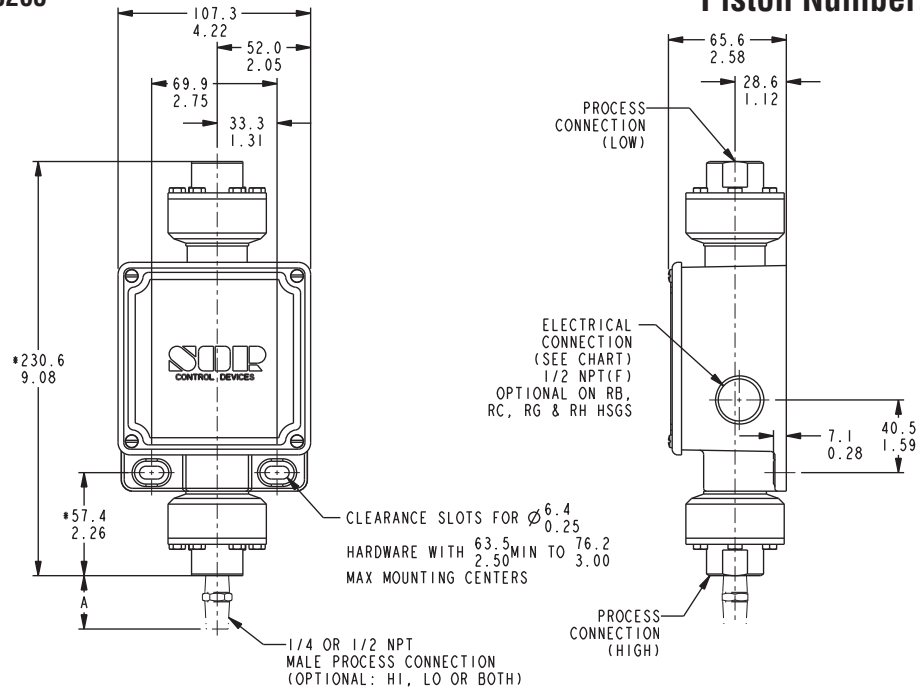
Housing Designator: S
Piston Number: 18



Weathertight-NEMA 4, 4X, IP65

Linear = mm/inches

Drawing 0090265



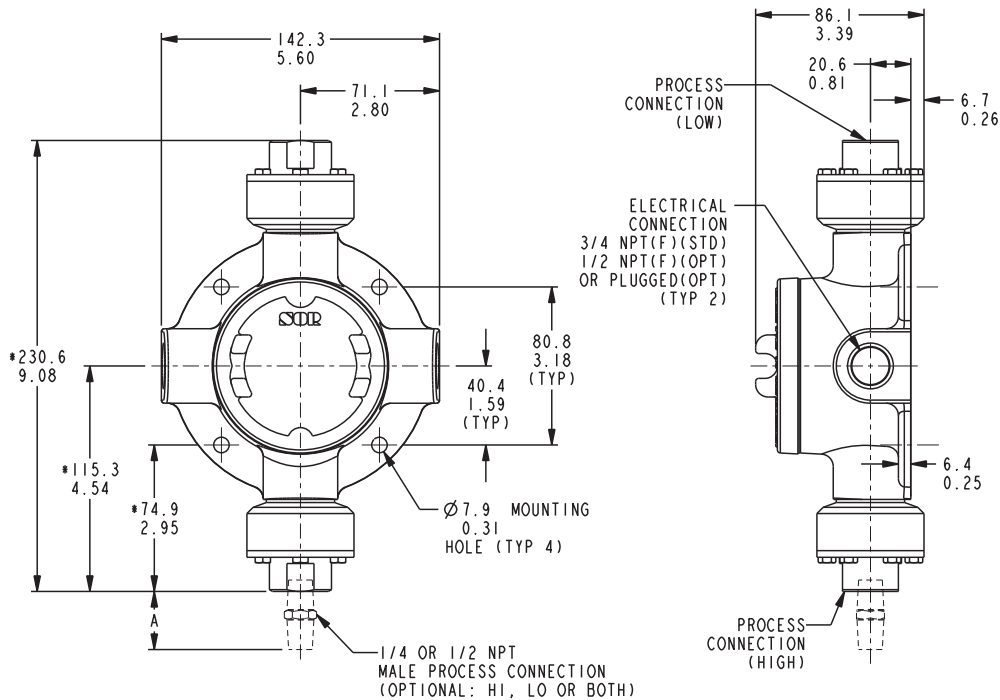
Housing Designator: RB, RH, RE
Piston Number: 15, 17

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

Conventional Explosion Proof

Linear = mm/inches

Drawing 0090151



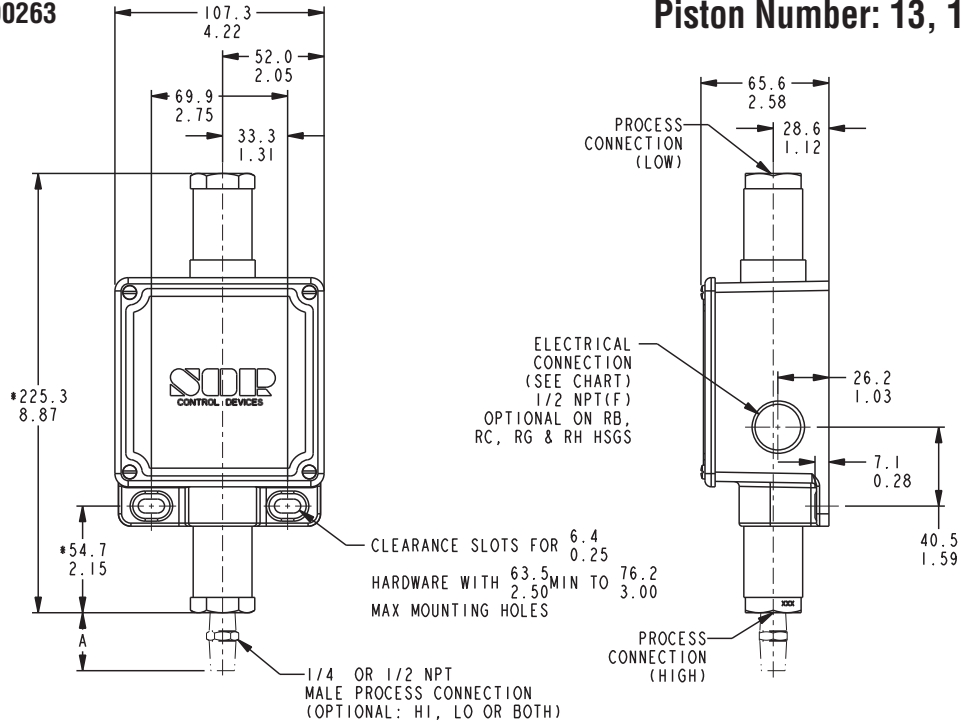
Housing Designator: S
Piston Number: 15, 17

Weathertight-NEMA 4, 4X, IP65

Linear = mm/inches

Drawing 0090263

Housing Designator: RB, RH, RE
Piston Number: 13, 14, 16



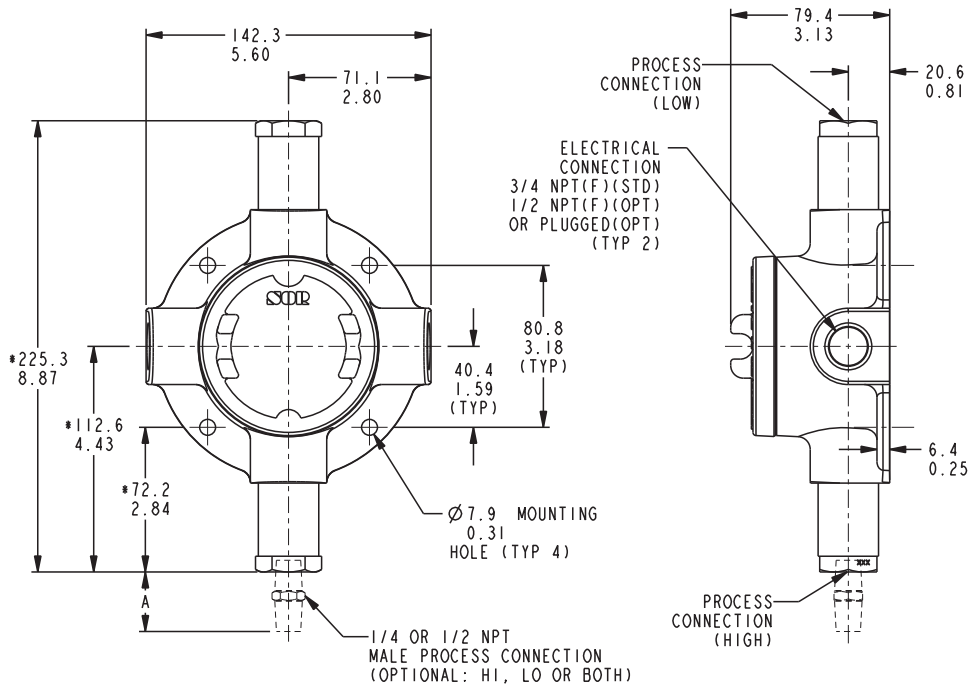
Dimensions are for reference only. Contact the factory for certified drawings for a particular model number.

Conventional Explosion Proof

Linear = mm/inches

Drawing 0090150

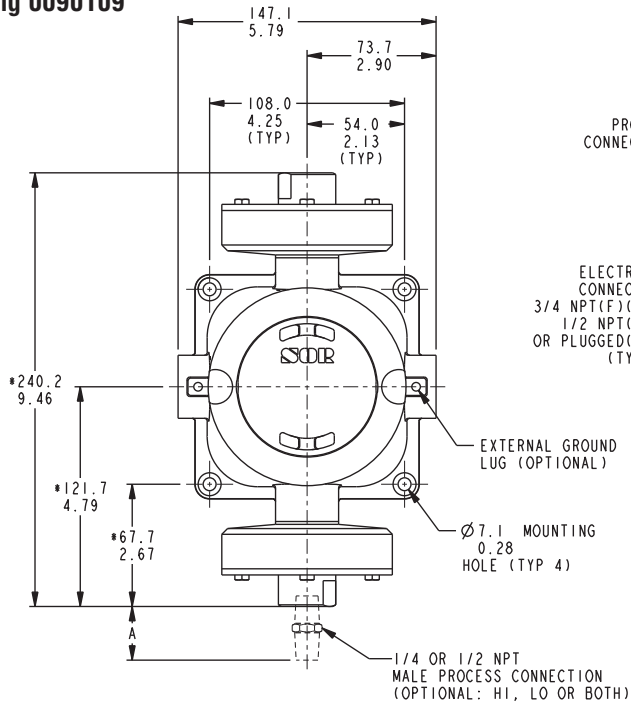
Housing Designator: S
Piston Number: 13, 14, 16



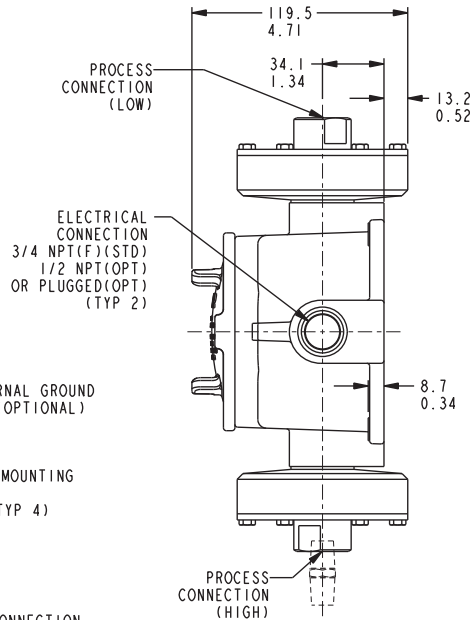
Conventional Explosion Proof

Linear = mm/inches

Drawing 0090109



Housing Designator: SC
Piston Number: 18

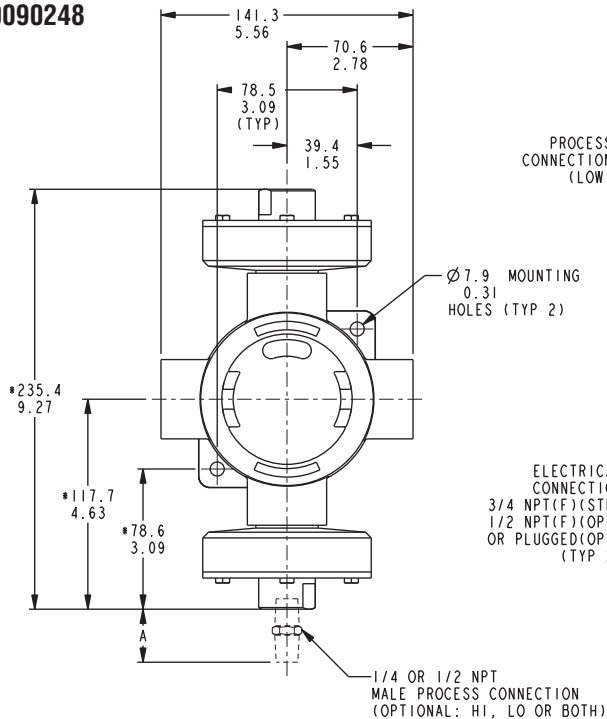


Dimensions are for reference only. Contact the factory for certified drawings for a particular model number.

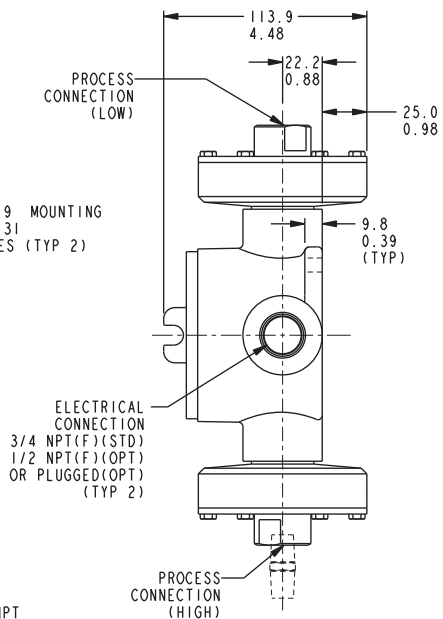
Conventional Explosion Proof

Linear = mm/inches

Drawing 0090248



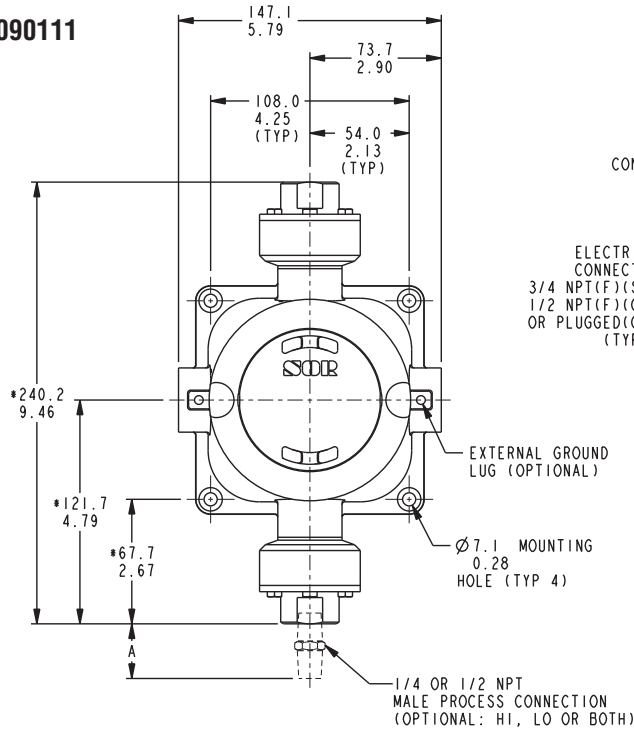
Housing Designator: TA
Piston Number: 18



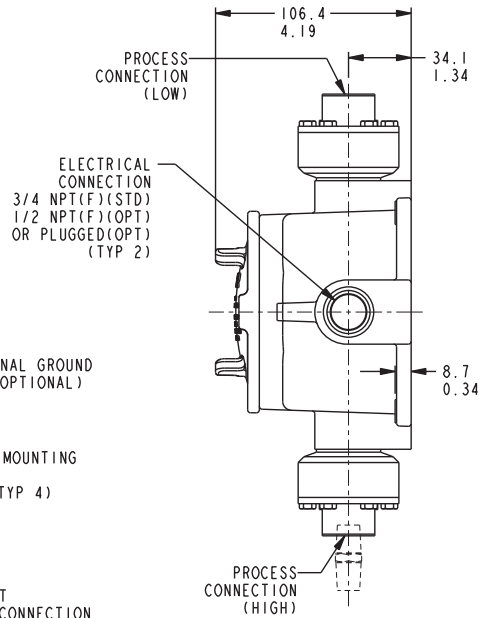
Conventional Explosion Proof

Linear = mm/inches

Drawing 0090111



Housing Designator: SC
Piston Number: 15, 17

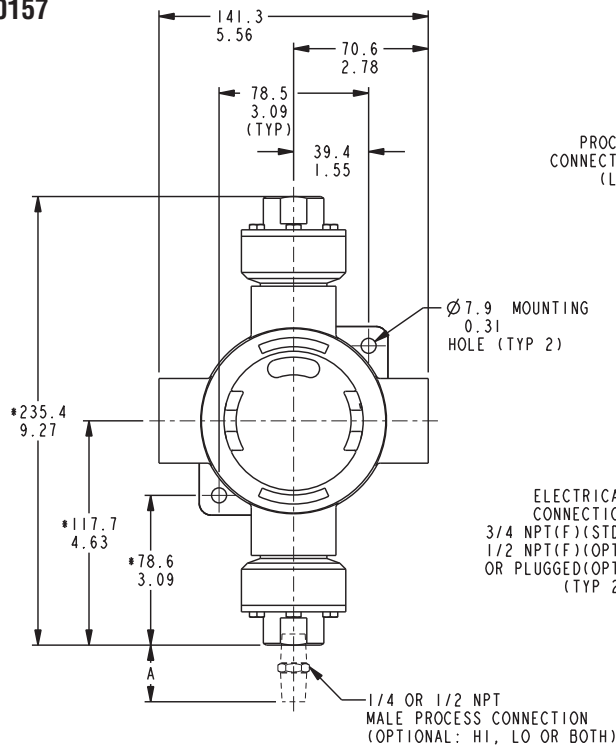


Dimensions are for reference only. Contact the factory for certified drawings for a particular model number.

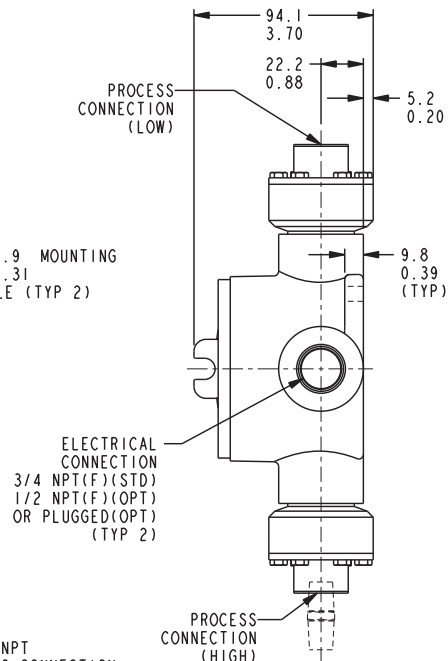
Conventional Explosion Proof

Linear = mm/inches

Drawing 0090157



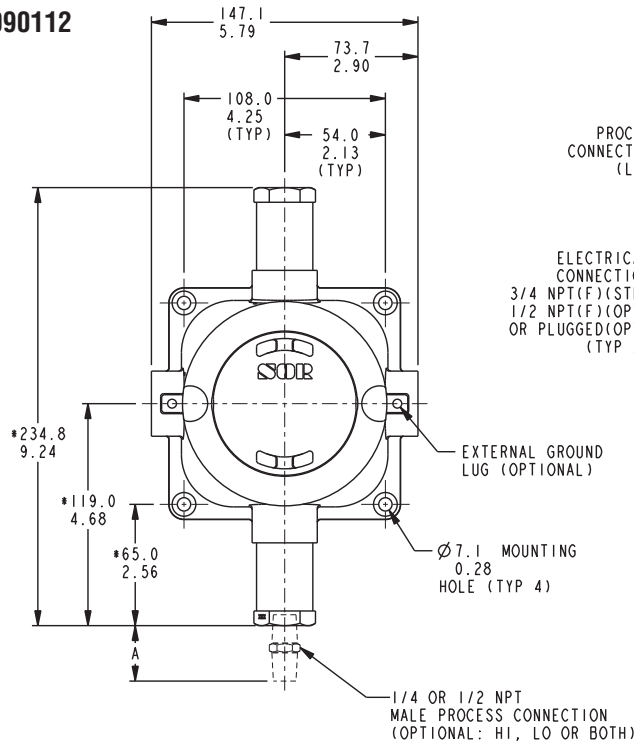
Housing Designator: TA
Piston Number: 15, 17



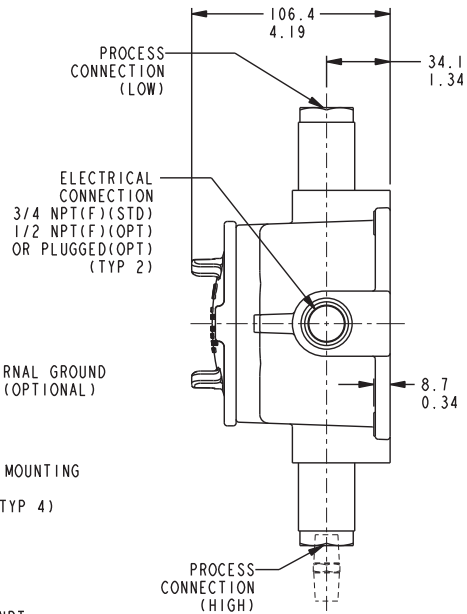
Conventional Explosion Proof

Linear = mm/inches

Drawing 0090112



Housing Designator: SC
Piston Number: 13, 14, 16

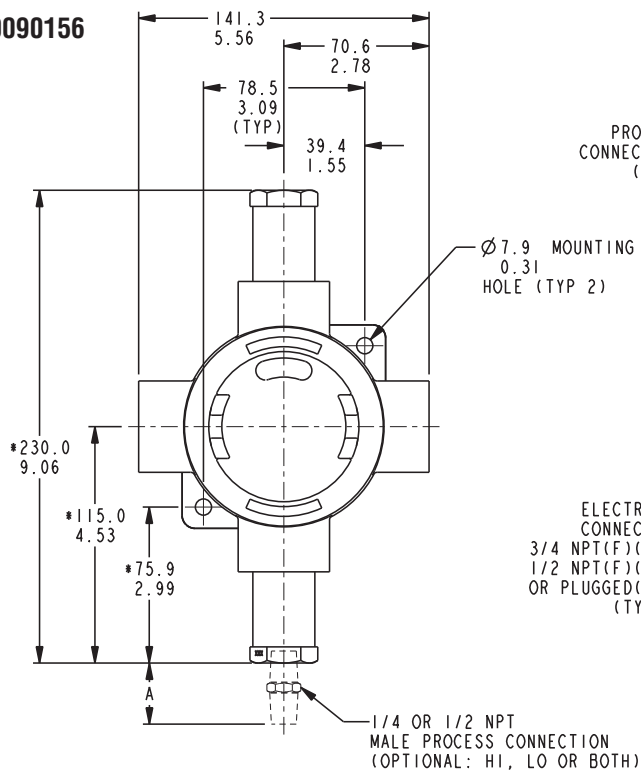


Dimensions are for reference only. Contact the factory for certified drawings for a particular model number.

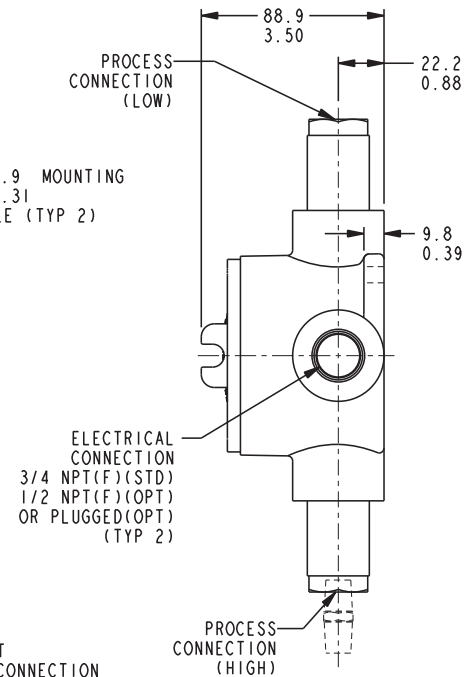
Conventional Explosion Proof

Linear = mm/inches

Drawing 0090156



Housing Designator: TA
Piston Number: 13, 14, 16





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14685 West 105th Street, Lenexa, KS 66215 ■ 913-888-2630 ■ 800-676-6794 USA ■ Fax 913-888-0767

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