These instructions provide information for installation, electrical connection, process connection and calibration of 102 Differential Pressure Switches.

Process pressure is sensed by a piston assembly. The piston responds to differential pressure and moves a lever connected to a torsionally stiff cross-shaft. One end of the cross-shaft is connected to a lever that is biased by the range spring. The other end has a lever that actuates (deactuates) an 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.
Use care during installation not to inadvertently move the electrical switching element or its housing. Movement of either could disturb the relative positions of internal working parts and alter factory-set calibration or render the device inoperative.

**Installation**

This product should be installed by trained and competent personnel only.

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

Securely mount a pipe kit bracket or base plate as supplied to horizontal member of the pipe stanchion, channel rack or a flat surface using suitable bolts. The 102 is not position sensitive, and may be mounted in any position.

**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**

The high pressure side (marked Hi) and the low pressure side (marked Lo) have 1/4” NPT(F) process connections (1/2” NPT(F) optional).

*When the process could be considered dirty in terms of suspended particles, it is recommended that 20-micron in-line filters be installed on the Hi and Lo pressure ports.*

**Electrical Connection**

**Weathertight Models:**

Interrupt the electrical power. Remove the top cover plate. The terminal block is standard, except with B, BB, W or Y high-temperature switching elements. The insulation is labeled C - Common, NO - Normally Open, NC - Normally Closed and C2, NO2, NC2 when 2-SPDT switching elements are installed.

**Explosion Proof Models:**

Units in hazardous locations: prior to removal from service, make sure that the work area is declassified. Failure to do so could result in severe personal injury or substantial property damage.

The hermetically sealed switching element capsule has 18” - 18 AWG wire leads color coded and marked C - Common, NO - Normally Open, NC - Normally Closed, and G - Ground (earth) when applicable. When 2-SPDT switching elements are installed, additional wires are marked C2, NO2 and NC2. (See schematic.)
Special Conditions for Safe Use ATEX/IECEx

- The permanently attached cables are to be suitably terminated and protected from impact.

- The apparatus may have a combined nameplate which carries multiple approvals (Intrinsic Safety & Flameproof). The equipment should be marked as to which protection method it is installed as, and shall not be changed or utilized in any other manner than was originally marked by the end user.

- To minimize the risk of electrostatic discharge, clean only with a damp cloth.

**NOTE:** These circuits are all part of the same IS circuit meeting the requirement of 30V max and 1A max. You cannot connect a zener barrier to C/NO/NC circuit and another barrier to C2/NO2/NC2 circuit unless the combination of the two barriers is intrinsically safe and is less than 30V and 1A.

**NOTE:** For IS, there must be no connection to GND if the switch circuit is connected to a shunt zener diode safety barrier.
Calibration

Coarse Calibration:
Device calibrated without reference to system (static) pressure (Lo side vented).
Test apparatus: Pressure gauge
Variable pressure source
Test light or ohmmeter

1. Remove the weathertight knurled cap.
2. Insert a 5/32 Allen hex wrench into Set Point adjustment screen.
3. Connect a test light or ohmmeter to C – Common and NO – Normally Open.
4. Increase the pressure to the desired Set Point on increasing pressure.
5. Turn the hex wrench clockwise to increase the Set Point and counterclockwise to decrease the Set Point. Note the actuation/deactuation by test light or ohmmeter.
6. For the Set Point on Decreasing pressure, decrease the pressure to the desired Set Point and repeat Step 5.
7. Remove the hex wrench and replace the weathertight cap.

Precise Calibration:
The device is calibrated with reference to system (static) pressure. Performance is enhanced when calibration is accomplished under simulated system pressure profile or as it is intended to be used in actual service.
Test apparatus: Differential pressure gauge
Variable pressure source
Block/bleed and equalizer valves
Test light or ohmmeter

1. Remove the weathertight knurled cap.
2. Insert a 5/32 Allen hex wrench into the Set Point adjustment.
3. Connect a test light or ohmmeter to C – Common and NO – Normally Open.
4. Increase the pressure equally on Hi and Lo sides to the desired system (static) operating pressure (equalizer valve open).
5. To adjust Set Point on Increasing Differential Pressure: Close the equalizer valve and bleed the Lo side until the desired pressure appears on indicator and the Set Point is verified by a test light or ohmmeter. Turn the hex wrench clockwise to increase the Set Point and counterclockwise to decrease the Set Point. Note actuation/deactuation by test light or ohmmeter.
6. To adjust the Set Point on Decreasing Differential Pressure: Differential Pressure must be at or above the Increasing Set Point. Slightly open the equalizer valve until desired decreasing pressure appears on the indicator and the set point is verified by a test light or ohmmeter. Perform Step 5 above as necessary.
7. Remove the Allen wrench and replace the weathertight cap.

CAUTION: Do not remove other covers or attempt to adjust other parts of the mechanism. All have been precisely positioned at the factory and should not be moved in the field.
Dimensions are for reference only. Contact the factory for certified drawings for a particular model number.
General Information for ATEX/IECEx-Certified Models

Manufacturer's Registered Trademark

ATEX/IECEx Listing Information

Thread Form Information

Product Model Identification

Serial Number (First Two Numbers Indicate Year of Manufacture)

Drawing 8304205
# Declaration of Conformity

For ATEX Certified Models

## EC Declaration of Conformity

<table>
<thead>
<tr>
<th>Product</th>
<th>A Series 102 or 103 Differential Pressure Switch</th>
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| Manufacturer | SOR Inc.  
14685 West 105th Street, Lenexa, Kansas 66215-2003  
United States of America |
| Date of Issue | August 11, 2016 |
| We declare that the above products conform to the following specifications and directives | ATEX Directive (2014/34/EU) Equipment Intended for use in Potentially Explosive Atmospheres  
EN 60079-0:2012  
EN 60079-1:2014  
IEC 60079-0:2011  
EN 60079-11:2012 |
| Carries the marking | Ex db IIC T6 Gb (-40°C ≤ Ta ≤ +65°C)  
Ex db IIC T5 Gb (-40°C ≤ Ta ≤ +75°C)  
Ex ia IIC T6 Gb (-40°C ≤ Ta ≤ +65°C)  
Ex ia IIC T5 Gb (-40°C ≤ Ta ≤ +75°C) |
| Reference document | EC-Type Examination Certificates  
Baseefa03ATEX0608X, issued October 31, 2003  
Baseefa11ATEX0173X, issued March 28, 2012 |
| ATEX Notified Body | SGS Baseefa (Notified Body No. 1180)  
Rockhead Business Park, Staden Lane, Buxton, Derbyshire SK17 9RZ  
United Kingdom  
Baseefa Customer Reference No. 1021 |
| Person responsible | Michael J. Bequette (VP of Engineering) |

Engineered to Order with Off-the-Shelf Speed

SOR  
14685 West 105th Street, Lenexa, KS 66215-2003  
913-888-2630 • 800-676-6794 USA • 913-888-0767 FAX