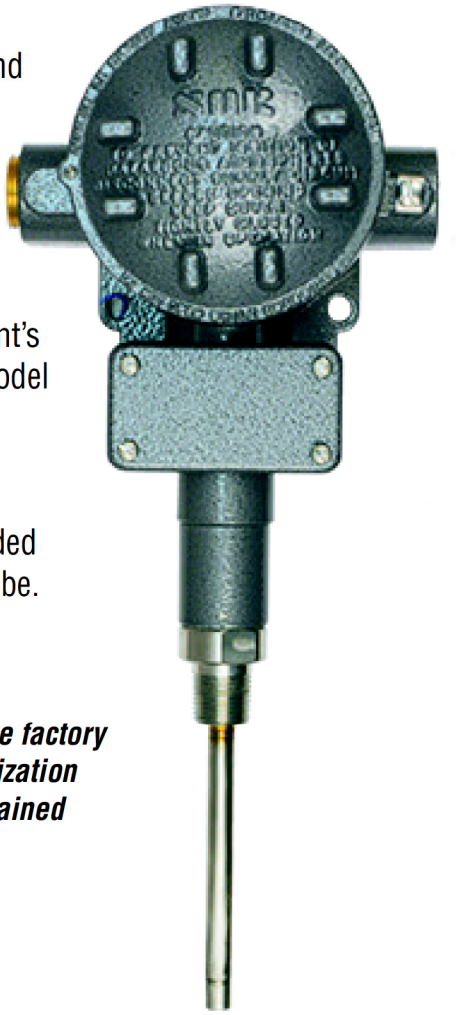
B Temperature Switches

General Instructions



These instructions provide information for installation and field calibration of B Temperature Switches.

Process temperature changes cause proportional vapor pressure changes in the temperature sensing bulb that acts on a diaphragm/piston assembly to actuate and deactuate a snap-action electrical switching element at discrete process temperatures. The instrument's behavior is determined by vapor pressure (105 range model fill media is inert gas). For best results with the SOR® thermal activated temperature switch, the entire probe must experience the media being monitored. If a thermowell is being used, a thermal paste is recommended to ensure the transfer of heat through the well to the probe.

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.

Design and specifications are subject to change without notice.

For latest revision, go to ***SORInc.com***

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Installation

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

Direct-Mount Probe

The temperature sensing probe is rigidly attached to the instrument's body/housing. Carefully insert the sensing probe into the process through a suitable fitting or into a thermowell. The standard process connection is 1/2" NPT(M). Ensure that ample clearance exists before rotating the instrument housing to make the threaded connection. Tighten the probe hex fitting with a 1-1/8" open-end wrench for a leak-free fit. A locally customized mounting bracket may be used if more support is desired. Direct mounting is not recommended where vibration is expected unless housing is securely mounted to a flat surface (bulkhead or panel rack) or a pipe stanchion.

Remote-Mount Probe — Capillary

Secure a housing-mounting pad to bulkhead, panel rack or pipe stanchion with suitable 1/4" (6.35 mm) bolts.

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 switch inoperative.

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

Mounting by electrical conduit connection is NOT recommended.

Suggested mounting orientation is electrical conduit connection at 3 or 9 o'clock and sensing body at 6 o'clock. However, the device is not position sensitive and can be mounted in any position. If a breather drain is installed, it must be oriented at 6 o'clock (pointing down) so condensation will drain. It must be kept clear of paint and foreign matter and must carry the same area classifications as the SOR product. Carefully insert the sensing probe into the process through a suitable fitting or into a thermowell. Adjust desired insertion length. Tighten the probe hex fitting with a 7/8" open-end wrench and the capillary hex fitting with a 9/16" open-end wrench for a leak-free fit. Avoid sharp bends in capillary.

One vent hole (#10, A) should be fitted with a breather suitable to maintain weathertight rating NEMA 4, 4X, IP65 or vented to a safe area. Piping should be minimum 1/4" diameter and maximum 5 meters long (based on process fluid SG 1.0). The other vent hole may be plugged.

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.

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.

NOTE: FOR ATEX/IECEx/UKEX Certified Models, Electrical conduit connection threads may be of non-ISO thread form. Check the product nametag for relevant thread form information before attempting to connect to the electrical conduit connection. In the event a fitting is used, check the adaptor body for thread size information.

Electrical power must be disconnected from explosion-proof models before the cover is removed. Failure to do so could result in severe personal injury or substatntial property damage.

Standard electrical connection is a terminal block. B-series is 6-place compression type. The terminal block is marked: Common (C), Normally Open (NO), Normally Closed (NC). If DPDT is specified, additional markings are: Common 2 (C-2), Normally Open 2 (NO-2), and Normally Closed (NC-2).

Overtravel has been preset at the factory, i.e. the switching element assembly has been precisely positioned in the housing for optimum performance. It normally should not be changed in the field. Should adjustment be necessary, factory approved procedures must be closely followed. Any inadvertent movement or replacement in the field will degrade performance, void the warranty and could render the device inoperative, unless factory approved procedures are followed.

NOTE: The internal primary equipment ground (earth) screw must be used for the equipment ground connection and the external supplemental ground screws are provided for safety and compliance with specific code requirements.

Calibration

❶ Remove the set point adjustment compartment cover.

❷ To increase the set point at which the switching element actuates, turn the hex adjusting nut clockwise with a 3/4" open-end wrench.

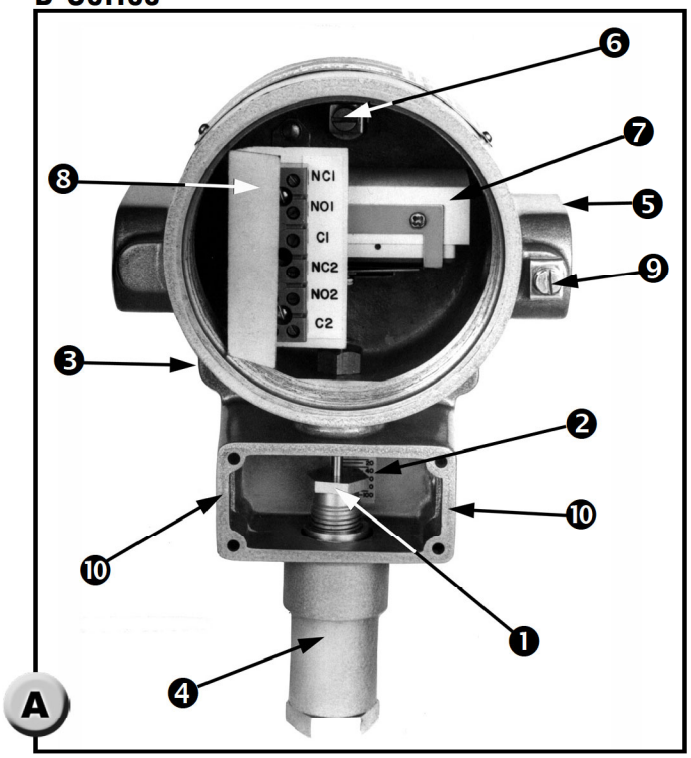
The electrical compartment cover must remain sealed and the allen locking screw tightened at all times to prevent removal of the cover while the temperature switch is in service. Removal of the cover while the temperature switch is in service in a hazardous location could result in severe personal injury or substantial property damage.

❸ Sight across the flat top of the adjusting nut to the calibration scale at the bottom of the housing for an approximate set point. Use a regulated thermal bath to more precisely calibrate the temperature switch.

❹ Replace the set point adjustment compartment cover.

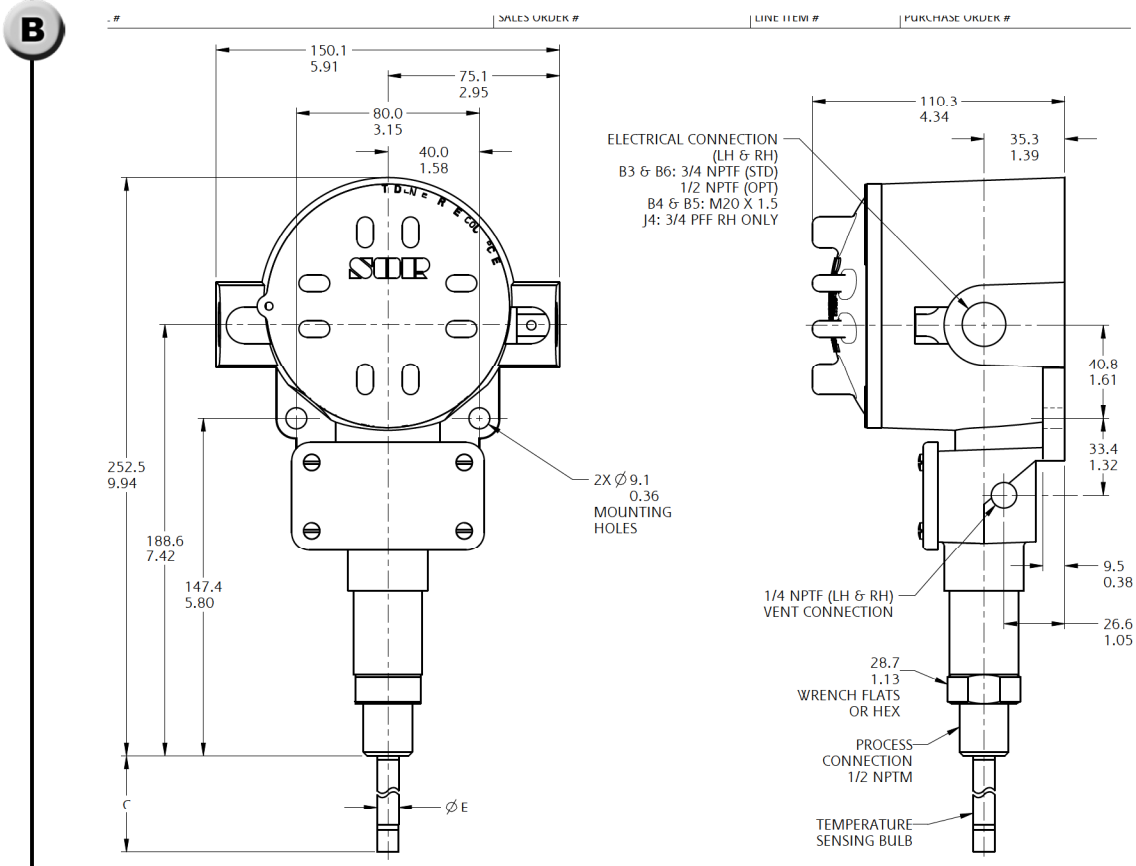
NOTE: The set point adjustment compartment is separate from the electrical compartment. The set point may be changed without disconnecting electrical power.

B-Series



1. 3/4” hex set point adjusting nut
2. Calibration scale
3. Housing mounting pad
4. See B and C for temperature sensing probe details
5. Electrical conduit connection
6. Internal primary equipment ground (earth) screw
7. Electrical switching element (under terminal block)
8. Terminal block
9. External supplemental case ground (earth)
10. Vent hole 1/4” NPT(F) (Prevents pressurization of the electrical switch compartment in the event of sensing element failure.) (See Caution on page 2.)

Dimensions



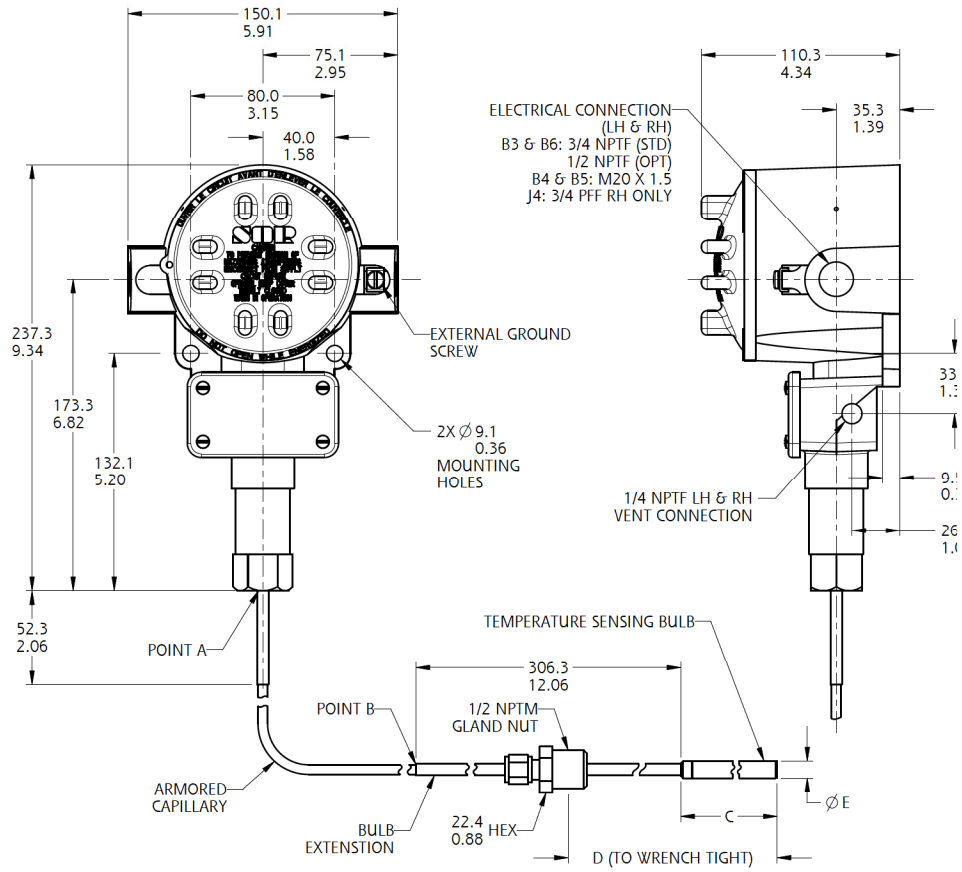
Linear = mm/inches

Drawing 0190130

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

C

MODEL # | SALES ORDER # | LINE ITEM # | PURCHASE ORD



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Linear = mm/inches

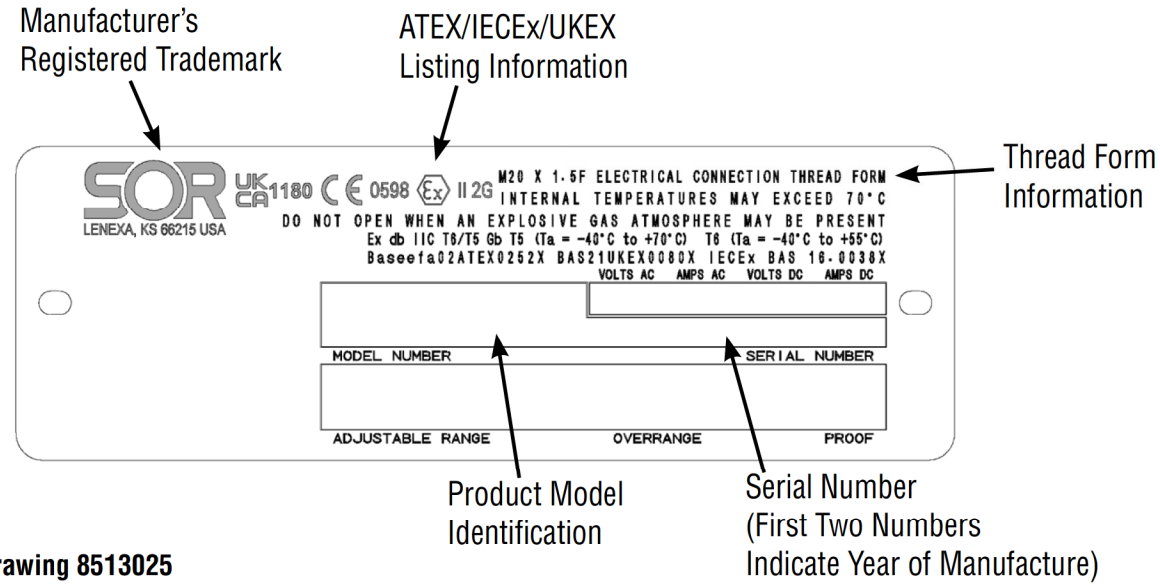
Drawing 0190312

SALES PAGE

ER #

STANDARD MODELS				
BULB MODEL #	LENGTH			∅ E
	A-B	C	D	
203	1829 72	112.0 4.41	125.7 4.95 TO 381.8 15.03	9.7 0.38
205	3048 120	124.7 4.91	138.4 5.45 TO 394.5 15.53	
207	4572 180	162.8 6.41	176.5 6.95 TO 432.6 17.03	
209	6096 240	194.6 7.66	208.3 8.20 TO 464.3 18.28	
HI-TEMP 105 RANGE	SEE ABOVE PER PROBE MODEL #	148.3 5.84	162.1 6.38 TO 418.1 16.46	16.0 0.63
NON-STANDARD MODEL DIMENSIONS				

ATEX/IECEx/UKEX Marking Information



Drawing 8513025

Special Conditions for Safe Use

- To minimize the risk of electrostatic discharge, clean only with a damp cloth.
- The operating rod and the bushing gap shall not exceed from 0.08mm.

Declaration of Conformity

For ATEX/IECEx/UKEX Certified Models

EU/UK Declaration of Conformity

CE UKCA

Product	**B Series Pressure and Temperature Switches**
Manufacturer	SOR Inc.
Place of Issue	14685 West 105th Street Lenexa, Kansas 66215-2003 United States of America
Date of Issue	**June 28, 2024**
We declare under our sole responsibility that the above products conform to the following specifications and directives	ATEX Directive (2014/34/EU) and UK Statutory (SI 2016 No. 1107) Equipment Intended for use in Potentially Explosive Atmospheres EN 60079-0:2018 IEC 60079-0:2017 EN 60079-1:2014 IEC 60079-1:2014-06
Carries the marking	Ex **II 2 G Ex db IIC T6/T5 Gb** **T6** (-40°C ≤ Ta ≤ +55°C) **T5** (-40°C ≤ Ta ≤ +70°C)
Reference document	**Examination Certificates** **Baseefa02ATEX0252X** **IECEx BAS 16.0038X** **BAS21UKEX0080X**
Notified/Approved Body	**SGS Fimko Oy** (Notified Body No. 0598) **SGS United Kingdom Ltd.** (Approved Body No. 1180)
Person responsible	Michael J. Bequette (VP of Engineering)

Michael J. Bequette

Engineered to Order with Off-the-Shelf Speed

SOR
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