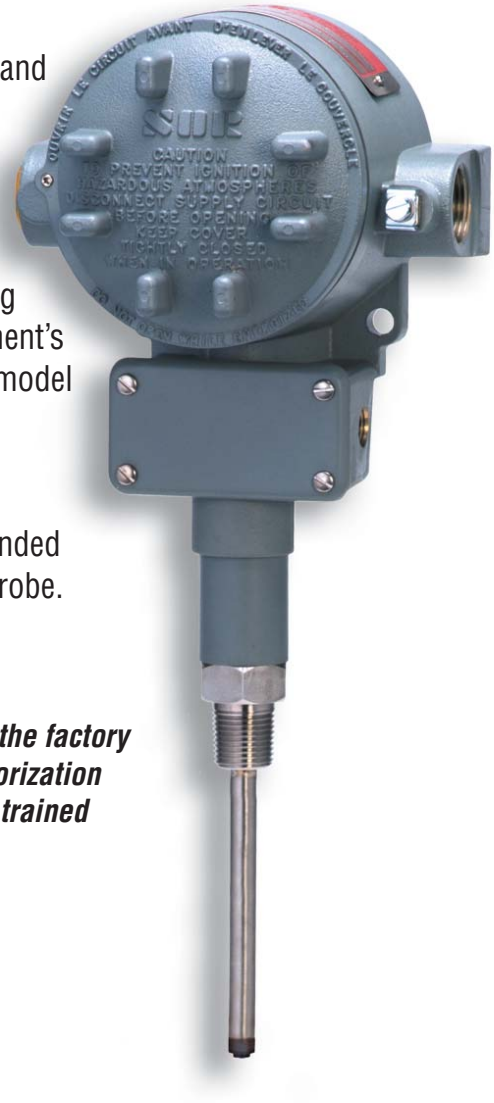
B Series
Temperature Switches

General Instructions



These instructions provide information for installation and field calibration of B Series 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 ***www.sorinc.com***

Table of Contents

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.

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 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.

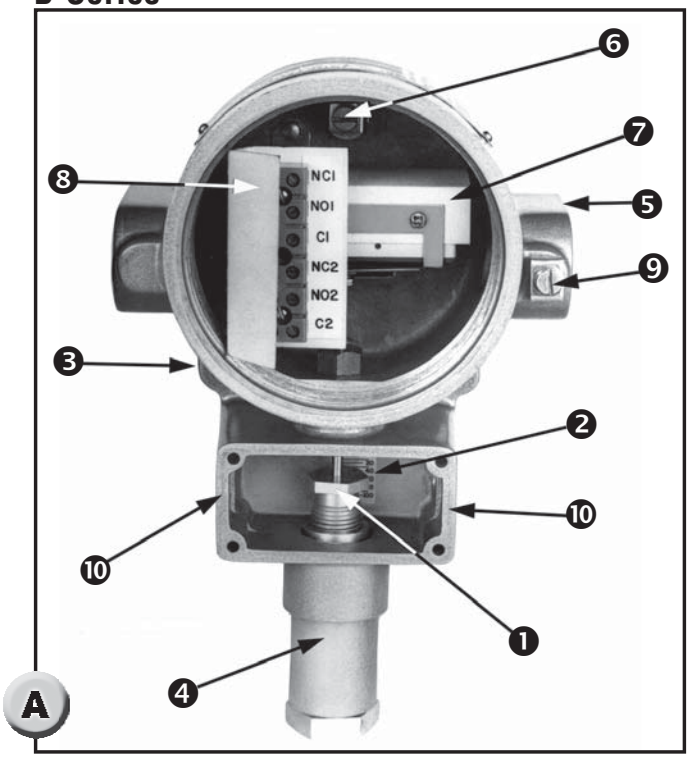
The electrical compartment cover must remain sealed and the allen locking screw tightened at all times to prevent removal of the cover while the temperature switch is in service. Removal of the cover while the temperature switch is in service in a hazardous location could result in severe personal injury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

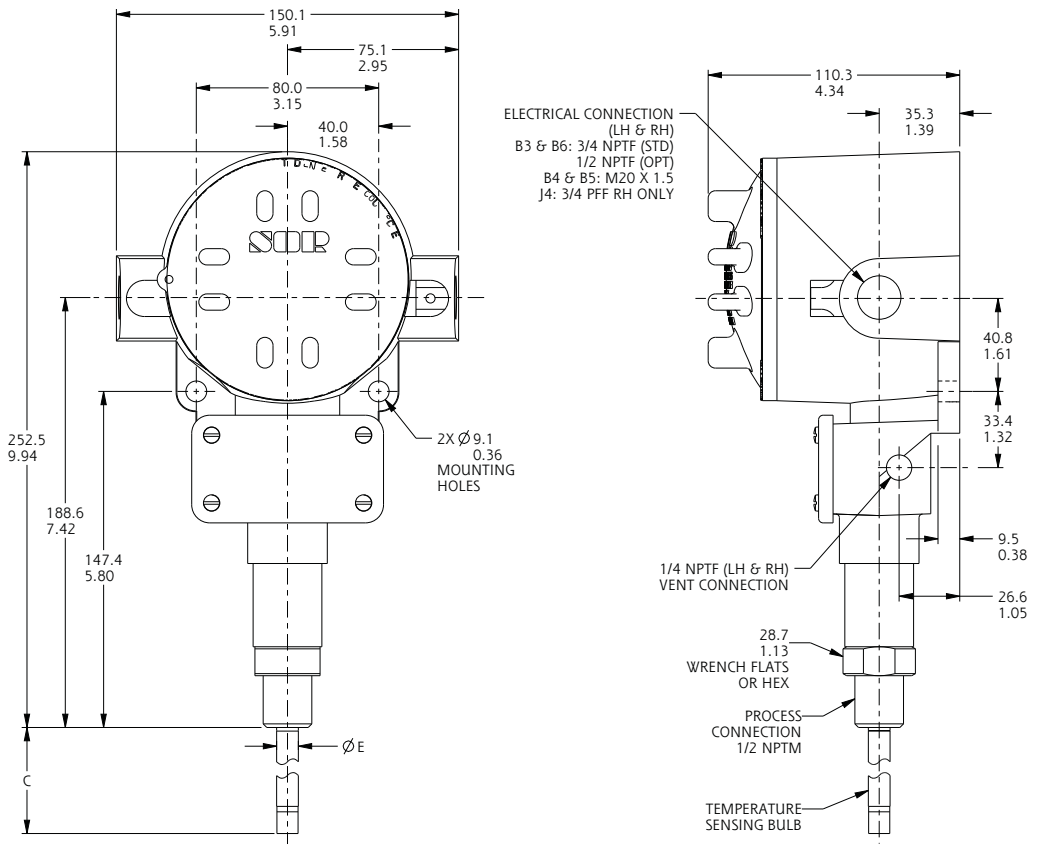
B-Series



❶ 3/4” hex set point adjusting nut
❷ Calibration scale
❸ Housing mounting pad
❹ See B and C for temperature sensing probe details
❺ Electrical conduit connection
❻ Internal primary equipment ground (earth) screw
❼ Electrical switching element (under terminal block)
❽ Terminal block
❾ External supplemental case ground (earth)
❿ 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

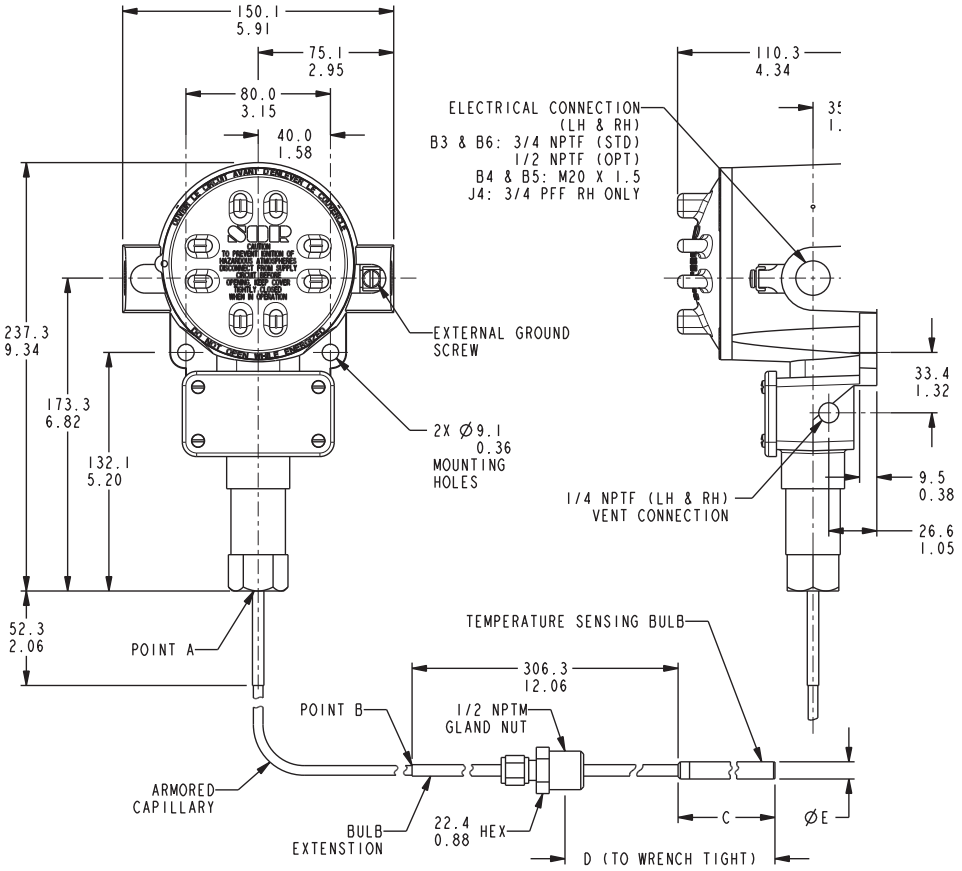
B



Linear = mm/inches

Drawing 0190130

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



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

Linear = mm/inches

Drawing 0190312

STANDARD MODELS				
BULB MODEL #	LENGTH			Ø BULB
	A-B	C	D	E
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	
W/ NB OPTION 125, 135 RANGE ONLY	SEE ABOVE PER PROBE MODEL NO.	112.0 4.41	125.7 4.95 TO 381.8 15.03	
HI-TEMP 105 RANGE	SEE ABOVE PER PROBE MODEL NO.	148.3 5.84	162.1 6.38 TO 418.1 16.46	16.0 0.63

Operation

For ATEX Certified Models

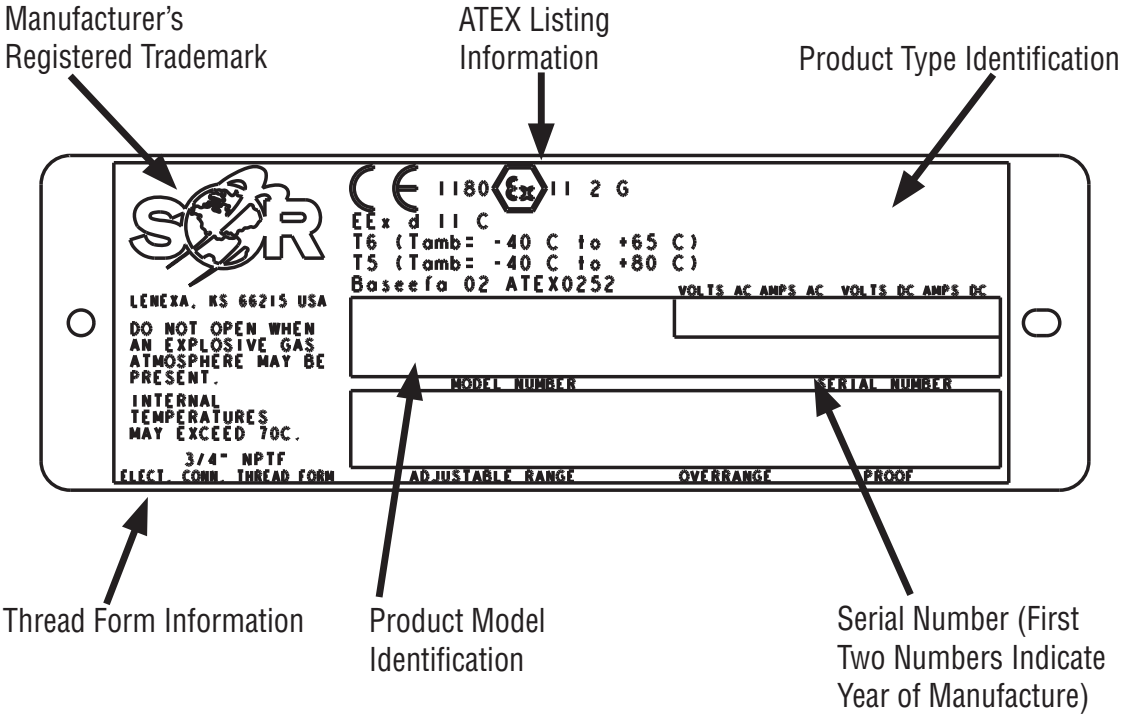
Maximum Surface Temperature
T6 Rating - 85°C
T5 Rating - 100°C

Designator	Adjustable Range (Increasing Temperature)		Overrange Temperature		Maximum Process Pressure	
	°F	°C	°F	°C	psi	bar
135	-50 to 70	-45 to 21	190	88	2300	158
125	40 to 225	5 to 107	360	182	2300	158
115	150 to 375	66 to 190	520	270	2300	158
105	300 to 1000	150 to 540	1100	590	1000	70

Designator		AC Rating		DC Rating (Resistive)			
SPDT	DPDT	Volts	Amps	Volts	Amps	Volts	Amps
K	KK	250	15	125	0.4	30	5
KA	N/A	125	1	-	-	28	1
J	JJ	125	1	-	-	30	1
G	GG	250	15	125	0.5	-	-
A	AA	250	11	125	0.5	30	5.0
L	LL	250	15	125	0.5	30	10
E	EE	250	5	125	0.5	30	5.0
C	N/A	250	15	125	0.5	-	-
S	N/A	125	10	125	1.5 Min. 10.0 Max.	-	-
B	BB	250	5	125	0.3	-	-
Y	VY	250	5	125	0.5	-	-
W	N/A	250	5	125	0.3	-	-
T	N/A	250	15	125	0.4	-	-
H	N/A	250	15	-	-	-	-
N/A	EB	250	11	125	0.5	30	5
AF	AG	250	5	125	0.5	30	5
EF	EG	125	1	-	-	28	1
JF	JG	250	7	250	.25	30	7

ATEX Marking Information

For ATEX Certified Models



Drawing 8513203

Declaration of Conformity

For ATEX Certified Models

EC Declaration of Conformity

CE

Product	**B Series Pressure and Temperature Switches**
Manufacturer	SOR Inc. 14685 West 105th Street Lenexa, Kansas 66215-2003 United States of America
Date of Issue	**January 24, 2011**
We declare that the above products conform to the following specifications and directives	ATEX Directive (94/9/EC) Equipment Intended for use in Potentially Explosive Atmospheres EN 60079-0:2004 (Technically identical to EN 60079-0:2009 which is harmonised) EN 60079-1:2004 (Technically identical to EN 60079-1:2007 which is harmonised)
Carries the marking	Ex **II 2 G EEx d IIC T6** **(Tamb = -40°C to +65°C) or T5 (Tamb = -40°C to +80°C)**
Reference document	**EC-Type Examination Certificate Baseefa02ATEX0252** Issued May 7, 2003
ATEX Notified Body	**Baseefa Ltd.** (Notified Body No. 1180) Rockhead Business Park, Staden Lane, Buxton, Derbyshire SK17 9RZ United Kingdom Baseefa Customer Reference No. 1021
Persons responsible	John J. Fortino (VP of Engineering) Colbert O. Turney (VP of Quality Assurance)

John Fortino
John J. Fortino

Colbert Turney
Colbert O. Turney

WE DELIVER QUALITY ON TIME

SOR

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Process Instrumentation | PRESSURE | LEVEL | TEMPERATURE | FLOW