



# Temperature Switches

## General Instructions

### General

This instruction provides information for mounting, electrical connection, process connection, and calibration of SOR Temperature Switches.

**NOTE:** If you suspect that an instrument is defective, contact the factory or the SOR representative in your area for a return authorization number. If the instrument cannot be returned for service, field work should be performed by a qualified instrument technician using factory authorized procedures. Contact the factory or the SOR representative in your area for technical support.

The SOR Temperature Switch consists of a pressure switch with a sealed temperature sensing bulb attached directly to the pressure port. (An optional remote temperature sensing bulb can be connected to the pressure port with an armor-clad capillary.) The temperature sensing system is pressure filled with a volatile fluid. Process temperature changes cause proportional vapor pressure changes in the temperature sensing bulb that act on the 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.)

*Design and specifications are subject to change without notice.*

### Installation

#### Direct-Mount Probe

The temperature sensing probe is rigidly attached to the instrument's body/housing. Carefully insert sensing probe into process through suitable fitting or thermowell. Standard process connection is 1/2-inch NPT(M). Ensure that ample clearance exists before rotating the instrument housing to make threaded

connection. Tighten probe hex fitting with 1-1/8-inch open-end wrench for leak free fit. A locally customized mounting bracket may be used if more support is desired. Housings L, S, TA, V1, V2, V3, LC, SC, BA, B3, B4, B5 and B6 are not recommended for direct mount where vibration is expected. These housings should be securely mounted to a flat surface (bulkhead or panel rack) or pipe stanchion.

#### Remote-Mount Probe — Capillary

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

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

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2. Mounting by electrical conduit connection is **NOT** recommended.
3. Suggested mounting orientation is electrical conduit connection at 3 or 9 o'clock and sensing body at 6 o'clock. However, device is not position sensitive and can be mounted in any position. If 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.
4. Carefully insert sensing probe into process through suitable fitting or thermowell. Adjust desired insertion length. Tighten probe hex fitting with 7/8" open-end wrench. Tighten 9/16" hex nut to fingertight. Then hold the 7/8" fitting with a wrench and tighten the 9/16" hex nut an additional 1-1/4 turns from finger tight. Avoid sharp bends in capillary.

### Process Connection

Temperature sensing probe is 300 series stainless steel. If process is compatible, it may be directly inserted into the process without use of a thermowell. Best results are obtained when the probe is completely immersed in the process. A thermowell increases response time (lag). A thermowell filled with thermal transfer media reduces lag.

## Electrical Connection

**CAUTION:** Switching Element Assembly has been precisely positioned in the housing at the factory for optimum performance. Any inadvertent movement or replacement in the field will degrade performance and could render the device inoperative, unless factory authorized procedures are followed.

When making electrical connections, use care to apply minimal strain to the electrical switching element. Refer to wiring schematic on reverse for terminal and wire codes.

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

## Calibration

Disconnect electrical power to temperature switch. Remove housing cover ( or weathertight cap).

**NOTE:** It is not necessary to disconnect electrical power with the Big Hermet series or models in B3, B4, B5 and B6 housings provided that only the cover fastened with four captive screws over Set Point adjustment is removed.

**WARNING:** 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.

### For instruments with 1/8" hex Allen wrench set point adjustment under weathertight cap:

Use 1/8" hex Allen wrench to turn adjusting screw to achieve desired set point. Turn adjusting screw clockwise (in) to increase set point and counterclockwise (out) to decrease set point. Calibration scale is not installed, so external measurement of process temperature is necessary. Consult factory.

### For instruments with 3/4-inch hex set point adjustment:

Use 3/4-inch open-end wrench to turn hex adjusting nut clockwise to increase set point, and counterclockwise to decrease set point. Approximate set point can be obtained by sighting across top of adjusting nut to calibration scale on the housing floor. If precise set point calibration is required, it will be necessary to use a regulated thermal bath and suitable continuity tester. Consult factory.

### For instruments with dead band adjustment:

Use the fixed dead band procedure (above) to calibrate the desired decreasing temperature set point. The increasing temperature set point can then be adjusted by turning the white thumbwheel on the electrical switching element. Setting A yields the smallest possible dead band. Setting F yields the widest possible dead band. Settings above E may degrade repeatability.

## Special Conditions for Safe Use for CENELEC Certified Mini-Hermet Temperature Switches only

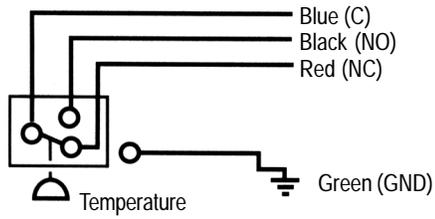
1. The terminal box to which the equipment is attached must, together with the switch, ensure the requisite thread engagement for Apparatus Group IIC.
2. The reliability of the diaphragm has been assessed on the basis of 100,000 operations. The diaphragm assembly must be changed before this number of operations is exceeded.
3. When the switch is attached to an increased safety terminal box the assembly must be capable of withstanding the impact test specified in BS 5501: Part 1: 1997.
4. The sealing arrangements must maintain the minimum IP54 rating required by the increased safety enclosure.
5. The switch must attach to the enclosure using an existing entry.

## Wiring Schematics

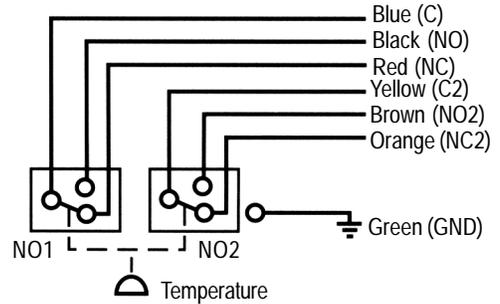
Housing Type	Conduit Connection	Contact Termination	Contact Identification
Open Bracket	None	Screw Terminals	Stamped on insulation
		Wire leads	Color coded and marked
All others	3/4 NPT(F), M 20 x 1.5 (F), or 1/2 NPT(M) unless optional adapter is specified	Screw terminals	Stamped on insulation
		Wire leads	Color coded and marked
		Terminal strip	Stamped on insulation

# Wiring Lead Code Colors

## SPDT

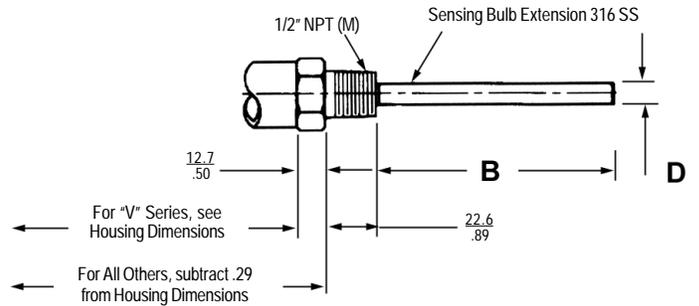
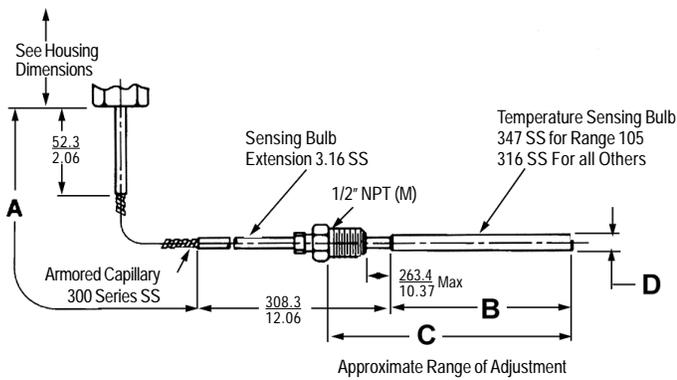


## DPDT



# Probe Dimensions

## Remote Mount



## Direct Mount

$$\text{Linear} = \frac{\text{mm}}{\text{in.}}$$

Feature	A		B				B with NB option		C				D dia.			
	Range	All	135,125,115		105		135,125		135,125,115		105		135,125,115		105	
Probe	m	ft	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
201	NA	NA	105.7	4.16	--	--	107.2	4.22	128.3	5.05	--	--	9.7	0.38	--	--
203	1.8	6.0	112.0	4.41	148.3	5.84	112.0	4.41	135 to 396	5.3 to 15.6	170 to 433	6.7 to 17.1	9.7	0.38	16.0	0.63
205	3.0	10.0	124.7	4.91	148.3	5.84	112.0	4.41	147 to 409	5.8 to 16.1	170 to 433	6.7 to 17.1	9.7	0.38	16.0	0.63
207	4.5	15.0	162.8	6.41	148.3	5.84	112.0	4.41	185 to 447	7.3 to 17.6	170 to 433	6.7 to 17.1	9.7	0.38	16.0	0.63
209	6.0	20.0	194.6	7.66	148.3	5.84	112.0	4.41	216 to 480	8.5 to 18.9	170 to 433	6.7 to 17.1	9.7	0.38	16.0	0.63

