

## Bearing Temperature Sensor Replacement Criteria

This Engineering Instruction describes the recommended inspections and tests to determine if a bearing temperature sensor should be replaced when the bearing is opened for service.

- 1. Continuity Test:** Disconnect the sensor leadwires from the monitoring instrumentation. Use a multimeter (set on the lowest "Ohms" range) to measure the resistance between the leadwires. Replace the sensor if the measured resistance is higher than the resistance values listed below.

For RTDs (Resistance Temperature Detectors), the room temperature resistance of the element (measured between Red and White, or Blue and Yellow leadwires) varies between 10 ohms (for copper RTDs) and 220 ohms (for 200 ohm platinum RTDs). See chart below for approximate room temperature resistance for common RTD types. For RTDs with 3 leadwires (or 6 in the case of dual elements), the reading between the common leadwires (White to White or Yellow to Yellow) usually is less than 5 ohms.

RTD Type	Resistance at Room Temperature (Approximate)
10Ω Copper	10Ω
100Ω Platinum	110Ω
120Ω Nickel	140Ω
200Ω Platinum	220Ω
1000Ω Platinum	1100Ω

For T/C's (Thermocouples), the resistance reading should be less than 10 ohms.

- 2. Insulation Test:** Use a multimeter (set on the highest "Ohms" range, 100 Kilohms or more) and measure the insulation resistance between any leadwire and the sensor case (or the bearing, if the sensor is still installed in it). If the sensor leadwires have stainless steel braid, also measure between any leadwire and the braid (Note: Make sure that the stainless steel braid does not touch the stripped portion of the leadwire when performing this test). Replace the sensor if the insulation resistance measures less than 100 Kilohms.

**Note:** The insulation test cannot be done on a T/C sensor, which has a grounded junction. If you are uncertain whether the T/C is grounded, check the instruction manual for the monitoring instrument, and/or the wiring schematic.

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- 3. Visual and Mechanical Inspection:** Carefully pull the entire length of the sensor leadwires through your fingers to detect any damage (cuts, nicks, crushing, etc.) to the Teflon insulation and fraying of the stainless steel braid (when used). If the braid has broken strands, they can pierce the Teflon insulation, causing an electrical short-circuit. Replace the sensor if the Teflon is damaged or if the stainless steel braid has broken strands or shows signs of fraying.

Inspect the path by which the sensor leadwires exit the bearing housing. Deburr all sharp metal edges to prevent damage to the sensor leadwires or fraying of the braid. Secure the sensor leadwires so they cannot loosen and rub against the bearing or housing during normal equipment operation. Where the leadwires are bent around a corner, provide enough wire length so the leadwires do not rub against the bearing or housing leadwire during normal operation. Do not pinch the leadwires because this could damage the Teflon insulation.

Request the following Engineering Instructions for the Suggested Installation Procedure Of Temperature Detectors In:

- EI164 Sleeve Bearing Case Style A, Babbitt Method
- EI167 Thrust Bearing Case Style A, Babbitt Method
- EI180 Thrust Bearing Case Style B, Babbitt Method
- EI181 Thrust Bearing Case Style B, Spring And Ring Method
- EI184 Bearing Shoe Case Style C And D, Potting Method