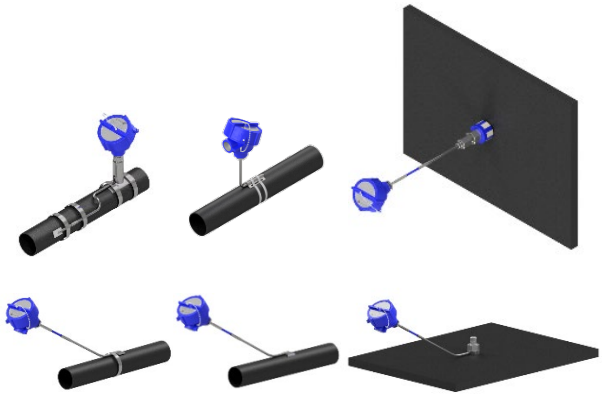
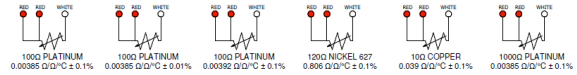
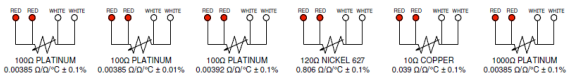


Surface Mount Assemblies.

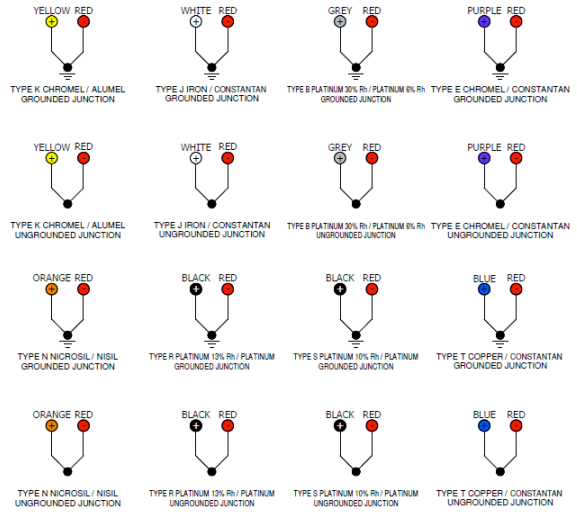
Wiring Installation Considerations:

- Mounting of the connection head enclosure (*e.g.*, using a union fitting on the connection extension for lining up the connection head connection nozzle with the conduit/conduit-fitting, *etc.*).
- Type of extension-wiring (e.g., copper, RTD, or thermocouple).
- Termination of the extension wire. See the applicable wiring diagram(s) (RTD, or thermocouple) and any drawing(s)/schematic(s) for the applicable connection type (e.g., terminal block, wire connectors, temperature transmitter, etc.).
- Grounding of the components (*e.g.*, connection head, *etc.*).
- Sealing of the connecting conduit, cable, or wiring (e.g., Class I, Division 1 conduit within 50 mm (2") of the connection head enclosure wiring nozzle, electrical/sensor assembly threads adequately engaged, *etc.*).
- Cleanliness of the inside of the connection head enclosure (*e.g.*, avoiding moisture, dust, fibres, or other contaminants inside of the connection head enclosure, *etc.*).

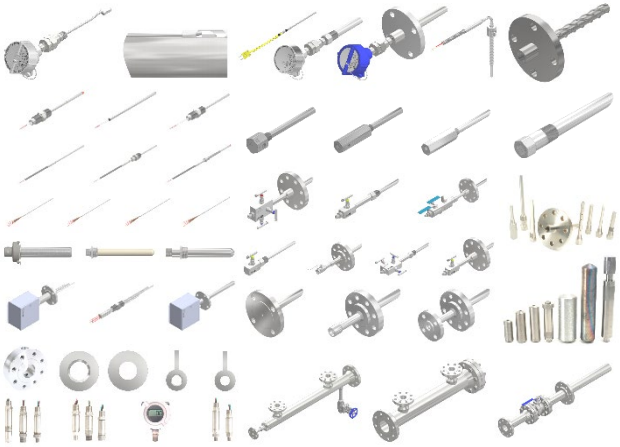




RTD Wiring Diagrams.



Thermocouple Wiring Diagrams.



General Aircom Products.

File: Aircom-CSA-Temperature-Sensor-Assembly-Safety-Use-Handling

Revision: 1 | **Date:** 2021-06-02 | **By:** BSG

For Assistance Contact: Aircom Instrumentation Ltd.
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Email: sales@aircominstrumentation.com
Website: www.aircominstrumentation.com

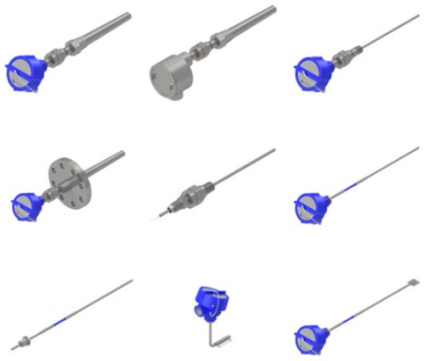
Full Product Manual:

Aircom Instrumentation Ltd.

Hazardous Location Temperature Sensor Assemblies Safety, Use, and Handling

Model Series Thermocouples, RTDs, and Thermowells:

TC8, TC9, TC10, TC11, TC14, TC15, TC16, TC17, RT6, RT7, RT9, RT11, RT14, RT15, RT16, RT17, SM2, SM4, HT2, HT3, WPT, MG1, MG2, MG3, S22, S24, S26, S32, S34, SL22, SL24, SL26, SL32, SL34, TW52, TW72, SW22, SW24, SW26, SW32, SW34, WF22, WF24, WF26, WF32, WF34, B24, BL24, F22, F24, F26, F32, F34, FS22, and VST



General temperature sensor assemblies

Safety:

⚠ DANGER

- Ensure the process connection nozzle is isolated from all hazardous sources before installing the thermowell or welded fixed fitting sensor.
- Ensure all ⚡ electrical sources are isolated from all hazardous atmospheres before installing the temperature sensor assembly.
- Hazardous areas/locations may have 🔥 flammable/ignitable, or 💥 explosive materials present (e.g., gases, vapours, dust, fibres, etc.).
- For Class I, Division 1 rated devices:
  - A seal shall be installed within 50 mm (2") of the connection head enclosure.
- For Non-Incendive Class I, Division 2 rated devices:
  - Follow the control drawings for the specific transmitter module and use Non-Incendive field wiring.
  - Refer to the specific transmitter module documents for calculating the allowed capacitance and inductance values for the NI field wiring circuit, the hazardous/classified locations in which the apparatus may be located, and the permissible connections to simple apparatus.
- Re-use of a thermowell in another service may cause contamination and/or an 💥 explosion (e.g., moving an oil/hydrocarbon service thermowell to an oxidizing service (some cleaning methods may not be effective enough to eliminate the hazards), etc.).
- Re-use of a thermowell from one installation to a subsequent installation may lead to early failure from previous cycles of variable flow conditions (e.g., pulsation, vibration, etc.) weakening the thermowell for other types of loading.
- Re-use of a thermowell that was installed in a corrosive environment may lead to early failure in further installations.

⚠ WARNING

- Do not exceed the temperature/pressure ratings of the process connection fitting (e.g., thermowell, fixed fitting probe, etc.).
- Do not exceed the rated temperatures of the temperature sensor assembly and its components (see the Temperature Code Ratings Table that follows).
- Aircom instrumentation temperature sensor assemblies are only certified for use in hazardous locations when they are installed in a hazardous location/area certified fitting (e.g., an Aircom CSA approved thermowell, an Aircom CSA approved welded fixed fitting probe, an Aircom CSA approved welded fixed fitting with flex-armor probe, etc.).

⚠ CAUTION

- Keep covers closed and sealed when there is a hazardous atmosphere.
- For Class I, Division 1, and Class II, Division 1 rated devices:
  - Open circuit before removing cover.
  - Keep covers tight while circuits are alive.
- If the device has been exposed to a hazardous environment it may have substances that have penetrated crevices, cracks, pores, or diffused into the device, ensure that the device is handled with care after service to avoid health issues.

Equipment Ratings:

CSA Certifications.

Item	Description
Master Contract:	163846
Certificate:	1526478
Hazardous Location Designations:	**TC9, TC14, RT9, RT14:** *Class I, Division 1, Groups A, B, C, D; Class II, Division 1, Groups E, F, G; Class III; T6…T1 Class I, Zone 1, Groups IIC, IIB plus hydrogen, IIB, Zone 20 **TC8, TC10, TC17, RT6, RT7, RT17:** *Class I, Division 1, Groups B, C, D; Class II, Division 1, Groups E, F, G; Class III; T6…T1 Class I, Zone 1, Groups IIB plus hydrogen, IIB, Zone 20 **TC16, RT16:** *Class I, Division 1, Groups C, D; Class II, Division 1, Groups E, F, G; Class III; T6…T1 Class I, Zone 1, Groups IIB, Zone 20 **TC11, TC15, RT11, RT15, SM2, SM4, HT2, HT3:** **Class I, Division 2, Groups A, B, C, D; T6…T1, (NI) Class I, Zone 2, Group IIC, (US only) When installed per transmitter Control Drawing and using non-incendive field wiring.

Table Notes: *Canada only when SNUN or STXUN is selected (for stainless steel unions). **Non-Incendive (NI) when installed per control drawing and using non-incendive field wiring.

Temperature Sensor Assemblies Supply, I/O Connections, and Operating Environmental Conditions.

Item	Description
Operation Conditions:	Continuous operation in extended environmental conditions
Electrical Rating:	30 Vdc, 1.0 A maximum
Enclosure Rating:	for indoor use, unless marked with an enclosure rating (*e.g.*, 4, 4X, none, *etc.*)
Maximum Altitude:	2,000 meters (6,561 feet)
Maximum Relative Humidity:	80% for temperatures up to 31°C (87.8°F), decreasing linearly to 50% RH at 40°C (104°F)

Item	Description
Equipment Class:	I
Overvoltage Category:	II
Pollution Degree:	2
Intended Supply:	Class 2, SELV (Safety Extra Low Voltage), or equivalent

Table Notes: Temperature sensor assemblies are intended to be connected to control/monitoring systems, consult the specific equipment documents for the I/O requirements.

Technical Specifications:

CSA Maximum Ambient Working Pressure.

Style	Maximum Working Pressure (Process Gauge-Pressure)
**Threaded Thermowell	Up to 48.26 MPa @ 20°C (7,000 psi @ 68°F)
*Flanged Thermowell	Up to 43.09 MPa @ 38°C (6,250 psi @ 100°F)
**Style F – Welded Probe	Up to 34.4 MPa @ 20°C (5,000 psi @ 68°F)
**Style G – Flex-Assembly Probe	Up to 34.4 MPa @ 20°C (5,000 psi @ 68°F)

Table Notes: *Flanged Thermowell pressure ratings are based on their Class from ASME B16.5 (e.g., 150# to 2500#). **Pressure ratings may be limited depending on the fitting type, materials selected, and the design code or standard used. The pressure values in this table are based on CSA and CRN rated values, for specific ratings contact Aircom.

Temperature Sensor Assembly Temperature Code Ratings Based on Ambient and Process Conditions Limits.

*Minimum Connection Extension (Nipple) Length	Rated Ambient Temperature Range	Rated Process Temperature Range	**T-Code
None (Style F probe) / zero clearance nipple	-50°C to +50°C (-58°F to +122°F)	-50°C to +50°C (-58°F to +122°F)	T6 (+85°C) (+185°F)
Short (1-inch)	-50°C to +50°C (-58°F to +122°F)	-50°C to +200°C (-58°F to +392°F)	T4A (+120°C) (+248°F)
Long (3-inch)	-50°C to +50°C (-58°F to +122°F)	-50°C to +230°C (-58°F to +446°F)	T3C (+160°C) (+320°F)
Extra-Long (8-inch)	-50°C to +50°C (-58°F to +122°F)	-50°C to +450°C (-58°F to +842°F)	T2 (+300°C) (+572°F)

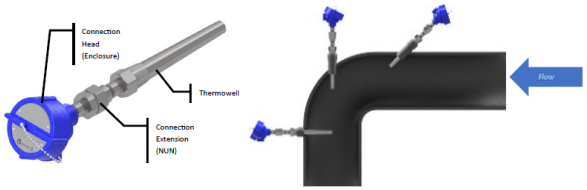
Table Notes: Surface temperatures not exceeding 100°C (T5) may not be marked on products. Pressure components may have different temperature ratings based on the design code or standard used. *The minimum connection extension length is the minimum length not in contact with the process at its maximum temperature. *This also applies to the flex-armor extension, probe tubing extension, or other styles of extensions (when adding 1.5" to the nipple length to account for not having the thermowell hex fitting length). **The maximum surface temperature at the maximum rated ambient temperature and the maximum rated process temperature.

Use and Installation Information:

- Ensure proper planning and selection are performed before installations of the temperature sensor assembly in an application as each instance is specific to the process and the location/site they are going into.
- Ensure all installation, operation, and maintenance information, safety warnings and notices are all reviewed before using temperature sensor assemblies, see (or use the QR code below) www.aircominstrumentation.com/product-manuals → Aircom-CSA-Temperature Sensor Assembly-IOM.
- Only qualified and authorized personnel following local jurisdictional, and location/site-specific requirements (*e.g.*, CEC, NEC, *etc.*) should install and operate temperature sensor assemblies when there are hazardous conditions present (*e.g.*, hazardous locations/areas, *etc.*). Special considerations may be required including overcurrent and fault protection.
- Protect the assembly from damage, shock, and moisture when shipping and handling.
- Store in a protected, dry, and warm indoor location. Use rust protection for prolonged storage, as applicable to the environment and material type (*e.g.*, desiccants, coatings, *etc.*).
- Verify the temperature sensor assembly is complete and free of damage or defects on receipt from shipping or storage before installing.
- Follow local regulations and good practices when disposing of the temperature sensor assembly.
- The temperature sensor assembly is not intended to be repaired or re-used.
- Partial assemblies and field replacement kits are available to complete assemblies that use certified thermowells and interconnecting components in the field.

General Installation Considerations:

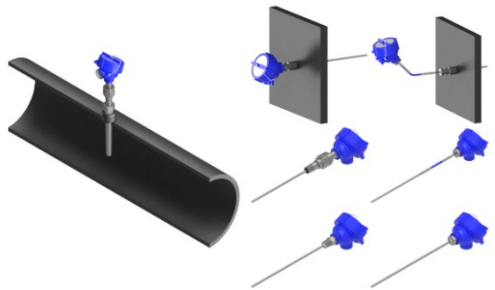
- Cleanliness of the sensor's contact surface (*e.g.*, remove rust at surface mount location, *etc.*).
- Pressure and temperature ratings (*e.g.*, extension length, surface temperatures, *etc.*).
- Electrical and hazardous location/area ratings.
- Moisture ingress protection and compatibility with the external environment.
- Compatibility with the process medium(s).
- Insulation, and heat tracing.
- If the assembly is provided with a transmitter, then review the transmitter documentation before installation and follow the installation instruction for the application as required.
  - Documents may include but are not limited to the catalogue, datasheet, IOM manual, quick/installation instructions, specifications, drawings, control drawings, wiring diagrams, hazardous location drawings, etc.
- Wiring and controls methods.
- Mounting methods (*e.g.*, brackets, band clamps, etc.), orientation of sensor and head, and insertion angle and depth.



Assembly parts and orientations covered by ASME PTC 19.3 TW.

Threaded Installation Considerations:

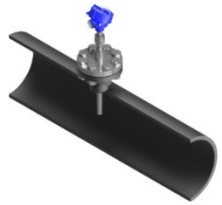
- Type of threads (e.g., NPT, etc.).
- Materials of threads and combinations (e.g., bimetallic corrosion, compatibility, etc.).
- Thread engagement (e.g., torque, etc.).
- Sealing of threads (e.g., thread sealants, dry seal threads, seal welds, etc.).



Threaded and compression fitting assemblies.

Flanged Installation Considerations:

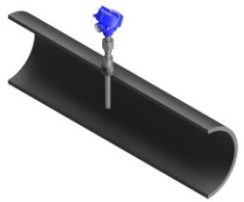
- Flange type, gasket type, and flange alignment/orientation.
- Materials of flanges and fasteners (e.g., bimetallic corrosion, compatibility, etc.).
- Thread engagement of bolts (e.g., bolt stretch based on torque, thermal expansion, pattern used for tightening, etc.).



Flanged assembly.

Welded Installation Considerations:

- Thermowell alignment/orientation.
- Materials of thermowell and filler metal (e.g., bimetallic corrosion, compatibility, etc.).
- Qualified weld procedures and qualified welder.
- Socket weld gap for thermal expansion.



Welded assembly.

Surface Mount Installation Considerations:

- Mounting method for the application (*e.g.*, remote mounted head, ability to reposition/move around, magnet strength 22 kg, 34 kg, or 68 kg (50 lb, 75 lb, or 150 lb) pull-force (hanging weight), clamping force, compatibility with insulation, corrosion effects, ease of maintenance, *etc.*).
- Surface contact type (*e.g.*, surface contact (*e.g.*, spring-loaded, clamped, welded, *etc.*), surface embedded, *etc.*).