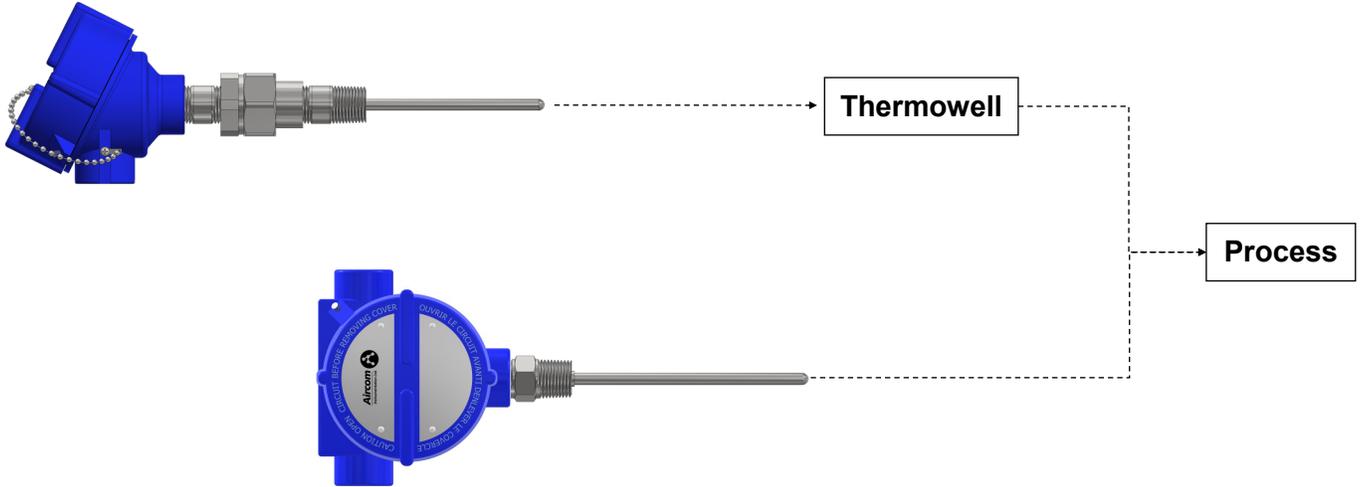


TC10 Thermocouple Assembly

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; T6...T1



Overview

Description:

The TC10 thermocouple assembly is a thermocouple designed for use in hazardous locations. The TC10 is a customizable product that is model number configured and made to order.

The TC10 consists of a thermocouple sensor probe, complete with a connection head (enclosure) that may be provided with a terminal block, DIN rail, wire splice connectors, or internal transmitter. Connection extension fittings will spring load the sensor into a thermowell or a fixed fitting can be used without a thermowell.

Features:

- Simple design that is used and accepted across multiple process industries.
- TC10 configuration options allow for many different arrangements to be configured for almost any temperature measurement application.

Application:

- Hazardous location temperature measurement
- Industrial temperature measurement
- Process control
- Outdoor / indoor use

Specifications

| | |
|-------------------------------|-----------------------------------|
| Accuracy TC | Tolerance per ASTM E230 |
| T-Code | T6...T1 |
| Electrical rating | 30 Vdc, 1.0 A max |
| Ambient temperature | -50°C to +50°C (-58°F to +122°F) |
| Process temperature | -50°C to +450°C (-58°F to +842°F) |
| CSA Certificate of Compliance | 1526478 |

Note: Specifications will depend on model code variants, and the values shown are the full rated model ranges.



TC10 Thermocouple Assembly Model Code

TC10 - T1 T1A - T2 - T3 - T4 - T5 - T6 - T7 - T8 - T9

TC10 Thermocouple assembly with connection head and connection extension fittings

| T1 | Connection Head | Color | Material | Conduit Connection | Terminal Block | Type Rating |
|------|--|-------|-----------------------|--------------------|----------------|-------------|
| 2ALT | Standard style | Blue | Aluminum epoxy coated | 1x 3/4" NPT | Bakelite | Type 4X |
| 1ALT | Standard style | Blue | Aluminum epoxy coated | 1x 1/2" NPT | Bakelite | Type 4X |
| 3ALT | Standard style | Blue | Aluminum epoxy coated | 1x 3/4" NPT | Ceramic | Type 4X |
| 2ALW | Mounting holes | Grey | Aluminum epoxy coated | 1x 3/4" NPT | Bakelite | Type 4X |
| 2ALM | Multi connection | Blue | Aluminum epoxy coated | 2x 3/4" NPT | Bakelite | Type 4X |
| 2AL | Standard style | Grey | Aluminum | 1x 3/4" NPT | Bakelite | Type 4 |
| 2SS | Standard style | Steel | Stainless steel | 1x 3/4" NPT | Bakelite | Type 4X |
| Note | Refer to page 6 for additional options, details and other styles | | | | | |

| T1A | Terminal Block / Transmitter | T1A | Continued |
|---------|------------------------------|-------|--|
| 'Blank' | Bakelite terminal block | 31D | 5331D PR puck transmitter |
| C | Ceramic terminal block | 35D | 5335D PR puck transmitter (with HART) |
| D | DIN mount technology | Other | See page 7 or consult factory for additional options |
| S | Splicing connectors | | |

| T2 | Connection Extension | Material | CSA Note |
|-------------|---|-----------------|--|
| N | Nipple 1/2" NPT ¹ | Galvanized | Thermowell required ² for hazardous rating |
| SN | Nipple 1/2" NPT ¹ | Stainless Steel | |
| NUN | Nipple-union-nipple 1/2" NPT¹ | Galvanized | |
| TX | Spring loaded fitting 1/2"x1/2" NPT | Stainless Steel | |
| TXUN | Spring loaded fitting-union-nipple | Galvanized | Canada only, Thermowell required ² for hazardous rating |
| SNUN | Nipple-union-nipple 1/2" NPT ¹ | Stainless Steel | |
| STXUN | Spring loaded fitting-union-nipple | Stainless Steel | |
| FS | Fixed bushing 1/2"x1/2" NPT | Stainless Steel | CSA process pressure rating ≤ 34.4 MPa @ +20°C (5000 psi @ +68°F) |
| FX | Fixed hex instrument fitting 1/2" NPT | Stainless Steel | CRN process pressure rating ≤ 25.5 MPa @ +20°C (3700 psi @ +68°F) |

| T3 | Connection Extension Length (CEL) | Connection Extension (T2) Options | CSA Rating |
|------------|--|-----------------------------------|--|
| X | Fixed - FS/TX = 1" (A), FX = 0.5" (A) | FS, FX, TX | -50°C to +50°C (-50°F to +122°F), T6 |
| 0.5 | Clearance fit | N, SN | -50°C to +50°C (-50°F to +122°F), T6 |
| 1.5 | 1.5" (CEL), 1" installed length (A) | N, SN | -50°C to +200°C (-50°F to +392°F), T4A |
| 3.5 | 3.5" (CEL), 3" installed length (A) | N, NUN, TXUN, SN, SNUN, STXUN | -50°C to +230°C (-58°F to +446°F), T3C |
| 4.5 | 4.5" (CEL), 4" installed length (A) | N, NUN, TXUN, SN, SNUN, STXUN | -50°C to +230°C (-58°F to +446°F), T3C |
| 8.5 | 8.5" (CEL), 8" installed length (A) | SN, SNUN, STXUN | -50°C to +450°C (-58°F to +842°F), T2 |
| "inches" | Specify other Connection Extension Length (CEL). Note ³ : CEL = A + t _p ; A = CEL - t _p | | Reference above |

Continued on page 3

NOTES:

1. N, SN, NUN, SNUN require connection heads and terminal block to enable spring-loaded functionality.
2. Must be installed into certified thermowell at Aircom or in the field.
3. CEL=Connection Extension Length, A=Installed Length, OAL=Fitting Overall Length, t_h=Head thread, t_p=Process thread.
4. Bold text indicates most common part selections.



TC10 Thermocouple Assembly Model Code

TC10 - T1 T1A - T2 - T3 - T4 - T5 - T6 - T7 - T8 - T9

Continued from page 2

| T4 | Thermocouple Type | |
|----------|-------------------|----------|
| K | Type K | N Type N |
| J | Type J | R Type R |
| T | Type T | S Type S |
| E | Type E | B Type B |

| T5 | Sensor Sheath Diameter |
|-----------|------------------------|
| 18 | 1/8" OD |
| 36 | 3/16" OD |
| 14 | 1/4" OD |
| 38 | 3/8" OD |

| T6 | Thermocouple Junction |
|----------|-----------------------|
| G | Grounded |
| U | Ungrounded |
| E | Exposed |

| T7 | Thermocouple Junction Quantity |
|----------|--------------------------------|
| S | Single |
| D | Dual |
| T | Triple |
| Q | Quad |

| T8 | Sensor Sheath Material |
|------------|---------------------------------|
| 304 | 304/304L stainless steel |
| 316 | 316/316L stainless steel |
| 310 | 310 stainless steel |
| 600 | Inconel 600 |
| HAC | Hastelloy C-276 |
| Other | Consult factory |

| T9 | Sensor "L" Length (inches) |
|----------|----------------------------|
| "inches" | Specify length in inches |

NOTES:

1. Part number example: TC10-2ALT32D-NUN-3.5-K-14-U-S-316-14.
2. Reference page 4-5 for outline and dimensions.
3. Bold text indicates most common part selections.



TC10 Thermocouple Assembly Outline

Connection Head



Refer to page 6 for additional connection head styles, options, and details

Connection Extension

N & SN



NUN & SNUN



FS



FX



TX



TXUN & STXUN



Sensor Probe (OD)

18
(0.125")



36
(0.188")



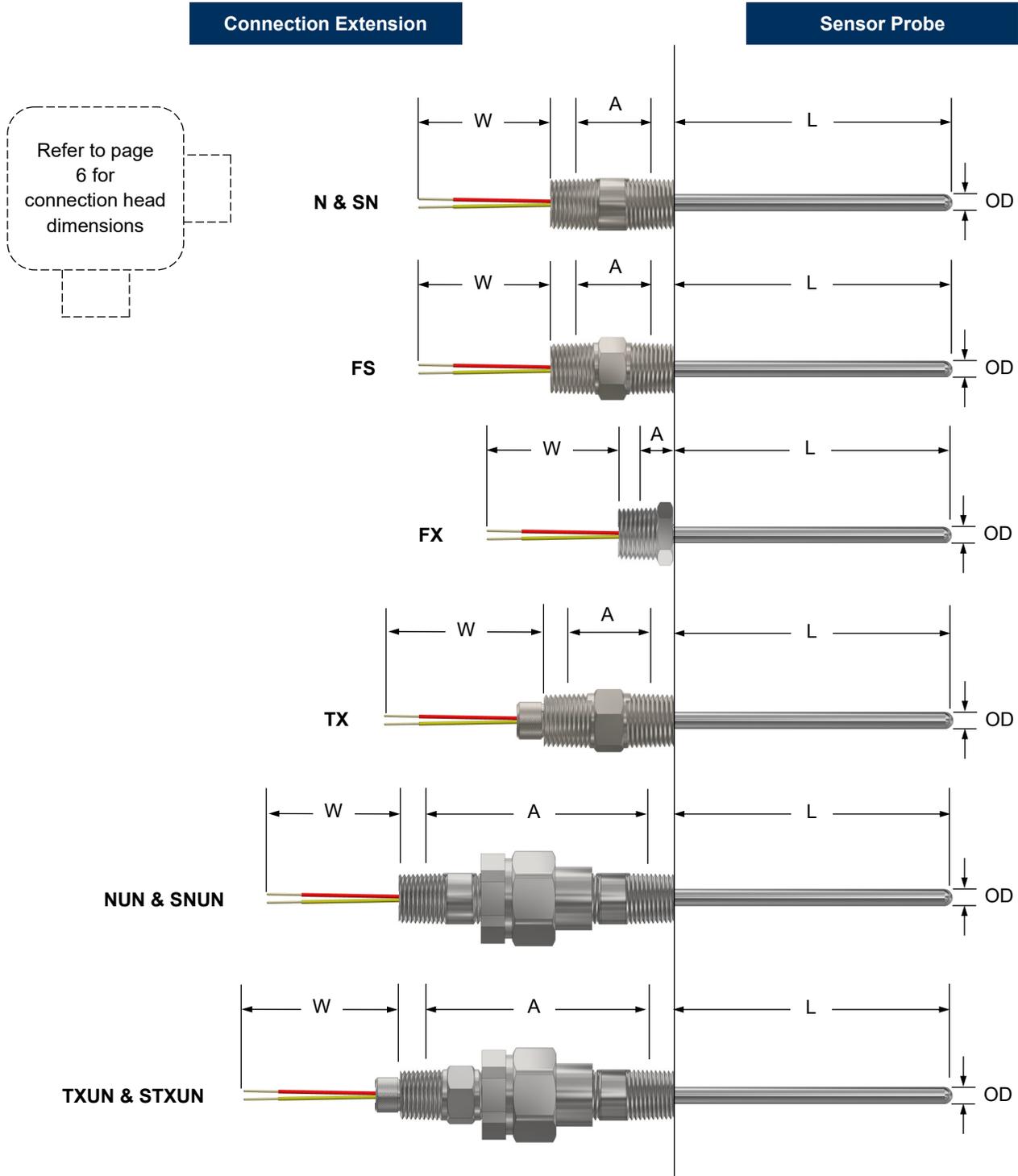
14
(0.250")



38
(0.375")



TC10 Thermocouple Assembly Dimensions



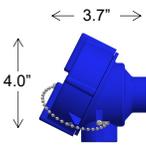
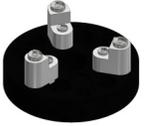
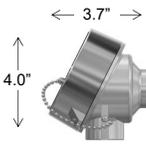
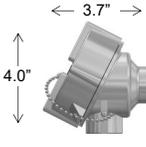
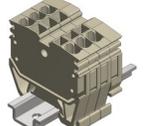
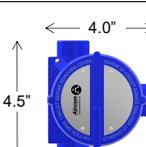
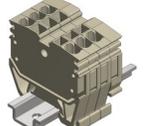
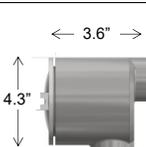
NOTE:

1. Assemblies are supplied with 6" to 8" of lead wire (W).
2. Thread engagements are approximately 0.5".



TC10 Connection Heads

Model, Outline, and Dimensions

| Outline & Dimensions | Model | Connection (NPT) | | Material & Type | Ambient Temperature | Terminal Block Options (T1A) | |
|--|-------------------|-------------------|----------------------|--|---|---|--|
| | | Instrument | Conduit | | | | |
|  | 1ALT | 1/2" | 1x 1/2" ² | Cast aluminum epoxy coated Buna O-ring Type 4X | -50°C to +85°C (-58°F to +185°F) (+125°C (+257°F) Canada only) |  Bakelite - <u>standard</u> Screw terminals to suit sensor configuration | |
| | 2ALT | 1/2" | 1x 3/4" | | | | |
| | 3ALT | 3/4" | 1x 3/4" | | | | |
|  | 1SS | 1/2" | 1x 1/2" ² | 316 stainless steel Buna O-ring Type 4X | | -50°C to +85°C (-58°F to +185°F) (+125°C (+257°F) Canada only) |  Ceramic - optional Screw terminals to suit sensor configuration Add suffix "C" to connection head model number. |
| | 2SS | 1/2" | 1x 3/4" | | | | |
| | 3SS | 3/4" | 1x 3/4" | | | | |
|  | 1AL | 1/2" | 1x 1/2" ² | Cast aluminum Buna O-ring Type 4 | -50°C to +85°C (-58°F to +185°F) (+125°C (+257°F) Canada only) | |  Ceramic - optional Screw terminals to suit sensor configuration Add suffix "C" to connection head model number. |
| | 2AL | 1/2" | 1x 3/4" | | | | |
| | 3AL | 3/4" | 1x 3/4" | | | | |
|  | 1ALW | 1/2" ² | 1x 1/2" ² | Cast aluminum epoxy coated Buna O-ring Type 4X | | -40°C to +85°C (-40°F to +185°F) |  Clamp technology - optional DIN mounted clamp technology terminals to suit sensor configuration Add suffix "D" to connection head model number. |
| | 2ALW | 1/2" ² | 1x 3/4" | | | | |
| | 3ALW | 3/4" | 1x 3/4" | | | | |
| | 4ALW | 3/4" | 2x 3/4" | | | | |
|  | 1ALM | 1/2" | 2x 1/2" | Cast aluminum epoxy coated Buna O-ring Type 4X | -40°C to +85°C (-40°F to +185°F) | |  Clamp technology - optional DIN mounted clamp technology terminals to suit sensor configuration Add suffix "D" to connection head model number. |
| | 2ALM | 1/2" | 2x 3/4" | | | | |
| | 3ALM | 3/4" | 2x 3/4" | | | | |
|  | 1CAL ³ | 1/2" ² | 1x 1/2" ² | Cast aluminum Buna O-ring Type 4 | | -20°C to +40°C (-4°F to +104°F) |  Splice technology - optional Wire splicing connectors contained loosely within connection head. Add suffix "S" to connection head model number. |
| | 2CAL ³ | 3/4" | 1x 3/4" | | | | |
|  | 4CAL ³ | 1/2" | 2x 1/2" | Cast aluminum Buna O-ring Type 4 | | | -20°C to +40°C (-4°F to +104°F) |
| | 3CAL ³ | 3/4" | 2x 3/4" | | | | |

NOTES:

1. Ambient ratings are of the connection head only, temperature assembly ambient rating is typically -50°C to +50°C (-58°F to +122°F).
2. May be supplied with an approved 3/4" x 1/2" NPT reducer bushing.
3. Type ratings are for enclosure component of assembly ONLY and not full assembly.



TC10 Thermocouple Assembly Transmitters

Transmitter Options for T1/T1A

| Image | Code | Model | Specifications |
|---|-------|--|---|
|  | 31D | 5331D PR Order PN RTD, TC, Ohm, or mV input Extremely high accuracy 1.5 kVAC galvanic isolation Programmable sensor error value For DIN form B sensor head mounting | Operating Temperature: -40°C to +85°C Protection Degree: IP68 (enclosure) / IP00 (terminal) Dimensions: Ø 44 x 20.2 mm Weight: Approx. 50 g Supply Voltage: 7.2...30 VDC Isolation Voltage: 1.5 kVAC (test) / 50 VAC (working) Accuracy: Better than 0.05% of selected range Response Time (Programmable): 1...60 s Signal Range (Output): 4...20 mA Approvals: ATEX, IECEx, FM, CSA, INMETRO Refer to PR Electronics for full details |
|  | 35D | 5335D PR Order PN RTD, TC, Ohm, or mV input Extremely high accuracy HART 5 protocol Galvanic isolation For DIN form B sensor head mounting | Zone 0,1,2,21,22, M1 / DIV.1, DIV.2 Operating Temperature: -40°C to +85°C Protection Degree: IP68 (enclosure) / IP00 (terminal) Dimensions: Ø 44 x 20.2 mm Weight: Approx. 50 g Supply Voltage: 8.0...30 VDC Isolation Voltage: 1.5 kVAC (test) / 50 VAC (working) Accuracy: Better than 0.05% of selected range Response Time (Programmable): 1...60 s Signal Range (Output): 4...20 mA Approvals: ATEX, IECEx, FM, CSA, INMETRO, SIL Refer to PR Electronics for full details |
| Image Not Applicable | 37D1 | 5337D1 PR Order PN | Refer to PR Electronics for full details |
| Image Not Applicable | 37D2 | 5337D2 PR Order PN | Refer to PR Electronics for full details |
| Image Not Applicable | 47D1 | 5437D1 PR Order PN | Refer to PR Electronics for full details |
| Image Not Applicable | Other | Consult Aircom for other available options | |