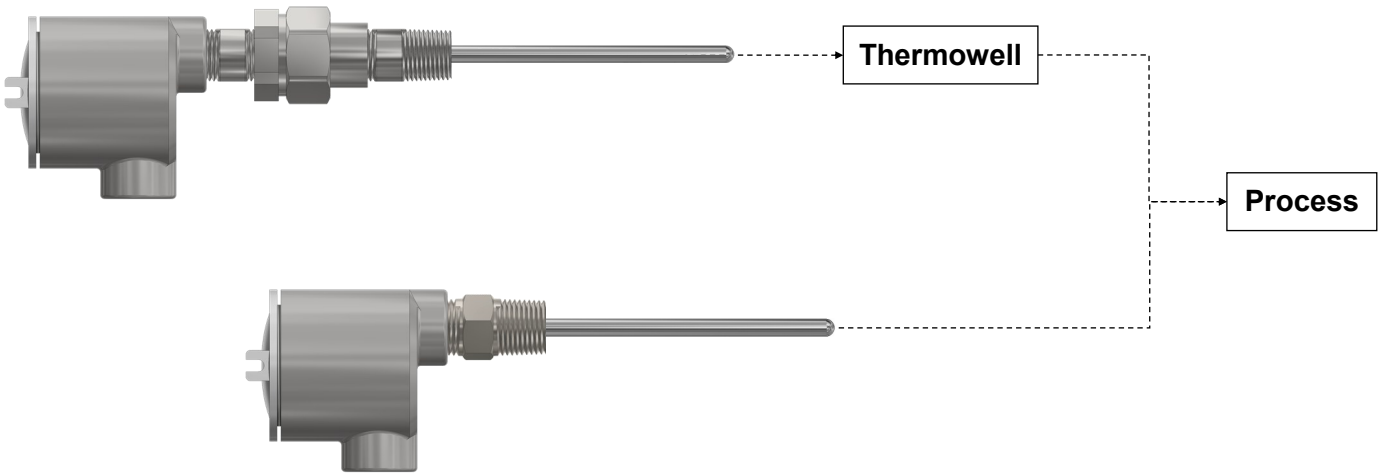
TC9 Thermocouple Assembly

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; T6…T1



Overview

Description:

The TC9 thermocouple assembly is a thermocouple designed for use in hazardous locations. The TC9 is a customizable product that is model number configured and made to order.

The TC9 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.
- TC9 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.*

C US

Aircom Instrumentation Ltd.
9328 - 37 Avenue NW
Edmonton, AB T6E 5K3
Ph: (780) 434-6916
Sales@AircomInstrumentation.com
www.AircomInstrumentation.com

TC9 Thermocouple Assembly Model Code

TC9 - T1 T1A - T2 - T3 - T4 - T5 - T6 - T7 - T8 - T9

TC9	Thermocouple assembly with connection head and connection extension fittings

T1	Connection Head	Color	Material	Conduit Connection	Terminal Block	Type Rating
1AAL	Traditional enclosure	Grey	Cast aluminum	1x 1/2” NPT	Bakelite	Type 4
2AAL	Traditional enclosure	Grey	Cast aluminum	1x 3/4” NPT	Bakelite	Type 4
3AAL	Traditional enclosure	Grey	Cast aluminum	2x 3/4” NPT	Bakelite	Type 4
4AAL	Traditional enclosure	Grey	Cast aluminum	2x 1/2” NPT	Bakelite	Type 4
1CCI	Traditional enclosure	Grey	Cast iron	1x 1/2” NPT	Bakelite	Type 4
2CCI	Traditional enclosure	Grey	Cast iron	1x 3/4” NPT	Bakelite	Type 4
3CCI	Traditional enclosure	Grey	Cast iron	2x 3/4” NPT	Bakelite	Type 4
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
TX	Spring loaded fitting 1/2”x1/2” NPT	Stainless Steel	Thermowell required[1] for hazardous rating
TXUN	**Spring loaded fitting-union-nipple**	Galvanized	
STXUN	Spring loaded fitting-union-nipple	Stainless Steel	Canada only, Thermowell required[1] for hazardous rating
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
3.5	**3.5” (CEL), 3” installed length (A)**	TXUN, STXUN	-50°C to +230°C (-58°F to +446°F),T3C
4.5	4.5” (CEL), 4” installed length (A)	TXUN, STXUN	-50°C to +230°C (-58°F to +446°F), T3C
8.5	8.5” (CEL), 8” installed length (A)	STXUN	-50°C to +450°C (-58°F to +842°F), T2
“inches”	Specify other Connection Extension Length (CEL). Note[2]: CEL = A + t_p; A = CEL - t_p		Reference above

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

Continued on page 3

NOTES:

1. Must be installed into certified thermowell at Aircom or in the field.
2. CEL=Connection Extension Length, A=Installed Length, OAL=Fitting Overall Length, t_h=Head thread, t_p=Process thread.
3. Bold text indicates most common part selections.

Aircom Instrumentation Ltd.
9328 - 37 Avenue NW
Edmonton, AB T6E 5K3
Ph: (780) 434-6916
Sales@AircomInstrumentation.com
www.AircomInstrumentation.com

TC9 Thermocouple Assembly Model Code

TC9	-	T1	T1A	-	T2	-	T3	-	T4	-	T5	-	T6	-	T7	-	T8	-	T9

Continued from page 2

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

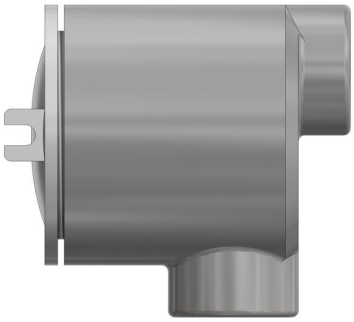
NOTES:
1. Part number example: TC9-1AAL-TXUN-3.5-K-14-U-S-316-14.
2. Reference page 4-5 for outline and dimensions.
3. Bold text indicates most common part selections.

Aircom Instrumentation Ltd.
9328 - 37 Avenue NW
Edmonton, AB T6E 5K3
Ph: (780) 434-6916
Sales@AircomInstrumentation.com
www.AircomInstrumentation.com

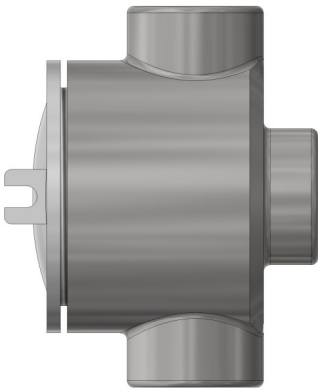
TC9 Thermocouple Assembly Outline

Connection Head

1AAL



3AAL



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

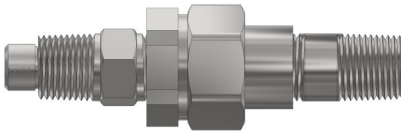
Connection Extension

FS

FX

TX

TXUN & STXUN



Sensor Probe (OD)

18
(0.125”)

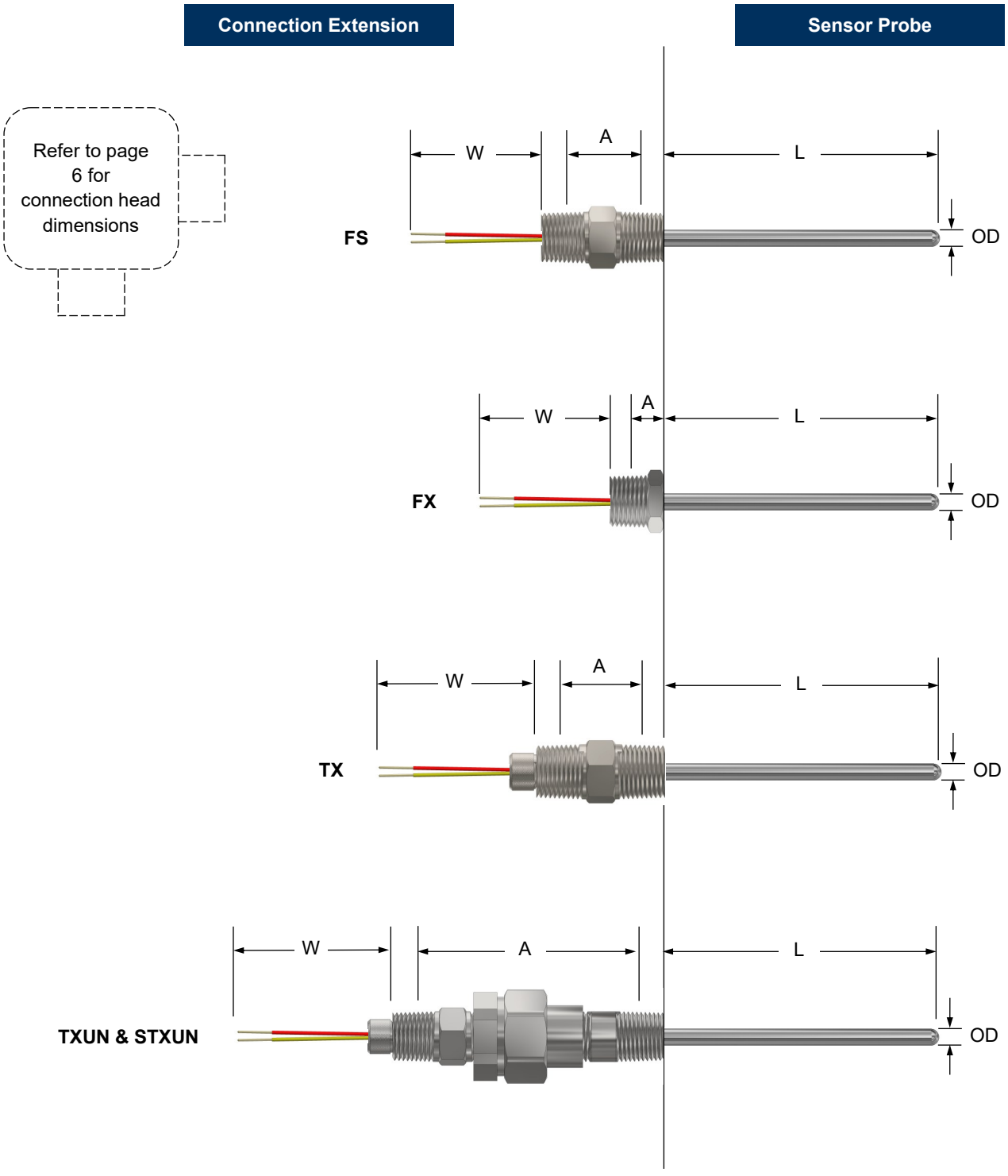
36
(0.188”)

14
(0.250”)

38
(0.375”)

Aircom Instrumentation Ltd.
9328 - 37 Avenue NW
Edmonton, AB T6E 5K3
Ph: (780) 434-6916
Sales@AircomInstrumentation.com
www.AircomInstrumentation.com

TC9 Thermocouple Assembly Dimensions



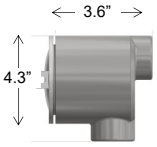
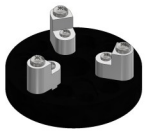
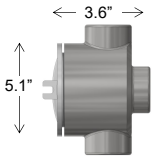
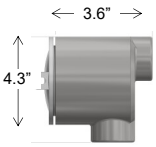
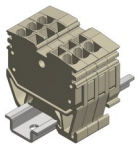
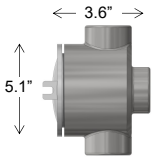
NOTE:

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

Aircom Instrumentation Ltd.
9328 - 37 Avenue NW
Edmonton, AB T6E 5K3
Ph: (780) 434-6916
Sales@AircomInstrumentation.com
www.AircomInstrumentation.com

TC9 Thermocouple Connection Heads

Model, Outline, and Dimensions

Outline & Dimensions	Model	Connection (NPT)		Material & Type	Ambient Temperature	Terminal Block Options (T1A)
		Instrument	Conduit			
	1AAL	1/2"	1x 1/2"	Cast aluminum Buna O-ring Type 4	-20°C to +120°C	 Bakelite - standard Screw terminals to suit sensor configuration
	2AAL	3/4"	1x 3/4"			
	4AAL	1/2"	2x 1/2"			 Ceramic - optional Screw terminals to suit sensor configuration Add suffix "C" to connection head model number.
	3AAL	3/4"	2x 3/4"			
	1CCI	1/2"	1x 1/2"	Cast iron Buna O-ring Type 4	-25°C to +40°C	 Clamp technology - optional DIN mounted clamp technology terminals to suit sensor configuration Add suffix "D" to connection head model number.
	2CCI	3/4"	1x 3/4"			
	4CCI	1/2"	2x 1/2"			 Splice technology - optional Wire splicing connectors contained loosely within connection head. Add suffix "S" to connection head model number.
	3CCI	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.

Aircom Instrumentation Ltd.
9328 - 37 Avenue NW
Edmonton, AB T6E 5K3
Ph: (780) 434-6916
Sales@AircomInstrumentation.com
www.AircomInstrumentation.com

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	37D	5337D 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	47D2	5437D2 PR Order PN	Refer to PR Electronics for full details
Image Not Applicable	Other	Consult Aircom for other available options	

Aircom Instrumentation Ltd.
9328 - 37 Avenue NW
Edmonton, AB T6E 5K3
Ph: (780) 434-6916
Sales@AircomInstrumentation.com
www.AircomInstrumentation.com