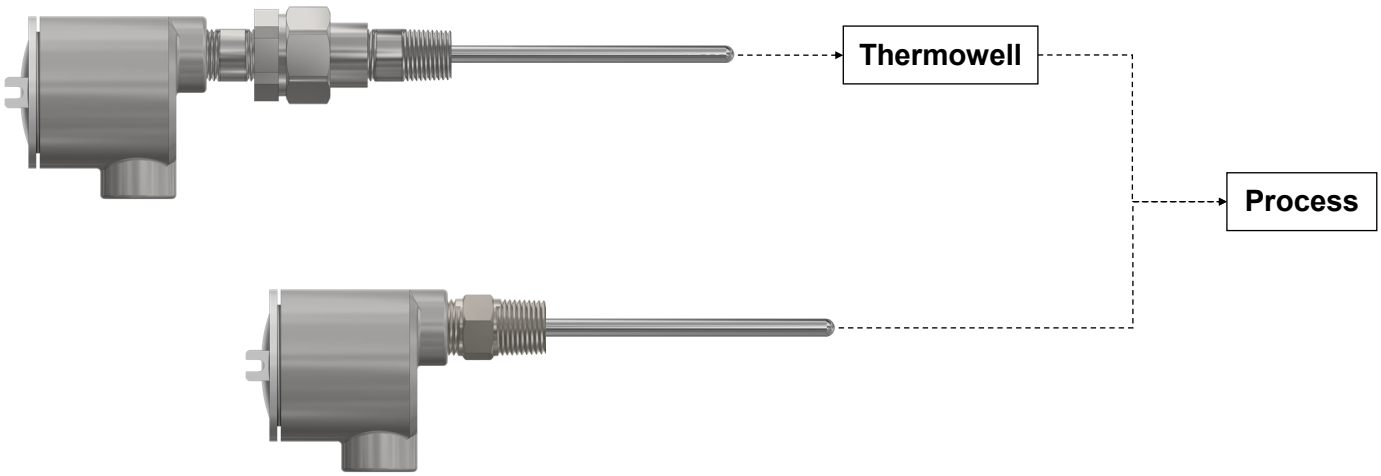
RT9 RTD Assembly

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 RT9 RTD assembly is a resistance temperature detector designed for use in hazardous locations. The RT9 is a customizable product that is model number configured and made to order.

The RT9 consists of a stainless steel RTD sensor, 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.
- RT9 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 RTD	Tolerance per IEC 60751 (DIN EN 60751)
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.*

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RT9 RTD Assembly Model Code

RT9	-	T1	T1A	-	T2	-	T3	-	T4	-	T5	-	T6	-	T7	-	T8	-	T9

RT9	RTD 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
Other	Refer to page 6 for additional options, details and other styles					

T1A	Terminal Block / Transmitter	T1A	Continued
'Blank'	**Bakelite terminal block**	**32D**	**5332D PR puck transmitter**
C	Ceramic terminal block	31D	5331D PR puck transmitter
D	DIN mount technology	35D	5335D PR puck transmitter (with HART)
S	**Splicing connectors**	Other	See page 7 or consult factory for additional options

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	Element Type
A	**100Ω Pt. 385 Class A (Class A tolerance ≤ +300°C (+572°F), Class B tolerance typically applies >+300°C (+572°F))**
B	100Ω Pt. 385 1/10 Class B (1/10 DIN; tolerance typically applies ≤ +150°C (+302°F))
C	100Ω Platinum 392
D	120Ω Nickel 627 0.806Ω/ºC
E	10Ω Copper 427 0.039Ω/ ºC
F	1000Ω Pt. 385 Class A

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.

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RT9 RTD Assembly Model Code

RT9	-	T1	T1A	-	T2	-	T3	-	T4	-	T5	-	T6	-	T7	-	T8	-	T9

Continued from page 2

T5	Number of Elements
S	**Single element**
D	Dual element

T6	Lead Wire Configuration
2	2 Wire
3	**3 Wire**
4	**4 Wire**

T7	Sensor Probe Construction	
LT	**Low temperature (-50 to +260ºC) (-58°F to +500°F)**	Temperature values are for the RTD temperature sensor probe construction only. The CSA process and ambient temperature assembly ratings are dependant on connection head (T1), connection extension type and length (T2 & T3), as well as the thermowell or fixed fitting it is connected to.
HT	High temperature (-50 to +482ºC) (-58°F to +899°F)	
ET	Extreme temperature (-50 to +850°C) (-58°F to +1562°F)	
VL	Vibration construction low temp (-50 to +260ºC) (-58°F to +500°F)	
VH	Vibration construction high temp (-50 to +482ºC) (-58°F to +899°F)	
CT	Cryogenic temperature (-200 to +260°C) (-328°F to +500°F)	

T8	Sensor “L” Length (inches)
“inches”	Specify length in inches

T9	Sensor Sheath Diameter
18	1/8” (0.125”)
36	3/16” (0.188”)
14	**1/4” (0.250”)**
38	3/8” (0.375”)

NOTES:
1. Part number example: RT9-1AAL-TXUN-3.5-A-S-3-LT-12-14.
2. Reference page 4-5 for outline and dimensions.
3. Standard sheath material supply is 316/316L stainless steel.

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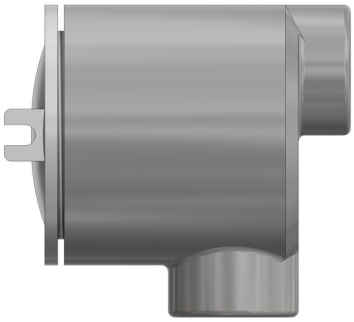
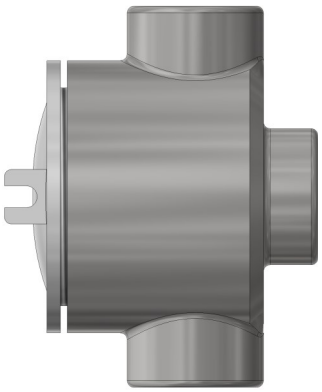
RT9 RTD Assembly Outline

Connection Head

1AAL



3AAL



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

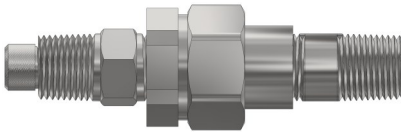
Connection Extension

FS

FX

TX

TXUN & STXUN



Sensor Probe (OD)

18

(0.125”)

36

(0.188”)

14

(0.250”)

38

(0.375”)

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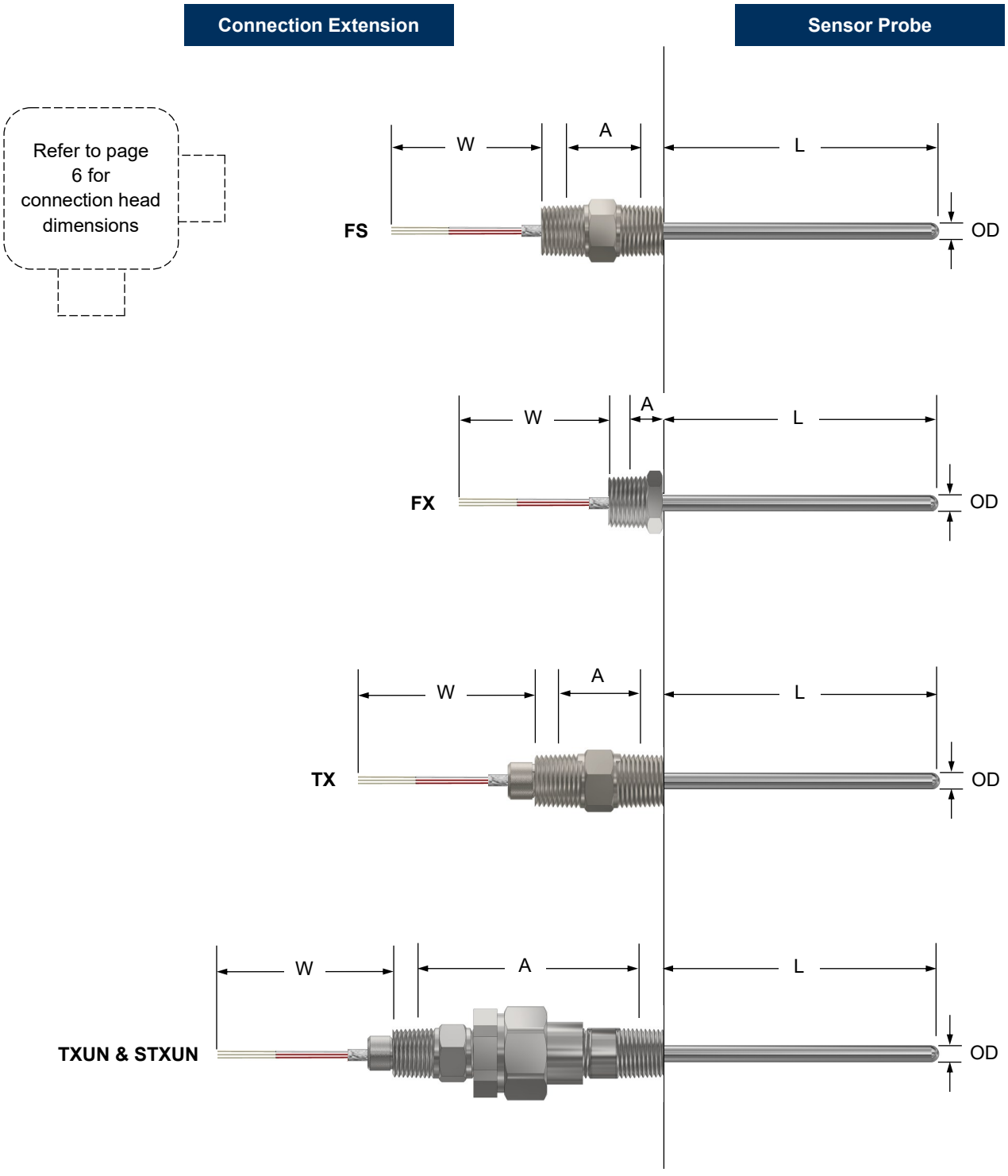
RT9 RTD Assembly Dimensions



NOTE:

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

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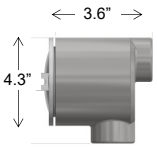
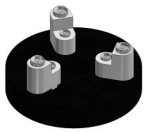
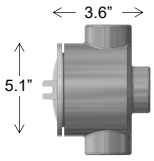
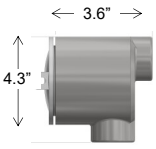
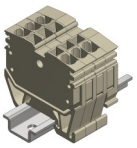
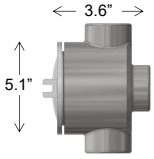
RT9 RTD Assembly Connection Heads

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.

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Transmitter Options for T1/T1A

Image	Code	Model	Specifications
	32D	5332D PR Order PN RTD or Ohm input Extremely high accuracy Programmable sensor error value For DIN form B sensor head mounting	Hazardous area, Zone 0 / Div. 0 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 Signal Range (Output): 4…20 mA Accuracy: Better than 0.05% of selected range Response Time (Programmable): 1…60 s Signal Dynamics: Input 20 bit / Output 16 bit Approvals: ATEX, IECEx, FM, CSA Refer to PR Electronics for full details
	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	

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