



TEL-TRU MANUFACTURING COMPANY

TEMPERATURE TRANSMITTERS

RTD Probe Assemblies

with Built-in Programmable Microprocessor Based Transmitters



www.teltru.com

<i>World-Class Instruments</i>	<i>Since 1916</i>
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How to Order

Ordering Example: Model STAA3, .187" probe diameter, 4" length, 2-1/2" Tri-Clamp connection, -50/120°F range, M-12 termination with 15' of cable, programmable built-in compact transmitter.

A	B	C	D	E	F	G
S T A A 3	1 0 4	2 5	5 2	A 1 5	Z 1	

Range Chart

Code Range

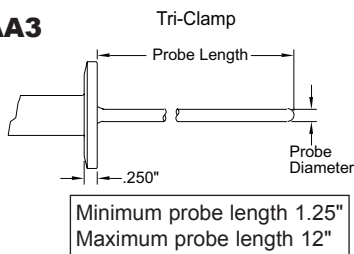
Standard Ranges

Code	Range°F	Code	Range°C
52	-50/120	71	-50/100
53	-40/160	72	-50/25
54	0/140	73	-50/50
55	0/180	84	-40/70
50	0/200	86	-20/120
56	0/220	74	-10/110
67	0/250	75	0/50
57	0/300	95	0/60
59	20/240	EI	0/80
60	25/125	76	0/100
61	50/250	77	0/150
62	50/300		

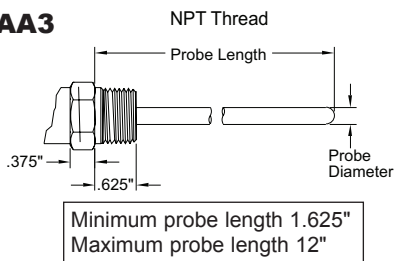
Other ranges available on request, minimum scale
Minimum span 10°C or 18°F

Process Connection Options

STAA3

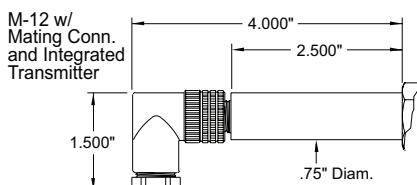


NTAA3



Termination Option - ST and NT

AXX



RTD Probe Assemblies

NTAA3

Industrial RTD probe assembly with built-in compact transmitter

Probe: 316SS with threaded fitting

STAA3

Sanitary RTD probe assembly with built-in compact transmitter

Probe: 316L SS with Tri-Clamp CIP fitting

Surface finish:
Wetted parts
<16µin.



4 to 20 mA 2-wire loop powered output, with single element thin film Pt100 3-wire RTD, Accuracy Class A +/- .06% at 0°C (coefficient 0.00385)

PC programmable

Measurement Range:
-60/320°F (-50/160°C)

A	MODEL	CODE	MODEL	CODE
	NTAA3	NTAA3	STAA3	STAA3
B	PROBE DIAMETER		PROBE DIAMETER	
	0.187"	1	0.187"	1
	0.250"	2	0.250"	2
C	PROBE LENGTH		PROBE LENGTH	
	2-1/2"	02	2-1/2"	02
	4"	04	4"	04
	6"	06	6"	06
	9"	09	9"	09
	12"	12	12"	12
	Other as specified	XX	Other as specified	XX
D	PROCESS CONNECTION		PROCESS CONNECTION	
	1/2" NPT	A1	Tri-Clamp 1/2" and 3/4"	05
	1/4" NPT	A2	Tri-Clamp 1" and 1-1/2"	10
	3/8" NPT	A3	Tri-Clamp 2"	20
	Other as specified	XX	Tri-Clamp 2-1/2"	25
E	TEMPERATURE RANGE		TEMPERATURE RANGE	
	See Range Chart		See Range Chart	
F	TERMINATION		TERMINATION	
	M-12 conn. w/o mate	E00	M-12 conn. w/o mate	E00
	M-12 w/mating conn. and XX feet cable	AXX	M-12 w/mating conn. and XX feet cable	AXX
	Other as Specified	XXX	Other as Specified	XXX
G	TRANSMITTER		TRANSMITTER	
	Programmable built-in compact transmitter	Z1	Programmable built-in compact transmitter	Z1

OEM Special configurations available upon application

Microprocessor Integrated Sensor Technology (MIST™)

The key innovation of the Tel-Tru MIST™ Series temperature sensors is a compact and programmable microprocessor based transmitter, fully integrated, and built-in to the RTD probe assemblies. Based on patented* MIST™ Technology, the MIST Temperature Sensors are designed for optimum accuracy and performance.

Best Value in RTD Temperature Transmitters

Compact Size

- More compact than conventional RTD and transmitter assemblies
- Easily used in environments where space is limited or access is difficult
- Electronic circuit and microprocessor are potted in a miniature stainless steel housing, only 2.5" long by 0.75" in diameter

Robust and Long Lasting

- TIG welded construction
- Hermetic seal keeps moisture out
- Highest quality materials
 - Fully potted electronics
 - 316 stainless steel probe
- Robust construction of the transmitter housing enables it to withstand:
 - Severe vibrations
 - Harsh wash downs
 - Drastic temperature changes
 - Other severe operational conditions
- Maintenance free
- Sturdy, reusable and well designed construction for long lifespan

Easy Installation-Unique Design

- RTD element and electronics are integrated in the mechanical assembly for reduced installation time and wiring
- No additional connection leads and hardware required
- No connection head type transmitter housing needed
- Direct installation into process piping or thermowell

Superior Accuracy

- Factory calibrated to a customer specified temperature range
- Accuracy is stable over the entire measuring scale
- The transmitter is perfectly matched to its element
- High accuracy, long term stability, consistent repeatability
- Fast response time
- The RTD element Pt100 accurate to IEC751 Class A

Traceable Calibration

- Part number, range and date is marked on the housing
- Calibrated to traceable standards
- As an option, a full calibration certificate to NIST (National Institute of Standards and Technology) can be supplied

Applications

The sturdy construction makes it highly resistant to vibrations. It is ideal for use in:

- Generators
- Engines
- Compressors
- Other vibrating equipment

The hermetically sealed transmitter allows it to function even in the roughest environmental conditions. It yields accurate readings in extreme temperatures, moisture, snow and rain and is suitable for any outdoor use. Common applications include:

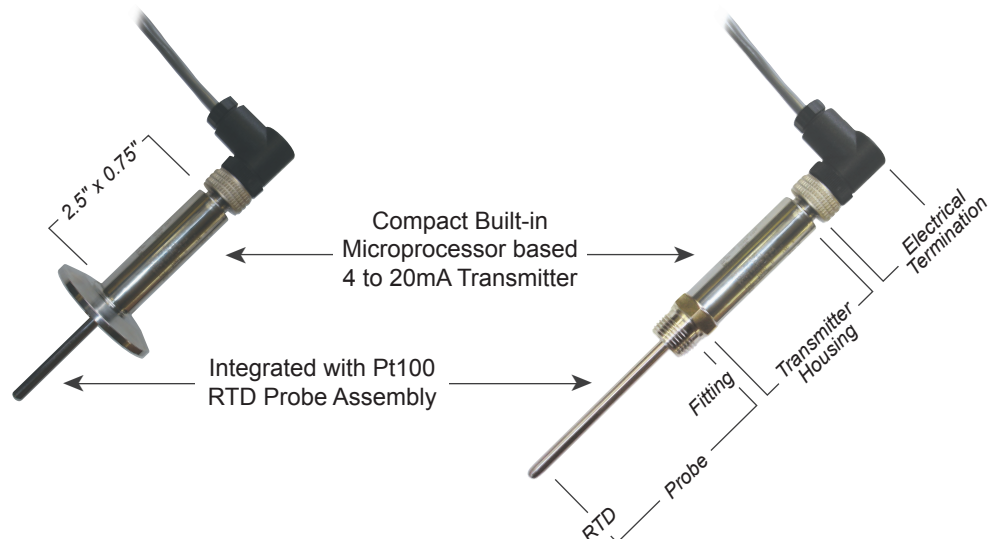
- Pharmaceutical industries
- Utilities
- Chemical plants
- Paper mills
- Food/Dairy processing
- Refineries
- Petrochemical plants
- Gas pipelines

Field Programming-optional

- Kit available for user programmable temperature range scaling of transmitters
- See www.teltru.com/s-159-rtds.aspx



Compact Size
Rugged Service
Easy Installation
Superior Accuracy
Field Programmable (optional)
Connection Head Not Required



*Patent No.: US 7,223,014 MIST™

TEL-TRU Sanitary and Industrial RTDs

Specifications

Technical Specifications @ Vnom. = 24VDC, T ambient = 25°C, Min. Span 100°C
Only for series ST100 and NT100 RTD probe assemblies with integrated programmable compact transmitter. Specifications subject to change.

Electrical Properties

Input:	RTD, type Pt100 ($\alpha=0.00385$), 3-wire
Sensor Temperature Ranges:	See range chart for standard ranges Custom ranges available from -103 to 392°F (-75 to 200°C) Minimum span 45°F (25°C)
Output:	4-20mA loop powered, linear to temperature Induced current required < 2.5mA Current limit < 25mA
Power Supply:	9-32VDC, polarity protected
Supply Effect:	0.001%/V
Accuracy:	$\pm(.25^{\circ}\text{C} + 0.40\% \text{ of span})$ with one-point calibration ¹ $\pm(.10^{\circ}\text{C} + 0.10\% \text{ of calibrated span})$ with two-point calibration ²
Maximum Loop Resistance:	$[(V_{\text{supply}} - 7) / 0.025\text{A}]$ ohms
Sensor Open Circuit:	Upscale 24mA or Downscale 2.5mA
Undershooting Measurement Range:	Decreases to 3.5mA
Exceeding Measurement Range:	Increases to 23mA
Switch on Delay:	2s
Electronic Response Time:	1s at startup
RFI Effect:	1% or less typical
Isolation:	500VDC Input/Output
Temp. Effects:	$\pm 0.001\%$ of Span/°C
Long Term Drift:	<0.1% FS/Year

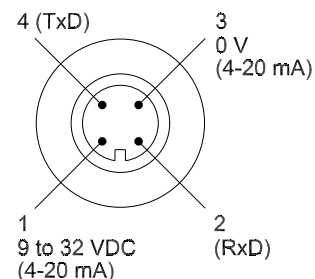
1. Max. error on complete span. Error at calibration point <0.1% of Span.

2. Max. error on complete calibrated span. Error at calibration points <0.1% of Span.

Mechanical Properties

Probe and Housing Material:	Stainless steel 316, welded to probe
Protection:	IP67 (NEMA 6)
Storage Temp. Range:	-40°F to 176°F (-40°C to 80°C)
Operating Temp. Range:	-40°F to 176°F (-40°C to 80°C)
Maximum Operating Pressure:	1500 PSIG Max (probe only) 500 PSIG (Tri-clamp)
Sanitary Surface Finish:	Polished to #4 finish per 3-A standard 74-03, 32 micro-inches max

Electrical Connection



AXX Wiring

Models NT100 and ST100

1 = Red
3 = Black

Electrical connection of the compact thermometer (view from above) – M12 plug, 4-pin

Pin 1: Power supply 9 to 32Vdc; Current output 4 to 20mA

Pin 2: PC configuration cable connection

Pin 3: Power supply 0Vdc; Current output 4 to 20mA

Pin 4: PC configuration cable connection

Approvals 3A Sanitary Council Standard 74-03 (ST100 sensors only)

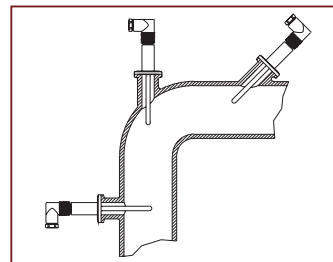
Additional Products available from Tel-Tru



Bimetal Thermometers
Sanitary Bimetal Thermometers
Thermowells
Glow Dial Thermometers
Digi-Tel Thermometers
Digi-Tel Sanitary Thermometers
Digi-Tel Temperature Transmitter
Pressure Gauges
Sanitary Pressure Gauges
Electronic Calibration Instruments
Gas Actuated Thermometers
Vapor Tension Thermometers
Non-Contact Thermometers
Glass Industrial Thermometers
Surface Thermometers

RTD Installation

Shown below are examples of mounting locations for various pipe sizes and configurations. Minimum recommended insertion length = 1"



TEL-TRU PRODUCT WARRANTY

TEL-TRU products are guaranteed to be free from defective workmanship and material for one (1) year following date of shipment. This warranty does not cover exposure to corrosive materials, erosion, excessive vibration, pressures or temperatures in excess of those recommended, normal wear, or improper handling or storage. Any Tel-Tru product claimed to be defective may be returned to our factory, shipping charges prepaid, after notification to and authorization from us. If, after examination by us, the product is found to be defective under warranty conditions, it will be repaired or replaced free of charge.

When in doubt as to the proper application of any product, you are invited to contact your nearest TEL-TRU office or representative for assistance. Suitability of the material and product for the use contemplated by the buyer shall be the sole responsibility of the buyer.

This warranty is in lieu of all other warranties expressed or implied, and all other obligations or liabilities on our part for damages, including but not limited to consequential damages, arising out of the use or misuse of our products, and we neither assume nor authorize anyone to assume for us, any other liability in connection with the sale of our products.



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RTDT-12

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