BULLET PROBE

Remote Probes with Transmitters

The ACI Transmitter Bullet Probe Series features a two-wire, 4 to 20 mA loop powered output signal with an optional 3-Wire voltage output signal available. All transmitters include Zero and Span adjustments for field calibration and are calibrated using NIST Certified Calibration equipment. We recommend the use of an 18 to 22 AWG shielded cable for all temperature transmitter installations to help eliminate the possibility of noise being introduced onto the signal lines. The sensor assemblies are manufactured using a 2 conductor unshielded FEP/FEP Plenum rated, unshielded cable and ACI's proven double encapsulation process to eliminate the effects of moisture on the sensors as well as increased response times using our high quality, thermally conductive epoxy. The Bullet Probe remote sensors include an optional 10 or 20 Foot Plenum rated cable for use in remote sensor applications. All TT100 and TT1K Series Bullet Probe transmitter's sensor leads may be shortened in the field as needed but all Matched TTM100 and TTM1K Series transmitter's sensor leads should not be shortened due to the affect that it would have on the calibration accuracy of the sensor and transmitter. Optional NEMA/IP rated weather proof enclosures are available as specified on the back of the product data sheet. For best accuracy, ACI recommends the use of the A/TTM Series Matched transmitters with 3 or 5 Point NIST Calibration Certificate, since they include a second calibration step in which the RTD and transmitter are calibrated together as a system.

Applications: Chilled Water Systems, Hot Water Systems, Boilers, Pumps, Compressors, Chillers, Remote Sensing, Process Control

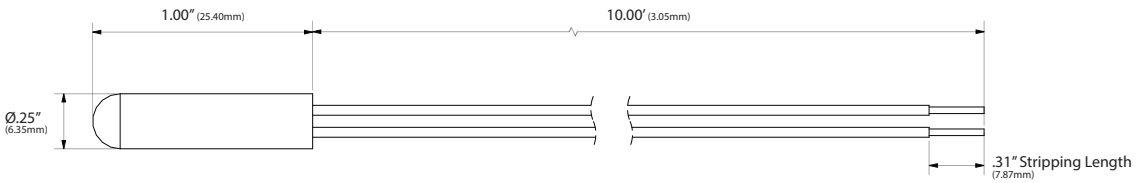
The ACI Transmitter Bullet Probe Series is covered by ACI's Five (5) Year Limited Warranty. The warranty can be found in the front of ACI's Sensors & Transmitters catalog, as well as on ACI's website, www.workaci.com.

PRODUCT SPECIFICATIONS

Transmitter Supply Voltage | Supply Current:	+8.5 to 32 VDC (Reverse Polarity Protected) | 25 mA minimum **250 Ohm Load:** +13.5 to 32 VDC | **500 Ohm Load:** +18.5 to 32 VDC
Maximum Load Resistance:	(Terminal Voltage - 8.5 V) | 0.020 A
Output Signals:	**Current:** 4-20 mA (2-Wire Loop Powered) | **Voltage:** 1-5 VDC or 2-10 VDC (3-Wires)
Calibrated Accuracy | Linearity[1]:	**Temp. Spans < 500°F (260°C):** +/- 0.2%
Thermal Drift[2]:	**Temp. Spans < 100°F (38°C):** +/- 0.04%/°F | **Temp. Spans > 100°F (38°C):** +/- 0.02%
Min./Max. Calibrated Temperature Spans:	**Minimum Temp. Span:** 50°F (28°C) | **Maximum Temp. Span:** 400°F (204°C)
Matched Calibrated Temperature Spans (A/TTM models) Range:	-45 to 155°C (-49 to 311°F)
TTM100/TTM1K Certification Points:	**3 Point NIST:** 20%, 50% & 80% of span | **5 Point NIST:** 20%, 35%, 50%, 65%, 80% of span
Warm Up Time | Warm Up Drift:	10 Minutes | +/- 0.1%
Transmitter Operating Temperature Range:	-40 to 200°C (-40 to 392°F)
Transmitter Operating Humidity Range:	0 to 90%, non-condensing
Connections | Wire Size:	Screw Terminal Blocks (Polarity Sensitive) | 16 AWG (1.31 mm²) to 26 AWG (0.129 mm²)
Terminal Block Torque Rating:	0.37 ft-lb (0.5 Nm) nominal
Sensor Type | Sensor Curve | Sensing Points:	Platinum RTD | PTC (Positive Temperature Coefficient) | One
Number Wires | Wire Colors:	Two | Red and Black (Non Polarity Sensitive)
Sensor Output @ 0°C (32°F):	**A/TT100/TTM100 Series:** 100 Ohms nominal | **A/TT1K/TTM1K Series:** 1000 Ohms nominal
RTD Tolerance Class | Accuracy:	+/- 0.06% Class A | (**Tolerance Formula:** +/- °C = (0.15°C + (0.002 * |t|)) where |t| is the absolute value of temperature above or below 0°C in °C)
Din Standard | Temperature Coefficient:	DIN EN 60751 (IEC 751) | 3850 ppm / °C
Sensor Stability:	+/- 0.03% after 1000 Hours @ 300°C (572°F)
Response Time (63% Step Change):	8 Seconds nominal
Sensor Operating Temperature Range:	-40 to 150°C (-40 to 302°F)
Enclosure Specifications (Operating Temperature, Material, Flammability, NEMA/IP Ratings):	**"-GD" Enclosure:** Galvanized Steel, -40 to 85°C (-40 to 185°F), NEMA 1 (IP10) **"-PB" Enclosure:** ABS Plastic, -30 to 85°C (-22 to 185°F), UL94-HB, Plenum Rated **"-BB" Enclosure:** Aluminum, -40 to 85°C (-40 to 185°F), NEMA 3R (IP 14) **"-4X" Enclosure:** Polystyrene Plastic, -40 to 70°C (-40 to 158°F), UL94-V2, NEMA 4X (IP 66)
Storage Temperature Range:	-40 to 80°C (-40 to 176°F)
Operating Humidity Range:	5 to 95% RH, non-condensing
Probe Diameter | Probe Material:	0.250" (6.35mm) | 304 Stainless Steel
Cord Grip Fitting Material | Flammability Rating:	Polyamide 6.6 | UL94-V2
Cord Grip Seal Material | NEMA/IP Rating:	Neoprene | IP68 (NEMA 4X)
Torque Recommendation Cord Grip:	1.83 ft-lbs (2.50 Nm)
Lead Length | Cable Diameter | Conductor Size:	10' (3.05 m) or 20' (6.1 m) | 0.106" nominal (2.69 mm) | 22 AWG (0.65mm)
Lead Wire Insulation | Wire Rating:	FEP/FEP Teflon Unshielded Cable | UL CL2P or CL3P; CMP C(UL) US 150°C, FT-6
Conductor Material:	Tin Plated Copper
Product Dimensions | Product Weight:	See table on back of Product Data sheet
Agency Approvals:	RoHS2, WEEE

Note[1]: Transmitter's calibrated at 71°F (22°C) nominal | **Note[2]:** Temperature Drift is referenced to 71°F nominal calibration temperature

DIMENSIONAL DRAWING



Standard View

CUSTOM ORDERING

Model # Example: A/ (A.) | TT100 (B.) | BP (C.) | 1 (D.) | PB (E.) | 10'CL2P (F.) | 0 to 40°C (G.)

		MODEL #
A. Sensor Series *No Selection Required*	**A/** →	**A/**
B. Model Series *Select One (1)*	**TT100** = 100Ω | **TTM100** = Matched 100Ω* | **TT1K** = 1KΩ | **TTM1K** = Matched 1KΩ*	
C. Configuration *No Selection Required*	**BP** = 1" Stainless Steel Probe →	**BP**
D. Output Signal *Select One (1)*	**1** = 1 to 5 VDC | **2** = 2 to 10 VDC | **4** = 4 to 20 mA	
E. Enclosure *Select One (1)*	**GD** = Galvanized | **PB** = Plastic | **BB** = Aluminum, NEMA 3R | **4X** = NEMA 4X	
F. Lead Wire Type *Select One (1)*	**----** = Standard 24" Etched PTFE Colored Leads **6'CL2P** = 6 ft (1.83m), 2 Conductor Plenum Rated Cable **10'CL2P** = 10 ft (3.05m), 2 Conductor Plenum Rated Cable **20'CL2P** = 20 ft (6.10m), 2 Conductor Plenum Rated Cable	
G. Calibrated Span	**Specify Span in °F or °C (Best Accuracy in 100°F Increments)**	

Note*: For TTM100 or TTM1k part numbers, the default NIST is 3 points | 5 points may be requested by adding the part number listed below (NIST TTM CERT - 5PT.)
There is a surcharge of $25 to upgrade to 5 point calibration

ACCESSORIES ORDERING | MOUNTING CLIPS

Model # Example: A/MOUNTING U-CLIP-1/4" -OR- 143352

Model #	Item #	Description	Galvanized Metal	Plastic w/ Adhesive
A/MOUNTING CLIP-1/4"	143351	Hardware, ¼" Mounting Clip	•	
A/MOUNTING U-CLIP-1/4"	143352	Hardware, ¼" U-Mounting Clip Adhesive		•

ACCESSORIES ORDERING

Model # Example: NIST TTM CERT-5PT. -OR- 129743

Model #	Item #	Description
NIST TTM CERT-5PT.	129743	5 Point Calibration & Certificate