



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

PRODUCT SPECIFICATIONS

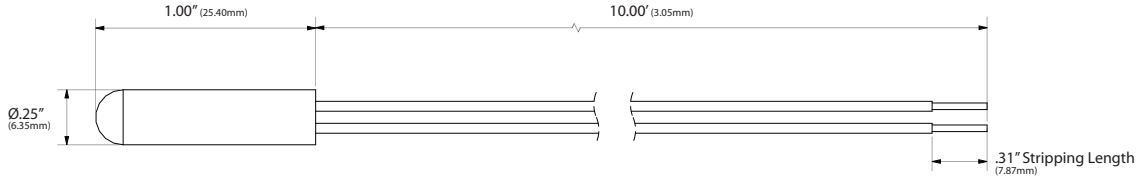
| | |
|---|---|
| Transmitter Supply Voltage Supply Current: | +8.5 to 32 VDC (Reverse Polarity Protected) 25 mA minimum |
| Maximum Load Resistance: | 250 Ohm Load: +13.5 to 32 VDC 500 Ohm Load: +18.5 to 32 VDC (Terminal Voltage - 8.5 V) 0.020 A |
| Output Signals: | Current: 4-20 mA (2-Wire Loop Powered) Voltage: 1-5 VDC or 2-10 VDC (3-Wires) |
| Calibrated Accuracy Linearity¹: | Temp. Spans < 500°F (260°C): +/- 0.2% |
| Thermal Drift²: | 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) |
| TTM100/TTM1K Certification Points: | 3 Point NIST: 20%, 50% & 80% of span 5 Point NIST: 0%, 20%, 50%, 80% & 100% of span |
| Warm Up Time Warm Up Drift: | 10 Minutes +/- 0.1% |
| Transmitter Operating Temperature Range: | -40°F to 185°F (-40 to 85°C) |
| Transmitter Operating Humidity Range: | 0 to 90%, non-condensing |
| Connections Wire Size: | Screw Terminal Blocks 16 AWG (1.31 mm ²) to 26 AWG (0.129 mm ²) |
| 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 |

Note¹: Transmitter's calibrated at 71°F (22°C) nominal | **Note²:** Temperature Drift is referenced to 71°F nominal calibration temperature





DIMENSIONAL DRAWING



Standard View

CUSTOM ORDERING

Model # Example: **A/ TT100 BP 1 PB 10'CL2P 0 to 40°C**

MODEL #

| | | |
|--|--|-----------|
| A. Sensor Series <i>No Selection Required</i> | A/ _____ → | A/ |
| B. Model Series <i>Select One (1)</i> | TT100 = 100Ω TTM100* = Matched 100Ω TT1K = 1KΩ TTM1K* = Matched 100Ω | |
| C. Configuration <i>No Selection Required</i> | BP = 1" Stainless Steel Probe _____ → | BP |
| D. Output Signal <i>Select One (1)</i> | 1 = 1 to 5 VDC 2 = 2 to 10 VDC 4 = 4 to 20 mA | |
| E. Enclosure <i>Select One (1)</i> | GD = Galvanized PB = Plastic BB = Aluminum, NEMA 3R 4X = NEMA 4X | |
| F. Cable Length <i>Select One (1)</i> | 10'CL2P = 10 Feet (3.05 m) Plenum Cable 20'CL2P = 20 Feet (6.1 m) Plenum Cable | |
| G. Calibrated Span | Specify Span in °F or °C (Best Accuracy in 100°F Increments) | |

Note*: Must specify a 3 or 5 Point NIST Certificate with the TTM100 or TTM1K Transmitter above

ACCESSORIES ORDERING

Model # Example: **HARDWARE, 1/4" MOUNTING CLIP -OR- 108169**

| Model # | Item # | Description | Galvanized Metal | Plastic w/ Adhesive |
|---------------------------------------|--------|---|------------------|---------------------|
| HARDWARE, 1/4" MOUNTING CLIP | 108169 | Hardware, 1/4" Mounting Clip | • | |
| HARDWARE, 1/4" U-MOUNTING CLIP | 100090 | Hardware, 1/4" U-Mounting Clip Adhesive | | • |

