

# DUCT

## Duct Sensors with Transmitters

The ACI Transmitter Duct 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. ACI recommends 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 colored Etched Teflon lead wires 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 duct sensors include a foam pad to properly seal the duct and limit vibration once installed.

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, Cooling Towers, Process Control

### PRODUCT SPECIFICATIONS

<b>Transmitter Supply Voltage   Supply Current:</b>	+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
<b>Maximum Load Resistance:</b>	(Terminal Voltage - 8.5 V)   0.020 A
<b>Output Signals:</b>	<b>Current:</b> 4-20 mA (2-Wire Loop Powered)   <b>Voltage:</b> 1-5 VDC or 2-10 VDC (3-Wires)
<b>Calibrated Accuracy   Linearity<sup>1</sup>:</b>	<b>Temp. Spans &lt; 500°F (260°C):</b> +/- 0.2%   <b>Temp. Spans &gt; 500°F (260°C):</b> +/- 0.5%
<b>Temperature Drift<sup>2</sup>:</b>	<b>Temp. Spans &lt; 100°F (38°C):</b> +/- 0.04%/°F   <b>Temp. Spans &gt; 100°F (38°C):</b> +/- 0.02%
<b>TTM100/TTM1K Certification Points:</b>	<b>3 Point NIST:</b> 20%, 50% & 80% of span   <b>5 Point NIST:</b> 10%, 20%, 50%, 80% & 90% of span
<b>Warm Up Time   Warm Up Drift:</b>	10 Minutes   +/- 0.1%
<b>Transmitter Operating Temperature Range:</b>	-40°F (-40°C) to 185°F (85°C)
<b>Operating Humidity Range:</b>	0 to 90%, non-condensing
<b>Calibrated Temperature Spans<sup>1</sup>:</b>	<b>Minimum Temp. Span:</b> 50°F (28°C)   <b>Maximum Temp. Span:</b> 500°F (260°C)
<b>Connections   Wire Size:</b>	Screw Terminal Blocks (Non-Polarity Sensitive)   16 AWG (1.31mm <sup>2</sup> ) to 26 AWG (0.129mm <sup>2</sup> )
<b>Terminal Block Torque Rating:</b>	0.37 ft-lb (0.5 Nm) nominal
<b>Sensor Type   Sensor Curve   Sensing Points:</b>	Platinum RTD   PTC (Positive Temperature Coefficient)   One
<b>Number Wires   Wire Colors:</b>	Two   <b>A/TT100/TTM100 Series:</b> Brown/Brown   <b>A/TT1K/TTM1K Series:</b> Black/Black
<b>Sensor Output @ 0°C (32°F):</b>	<b>A/TT100/TTM100 Series:</b> 100 Ohms nominal   <b>A/TT1K/TTM1K Series:</b> 1000 Ohms nominal
<b>RTD Tolerance Class   Accuracy:</b>	+/- 0.06% Class A   ( <b>Tolerance Formula:</b> +/- °C = (0.15°C + (0.002 *  t ))) where  t  is the absolute value of Temperature above or below 0°C in °C
<b>Din Standard   Temperature Coefficient:</b>	DIN EN 60751 (IEC 751)   3850 ppm / °C
<b>Sensor Stability:</b>	+/- 0.03% after 1000 Hours @ 300°C (572°F)
<b>Response Time (63% Step Change):</b>	8 Seconds nominal
<b>Sensor Operating Temperature Range:</b>	-40 to 200°C (-40 to 392°F)
<b>Enclosure Specifications (Operating Temperature, Material, Flammability, NEMA/IP Ratings):</b>	<b>"-GD" Enclosure:</b> Galvanized Steel, -40 to 121°C (-40 to 250°F), NEMA 1 (IP10) <b>"-PB" Enclosure:</b> ABS Plastic, -30 to 90°C (-22 to 194°F), UL94-HB <b>"-BB" Enclosure:</b> Aluminum, -40 to 121°C (-40 to 250°F), Plenum Rated, NEMA 3R (IP 14) <b>"-4X" Enclosure:</b> Polystyrene Plastic, -40 to 70°C (-40 to 158°F), UL94-V2, NEMA 4X (IP 66)
<b>Storage Temperature Range:</b>	-40 to 85°C (-40 to 185°F)
<b>Operating Humidity Range:</b>	10 to 90% RH, non-condensing
<b>Probe Diameter   Probe Material:</b>	0.250" (6.35mm)   304 Stainless Steel
<b>Fitting Material   Flammability Rating:</b>	Polyamide 66 (High Performance Nylon 66)   UL94-HB
<b>Fitting Thread Size:</b>	1/8"-27 NPSM
<b>Foam Pad Material   Flammability Rating:</b>	Neoprene/EPDM/SBR Polymer   UL94-HBF; FMVSS-302; MIL-R-6130C
<b>Lead Length   Conductor Size:</b>	14" (35.6 cm)   22 AWG (0.65mm)
<b>Lead Wire Insulation   Wire Rating:</b>	Etched Teflon (PTFE) Colored Leads   Mil Spec 16878/4 Type E
<b>Conductor Material:</b>	Silver Plated Copper
<b>Product Dimensions   Product Weight:</b>	See table on back of Product Data sheet
<b>Agency Approvals:</b>	RoHS2, WEEE

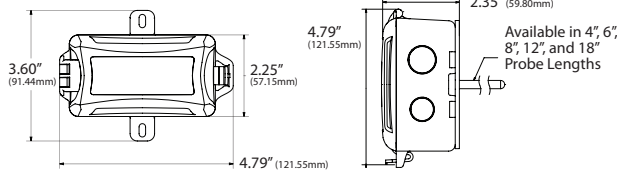
**Note<sup>1</sup>:** Transmitter's calibrated at 71°F (22°C) nominal | **Note<sup>2</sup>:** Temperature Drift is referenced to 71°F nominal calibration temperature





**DIMENSIONAL DRAWING, WEIGHTS**

**Plastic Box Enclosure [PB]**

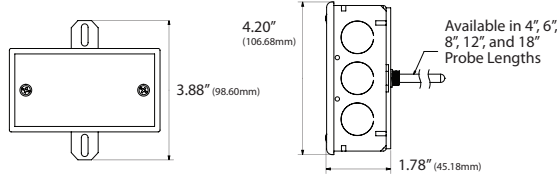


xx = Sensor Type | yy = Insertion Length

**Plastic Box Enclosure [PB] Weights**

ACI Model #	4" (Probe Length)	6" (Probe Length)	8" (Insertion Length)
A/xx-D-yy-PB	0.24 lbs. (0.109 kg)	0.25 lbs. (0.113 kg)	0.26 lbs. (0.117 kg)
ACI Model #	12" (Probe Length)	18" (Probe Length)	
A/xx-D-yy-PB	0.28 lbs. (0.127 kg)	0.30 lbs. (0.136 kg)	

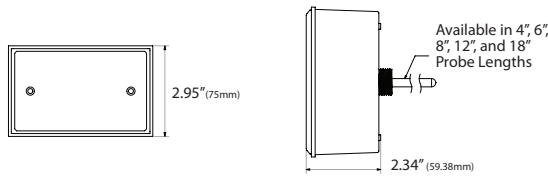
**Galvanized Enclosure [GD]**



**Galvanized Enclosure [GD] Weights**

ACI Model #	4" (Probe Length)	6" (Probe Length)	8" (Insertion Length)
A/xx-D-yy-GD	0.66 lbs. (0.299 kg)	0.67 lbs. (0.303 kg)	0.68 lbs. (0.308 kg)
ACI Model #	12" (Probe Length)	18" (Probe Length)	
A/xx-D-yy-GD	0.70 lbs. (0.317 kg)	0.74 lbs. (0.336 kg)	

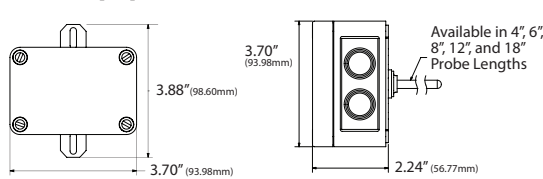
**Bell Box Enclosure [BB]**



**Bell Box Enclosure [BB] Weights**

ACI Model #	4" (Probe Length)	6" (Probe Length)	8" (Insertion Length)
A/xx-D-yy-BB	0.70 lbs. (0.317 kg)	0.71 lbs. (0.322 kg)	0.72 lbs. (0.326 kg)
ACI Model #	12" (Probe Length)	18" (Probe Length)	
A/xx-D-yy-BB	0.74 lbs. (0.336 kg)	0.78 lbs. (0.354 kg)	

**NEMA 4X Enclosure [4X]**



**NEMA 4X Enclosure [4X] Weights**

ACI Model #	4" (Probe Length)	6" (Probe Length)	8" (Insertion Length)
A/xx-D-yy-4X	0.34 lbs. (0.154 kg)	0.35 lbs. (0.159 kg)	0.36 lbs. (0.163 kg)
ACI Model #	12" (Probe Length)	18" (Probe Length)	
A/xx-D-yy-4X	0.38 lbs. (0.172 kg)	0.40 lbs. (0.181 kg)	

Standard Views

Product Weights

**CUSTOM ORDERING**

Model # Example: A/ TT1K D 4" 1 GD

**MODEL #**

<b>A. Sensor Series</b> No Selection Required	A/	A/
<b>B. Model Series</b> Select One (1)	TT100 = 100Ω   TTM100* = Matched 100Ω   TT1K = 1KΩ   TTM1K* = Matched 100Ω	
<b>C. Configuration</b> No Selection Required	D = Duct	D
<b>D. Thermowell Length</b> Select One (1)	4" = 4" Probe   6" = 6" Probe   8" = 8" Probe   12" = 12" Probe   18" = 18" Probe	
<b>E. Output Signal</b> Select One (1)	1 = 1 to 5 VDC   2 = 2 to 10 VDC   4 = 4 to 20 mA	
<b>F. Enclosure</b> Select One (1)	GD = Galvanized   PB = Plastic   BB = Aluminum, NEMA 3R   4X = NEMA 4X	
<b>G. Calibrated Span</b>	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

