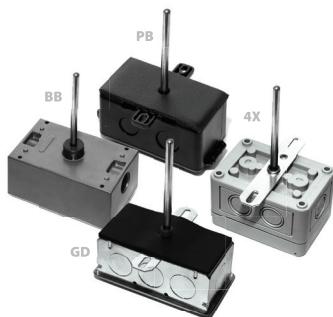




# RIGID AVERAGING

## Continuous Averaging, Transmitter



The ACI Transmitter Rigid Averaging Series features a two-wire, 4 to 20 mA loop powered output signal with an optional 3-Wire voltage output signal available. The Rigid Averaging sensors are designed to be installed in small to medium size ducts to give you a better average compared to that of a single point sensor. 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 1K Ohm Rigid Averaging sensor assemblies include a continuous sensing element that covers the entire length of the stainless steel probe and are manufactured using colored Etched Teflon lead wires to differentiate between the different sensor types. All units are hermetically sealed using our epoxy

material to eliminate the effects of moisture on the sensors. The Rigid Averaging transmitters 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 a 3 or 5 Point NIST Calibration Certificate, since they include a second calibration process in which the RTD and transmitter are calibrated together as a system. On larger ducts, ACI's bendable copper averaging transmitter should be used for better coverage and control of the air inside of the duct.

**Applications:** Roof Top Units, Air Handlers, Monitoring Supply/Discharge/Return/Mixed Air Temperatures, Data Centers, Hospitals

**The ACI Rigid Averaging Transmitter 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 web site, [workaci.com](http://workaci.com).**

### PRODUCT SPECIFICATIONS

<b>Transmitter Supply Voltage   Supply Current:</b>	+8.5 to 32 VDC (Reverse Polarity Protected)   25 mA minimum <b>250 Ohm Load:</b> +13.5 to 32 VDC   <b>500 Ohm Load:</b> +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>Thermal 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>Min/Max Temperature Spans:</b>	<b>Minimum Span:</b> 50°F (28°C)   <b>Maximum Span:</b> 400°F (204°C)
<b>TTM100/TTM1K NIST Certification Points:</b>	<b>3 Point NIST:</b> 20%, 50% & 80% of span   <b>5 Point NIST:</b> 20%, 35%, 50%, 65%, 80% of span
<b>Warm Up Time   Warm Up Drift:</b>	10 Minutes   +/- 0.1%
<b>Transmitter Operating Temperature Range:</b>	-40°F to 185°F (-40 to 85°C)
<b>Transmitter Operating Humidity Range:</b>	0 to 90%, non-condensing
<b>Connections   Wire Size:</b>	Screw Terminal Blocks (Polarity Sensitive)   16 AWG (1.31 mm <sup>2</sup> ) to 26 AWG (0.129 mm <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)   Continuous
<b>Number Wires   Wire Colors:</b>	Three   Black/Black/White (Polarity Sensitive)
<b>Sensor Output @ 0°C (32°F):</b>	1000 Ohms nominal
<b>Sensor Accuracy:</b>	+/- 0.1% @ 0°C (32°F)   +/- 0.25% @ 21°C (70°F)   +/- 1.0% @ 130°C (266°F)
<b>Din Standard   Temperature Coefficient:</b>	DIN EN 60751 (IEC 751)   3850 ppm / °C
<b>Response Time (63% Step Change):</b>	15 Seconds nominal
<b>Sensor Operating Temperature Range:</b>	-40 to 135°C (-40 to 275°F)
<b>Enclosure Specifications (Operating Temperature, Material, Flammability, NEMA/IP Ratings):</b>	<b>"-GD" Enclosure:</b> -40 to 115°C (-40 to 239°F); Galvanized Steel; NEMA 1 (IP10)
	<b>"-PB" Enclosure:</b> -30 to 90°C (-22 to 194°F); ABS Plastic; UL94-HB; Plenum Rated
	<b>"-BB" Enclosure:</b> -40 to 115°C (-40 to 239°F); Aluminum; NEMA 3R (IP 14)
	<b>"-4X" Enclosure:</b> -40 to 70°C (-40 to 158°F); Polystyrene Plastic; UL94-V2; NEMA 4X (IP 66)
<b>Storage Temperature Range:</b>	-40 to 80°C (-40 to 176°F)
<b>Operating Humidity Range:</b>	5 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>	12" (30.5 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

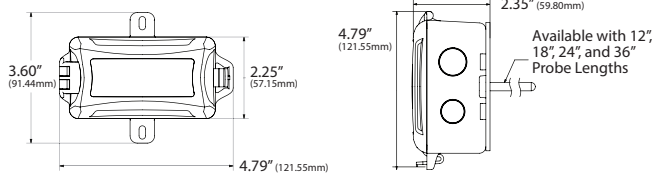
**Note<sup>1</sup>:** Transmitter's calibrated at 71°F (22°C) nominal | **Note<sup>2</sup>:** Temperature Drift is referenced to 71°F nominal calibration temperature





**DIMENSIONAL DRAWING, WEIGHTS**

**Plastic Box Enclosure [PB]**

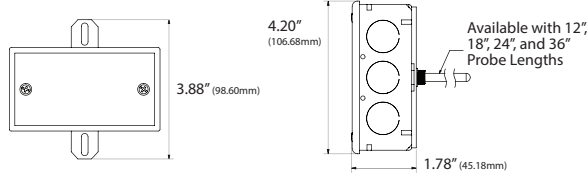


xx = Sensor Type | yy = Insertion Length

**Plastic Box Enclosure [PB] Weights**

ACI Model #	12" (Probe Length)	18" (Probe Length)
A/xx-RA-yy-PB	0.28 lbs. (0.127 kg)	0.30 lbs. (0.136 kg)
ACI Model #	24" (Probe Length)	36" (Probe Length)
A/xx-RA-yy-PB	0.32 lbs. (0.145 kg)	0.36 lbs. (0.163 kg)

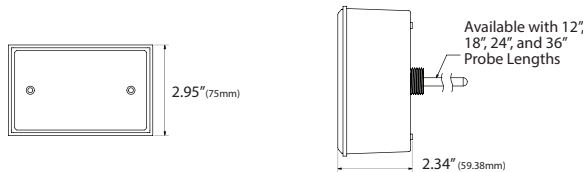
**Galvanized Enclosure [GD]**



**Galvanized Enclosure [GD] Weights**

ACI Model #	12" (Probe Length)	18" (Probe Length)
A/xx-RA-yy-GD	0.70 lbs. (0.317 kg)	0.74 lbs. (0.336 kg)
ACI Model #	24" (Probe Length)	36" (Probe Length)
A/xx-RA-yy-GD	0.78 lbs. (0.354 kg)	0.82 lbs. (0.372 kg)

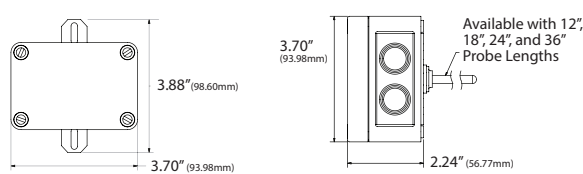
**Bell Box Enclosure [BB]**



**Bell Box Enclosure [BB] Weights**

ACI Model #	12" (Probe Length)	18" (Probe Length)
A/xx-RA-yy-BB	0.74 lbs. (0.336 kg)	0.78 lbs. (0.354 kg)
ACI Model #	24" (Probe Length)	36" (Probe Length)
A/xx-RA-yy-BB	0.78 lbs. (0.354 kg)	0.84 lbs. (0.381 kg)

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



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

ACI Model #	12" (Probe Length)	18" (Probe Length)
A/xx-RA-yy-4X	0.38 lbs. (0.172 kg)	0.40 lbs. (0.181 kg)
ACI Model #	24" (Probe Length)	36" (Probe Length)
A/xx-RA-yy-4X	0.44 lbs. (0.200 kg)	0.50 lbs. (0.227 kg)

Standard Views

Product Weights

**PRODUCT WEIGHT**

Model #	Weight (lbs.)	Weight (kg)	Model #	Weight (lbs.)	Weight (kg)
A/TT1K-RA-18"-x-PB	0.32	0.145	A/TT1K-RA-24"-x-BB	0.83	0.376
A/TT1K-RA-18"-x-GD	0.76	0.345	A/TT1K-RA-24"-x-4X	0.47	0.213
A/TT1K-RA-18"-x-BB	0.80	0.363	A/TT1K-RA-36"-x-PB	0.43	0.195
A/TT1K-RA-18"-x-4X	0.44	0.200	A/TT1K-RA-36"-x-GD	0.89	0.404
A/TT1K-RA-24"-x-PB	0.35	0.159	A/TT1K-RA-36"-x-BB	0.91	0.413
A/TT1K-RA-24"-x-GD	0.79	0.358	A/TT1K-RA-36"-x-4X	0.57	0.259

**CUSTOM ORDERING**

Model # Example: A / TT1K RA 24" 1 GD 0 to 40°C

<b>A. Sensor Series</b> No Selection Required	A/
<b>B. Model Series</b> Select One (1)	TT1K = 1K Ω RTD, Temperature Transmitter*   TTM1K = 1K Ω Matched RTD/Transmitter*
<b>C. Configuration</b> No Selection Required	RA = Rigid Averaging
<b>D. Probe Length</b> Select One (1)	12" = 12" Probe   18" = 18" Probe   24" = 24" Probe   36" = 36" 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. Calibration Span</b>	Specify Span in °F or °C (Best Accuracy in 100°F Increments)

**MODEL #**

A/
RA

Note\*: For TTM100 or TTM1K part numbers, the default NIST is 3 points | 5 points may be specified by using "-5PTNIST" at the end of any TTM part number.

**ACCESSORIES ORDERING (NIST)**

Model #	Description
-5PTNIST	5 Point Calibration & Certificate for TTM parts

