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 the 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**.**
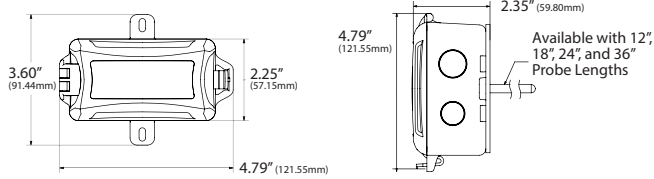
PRODUCT SPECIFICATIONS

**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 < 500ºF (260ºC):** +/- 0.2%
Thermal Drift[2]:	**Temp. Spans < 100ºF (38ºC):** +/- 0.04%/ºF	**Temp. Spans > 100ºF (38ºC):** +/- 0.02%
Min/Max Temperature Spans:	**Minimum Span:** 50ºF (28ºC)	**Maximum Span:** 400ºF (204ºC)
TTM100/TTM1K NIST 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:	-40ºF to 185ºF (-40 to 85ºC)
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)	Continuous
**Number Wires	Wire Colors:**	Three	Black/Black/White (Polarity Sensitive)
Sensor Output @ 0°C (32°F):	1000 Ohms nominal
Sensor Accuracy:	+/- 0.1% @ 0ºC (32ºF)	+/- 0.25% @ 21ºC (70ºF)	+/- 1.0% @ 130ºC (266ºF)
**Din Standard	Temperature Coefficient:**	DIN EN 60751 (IEC 751)	3850 ppm / ºC
Response Time (63% Step Change):	15 Seconds nominal
Sensor Operating Temperature Range:	-40 to 135ºC (-40 to 275ºF)
Enclosure Specifications (Operating Temperature, Material, Flammability, NEMA/IP Ratings):	**"-GD" Enclosure:** -40 to 115ºC (-40 to 239ºF); Galvanized Steel; NEMA 1 (IP10) **"-PB" Enclosure:** -30 to 90ºC (-22 to 194ºF); ABS Plastic; UL94-HB; Plenum Rated **"-BB" Enclosure:** -40 to 115ºC (-40 to 239ºF); Aluminum; NEMA 3R (IP 14) **"-4X" Enclosure:** -40 to 70ºC (-40 to 158ºF); Polystyrene Plastic; UL94-V2; NEMA 4X (IP 66)
Storage Temperature Range:	-40 to 80ºC (-40 to 176ºF)
Operating Humidity Range:	5 to 90% RH, non-condensing
**Probe Diameter	Probe Material:**	0.250" (6.35mm)	304 Stainless Steel
**Fitting Material	Flammability Rating:**	Polyamide 66 (High Performance Nylon 66)	UL94-HB
Fitting Thread Size:	1/8"-27 NPSM
**Foam Pad Material	Flammability Rating:**	Neoprene/EPDM/SBR Polymer	UL94-HBF; FMVSS-302; MIL-R-6130C
**Lead Length	Conductor Size:**	12" (30.5 cm)	22 AWG (0.65mm)
**Lead Wire Insulation	Wire Rating:**	Etched Teflon (PTFE) Colored Leads	Mil Spec 16878/4 Type E
Conductor Material:	Silver 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, WEIGHTS

Plastic Box Enclosure [PB]

3.60" (91.44mm)
2.25" (57.15mm)
4.79" (121.55mm)
2.35" (59.80mm)
4.79" (121.55mm)

Available with 12", 18", 24", and 36" Probe Lengths

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]

3.88" (98.60mm)
4.20" (106.68mm)
1.78" (45.18mm)

Available with 12", 18", 24", and 36" Probe Lengths
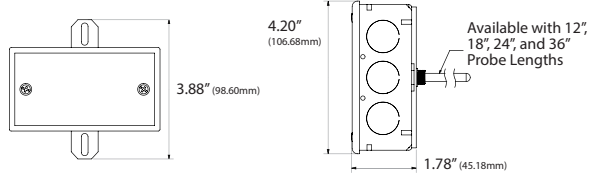
Galvanized Enclosure [GD] Weights

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]

2.95" (75mm)
2.34" (59.38mm)

Available with 12", 18", 24", and 36" Probe Lengths
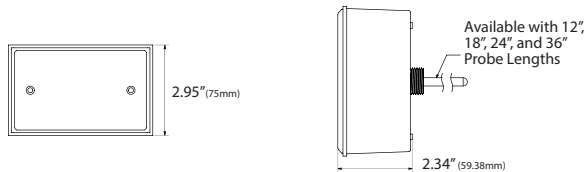
Bell Box Enclosure [BB] Weights

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]

3.88" (98.60mm)
3.70" (93.98mm)
3.70" (93.98mm)
2.24" (56.77mm)

Available with 12", 18", 24", and 36" Probe Lengths
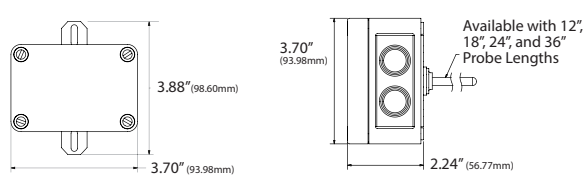
NEMA 4X Enclosure [PB] Weights

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
A.	B.	C.	D.	E.	F.	G.

		MODEL#
A. Sensor Series *No Selection Required*	A/ ⟶	A/
B. Model Series *Select One (1)*	**TT1K** = 1K Ω RTD, Temperature Transmitter* | **TTM1K** = 1K Ω Matched RTD/Transmitter*	
C. Configuration *No Selection Required*	**RA** = Rigid Averaging ⟶	RA
D. Probe Length *Select One (1)*	**12"** = 12" Probe | **18"** = 18" Probe | **24"** = 24" Probe | **36"** = 36" Probe	
E. Output Signal *Select One (1)*	**1**=1 to 5 VDC | **2**=2 to 10 VDC | **4**=4 to 20 mA	
F. Enclosure *Select One (1)*	**GD**=Galvanized | **PB**=Plastic | **BB**=Aluminum, NEMA 3R | **4X**=NEMA 4X	
G. Calibration 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 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