

# DUCT

## Low Temperature Duct Sensors & Transmitters

The ACI Low Temperature Duct Series sensors and transmitters are a single point duct sensor featuring a three wire RTD sensor assembly using Teflon Lead wires and a 316 Series stainless steel probe. The three wire sensors can be used with a two wire transmitter by connecting the two (Red) colored wires to one of the RTD Terminal blocks with the third wire (White) wire going to the second RTD Terminal block. The purpose of the third wire is to compensate for external lead wire resistance that will affect the accuracy of your sensor output when using with a three wire temperature transmitter or sensor configuration on your Building Management System or PLC (Programmable Logic Controller). ACI recommends the use of 18 AWG lead wires to reduce the external lead wire resistance when using a Platinum RTD. The operating specifications are for both the sensor and transmitter as designated in the specification table. Standard enclosure options include the “-GD” Galvanized or “-BB” Aluminum weather proof enclosure. NIST Certificates are available for all of the configurations listed in the ordering grid on the back of the product data sheet. For best accuracy, ACI recommends the use of the TTM100 or TTM1K Series

Matched transmitters since they include a second calibration step in which the RTD and transmitter are calibrated together as a system, in order to remove most of the sensor error over the calibrated temperature span of the transmitter.

**Applications:** Pharmaceutical, Liquid Nitrogen, Refrigerators, Freezers, Hydronic Heating, Remote Sensor Applications

**The ACI Low Temperature Duct Sensors and Transmitters 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).**

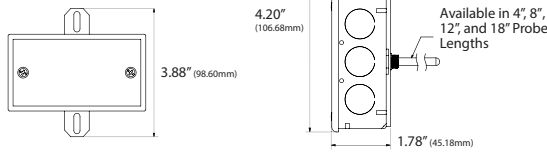
PRODUCT SPECIFICATIONS	
<b>Transmitter Supply Voltage   Supply Current:</b>	+8.5 to 32 VDC (Reverse Polarity Protected)   25 mA minimum
<b>Maximum Load Resistance:</b>	<b>250 Ohm Load:</b> +13.5 to 32 VDC   <b>500 Ohm Load:</b> +18.5 to 32 VDC (Terminal Voltage - 8.5 V)   0.020 A
<b>Output Signal:</b>	<b>Current:</b> 4-20 mA (2-Wire Loop Powered)   <b>Voltage:</b> 1-5 VDC or 2-10 VDC (3-Wires)
<b>Calibration Transmitter Accuracy   Linearity:</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:</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>Warm Up Time   Warm Up Drift:</b>	10 Minutes   +/- 0.1%
<b>Operating   Storage Temperature Range:</b>	-40°F (-40°C) to 185°F (85°C)
<b>Operating Humidity Range:</b>	0 to 90%, non-condensing
<b>Calibration Temperature Spans<sup>1</sup>:</b>	<b>Minimum Temp. Span:</b> 50°F (28°C)   <b>Maximum Temp. Span:</b> 700°F (370°C)
<b>Connections   Wire Size:</b>	Screw Terminal Blocks (Non-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>	0.5 Nm nominal
<b>Sensor Type   Sensor Curve   Sensor Points:</b>	Platinum RTD   PTC (Positive Temperature Coefficient)   One
<b>Number Wires:</b>	<b>A/100-3W-LT-I-XX” and A/1K-3W-LT-I-xx”:</b> Three (White / Two Red) Polarity Sensitive
<b>Sensor Output @ 0°C (32°F):</b>	<b>A/100-3W-LT-I-xx”:</b> 100 Ohms nominal   <b>A/1K-3W-LT-I-xx”:</b> 1000 Ohms nominal
<b>Sensor Tolerance   Accuracy<sup>2</sup>:</b>	+/- 0.12% Class B   <b>Class B Tolerance Formula:</b> +/- °C = (0.30°C + (0.005 *  t ))
<b>Din Standard   Temperature Coefficient:</b>	DIN EN 60751 (IEC 751)   3850 ppm / °C
<b>Sensor Stability:</b>	< 0.04 % at 1000 hours at 400°C
<b>Self-Heating   Maximum Operating Current:</b>	<b>100 Ohm RTD:</b> 7 mW/°C (Still Air)   5 mA   <b>1K Ohm RTD:</b> 4 mW/°C (Still Air)   3 mA
<b>Sensor Operating Temperature Range:</b>	-198 to 150°C (-324 to 302°F)
<b>Enclosure Specifications (Operating Temperature Range, Material, Flammability, NEMA/IP Rating):</b>	<b>“-GD” Enclosure:</b> -40 to 199°C (-40 to 390°F); Galvanized Steel; NEMA 1 (IP10) <b>“-BB” Enclosure:</b> Aluminum, -40 to 121°C (-40 to 250°F), Plenum Rated, NEMA 3R
<b>Storage Temperature Range:</b>	-40 to 85°C (-40 to 185°F)
<b>Operating Humidity Range:</b>	10 to 95% RH, non-condensing
<b>Probe Material   Probe Diameter:</b>	316 Stainless Steel   0.250” (6.35mm)
<b>Compression Fitting Material:</b>	316 Stainless Steel
<b>Lead Length   Conductor Size:</b>	8’ (2.44 m)   22 AWG (0.25 mm)
<b>Lead Wire Insulation   Conductor Material:</b>	Etched Teflon (PTFE)   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>:** Where |t| is the absolute value of temperature above or below 0°C in Centigrade

# TEMPERATURE | LOW TEMP TRANSMITTERS | DUCT

## DIMENSIONAL DRAWING

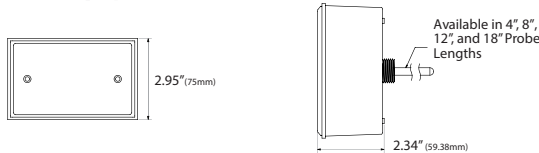
### Galvanized Enclosure [GD]



### Galvanized Enclosure [GD] Weights

ACI Model #	4" (Probe Length)	8" (Insertion Length)
A/xx-D-yy-GD	0.66 lbs. (0.299 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)	8" (Insertion Length)
A/xx-D-yy-BB	0.70 lbs. (0.317 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)

Standard Views

Product Weights

**Note:** There are two enclosures included with configurations involving Temperature Transmitters. A secondary GD (Galvanized) enclosure contains the transmitter board to protect it from the extreme temperatures exposed to the sensing element

## CUSTOM ORDERING LOW TEMPERATURE DUCT SENSORS

Model # Example: A/ 1K 3W LT D 4" GD NIST

<b>A. Sensor Series</b> No Selection Required	A/	
<b>B. Model Series</b> Select One (1)	100 = 100 Ohm Platinum RTD only   1K = 1K Ohm Platinum RTD only	
<b>C. Number of Wires</b> No Selection Required	3W = Three Wires (Specify for 100 and 1K RTD Sensors only)	
<b>D. High Temperature</b> No Selection Required	LT = Low Temperature Series	
<b>E. Configuration</b> Select One (1)	D = Duct	
<b>F. Thermowell Insertion Length</b> Select One (1)	4" = 4" Probe   8" = 8" Probe   12" = 12" Probe   18" = 18" Probe	
<b>G. Enclosure</b> Select One (1)	GD = Galvanized Enclosure   BB = Cast Aluminum Weather Proof Enclosure	
<b>H. NIST</b> Select One (1)	---- = No NIST Certificate   NIST = NIST Certificate (3 Points)	

## MODEL#

A/
3W
LT
D

## CUSTOM ORDERING LOW TEMPERATURE DUCT TRANSMITTERS

Model # Example: A/ TT100 LT D 8" 2 GD

<b>A. Sensor Series</b> No Selection Required	A/	
<b>B. Model Series</b> Select One (1)	TT100 = Unmatched Temperature Transmitter & 100 Ohm RTD TT1K = Unmatched Temperature Transmitter & 1K RTD TTM100 = Matched 100 Ohm Temperature Transmitter/Sensor TTM1K = Matched 1K Ohm Temperature Transmitter/Sensor (Must specify 3 or 5 Point NIST Certificates for all TTM100 and TTM1K Transmitters)	
<b>C. High Temperature</b> No Selection Required	LT = Low Temperature Series	
<b>D. Configuration</b> Select One (1)	D = Duct	
<b>E. Thermowell Insertion Length</b> Select One (1)	4" = 4" Probe   8" = 8" Probe   12" = 12" Probe   18" = 18" Probe	
<b>F. Analog Output</b> Select One (1)	1 = 1 to 5 VDC   2 = 2 to 10 VDC   4 = 4 to 20 mA	
<b>G. Enclosure</b> Select One (1)	GD = Galvanized Enclosure   BB = Cast Aluminum Weather Proof Enclosure	
<b>H. Calibration Span</b>	Specify Span in °F or °C (Best Accuracy in 100°F Increments)	

## MODEL#

A/
LT
D

## ACCESSORIES ORDERING

Model # Example: A/316SS\_1-8IN\_NPT\_COMPRESS\_FIT -OR- 143457

Model #	Item #	Description
A/316SS_1-8IN_NPT_COMPRESS_FIT	143457	1/8" MNPT x 1/4" Tube Fitting (Bore Through), Compression Fitting
A/316SS_1-2IN_NPT_COMPRESS_FIT	143458	1/2" MNPT x 1/4" Tube Fitting (Bore Through), Compression Fitting