

# Freezer Series I Transmitters

## Remote Freezer Transmitters



Automation Components  
a DwyerOmega brand

The ACI RTD Freezer Series features a 4.76 mm (3/16 in) diameter stainless steel probe with a 3.05 m (10 ft) or 9.14 m (30 ft), 3 Conductor, 0.51 mm (24 AWG) Plenum rated jacketed Teflon cable. The sensor is designed to be used in Pharmaceutical, Liquid Nitrogen, Freezers, Refrigerators and Hydronic applications where a remote sensor is required. Optional "-GD" galvanized, "-BB" Aluminum, or "-4x" NEMA 4X weather proof plastic enclosures are available as well as NIST Certificates as referenced on the back of the product data sheet. A/TT Series transmitter accuracies must be calculated using both the calibration accuracy of the transmitter and the sensor accuracy over your applications operating temperature range. For higher accuracies, the A/TTM Series includes a secondary calibration process designed to eliminate most of the sensor error from the overall system accuracy. Any Freezer Transmitter can be used with the Single or Triple Point Glycol Kits when a Thermal Buffer (slower) response time is desired.

### Applications

Pharmaceutical, Liquid Nitrogen, Refrigerators, Freezers, Hydronic Heating, Remote Sensor Applications, Hospital, Agricultural

### Warranty

The ACI Transmitter Freezer 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 website, [workaci.com](http://workaci.com).

### Specifications

**Transmitter Supply Voltage | Supply Current:** 8.5 V dc to 32 V dc (Reverse Polarity Protected) | 25 mA minimum

**250 Ω Load:** 13.5 V dc to 32 V dc

**500 Ω Load:** 18.5 V dc to 32 V dc

**Maximum Load Resistance:** Terminal Voltage - 8.5 V | 0.020 A | (775 Ω @ 24 V dc)

#### Output Signals

**Current:** 4 mA to 20 mA (2-Wire Loop Powered)

**Voltage:** 1 V dc to 5 V dc or 2 V dc to 10 V dc (3-Wires)

#### Calibrated Transmitter Accuracy | Linearity

**Temp. Spans < 260 °C (500 °F):** ± 0.2 %

**Temp. Spans > 260 °C (500 °F):** ± 0.5 %

#### Temperature Drift

**Temp. Spans < 38 °C (100 °F):** ± 0.04 % / °F

**Temp. Spans > 38 °C (100 °F):** ± 0.02 % / °F

#### TTM100/TTM1K Certification Points

**3 Point NIST:** 20 %, 50 % & 80 % of span

**5 Point NIST:** 20 %, 35 %, 50 %, 65 %, 80 % of span

**Minimum:** -80 °C (-112 °F)

**Maximum:** 155 °C (311 °F)

**Warm Up Time | Warm Up Drift:** 10 Minutes | ± 0.1 %

**Operating | Storage Temperature Range:** -40 °C to 85 °C (-40 °F to 185 °F)

**Operating Humidity Range:** 0 % to 95%, non-condensing

#### Calibrated Temperature Spans<sup>1</sup>

**Minimum Temp. Span:** 28 °C (50 °F)

**Maximum Temp. Span:** 538 °C (1000 °F)



**Connections | Wire Size:** Screw Terminal Blocks (Polarity Sensitive) | 1.31 mm<sup>2</sup> (16 AWG) to 0.129 mm<sup>2</sup> (26 AWG)

**Terminal Block Torque Rating:** 0.5 Nm nominal

**Sensor Type | Sensor Curve:** Platinum RTD | Linear, PTC (Positive Temperature Coefficient)

**Number Wires:** Three Conductors (White and Two Red Wires); Polarity Sensitive (Red wires tied together)

#### Sensor Output @ 0 °C (32 °F)

**A/TT/TTM100-LTS Series:** 100 Ω nominal

**A/TT/TTM1K-LTS Series:** 1000 Ω nominal

#### RTD Tolerance Class<sup>2</sup> | Sensory Accuracy

Class B | **Accuracy Formula:** ± °C = (± 0.30 °C + (0.005 × |t|))

**-200 °C (-328 °F):** ± 1.30°C (± 2.43 °F)

**0 °C (-32 °F):** ± 0.30 °C (± 0.54 °F)

#### Response Time (63% Step Change)

**A/TT/TTM100-LTS Series:** In still air: 3:40 (minutes:seconds) In water: 19 seconds

**A/TT/TTM1K-LTS Series:** In still air: 3:50 (minutes:seconds) In water: 22 seconds

**Temperature Coefficient | Din Standard:** 3850 ppm / °C | DIN EN 60751 (IEC 751)

**Stability:** < 0.04 % at 1000 hours at 400 °C (752 °F)

**Sensor Operating Temperature Range:** -198 °C to 150 °C (-324 °F to 302 °F)

#### Enclosure Specifications (Operating Temperature, Material, Flammability, NEMA/IP Ratings)

**"-GD" Enclosure:** -40 °C to 121 °C (-40 °F to 250 °F); Galvanized Steel; NEMA 1 (IP10)

**"-BB" Enclosure:** Aluminum, -40 °C to 121 °C (-40 °F to 250 °F), Plenum Rated, NEMA 3R (IP 14)

**"-4X" Enclosure:** -40 °C to 70 °C (-40 °F to 158 °F); Polystyrene Plastic; UL94-V2; NEMA 4X (IP 66)

**Storage Temperature Range:** -40 °C to 80 °C (-40 °F to 176 °F)

**Cable Gland (Fitting) Size | Hole Size | Material:** PG7 | 15 mm (0.591 in) | Polyamide 6

**Cable Gland Sleeve Material | Wire Clamping Size:** Neoprene | 2.5 mm (0.098 in) to 6.5 mm (0.256 in)

**Cable Gland IP Rating | Torque Rating:** IP 68 (NEMA 6P) | 2.5 Nm (22.127 lb-in)

**Probe Material | Length | Diameter:** 316 Stainless Steel | 50.8 mm (2 in) | 4.76 mm (0.1875 in) nominal

**Lead Length | Cable Diameter:** 3.05 m (10 ft) or 9.15 m (30 ft) | 2.69 mm (0.106 in) nominal

**Conductor Size | Conductor Material:** 0.51 mm (24 AWG) | Silver Plated Copper

**Lead Wire Insulation | Jacket Color:** FEP/FEP (Teflon) Jacketed Cable | White

**Product Weights**

A/TT/TTMxxx-LTS-BB-10': 0.39 kg (0.84 lb)



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A/TT/TTMxxx-LTS-4X-10': 0.19 kg (0.42 lb)

A/TT/TTMxxx-LTS-GD-10': 0.32 kg (0.73 lb)

A/TT/TTMxxx-LTS-BB-30': 0.48 kg (1.04 lb)

A/TT/TTMxxx-LTS-4X-30': 0.29 kg (0.62 lb)

A/TT/TTMxxx-LTS-GD-30': 0.43 kg (0.93 lb)

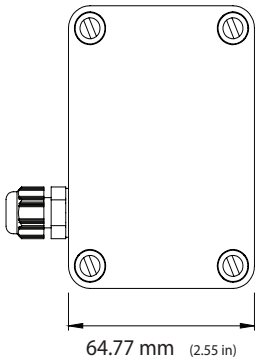
**Agency Approvals:** CE, UKCA, WEEE, RoHS

**Note<sup>1</sup>:** Transmitter's calibrated at 22 °C (71 °F) nominal

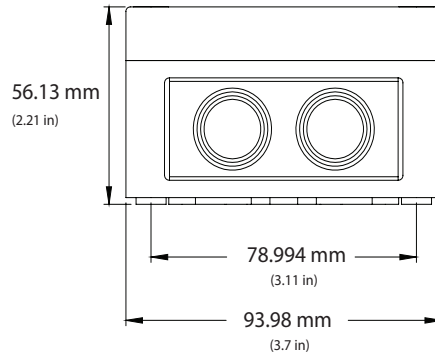
**Note<sup>2</sup>:** Where *t* is the Absolute Value of temperature in Centigrade above or below 0 °C

**Dimensions**

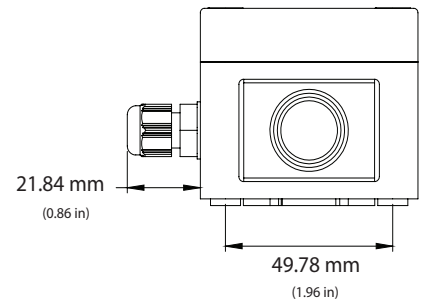
**NEMA 4X Enclosure (4X)**



Front View

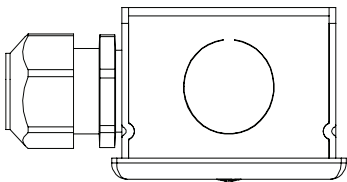


Side View

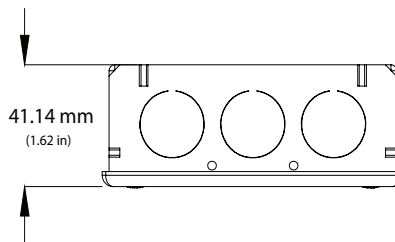


Top View

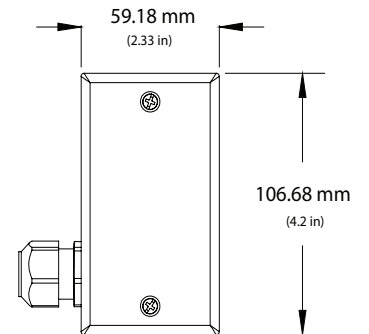
**Galvanized Enclosure (GD)**



Front View



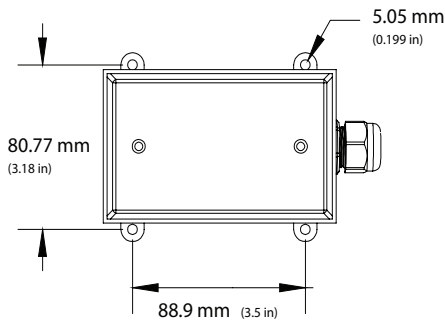
Side View



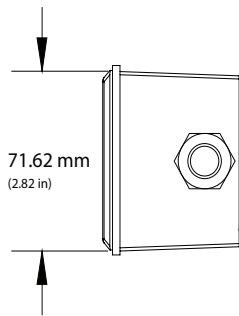
Top View



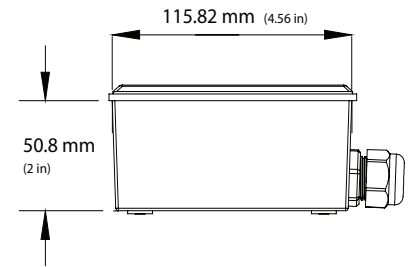
### Bell Box Enclosure (BB)



Front View



Side View

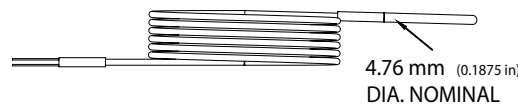


Top View

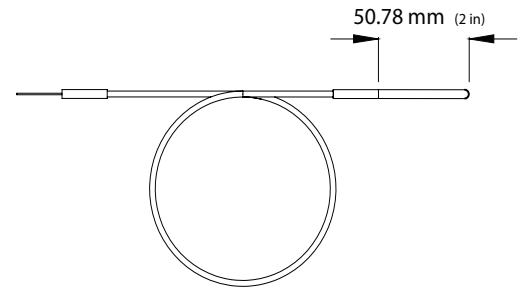
### Sensor Probe



Front View



Side View



Top View

### Optional Sensor Ordering

		Options and Descriptions			Model #
<b>A.</b>	<b>Sensor Series</b> <i>No Selection Required</i>	A/ _____ →			A/
		TT100 = 100 Ω RTD			
<b>B.</b>	<b>Model Series</b> <i>Select One (1)</i>	TTM100 = Matched 100 Ω RTD*			
		TT1K = 1 kΩ RTD			
		TTM1K = Matched 1 kΩ RTD*			
<b>C.</b>	<b>Configuration</b> <i>No Selection Required</i>	LTS = Freezer Sensor _____ →			LTS
<b>D.</b>	<b>Output Signal</b> <i>Select One (1)</i>	1 = 1 V dc to 5 V dc (3-Wire)	2 = 2 V dc to 10 V dc (3-Wire)	4 = 4 mA to 20 mA (2-Wire Loop Powered)	
<b>E.</b>	<b>Enclosure</b> <i>Select One (1)</i>	GD = Galvanized Enclosure	BB = NEMA 3R Enclosure	4X = NEMA 4X Enclosure	
<b>F.</b>	<b>Lead Length</b> <i>Select One (1)</i>	10' = 3.05 m (10 ft) leads		30' = 9.15 m (30 ft) leads	
<b>G.</b>	<b>Calibration Span</b> <i>Select One (1)</i>	Specify Span in °F or °C (Best Accuracy in 100 °F Increments)			
		Model # Example: A/ 1K LTS 4X 30' NIST			
		A. B. C. D. E. F.			

**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

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

