## Strap-on Temperature Sensor

### **Installation Instructions**

### ABS Enclosure



### Strap-on Temperature Sensor

Designed for monitoring temperatures on pipes where an immersion sensor can not be used. It is available with various probe lengths and enclosures to fit any application

### **Specifications**

Standard Length	2", 4", 6", 8", 12", 18"		
Operating Temperature Range	-20 to 105 °C (-4 to 221 °F)		
Cable Type	PVC insulated, parallel bonded		
Wiring Connections	Pig Tail (2 or 3 wire)		
Enclosures	ABS, Metal or Weatherproof		
Sensor Types	100 Ω, 1K PT, 1K Nickel RTD's, 1801 K, 3K, 10K (type 2 & 3) 20K & 100K Thermistors		

## Wiring & Color codes

All two-wire sensors are polarity insensitive. The three-wire sensors have the following color code:

<b>Connection</b>	<u>Strap-on Wire Color</u>
EXCitation	RED
SENse	GREEN
NEGative	BLACK

To connect a three-wire sensor as a two-wire, tie the EXCitation and SENse lines together.

Dual sensor probes will have one sensor on the RED and BLACK wires and the second sensor on the GREEN and WHITE wires.

Metal Enclosure Weatherproof Enclosure

### **Temperature Transmitter Information**

Mount the probe under any pipe insulation in direct contact with the pipe to measure the temperature of the pipe using metal pipe straps or cable ties. For best results, thermal compound should be used between the probe and pipe to improve heat transfer and the installation should be wrapped with insulation to reduce the effects of ambient air

## **Typical Wire Resistance Values**

When using low resistance sensors (i.e. 100 ohm RTD), long wire runs can add significant error to the readings. Use the following chart to determine errors due to wire resistance or consider using a 1000 ohm sensor or a transmitter for better accuracy. Locate the type of wire being used. Multiply the total length of the wire (distance from the controller to the sensor and back) by the number found in the following chart for total resistance

GAUGE WIRE TYPE	18 AWG	22 AWG	24 AWG
STRANDED (OHMS/ FOOT)	5.85 mΩ	14.75 mΩ	23.29 mΩ
SOLID (OHMS/FOOT)	6.4 mΩ	15.85 mΩ	25.72 mΩ

# **Temperature Transmitter**

#### Specifications

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Power Supply 24 Vdc $\pm$ 20% or 24 Vac $\pm$ 10%
Consumption 22 mA maximum
Output Signals 4-20 mA or 0-5 Vdc or 0-10 Vdc
Output Drive 400 ohm max for current output
5K ohm min for voltage output
Accuracy $\dots \pm 0.1\%$ FSO
Operating Range 0-50 °C (32-122 °F), 5-95 %RH
Wire Connections Screw terminal block (14-22 AWG)
Sensor 1000 ohm RTD
LCD Display 3 digit for 88.8 or 888 as necessary
0.95" w x 0.45" h (24 x 11 mm)
Enclosure 5.7"w x 3.95"h x 2.5"d
(145 x 100 x 63 mm)

#### Wiring

Use shielded twisted pair wiring of at least 22 AWG for all connections and do not run the signal or power wires in the same conduit with wiring used to supply inductive loads such as motors. Disconnect the power supply before making any connections to prevent electrical shock or equipment damage. Make all connections in accordance with national and local electrical codes.

The transmitter is available with either 4-20 mA, 0-5 Vdc or 0-10 Vdc output signals. Follow the example wiring diagrams to determine the correct wiring for the product. All models have the same terminal functions. For 4-20 mA loop powered operation, only **POWER** and **OUTPUT** are required. The **COMMON** terminal is only used for voltage output types or for AC power.

Ensure the controller Analog Input (AI) matches the transmitter output signal type before power is applied. The device is reverse voltage protected and will not operate if connected backwards. The voltage output signal has a minimum load that it is able to drive and the current signal has a maximum load. Follow the ratings in the Specification section or inaccurate readings may result.

If the transmitter has a dual sensor probe, connect the RTD (Red/Black) leads to the SENSOR terminals. The second sensor is Green/White.

### Operation

The product should be allowed to warm-up for several

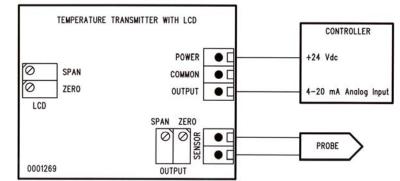
minutes before attempting to verify accuracy. Allow the transmitter to operate for 20 minutes before any calibration is performed.

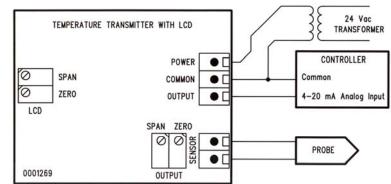
Operation can be verified by measuring the output signal. For voltage output models, measure the voltage between the **OUTPUT** and **COMMON** terminals. The voltmeter should read between 0-5 or 0-10 Vdc depending on the model. For current output models, insert a mA meter in series with the **OUTPUT** terminal and it should read between 4 and 20 mA. The LCD will indicate the same temperature value as the output signal.

### Calibration

The unit can be calibrated in the field using precision resistance values equal to the zero and span of the temperature range. Simply replace the attached probe with the resistor, then adjust the ZERO and SPAN pots accordingly to obtain the correct output signal and display value. Repeat the adjustments until both values are correct.

#### Loop Powered Connection With Controller 24 Vdc Power





4-20 mA Connection With 24 Vac Power

0-10 Vdc Connection With Controller 24 Vdc Power

