



Thermowell Installation Example

### Immersion Temperature Sensor

Immersion type probes are designed to measure the temperature inside pipes carrying liquid or steam. They are to be used with a thermowell. Brass (for non-corrosive liquids) and 304 stainless steel (for corrosive liquids) wells are available.

### Specifications

|                    |  |
|--------------------|--|
| Standard Lengths   | 2", 4", 6", 8", 12", 18"   |
| Operating          | -40 to 105 °C  |
| Cable Type         | PVC insulated, parallel bonded (100 Ω, IC Sensors – FT-4)                                      |
| Wiring Connections | Pig Tail (2 or 3 wire)   |
| Enclosures         | ABS, Metal or Weatherproof   |
| Sensor Types       | 100 Ω, 1K PT, 1K Nickel RTD's, 1801Ω, 3K, 10K (type 2 & 3), 20K & 100K Thermistors, IC Sensors |

### Wiring & Color codes

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

|                   |                             |
|-------------------|-----------------------------|
| <u>Connection</u> | <u>Immersion 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. All connections should be made using either butt-splices or soldering. The use of wire nuts is not recommended

### Installation

Immersion probes must be installed into a thermowell. Mount the thermowell either horizontally or with the open end facing down to allow any condensation to drain and ensure that the well does not contact the inside of the pipe. For best results, use thermal compound inside the well and a spring loaded probe.

### 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 |

### Other Enclosure Styles

Metal Enclosure

Weatherproof Enclosure

