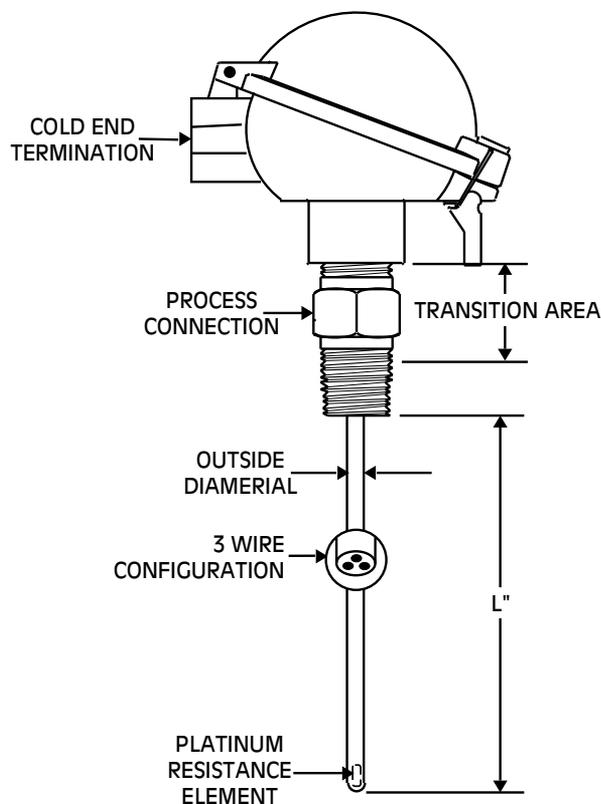


RTD'S - RESISTANCE TEMPERATURE DETECTORS

RTD's work on the principle that there is a positive correlation between the electrical resistance of a metal conductor and changes in temperature. The standard temperature range is from -200°F to 900°F. High temperature assemblies are available which can operate at up to 1475°F.

The advantages of using RTD's include accuracy, repeatability, and stability. Another advantage is that cold junction compensation is unnecessary. Copper wire is used for all connections. The signal level of an RTD is over ten times higher than that of a thermocouple which eliminates the need for high gain amplifiers. The signal is also less susceptible to noise than thermocouples. The accuracy of a 4 wire RTD is independent of the distance between the sensor and the readout instrument.



COMPONENTS OF RTD'S

The Platinum Resistance Element

This is the actual temperature sensing portion of the RTD. Elements range in length from 1/8" to 3" (See Pg 3-8). There are many options. The standard resistance is 100 ohms at 0°C and the standard temperature coefficient is an alpha of 0.00385. A complete list of options is listed on page 3-22.

Outside diameter / Inside diameter

The most standard outside diameter is 1/4". However, outside diameters range from .063" to .500". A selection of tube diameters can be found on page 1.

Tubing Material

316 Stainless steel is commonly used for all assemblies up to 500°F. Above 500°F it is advisable to use Inconel 600. A list of some materials available is on page 1.

Process Connection

Process connection fittings include compression fittings and 1/2" N.P.T. x 1/2" N.P.T. welded or spring-loaded fittings. Various connection options are listed on page 1.

Wire Configuration and Insulation

RTD's are available in two, three, and four wire configurations. Three wire configuration is the most common. See page 3-17 for further information on selecting wire configuration for your application. Teflon and fiberglass are the standard wire insulation materials. Teflon is moisture resistant and has a maximum temperature rating of 400°F. Fiberglass is used for high temperature applications because it has a maximum temperature rating of 1000°F. AL₂O₃ powder is used to fill voids. Hard ceramic insulators may be used for high temperatures.

Cold End Termination

This may be in the form of bare wires, plugs, or terminal heads. The accessory section contains a wide variety of these options. Standard cold end terminations are listed on page 3-2.

