

## ***Interchangeability and Repeatability***

Interchangeability and accuracy are commonly cited as the RTD's most distinguishing attributes. Because of the tight tolerances of the Class A and Class B, RTD's are quite interchangeable. Their accuracy is also very good because of the RTD's repeatability over the standard temperature scale from  $-260^{\circ}\text{C}$  to  $630^{\circ}\text{C}$ . Ordinary industrial RTD's tend to show a drift of less than  $0.1^{\circ}\text{C}$  per year in normal use.

Because RTD's are exactly what the name implies (Resistance Temperature Detector), a resistance type sensor, any resistance introduced by the addition of extension wires between the RTD and the control or measuring instrument will add to the readings. This added resistance is not constant since the extension wires, usually copper, change their resistance values with changing ambient temperature. Extension wire errors can be significant, particularly with small gauge wires or elements with low sensitivity. Fortunately most of these errors may be nearly canceled by using a three wire system.

The majority of RTD's in today's industry are 3- or 4-wire systems; the 2-wire lead system is the least efficient unless the leads are heavy gauge, very short, or both. In 3- or 4-wire circuits, common leads, connected to the same end of the RTD element, are the same color.