

**PRODUCT INFORMATION****TEMPERATURE COMPENSATION**

One of the most difficult problems that precision pressure instrument manufacturers must overcome is the effects of temperature on a metal elastic element, such as a Bourdon tube, bellows or diaphragm. Under a constant nominal input pressure, as the ambient temperature changes the element will deflect more or less with increases or decreases in ambient temperature, resulting in erroneous readings.

To compensate for the affects of ambient temperature deviations upon the Bourdon tube, a bimetallic link can be incorporated into the movement. This device is available as an optional feature on any Heise® dial mechanical gauge. The principle behind bimetallic temperature compensation is simple. The bimetal reacts to the same temperature that is effecting the Bourdon tube and, as the temperature changes, the bimetal adjusts one of the angle settings within the movement to offset the temperature effect on the Bourdon tube. Each bimetal is custom manufactured to exactly match and offset the temperature characteristics of the actual Bourdon tube that it will be used with.

Many customers use their Heise® gauges as secondary standard “master gauges.” In this application, the gauge is usually confined to a laboratory environment with a controlled ambient temperature and, therefore, the temperature compensation option is probably not necessary. However, if an *uncompensated* gauge is to be used outside of a controlled environment, the user may experience an additional error of as much as 0.1% FS per 5° deviation from 73°F.

It is important to note that the temperature compensation option is designed to compensate for *ambient* temperature only, *not* the temperature of the process medium. The question often arises as to the effects of steam as a pressure medium. In such applications, the temperature compensation option will have very little effect and we recommend the use of a pigtail "siphon" in order to cool down the steam as much as possible before it enters the Bourdon tube.

Since the temperature compensation option is custom fit to the Bourdon tube, it cannot be purchased as a separate part or added in the field later. (Conversely, Bourdon tubes are not field replaceable in temperature compensated gauges.) That's one reason why it always pays to carefully analyze the application and review the specification prior to ordering a gauge.

