High Temperature Liquids & Gases

When selecting a pressure transducer for monitoring high temperature liquids or gases, be aware of the operating temperature range of the transducer. This specification can be found under environmental data on most manufacturers' data sheets. The temperature compensated range specification of a transducer is the error introduced as temperature increases or decreases from 70°F. This thermal error affects both the span and zero setting of the transducer's analog output and is generally listed as a percent of full scale per degree (% FS/°F). The static accuracy, the accuracy at 70°F, of the pressure transducer plus the thermal error introduced by a high temperature pressure source is the total possible error for a specific high temperature pressure measurement.

The expense of a special high temperature pressure transducer can be avoided by using a temperature stand-off (short length of tubing) to isolate the transducer from the high temperature pressure media. Table 1 shows various lengths and diameters of tubing for 303 stainless steel (SS) and brass that will limit the media temperature at the transducer to 0 to 200°F. Table 1 assumes the ambient temperature around the transducer is 100°F, and the major source of thermal input is through the connecting tubing.

For example, a 6" length of 0.25" outside diameter (OD) and 0.18" inside diameter (ID) 303 SS tubing will protect a transducer from an 1100°F pressure media.

TABLE 1: LENGTH OF TEMPERATURE STAND-OFFS (INCHES)

Pressure Media Temperature (°F)	303 SS (0.125 OD x 0.007 ID)	303 SS (0.25 OD x 0.18 ID)	Brass (0.25 OD x 0.18 ID)
-400	-	4.50	-
-300	-	4.25	-
-200	-	3.75	-
-100	-	3.00	-
0	Not Required	Not Required	Not Required
200	Not Required	Not Required	Not Required
400	3.00	3.50	7.00
600	3.75	4.50	8.75
800	4.30	5.20	10.00
1000	4.90	5.75	-
1200	5.25	6.10	-
1400	5.60	6.40	-
1600	5.85	6.80	-