

Pressure and Temperature Application and Installation Note

TP Series - Temperature & Pressure Transducers

Background

Many Applications require the measurement of temperature & pressure and to simplify installation and use, the TP series has both sensors built into one device. When using a combined pressure and temperature device, there are many vital factors that need to be considered.

Application:

There are an abundant number of applications that require the measurement of both temperature and pressure. Which include but are not limited to:

- Commercial Refrigeration
- Heat Pumps
- HVAC
- Compressors
- Hydraulics
- Automotive

Factor #1: Location of Device

Ideally the location of the device will be at the point where you want to measure temperature. However, this is not always practical. Interconnects, fittings, and piping layout may restrict access to the ideal point of measurement.

Example: Refrigeration Applications

Typically, copper pipes are used in the refrigeration cycle. For example, when measuring superheat, it is important to achieve fast response and accurate temperature measurement – ideally at the same point of pressure measurement. Typically, refrigerant fluid systems would require temperature and

pressure measurements for superheat to be at both the low end and high end of the systems pressure cycle. It's important to be as close to the flow of refrigerant as possible. We have designed a solution for our TP Series to achieve the best performance. Our fitting (fig.1), was designed to be brazed onto copper pipes. Thus, allowing the closest point of contact for temperature measurement.

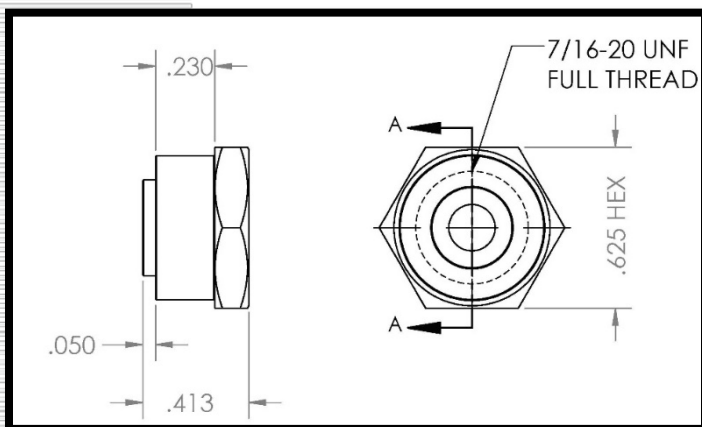


Figure 1 - Seat Fitting for copper line and transducer Connection

Factor #2: Ambient Temperature vs. Media Temperature

When packaged with a pressure sensor, a key factor in the accuracy and response time of the temperature measurement is the ambient temperature in relation to the contact media temperature. This delta and the thermo conductivity of your package can introduce unwanted errors. For improved temperature measurement accuracy, we recommend wrapping the sensors with insulation (Ex. Cork/tar tape, etc.) to reduce the temperature delta between the sensor and the media being measured. *Figure 2* shows some test done at 70F comparing transducers wrapped and unwrapped.

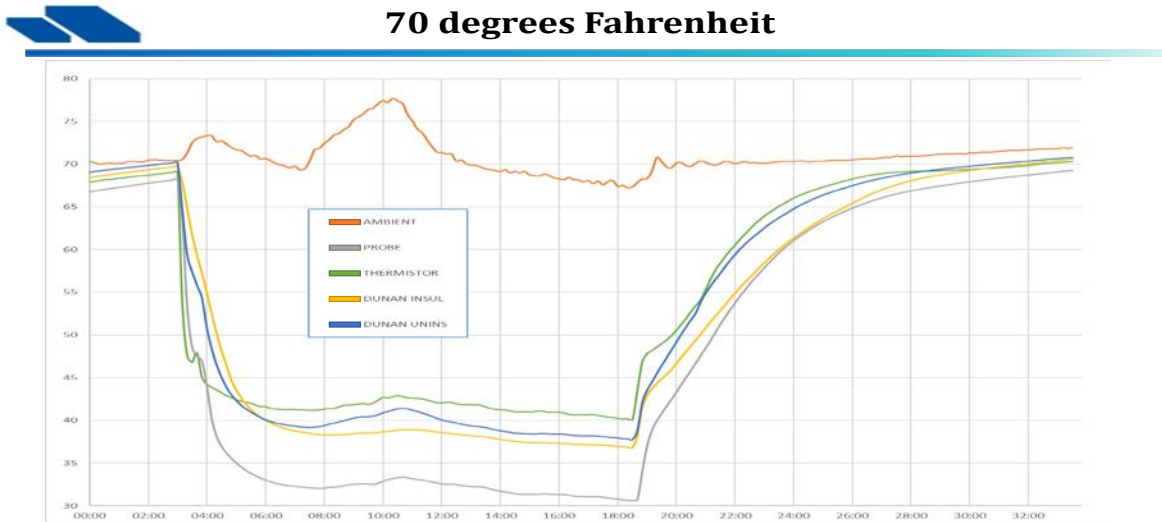


Figure 2 – Uninsulated Temperature Sensor VS. Insulated Temperature Sensor

Installation Note:

When making the pressure connection on your transducers it is recommended to:

1. Select the correct adaptor fitting based on your pipe size.
2. Braze seat ONLY onto pipe before installing/threading the transducer into the adapter.
3. After brazing seat fitting, make sure the seat is around ambient temperature.
4. Install transducer pressure/temperature port into seat fitting
 - a. Hand tighten and then torque per specification in *Table 1*
5. Install the insulation around the transducer

Threads	FLARE Fitting	TORQUE	
		O-ring Fitting	
		Aluminum	Brass/Steel
7/16-20	10-15 lbf*ft (13.56-20.33 N*m)	5-7 lbf*ft (6.78 - 9.49 N*m)	5-10 lbf*ft (6.78 - 13.56 N*m)
	TORQUE	Assembly turns from finger tight with pipe thread sealant or teflon tape applied	
NPT 1/8-27	0.58 lbf*ft (0.79 N*m)	2-3	
NPT 1/4 - 18	1.33 lbf*ft (1.80 N*m)	2-3	

Table 1 - Transducer Torque Specification