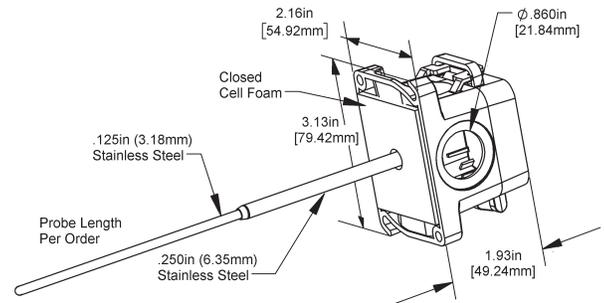


### Overview and Identification

The Submersible Duct Unit is for duct mounting and temperature measurement of air across cooling coils or wet locations. The Stainless Steel probe tip is very small (1/8") to fit between coil fins and made in different lengths for a custom duct fit. The units are available with 4 to 20mA output and a variety of probe lengths. They can be ordered with a 1KΩ Platinum RTD or special high accuracy RTD matched transmitters which match the sensor to the transmitter for improved accuracy.

The BAPI-Box Crossover enclosure has a hinged cover for easy termination and comes with an IP10 rating (or IP44 rating with a pierceable knockout plug installed in the open port).

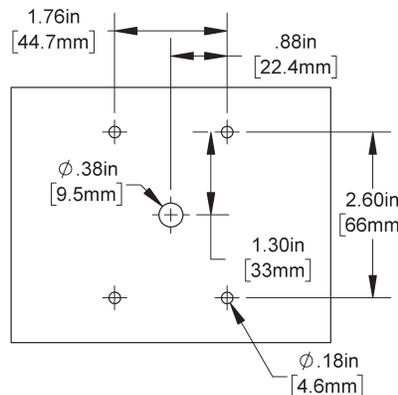
**This instruction sheet is specific to temperature transmitter units with the BAPI-Box Crossover Enclosure. For all other temperature transmitter units, please refer to instruction sheet "20916\_ins\_SubmersibleDuct\_Active.pdf" which is available on the BAPI website or by contacting BAPI.**



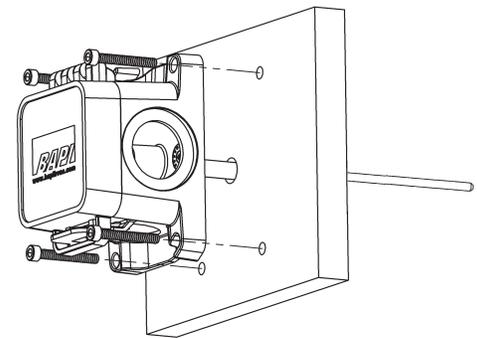
**Fig 1:** Submersible Duct Unit with BAPI-Box Crossover Enclosure

### Mounting

1. Choose an appropriate location on the duct and drill the probe and mounting holes as shown in Figs 2 & 3.
2. Insert the probe into the duct and mount the enclosure to the duct using BAPI recommended #8 screws through a minimum of two opposing mounting tabs provided. A 1/8" pilot screw hole in the duct makes mounting easier through the mounting tabs. Use the enclosure tabs to mark the pilot hole locations.
3. Snug up the sensors so that the foam backing is depressed to prevent air leakage but do not over-tighten or strip the screw threads.
4. A pierceable knockout plug is available for the open port in the BAPI-Box Crossover enclosure. The plug increases the enclosure rating from IP10 to IP44.



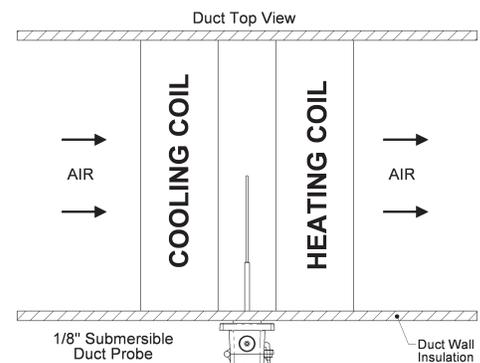
**Fig 2:** BAPI-Box Crossover Enclosure Mounting Holes



**Fig 3:** BAPI-Box Crossover Enclosure Mounting

#### Notes:

Use caulk or Teflon tape for your conduit entries to maintain the appropriate IP or NEMA rating for your application. Conduit entry for outdoor or wet applications should be from the bottom of the enclosure.



**Fig 4:** Cooling Coil Discharge Air Temperature Application

Specifications subject to change without notice.

### Wiring & Termination

BAPI recommends using twisted pair of at least 22AWG and sealant filled connectors for all wire connections. Larger gauge wire may be required for long runs. All wiring must comply with the National Electric Code (NEC) and local codes. Do NOT run this device's wiring in the same conduit as high or low voltage AC power wiring. BAPI's tests show that inaccurate signal levels are possible when AC power wiring is present in the same conduit as the sensor wires.

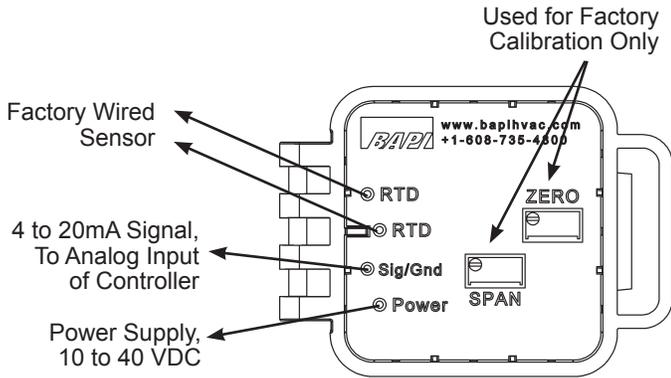


Fig. 5: Transmitter with Flying Leads

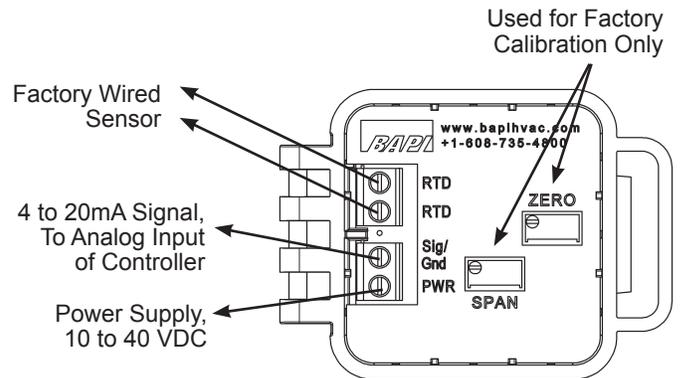


Fig. 6: Transmitter with Terminals

Note: Green LED on cover face will light when power is applied.

### Diagnostics

**Possible Problems:**

Green power LED is not on.

**Possible Solutions:**

- Measure the power supply voltage by placing a multi-meter across the transmitter's "Power" and "Sig/Gnd" leads or terminals. Make sure that the power is 10 to 40 VDC.
- Make sure that the "Power" and "Signal/Gnd" wires are not open or shorted together and are terminated correctly to the controller.

The reading is incorrect in the controller.

- Determine if the input is set up correctly in the BAS and controller's software.
- Compare the transmitted current to the actual temperature measurement at the sensor location. Measure the physical temperature at the temperature sensor's location using an accurate temperature standard. Measure the transmitter current by placing an ammeter in series with the controller input. The current should read according to the "4 to 20mA Temperature Equation" shown below. If the measured resistance is different from the temperature table by more than 5% call BAPI technical support.

**4 to 20mA Temperature Equation**

$$T = \frac{T_{Low} + (A - 4) \times (T_{Span})}{16}$$

T = Temperature at sensor  
 T<sub>Low</sub> = Low temperature of span  
 T<sub>High</sub> = High temperature of span  
 T<sub>Span</sub> = T<sub>High</sub> - T<sub>Low</sub>  
 A = Signal reading in mA

Specifications subject to change without notice.



# Submersible Duct Temperature Transmitters in the BAPI-Box Crossover Enclosure

Installation & Operations

37723\_ins\_subduct\_active\_bbx

rev. 03/23/18

## Specifications

### RTD Transmitter

Power Required: ..... 10 to 40VDC  
Output: ..... 4 to 20mA, 850Ω@24VDC  
Output Wiring: ..... 2 wire loop  
Output Limits: ..... <1mA (short), <22.35mA (open)  
Span: ..... Min. 30°F (17°C), Max 1,000°F, (555°C)  
Zero: ..... Min. -148°F (-100°C), Max 900°F (482°C)  
Zero & Span Adjust:..... 10% of span  
Accuracy: ..... ±0.065% of span  
Linearity: ..... ±0.125% of span  
Power Output Shift: ..... ±0.009% of span  
RTD Sensor: ..... 2 wire Platinum (Pt), 385 curve  
Transmitter Ambient..... -4 to 158°F(-20 to 70°C)  
0 to 95% RH, Non-condensing)

### **RTD Sensor:** Resistance Temp Device (Bare Sensor)

Platinum (Pt): ..... 1KΩ @0°C, 385 curve  
Pt Accuracy (Std): ..... 0.12% @Ref, or ±0.55°F, (±0.3°C)  
Pt Accuracy (High): ..... 0.06% @Ref, or ±0.277°F, (±0.15°C), **[A]**option  
Pt Stability: ..... ±0.25°F, (±0.14°C)  
Pt Self Heating: ..... 0.4 °C/mW @0°C  
Pt Probe Range: ..... -40° to 221°F, (-40 to 105°C)

**Lead Wire:** ..... 22AWG stranded

**Insulation:** ..... Etched Teflon, Plenum rated

**Probe:** ..... Stainless Steel, Sheath 0.25" OD, probe 0.125

**Probe Length:** ..... 12" to 48" per order

**Duct Gasket:** ..... 1/4" Closed cell foam (impervious to mold)

**Mounting:** ..... Extension tabs (ears), 3/16" holes

### **BAPI-Box Crossover Enclosure Ratings:**

IP10, NEMA 1  
IP44 with knockout plug installed in the open port

### **BAPI-Box Crossover Enclosure Material:**

UV-resistant polycarbonate & Nylon, UL94V-0

### **Environmental Operating Range:**

-40 to 185°F (-40 to 85°C)  
0 to 100% RH, Non-condensing

### **Agency:**

RoHS  
PT= DIN43760, IEC Pub 751-1983,  
JIS C1604-1989

Specifications subject to change without notice.