

Overview and Identification

BAPI's Temperature Transmitters in the BAPI-Box Crossover enclosure (BBX) can be ordered with a 1K Ω (385) RTD that has a field adjustable 0 to 5, 1 to 5, 0 to 10, 2 to 10VDC or 4 to 20 mA output over a selected temperature range.

These adjustable outputs can be set at the factory to order or default set to 4 to 20mA. They can also be ordered with a special high accuracy matched RTD transmitter which matches 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 units with the BAPI-Box Crossover Enclosure. For all other units, please refer to instruction sheet "22199_ins_T1K_T100_XMTR.pdf" which is available on the BAPI website or by contacting BAPI.



Fig. 1: Temperature Transmitter in a BAPI-Box Crossover Enclosure. (Left unit with terminal strip and right unit with flying leads.)

Mounting

Mount the enclosure to the surface using BAPI recommended #8 screws through a minimum of two opposing mounting tabs. A 1/8" inch pilot screw hole makes mounting easier through the tabs. Use the enclosure tabs to mark the pilot hole locations.

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).

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.

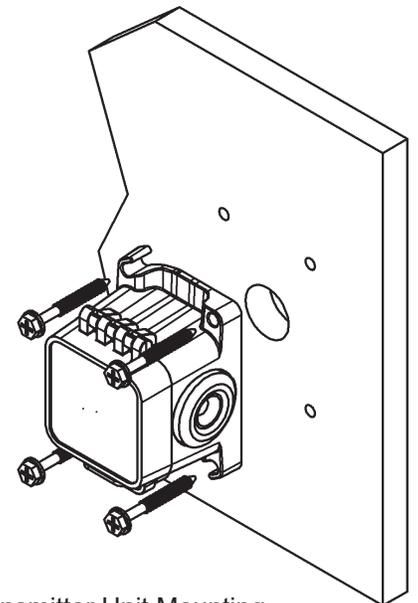


Fig 2: Transmitter Unit Mounting (Shown with knockout plug in open port.)

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. *Note: Keep transmitter at least 5 feet from any radio wave-emitting device (ie: 2 way radio). Transmitters that are less than 5 feet from a radio wave-emitting device can cause unwanted interference.*

A green LED on cover face will light when power is applied.



BAPI recommends wiring the product with power disconnected. Proper supply voltage, polarity, and wiring connections are important to a successful installation. Not observing these recommendations may damage the product and will void the warranty.

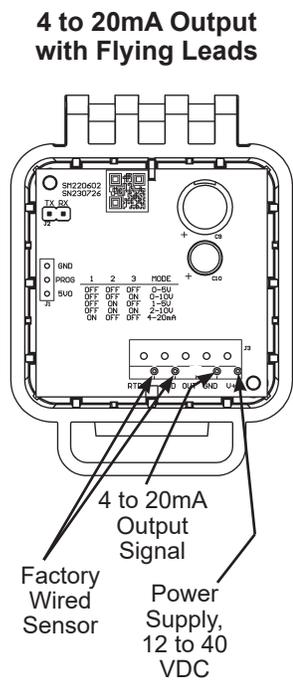


Fig. 3: Typical 4 to 20mA Output Transmitter with Flying Leads

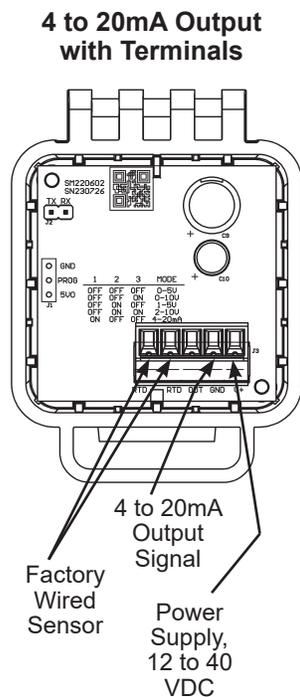


Fig. 4: Typical 4 to 20mA Output Transmitter with Terminals

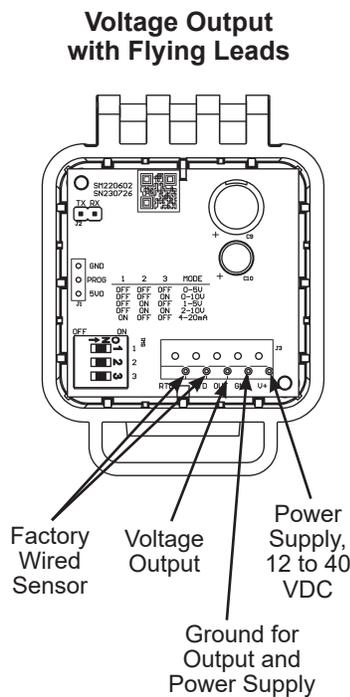


Fig. 5: Typical Voltage Output Transmitter with Flying Leads

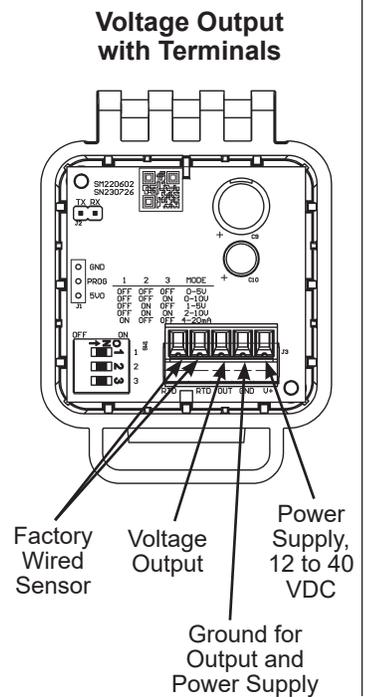
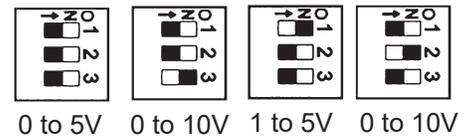


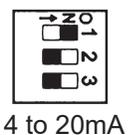
Fig. 6: Typical Voltage Output Transmitter with Terminals

DIP Switch Settings for Field-Selectable Voltage Output Units

The circuit board for voltage output units has a 3-position DIP switch that controls the output value. This switch is set at the factory at the time of the order but may be changed in the field.



Note: Units ordered with Voltage Output can be switched to 4 to 20mA output with the DIP switch setting shown at right. The middle flying lead or middle terminal would not be used in that case and the unit would be wired similar to Figs 3 and 4 above.





Diagnostics

Possible Problems:

Green power LED is not on.

The reading is incorrect in the controller.

Possible Solutions:

- Measure the power supply voltage by placing a multi-meter across the transmitter's "V+" and "GND" leads or terminals. Make sure that the power is 12 to 40 VDC.
- Make sure that the "V+" and "GND" wires are not open or shorted together and are terminated correctly to the controller.

- Determine if the input is set up correctly in the BAS and controller's software.
- Compare the transmitted current or voltage 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 current or voltage output from the sensor and compare it to the appropriate equation below. If the output differs from the equation 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
 TLow = Low temperature of span
 THigh = High temperature of span
 TSpan = THigh - TLow
 A = Signal reading in mA

Voltage Temperature Equation

$$T = T_{Low} + \left(\frac{V \times T_{Span}}{V_{Span}} \right)$$

T = Temperature at sensor
 TLow = Low temperature of span
 THigh = High temperature of span
 TSpan = THigh - TLow
 VLow = Low transmitter voltage usually=(0, 1 or 2v)
 VHigh = High transmitter voltage usually=(5 or 10v)
 VSpan = VHigh - VLow
 V = Signal reading in volts

Specifications

Platinum 1K RTD Transmitter

- Power Required:..... 12 to 40VDC
- Transmitter Output:..4 to 20mA, 0 to 5, 1 to 5, 0 to 10 or 2 to 10VDC, 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 x T-20°C)/100
- Transmitter Ambient: -4 to 158°F (-20 to 70°C)
0 to 95% RH, Non-condensing
- Resistance..... 1KΩ @ 0°C, 385 curve (3.85Ω/°C)
- Standard Accuracy ..0.12% @ Ref, or ±0.55°F (±0.3°C)
- High Accuracy.....0.06% @ Ref, or ±0.28°F (±0.15°C), [A]option
- Stability.....±0.25°F (±0.14°C)
- Self Heating.....0.4°C/mW @ 0°C
- Probe Range-40 to 221°F (-40 to 105°C)
- Wire Colors:.....General color code (other colors possible)
1KΩ, Class BOrange/Orange (no polarity)
1KΩ, Class AOrange/White (no polarity)

Environmental Operating Range:

- 4 to 158°F (-20 to 70°C)
- 0 to 95% RH, Non-condensing

Lead Wire: 22AWG stranded

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

BAPI-Box Crossover Enclosure Ratings:

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

BAPI-Box Crossover Enclosure Material:

- UV-resistant polycarbonate & Nylon, UL94V-0

Agency:

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

Specifications subject to change without notice.