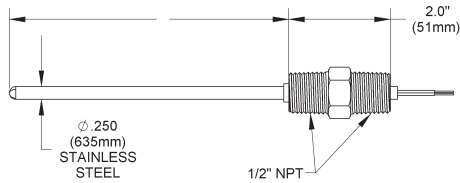


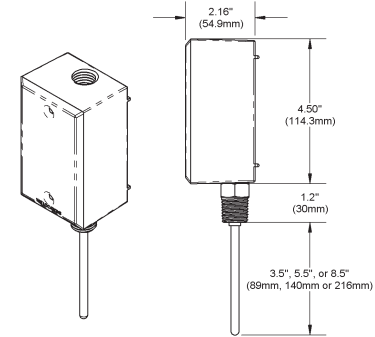
#### Overview

The BA/1x[1,2,3] Extreme Temperature Sensor is made for thermowell mounting, direct insertion or remote probe mounting. The probe is made of Stainless Steel and made in different lengths for a custom fit. The RTD's are available in 100Ω or 1KΩ 385 curve as shown in the specifications. Enclosure mounting styles come in plastic or metal for both NEMA 3R and NEMA 4 applications and are all plenum rated.

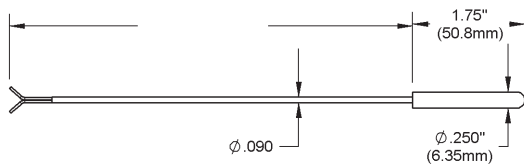
#### Identification



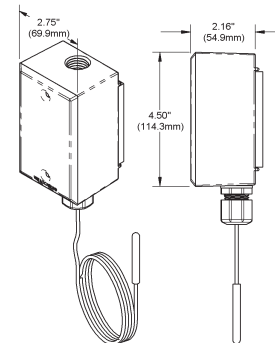
**Fig: 1** Double Threaded Probe Sensor



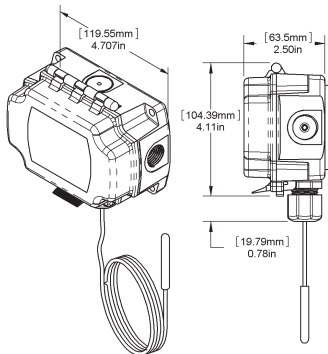
**Fig: 2** Double Threaded Probe w/Aluminum Box



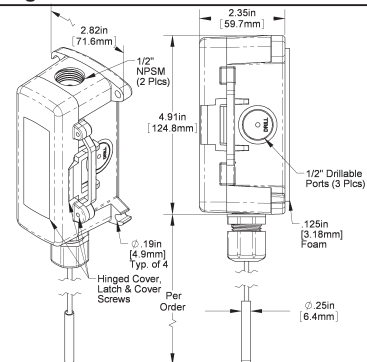
**Fig: 3** Remote Sensor



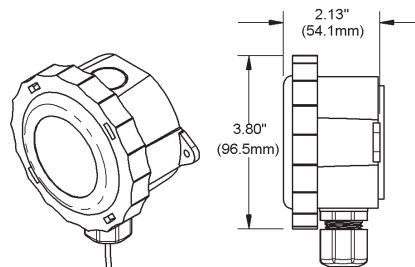
**Fig: 4** Remote Sensor w/Aluminum Box



**Fig: 5** Remote Sensor w/BAPI-Box



**Fig: 6** Remote Sensor w/BAPI-Box 2



**Fig: 7** Remote Sensor w/Round European Box

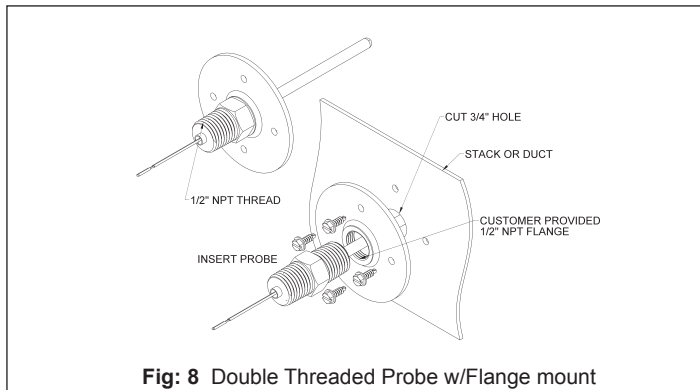
Specifications subject to change without notice.

### Mounting

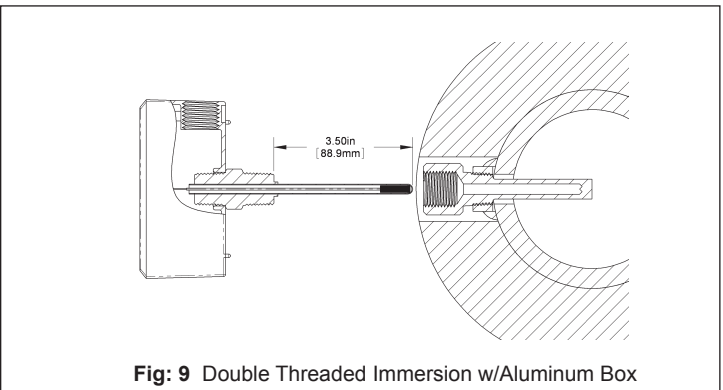
**Application:** Figure 9 shows a typical four-inch thermowell and four-inch immersion probe installed into an eight inch pipe. In a properly insulated pipe with liquid or steam, the temperature is essentially the same across the entire cross section of the pipe. Usually thermowells are sized to extend to the center of the pipe; however, shorter thermowells will give proper temperature readings if properly insulated. The shorter thermowells are used in pipes with high flow velocities. See Application notes "Thermowells Explained" on our web site BAPIHVAC.com

**Thermowell Installer:** Typically a Pipe Fitter drills a 3/4-inch hole into the pipe where the thermowell is needed. A customer provided fitting, called a Threadolet or Weldolet, is welded to the pipe over the hole. The Threadolet has a 1/2" NPT thread in the center. Thread sealant such as Teflon tape or pipe dope is applied to the 1/2" NPT threads of the thermowell. The thermowell is then inserted into the Threadolet and tightened. Estimates on insertion depths can be seen in our Application note "Thermowells Explained" on our web site BAPIHVAC.com

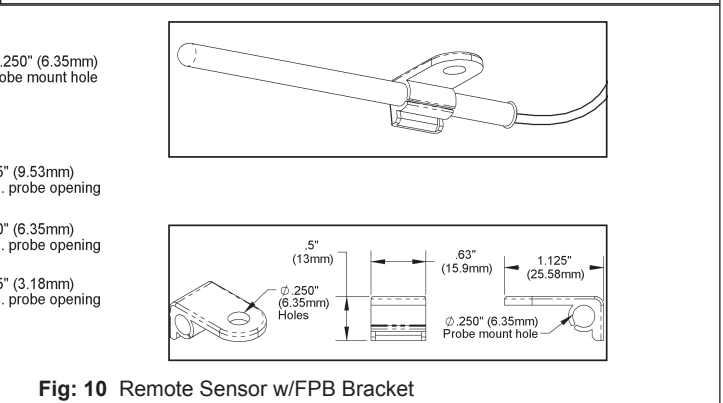
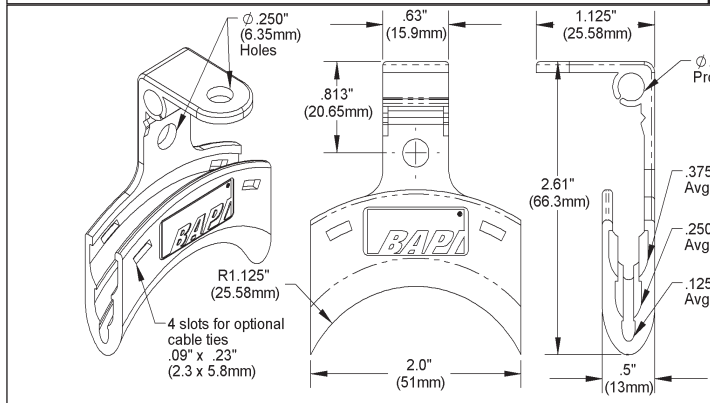
**Sensor Installation:** Insert the immersion sensor into the well with the stainless steel screw fitting into the opening on the well. Hand tighten the immersion sensor snugly without too much torque. Make sure that the tip of the immersion sensor is inserted as close to the well bottom as possible. The well is close fitting to the sensor and will offer an accurate reading without the need for thermal compound.



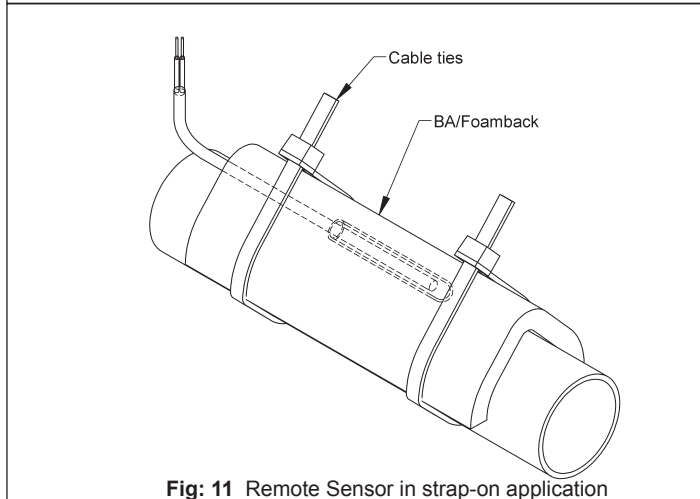
**Fig. 8** Double Threaded Probe w/Flange mount



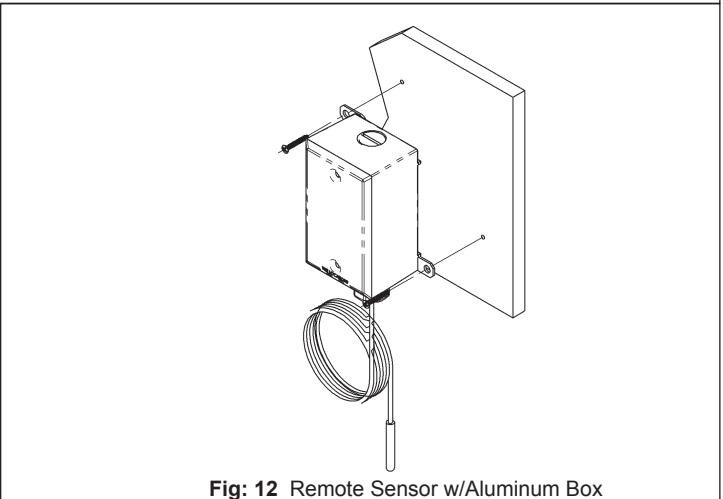
**Fig. 9** Double Threaded Immersion w/Aluminum Box



**Fig. 10** Remote Sensor w/FPB Bracket

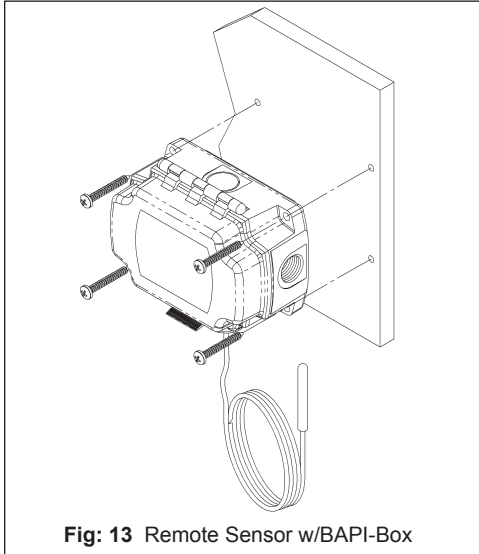


**Fig. 11** Remote Sensor in strap-on application

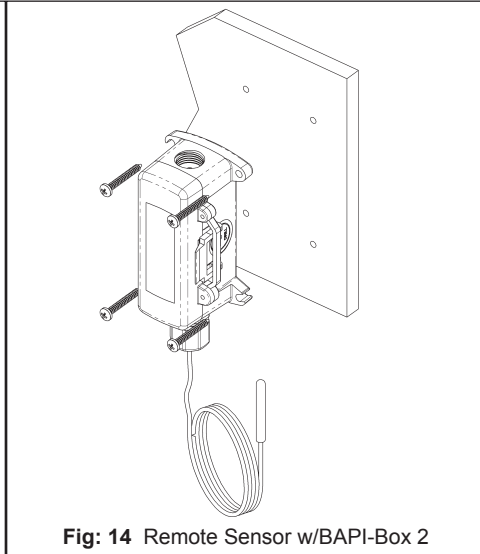


**Fig. 12** Remote Sensor w/Aluminum Box

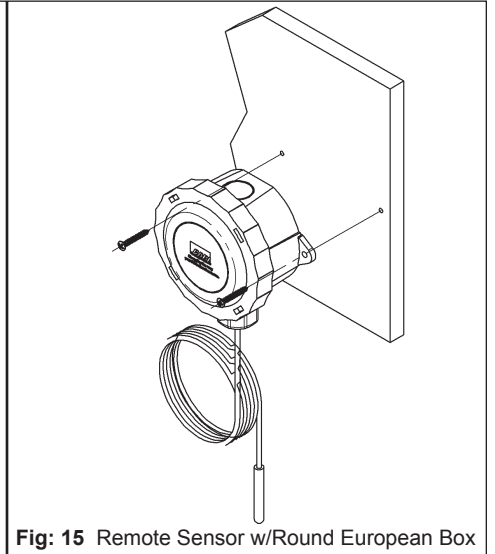
Specifications subject to change without notice.



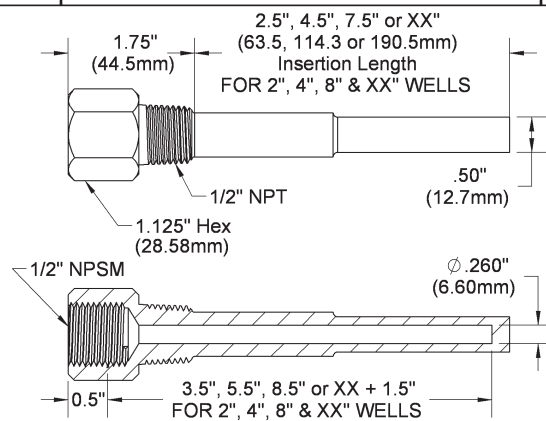
**Fig. 13** Remote Sensor w/BAPI-Box



**Fig. 14** Remote Sensor w/BAPI-Box 2



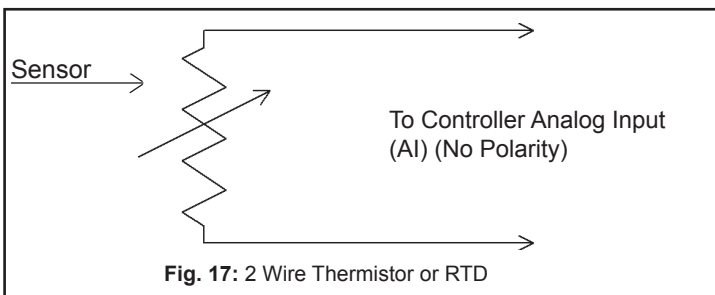
**Fig. 15** Remote Sensor w/Round European Box



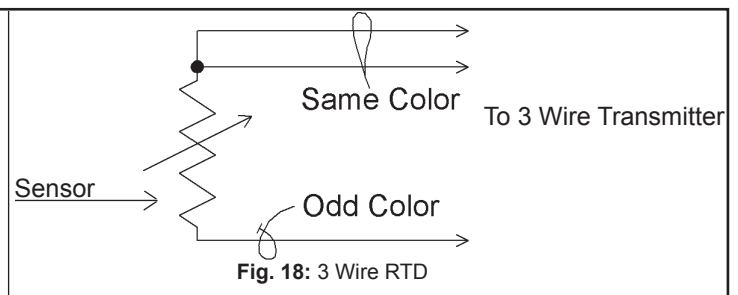
**Fig. 16** Immersion Well

### 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. 17:** 2 Wire Thermistor or RTD



**Fig. 18:** 3 Wire RTD

### Diagnostics

#### Problems:

Controller reports higher or lower than actual temperature

#### Possible Solutions:

- Confirm the input is set up correctly in the front end software
- Check wiring for proper termination & continuity. (shorted or open)
- Disconnect wires and measure sensor resistance and verify the "Sensor" output is correct.

Specifications subject to change without notice.



# Extreme Temperature RTD Sensors BA/1x[1,2,3] Temperature Sensor Installation & Operating Instructions

8612\_ins\_rtd\_extrm

rev.06/10/11

## Specifications

<b>Sensor</b>	Passive resistance	<b>Mounting</b>	
RTD	PTC, 2 or 3 wire in the 100ΩRTD	Probe	½" NPT Double Threaded
<b>RTD</b>	Resistance Temperature Device	Remote Sensor	Probe with or without enclosure
Platinum (PT)	100Ω or 1KΩ @0°C, 385 curve,	<b>Enclosure Types</b>	Note: The double threaded probe is only available with the (-WP) box due to the very high or very low temperature RTD capabilities.
PT Accuracy (std)	0.12% @Ref, or ±0.55°F, (±0.3°C)	Weather Proof	-WP, w/ two ½" FNPT entries, (Bell box)
PT Stability	±0.25°F, (±0.14°C)	BAPI-Box	-BB, w/four ½" NPSM & one 1/2" knockout
PT Self Heating	0.4 °C/mW @0°C	BAPI-Box 2	-BB2, w/three ½" NPSM & three 1/2" knockout
<b>RTD Probe range</b>		European round	-EU, w/two ½" knockouts
1KΩ [1]	-328° to 32°F, (-200 to 0°C)	<b>Enclosure ratings</b>	
1KΩ [2]	212° to 410°F, (100 to 210°C)	Weather Proof	-WP, NEMA 3R, IP14
1KΩ [3]	392° to 1,112°F, (200 to 600°C)	BAPI-Box	-BB, NEMA 4, IP66
100Ω [2]	212° to 410°F, (100 to 210°C)	BAPI-Box 2	-BB2, NEMA 4, IP66
100Ω [3]	392° to 1,112°F, (200 to 600°C)	European round	- EU, IP66
<b>Sensitivity</b>	Approximate @ 32°F (0°C)	<b>Enclosure materials</b>	
RTD (PT)	3.85Ω/°C for 1KΩ RTD	Weather Proof	-WP, Cast Aluminum, UV rated
	0.385Ω/°C for 100Ω RTD	BAPI-Box	-BB, Polycarbonate, UL94V-0, UV rated
<b>Lead wire</b>	22awg stranded	BAPI-Box 2	-BB2, Polycarbonate, UL94V-0, UV rated
<b>Wire Insulation</b>	Plenum rated	European round	-EU, ABS Plastic, UL94V-0
1KΩ[1]	TFE, 392°F (200°C)	<b>Ambient (Encl.)</b>	0 to 100% RH, Non-condensing
100Ω[1]		BB, BB2, EU	-40°F to 185°F, (-40° to 85°C)
1KΩ[2]		WP	-100°F to 1,000°F, (-73° to 538°C)
100Ω[2]		<b>Agency</b>	RoHS
1KΩ[3]	Fiberglass, 1,112°F(600°C)		PT= DIN43760, IEC Pub 751-1983, JIS C1604-1989
100Ω[3]			
<b>Probe</b>	Rigid, 304 Stainless Steel, 0.25" OD		
<b>Probe Length</b>			
Probe	2", 4", 8" or custom per order		
Remote Sensor	2" w/ customer cable length		

## Related Products

<b>BA/2"M304</b>	2" Machined Thermowell w/304 Stainless Steel
<b>BA/4"M304</b>	4" Machined Thermowell w/304 Stainless Steel
<b>BA/8"M304</b>	8" Machined Thermowell w/304 Stainless Steel

Specifications subject to change without notice.