

## Overview

The Boiler Tube Block (BTB) is a specifically designed and patented temperature sensor for measuring tube metal temperature inside boilers, furnaces and industrial process equipment.

### Features:

- Robust design that is very simple to install
- Unmatched reliability
- Third party proven - the most accurate tube metal temperature sensor when compared to traditional surface mount sensors

### Application:

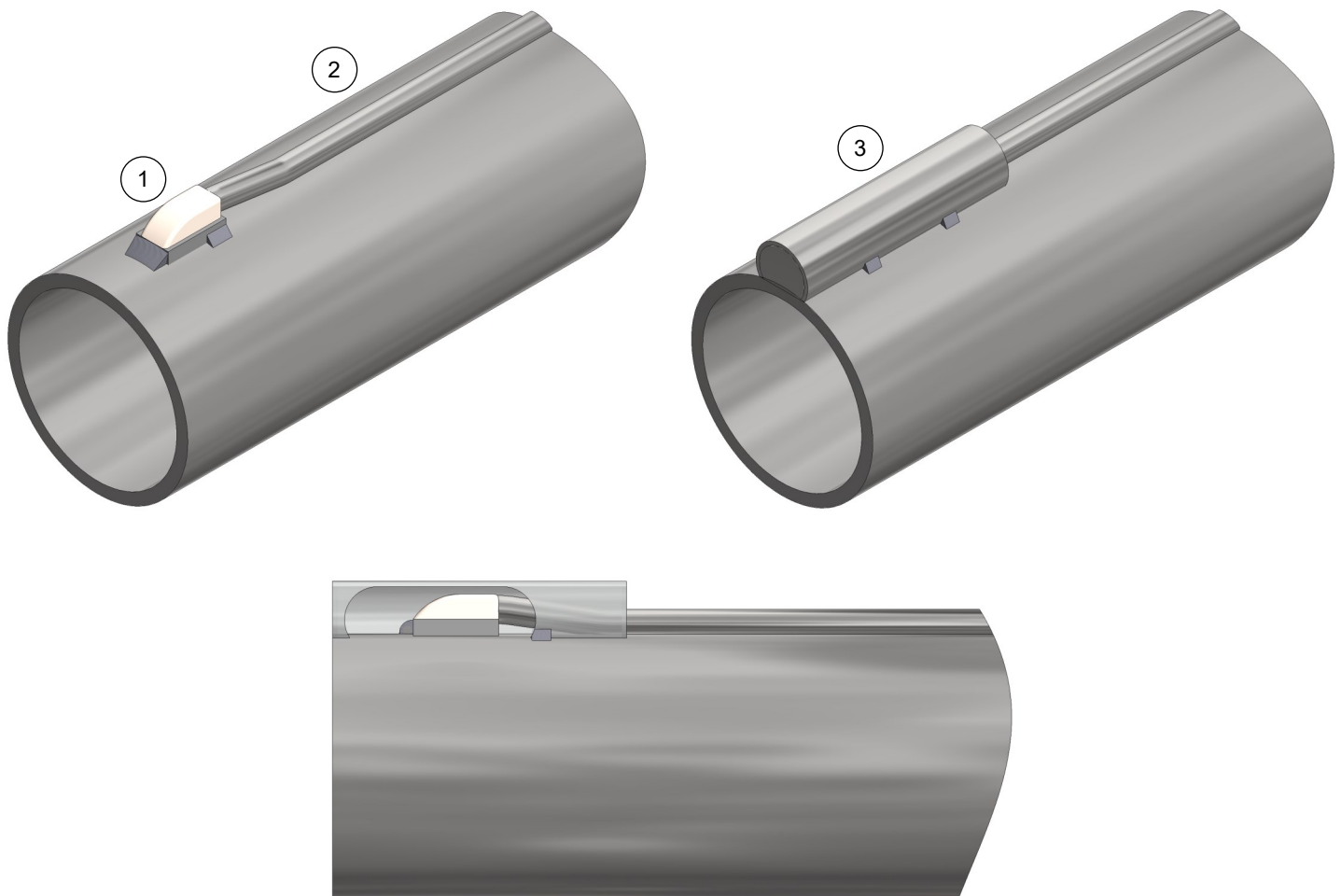
BTB's are commonly used inside OSTG's, HRSG's, Coker Furnaces, Industrial boilers and furnaces.

## BTB

1. **BTB Block** is where the thermocouple junction is welded to the boiler tube metal surface. The block is attached with three simple fillet welds.

2. **Mineral Insulated (MI) cable** extends from the BTB block to the outside of the boiler where it will transition to soft lead wires for termination into the electrical control equipment.

3. **Shroud** or heat shield will isolate and insulate for accurate tube metal inner wall temperature. The shroud is insulated with a high temperature fibrous material. It can be attached to the boiler tube with 4 fillet welds or 1 continuous fillet weld depending on end user preference.



# BTB Boiler Tube Block Model Code

BTB - T1 - T2 - T3 - T4 - T5 - T6 - T7 - T8

## BTB Boiler Tube Block Sensor

### T1 Connection Head

2AL	Aluminum, 3/4" conduit, Bakelite terminal block
2ALT	Aluminum epoxy, 3/4" conduit, Bakelite terminal block
2SS	Stainless steel, 3/4" conduit, Bakelite terminal block
Other	Refer to page 4 for details, styles and options
<b>X</b>	<b>Not required</b>

### T2 Sensor "A" Length (inches)<sup>2</sup>

"inches"	Specify length in inches
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### T3 Sensor Extension Style

<b>CF</b>	<b>Compression Fitting</b>
<b>GS</b>	<b>Gas Seal Union</b>
AF	Flex armour over fiberglass (482°C)
TE	Teflon (260°C)
ST	Teflon with SS overbraid (260°C)
AT	Flex armour over Teflon (260°C)
SP	Special (specify)

### T4 Process Fitting

<b>12</b>	<b>1/2" NPT</b>
<b>34</b>	<b>3/4" NPT</b>
10	1" NPT
X	Not applicable
Other	Consult factory

### T5 Sensor Type

<b>K</b>	<b>Type K Thermocouple</b>
Other	Consult factory

### T5 Sensor Sheath & BTB Block Material

<b>316</b>	<b>316/L stainless steel</b>
<b>310</b>	<b>310 stainless steel</b>
<b>600</b>	<b>Inconel 600</b>
Other	Consult factory

### T7 Probe Diameter

<b>14</b>	<b>1/4"</b>
38	3/8"

### T8 Sensor "L" Length (inches)<sup>2</sup>

"inches"	Specify length in inches
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**Sensor Shroud (heat shield) & MI Cable Clamp**  
 Each BTB is supplied with one shroud and three MI cable clamps in the same material as BTB sensor

#### NOTES:

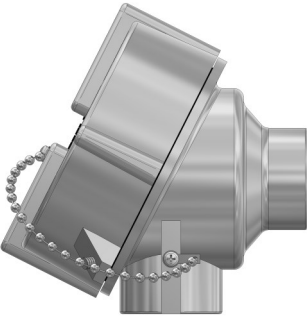
1. Part number example: BTB-X-12-TE-X-K-316-14-120 or BTB-2SS-GS-6.5-34-K-600-14-160
2. Reference page 3 for part outline and page 4 for dimensions
3. BTB's are supplied with MTR's and welding - install instructions
4. Bold text indicates most common part selections



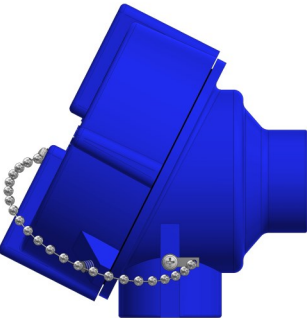
# BTB Boiler Tube Block Outline

## Connection Head

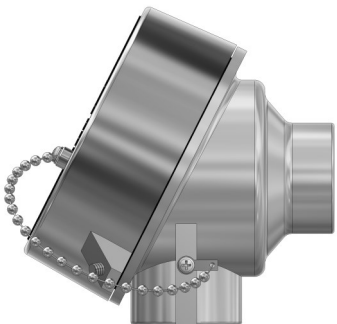
2AL



2ALT



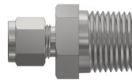
2SS



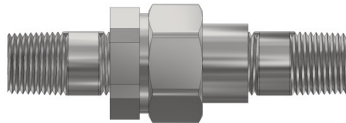
Refer to page 5 for further connection head styles, options and details

## Connection Extension

CF



GS



TE



ST



AT



## Sensor

Shroud



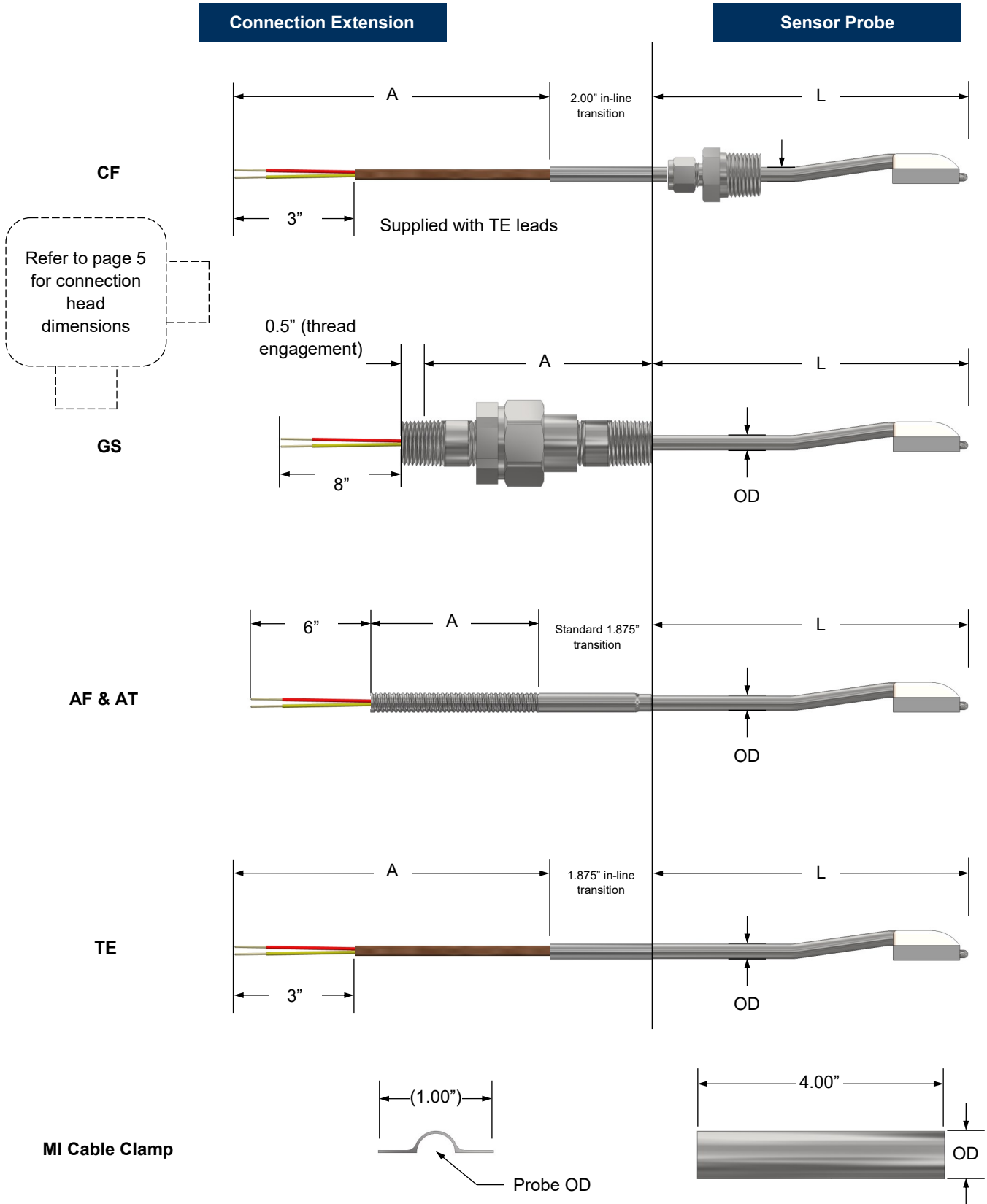
Sensor



MI Cable Clamps

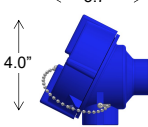
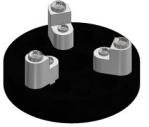
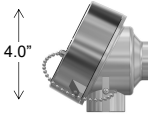
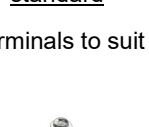
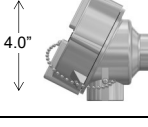

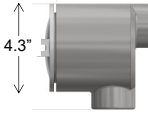
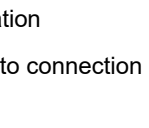
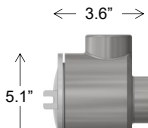
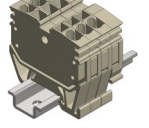

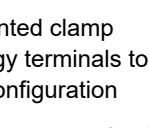
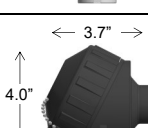
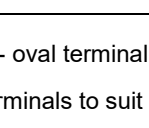
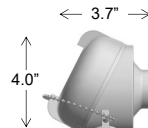


# BTB Boiler Tube Block Dimensions



# BTB Connection Heads

## Model, Outline, and Dimensions

Outline & Dimensions	Model	Connection (NPT)		Terminal Block Options	Material	Connection Head Electrical Approval <sup>1</sup>
		Instrument	Conduit			
 <p>← 3.7" → 4.0"</p>	1ALT	1/2"	1x 1/2" <sup>2</sup>	 Bakelite - <u>standard</u> Screw terminals to suit sensor	Cast aluminum epoxy coated Buna O-ring	Class I Groups B,C,D Class II Groups E,F,G Class III Enclosure Type 4X
	2ALT	1/2"	1x 3/4"			
	3ALT	3/4"	1x 3/4"			
 <p>← 3.7" → 4.0"</p>	1SS	1/2"	1x 1/2" <sup>2</sup>	 Ceramic - optional Screw terminals to suit sensor configuration Add: "C" to connection head	316 stainless steel Buna O-ring	Class I Groups B,C,D Class II Groups E,F,G Class III Enclosure Type 4
	2SS	1/2"	1x 3/4"			
	3SS	3/4"	1x 3/4"			
 <p>← 3.7" → 4.0"</p>	1AL	1/2"	1x 1/2" <sup>2</sup>	 Ceramic - optional Screw terminals to suit sensor configuration Add: "C" to connection head	Cast aluminum Buna O-ring	Class I Groups B,C,D Class II Groups E,F,G Class III Enclosure Type 4
	2AL	1/2"	1x 3/4"			
	3AL	3/4"	1x 3/4"			
 <p>← 3.6" → 4.3"</p>	1CAL <sup>3</sup>	1/2" <sup>2</sup>	1x 1/2" <sup>2</sup>	 Clamp technology - optional DIN mounted clamp technology terminals to suit sensor configuration Add: "D" to connection head	Iron alloy Buna O-ring	Class I Groups A,B,C,D Class II Groups E,F,G Class III
	2CAL <sup>3</sup>	3/4"	1x 3/4"			
	1CCI <sup>3</sup>	1/2" <sup>2</sup>	1x 1/2" <sup>2</sup>			
	2CCI <sup>3</sup>	3/4"	1x 3/4"			
 <p>← 3.6" → 5.1"</p>	4CAL <sup>3</sup>	1/2"	2x 1/2"	 Clamp technology - optional DIN mounted clamp technology terminals to suit sensor configuration Add: "D" to connection head	Cast aluminum Buna O-ring	Class I Groups B,C,D Class II Groups E,F,G Class III; Enclosure
	3CAL <sup>3</sup>	3/4"	2x 3/4"			
	4CCI <sup>3</sup>	1/2" <sup>2</sup>	2x 1/2" <sup>2</sup>			
	3CCI <sup>3</sup>	3/4"	2x 3/4"			
 <p>← 3.7" → 4.0"</p>	4AL	1/2"	1x 1/2" <sup>2</sup>	 Ceramic - oval terminal block Screw terminals to suit sensor	Iron alloy Buna O-ring	General purpose
	0AL	1/2"	1x 3/4"			
 <p>← 3.7" → 4.0"</p>	1CI	1/2"	1x 1/2" <sup>2</sup>	 Ceramic - oval terminal block Screw terminals to suit sensor	Iron alloy Buna O-ring	General purpose
	2CI	1/2"	1x 3/4"			
	3CI	3/4"	1x 3/4"			
 <p>← 3.7" → 4.0"</p>	0PY	1/2"	1x 3/4"	Terminal block integral to connection head Screw terminals to suit sensor	Polypropylene	

### NOTES:

1. Connection head approval rating is that of the enclosure ONLY and not the BTB sensor assembly
2. May be supplied with an approved reducer bushing