

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:

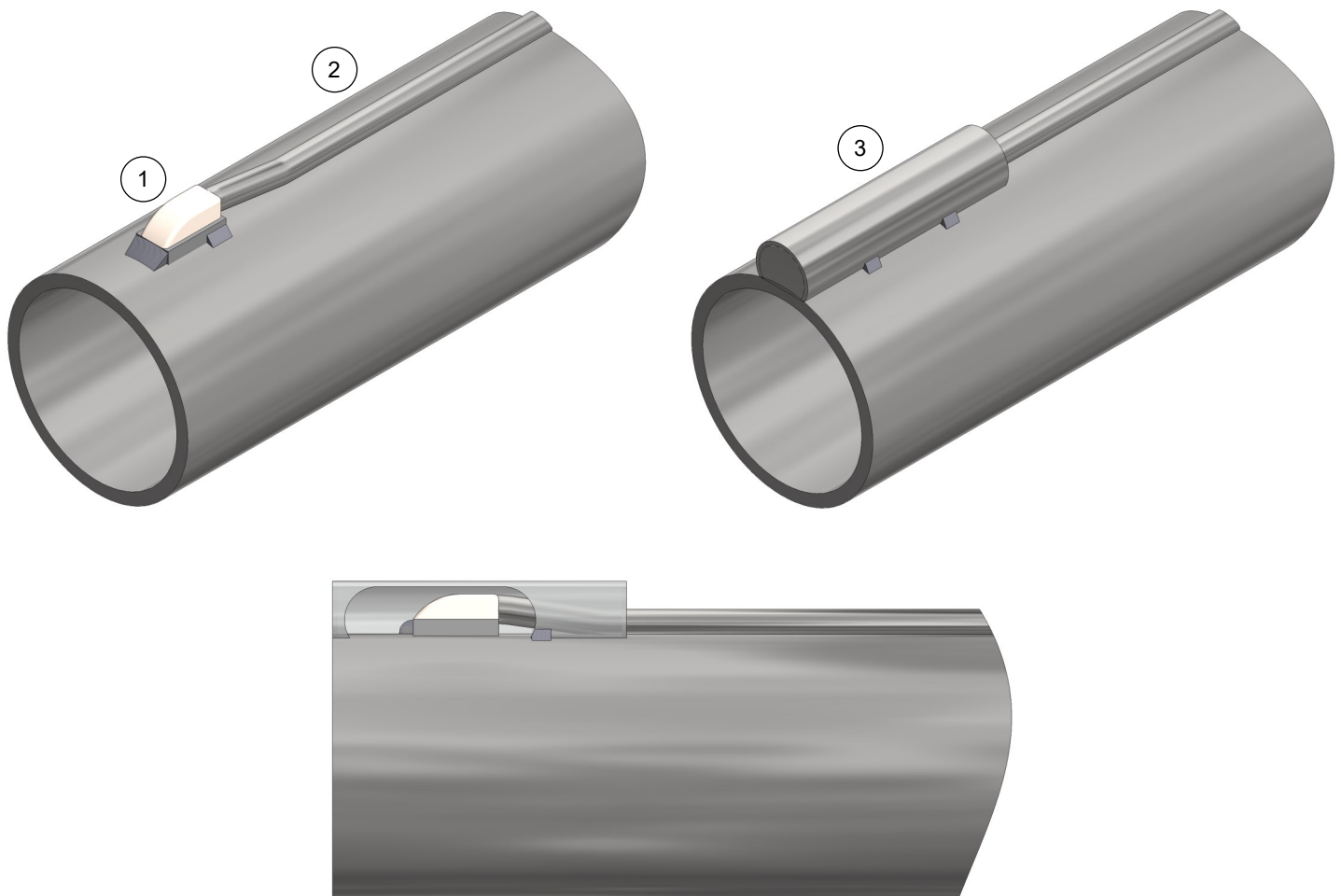
BTB's are commonly used inside OSTG's, HRSG's, Coker Furnaces, Industrial boilers and furnaces.

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 |
| X | Not required |

T2 Sensor "A" Length (inches)²

| | |
|----------|--------------------------|
| "inches" | Specify length in inches |
|----------|--------------------------|

T3 Sensor Extension Style

| | |
|-----------|-------------------------------------|
| CF | Compression Fitting |
| GS | Gas Seal Union |
| 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

| | |
|-----------|-----------------|
| 12 | 1/2" NPT |
| 34 | 3/4" NPT |
| 10 | 1" NPT |
| X | Not applicable |
| Other | Consult factory |

T5 Sensor Type

| | |
|----------|----------------------------|
| K | Type K Thermocouple |
| Other | Consult factory |

T5 Sensor Sheath & BTB Block Material

| | |
|------------|------------------------------|
| 316 | 316/L stainless steel |
| 310 | 310 stainless steel |
| 600 | Inconel 600 |
| Other | Consult factory |

T7 Probe Diameter

| | |
|-----------|-------------|
| 14 | 1/4" |
| 38 | 3/8" |

T8 Sensor "L" Length (inches)²

| | |
|----------|--------------------------|
| "inches" | Specify length in inches |
|----------|--------------------------|

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

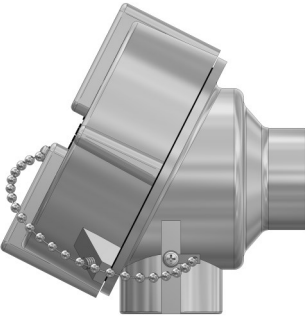


Section: Surface Mount Temperature Sensors
File: Boiler-Tube-Block-Overview-BTB-5

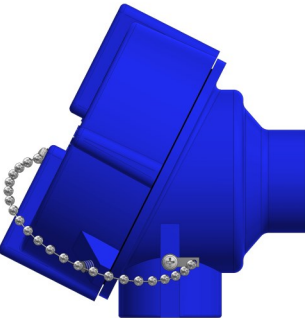
BTB Boiler Tube Block Outline

Connection Head

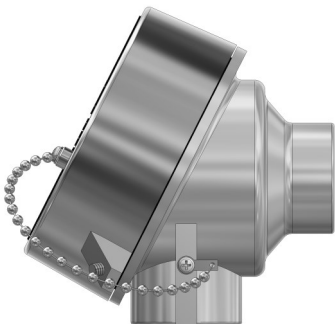
2AL



2ALT



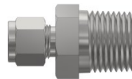
2SS



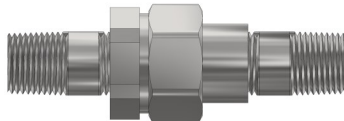
Refer to page 5 for further connection head styles, options and details

Connection Extension

CF



GS



TE



ST



AT



Sensor

Shroud



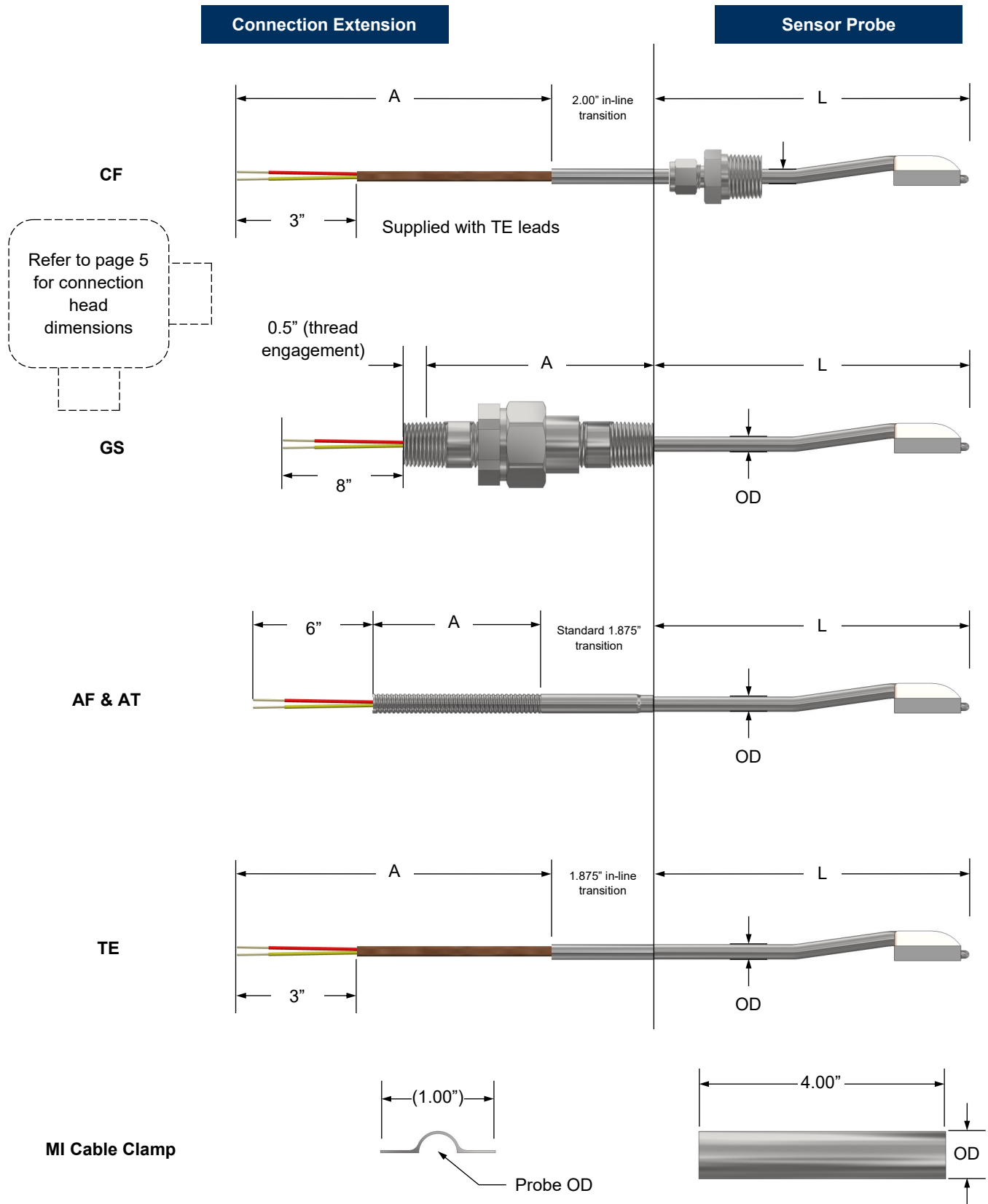
Sensor



MI Cable Clamps

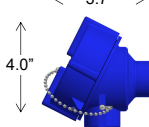
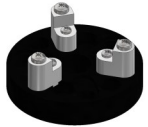
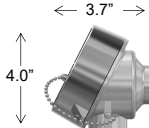
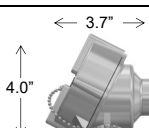

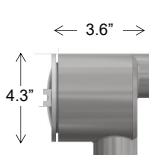
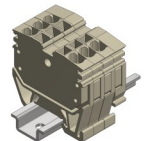
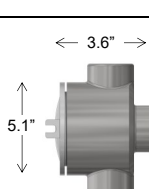
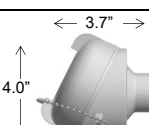
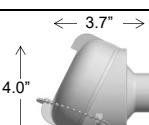
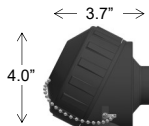
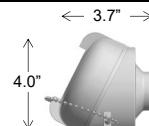


BTB Boiler Tube Block Dimensions



BTB Connection Heads

Model, Outline, and Dimensions

| Outline & Dimensions | Model | Connection (NPT) | | Terminal Block Options | Material | Connection Head Electrical Approval ¹ |
|---|-------------------|-------------------|----------------------|--|--|---|
| | | Instrument | Conduit | | | |
|  | 1ALT | 1/2" | 1x 1/2" ² |  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" | | | |
|  | 1SS | 1/2" | 1x 1/2" ² | Ceramic - <u>optional</u> Screw terminals to suit sensor configuration | 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" | | | |
|  | 1AL | 1/2" | 1x 1/2" ² |  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" | | | |
|  | 1CAL ³ | 1/2" ² | 1x 1/2" ² |  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 ³ | 3/4" | 1x 3/4" | | | |
| | 1CCI ³ | 1/2" ² | 1x 1/2" ² | | | |
| | 2CCI ³ | 3/4" | 1x 3/4" | | | |
|  | 4CAL ³ | 1/2" | 2x 1/2" |  | Cast aluminum Buna O-ring | Class I Groups B,C,D Class II Groups E,F,G Class III; Enclosure |
| | 3CAL ³ | 3/4" | 2x 3/4" | | | |
| | 4CCI ³ | 1/2" ² | 2x 1/2" ² | | | |
| | 3CCI ³ | 3/4" | 2x 3/4" | | | |
|  | 4AL | 1/2" | 1x 1/2" ² | Add: "D" to connection head | Cast aluminum Buna O-ring | Class I Groups A,B,C,D Class II Groups E,F,G Class III |
| | 0AL | 1/2" | 1x 3/4" | | | |
|  | 1CI | 1/2" | 1x 1/2" ² | 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" | | | |
|  | 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