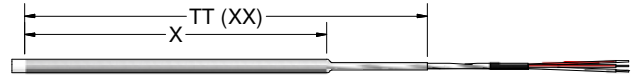
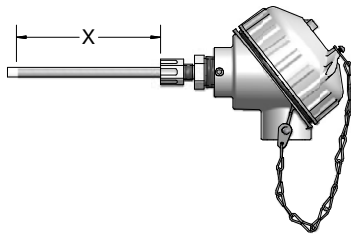


# SPECIAL-PURPOSE

Configuration Code SP01  
**FEP-Coated Thermocouple Assemblies**  
 Configuration Code SP02  
**FEP-Coated RTD Assemblies**

The assemblies listed below are designed for a broad range of applications that require resistance to corrosion and chemical attack. They provide very good temperature measurement and service life in plating, pickling, and acid bath applications. The stainless steel sheath is coated with FEP and includes a fused FEP tip for excellent corrosion resistance.



Maximum Temperature Rating 200 °C

## ORDER CODES

**Example Order Number:** **JP38UT** - **012** - **00** - **TT(36)** - **T3072** - **4**

### 1 Thermocouple Types

| CODE   | T/C TYPE | SHEATH O.D. (inches) |
|--------|----------|----------------------|
| JP38UT | J        | 3/16                 |
| JP48UT | J        | 1/4                  |
| KP38UT | K        | 3/16                 |
| KP48UT | K        | 1/4                  |
| TP38UT | T        | 3/16                 |
| TP48UT | T        | 1/4                  |

For grounded hot junctions substitute the letter 'G' in place of the 'U' above.

### 1-2 100 Ω Platinum RTD α = 0.003 85 °C<sup>-1</sup> Tolerance<sup>[1]</sup> Class B

| CODE        | LEADS | SHEATH O.D. (inches) |
|-------------|-------|----------------------|
| RBF185L383T | 3     | 3/16                 |
| RBF185L483T | 3     | 1/4                  |

[1] Refer to RTD tolerance information in the General Information section for calculations to determine specific tolerance at temperature.

### 2 'X' Dimension

Insert 3 Digit Sheath Length (X dimension) in Inches.

### 3 Sheath Mountings

| CODE | DESCRIPTION |
|------|-------------|
| 00   | No fitting  |

### Re-Adjustable Compression Fittings

| CODE | DESCRIPTION         | NPT SIZE (inches) | AVAILABLE SHEATH DIAMETERS (inches) |
|------|---------------------|-------------------|-------------------------------------|
| 10A  | 303 stainless steel | 1/8               | 3/16                                |
| 10B  | 303 stainless steel | 1/4               | 1/4                                 |
| 10C  | 303 stainless steel | 1/2               | 1/4                                 |
| 56B  | FEP                 | 1/4               | 1/4                                 |
| 56C  | FEP                 | 1/2               | 1/4                                 |

### 6 Leadwire Terminations

| CODE | DESCRIPTION                    |
|------|--------------------------------|
| 0    | No termination                 |
| 2    | 2" split leads, 1/4" stripped  |
| 3    | 2" split leads with spade lugs |
| 4    | Standard plug                  |
| 6    | Miniature plug                 |

#### Options

|    |                  |
|----|------------------|
| MC | Mating connector |
| RB | Rubber boot      |

### 5 Extension Leadwire

| CODE | DESCRIPTION  |
|------|--|
| T1   | Fluoropolymer insulation - solid conductor (available in thermocouples only) |
| T3   | Fluoropolymer insulation - stranded conductor                                |

### 4 Head Terminations

| CODE                  | DESCRIPTION  |
|-----------------------|--|
| 8HN63                 | White polypropylene screw-cover head with 1/2" NPT stainless steel hex mounting fitting  |
| 9HP63                 | White polypropylene screw-cover head with 1/2" NPT bushing holding head to sheath        |
| 56CF63 <sup>[1]</sup> | White polypropylene screw-cover head with FEP compression fitting holding head to sheath |

[1] Not available with 3/16" O.D. sheath

### 4-1 Sheath Terminations

| CODE           | DESCRIPTION      |
|----------------|------------------|
| 4              | Standard plug    |
| 5              | Standard jack    |
| <b>Options</b> |                  |
| MC             | Mating connector |
| RB             | Rubber boot      |

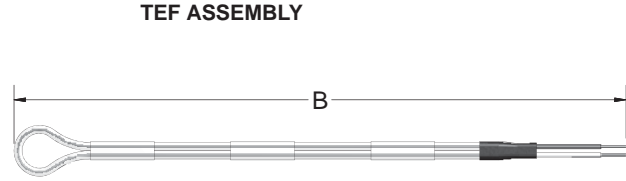
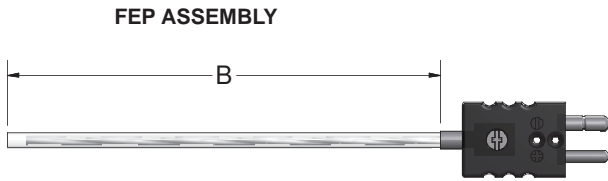
### 4-2 Leadwire Transitions

| CODE | DESCRIPTION   |
|------|---|
| TT   | FEP coating: both sheath and leads (specify total length of FPE coating)<br>Example: TT(36) |
| 15   | Extension leadwire transition with relief spring  |
| 16   | Extension leadwire transition with heat-shrink tubing                                       |



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The thermocouples listed below are designed for a broad range of uses in applications that require resistance to corrosion and chemical attack. They provide very good temperature measurement and service life in plating, pickling, and acid bath applications. The fluoropolymer assemblies provide excellent resistance to strong acids, alkalines, and saline solutions.



### ORDER CODES

**Example Order Number:**

1-1 1-2 2 3  
**J4 TEF - 072 - 4, RB**

#### 1-1 Thermocouple Type

| CODE | DESCRIPTION |
|------|-------------|
| J4   | Type J      |
| K4   | Type K      |
| T4   | Type T      |

#### 1-2 Outer Tubing

| CODE | DESCRIPTION | TEMPERATURE RATING |
|------|-------------|--------------------|
| TEF  | TFE         | 260 °C [500 °F]    |
| FEP  | FEP         | 200 °C [392 °F]    |

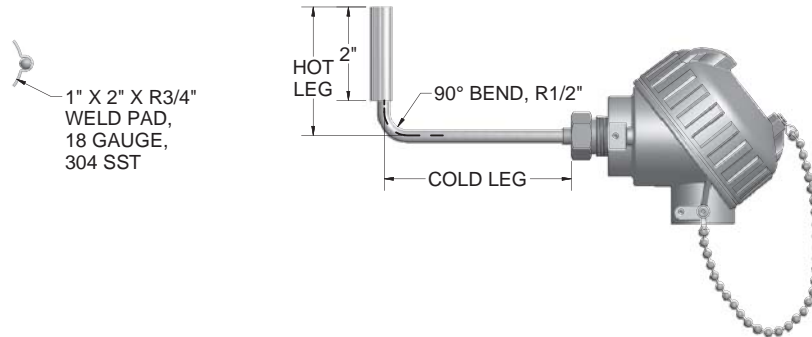
#### 2 Length

3 Digit "B" Length in Inches.

#### 3 Terminations

| CODE    | DESCRIPTION                    |
|---------|--------------------------------|
| 2       | 2" split leads, 1/4" stripped  |
| 3       | 2" split leads with spade lugs |
| 4       | Standard plug                  |
| 5       | Standard jack                  |
| 6       | Miniature plug                 |
| 7       | Miniature jack                 |
| Options |                                |
| MC      | Mating connector               |
| CG      | Cord grip (1/2" NPT PVC)       |
| RB      | Rubber boot                    |
| SP      | Solid pin plug                 |

Heat-tracing temperature sensors are made for use in systems that measure the surface temperature of process pipe that is carrying products whose temperatures must be controlled to prevent freeze-up, or to maintain a viscosity level so that the inner medium will flow. These sensors are offered with either Thermocouple or RTD sensing elements inside 316SS sheaths, and with a 3/4" Radius stainless steel mounting pad. Cold legs are available in customer-specified lengths to accommodate pipe insulation thickness.



### ORDER CODES

**Example Order Number:**

1-1      1-2      3      4      5      5-1  
**RBF185L483 - HT - 0304 - 18RD - 31, I**

#### 1-1 Thermocouple Styles

| CODE  | T/C TYPE | HOT JUNCTION STYLE | SHEATH INSULATION |
|-------|----------|--------------------|-------------------|
| JP48G | J        | Grounded           | Fiberglass        |
| KP48G | K        | Grounded           | Fiberglass        |
| TP48G | T        | Grounded           | Fiberglass        |
| EP48G | E        | Grounded           | Fiberglass        |

For ungrounded hot junctions substitute the letter "U" in place of the "G" above.

#### 1-2 100 Ω Platinum 3 Wire RTD Styles $\alpha = 0.00385 \text{ } ^\circ\text{C}^{-1}$

| CODE       | TOLERANCE <sup>[1]</sup> | MAX. TEMP. RATING | INSULATION TYPE |
|------------|--------------------------|-------------------|-----------------|
| RBF185L483 | Class B                  | 200 °C [392 °F]   | PTFE            |
| RBF185M483 | Class B                  | 482 °C [900 °F]   | Fiberglass      |
| R1T185H483 | Grade B                  | 593 °C [1100 °F]  | MgO             |

[1] Refer to RTD tolerance information in the General Information section for calculations to determine specific tolerance at temperature.

#### 3 Sheath Lengths

| CODE | HOT LEG (inches) | COLD LEG (inches) |
|------|------------------|-------------------|
| 0304 | 3                | 4                 |
| 0306 | 3                | 6                 |
| 0308 | 3                | 8                 |

Consult factory for other hot leg lengths or cold leg lengths.

#### 4 Radius Mounting Pads 1" W x 2" L x 18 Ga. 304 SS

| CODE | RADIUS (inches) | NPT PIPE SIZE (inches) |
|------|-----------------|------------------------|
| 18RD | 3/4             | 1 1/2                  |

Mounting pad is flexible enough to be formed around pipe sizes from 1" to 12" NPS pipe.

#### 5 Standard Head Terminations

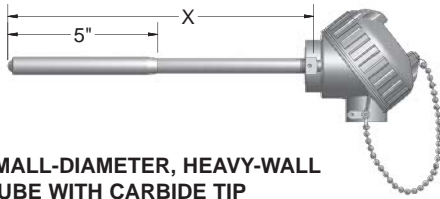
| CODE | DESCRIPTION                            |
|------|--|
| 31   | Aluminum screw-cover head              |
| 34   | Cast iron screw-cover head             |
| 49   | Flip-top aluminum head                 |
| 63   | White polypropylene screw-cover head   |
| 91   | 316 L Stainless steel screw-cover head |
| 93   | Aluminum explosion-proof head, Group B |
| 94   | 316 L SS explosion-proof head, Group A |

#### 5-1 Standard Head Options

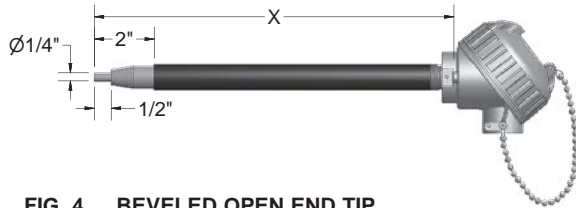
| CODE  | DESCRIPTION  |
|-------|--|
| CG    | Nylon cord grip  |
| GS    | Ground screw   |
| I     | Stainless steel tag  |
| NB    | 1/2" NPT nylon conduit reducer bushing                                   |
| SB    | 1/2" NPT conduit reducer bushing   |
| T-440 | 4-20 mA head-mounted RTD transmitter (see instrument section)            |
| T-441 | 4-20 mA isolated head-mounted transmitter (see instrument section)       |
| T-442 | 4-20 mA Hart® isolated head-mounted transmitter (see instrument section) |

The hardened tip aggregate temperature sensor assemblies illustrated in Figures 1, 2, and 3 below are typically used to measure the temperature of severely abrasive materials found in asphalt aggregate mixers and other granular material mixing and drying processes. Three styles of hardened tip constructions are offered to resist destructive abrasion and wear. Figure 4 illustrates an open-end tube style thermocouple assembly used to measure the temperature of hot sand and other similar free flowing materials on conveyors, or at drop chutes, where abrasion is not as severe, but where product temperature response time is important.

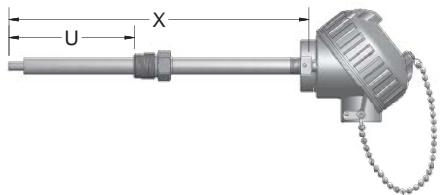
**FIG. 1 FLAME-SPRAYED, TUNGSTEN CARBIDE TIP**



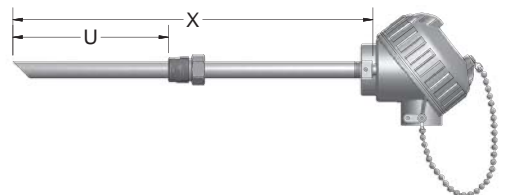
**FIG. 2 RUGGEDIZED BULLET-NOSED, HARDENED-TOOL STEEL WITH CARBIDE TIP**



**FIG. 3 SMALL-DIAMETER, HEAVY-WALL TUBE WITH CARBIDE TIP**



**FIG. 4 BEVELED OPEN END TIP**



### ORDER CODES

**Example Order Number:**

**J29GA1** - **18** - **6D12** - **31, H**

#### 1 Thermocouple Styles

| CODE   | T/C TYPE | NOM. PIPE DIA. (inches) | MEASURING TIP CONSTRUCTION     | FIG. NO. |
|--------|----------|-------------------------|--------------------------------|----------|
| J29GA1 | J        | 0.540                   | Flame-sprayed tungsten carbide | 1        |
| J29GA2 | J        | 0.840                   | Tool steel with carbide tip    | 2        |
| J29GA3 | J        | 0.540                   | Carbide tip                    | 3        |
| J14CS  | J        | 0.540                   | Open end tube                  | 4        |

For ungrounded junctions, change 'G' in above order code to 'U'. Consult factory for availability of other thermocouple types and duplex elements.

#### 2 Length 'X'

| CODE | LENGTH (inches) | CODE                  | LENGTH (inches) |
|------|-----------------|-----------------------|-----------------|
| 12   | 12              | 20                    | 20              |
| 14   | 14              | 24                    | 24              |
| 18   | 18              | Specify other lengths |                 |

#### 4 Head Terminations

| CODE              | DESCRIPTION                            |
|-------------------|--|
| 22 <sup>[1]</sup> | 3" individual leads with terminal pins |
| 31                | Aluminum screw-cover head              |
| 34                | Cast iron screw-cover head             |
| 49                | Flip-top aluminum head                 |
| 91                | 316L stainless steel screw-cover head  |

[1] Not available with J14CS Series

#### Options

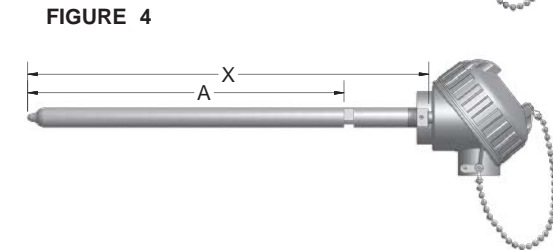
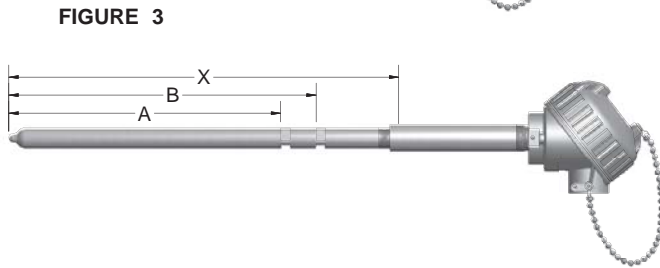
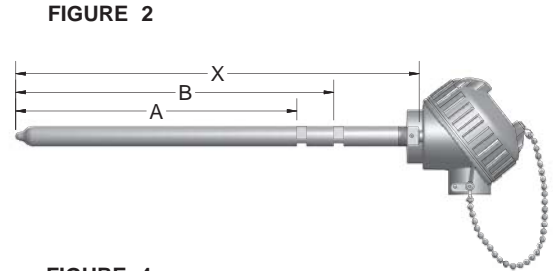
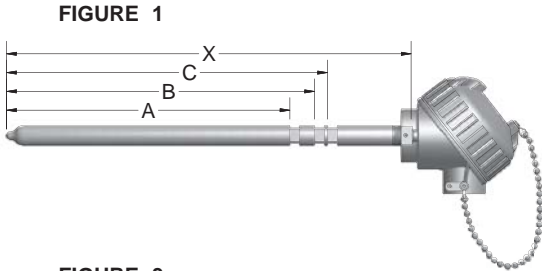
|    |                                  |
|----|----------------------------------|
| H  | Adjustable steel mounting flange |
| SB | 1/2" NPT conduit reducer bushing |

#### 3 Welded Bushings

| CODE  | DESCRIPTION  |
|-------|--|
| 6C(U) | 1/2" NPT steel bushing (for use with figures 1, 3, and 4 only) |
| 6D(U) | 3/4" NPT welded steel bushing                                  |
| 6E(U) | 1" NPT welded steel bushing                                    |

Substitute length in inches from hot tip to bottom of bushing for 'U' above

The below illustrated thermocouples are most commonly used in the mixing of rubber compounds and other abrasive substances. All standard thermocouples are individually tested to meet or surpass the Industry Time Response Test Standard. Thermocouple sensors are supplied with grounded hot junctions as standard. Thermocouples may be ordered with a choice of either a hard-chrome plated tip, or with a XH-5 coated tip that provides greater abrasion and wear resistance.



All mill slots are 5/16" wide. Abrasion-resistant tips are 0.625" O.D. x 1/2" long.

### ORDER CODES

**Example Order Number:** **J050G** - **CM** - **10** - **31**

#### 1 Measuring Element

| CODE   |        | ELEMENT TYPE        |
|--|--------|---------------------|
| SINGLE   | DUPLEX |                     |
| J050G  | JJ050G | Type J thermocouple |
| To order type K thermocouple replace 'J' in the above order code with desired (K). |        |                     |

#### 3 Termination Options

| CODE  | ELEMENT TYPE                |
|---|-----------------------------|
| 31  | Aluminum screw-cover head   |
| 49  | Aluminum flip-top head      |
| [1]K1_ _ _  | Polyimide - solid conductor |
| [1] Specify lead length in inches using 3 digits. |                             |

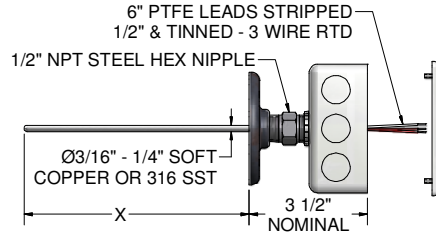
#### 2 Mounting Configuration

| CODE   |                 | MOUNTING NOTCH CONFIGURATION             | TYPICAL APPLICATION BY MIXER MODELS | FIG. NO. |
|--|-----------------|--|-------------------------------------|----------|
| HARD CHROME-PLATED TIP                             | XH-5 COATED TIP |  |                                     |          |
| 10   | 12              | 3 notch (square)                         | 11D, F80, 9D, 3D                    | 1        |
| 20   | 22              | 2 notch (triangular)                     | F270, F620                          | 2        |
| 20E  | 22E             | 2 notch (triangular) w/ nipple extension | F370, F620                          | 3        |
| 40   | 42              | 1 notch (triangular)                     | F270                                | 4        |
| Applications are typical, but may vary by machine. |                 |  |                                     |          |

#### Critical Sensor Dimensions

| MOUNTING CONFIG. CODE                | FIG. NO. | DIMENSIONS (inches) |          |         |        |   |
|--------------------------------------|----------|---------------------|----------|---------|--------|---|
|                                      |          | A                   | B        | C       | X      | E |
| 10 or 12                             | 1        | 9 1/16              | 9 13/16  | 10 5/16 | 13     |   |
| 20 or 22                             | 2        | 13 31/32            | 15 31/32 |         | 18     |   |
| 20E or 22E                           | 3        | 13 31/32            | 15 31/32 |         | 17 5/8 | 5 |
| 40 or 42                             | 4        | 10 7/32             |          |         | 12     |   |
| All notches are 5/16" wide (nominal) |          |                     |          |         |        |   |

The averaging RTD sensor listed below measures the temperature over the entire sheath length to provide an average temperature measurement of the cross sectional area of air ducts, room gradient temperatures, and other low temperature averaging applications. The sensing element has a resistance output that conforms to a 100 Ω platinum element with a 0.003 85 °C<sup>-1</sup> temperature coefficient within a measurement range of (0 to 100) °C [32 to 212] °F. The RTD sensors are available in copper or 316 stainless steel sheath materials and can be supplied in various lengths up to 800 inches. All RTD sensors 48 inches and longer will be shipped in a coiled configuration. The sensors on this page can be provided with a (4 to 20) mA Transmitter integrally mounted inside the available enclosures.



### ORDER CODES

**Example Order Number:**

**2290L 4(23)3 - 120 - 8HN 47, HT**

#### 1 RTD Averaging Sensor

| CODE  | DESCRIPTION                            |
|-------|--|
| 2290L | 3-wire continuous averaging RTD sensor |

#### 2 Sheath Material and Diameter

| CODE   | DESCRIPTION       |          |
|--------|-------------------|----------|
|        | DIAMETER (inches) | MATERIAL |
| 3(23)3 | 3/16              | Copper   |
| 4(23)3 | 1/4               | Copper   |
| 383    | 3/16              | 316 SS   |
| 483    | 1/4               | 316 SS   |

#### 3 Length

| AVAIL. LENGTHS (inches) | DIAMETER O.D. (inches) | BENDABILITY |
|-------------------------|------------------------|-------------|
| 12                      | 3/16, 1/4              | Rigid       |
| 24                      | 3/16, 1/4              | Rigid       |
| 36                      | 3/16, 1/4              | Rigid       |
| 37 to 324               | 3/16, 1/4              | Bendable    |
| 325 to 828              | 1/4                    | Bendable    |

Specify length in inches using 3 digits.

Initial averaging RTD accuracy calculation:  $\pm [1.3 + 0.005 |t|]$  °C  
 |t| = Value of temperature without regard to sign, °C

| TEMPERATURE    | °C  | °F  | TEMPERATURE     | °C  | °F  |
|----------------|-----|-----|-----------------|-----|-----|
| 0 °C [32 °F]   | 1.3 | 2.3 | 60 °C [140 °F]  | 1.6 | 2.9 |
| 20 °C [68 °F]  | 1.4 | 2.5 | 80 °C [176 °F]  | 1.7 | 3.1 |
| 40 °C [104 °F] | 1.5 | 2.7 | 100 °C [212 °F] | 1.8 | 3.2 |

#### 4 Head Mounting Fittings

| CODE | DESCRIPTION                                |
|------|--|
| 8HN  | 1/2" x 1/2" NPT stainless steel hex nipple |
| 6HN  | 1/2" x 1/2" NPT steel hex nipple           |

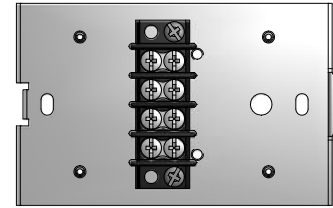
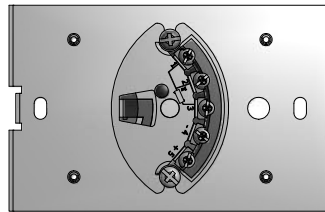
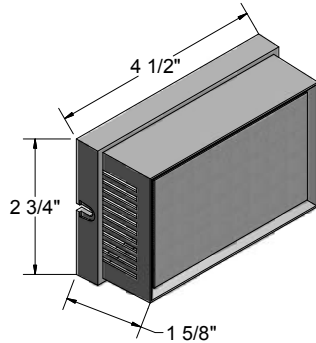
#### 5 Terminations

| CODE    | DESCRIPTION   |
|---------|---|
| 22(06)  | 6" individual fluoropolymer leads with terminal pins      |
| 31      | Aluminum screw-cover head                                 |
| 49      | Flip-top aluminum head                                    |
| 47      | 2" x 4" electrical handibox                               |
| Options |   |
| HT      | Floor flange threaded on hex                              |
| T-440   | 4-20 mA head-mounted transmitter (see instrument section) |

# SPECIAL-PURPOSE

## Configuration Code SP07 Thermostat Temperature Sensors

The Pyromation thermostat temperature sensors are provided with the sensor, or the sensor and a (4 to 20) mA temperature transmitter, mounted on a subplate within a standard size thermostat housing. The thermostat housing measures 2 3/4" h x 4 1/2" w x 1 5/8" d and can be mounted either horizontally or vertically on a 2" x 4" electrical handibox. The cover is vented on two sides to provide for airflow over the sensing element, regardless of mounting position. The standard temperature sensing elements are available as a fluoropolymer insulated thermocouple or a three-wire RTD. Matching transmitters are available for all configurations and output ranges.



Temperature Range (-40 to 85) °C

### ORDER CODES

**Example Order Number:**

**2215-RBF185L3 - T**

#### Thermostat Housings

| CODE                | DESCRIPTION   |
|---------------------|---|
| 2215 - RBF185L3     | Thermostat housing with integral 100 Ω platinum RTD 0.003 85 0 °C <sup>-1</sup> temperature coefficient Class B |
| 2215 - (J, K, T, E) | Thermostat housing with integral thermocouple element   |
| 2415                | Thermostat housing with base plate and 4-position terminal strip - no sensing element                           |

#### Option

| CODE  | DESCRIPTION  |
|-------|--|
| T-440 | 4-20 mA RTD transmitter mounted in housing with sensor (see instrument section)      |
| T-441 | 4-20 mA isolated transmitter mounted in housing with sensor (see instrument section) |



# SPECIAL-PURPOSE

## Configuration Code SP08 Variable-Length RTD Elements

The sensing elements listed on this page can be cut to any desired length over 3" long by using an ordinary tubing cutter. All sheaths are provided in 316 stainless steel.



### ORDER CODES

**Example Order Number:**

**R1T185L48 3 - 012 - VCL - T3012 - 2**

**1 3-Wire RTD Assemblies Pt100  $\alpha = 0.00385 \text{ } ^\circ\text{C}^{-1}$**

| CODE       |            | TOLERANCE <sup>[1]</sup> | SHEATH DIAMETER O.D. (inches) |
|------------|------------|--------------------------|-------------------------------|
| SINGLE     | DUPLEX     |                          |                               |
| RBF185L483 | RBF285L483 | Class B                  | 1/4                           |
| R1T185L483 | R1T285L483 | Grade B                  | 1/4                           |
| RBF185L683 | RBF285L683 | Class B                  | 3/8                           |
| R1T185L683 | R1T285L683 | Grade B                  | 3/8                           |

Consult factory for other RTD elements.

[1] Refer to RTD tolerance information in the General Information section for calculations to determine specific tolerance at temperature.

**3 RTD Extension Leadwire**

| CODE <sup>[1]</sup> | DESCRIPTION  | TEMP. RATING    |
|---------------------|--|-----------------|
| T3J _ _ _           | Fluoropolymer insulation - individual leads stranded conductor (12" limit) | 204 °C [400 °F] |
| T3 _ _ _            | Fluoropolymer insulation - stranded conductor                              | 204 °C [400 °F] |

Leads supplied stripped and tinned 1/2"  
[1] Insert wire code number and 3 digit "E" length code in inches

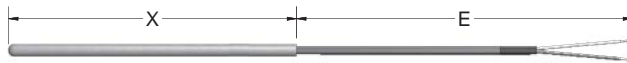
**2 Sheath "X" Length**

Specify "X" Length in Inches Using (3) Digits

Configuration Code SP10  
Variable-Length Thermocouple Elements

### ORDER CODES

**Maximum T/C Temperature Limits:**  
Fiberglass insulated lead style: 482 °C [900 °F]  
Fluoropolymer insulated lead style: 204 °C [400 °F]



**Example Order Number:**

**JP48 G - 006 - VCL - T1012 - 2**

**1-1 Thermocouple Assemblies**

| CODE   |        | T/C TYPE | SHEATH DIAMETER O.D. (inches) |
|--------|--------|----------|-------------------------------|
| SINGLE | DUPLEX |          |                               |
| JP48   | JJP48  | J        | 1/4                           |
| KP48   | KKP48  | K        | 1/4                           |
| TP48   | TTP48  | T        | 1/4                           |
| EP48   | EEP48  | E        | 1/4                           |
| JP68   | JJP68  | J        | 3/8                           |
| KP68   | KKP68  | K        | 3/8                           |
| TP68   | TTP68  | T        | 3/8                           |
| EP68   | EEP68  | E        | 3/8                           |

**1-2 Hot Junction**

| CODE | DESCRIPTION |
|------|-------------|
| G    | Grounded    |
| U    | Ungrounded  |

**3 Thermocouple Extension Leadwire**

| CODE <sup>[1]</sup> | DESCRIPTION                                | INSUL. TEMP. LIMIT |
|---------------------|--|--------------------|
| F1 _ _ _            | Fiberglass insulation - solid conductor    | 482 °C [900 °F]    |
| T1 _ _ _            | Fluoropolymer insulation - solid conductor | 204 °C [400 °F]    |

Leads supplied split 2", 1/4" stripped  
[1] Insert wire code number and 3 digit "E" length code in inches

**2 Sheath "X" Length**

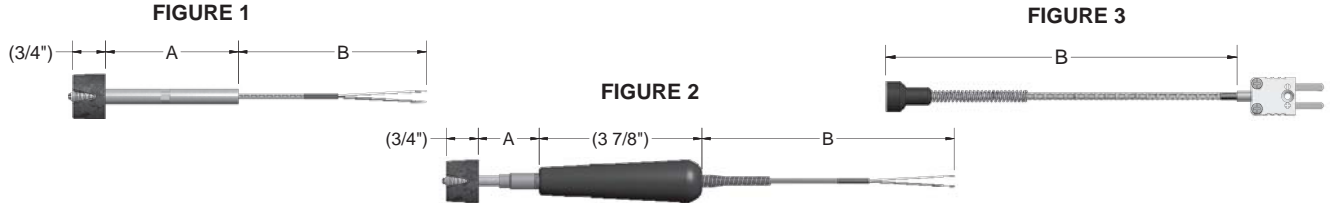
Specify "X" Length in Inches Using (3) Digits



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The magnet sensors are designed to measure the surface temperature of ferrous metals with a convenient and non-destructive magnetic attachment. These sensors are designed to be mounted either vertically or horizontally and may be attached to molding press platens, bearing/motor housings and various other metal surfaces. These sensors provide stabilized temperature readings in less than 5 seconds. The magnet sensors have a continuous operating temperature of 400 °F. The T and H series can take intermittent temperatures up to 600 °F, but the pull of the magnet will be degraded at temperatures above 450 °F. The M series has a 2 lb. pull force magnet and the T and H series have a 16 lb. pull force magnet.



### ORDER CODES

**Example Order Number:** **JMAG** - **T** - **006** - **304** - **T1B072** - **2**

#### 1 Thermocouple Types

| CODE | DESCRIPTION          |
|------|----------------------|
| JMAG | Type J magnet sensor |
| KMAG | Type K magnet sensor |

#### 2 Magnet Assembly Styles

##### SHEATH STYLE (FIGURE 1)

| CODE             | DESCRIPTION                               |
|------------------|---|
| T <sup>[1]</sup> | 16 lb. Pull magnet with 5/16" O.D. sheath |

##### PHENOLIC HANDLE STYLE (FIGURE 2)

| CODE             | DESCRIPTION                    |
|------------------|--------------------------------|
| H <sup>[2]</sup> | 16 lb. Pull magnet with handle |

##### MINIATURE STYLE (FIGURE 3)

| CODE             | DESCRIPTION       |
|------------------|-------------------|
| M <sup>[3]</sup> | 2 lb. Pull magnet |

[1] 3 inch minimum "A" dimension

[2] 1 inch minimum "A" dimension

[3] No "A" Dimension required-specify as 000

#### 3 "A" Dimension

Specify 3 digit "A" Dimension length in inches.

#### 4 Bend Options<sup>[1]</sup>

| CODE | DESCRIPTION     |
|------|-----------------|
| 00   | No Bend         |
| 2__  | Sheath bent 45° |
| 3__  | Sheath bent 90° |

[1] Only available with "T" style magnet sensor. Requires a minimum "A" dimension of 4 3/4 inches.

#### 5 Extension Leadwire Type

| CODE               | DESCRIPTION   |
|--------------------|---|
| F1                 | Fiberglass insulation-solid conductor                                 |
| F1B                | Fiberglass insulation-solid conductor-stainless steel overbraid       |
| F1A <sup>[1]</sup> | Fiberglass insulation-solid conductor-flexible armor                  |
| F3                 | Fiberglass insulation-stranded conductor                              |
| F3B                | Fiberglass insulation-stranded conductor-stainless steel overbraid    |
| F3A <sup>[1]</sup> | Fiberglass insulation-stranded conductor-flexible armor               |
| T1                 | Fluoropolymer insulation-solid conductor                              |
| T1B                | Fluoropolymer insulation-solid conductor-stainless steel overbraid    |
| T1A <sup>[1]</sup> | Fluoropolymer insulation-solid conductor-flexible armor               |
| T3                 | Fluoropolymer insulation-stranded conductor                           |
| T3B                | Fluoropolymer insulation-stranded conductor-stainless steel overbraid |
| T3A <sup>[1]</sup> | Fluoropolymer insulation-stranded conductor-flexible armor            |

[1] Not available with M1 series assembly

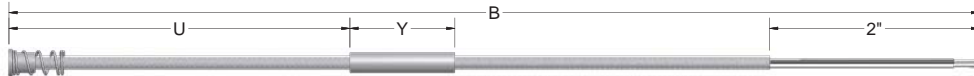
#### 6 Terminations and Options

| CODE | DESCRIPTION  |
|------|--|
| 0    | Leads not stripped   |
| 2    | 2" split leads, 1/4" stripped                                  |
| 3    | 2" split leads with spade lugs                                 |
| 4    | Standard plug  |
| 5    | Standard jack  |
| 6    | Miniature plug   |
| 7    | Miniature jack   |
| 8    | 2" split leads with 1/4" quick-disconnect female terminal lugs |

#### Options

| CODE | DESCRIPTION                                 |
|------|---|
| MC   | Mating Connector                            |
| CC   | Connector secured to leads with cable clamp |
| BX   | 1/2" NPT junction box connector             |

The miniature sensors are designed to measure the critical temperature of equipment such as sleeve bearings, thrust bearings, bearing shoes, and various other bearings where temperature is critical to performance. These types of bearings are generally used in the operation of high-speed rotating equipment such as compressors, generators, and turbines. The sensors are typically imbedded or installed beneath the Babbitt layer of the bearing to monitor the temperature, allowing early warning of the breakdown of the lubricants. This early warning allows preventative maintenance to take place before major problems occur.



### ORDER CODES

**Example Order Number:** HL30 - RBF185LBS 3 - BST - 3P02(1/2),24 - T3120 - 2

#### 0 ATEX Certification<sup>[1]</sup>

| CODE | DESCRIPTION                               |
|------|---|
| HL30 | ATEX Certified<br>CE Ex II3G Ex ic IIC T4 |

[1] Selection optional, not required for general-purpose sensors

#### 1-1 Element Connection

| CODE | DESCRIPTION |
|------|-------------|
| 2    | 2-Wire      |
| 3    | 3-Wire      |

#### 2 Case Options

| CASE STYLE       |   |
|------------------|---|
| CODE             | DESCRIPTION   |
| A                | 0.275" O.D. x 0.250" Long                                 |
| B                | 0.188" O.D. x 0.250" Long                                 |
| BS               | 0.188" O.D. x 0.250" Long<br>(Includes spring and washer) |
| C <sup>[1]</sup> | 0.125" O.D. x 0.300" Long                                 |
| D <sup>[1]</sup> | 0.080" O.D. x 0.300" Long                                 |
| CASE MATERIAL    |   |
| CODE             | DESCRIPTION   |
| T                | Tin-plated copper   |
| N                | Nickel-plated copper                                      |

[1] Not available in duplex

#### 3 Sealing Options

| CODE       | DESCRIPTION   |
|------------|---|
| 00         | No sealing option   |
| E "U"      | Elastomer fill (must specify length of elastomer fill "u" dimension) 72" maximum fill length. T3BT wire type must be specified. |
| 3P"Y", "U" | 3/16" O.D. pass through (must specify "Y" length and "U" length)  |
| 4P"Y", "U" | 1/4" O.D. pass through (must specify "Y" length and "U" length)   |

#### 4 Extension Leadwire Type ("B" Dimension)

| CODE | DESCRIPTION   |
|------|---|
| T3J  | Fluoropolymer insulation-individual leads-stranded conductor          |
| T3   | Fluoropolymer insulation-stranded conductor                           |
| T3B  | Fluoropolymer insulation-stranded conductor-stainless steel overbraid |
| T3BT | Fluoropolymer insulation-stranded conductor-stainless steel overbraid |

#### 5 Termination

| CODE | DESCRIPTION                    |
|------|--------------------------------|
| 0    | No Termination                 |
| 2    | 2" split leads 1/4" strip      |
| 3    | 2" split leads with spade lugs |

#### 1 100 Ω Platinum RTD Elements (-40 to 204 °C)

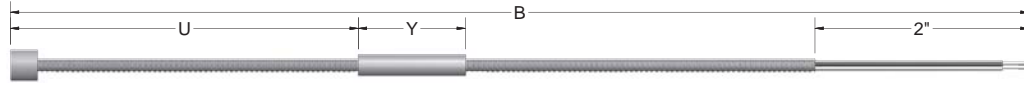
| SENSOR TYPE |           | DESCRIPTION              |   |
|-------------|-----------|--------------------------|---|
| CODE        |           | TOLERANCE <sup>[1]</sup> | TEMPERATURE COEFFICIENT                         |
| SINGLE      | DUPLEX    |                          |   |
| RBF185LBS   | RBF285LBS | Class B                  | $\alpha = 0.00385 \text{ } ^\circ\text{C}^{-1}$ |
| RBF192LBS   | RBF292LBS | Class B                  | $\alpha = 0.00392 \text{ } ^\circ\text{C}^{-1}$ |

[1] Refer to RTD tolerance information in the General Information section for calculations to determine specific tolerance at temperature.

| WIRE TYPE |  | CASE STYLE A <sup>[1]</sup> |                        | CASE STYLE B <sup>[1]</sup> |                        | CASE STYLE C <sup>[1]</sup> |                        | CASE STYLE D <sup>[1]</sup> |        |
|-----------|--|-----------------------------|------------------------|-----------------------------|------------------------|-----------------------------|------------------------|-----------------------------|--------|
| CODE      | DESCRIPTION  | Single                      | Duplex                 | Single                      | Duplex                 | Single                      | Duplex                 | Single                      | Duplex |
| T3J       | Fluoropolymer insulation-individual leads-stranded conductor                                     | 2- or 3-wire<br>24 AWG      | 2- or 3-wire<br>28 AWG | 2- or 3-wire<br>24 AWG      | 2- or 3-wire<br>28 AWG | 2- or 3-wire<br>28 AWG      | 2- or 3-wire<br>30 AWG | 2- or 3-wire<br>30 AWG      | N/A    |
| T3        | Fluoropolymer insulation-stranded conductor  | 2- or 3-wire<br>24 AWG      | 2- or 3-wire<br>28 AWG | 2- or 3-wire<br>24 AWG      | 2- or 3-wire<br>28 AWG | 2- or 3-wire<br>28 AWG      | 2- or 3-wire<br>28 AWG | N/A                         | N/A    |
| T3B       | Fluoropolymer insulation-stranded conductor-stainless steel overbraid                            | 2- or 3-wire<br>24 AWG      | 2- or 3-wire<br>28 AWG | 2- or 3-wire<br>24 AWG      | 2- or 3-wire<br>28 AWG | N/A                         | N/A                    | N/A                         | N/A    |
| T3BT      | Fluoropolymer insulation-stranded conductor-stainless steel overbraid-Fluoropolymer outer jacket | 2- or 3-wire<br>24 AWG      | 2- or 3-wire<br>30 AWG | 2- or 3-wire<br>24 AWG      | 2- or 3-wire<br>30 AWG | N/A                         | N/A                    | N/A                         | N/A    |

[1] Refer to page SP-12 for case style dimenons.

The miniature sensors are designed to measure the critical temperature of equipment such as sleeve bearings, thrust bearings, bearing shoes, and various other bearings where temperature is critical to performance. These types of bearings are generally used in the operation of high-speed rotating equipment such as compressors, generators, and turbines. The sensors are typically imbedded or installed beneath the Babbitt layer of the bearing to monitor the temperature, allowing early warning of the breakdown of the lubricants. This early warning allows preventative maintenance to take place before major problems occur.



### ORDER CODES

**Example  
Order Number:**

0 1 2 3 4 5  
**HL30 - JBS U - AT - 00 - T3120 - 2**

#### 0 ATEX Certification<sup>[1]</sup>

| CODE | DESCRIPTION                               |
|------|---|
| HL30 | ATEX Certified<br>CE Ex II3G Ex ic IIC T4 |

[1] Selection optional, not required for general-purpose sensors

#### 1 Thermocouple Type

| CODE   | DESCRIPTION |
|--------|-------------|
| SINGLE | DUPLEX      |
| JBSU   | JJBSU       |
| KBSU   | KKBSU       |
| TBSU   | TTBSU       |
| EBSU   | EEBSU       |

#### 3 Sealing Options

| CODE       | DESCRIPTION  |
|------------|--|
| 00         | No sealing option  |
| 3P"Y", "U" | 3/16" O.D. pass through (must specify "Y" length and "U" length) |
| 4P"Y", "U" | 1/4" O.D. pass through (must specify "Y" length and "U" length)  |

#### 2 Case Options

| CASE STYLE       |   |
|------------------|---|
| CODE             | DESCRIPTION   |
| A                | 0.275" O.D. x 0.250" Long                                 |
| B                | 0.188" O.D. x 0.250" Long                                 |
| BS               | 0.188" O.D. x 0.250" Long<br>(Includes spring and washer) |
| C <sup>[1]</sup> | 0.125" O.D. x 0.300" Long                                 |
| D <sup>[1]</sup> | 0.080" O.D. x 0.300" Long                                 |
| CASE MATERIAL    |   |
| CODE             | DESCRIPTION   |
| T                | Tin-plated copper   |
| N                | Nickel-plated copper                                      |

[1] Not available in duplex

#### 4 Extension Leadwire Type ("B" Dimension)

| CODE | DESCRIPTION   | AVAILABLE CALIBRATIONS |   |   |   |
|------|---|------------------------|---|---|---|
|      |   | J                      | K | T | E |
| T1   | Fluoropolymer insulation-solid conductor                              | X                      | X | X |   |
| T3J  | Fluoropolymer insulation-individual leads-stranded conductor          | X                      | X | X | X |
| T3   | Fluoropolymer insulation-stranded conductor                           | X                      | X | X | X |
| T3B  | Fluoropolymer insulation-stranded conductor-stainless steel overbraid | X                      | X |   |   |

#### 5 Termination

| CODE | DESCRIPTION                    |
|------|--------------------------------|
| 0    | No Termination                 |
| 2    | 2" split leads 1/4" strip      |
| 3    | 2" split leads with spade lugs |

| WIRE TYPE |   | CASE STYLE A <sup>[1]</sup> |        | CASE STYLE B <sup>[1]</sup> |        | CASE STYLE C <sup>[1]</sup> |        | CASE STYLE D <sup>[1]</sup> |        |
|-----------|---|-----------------------------|--------|-----------------------------|--------|-----------------------------|--------|-----------------------------|--------|
| CODE      | DESCRIPTION   | Single                      | Duplex | Single                      | Duplex | Single                      | Duplex | Single                      | Duplex |
| T1        | Fluoropolymer insulation-solid conductor                              | 24 AWG                      | 24 AWG | 24 AWG                      | 24 AWG | 24 AWG                      | N/A    | 30 AWG                      | N/A    |
| T3J       | Fluoropolymer insulation-individual leads-stranded conductor          | 24 AWG                      | 24 AWG | 24 AWG                      | 24 AWG | 24 AWG                      | N/A    | N/A                         | N/A    |
| T3        | Fluoropolymer insulation-stranded conductor                           | 24 AWG                      | 24 AWG | 24 AWG                      | 24 AWG | 24 AWG                      | N/A    | N/A                         | N/A    |
| T3B       | Fluoropolymer insulation-stranded conductor-stainless steel overbraid | 24 AWG                      | 24 AWG | 24 AWG                      | N/A    | 24 AWG                      | N/A    | N/A                         | N/A    |

[1] Refer to page SP-12 for case style dimensions.

### Installation Instructions

| CASE STYLE | INSTALLATION   | ILLUSTRATION |
|------------|--|--------------|
| A          | Install sensor just below the babbitt layer – near bearing shoe surface, then puddle the babbitt metal over the sensor tip and smooth.   |              |
| B          | This sensor is designed with a spring and retaining washer that allows for spring loading. Slide the spring and washer over the leads. Insert the sensor tip into a hole bored into the bearing shoe and push down on the retaining ring to compress the spring and secure the sensor. |              |
| C & D      | Bore the sensor hole in the bearing shoe near, but not touching, the babbitt surface. Insert sensor and secure by potting/bonding with epoxy.  |              |

### Case Style Dimensions

|  |
|--|
| <p><b>CASE STYLE A</b></p> <p>Ø 0.275" O.D. x 0.250" L</p>                                   |
| <p><b>CASE STYLE B</b></p> <p>Ø 0.188" O.D. x 0.250" L<br/>Flange 0.250" O.D. x 0.030" L</p> |
| <p><b>CASE STYLE C</b></p> <p>Ø 0.125" O.D. x 0.300" L</p>                                   |
| <p><b>CASE STYLE D</b></p> <p>Ø 0.080" O.D. x 0.300" L</p>                                   |

### Accessories

| PART NUMBER | DESCRIPTION      | ILLUSTRATION |
|-------------|------------------|--------------|
| 12920       | Spring           |              |
| 12919       | Retaining Washer |              |
| 10494       | Retaining Ring   |              |