

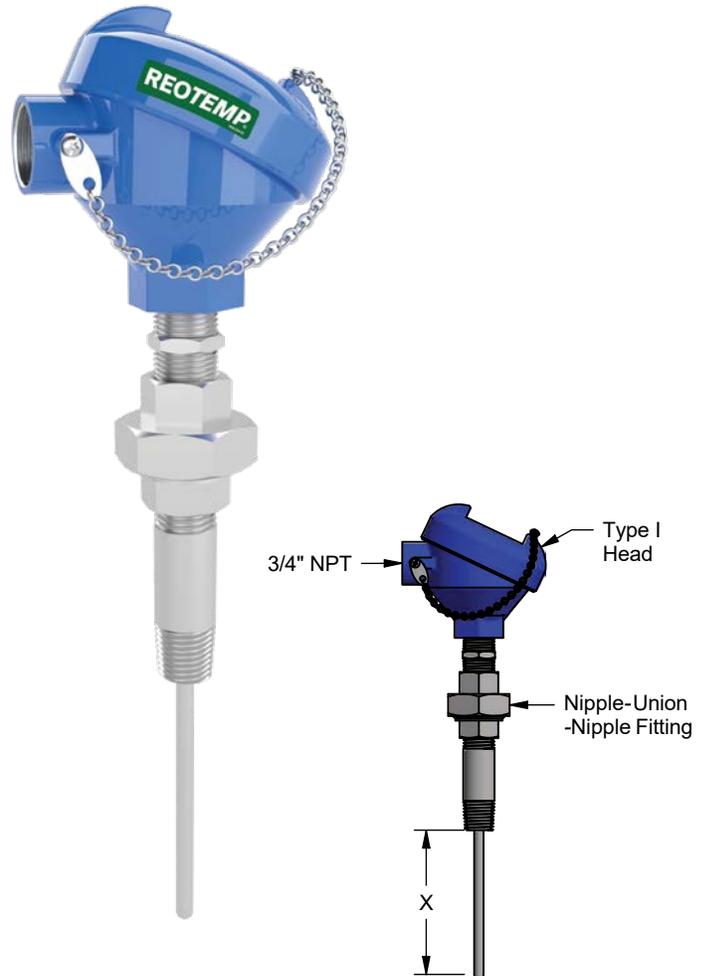
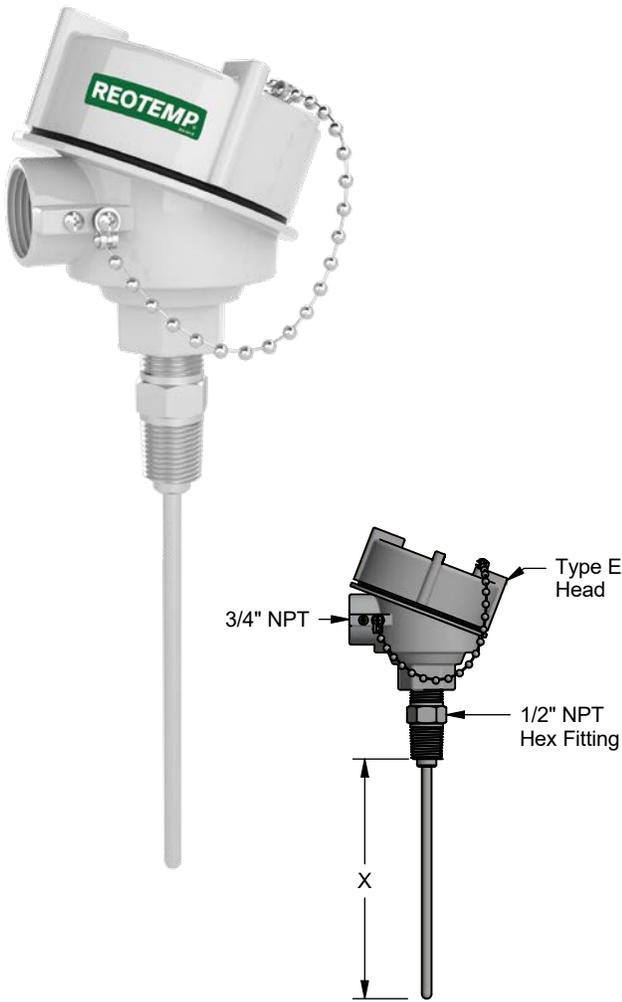
THERMOCOUPLE HEAD ASSEMBLY

Reotemp offers a large selection of Industrial Thermocouple Head Assemblies supplied with or without a transmitter. Customizable options include a large variety of elements, connection heads, explosion proof approvals, stem lengths and process connections.



Made in USA

THERMOCOUPLES



THERMOCOUPLE HEAD ASSEMBLY

BUILD YOUR THERMOCOUPLE ASSEMBLY: Choose options to build a part number. For example: BX1TM25K1SG6

B

HEAD STYLE

| Head | Code | Description | Ratings |  |  |  | Display | Standard Conduit |
|-------------------------------------------------------------------------------------|----------|----------------------------------------|---------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------|------------------|
|  | A | Cast Iron Black | NEMA 4 | | | | | 3/4" |
|  | B | Cast Aluminum | NEMA 4X | | | | | 3/4" |
|  | E | Explosion Proof Aluminum | NEMA 4X | ✓ | ✓ | | | 3/4" |
|  | I | Blue Epoxy Aluminum | NEMA 4X | | | | | 3/4" |
|  | S | Polypropylene White | NEMA 4 | | | | | 3/4" |
|  | W | Field HART Transmitter | IP68, NEMA 4X | ✓ | ✓ | ✓ | ✓ | 1/2" |
|  | Z | Z-Temp™ Explosion Proof Aluminum | NEMA 4X, IP66 | ✓ | ✓ | ✓ | ✓ | 1/2" |
|  | G | 316SS | NEMA 4X | | | | | 3/4" |
|  | T | ATEX Explosion Proof Aluminum | NEMA 4X | ✓ | ✓ | ✓ | | 1/2" |
|  | L | Explosion Proof Epoxy Coated Aluminium | NEMA 4X | ✓ | ✓ | | | 3/4" |

See page 49 for additional head style options.



HEAD OPTIONS (OPTIONAL)

TRANSMITTER (OPTIONAL)

Note: All heads come standard with a ceramic terminal block unless no terminal block or a transmitter is chosen.

- H** = 1/2" Conduit
- S** = 1/2" BSPP Conduit
- M** = M20 x 1.5"
- N** = No Terminal Block

Standard

- X** = 4-20 mA 2-wire Transmitter
- R** = 4-20 mA 2-wire HART Transmitter
- F** = 4-20 mA 2-wire Foundation Fieldbus
- P** = 4-20 mA 2-wire Profibus

Required when Z-Head is Selected:

- B** = 4-20 mA 2-wire Transmitter with Digital Display
- Y** = 4-20 mA 2-wire HART Transmitter with Digital Display

THERMOCOUPLE HEAD ASSEMBLY

THERMOCOUPLES

1T

M

25

THREADED CONNECTIONS

METAL SHEATH

SHEATH DIAMETER

- All have 1/2" NPT male unless noted.
- Use a spring loaded connection with a thermowell.
- Use a welded connection when the stem goes directly into the process medium.
- All threaded connections have 316 stainless steel fittings.

M = Metal Sheathed Thermocouple

- 06** = 0.062 in
- 12** = 0.125 in
- 18** = 0.188 in
- 25** = 0.250 in
- 37** = 0.375 in

Threaded Connections

1T = Spring-loaded 316SS Hex Bushing

4T = 5" Nominal Spring Loaded Nipple-Union-Nipple 316SS

2T = 2.5" Spring Loaded Nipple 316SS

7T = Spring Loaded Explosion Proof Bushing 316SS

5T = Nipple-Union-Nipple Spring Loaded Explosion Proof Bushing, Explosion Proof Union

Welded Fittings

1F = Welded Hex Bushing 316SS

4F = Nipple-Union-Nipple Welded 316SS

6F = Stainless Steel Bushing, 1/2" NPT, No Process Threads

Welded Fittings with Compression Fitting Loose on Stem

6FT = SS Welded Bushing with 1/4" NPT Comp Fitting "Set Once" Loose On Stem

6FU = SS Welded Bushing with 1/2" NPT Comp Fitting "Set Once" Loose On Stem

6FV = SS Welded Bushing with 1/8" NPT Comp Fitting "Set Once" Loose On Stem

Other Nipple-Union-Nipple

4T3 = 3" Nominal Spring Loaded N-U-N

4T4 = 4" Nominal Spring Loaded N-U-N

4T6 = 6" Nominal Spring Loaded N-U-N

4T7 = 7" Nominal Spring Loaded N-U-N

Other Nipples

2T3 = 3" Spring Loaded Nipple

2T4 = 4" Spring Loaded Nipple

2T5 = 5" Spring Loaded Nipple

2T6 = 6" Spring Loaded Nipple

2T7 = 7" Spring Loaded Nipple

2T8 = 8" Spring Loaded Nipple

Special Fittings

8T = Spring Loaded Terminal Block, No Fitting 1/2" NPT Female Head Opening

Connection Types

| | | |
|------------------------------|-----------------------------|--|
| 1T, 7T, 1F | Hex Bushing | |
| 2T | Pipe Nipple | |
| 4T3, 4T, 5T, 4F, etc. | Nipple-Union-Nipple (N-U-N) | |
| 6FT, 6FU, 6FV | Compression Fitting | |
| 6F | No Process Threads | |

K

1

S

G

6

-TS

THERMOCOUPLE TYPE

SHEATH MATERIAL

NUMBER OF ELEMENTS

TYPE OF JUNCTION

STEM LENGTH "X"

OPTIONS

- J** = Type J
- K** = Type K
- E** = Type E
- T** = Type T
- JS** = Type J Special Limits of Error
- KS** = Type K Special Limits of Error
- ES** = Type E Special Limits of Error
- TS** = Type T Special Limits of Error

- 1** = 316 Stainless Steel
- 2** = 310 Stainless Steel
- 3** = 304 Stainless Steel
- 5** = Inconel 600
- S** = Single Element
- D** = Dual Element

- G** = Grounded Elements
- U** = Ungrounded Elements
- E** = Exposed Elements
- UU** = Ungrounded Uncommon Elements

Stem length measured from bottom of threads to stem tip.
??? = Stem length in inches.

- TS** = Stainless Tag
- R1** = One Point Calibration Certification (Reotemp Chooses)
- R3** = Three Point Calibration Certification (Reotemp Chooses)

For thermocouple accuracy information see page 5.

For thermocouple temperature operating ranges see page 6.

For additional options see page 147.

For thermowells see pages 140-146.

REFERENCE INFORMATION

| THERMOCOUPLE WIRE COLOR CODES (U.S.A. ANSI) | | | | | |
|---------------------------------------------|-----------------|-----------|--------------------|-----------------|-----------|
| Thermocouple Grade | Extension Grade | Plug/Jack | Thermocouple Grade | Extension Grade | Plug/Jack |
| K | | Yellow | N | | Orange |
| J | | Black | S | | Green |
| T | | Blue | R | | Green |
| E | | Purple | B | | White |

THERMOCOUPLE & RTD ACCURACIES

| | Type K | Type J | Type T | Type E | Type N | Type S | Type R | Type B | RTD Class B | RTD Class A |
|--------|----------|----------|---------|----------|----------|---------|---------|----------|-------------|-------------|
| -328°F | * | — | * | * | — | — | — | — | ± 2.34°F | ± 2.34°F |
| -148°F | * | — | * | * | — | — | — | — | ± 1.44°F | ± 1.44°F |
| 32°F | ± 3.96°F | ± 3.96°F | ± 1.8°F | ± 3.06°F | ± 3.96°F | ± 2.7°F | ± 2.7°F | — | ± 0.54°F | ± 0.27°F |
| 392°F | ± 3.96°F | ± 3.96°F | ± 2.7°F | ± 3.06°F | ± 3.96°F | ± 2.7°F | ± 2.7°F | — | ± 2.34°F | ± 0.99°F |
| 752°F | ± 5.4°F | ± 5.4°F | — | ± 3.6°F | ± 5.4°F | ± 2.7°F | ± 2.7°F | — | ± 4.14°F | ± 4.14°F |
| 1112°F | ± 8.1°F | ± 8.1°F | — | ± 5.4°F | ± 8.1°F | ± 2.7°F | ± 2.7°F | — | ± 5.94°F | ± 5.94°F |
| 1472°F | ± 10.8°F | — | — | ± 7.2°F | ± 10.8°F | ± 3.6°F | ± 3.6°F | — | — | — |
| 1832°F | ± 13.5°F | — | — | — | ± 13.5°F | ± 4.5°F | ± 4.5°F | ± 9°F | — | — |
| 2192°F | ± 16.2°F | — | — | — | ± 16.2°F | ± 5.4°F | ± 5.4°F | ± 10.8°F | — | — |
| 2552°F | — | — | — | — | — | ± 6.3°F | ± 6.3°F | ± 12.6°F | — | — |
| 2912°F | — | — | — | — | — | — | — | ± 14.4°F | — | — |

Note: The accuracies in the above table are estimates given at fixed points, they do not apply to temperature ranges and are intended only as examples to give a general idea of what can be expected. Consult Reotemp if a specific accuracy is required or to confirm accuracies at any points not listed in the above table.

*Thermocouples are normally supplied to meet the tolerances specified in the table for temperatures above 32°F. The same materials, however, may not fall within the tolerances for temperatures below 32°F. If materials are required to meet the tolerances stated for temperatures below 32°F, contact Reotemp sales.

Looking for better accuracy?



Reotemp offers **RTDs** up to 5x more accurate than Class B RTDs with the Hi-Accuracy™ option.

Thermocouples up to 2x more accurate with the Special Limits of Error option.

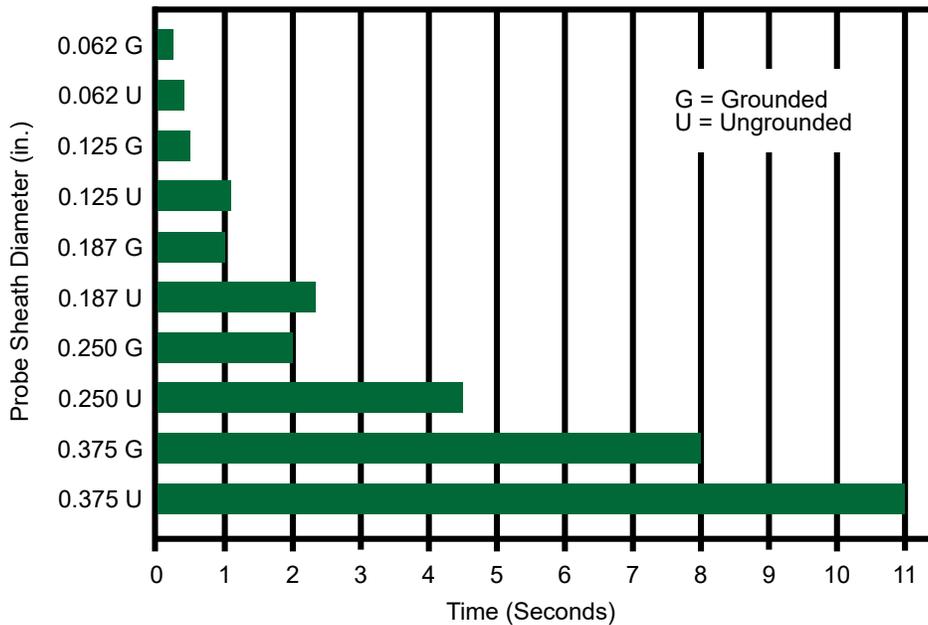
REFERENCE INFORMATION

THERMOCOUPLE TEMPERATURE OPERATING RANGES

| Type | Minimum Temp. °F | Maximum Temp. °F |
|------|------------------|------------------|
| K | -328 | 2300 |
| J | 32 | 1400 |
| T | -328 | 700 |
| E | -328 | 1600 |
| N | 32 | 2300 |
| S | 32 | 2700 |
| R | 32 | 2700 |
| B | 1600 | 3100 |

THERMOCOUPLE TYPICAL RESPONSE TIMES

63.2% Temperature Change in an Agitated Water Bath



TEMP. LIMITS OF WIRE JACKETS

| Jacket | Temp. Limit |
|------------|-------------|
| PVC | 221°F |
| Teflon | 400°F |
| Fiberglass | 900°F |

THERMOCOUPLE & RTD OPTIONS

| | | Thermocouple | RTD | Digital Thermometers | Handheld Digital |
|------------------------------|-----------------------------------------------------|--------------|-----|----------------------|------------------|
| CERTIFICATION OPTIONS | | | | | |
| -R1 | 1 Point Calibration Certification, Reotemp Chooses | ✓ | ✓ | ✓ | ✓ |
| -R3 | 3 Point Calibration Certification, Reotemp Chooses | ✓ | ✓ | ✓ | ✓ |
| -C1 | 1 Point Calibration Certification, Customer Chooses | ✓ | ✓ | ✓ | ✓ |
| -C3 | 3 Point Calibration Certification, Customer Chooses | ✓ | ✓ | ✓ | ✓ |
| -CC | Certificate of Conformance | ✓ | ✓ | ✓ | ✓ |
| -CS | NIST Calibration Sticker (No Logged Points) | ✓ | ✓ | ✓ | ✓ |
| OTHER OPTIONS | | | | | |
| -VB | Hi-Vibration | N/A | ✓ | ✓ | ✓ |
| -AC | Hi-Accuracy | N/A | ✓ | N/A | N/A |
| -PS | Pointed Stem | ✓ | ✓ | ✓ | ✓ |
| -TF | Teflon Coating | ✓ | ✓ | ✓ | ✓ |
| -SS | 316 SS stem | N/A | STD | ✓ | ✓ |
| -NL | No Logo | ✓ | ✓ | ✓ | ✓ |
| -HT | Heat Transfer Compound (2 oz) | ✓ | ✓ | ✓ | N/A |
| -GL | Plain Glass Lens | N/A | N/A | ✓ | ✓ |
| -CL | Custom Logo Dial | N/A | N/A | ✓ | ✓ |
| -BP | Replacement Battery Pack | N/A | N/A | ✓ | ✓ |
| -WD | White Dial | N/A | N/A | ✓ | ✓ |
| -AS | Allows to Fit 1-1/4-18 Industrial Thermowell | ✓ | ✓ | ✓ | N/A |
| TAG OPTION | | | | | |
| -TS | Stainless Steel Tag (1-10 Characters) | | | ✓ | |
| -TM | Stainless Steel Tag (11-80 Characters) | | | ✓ | |
| -TP | Paper Tag | | | ✓ | |

| | |
|-----|---------------------------------------------------------|
| ✓ | Indicates that the option is available with this model. |
| N/A | Indicates the option is not available with this model. |
| STD | Indicates standard options with no additional cost. |

HEAD STYLES

All head styles are IP65 or greater. Additional head styles available, contact customer service for more information.

| Head | Code | Description | NEMA Rating | IP Rating | | | | Display | STD Conduit | Material |
|------|------|----------------------------------------|-------------|-----------|---|---|---|---------|-------------|----------------|
| | A | Cast Iron Black | 4 | 65 | | | | | 3/4" | Cast Iron |
| | B | Cast Aluminum | 4X | 68 | | | | | 3/4" | Cast Aluminium |
| | E | Explosion Proof Aluminum | 4X | 68 | ✓ | ✓ | | | 3/4" | Cast Aluminium |
| | I | Blue Epoxy Aluminum | 4X | 68 | | | | | 3/4" | Cast Aluminium |
| | S | Polypropylene White | 4 | 65 | | | | | 3/4" | Polypropylene |
| | W | Explosion Proof Field HART Transmitter | 4X | 68 | ✓ | ✓ | ✓ | ✓ | 1/2" | Cast Aluminium |
| | Z | Z-Temp™ Explosion Proof Aluminum | 4X | 66 | ✓ | ✓ | ✓ | ✓ | 1/2" | Cast Aluminium |
| | C | Polypropylene Black | 4 | 65 | | | | | 3/4" | Polypropylene |
| | G | 316SS | 4X | 65 | | | | | 3/4" | 316SS |
| | H | Aluminum Flip Top | 4 | 65 | | | | | 3/4" | Cast Aluminium |
| | J | Explosion Proof 316SS | 4X | 65 | ✓ | ✓ | | | 3/4" | 316SS |
| | T | ATEX Explosion Proof Aluminum | 4X | 68 | ✓ | ✓ | ✓ | | 1/2" | Cast Aluminium |
| | L | Explosion Proof Epoxy Coated Aluminium | 4X | 68 | ✓ | ✓ | | | 3/4" | Cast Aluminium |
| | D | Mini Cast Aluminum | 4 | 65 | | | | | 3/4" | Cast Aluminium |
| | K | Polished 316SS Knurl | 4X | 65 | | | | | 1/2" | 316SS |
| | P | DIN Black Polypropylene | 4 | 65 | | | | | 3/4" | Polypropylene |
| | U | Hi-dome Aluminum Fliptop | 4 | 65 | | | | | 3/4" | Cast Aluminium |
| | V | Ball-dome Aluminum Fliptop | 4 | 65 | | | | | 3/4" | Cast Aluminium |