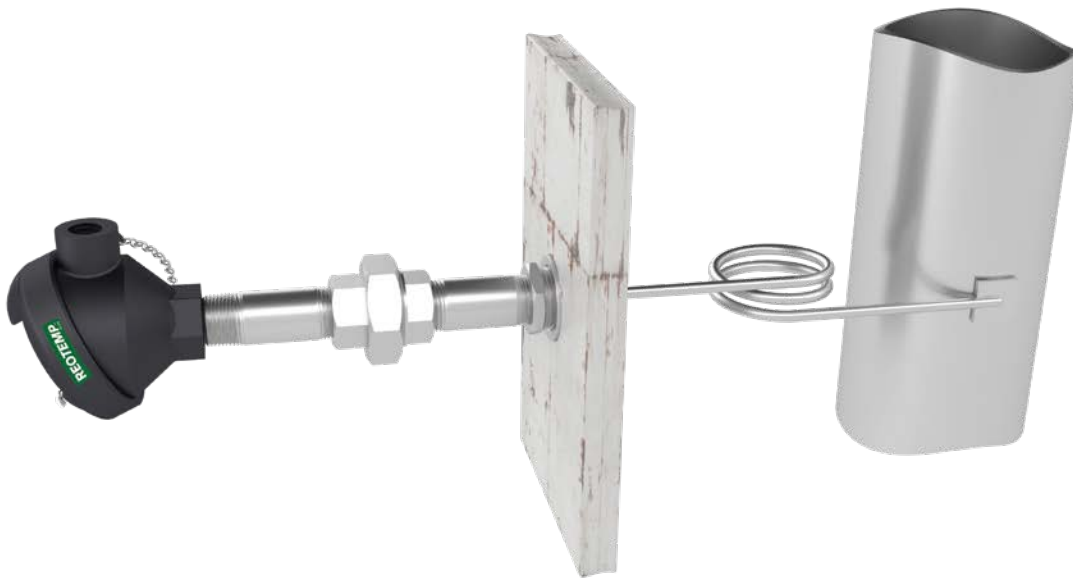


WELD PAD (TUBE SKIN) THERMOCOUPLE

Reotemp manufactures a full line of standard and custom Weld Pad Thermocouples. The weld pad (tube skin) termination allows a temperature sensor to be welded directly on to piping or other metal surfaces to measure the surface temperature, and indirectly the process temperature inside the pipe. Reotemp weld pad sensors are designed to handle extreme temperatures and the long-term continuous service requirements in refineries, chemical processors, and power plants.



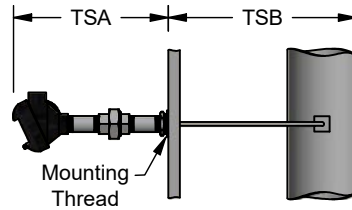
Made in USA

FEATURES / BENEFITS

- Sheaths are formable to enable easy installation and are self-supporting within the application
- Made to your size requirements including:
 - Long lengths
 - Large diameter sheaths
 - Heavy walled sheaths
 - Long lead extensions
- Available in many high temperature alloys including Inconel 600 and 310 stainless steel
- Made to your orientation requirements including:
 - Expansion Loops
 - Bends and Radii
 - Variety of Weld Pad Styles
- Made to your configuration requirements
 - Connection head Assemblies
 - Gas seals
 - Connector Combinations
 - Lead Wire Protection
 - Heat Shields
 - Weld Clips

WELD PAD (TUBE SKIN) THERMOCOUPLE

BUILD YOUR WELD PAD: The weld pad part number is built in two halves. **TSA** covers the head assembly on the left or outside the process wall as shown below; **TSB** covers the portion on the right or inside the process wall.



TSA-	N	N	045	K	S	U
HEAD STYLE	IN-HEAD TRANSMITTERS	CONNECTION	THERMOCOUPLE TYPE	JUNCTIONS	JUNCTION STYLE	

- A** = Cast Iron Black
- B** = Cast Aluminum
- E** = Explosion Proof Aluminum
- N** = No Head

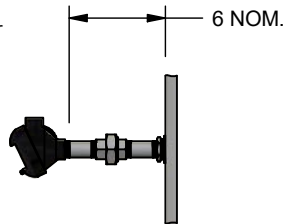
- X** = 4-20 mA Transmitter
- R** = 4-20 mA Hart Transmitter
- F** = Foundation Fieldbus Transmitter
- P** = Profibus Transmitter
- N** = None

- NUN** = 3/4" NPT SS N-U-N with Compression Fitting in Union, 6" Nominal

- J** = Type J
- K** = Type K
- E** = Type E
- T** = Type T

- S** = Single
- D** = Dual

- G** = Grounded
- U** = Ungrounded
- C** = Ungrounded-Uncommon

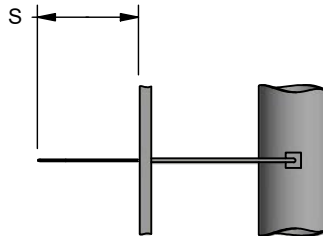


For thermocouple accuracy information see page 5.

For thermocouple temperature operating ranges see page 6.

If No Head or Connection Is Selected

??? = "S" length in inches. From the top of the female process connection to the top of the stem. Ex: 045 = 4.5", Ex: 105 = 10.5".



Continue: To next page to complete TSB portion of part number.

25	5	75
STEM DIAMETER	STEM MATERIAL	MOUNTING THREAD

- 18** = 0.188 in.
- 25** = 0.25 in.
- 37** = 0.375 in.
- 50** = 0.5 in.

- 1** = 316 Stainless Steel
- 2** = 310 Stainless Steel
- 5** = Inconel 600

Other materials available.

- 75** = 3/4" NPT
- 10** = 1" NPT
- 15** = 1.5" NPT

WELD PAD (TUBE SKIN) THERMOCOUPLE

THERMOCOUPLES

TSB- E

STYLE

S = Straight Shot
E = Expansion Loops

060

IMMERSION LENGTH "A"

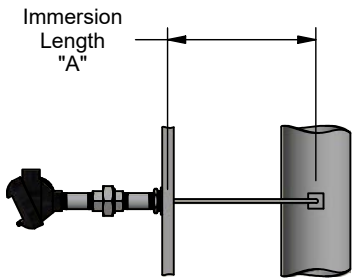
3 digit length from bottom of mounting threads to center line of pipe.

??? = ??? in
060 = 60 in
080 = 80 in
100 = 100 in

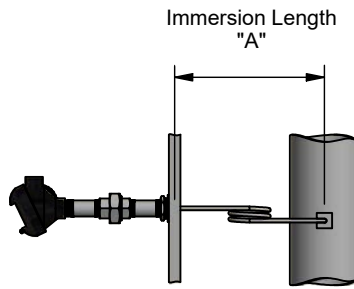
L

BEND

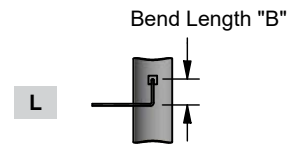
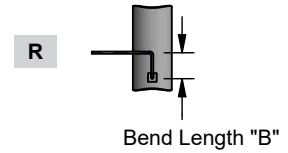
N = None
L = Left
R = Right



Straight Shot



Expansion Loops



06

BEND LENGTH "B"

2 digit bend length in inches.

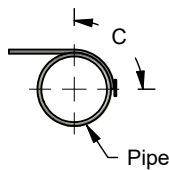
?? = Specify Custom Length in Inches
06 = 6 in
08 = 8 in
10 = 10 in

N

WRAP AROUND ANGLE

Degrees clockwise.

N = None
1 = 90°
2 = 180°

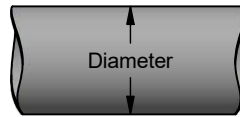


3

ANSI PIPE SIZE

Specify nominal diameter of pipe.

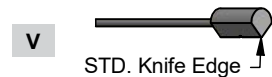
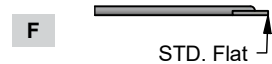
- 1 = 2" Pipe
- 2 = 2.5" Pipe
- 3 = 3" Pipe
- 4 = 3.5" Pipe
- 5 = 4" Pipe
- 6 = 4.5" Pipe
- 7 = 5" Pipe
- 8 = 6" Pipe



F

WELD PAD STYLE

F = Standard Flat 1" x 1" x 1/8"
C = Standard Curved 1" x 1" x 1/8"
V = Standard Knife Edge
K = Curved Knife Edge



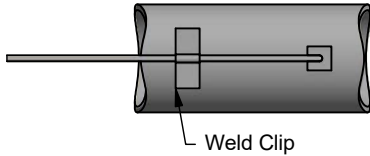
WELD PAD (TUBE SKIN) THERMOCOUPLE

THERMOCOUPLES

2

NUMBER OF
WELD CLIPS

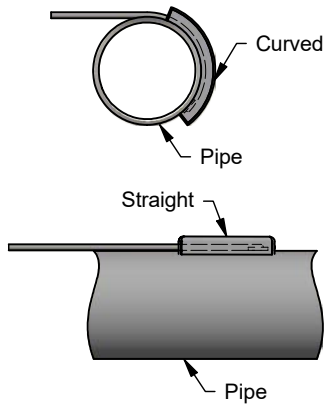
? = Number of
Clips



N

HEAT SHIELD

N = None
S = Straight
C = Curved



Continue: Only if you require expansion loops. Otherwise, stop at heat shield.

040

EXPANSION LOOP
LOCATION

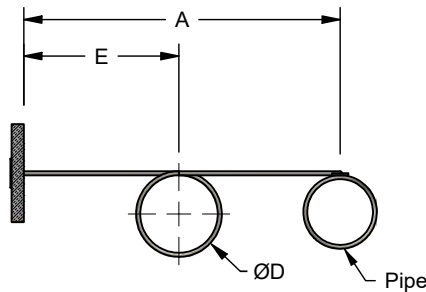
??? = 3 digit expansion
loop location "E".
Example: 040 =
40 inches.

*Standard expansion loop
orientation: axis of the
expansion loop is parallel
to the axis of the pipe. If
a specific orientation is
desired, provide sketch.*

6

EXPANSION LOOP
DIAMETER

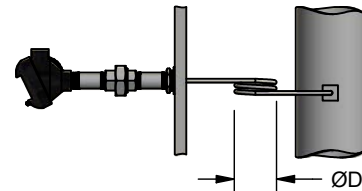
? = 1 digit expansion
loop diameter "D" in
inches.



3

NUMBER OF
EXPANSION LOOPS

? = 1 digit number of
expansion loops.



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.

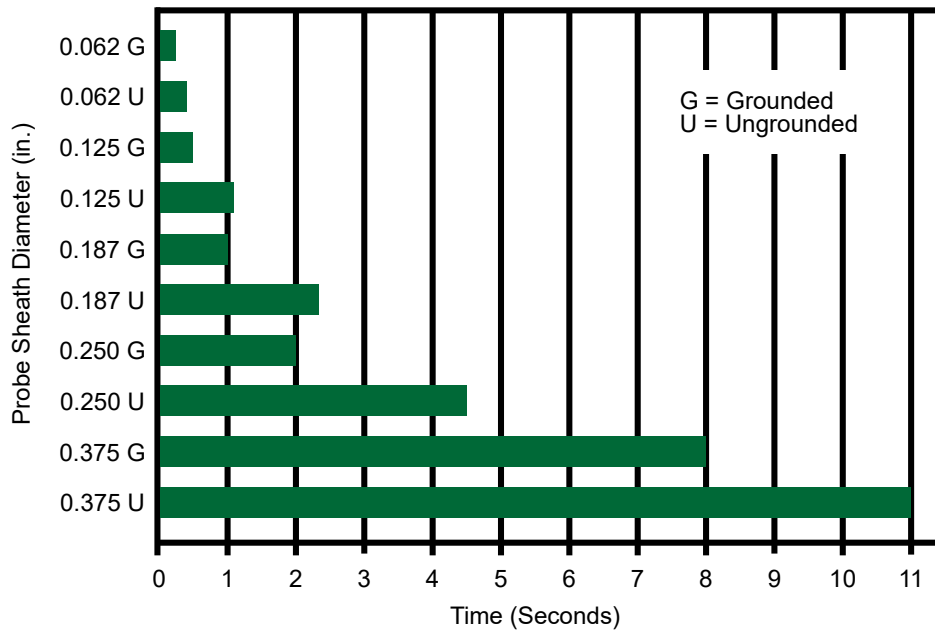
REFERENCE INFORMATION

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.