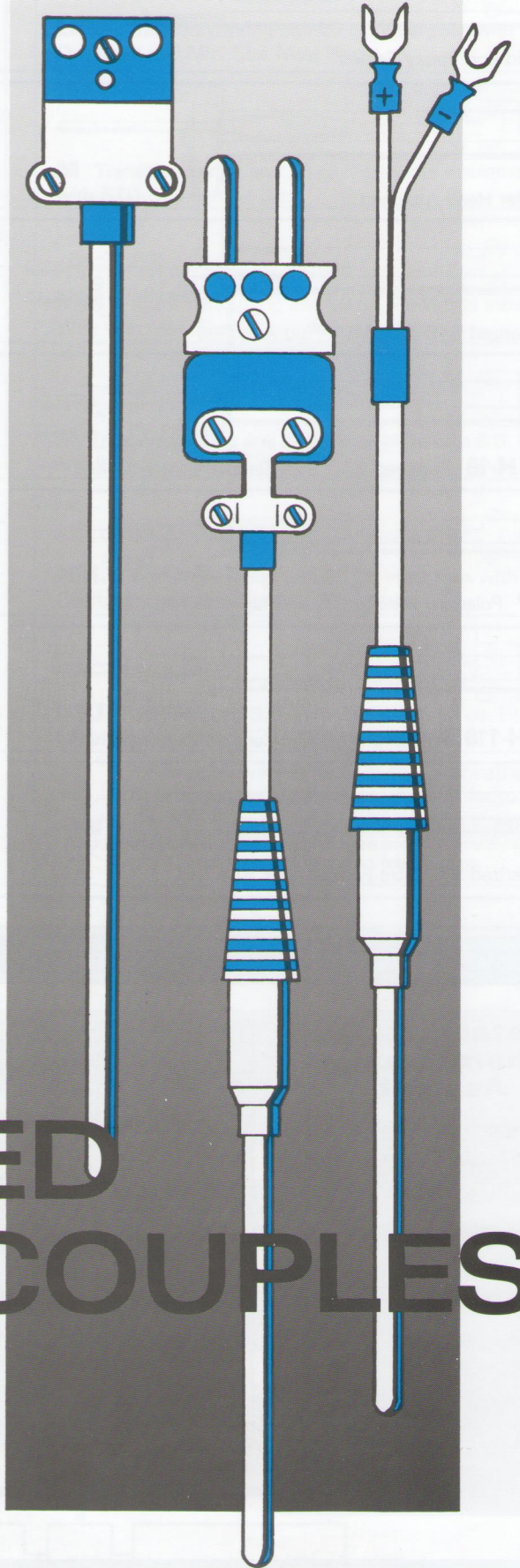
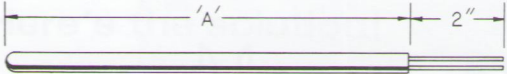
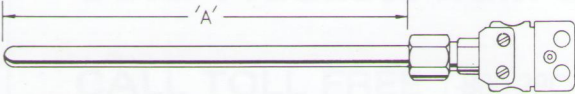
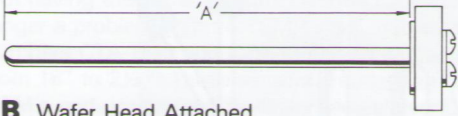
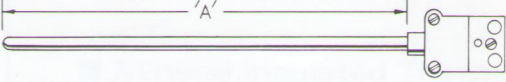
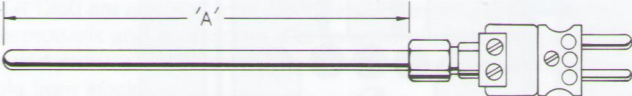
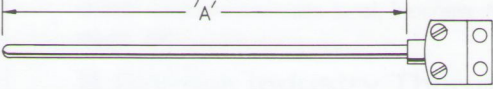
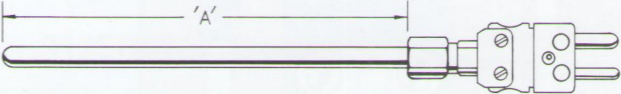
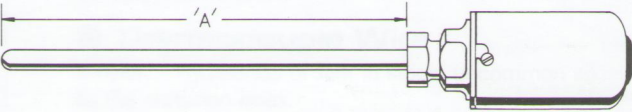
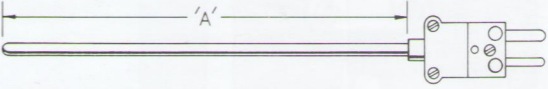
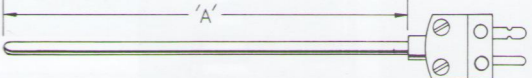
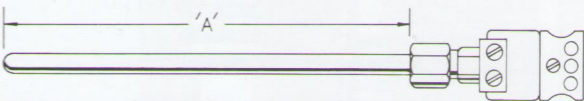


MINERAL INSULATED THERMOCOUPLES



MODEL	STEP 4	MODEL
 <p>A Cold End Epoxy Sealed</p>	 <p>DHXH-20 Polarized Std Size Ceramic Jack Attached</p>	
 <p>B Wafer Head Attached</p>	 <p>DMJ Polarized Mini Size Female Jack Attached</p>	
 <p>C Polarized STD Size Male Plug Attached</p>	 <p>DHXH-120 Polarized Mini Size Ceramic Jack Attached</p>	
 <p>CHX H-10 Polarized STD Size Ceramic Plug Attached</p>	 <p>E Plain Screw Cover Head with "O" Ring Seal Attached</p>	
 <p>CMP Polarized Mini Size Male Plug Attached</p>	<p>For additional metal sheath assemblies - see Section 3 of master catalog or consult factory</p>	
 <p>CHXH-110 Polarized Mini Size Ceramic Plug Attached</p>		
 <p>D Polarized STD Size Female Jack Attached</p>		

HOW TO CONSTRUCT A TEMP-O-PAK

Metal Sheathed Thermocouple Assembly

Step 1 - Insert Two Digit Number Designation Below.

Sheath Diameter

01 = .010 (.25)
02 = .020 (.51)
03 = .032 (.81)
04 = .040 (1.02)
06 = .063 (1.57)
09 = .090 (2.29)
12 = .125 (3.18)
18 = .188 (4.78)
25 = .250 (6.35)
31 = .313 (7.95)
37 = .375 (9.53)
50 = .500 (12.7)

Step 2 - Insert Single Digit Number Designation Below.

ANSI Type Thermocouple Element

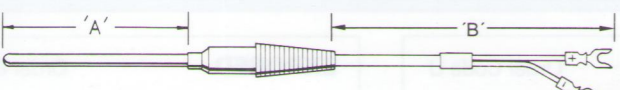
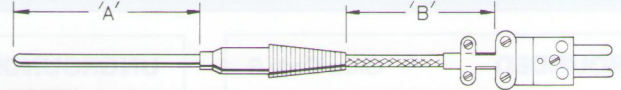
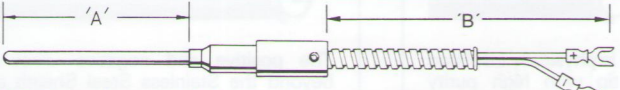
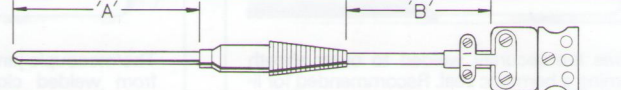
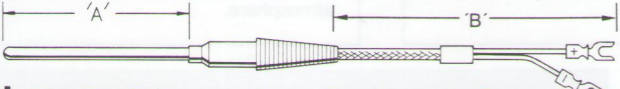



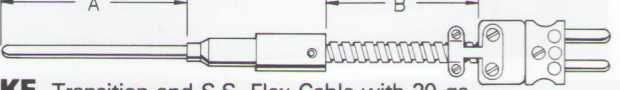

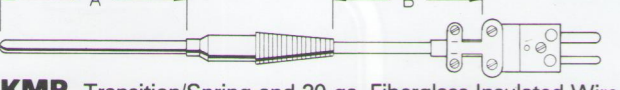
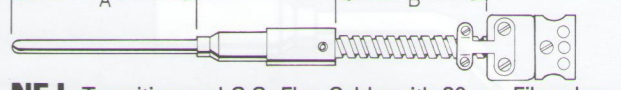
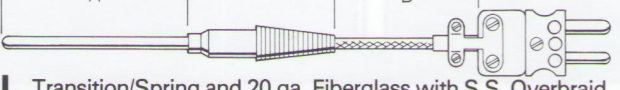
1 = Chromel-Alumel (K)
2 = Iron-Constantan (J)
3 = Copper-Constantan (T)
4 = Chromel-Constantan (E)
5 = Platinum/Platinum 13% Rhodium (R)
6 = Platinum/Platinum 10% Rhodium (S)
7 = Platinum 30% Rhodium/Platinum 6% Rhodium (B)
8 = Tungsten/Tungsten 26% Rhenium (W)
9 = Tungsten 5% Rhenium/Tungsten 26% Rhenium (W5)
10 = Tungsten 3% Rhenium/Tungsten 25% Rhenium (W3)
11 = Nicrosil/Nisil (N)

Step 3 - Insert Single Digit Number Designation Below.

Type of Sheath Material

1 = 316 Stainless Steel - 1700F (927C)
2 = 310 Stainless Steel - 2100F (1149C)
3 = 304 Stainless Steel - 1650F (899C)
*4 = Inconel 702 - 2200F (1240C)
5 = Inconel 600 - 2100F (1149C)
*6 = Inconel 601 - 2100F (1149C)
*7 = Hastelloy X - 2300F (1260C)
*8 = Molybdenum - 4000F (2200C)
*9 = Tantalum - 4500F (2480C)

* Not available in some diameters.
Consult factory.

MODEL	STEP 4	MODEL
		
I Transition/Spring and 20 ga. Fiberglass Insulated Wire		LMP Transition/Spring and 20 ga. Fiberglass with S.S. Overbraid and Mini Size Male Plug
		
IF Transition and S.S. Flex Cable with 20 ga. Fiberglass Insulated Wire		M Transition/Spring and 20 ga. Fiberglass Insulated Wire with STD Size Female Jack
		
J Transition/Spring and 20 ga. Fiberglass with Stainless Steel Overbraid		MMJ Transition/Spring and 20 ga. Fiberglass Insulated Wire with Mini Size Female Jack
		
K Transition/Spring and 20 ga. Fiberglass Insulated Wire with STD Size Male Plug		N Transition/Spring and 20 ga. Fiberglass with S.S. Overbraid and STD Size Female Jack
		
KF Transition and S.S. Flex Cable with 20 ga. Fiberglass Insulated Wire with STD Size Male Plug		NMJ Transition/Spring and 20 ga. Fiberglass with S.S. Overbraid and Mini Size Female Jack
		
KMP Transition/Spring and 20 ga. Fiberglass Insulated Wire with Mini Size Male Plug		NFJ Transition and S.S. Flex Cable with 20 ga. Fiberglass Insulated Wire and STD Size Female Jack
		
L Transition/Spring and 20 ga. Fiberglass with S.S. Overbraid and STD Size Male Plug		
		For special wire extension metal sheathed thermocouple assemblies, consult factory NOTE: Transition area max. temperature exposure is 260°F (125°C) STD. Higher temperature transition seals available specify in Step 9 max. exposed transition temperature.

THERMOCOUPLE PART NUMBER

Step 5

Insert Letter Designation Below.
S = Single Element Assembly
D = Dual Element Assembly

Step 6 - Type of Junction

Insert Letter Designation Below.
SINGLE ELEMENTS
G = Grounded E = Exposed U = Ungrounded
DUPLX ELEMENTS
GG = Grounded (Standard) US = Ungrounded Separate
UU = Ungrounded Common EE = Exposed Common
ES = Exposed Separate

Step 4

T/C Model Select the basic model type from the illustrations on pages 1 and 2. Insert letter designation in box below, A, B, C, etc.

Step 7 - Active Length "A"

Insert Total Inches Below.

Step 8 - Lead Length "B"

Insert Total Inches Below.

Step 9 - Insert Selected Termination and/or Hardware Codes Below, or wire other than standard.
Termination & Component Accessories
See opposite side of this page for information.

M - - - - - - -

SHEATH MATERIALS – STEP 3

TYPE	MAX TEMP.	DESCRIPTION
304 SS	1650°F (899°C)	Resistant to oxidation and corrosion. Generally used in process applications such as stream lines, oil refineries and chemical solutions. Resists nitric acids well, halogen acids poorly and the sulfur acids moderately. Subject to carbide precipitation in the 900 to 1600°F (482 to 871°C) range. Not recommended for use in reducing atmospheres. Melting point 2550°F (1399°C).
316 SS	1700°F (927°C)	Superior to 304 SS in corrosion resistance. Resists pitting in phosphorous and acetic acids. Subject to carbide precipitation in the 800 to 1500°F (427 to 816°C) range. Not recommended for use in reducing atmospheres. Melting point, 2550°C).
310 SS	2100°F (1149°C)	Excellent corrosion resistance. Provides good resistance to both carburizing and reducing environments. Subject to carbide precipitation in the 900 to 1600°F (482 to 871°C) range. Melting point, 2570°F (1410°C).
Inconel 600	2100° (1149°C)	Good in corrosive atmosphere at high temperature. Not recommended for use in sulfur or reducing atmospheres. Melting point, 2570°F (1410°C).
Inconel 702	2200°F (1204°C)	Excellent high temperature properties, resistance to oxidizing, carburizing, and sulfur containing atmospheres. Melting point 2570°F 1410°C).
Hastelloy X	2300°F (1260°C)	Alloy, principally Nickel, Chromium Iron and Molybdenum. Melting point 2350°F (1288°C).

STEP 2

T/C CALIBRATION	TEMPERATURE RANGE F (C)	LIMITS OF ERROR		CONDUCTOR IDENTIFICATION	
		STANDARD	SPECIAL	POS (+)	NEG. (-)
J Iron-Constantan	32 to 530 (0 to 277) 530 to 1400 (277 to 760)	± 4°F (± 2.2°C) ± 3/4%	±2°F (±1.1°C) ±.4%	Magnetic	Nonmagnetic
K Chromel-Alumel	32 to 530 (0 to 277) 530 to 2300 (277 to 1260)	± 4°F (± 2.2°C) ± 3/4%	± 2°F (±1.1°C) ± .4%	Nonmagnetic	Magnetic
T Copper-Constantan	-300 to -75 (-184 to -59) -150 to -75 (-101 to -59) -75 to +200 (-59 to 93) 200 to 700 (93 to 371)	± 2% ± 1½ °F (± .83°) ± 3/4%	± 1% ± 1% ± 3/4 (±.42%) .4%	Copper Color Nonmagnetic	Nonmagnetic
E Chromel-Constantan	32 to 600 (0 to 316) 600 to 1600 (316 to 871)	± 3°F (± 1.7°C) ± 1/2%	± 21/4°F (±1.2°C) ± .4%	Nonmagnetic	Silver Color Nonmagnetic
S,R Pt 10% Rh-Pt Pt 13% Rh-Pt	32 to 1000 (0 to 538) 1000 to 2700 (538 to 1482)	± 2½ °F (± 1.4°C) ± 1/4%	± 21/2°F (±1.4°C) ± 1/4%		Softer than Positive Conductor
B Pt 30% Rh-Pt 6% Rh	32 to 1000 (0 to 538) 1000 to 3200 (538 to 1760)	± 2½ °F (± 1.4°C) ± 1/4%			Softer than Positive Conductor
W* Tung/Tung 26% Re	32 to 800 (0 to 427) 800 to 4200 (427 to 2316)	± 8°F (± 4.4°C) ± 1%			
W5* Tung 5%/Tung 26% Re	32 to 800 (0 to 427) 800 to 4200 (427 to 2316)	± 8°F (± 4.4°C) ± 1%			More pliant than Pos. Cond.
W3* Tung 3%/Tung 25% Re	32 to 800 (0 to 427) 32 to 800 (0 to 427)	± 8°F (± 4.4°C) ± 1%			More pliant than Pos. Cond.
N* Nicrosil/Nisil	32 to 2372 (0 to 1300)	± 4°F (± 2.2°C) ± 3/8%	± 2°F ± .4%	Nonmagnetic	Nonmagnetic

* Not ANSI Symbols. Neg = Red Wire

TWO CONDUCTOR SINGLE ELEMENT THERMOCOUPLES	
SHEATH OUTSIDE DIAMETER	WIRE GAUGE
.010" (.21 mm)	44
.020" (.51 mm)	38
.032" (.81 mm)	34-36
.040" (1.0 mm)	33-36
.063" (1.5 mm)	28-30
.125" (3.2 mm)	22-24
.188" (4.7 mm)	19-20
.250" (6.4 mm)	16-18
.313" (8.0 mm)	14-16
.375" (9.5 mm)	14-16

FOUR CONDUCTOR DUPLEX THERMOCOUPLES	
SHEATH OUTSIDE DIAMETER	WIRE GAUGE
.063" (1.59 mm)	30
.125" (3.2 mm)	22-24
.188" (4.7 mm)	20
.250" (6.4 mm)	16-19
.313" (8.0 mm)	14
.375" (9.5 mm)	14

For Duplex Thermocouple Assemblies, insert the letter "D" following the model number.
Example: A Model "C" four wire Thermocouple 12" long, .125 Dia., Type K, with 316 SS would be ordered as M1211-C-D-12in.

CONDUCTOR IDENTIFICATION		
	POS. (+)	NEG. (-)
J	White	Red
K	Yellow	Red
T	Blue	Red
E	Purple	Red
S, R	Green	Red
B	Gray	Red
W*	White	Red
W3*	White	Red
W5*	White	Red
N	Orange	Red

*Not ANSI Symbols

Metric sizes available. Consult factory.

TYPE OF JUNCTION — STEP 6

GROUNDED

Order Code G



Wires are securely welded to outer sheath forming a hermetic seal. Recommended for liquid, gas, moisture or high pressure applications. This is the standard junction unless otherwise specified.

UNGROUNDED

Order Code U



Thermocouple junction is physically insulated from welded closed tip with high purity ceramic. Primarily used in critical electric applications where stray emf's could affect the reading.

EXPOSED

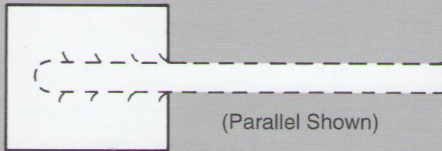
Order Code E



The positive and negative wires extend beyond the Stainless Steel Sheath and are butt-welded. Ceramic insulation is sealed to prevent moisture or gas penetration. Recommended for fast response in a noncorrosive atmosphere.

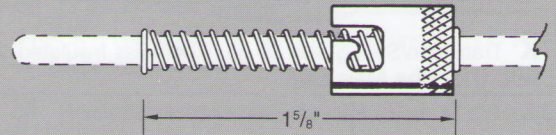
WP = WELD PADS

Std. size 1 in. x 1 in. x 1/8 in. S.S.
Other sizes and material available.



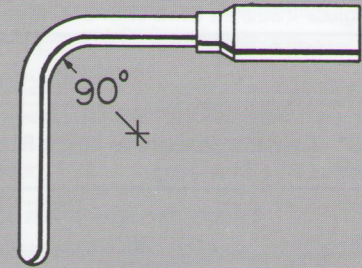
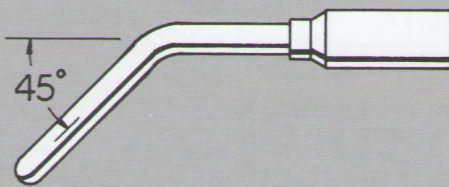
H = BAYONET CAP & SPRING

For .188 dia. T/C only.



A = BENDS

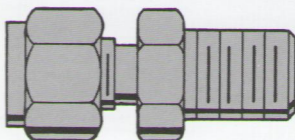
45° and 90° bends (± 5°)



MOUNTING ACCESSORIES

	DESCRIPTION	PART NO.	MATERIAL	SIZE	PART NO.	MATERIAL	SIZE
	Threaded process bushing. Specify size and distance from closed end of tube in inches from bottom of threads ("U" dim.) Specify "U" dim. in Step 9.	A 1/2 in. C.S.	CARBON STEEL	1/2 in. NPT	A 1/2 in. S.S.	STAINLESS STEEL	1/2 in. NPT
		A 3/4 in. C.S.	CARBON STEEL	3/4 in. NPT	A 3/4 in. S.S.	STAINLESS STEEL	3/4 in. NPT
		A 1 in. C.S.	CARBON STEEL	1 in. NPT	A 1 in. S.S.	STAINLESS STEEL	1 in. NPT
	Adapter bushing fixed at cold end to attach to thermocouple head. Specify "U" dim. in Step 9.	A 1-1/4 in. C.S.	CARBON STEEL	1-1/4 in. NPT	A 1-1/4 in. S.S.	STAINLESS STEEL	1-1/4 in. NPT
		G 1/2 in. C.S.	CARBON STEEL	1/2 in. NPT	G 1/2 in. S.S.	STAINLESS STEEL	1/2 in. NPT
		G 3/4 in. C.S.	CARBON STEEL	3/4 in. NPT	G 3/4 in. S.S.	STAINLESS STEEL	3/4 in. NPT
		G 1 in. C.S.	CARBON STEEL	1 in. NPT	G 1 in. S.S.	STAINLESS STEEL	1 in. NPT
	Process bushing. Specify "U" dim. in Step 9.	G 1-1/4 in. C.S.	CARBON STEEL	1-1/4 in. NPT	G 1-1/4 in. S.S.	STAINLESS STEEL	1-1/4 in. NPT
		PB 1/2 in. C.S.	CARBON STEEL	1/2 in. NPT	PB 1/2 in. S.S.	STAINLESS STEEL	1/2 in. NPT
		PB 3/4 in. C.S.	CARBON STEEL	3/4 in. NPT	PB 3/4 in. S.S.	STAINLESS STEEL	3/4 in. NPT
		PB 1 in. C.S.	CARBON STEEL	1 in. NPT	PB 1 in. S.S.	STAINLESS STEEL	1 in. NPT

COMPRESSION FITTINGS



TUBE O.D.	MALE N.P.T.	BRASS CAT. #	ST. ST. CAT. #	ST. ST. FER. CAT. #	TEF TEF-FER CAT. #
1/16	1/16	N/A	CSS-060	CST-060	N/A
1/16	1/8	CBB-06	CSS-06	CST-06	N/A
1/16	1/4	CBB-061	CSS-061	CST-061	N/A
1/8	1/8	CBB-12	CSS-12	CST-12	CTT-12
1/8	1/4	CBB-121	CSS-121	CST-121	N/A
3/16	1/8	CBB-18	CSS-18	CST-18	CTT-18
3/16	1/4	CBB-181	CSS-181	CST-181	N/A
1/4	1/8	CBB-25	CSS-25	CST-25	CTT-25
1/4	1/4	CBB-251	CSS-251	CST-251	CTT-251

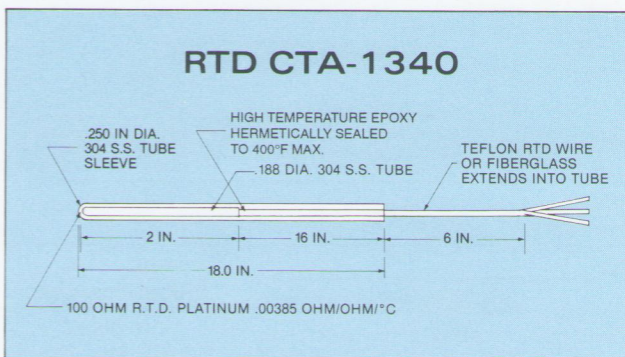
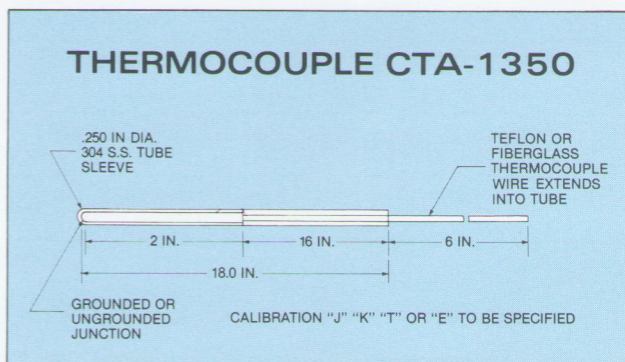
TUBE O.D.	MALE N.P.T.	BRASS CAT. #	ST. ST. CAT. #	ST. ST. FER. CAT. #	TEF TEF-FER CAT. #
1/4	3/8	CBB-253	CSS-253	CST-253	N/A
1/4	1/2	CBB-255	CSS-255	CST-255	N/A
5/16	1/4	CBB-311	CSS-311	CST-311	N/A
5/16	1/2	CBB-315	CSS-315	CST-315	N/A
3/8	1/4	CBB-371	CSS-371	CST-371	CTT-371
3/8	3/8	CBB-373	CSS-373	CST-373	CTT-373
3/8	1/2	CBB-375	CSS-375	CST-375	N/A
1/2	1/2	CBB-505	CSS-505	CST-505	CTT-505

Flexibility Problems?

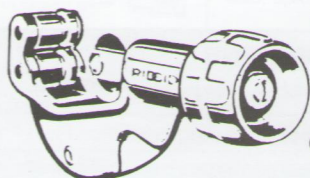
Here's the solution!

ADJUSTABLE RTD's AND THERMOCOUPLES

Not having the correct length THERMOCOUPLE or RTD is no longer a problem. With C-TEMP's adjustable sensor part numbers CTA-1340 and CTA-1350, you can adjust the length from 18" to 2 1/2". These sensors are ideal for distributors, OEM's and users. Their flexibility allows inventories to be kept to a minimum by stocking one adjustable size. CTA-1340 and CTA-1350 are supplied in a .250 Dia. S.S. to fit most standard thermowells and accessories. Compression fitting and spring loaded process bushings slip on with ease and are also available from stock.



The **ONLY** tool you will need is a tube cutter.



Simply mark the required length and cut off the excess.

Because these sensors are manufactured in large quantities, their cost is considerably less than our already low price for a similar sensor made to order. Specify the complete part number when ordering: Resistance Temperature Detector Part No. CTA-1340 or Thermocouple Part No. CTA-1350 - (ISA Type) - G or U (U = ungrounded, G = grounded).

Other Products from C-Temp

CALL TOLL FREE 1-800-28C-TEMP for any of the catalogs listed below. We will gladly forward your request the next business day.

■ Mineral Insulated Thermocouples

STOCK - In a wide variety of configurations and terminations, manufactured from .010 dia. to .500 dia. with every available sheath-standard stainless steel, Inconels, Molybdenum, Tantalum, etc.

■ Plastics Industry Thermocouples

STOCK - Complete thermocouple assemblies available for delivery from stock.

■ Thermocouple Wire

STOCK - Thousands of feet in stock, uncommon alloys as well as the common ones.

■ Thermocouple and RTD Accessories

STOCK - A large variety of standard plugs, jacks, compression fittings (miniature as well as ceramic high temperature), jack panels and strip jack panels. Ceramic insulators, screw cover heads and blocks, compensating terminal lugs, spade and ring lugs, thermocouple and RTD switches, etc.

■ Thermowells

STOCK - Threaded, flanged, socket, VanStone, straight and tapered, from standard stainless steels, Inconels, Monels, Hastelloy, Teflon, PVC, etc.

■ Digital and Hand-Held Temperature Indicators

STOCK - Fast, accurate, portable indicators and versatile probes.

■ Resistance Temperature Detectors

STOCK - Eight standard styles with unlimited variations. Temperature ranges of -200 to +1200°F. Platinum, nickel, copper.

■ Industrial Thermocouples

STOCK - Thermal assemblies, ceramic protection tubes, metal protection tubes, base metal, platinum, Tungsten/Rhenium thermocouples, complete line of industrial thermocouples. Temperature range from -300 to +4200°F.

■ Transmitters and Signal Conditioners

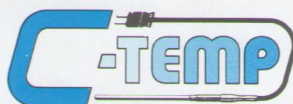
STOCK - 2 and 3 wire. RTD and thermocouple input, low cost, compact 4-20 mA output $\pm 0.1\%$ accuracy full scale. Small enough to fit standard screw cover heads.

■ Calibration Lab

On premises, traceable to the National Institute of Standards & Technology.

■ Research and Development Facility

Capable of creating prototype assemblies.



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