

# T/C, 90° Metal or Ceramic

## Thermocouple, Metal or Ceramic Tube, 90° Elbow

### Introduction

Base metal thermocouple assemblies are designed to be used in the most severe and demanding environments. The choice of a specific style is to a large degree determined by the temperature working range, ambient atmospheric or media conditions, as well as the size and shape required for the application. Control requirements such as accuracy and speed of response may also be considerations.

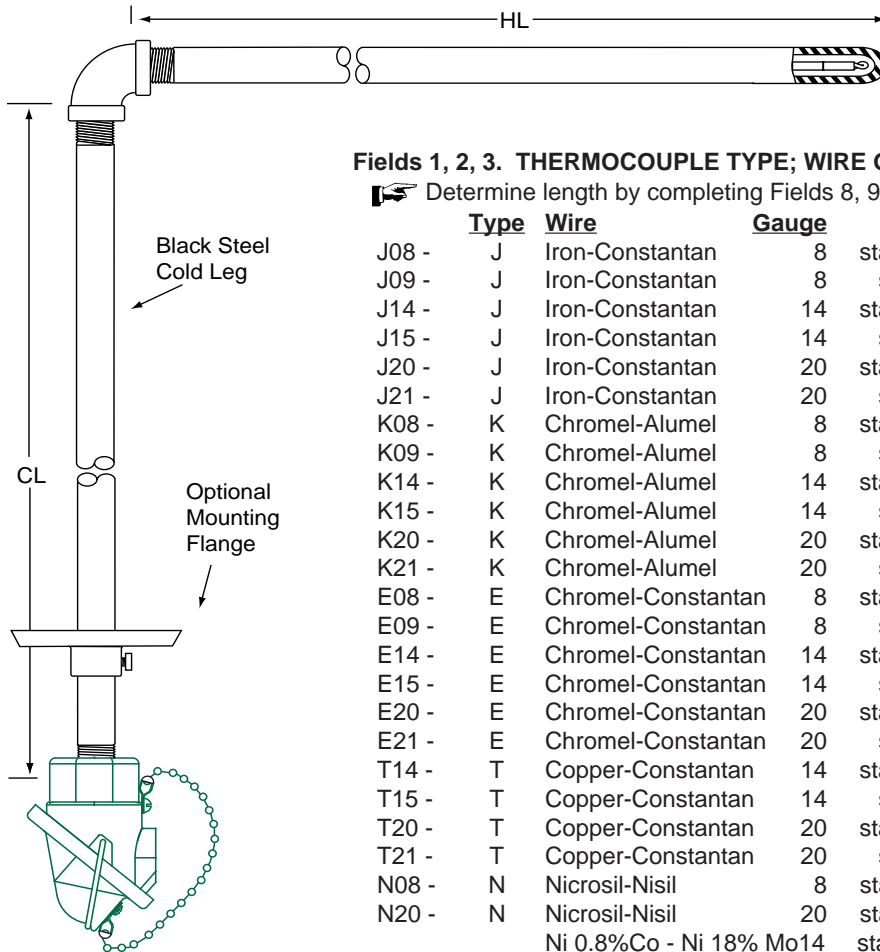
When speed of response is critical, specify the open end construction. An exposed element is directly subject to corrosion and physical damage; therefore, this style should be used only after consideration of the relative need for fast response versus thermocouple life.

Another feature for improving response time is the butt welded junction. This design has less mass and therefore faster response than the twist, which is normally supplied by Barber-Colman. The twist weld offers greater mechanical strength and longer life.

### Ordering Information

**Model No.**     -     -    -   **00**  
 Field No. 1 2 3 4 5 6 7 8 9 10 11 12 13 1415

**Schedule: S2**



### Fields 1, 2, 3. THERMOCOUPLE TYPE; WIRE GAUGE

☞ Determine length by completing Fields 8, 9 and Fields 11, 12; then add together.

Type	Wire	Gauge	Limits	12 to 30"	Ea. Add'l 6"
J08 -	J	Iron-Constantan	8	standard	
J09 -	J	Iron-Constantan	8	special	
J14 -	J	Iron-Constantan	14	standard	
J15 -	J	Iron-Constantan	14	special	
J20 -	J	Iron-Constantan	20	standard	
J21 -	J	Iron-Constantan	20	special	
K08 -	K	Chromel-Alumel	8	standard	
K09 -	K	Chromel-Alumel	8	special	
K14 -	K	Chromel-Alumel	14	standard	
K15 -	K	Chromel-Alumel	14	special	
K20 -	K	Chromel-Alumel	20	standard	
K21 -	K	Chromel-Alumel	20	special	
E08 -	E	Chromel-Constantan	8	standard	
E09 -	E	Chromel-Constantan	8	special	
E14 -	E	Chromel-Constantan	14	standard	
E15 -	E	Chromel-Constantan	14	special	
E20 -	E	Chromel-Constantan	20	standard	
E21 -	E	Chromel-Constantan	20	special	
T14 -	T	Copper-Constantan	14	standard	
T15 -	T	Copper-Constantan	14	special	
T20 -	T	Copper-Constantan	20	standard	
T21 -	T	Copper-Constantan	20	special	
N08 -	N	Nicrosil-Nisil	8	standard	
N20 -	N	Nicrosil-Nisil	20	standard	
		Ni 0.8%Co - Ni 18% Mo14		standard...	Special order, consult factory


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## Ordering Information (continued)

### Field 4. NUMBER OF ELEMENTS AND JUNCTION STYLE

- L - Single, twisted, grounded
- C - Single, twisted, ungrounded
- E - Single, butt welded, grounded
- F - Single, butt welded, ungrounded
- J - Dual, twisted, grounded. Return to Fields 1, 2, 3, double that price
- G - Dual common, butt welded, ungrounded. Return to Fields 1, 2, 3, double that price and add
- M - Dual isolated, butt welded, ungrounded. Return to Fields 1, 2, 3, double that price and add
- D - Reserved. Do not use when ordering new thermocouple.

### Fields 5, 6. PROTECTION TUBE (HOT LENGTH ONLY)

 Determine length by completing Fields 8, 9.

See compatibility table on page 3-3.

	<u>Size</u>	<u>Material</u>	<u>12" Min.</u>	<u>Ea. Add'l 6"</u>
<b>Metal Pipe</b>				
02 -	1/4"	NPT Low carbon black steel		
03 -	1/2"	NPT Low carbon black steel		
04 -	3/4"	NPT Low carbon black steel		
05 -	1" XH	NPT Low carbon black steel. Extra heavy wall, schedule 80 pipe		
08 -	1" XH	NPT SAE 1025 steel. Extra heavy wall, schedule 80 pipe		
11 -	3/4"	NPT 446 stainless steel		
12 -	1/2"	NPT 446 stainless steel		
13 -	1"	NPT 446 stainless steel		
14 -	1/2"	NPT Nickel		
15 -	3/4" XH	NPT Nickel. Extra heavy wall, schedule 80 pipe		
16 -	1/2"	NPT Inconel 601		
17 -	3/4"	NPT Inconel 601		
18 -	1/4"	NPT 304 stainless steel		
19 -	1/2"	NPT 304 stainless steel		
26 -	1/2"	NPT Incoloy 800		
27 -	3/4"	NPT Incoloy 800		
44 -	1/2"	NPT 316 stainless steel		
47 -	3/4"	NPT 316 stainless steel		
<b>Ceramic Tube</b>				
<b>(If ordering a ceramic tube that is not a multiple of 6", use the full increment price and add \$7.00)</b>				
21 -	1-3/4" o.d.	Silicon carbide (note 3)		
24 -	11/16" o.d.	High temperature Mullite		
25 -	1" o.d.	High temperature Mullite		
28 -	7/8" o.d.	Metal ceramic (note 3)		
30 -	11/16" o.d.	Aluminum oxide		
31 -	1" o.d.	Aluminum oxide		
<b>Other</b>				
01 -	1-5/8" o.d.	Cast iron, ceramic base painted (note 3))		
09 -	1-5/8" o.d.	Cast iron		
41 -	1-1/4" o.d.	Ceramic coated steel (notes 1 & 3)		
42 -	1-1/4" o.d.	Ceramic coated steel with spring (notes 2 & 3)		
46 -	1-3/4" o.d.	Silicon carbide, 1/2" pipe reinforced (note 3)		

#### Notes:

1) Immersion depth is 2" less than hot length. Replacement element is A-11711.

2) Immersion depth is 8" less than hot length. Minimum length is 18". Replacement element is A-11888.

3) Available only in increments of 6".

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## Ordering Information (continued)

### Field 7. COLD END TERMINATION


See page 3-24 for protection tube/cold end termination compatibility table.

Single

Dual

- 1 - General purpose, cast iron
  - 2 - Weatherproof, cast iron
  - 3 - General purpose, aluminum
  - A - Weatherproof, aluminum
  - B - Explosionproof (n/a with ceramic tube)
  - D - Aluminum, transmitter ready
  - E - Aluminum, explosionproof\* (n/a with ceramic tube)
- \*Extended lead time

### Fields 8, 9. HOT LENGTH (DIMENSION "HL")

 Complete these Fields to determine lengths for Fields 1, 2, 3, and Fields 5, 6

HL - Enter actual inches in 6" increments. Minimum 12", maximum 48"  
except if Fields 5, 6 is code 42, minimum length 18"

HL - Over 48" consult factory for availability.

Note: If Fields 5, 6 is code 24, 25, 30 or 31 (ceramic tube)  
and "HL" is not a multiple of 6",

### Field 10. HOT END

- 0 - Closed end metal pipe
- 8 - Open end metal pipe (See Fields 5, 6)
- 8 - Open end ceramic tube ( See Fields 5, 6) (Ceramic tube is  
1" shorter than specified "HL" dimension)

### Fields 11, 12. COLD LEG (DIMENSION "CL")

 Complete these Fields to determine lengths for Fields 1, 2, 3

6 to 12"

Ea Add'l 6"

CL - Black steel. Enter actual inches in multiples of 6"

### Field 13. MOUNTING FITTINGS

- 0 - None (Required when Fields 5, 6 is code 01, 09, 41 or 42)
- 2 - Adjustable flange

### Fields 14, 15. RESERVED