

PROTECTION TUBES AND HEADS

This Section Contains

Metal Protection Tubes ☐



Ceramic Protection Tubes ☐



Thermocouple Assemblies ☐



Thermocouple Angle Assemblies ☐



Thermocouple Heads ☐



Protection Tube Reference Data ☐

Please CALL For Quote!

If you can't find what you need call!

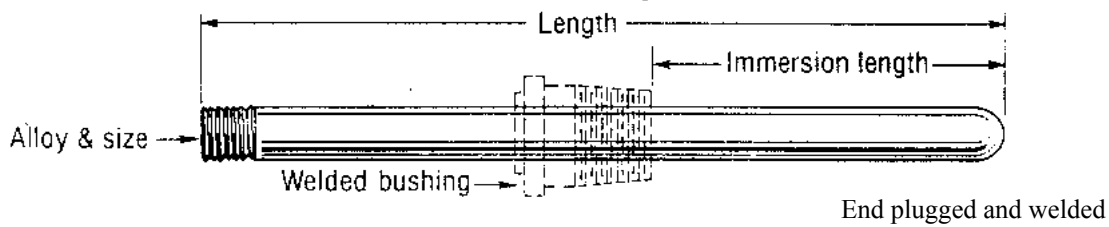
From Illinois 618-465-7623

From St. Louis 314-231-0752

Fax 618-465-7679

E-mail info@ipscustom.com

METAL PROTECTION TUBES



MPT - - - - - - - _____ "S" for Special
 "0" for No

Fraction

A = 1/8"

B = 1/4"

C = 3/8"

D = 1/2"

E = 5/8"

F = 3/4"

G = 7/8"

0 = None

F
R
A
C
T
I
O
N

F
R
A
C
T
I
O
N

VC for vented coupling
00 if none

Immersion length in inches
00 to 99 (00 if no bushing)

Bushing (00 if no bushing)

Length in inches
00.0 to 99.0

Alloy and size-Style

ALLOY & SIZE

Material		Size		Schedule	
Carbon Steel	C	1/2"	2	40	4
304 Stainless	4	3/4"	3	80.	8
310 Stainless	0	1"	4		
316 Stainless	6	1 1/2"	6	.	
Inconel 600	I				
446 Stainless	H				
Other	X				

BUSHING CHART

Male Pipe Thread	Carbon Steel	Stainless Steel
3/4"	B3	S3
1"	B4	S4
1 1/4"	B5	S5
1 1/2"	B6	S6
2"	B8	S8

Note: Other alloys and sizes available upon request.
 Ex: 310 SS, 3/4", Schedule 40 = 034

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CERAMIC PROTECTION TUBES

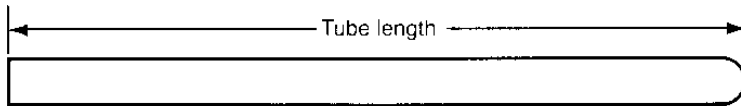


Figure A

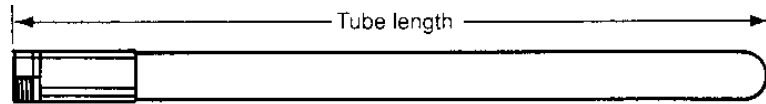


Figure B

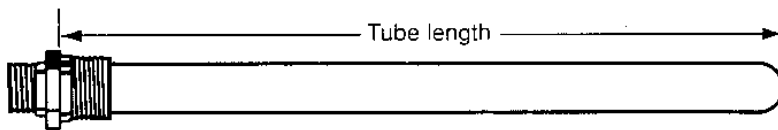


Figure C

CPT - - - - — “S” for Special, “0” for No

Fraction

A = 1/8"

D = 1/2"

G = 7/8"

B = 1/4"

E = 5/8"

0 = None

C = 3/8"

F = 3/4"

Length - Standard lengths are 12, 18, 24, 30, 36, 48
(Other lengths available upon request)

Style

STYLE

Mullite	Alumina	I.D. x O.D. and Example	I.D. x O.D. Decimal
150	250	1/4" x 3/8" Figure "A"	.250" x .375"
152	252	7/16" x 11/16" Figure "A"	.4375" x .6875"
158	258	1/2" x 3/4" Figure "A"	.500" x .750"
159	259	1/2" x 3/4" Figure "C" (with 1/2" x 3/4" hex metal fitting)	.500" x .750"
162	262	3/4" x 1" Figure "A"	.750" x 1.000"
154	254	7/16" x 11/16" Figure "B" (threaded metal sleeve 7/8" - 27)	.4375" x .6875"
156	256	7/16" x 11/16" Figure "C" (with 1/2" x 3/4" hex metal fitting)	.4375" x .6875"
164	264	1" x 1-1/4" Figure "A"	1.000" x 1.250"
166	266	1 x 1-1/8" Figure "A"	1.000" x 1.125"

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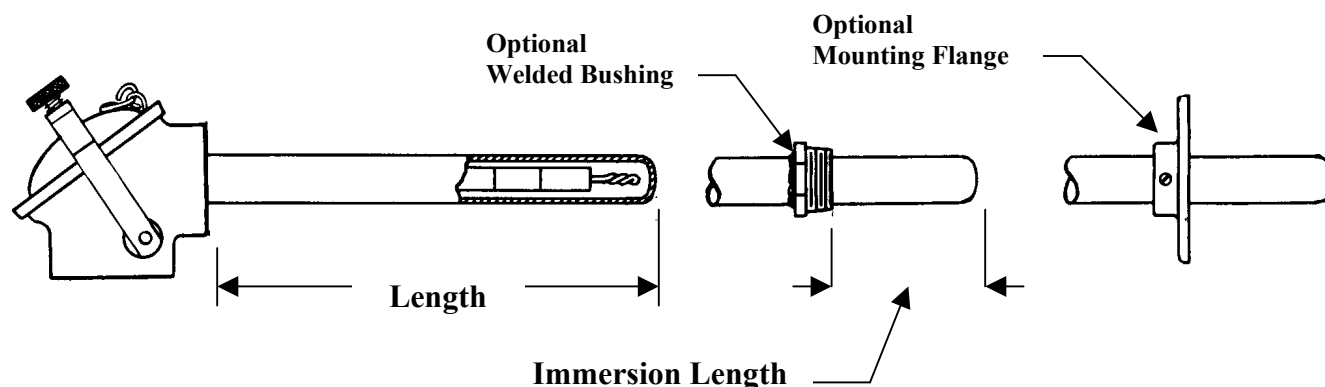
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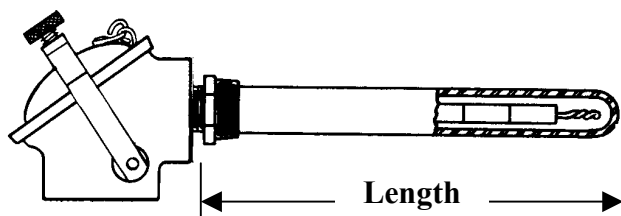
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INDUSTRIAL THERMOCOUPLE ASSEMBLY



Thermocouple Assembly w/ Metal Protection Tube



Thermocouple Assembly w/ Ceramic Protection Tube

If thermocouple is required then order the **Thermocouple Element**, by part number and mark "Assembly" with an "A".

If **Dual Tube** (ceramic and metal) is required then order Ceramic assembly, mark "Dual Tube" box with a "D" and order the Metal Protection Tube separately.

Note: If this is getting confusing, then call the factory for the part number.

Fraction		
A = 1/8"	D = 1/2"	G = 7/8"
B = 1/4"	E = 5/8"	0 = None
C = 3/8"	F = 3/4"	

PREFIX	TA
TUBE STYLE Select style from Page 2 for Metal Protection Tube or Page 3 for Ceramic Protection Tube.	
LENGTH In Inches	
FRACTION	
ASSEMBLY Use "A" if thermocouple to be included, "0" if none.	
DUAL TUBE If dual tube required "D" or "0" for none.	
HEAD Select Head from Chart on Page 6 .	
BUSHING Select bushing from table on Page 2 , "FL" for Flange or "00" if none.	
IMMERSION LENGTH In Inches	
FRACTION	
"S" for Special "0" for No	

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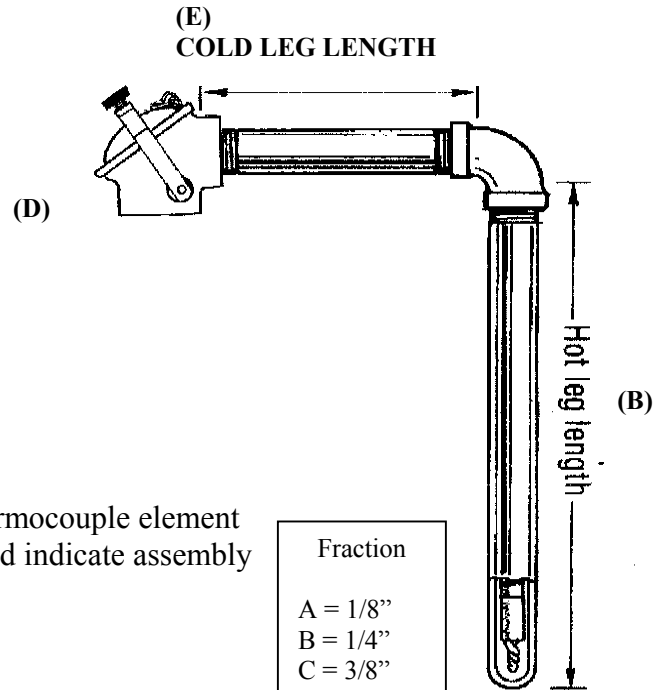
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INDUSTRIAL THERMOCOUPLE ANGLE ASSEMBLY



*If Thermocouple is to be included in the assembly, order the thermocouple element as a separate item from the **Industrial Thermocouple Section** and indicate assembly in part number below with an "A".

Other variations available please consult factory.

AA - - - - - - - - "S" for Special
 "0" for No

F
R
A
C
T
I
O
N

F
R
A
C
T
I
O
N

(E) Cold leg length 00 to 99
 (Cold leg and Ell to be carbon steel unless otherwise noted)

(D) Head - Select from chart.

(C) "A" if thermocouple to be included in assembly.
 "0" if no thermocouple

(B) Hot leg length 00 to 99

(A) Alloy and Size - Select from chart on page 2 this section

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THERMOCOUPLE HEAD P/N for Assemblies

Use Table 6 to choose the head number and Table 6A to choose the size of the head for a Protection Tube assembly.

Table 6

Head No.	Head Description	Part No.	Terminal Block Description
A	IPS Cast Aluminum Head. Stainless Steel cover. Thumb screw for easy cover removal.	HTB-7A	Single element with lift out bail
B	Standard Cast Aluminum Head with screw cover	HTB-M-100 HTB-M-108 HTB-M-200 HTB-M-300	Single element block Single element 8 AWG Dual Element 6-way terminal block
C	Standard Cast Iron Head with screw cover		
D	Cast Aluminum Head with hinged snap lever cap	HTB-TC-E-2PC HTB-TC-N2PC HTB-TC-N4PC HTB-TC-N6PC	2 pole elliptical Round single element 8 AWG Round dual Element Round 6-way
E	Large Cast Iron Head	HTB-M-100 HTB-M-108 HTB-M-200 HTB-M-300	Single element block Single element 8 AWG Dual Element 6-way terminal block
F	Mini Aluminum Head for MgO ONLY	Built in	As required Single or Dual
G	Explosion Proof Head	HTB-M-100 HTB-M-108 HTB-M-200 HTB-M-300	Single element block Single element 8 AWG Dual Element 6-way terminal block

Table 6A

Head Sizes			
Head Size	Process x Conduit	Head Size	Process x Conduit
1	1/2" x 1/2"	4	1/2" x 3/4"
2	3/4" x 1/2"	5	3/4" x 3/4"
3	1" x 1/2"	6	1" x 3/4"

When selecting a head for an assembly, the first digit will be the **Head No.** and the second digit is the **Head Size**. For example **C5** is a cast iron head with a 3/4" NPT process connection and a 3/4" NPT conduit connection.

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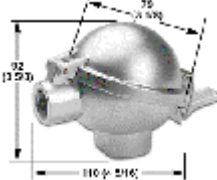
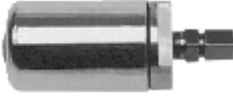
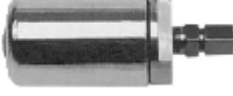
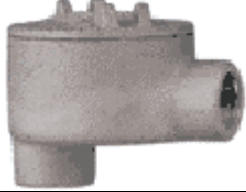
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THERMOCOUPLE HEADS

Table 8

Head No.	Head Description	Part No.	Available Terminal Block Description
H-7-X¹	IPS cast aluminum Head. Stainless Steel cover. Thumb screw for easy cover removal.		♦ Single element with lift out bail
H-7-A-X¹	Standard cast aluminum head with screw cover		♦ Single element block ♦ Single element 8 AWG
H-7-CI-X¹	Standard cast iron head with screw cover		♦ Dual Element ♦ 6-way terminal block
H-KNPL-X¹	Cast Aluminum Head with hinged snap lever cap		♦ 2 pole elliptical ♦ Round single element 8 AWG ♦ Round dual Element ♦ Round 6-way
H-LCI-X¹	Large Cast Iron Head		♦ Single element block ♦ Single element 8 AWG ♦ Dual Element ♦ 6-way terminal block
H-SMAH	.250 MgO Head Mini Aluminum Head Single Termination		♦ Single Termination
H-DMAH	.250 MgO Head Mini Aluminum Head Dual Termination		♦ Dual termination
H-EX-X¹	Explosion Proof Head		♦ Single element block ♦ Single element 8 AWG ♦ Dual Element ♦ 6-way terminal block

¹ **Note:** The last X in the Head P/N designates the Process x Conduit sizes. See Table 8A, next page.

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Thermocouple Head Size Selection

Use table 8A to select the head size for the thermocouple heads in Table 8.

Example: If you want an IPS Thermocouple head with, a cast aluminum body and a stainless steel cover, select an H-7 head.

And you want 1/2" X 1/2" connections, select Head Size 1 from Table 8A. Use the 1 to replace the "X" in the head P/N above.

The full part number of the thermocouple head is H-7-1

TABLE 8A

Head Sizes			
Head Size	Process x Conduit	Head Size	Process x Conduit
1	1/2" x 1/2"	4	1/2" x 3/4"
2	3/4" x 1/2"	5	3/4" x 3/4"
3	1" x 1/2"	6	1" x 3/4"

Terminal Block Part Numbers

Table 8B

Head No.	Head Description	Terminal Block Part No.	Terminal Block Description
H-7	IPS Cast Aluminum Head. Stainless Steel cover. Thumb screw for easy cover removal.	HTB-7A	◆ Single element with lift out bail
H-7A	Standard Cast Aluminum Head with screw cover	HTB-M-100 HTB-M-108 HTB-M-200 HTB-M-300	◆ Single element block ◆ Single element 8 AWG ◆ Dual Element ◆ 6-way terminal block
H-CI	Standard Cast Iron Head with screw cover		
H-KNPL	Cast Aluminum Head with hinged snap lever cap	HTB-TC-E-2PC HTB-TC-N2PC HTB-TC-N4PC HTB-TC-N6PC	◆ 2 pole elliptical ◆ Round single element 8 AWG ◆ Round dual Element ◆ Round 6-way
H-LCI	Large Cast Iron Head	HTB-M-100 HTB-M-108 HTB-M-200 HTB-M-300	◆ Single element block ◆ Single element 8 AWG ◆ Dual Element ◆ 6-way terminal block
H-EX	Explosion Proof Head	HTB-M-100 HTB-M-108 HTB-M-200 HTB-M-300	◆ Single element block ◆ Single element 8 AWG ◆ Dual Element ◆ 6-way terminal block

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PROTECTION TUBE DATA

MATERIAL	SIZE	OPERATING TEMP. °F	REMARKS
	Thread ID OD		
600 Inconel	1/2" .622 x .840 3/4" .824 x 1.050 1" 1.049 x 1.315	2220	Generally used for high temperature. Good corrosion resistance.
304 Stainless	1/2" .622 x .840 3/4" .824 x 1.050 1" 1.049 x 1.315	1800	Good corrosion resistance. Embrittles in the 900 – 1450 °F range.
310 Stainless	1/2" .622 x .840 3/4" .824 x 1.050 1" 1.049 x 1.315	2100	High mechanical and creep strength at elevated temperatures. Very good corrosion resistance.
316 Stainless	1/2" .622 x .840 3/4" .824 x 1.050 1" 1.049 x 1.315	1700	Higher corrosion resistance than 304. Resists pitting in sulfuric, phosphoric acids.
446 Stainless	1/2" .622 x .840 3/4" .824 x 1.050 1" 1.049 x 1.315	2000	Highly resistant to sulfur attack. General purpose alloy.
Carbon Steel	1/2" .622 x .840 3/4" .824 x 1.050 1" 1.049 x 1.315	1000	For non-corrosive gases and liquids. Scales quickly at higher temperatures.
Alumina	1/4" x 3/8" 7/16" x 11/16" 1/2" x 3/4" 1" x 1-1/8" 1" x 1-1/4"	Max. 3400 °F	Susceptible to thermal shock, needs preheating. Good mechanical strength. Resists chemicals and will not contaminate platinum.
Mullite	1/4" x 3/8" 7/16" x 11/16" 1/2" x 3/4" 1" x 1-1/8" 1" x 1-1/4"	Max. 2800 °F	Good resistance to thermal shock and chemicals. Good mechanical strength. Glazed tube recommended for generator and atmosphere furnaces. Can contaminate the platinum element above 2400 °F

Data available on other materials upon request.

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