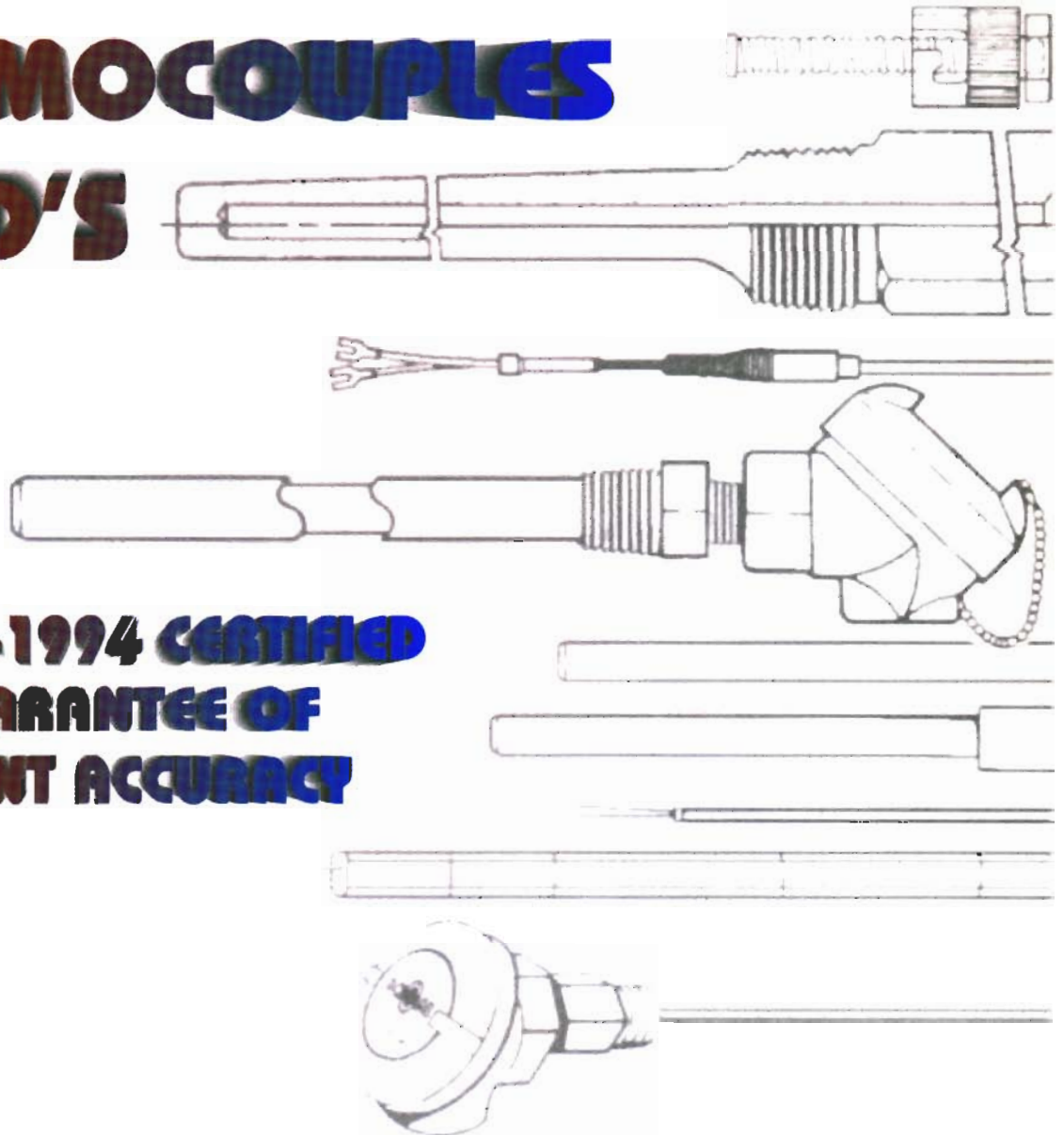




INDUSTRIAL THERMOCOUPLES & RTD'S



ISO 9001-1994 CERTIFIED
YOUR GUARANTEE OF
CONSISTENT ACCURACY

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ISO 9001:2000
International
Quality System Registrars



For the design and manufacture of Isobar and heat transfer systems, temperature sensor assemblies and calibration services for industry. Isobar division is Also successfully assessed to ISO 10012.1:1992

Thermocouple types

ANSI Calibration Code	Positive Leg	Negative Leg	Recommended Temp. Range °F(°C)of Prot. TC**	Application Information
J	Iron ThermoKanthal JP*	Constantan* Cupron* Advance* ThermoKanthal JN*	32 to 1400 (0 to 760)	Suitable for vacuum, reducing, or inert atmospheres, oxidizing atmospheres with reduced life. Iron oxidizes rapidly above 1000°F (538°C) so only heavy gauge wire is recommended for high temperature. Bare elements should not be exposed to sulphurous atmospheres above 1000°F (538°C).
K	Chromel* Tophel* T1* ThermoKanthal KP*	Alumel* Nial* T2* ThermoKanthal KN*	32 to 2300 (0 to 1260)	Recommended for continuous oxidizing or neutral atmospheres. Mostly used above 1000°F (530°C). Subject to failure if exposed to sulphur. Preferential oxidation of chromium in positive leg at certain low oxygen concentrations causes "green rot" and large negative calibration drifts most serious in the 1500 - 1900°F range (816 — 1038°C). Ventilation or inert-sealing of the protection tube can prevent this.
T	Copper	Constantan* Cupron* Advance*	—300 to + 700 (—184 to +371)	Useable in oxidizing, reducing, or inert atmospheres as well as vacuum. Not subject to corrosion in moist atmospheres. Limits of error published for sub-zero temperature ranges.
E	Chromel* Tophel* T1* ThermoKanthal KP*	Constantan* Cupron* Advance* ThermoKanthal JN*	32 to 1600 (0 to 871)	Recommended for continuously oxidizing or inert atmospheres. Sub-zero limits of error not established. Highest thermoelectric output of common calibrations.
R	Platinum— 13% Rhodium	Platinum	100 to 2700 (538 to 1482)	Recommended for high temperature. Must be protected with non-metallic protection tube and ceramic insulators. Continued high temperature usages causes grain growth which can lead to mechanical failure. Negative calibration drift caused by rhodium diffusion to pure leg as well as from rhodium volatilization. Type R is used in industry; type S in the laboratory
S	Platinum— 10% Rhodium	Platinum		
B	Platinum— 30% Rhodium	Platinum— 6% Rhodium	1600 to 3100 (871 to 1705)	Similar as R & S but output is lower. Also less susceptible to grain growth and drift.
M	Nickel	Nickel— 18% Molybdenum	32 to 2250 (0 to 1287)	High temperature applications in inert or vacuum atmosphere. Useful in many hydrogen applications. Continuous cycling causes excessive grain growth.
C	Tungsten- 5 % Rhenium(W-5Re)	Tungsten- 26% Rhenium (W-26Re)	32 to 4200 (0 to 2315)	Very high temperature applications in inert or vacuum. Preferred over Tungsten/Tungsten—26% Rhenium because less brittle at low temperatures.
W	Tungsten- 3% Rhenium (W-3Re)	Tungsten- 25% Rhenium (W-25Re)	32 to 4200 (0 to 2315)	The ductility of the W3Re leg is superior to pure Tungsten, but not as good as W5Re. This combination has highest output of the 3 common Tungsten Rhenium calibrations from 1860 to 4200°F.
N	Nicrosil*** 14.5% Chromium 1.4% Silicon .1% Magnesium Balance Nickel	Nisil*** 4.2% Silicon .1% Magnesium Balance Nickel	32 to 2300 (0 to 1260)	Can be used in applications where Type K elements have shorter life and stability problems due to oxidation and the development of "Green Rot"
None	Platinel* 5355	Platinel* 7674	32 to 2300 (0 to 1260)	Noble metal combination which approximates Type K curve but has much improved oxidation resistance. Should be treated as any noble metal calibration.

*Trade names. Chromel, Alumel: Hoskins Mfg. Co.; T1, T2, Advance: Driver-Harris Co.; Nial, Tophel: Wilbur B. Driver Co.; ThermoKanthal KP and KN: The Kanthal Corp.; Platinel; Engelhard Industries.

**The Recommended Temperature Range is that temperature range for which limits of error have been established.

***Trade Name: Amax Specialty Metals Corp.

Thermocouple Types

ANSI Limits of Error Thermocouples Reference Junction °C (32°F). Published in ANSI Circular MC 96.1 - 1982

NOTE: 1/4 limits available on request

Type	Temperature Range °C(°F) for Standard Limits of Error	Standard Limits of Error	Temperature Range °C (°F) for Special Limits of Error	Special Limits of Error
J	0 to 293 (32 to 559)	± 2.2°C (+4.0°F)	0 to 275 (32 to 527)	± 1.1 °C (+ 2°F)
	293 to 760 (559 to 1400)	± 0.75%	275 to 760 (527 to 1400)	± 0.4%
K	-200 to -110 (-328 to -166)	± 2%*		**
	-110 to 0 (-166 to 32)	± 2.2°C (+ 4°F)*	0 to 275 (32 to 527)	**
	0 to 293 (32 to 559)	± 2.2°C (+ 4°F)		± 1.1 °C (+ 2°F)
T	293 to 1250 (559 to 2282)	± 0.75%	275 to 1250 (527 to 2282)	± 0.4%
	-200 to -67 (-328 to -89)	± 1.5 % *		**
	-67 to 0 (-89 to 32)	± 1°C (+ 1.8°F)*	0 to 125 (32 to 257)	**
E	0 to 133 (32 to 271)	± 1 °C (+ 1.8 °F)		± 0.5°C (+ 0.9°F)
	133 to 350 (271 to 662)	± 0.75%	125 to 350 (257 to 662)	± 0.4%
	-200 to -170 (-328 to -274)	± 1%*		**
R	-170 to 0 (-274 to 32)	± 1.7°C (+ 3.1°F)*	0 to 250 (32 to 482)	**
	0 to 340 (32 to 644)	± 1.7°C (+ 3.1°F)		± 1 °C (+ 1.8°F)
	340 to 900 (644 to 1652)	± 0.5%	250 to 900 (482 to 1652)	± 0.4%
S	0 to 600 (32 to 1112)	± 1.5°C (+ 2.7°F)	0 to 600 (32 to 1112)	± 0.6°C (+ 1.1 °F)
	600 to 1450 (1112 to 2642)	± 0.25%	600 to 1450 (1112 to 2642)	± 0.1%
B	0 to 600 (32 to 1112)	± 1.5°C (+ 2.7°F)	0 to 600 (32 to 1112)	± 0.6°C (+ 1.1°F)
	600 to 1450 (1112 to 2642)	± 0.25%	600 to 1450 (1112 to 2642)	± 0.1%
B	800 to 1700 (1472 to 3092)	± 0.5%	800 to 1700 (1472 to 3092)	----

*Thermocouples and thermocouple materials are supplied to meet the Limits of error specified for temperatures above 0°C. A thermocouple material may not conform to the published sub-zero limits of error for that material when purchased,

unless conformance is agreed to.

**Special limits of error for sub-zero temperatures have not yet been established. The following limits for calibrations E and T are useful to start discussion.

-200 to 0°C
Type E + 1°C or +0.5%, whichever is greater
Type T +0.5°C or +0.8%, whichever is greater.

Sub-zero limits of error for Type J and sub-zero special limits of error for Type K are not considered because of the characteristics of the materials.

Non-ANSI Limits of Error Thermocouples

Pyro Type	Type	Temperature Range, °C (°F)	Limits of Error
G	W-W, 26%, Re	0 to 427 (32 to 800)	±4.4°C (+ 8°F)
		427 to 2316 (800 to 4200)	± 1%
C	W, 5% Re-W, 26% Re	0 to 427 (32 to 800)	± 4.4°C (+ 8°F)
		427 to 2316 (800 to 4200)	± 1%
M	Nickel - Nickel, 18% Moly	0 to 1287 (32 to 2250)	± .75%
N	Nicrosil - Nisil	0 to 1250 (32 to 2282)	± 2.2°C (+ 4°F)
		0 to 427 (32 to 800)	± .75%
D	W, 3% Re-W, 25% Re	0 to 427 (32 to 800)	± 4.4°C (+ 8°F)
		427 to 2316 (800 to 4200)	± 1%
P	Platinel II (Platinel 5355/Platinel 7674)	0 to 600 (32 to 1112)	± 0.10mV
		600 to 700 (1112 to 1292)	± 0.15mV
		700 to 1300 (1292 to 2372)	± 0.20mV

Recommended Temperature Limits for Protected Thermocouples

Maximum Temperature

Thermocouple Type	Minimum Temperature		11 ga. (Type M Only)												
	°C	°F	8 ga.	°C	°F	14 ga. (All Others)	20 ga.	°C	°F	24 ga.	°C	°F	30 ga.	°C	°F
Type T (Copper-Constantan)	-184°	-300°	---	---	---	---	---	260°	500°	204°	400°	204°	400°	---	---
Type J (Iron-Constantan)	-18°	-0°	760°	1400°	593°	1100°	482°	900°	371°	700°	371°	700°	---	---	
Type E (Chromel-Constantan)	-184°	-300°	871°	1600°	649°	1200°	538°	1000°	427°	800°	427°	800°	---	---	
Type K (Chromel-Alumel)	-18°	-0°	1260°	2300°	1093°	2000°	982°	1800°	871°	1600°	871°	1600°	---	---	
Type M (Nickel-Nickel, 18% Moly)	-18°	-0°	---	---	1287°	2250°	---	---	---	---	---	---	---	---	
Type N (Nicrosil-Nisil)	-18°	-0°	---	---	1093°	2000°	982°	1800°	---	---	---	---	---	---	
Type R and Type S	-18°	-0°	---	---	---	---	---	---	---	1482°	2700°	---	---	---	
Type B	-18°	-0°	---	---	---	---	---	---	---	1705°	3100°	---	---	---	
40% Iridium 600% Rhodium-Iridium	-18°	-0°	---	---	---	---	---	---	---	1985°	3600°	---	---	---	
Type C Tungsten 5% Rhenium-	-18°	-0°	---	---	---	---	---	---	---	2330°	4200°	---	---	---	
Type C Tungsten 26% Rhenium	-18°	-0°	---	---	---	---	---	---	---	---	---	---	---	---	

Resistance Temperature Detector (RTD)

Standard Assemblies

ACROLAB RTD Assemblies utilize wire wound platinum elements with a reference resistance of 100 Ohms at 0°C and a temperature coefficient of 0.00385 Ohms/Ohm/°C. ALL ACROLAB RTD probes are of the "filled tube" or "MGO" construction, providing long operating life in high vibration and/or temperature applications.

Specifications of platinum elements

Temperature	Tolerance	
	°C	±Ohms
-200	±0.55	±0.24
-100	±0.35	±0.14
0	±0.15	±0.06
100	±0.35	±0.13
200	±0.55	±0.20
300	±0.75	±0.27
400	±0.95	±0.33
500	±1.15	±0.38
600	±1.35	±0.43
650	±1.45	±0.46

Element types :

Single platinum elements of 100 Ohms at 0°C and duplex elements of two 100-Ohm elements inside the same sheath are both available as standard. Elements of other resistive materials such as copper and nickel are available upon request.

Self Heating :

Self heating is the rise in the measured temperature caused by the power dissipated in the element. Self heating error is affected by the thermal conductivity and velocity of the process being measured and is negligible for most applications. "The self heating effect @25°C in water flowing at 3 ft./sec. on a 3/16" OD SS sheath diameter RTD is 50 MW/°C typical."

Standard :

Excitation current and voltage 2 mA @24 VDC.

Time Constant :

The time required to sense 63% of a step temperature change from 25°C to 80°C in water flowing at 3 ft./sec. "The time constant for a 3/16" OD SS sheath diameter is 2.0 seconds typical."

Temperature Range :

The standard temperature range is -100°C to 260°C (-148°F to 500°F). Higher ranges available (up to 550°C) on request.

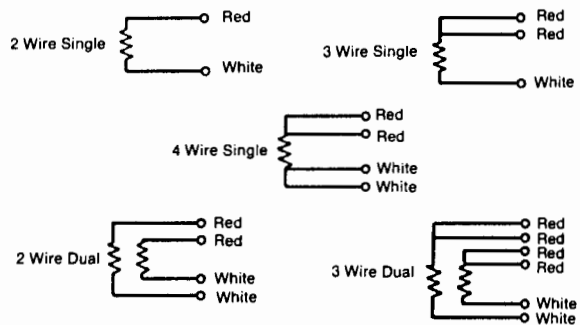
Element Leads :

Leadwire is stranded, silver plated copper with teflon insulation for low range units, and stranded, silver plated copper with fiberglass insulation for high range units. Three lead wires are recommended to compensate for lead wire resistance in industrial applications.

Leadwire Insulation :

Maximum temperature rating: 260°C (500°F) teflon
550°C (1022°F) fiberglass

Element Connections :

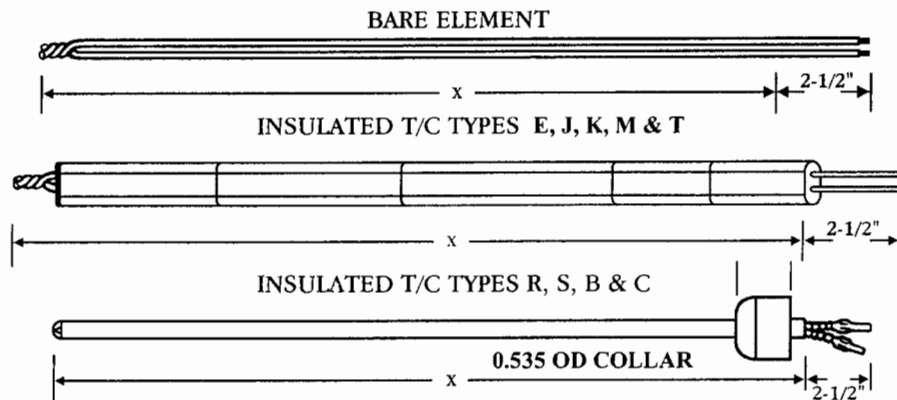


Common Protection Tube Materials

(All Chemical compositions are nominal, as obtained from suppliers)

<p>304 Stainless Steel 10% Nickel, 19% Chromium, 0.08% Carbon max., 2% Manganese max., 1% Silicon max., traces of Phosphorous and Sulfur, balance Iron</p>	<p>Up to 1650°F (899°C) under oxidizing conditions. Has general good oxidation and corrosion resistance in a wide range of industrial environments. Subject to carbide precipitation, which can reduce corrosion resistance in the 800-1000°F (427-538°C) range. Good mechanical properties from—300 to 1450°F (—184 to 788°C). Main areas of usage for thermocouple protection is in chemicals, foods, plastics, petroleum. Generally regarded as a standard protection tube material.</p>
<p>316 Stainless Steel 12% Nickel, 17% Chromium, 2-1/2% Molybdenum, 2% Manganese max., 0.08% Carbon max., 1% Silicon max., traces of Phosphorous and Sulfur, balance Iron</p>	<p>Up to 1700°F (927°C) under oxidizing conditions. Same areas of application as 304 Stainless Steel, has improved resistance to mild acid and pitting corrosion.</p>
<p>446 Stainless Steel 27% Chromium max., 0.25% Nitrogen max., 0.20% Carbon max., 1.50% Manganese max., 1.00% Silicon max., traces of Phosphorous and Sulfur, balance Iron</p>	<p>Up to 2000°F (1093°C) under oxidizing conditions. Excellent high temperature corrosion and oxidation resistance. Main areas of application are hardening, nitriding, and annealing furnaces; salt baths, molten lead; tin and babbitt metal; sulfurous atmospheres. Not for carburizing atmospheres. Other areas are steel soaking pits, tinning pots, waste heat boilers, ore roasters, cement exit flues, boiler tubes to 1800°F (982°C), asphalt mixing incinerators to 2000°F (1093°C), glass tank flues.</p>
<p>Inconel 600 76% Nickel 16% Chromium, 8% Iron</p>	<p>Up to 2100°F (1149°C) under oxidizing conditions. Reducing conditions reduce maximum temperature to 1900°F (1038°C). Must not be placed in sulfurous atmospheres above 1000°F (538°C). Main areas of application for thermocouple protection are carburizing, annealing and hardening furnaces, cyanide salt baths, blast furnace down-comers, open hearth flue-stacks, steel soaking pits, waste heat boilers, ore roasters, cement exit flues, incinerators, glass tank flues.</p>
<p>Inconel 601 61% Nickel, 23% Chromium, 14% Iron, 1.35% Aluminum</p>	<p>Similar applications to Inconel 600 but with superior resistance to Sulfur, and has high temperature oxidation resistance to 2300°F.</p>
<p>Carbon Steel - C1018 0.17% Carbon, 0.75% Manganese, 0.035 Phosphorous, max., 0.045 Sulfur, max., balance Iron</p>	<p>Up to 1000°F (538°C) in non-oxidizing environments. Main areas of usage are galvanizing pots, tinning pots, molten babbitt metal, molten magnesium, molten zinc, petroleum refinery applications such as dewaxing and thermal cracking.</p>
<p>Silicon Nitride</p>	<p>Up to 1700°F (927°C) For use in Aluminum and other non-ferrous metal foundries. Not wetted by molten aluminum and other non-ferrous metals. No contamination. Resists thermal and mechanical shock. Handle carefully.</p>
<p>Cast Iron</p>	<p>Up to 1300°F (704°C) in oxidizing conditions. Main area of usage is in molten non-ferrous metals, daily whitening is recommended. Can be used to 1600°F (871°C) under reducing conditions.</p>
<p>Metal Ceramic LT-1 (slip cast composite of Chromium and Aluminum Oxide,) 77% Chromium, 23% Aluminum Oxide</p>	<p>Up to 2500°F (1374°C) in oxidizing conditions. Main areas of usage are molten copper base alloys to 2100°F (1149°C), blast furnace and stack gases to 2400°F (1316°C), sulfur burners to 2000°F (1093°C), cement kilns to 2200°F (1204°C), chemical process reactors to 2500°F (1371°C). A ceramic primary tube is required when a noble metal thermocouple is used.</p>
<p>Mullite (53% alumina)</p>	<p>Up to 2750°F (1510°C) when supported. Has poor mechanical shock resistance, good thermal shock resistance. For barium chloride salt baths to 2350°F (1288°C). Should be vertical mounted or supported if horizontal. For high temperature applications of ceramic industry, heat treating, glass manufacture. Impervious to gases at high temperatures.</p>
<p>Alumina (Recrystallized 99.7% AL₂O₃)</p>	<p>Up to 3400°F (1889°C) when supported. Has only fair resistance to thermal and mechanical shock. Essentially same areas as Mullite including induction melting, vacuum furnaces. Impervious to gases at high temperatures.</p>
<p>Silicon Carbide, Carbofrax 90% Silicon Carbide, 9% Silicon Dioxide, balance Aluminum Oxide</p>	<p>Up to 3000°F (1649°C). For a secondary protection tube with alumina or Mullite primary tube. For brick and ceramic kilns, steel soaking pits, molten non-ferrous metals. Can withstand direct flame impingement. Fair thermal-shock resistance. Approximately 14% porosity.</p>
<p>Refractory Coated, Series 1100</p>	<p>Up to 1400°F (745°C). Refractory laminated coating resists erosion from molten aluminum, zinc or galvanizing baths. Special protective bulb at tip for fast response and thermal expansion.</p>

Straight Thermocouple Elements



Acrolab thermocouple elements and components which go into the making of complete thermocouple assemblies, are illustrated on pages 5 through 8. One or all parts of an assembly may be ordered separately however, for your convenience we have arranged the most common, standard length, complete assemblies in charts found on pages 10 through 13.

1. TYPE	2. WIRE GAUGE	3. INSULATION	4. LENGTH (inches)	5. OPTIONS
E (Chromel Constantan) 20 ga.	Code C.I. Dimensions	00 - No insulator	012 - 12 in.	1 - Twist and Weld
J (Iron Constantan) 8, 11, 14, 20 ga.	8 -.437 x .250	CI - Ceramic insulators two Hole oval	018 - 18 in.	
K (Chromel Alumel) 8, 11, 14, 20 ga.	11 -.375 x .218	CD - Duplex thermocouple	024 - 24 in.	2 - Butt Weld
T (Copper Constantan) 14, 20 ga.	14 -.313 x .188	Type E, J, K, T, M thermocouples supplied with refractory insulators — 2475°F max. Temp.	030 - 30 in.	3 - Special construction.
M (Nickel - Nickel 18% Moly) 11, 18 ga.	18 -.313 x .188	Type R, S, B, C thermocouples supplied with 99.7% Alumina Insulators — 3400°F max. temp.	036 - 36 in.	
R (Plat. - Plat.13% RH) 24, 26 ga.	20 -.172 x .118	Type N	- Other	
S (Plat. - Plat.10% RH) 24, 26 ga.	24 -.188 OD w/ .535 OD collar		- Specify	
B (Plat. 30% RH - Plat. 6% RH) 24 ga.	26 -.188 OD w/ .535 OD collar			
C (Tung 5% Re - Tung 26% Re) 24 ga.				
N (Nicrosil Nisil) 8, 14ga.				

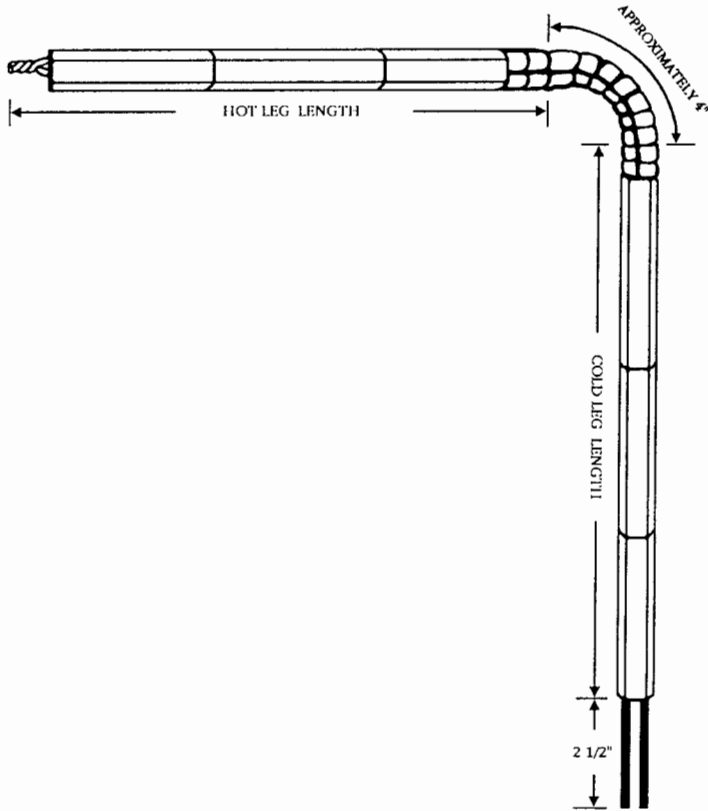
NOTE: Actual length will be 2½" longer than specified length to allow for terminal connections

EXAMPLE PART NUMBER : K8CI - 012 - 1

STRAIGHT THERMOCOUPLE ASSEMBLY ORDER NUMBER



Angle Thermocouple elements



Acrolab thermocouple elements and components which go into the making of complete thermocouple assemblies, are illustrated on page 5 through 8. One or all parts of an assembly may be ordered separately. However, for your convenience we have arranged the most common, standard length, complete assemblies in charts found on pages 10 through 13.

A. TYPE	
E	(Chromel Constantan)
J	(Iron Constantan)
K	(Chromel Alumel)

B. WIRE GAUGE	
8	(CA Dimensions - .437 x .250)
11	(CA Dimensions - .375 x .218)
14	(CA Dimensions - .313 x .188)

C. INSULATION	
CA	Ceramic Insulators - Two Hole Oval on Hot Leg and Cold Leg. Ball and Socket Insulators at Bend.

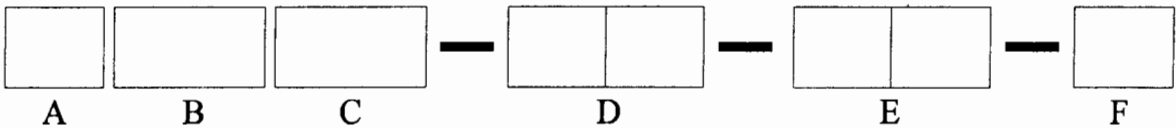
D. HOT LEG LENGTH	
12	- 12 in.
18	- 18 in.
24	- 24 in.
30	- 30 in.
36	- 36 in.
	- Other Specify

E. COLD LEG LENGTH	
12	- 12 in.
18	- 18 in.
24	- 24 in.
30	- 30 in.
36	- 36 in.
	- Other Specify
NOTES: Actual length will be 2 1/2 in. longer then specified length to allow for terminal connection.	

F. OPTIONS	
1	- Twist and weld
2	- Butt Weld
3	- Special Construction
	- Describe

EXAMPLE PART NUMBER : K14CA - 12 - 24 - 2

ANGLE THERMOCOUPLE ELEMENT ORDER NUMBER



Metal Protection Tubes

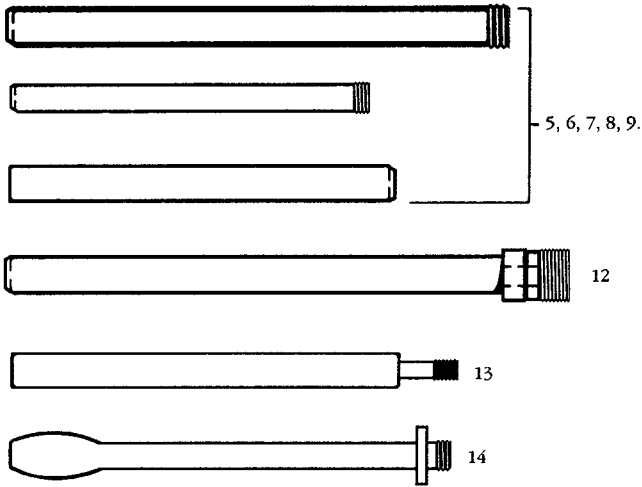


Table 1

SCH. 40 PIPE ALLOY AND SIZE

CODE No.	MATERIAL	ID	OD	NPT
No.5- .50	446 Stain. St.	.622	.840	1/2"
No.5- .75	446 Stain. St.	.824	1.050	3/4"
No.5- 1.00	446 Stain. St.	1.049	1.315	1"
No.6- .25	Carbon Steel	.364	.540	1/4"
No.6- .50	Carbon Steel	.622	.840	1/2"
No.6- .75	Carbon Steel	.824	1.050	3/4"
No.6- 1.00	Carbon Steel	1.049	1.315	1"
No.7- .50	Inconel 601	.622	.840	1/2"
No.7- .75	Inconel 601	.824	1.050	3/4"
No.7- 1.00	Inconel 601	1.049	1.315	1"
No.8- .50	316 Stain. St.	.622	.840	1/2"
No.8- .75	316 Stain. St.	.824	1.050	3/4"
No.8- 1.00	316 Stain. St.	1.049	1.315	1"
No.9- .25	304 Stain. St.	.364	.540	1/4"
No.9- .50	304 Stain. St.	.622	.840	1/2"
No.9- .75	304 Stain. St.	.824	1.050	3/4"
No.9- 1.00	304 Stain. St.	1.049	1.315	1"
No.11- .75	Cast Iron	.875	1.625	3/4"
No.12- .75	LT-1 Metal Ceramic	.625	.875	3/4"
No.13- .75	Silicon Nitride	.625	1.125	3/4"
No.14- .75	Refractory Coated	.493	1.5	3/4"

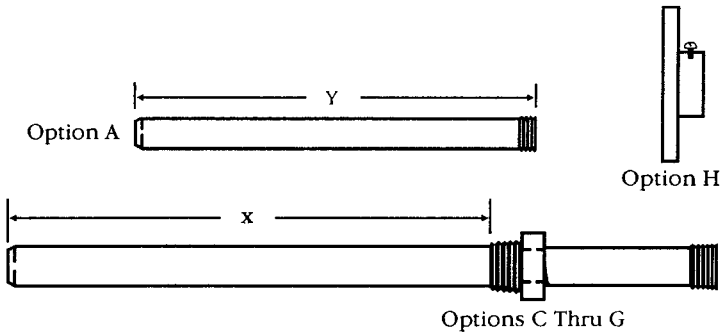
Table 2-TOTAL PIPE LENGTH (Y)

- 06 - 6" Tube Length
- 12 - 12" Tube Length
- 18 - 18" Tube Length
- 24 - 24" Tube Length
- 30 - 30" Tube Length
- 36 - 36" Tube Length
- XX - Specify Other Length

Table 3 -OPTIONS

- A -Open End (Closed End Standard)
- C (X) -1/2" NPT Welded Steel Bushing
(Only on .25 Size Tubes)
- D (X) -3/4" NPT Welded Steel Bushing
(Only on .50 Size Tubes)
- E (X) -1" NPT Welded Steel Bushing
(Only on .50 and .75 Size Tubes)
- F (X) -1 1/4" NPT Welded Steel Bushing
(Only on .50, .75, and 1.00 Size Tubes)
- G (X) - 1 1/2" NPT Welded Steel Bushing
(only on .50, .75, and 1.00 Size Pipes)
- H -Adjustable Steel Flange
- I -Other (Specify)
- SS -Stainless Steel Bushing

NOTE: SUBSTITUTE LENGTH IN INCHES FROM HOT END TO BOTTOM OF STEEL BUSHING FOR (X) ABOVE.
- STANDARD PIPE IS SCHEDULE 40, OTHER PIPE SIZES AVAILABLE ON REQUEST.



Complete Order Number

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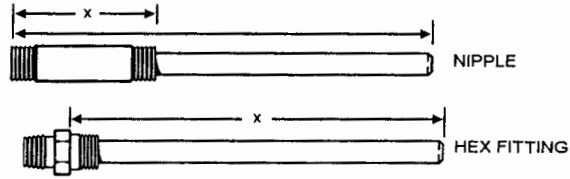
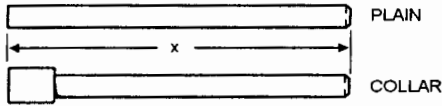
Table 1

Table 2

Table 3

Example: 7-50-20"-D(18")-SS

Ceramic Protection Tubes



*NOTE: Add (X)" Length in inches to protection tube code number to obtain complete part number.

TABLE 1 MULLITE (63% ALUMINA) PROTECTION TUBES (MAXIMUM TEMPERATURE 2750°F)

TUBE SIZE ID X OD	PLAIN END TUBES		CERAMIC COLLAR TUBES		TUBES WITH STEEL PIPE FITTING MOUNTINGS	
	CODE No.*	CODE No.*	COLLAR OD	CODE No.*	SIZE	FITTING TYPE
1/4" x 3/8"	16A	16AC	5/8"	16A1	1/2" NPT	1" Long Nipple
				16A4	1/2" NPT	4" Long Nipple
				16A(X)	1/2" NPT	(X)" Long Nipple (Specify)
7/16" x 11/16"	16B	16BC	1"	16B1	3/4" NPT	1-1/2" Long Nipple
				16B4	3/4" NPT	4" Long Nipple
				16BH	3/4" x 1/2" NPT	Hex Fitting
				16B(X)	3/4" NPT	(X)" Long Nipple (Specify)
				16C1	3/4" NPT	1-1/2" Long Nipple
1/2" x 3/4"	16C	16CC	1-3/16"	16C4	3/4" NPT	4" Long Nipple
				16C(X)	3/4" NPT	(X)" Long Nipple (Specify)
				16CH	3/4" x 1/2" NPT	Hex Fitting
5/8" x 7/8"	16D	16DC	1-3/8"	16D1	1-1/4" NPT	1-3/4" Long Nipple
				16D(X)	1-1/4" NPT	(X)" Long Nipple (Specify)
				16DH	1-1/4" x 1" NPT	Hex Fitting
1" x 1 1/4"	16E	16EC	1-3/4"	16E1	1-1/4" NPT	1-3/4" Long Nipple
				16E(X)	1-1/4" NPT	(X)" Long Nipple (Specify)
				16EH	1-1/4" x 1" NPT	Hex Fitting

TABLE 2 99.7% ALUMINA PROTECTION TUBES (MAXIMUM TEMPERATURE 3400°F)

1/4" x 3/8"	17A	17AC	5/8"	17A1	1/2" NPT	1" Long Nipple
				17A4	1/2" NPT	4" Long Nipple
				17A(X)	1/2" NPT	(X)" Long Nipple (Specify)
7/16" x 11/16"	17B	17BC	1"	17B1	3/4" NPT	1-1/2" Long Nipple
				17B4	3/4" NPT	4" Long Nipple
				17BH	3/4" x 1/2" NPT	Hex Fitting
				17B(X)	3/4" NPT	(X)" Long Nipple (Specify)
				17C1	3/4" NPT	1-1/2" Long Nipple
1/2" x 3/4"	17C	17CC	1 3/16"	17C4	3/4" NPT	4" Long Nipple
				17C(X)	3/4" NPT	(X)" Long Nipple (Specify)
				17CH	3/4" x 1/2" NPT	Hex Fitting
5/8" x 7/8"	17D	17DC	1 3/8"	17D1	1-1/4" NPT	1-3/4" Long Nipple
				17D(X)	1-1/4" NPT	(X)" Long Nipple (Specify)
				17DH	1-1/4" x 1" NPT	Hex Fitting
1" x 1 1/4"	17E	17EC	1 3/4"	17E1	1-1/4" NPT	1-3/4" Long Nipple
				17E(X)	1-1/4" NPT	(X)" Long Nipple (Specify)
				17EH	1-1/4" x 1" NPT	Hex Fitting

TABLE 3 SILICON CARBIDE TUBES (MAXIMUM TEMPERATURE 3000°F)

1" x 1-3/4"	18JC-(X)	18J-(X)	3"
1" x 1-3/4"	18J-(X) 6-50-6	18JC-(X)-6-50-6	3"

with 1/2" NPT x 6 inch pipe extensions
Specify (X) length in inches
Available (X) lengths are
12, 18, 24, 30, 36, 42, & 48 inches

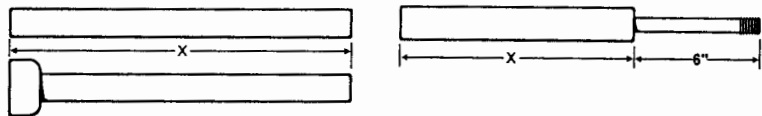
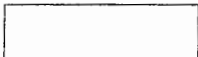


TABLE 4 SILICON NITRIDE TUBES (MAXIMUM TEMPERATURE 1700°F)

No. 13 .75 Silicon Nitride .625 1.125 3/4"

COMPLETE PART NUMBER



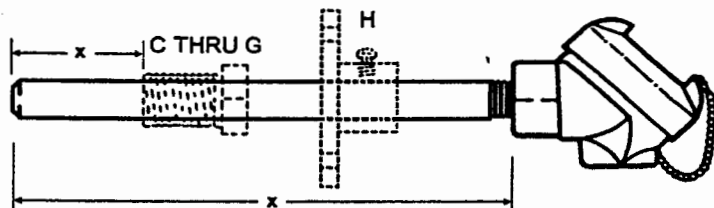
Code Number



Standard (x) lengths are
12, 18, 24, 30, 42 & 48 inches.
Special lengths on request.

Consult Factory for optional
NPT sizes and alloys.

Straight Thermocouple Assemblies With Metal Protection Tubes



CAST IRON
SCREW
COVER
HEAD
STANDARD

TABLE 2 OPTIONS

- A. Open End (Closed End Standard)
 - B. Head with internal ground screw
 - C.(X) 1/2" NPT Welded Steel Bushing (Only on .25 Size Pipes)
 - D.(X) 3/4" NPT Welded Steel Bushing (Only on .50 Size Pipes)
 - E.(X) 1" NPT Welded Steel Bushing (Only on .50 and .75 Size Pipes)
 - F.(X) 1-1/4" NPT Welded Steel Bushing (Only on .50, .75, and 1.00 Size Pipes)
 - G.(X) 1-1/2" NPT Welded Steel Bushing (Only on .50, .75, and 1.00 Size Pipes)
 - H. Adjustable Steel Flange
 - I. Other (Specify)
 - K. Weatherproof Head-Aluminum
 - L. T.C. Insulated from Tube
 - M. Special Limits of Error Wire
 - P. Steel union and nipples to connect head to protection tube
 - T. Heavy Duty Pyco Process Head
 - V. Stainless Steel Union and Nipples
 - W. Protective epoxy coating on head -2mil. min.-while only
 - X. Explosion-proof head CSA approved
- Note: Substitute length in inches from hot end to bottom of steel bushing for (X) above. If stainless steel bushings required, suffix SS after (X).

TABLE 1

PROTECTION TUBES		TYPE J THERMOCOUPLE		TYPE K THERMOCOUPLE		TYPE T THERMOCOUPLE		TYPE M THERMOCOUPLE
Material & Pipe Thread	Series	8 Gauge	14 Gauge	8 Gauge	14 Gauge	14 Gauge	20 Gauge	18 Gauge
446 Stainless Steel	1/2"	5	J8-5-50	J14-5-50	K8-5-50	K14-5-50	T14-5-50	-----
	3/4"	5	J8-5-75	-----	K8-5-75	-----	-----	-----
	1"	5	J8-5-100	-----	K8-5-100	-----	-----	-----
Carbon Steel	1/4"	6	-----	J14-6-25	-----	K14-6-25	T14-6-25	T20-6-25
	1/2"	6	J8-6-50	J14-6-50	K8-6-50	K14-6-50	T14-6-50	T20-6-50
	3/4"	6	J8-6-75	-----	K8-6-75	-----	-----	-----
Inconel 601	1"	6	J8-6-100	-----	K8-6-100	-----	-----	-----
	1/2"	7	J8-7-50	J14-7-50	K8-7-50	K14-7-50	-----	-----
	3/4"	7	J8-7-75	-----	K8-7-75	-----	-----	M18-7-50
304 Stainless Steel	1"	7	J8-7-100	-----	K8-7-100	-----	-----	-----
	1/4"	9	-----	J14-9-25	-----	K14-9-25	T14-9-25	T20-9-25
	1/2"	9	J8-9-50	J14-9-50	K8-9-50	K14-9-50	T14-9-50	T20-9-50
Cast Iron	3/4"	9	J8-9-75	-----	K8-9-75	-----	-----	-----
	1"	9	J8-9-100	-----	K8-9-100	-----	-----	-----
	3/4"	11	J8-11-75	J14-11-75	K8-11-75	K14-11-75	-----	-----
Silicon Nitride	3/4"	13	J8-13-75	J14-13-75	K8-13-75	K14-13-75	-----	-----
Refractory Coated	3/4"	14	J8-14-75	J14-14-75	K8-14-75	K14-14-75	-----	-----

COMPLETE ORDER NUMBER

Table 1 - Select protection tube material and pipe thread size in Table 1. Read across to gauge column under required thermocouple type. Enter number in first box above. Note: For duplex thermocouples use Type letter twice.

Specify Protection Tube Length (Y) in 6 inch increments (Minimum Standard: 12")

Options Select from Table 2

(Example: J8-5-75 - duplex becomes JJ8-5-75.) Duplex 8 or 11 gauge require minimum 3/4" tube size.

Special Lengths on request. Consult factory for optional NPT sizes and alloys.

Angle Thermocouple Assemblies

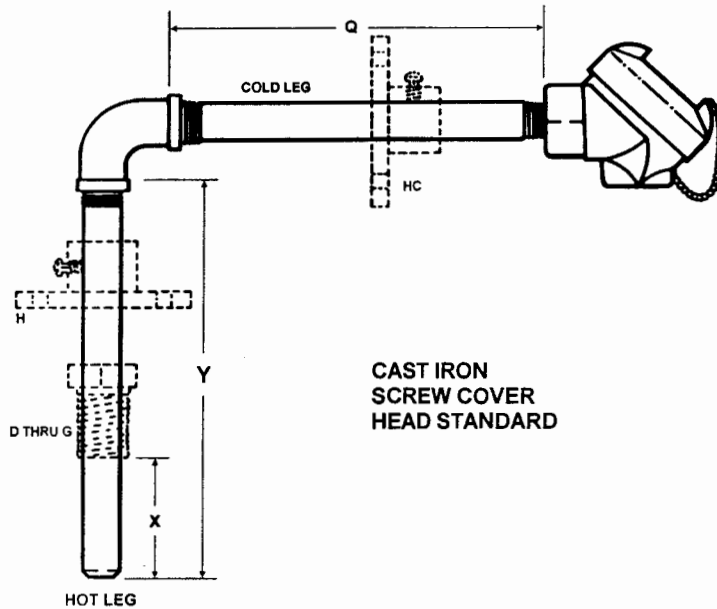


TABLE 2 OPTIONS

- A. Open End (Closed End Standard)
 - B. Head with internal ground screw
 - C. (X) 1/2" NPT Welded Steel Bushing (Only on .25 Size Tubes)
 - D. (X) 3/4" NPT Welded Steel Bushing (Only on .50 Size Tubes)
 - E. (X) 1" NPT Welded Steel Bushing (Only on .50 and .75 Size Tubes)
 - F. (X) 1-1/4" NPT Welded Steel Bushing (Only on .50, .75, and 1.00 Size Tubes)
 - G. (X) 1-1/2" NPT Welded Steel Bushing (Only on .50, .75, and 1.00 Size Tubes)
 - H. Adjustable Steel Flange
 - I. Other (Specify)
 - K. Weatherproof Head-Aluminum
 - L. T.C. Insulated from Tube
 - M. Special Limits of Error Wire
 - P. Steel union and nipples to connect head to protection tube
 - T. Heavy Duty Pyco Process Head
 - V. Stainless Steel Union and Nipples
 - W. Protective epoxy coating on head -2mil. min.-white only
 - X. Explosion-proof head CSA approved
- Note: Substitute length in inches from hot end to bottom of steel bushing for (X) above. If stainless steel bushings required, suffix SS after (X).

TABLE 1

PROTECTION TUBES HOT LEG		TYPE J THERMOCOUPLE		TYPE K THERMOCOUPLE		
Material & Pipe Thread	Series	8 Gauge	14 Gauge	8 Gauge	14 Gauge	
446 Stainless Steel	1/2"	5	J8A-5-50	J14A-5-50	K8A-5-50	K14A-5-50
	3/4"	5	J8A-5-75	-----	K8A-5-75	-----
Carbon Steel	1/2"	6	J8A-6-50	J14A-6-50	K8A-6-50	K14A-6-50
	3/4"	6	J8A-6-75	-----	K8A-6-75	-----
Inconel 601	1/2"	7	J8A-7-50	J14A-7-50	K8A-7-50	K14A-7-50
	3/4"	7	J8A-7-75	-----	K8A-7-75	-----
304 Stainless Steel	1/2"	9	J8A-9-50	J14A-9-50	K8A-9-50	K14A-9-50
Cast Iron	3/4"	11	J8A-11-75	J14A-11-75	K8A-11-75	K14A-11-75
LT--1	3/4"	12	J8A-12-75	-----	K8A-12-75	K14A-12-75
Silicon Nitride		13	J8A-13-75	-----	K8A-13-75	-----
Silicon Carbide		18	J8A-18J	-----	K8A-18J	K14A-18J
Refractory Coated	3/4"	14	J8A-14-75	J14A-14-75	K8A-14-75	K14A-14-75

COMPLETE ORDER NUMBER

-

-

-

Table 1 - Select protection tube material and pipe thread size in Table 1. Read across to gauge column under required thermocouple type. Enter number in first box above. Note: For duplex thermocouples use Type letter twice.

Specify Hot leg Tube Length Y in 6 inch increments (Minimum Standard: 12")

Cold leg Specify Protection Tube length Q in 6 Inch increments

Options Select from Table 2

(Example: J8-5-75 - duplex becomes JJ8-5-75.) Duplex 8 or 11 gauge require minimum 3/4" tube size.

Special Lengths on request. Consult factory for optional NPT sizes and alloys.

Straight Thermocouple Assemblies With Ceramic Protection Tubes

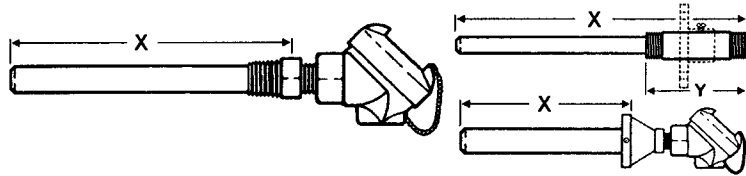


TABLE 2 OPTIONS

- | | |
|--|--|
| A. Open End (Closed End Standard) | P. Steel union and nipples to connect head to protection tube. |
| B. Head with internal ground screw | T. Heavy duty Pyco Process Head |
| H. Adjustable Steel Flange | V. Stainless Steel union and Nipples |
| I. Other (Specify) | W. Protective epoxy coating on head—2 mil. min.— white only If stainless steel bushings required, suffix SS after options. |
| K. Weatherproof Head—Aluminum | X. Explosion-proof head Only Wire |
| L. T.C. Insulated from Tube | |
| M. Special Limits of Error Wire | |
| N. Open Type Terminal Head for P-R-RH-T.C. | |

TABLE 1 MULLITE (63% ALUMINA) PROTECTION TUBES (MAXIMUM TEMPERATURE 2750° F.)

Protection Tubes		Mounting Fitting Type & Length	Series	Type K Thermocouple			Type R or S	Type R or S	Type B	Type C
ID x OD	Size			8 Gauge	11 Gauge	14 Gauge	24 Gauge	26 Gauge	24 Gauge	24 Gauge
1/4" x 3/8"	1/2" NPT	1" Long Nipple	16A1	----	----	----	S / R 24-16A1	S / R 26-16A1	----	----
1/4" x 3/8"	1/2" NPT	4" Long Nipple	16A4	----	----	----	S / R 24-16A4	S / R 26-16A4	----	----
1/4" x 3/8"	1/2" NPT	(Y)" Long Nipple(Specify)	16A(y)	----	----	----	S / R 24-16A(y)	S / R 26-16A(y)	----	----
7/16" x 11/16"	3/4" NPT	1" Long Nipple	16B1	----	K11-16B1	K14-16B1	S / R 24-16B1	S / R 26-16B1	----	----
7/16" x 11/16"	3/4" NPT	4" Long Nipple	16B4	----	K11-16B4	K14-16B4	S / R 24-16B4	S / R 26-16B4	----	----
7/16" x 11/16"	3/4" NPT	(Y)" Long Nipple(Specify)	16B(y)	----	K11-16B(y)	K14-16B(y)	S / R 24-16B(y)	S / R 26-16B(y)	----	----
7/16" x 11/16"	3/4" NPT	HEX Fitting	16BH	----	K11-16BH	K14-16BH	S / R 24-16BH	S / R 26-16BH	----	----
1/2" x 3/4"	3/4" NPT	1-1/2" Long Nipple	16C1	K8-16C1	----	----	----	----	----	----
1/2" x 3/4"	3/4" NPT	4" Long Nipple	16C4	K8-16C4	----	----	----	----	----	----
1/2" x 3/4"	3/4" NPT	(Y)" Long Nipple (Specify)	16C(y)	K8-16C(y)	----	----	----	----	----	----
1/2" x 3/4"	3/4" NPT	HEX Fitting	16CH	K8-16CH	----	----	----	----	----	----

99.7% A1²O³ ALUMINA (MAXIMUM TEMPERATURE 3400° F.)

1/4" x 3/8"	1/2" NPT	1" Long Nipple	17A1	----	----	----	S / R 24-17A1	S / R 26-17A1	B24-17A1	C24-17A1
1/4" x 3/8"	1/2" NPT	4" Long Nipple	17A4	----	----	----	S / R 24-17A4	S / R 26-17A4	B24-17A4	C24-17A4
1/4" x 3/8"	1/2" NPT	(Y)" Long Nipple(Specify)	17A(y)	----	----	----	S / R 24-17A(y)	S / R 26-17A(y)	B24-17A(y)	C24-17A4(y)
7/16" x 11/16"	3/4" NPT	1" Long Nipple	17B1	----	----	----	S / R 24-17B1	S / R 26-17B1	B24-17B1	C24-17B1
7/16" x 11/16"	3/4" NPT	4" Long Nipple	17B4	----	----	----	S / R 24-17B4	S / R 26-17B4	B24-17B4	C24-17B4
7/16" x 11/16"	3/4" NPT	(Y)" Long Nipple(Specify)	17B(y)	----	----	----	S / R 24-17B(y)	S / R 26-17B(y)	B24-17B(y)	C24-17B4(y)
7/16" x 11/16"	3/4" NPT	HEX Fitting	17BH	----	----	----	S / R 24-17BH	S / R 26-17BH	B24-17BH	C24-17BH

SILICON CARBIDE (MAXIMUM TEMPERATURE 3000° F.)

1" x 1-3/4"	None or Table 2 Option H	18J	K8-18J	K11-18J	K14-18J	----	----	----	----
-------------	--------------------------	-----	--------	---------	---------	------	------	------	------

COMPLETE ORDER NUMBER

Table 1 — Select protection tube material, diameters and fitting size in Table 1. Read across to Gauge Column under required Thermocouple Type. Enter number in first box above. Note: For duplex thermocouples use Type letter twice.

Specify Protection Tube Length X in 6 inch increments (Minimum Standard: 12") Special Lengths on request.

Options Select from Table 2

(Example: R24 - 16BH—duplex becomes RR24 - 16BH)

Consult factory for optional NPT sizes and alloys

Platinum Straight Thermocouple Assemblies With Double Protection Tubes

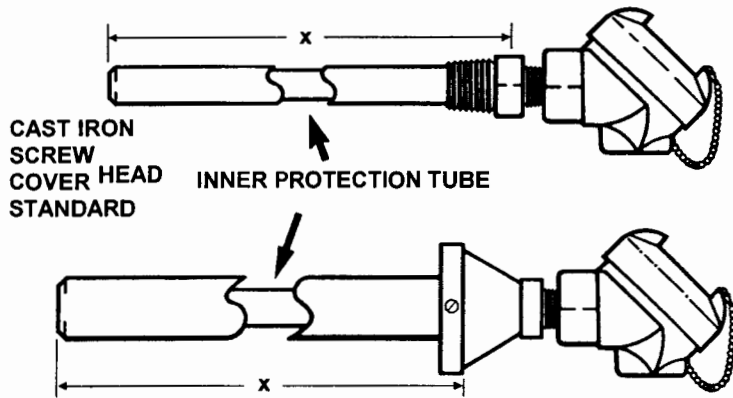


TABLE 2 OPTIONS

- B. Head with internal ground screw
 - E. (X) 1"NPT Welded Steel Bushing (Only .75 Size Tubes)
 - F. (X) 1-1/4" NPT Welded Steel Bushing (Only on .75 Sizes Tubes)
 - G. (X) 1-1/2" NPT Welded Steel Bushing (Only .75 Size Tubes)
 - H. Adjustable Steel Flange
 - I. Special Construction
 - P. Steel union and nipple to connect head to protection tube
 - K. Weatherproof Head—Aluminum
 - M. Special Limits of Error.
 - N. Open Type Terminal Head for P-R-RH T.C. Only
 - T. Heavy duty Pyco Process Head
 - V. Stainless Steel union and Nipples.
 - W. Protective epoxy coating on head —2 mil.-white only.
 - X. Explosion-proof head -CSA Approved.
- Note: Substitute length in inches from hot end to bottom of Steel bushing for (x) above. If stainless steel required, suffix SS after Option. SS = Stainless Bushing

TABLE 1

Inner Protection		Outer Protection		Tube Order Number Code			
Series	Material	Tube OD	Mounting Fitting	Series	Type R or S Thermocouple 24 Gauge	Type R or S Thermocouple 26 Gauge	Type B Thermocouple 24 Gauge
Mullite (63% Alumina)							
16A	Mullite	11/16"	3/4" NPT x 1-1/2" L Nipple	16B1	R/S 24-16A16B1	R/S 26-16A16B1	----
16A	Mullite	11/16"	3/4" NPT x 4" L.Nipple	16B4	R/S 24-16A16B4	R/S 26-16A16B4	----
16A	Mullite	11/16"	3/4" NPT x (X)" L.Nipple	16B(X)	R/S 24-16A16B(X)	R/S 26-16A16B(X)	----
16A	Mullite	11/16"	3/4" x 1/2" NPT Hex. Ftg.	16BH	R/S 24-16A16BH	R/S 26-16A16BH	----
16A	LT-1	7/8"	None or Table 2 Opts. E,F,G	12-75	R/S 24-16A1275	R/S 26-16A1275	----
16BH	Silicon Carb.	1-3/4"	None or Table 2 Opts. H	18-J	R/S 24-16BH18J	R/S26-16BH18J	----
16BH	446 SS	1.050"	None or Table 2 Opts. E,F,G,H,	5-75	R/S 24-16BH575	R/S 26-16BH575	----
16BH	Inconel 601	1.050"	None or Table 2 Opts. E,F,G,H,	7-75	R/S 24-16BH775	R/S 26-16BH775	----
Alumina (99.7% AL²O³)							
17A	Alumina	11/16"	3/4" NPT x 1-1/2" L. Nipple	17B1	R/S 24-17A17B1	R/S 26-17A17B1	B24 17A17B1
17A	Alumina	11/16"	3/4" NPT x 4" L. Nipple	17B4	R/S 24-17A17B4	R/S 26-17A17B4	B24-17A17B4
17A	Alumina	11/16"	3/4" NPT x (X)" L. Nipple	17B(X)	R/S 24-17A17B(X)	R/S 26-17A17B(X)	B24-17A17B(X)
17A	Alumina	11/16"	3/4" x 1/2" NPT Hex. Ftg.	17BH	R/S 24-17A17BH	R/S 26-17A17BH	B24-17A17BH
17A	LT-1	7/8"	None or Table 2 Opts. E,F,G	12-75	R/S 24-17A1275	R/S 26-17A1275	B24-17A1275
17BH	Silicon Carb.	1-3/4"	None or Table 2 Opts. H	18-J	R/S 24-17BH18J	R/S 26-17BH18J	B24-17BH18J

COMPLETE ORDER NUMBER

—

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Table 1 — Select inner and outer protection tube materials, outer tube OD, and mounting fitting in Table 1. Read across to Gauge Column under required Thermocouple Type. Enter number in first box above. Note: For duplex thermocouples use Type letter twice.

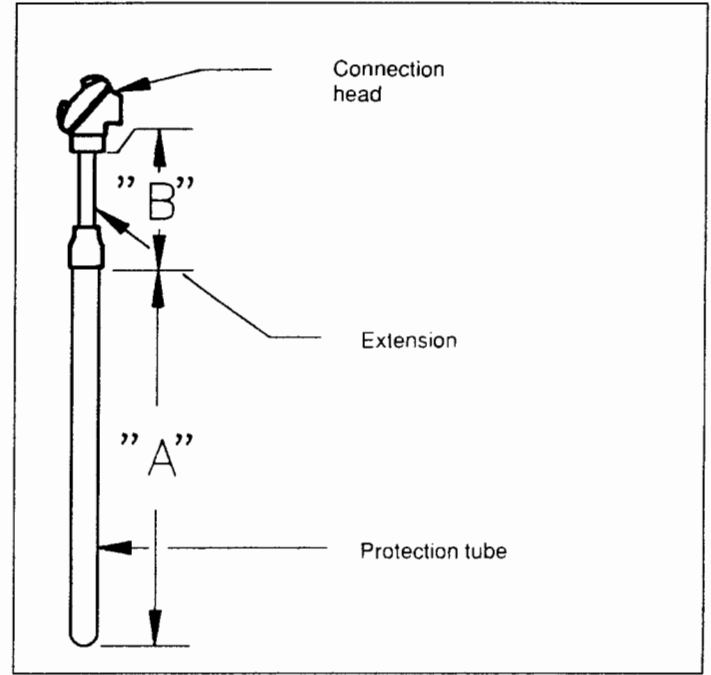
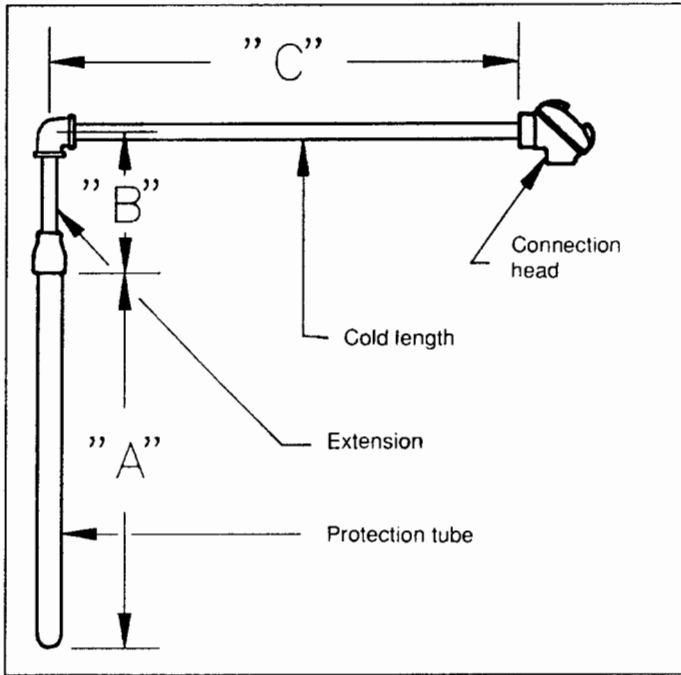
Specify Protection Tube Length X in 6 inch increments (Minimum Standard: 12")
Special Lengths on request.

Options
Select from Table 2

(Example: R24 - 16A16B1—duplex becomes RR24-16A16B1)

Consult factory for optional NPT sizes and alloys

Thermocouple Assemblies For Non-Ferrous Metals



ORDERING INFORMATION

- Specify 1 for elbow style
- Select thermocouple type (available in K, J and E)
- Also available with thermocouple plug type connector (add "P" after part number)

ORDERING INFORMATION

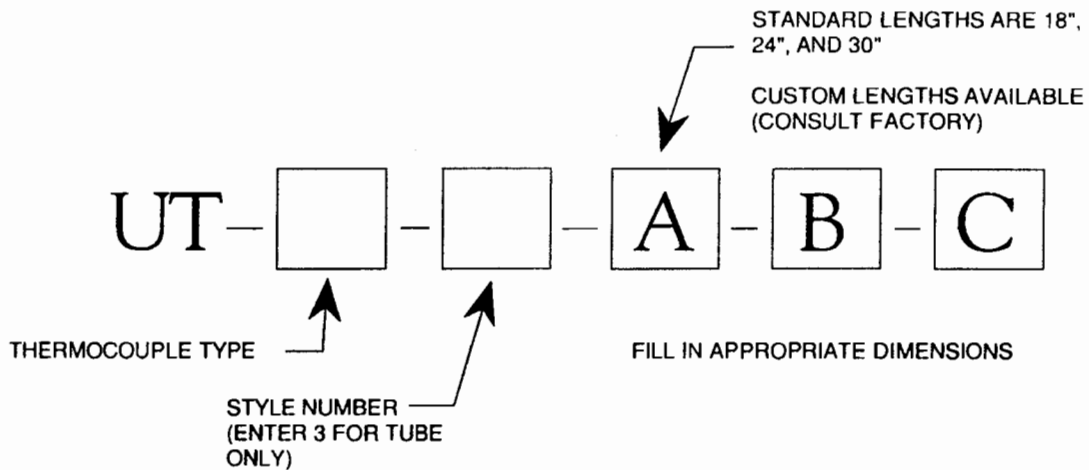
- Specify 2 for straight style
- Select thermocouple type (available in K, J and E)

Ultima Thermocouples

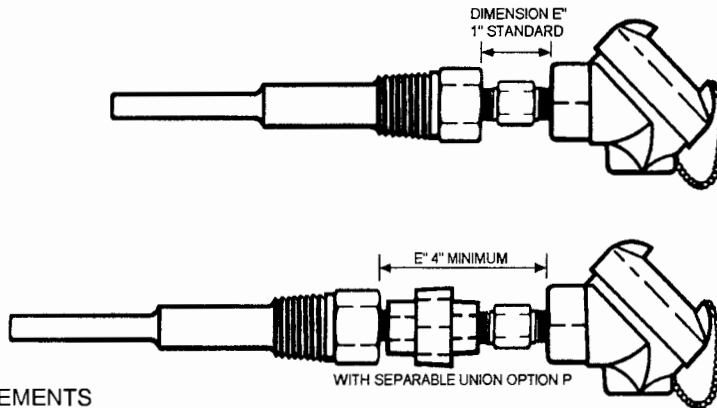
Exotic ceramic thermocouple protection tubes and assemblies

- Impervious to molten aluminum corrosion
- Pre-heating not required due to good thermal conductivity and low thermal expansion

COMPLETE THE FOLLOWING PART NUMBER:



Standard Thermocouple & RTD Assemblies With Pressure Tight Wells



CAST IRON
SCREW COVER HEAD
STANDARD

1. ELEMENTS
CHOOSE A OR B

A.	FOR USE WITH— 260S, 260H, 260F WELLS
Specify	Description
	MgO Insulated 1/4 in. OD 304 Stainless Steel Sheath
J49	Type J. 16 Ga.
JJ49	Type J. Duplex
K49	Type K. 16 Ga.
KK49	Type K. Duplex
T49	Type T. 16 Ga.
TT49	Type T. Duplex

RTD ASSEMBLIES	
RTD 48	100 OHM RTD
RTD/RTD 48	100 OHM Duplex RTD

B.	FOR USE WITH— 385S, 385H, 385F WELLS
Specify	Description
304 SS	MgO, 3/8" OD
J69	Type J. 14 Ga.
JJ69	Type J. Duplex
K69	Type K. 14 Ga.
KK69	Type K. Duplex
T69	Type T. 14 Ga.
TT69	Type T. Duplex

RTD ASSEMBLIES	
RTD 69	100 OHM RTD
RTD/RTD 69	100 OHM Duplex RTD

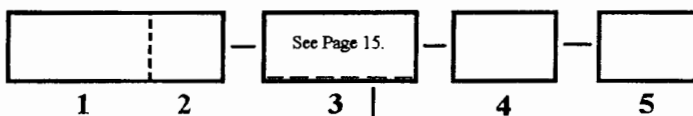
2. THERMOCOUPLE JUNCTION	
Specify	Description
G	Grounded
U	Ungrounded

3. PROTECTION WELL NUMBER	
NOTE: Show complete protection well number, as selected on page 15 or 16.	

4. EXTENSION LENGTH "E"	
Specify	Description
01	1" std.
04	4 in.
06	6 in.
08	8 in.
10	10 in.
(x)	Specify other length inches

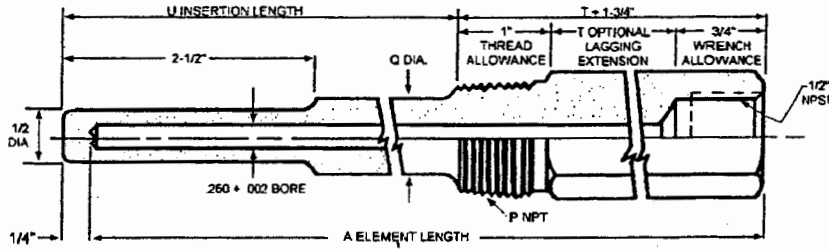
5. OPTIONS	
Code	Description
B	Head with internal ground screw
K	Screw cover head-aluminum
X	Explosion-proof head-CSA approved
W	Protective epoxy coating
P	Union and nipples to connect head and well
R	Spring-loaded T.C. element
T	Heavy Duty PYCO Process Head
V	Stainless Steel union and nipples
SS	Stainless Steel Nipple
HS	Stainless Steel Head

COMPLETE ORDER NUMBER SELECT FROM 1 THRU 5

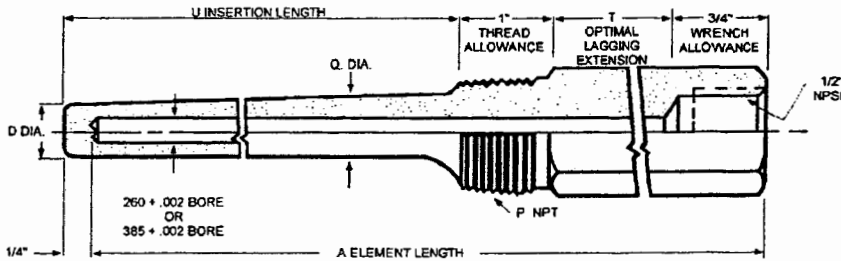


Standard And Heavy Duty Threaded Protection Wells

**NO. 260S
STANDARD DUTY
WELL FOR 1/4" DIA.
ELEMENTS**



**NO. 385S,
260H, AND 385H
STANDARD AND
HEAVY DUTY
WELLS FOR
1/4" OR 3/8"
DIA. ELEMENTS**



WELL NO.	Q DIA.	D DIA.
260S		
P = 1/2" NPT	5/8 in.	1/2 in.
P = 3/4" NPT	3/4 in.	1/2 in.
P = 1" NPT	7/8 in.	1/2 in.

385S		
P = 3/4" NPT	49/64 in.	49/64 in.
P = 1" NPT	49/64 in.	49/64 in.

260H		
P = 3/4" NPT	7/8 in.	5/8 in.
P = 1" NPT	1-1/16 in.	5/8 in.

385H		
P = 1" NPT	1-1/16 in.	49/64 in.

1.	WELL I.D. (BORE) /Style
Specify	Description
260S	Standard Stepped 1/4" dia. Elements
385S	Standard Stepped 3/8" dia. Elements
260H	Heavy duty Tapered 1/4" dia. Elements
385H	Heavy duty Tapered 3/8" dia. Elements

2.	EXTERNAL THREAD
Specify	Description
50	1/2" NPT Avail. for 1/4" dia. Elements only
75	3/4" NPT
100	1" NPT
125	1" O.D. Socket and weld-in style

3.	LAGGING EXTENSION
Specify	
O	(None)
L	(Lagging Extension)

4.	LENGTH - INCHES			
Specify	Element A	Insert. U	Lag. T	T
04	4	2 -1/2	0	
06	6	4 -1/2	0	
	6	2 -1/2	2	
09	9	7 -1/2	0	
	9	4 -1/2	3	
12	12	10-1/2	0	
	12	7 -1/2	3	
15	15	13-1/2	0	
	15	10-1/2	3	
18	18	16-1/2	0	
	18	13-1/2	3	
24	24	22-1/2	0	
	24	19-1/2	3	
XX	Specify Special "U" dimension			

5.	MATERIAL
Specify	Description
1	Brass (ASTM B-16)
2	Carbon Steel (C-1018)
3	304 Stainless Steel
4	316 Stainless Steel
5	Monel
6	Other (Describe) See Note

6.	OPTIONS - SPECIFY
B -	For Brass cap and chain
S -	For Stainless Steel cap and chain

NOTE: Other available material are - 304 Low Carbon, 309, 310, 321, 347 Stainless Steel, Nickel 200, Monel, Inconel 600, Incology 800 Carpenter 20, Titanium, Hastelloy B or C

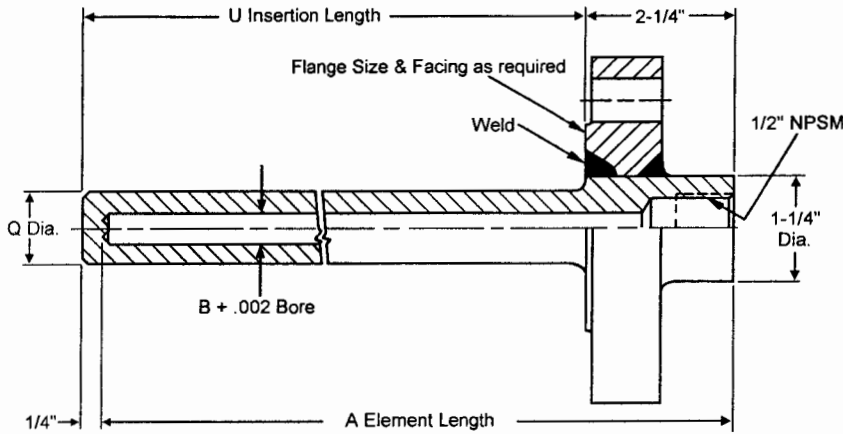
COMPLETE WELL NUMBER

1	2	3	4	5	6

→ Add above number to box "3" page 14 for complete assembly

Flanged Thermowells

NO. 260F AND 385F WELLS FOR 1/4" AND 3/8" DIA. ELEMENTS



Well NO.	Q DIA.	B DIA.
260F	3/4 in.	.260 in.
385F	7/8 in.	.385 in.

WELDING: Primary weld is "J" groove type, secondary weld is 45° bevel groove. Welding is performed by navy certified welders using inert gas shielded arc.

COMPLETE ORDER NUMBER SELECT FROM 1 THRU 7

WELL I.D. (BORE)	
Specify	Desc.
260F	1/4" dia. Elements
385F	3/8" dia. Elements

FLANGE SIZE	
Specify	Desc.
100	1 in.
150	1-1/2 in.
200	2 in.

FLANGE RATING	
Specify	Desc.
1	150 lb.
3	300 lb.
4	400 lb.
6	600 lb.
9	900 lb.
15	1500 lb.

FLANGE FACING	
Specify	Desc.
R	RF
F	FF
T	RTJ

MATERIAL	
Specify	Description
2	Carbon Steel (C-1018)
3	304 Stainless Steel
4	316 Stainless Steel
5	Monel
6	Other (Describe)
see Note	

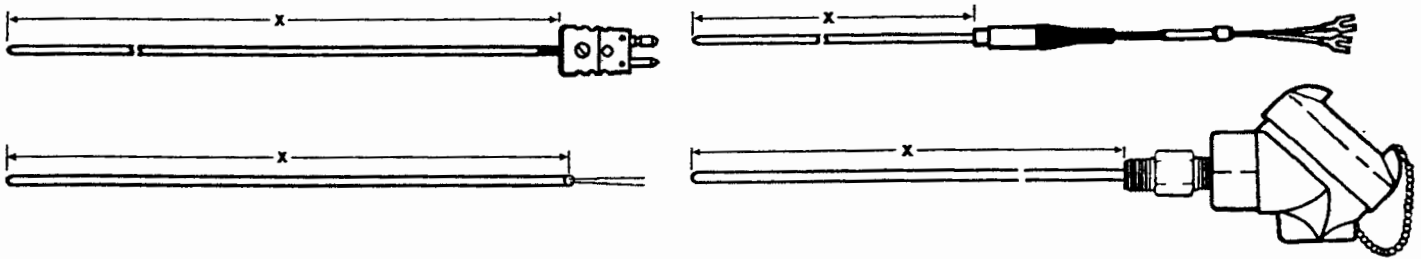
LENGTH — INCHES		
Specify	Element A	Insert U
04	4	2
06	6	4
09	9	7
12	12	10
15	15	13
18	18	16
24	24	22
XX Specify Special "U" Dimension		

OPTIONS — Specify B — For Brass cap and chain, Specify S — For Stainless Steel cap and chain.

NOTE: Other available materials are – 304 Low Carbon, 309, 310, 321, 347 Stainless Steel; Nickel 200, Monel, Inconel 600, incoloy 800; Carpenter 20; Titanium: Hastelloy B or C

Socket-Weld Design Wells and Van Stone Wells are available. Please contact us for specifications.

RTDs & MgO Insulated Thermocouples



For ordering information see the following three pages.

ELEMENT PART NUMBER

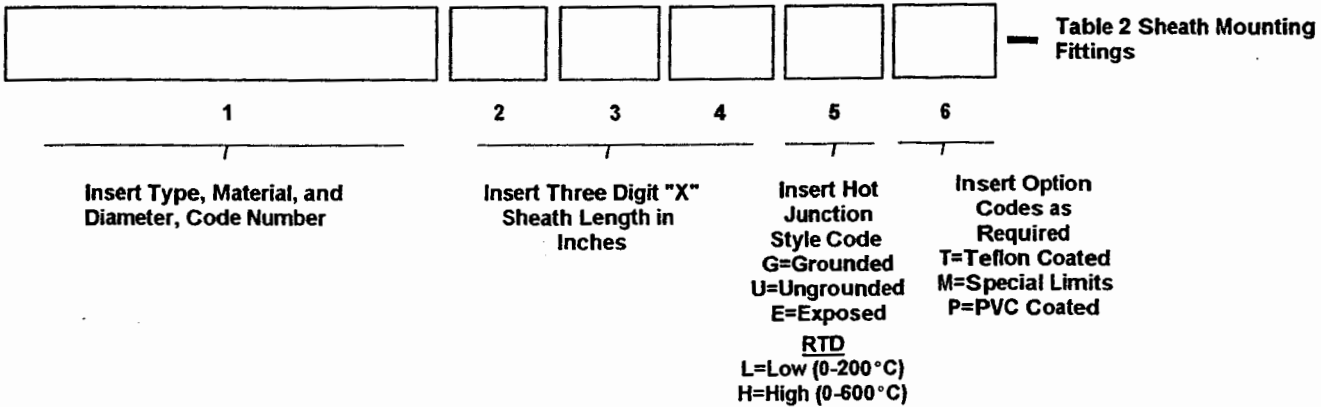


TABLE 1: ELEMENT									
Thermo couple Types	Sheath Material	Sheath Diameters							
		.020	.040	.0625	.125	.187	.250	.375	
SINGLE ELEMENT		ORDER CODE NUMBERS							
"E"	316 SS				E28	E38	E48		
"J"	304 SS	J009	J09	J19	J29	J39	J49	J69	
"J"	316 SS			J18	J28	J38	J48	J68	
"J"	446 SS			J15	J25	J35	J45	J65	
"J"	INC. 600			J17	J27	J37	J47	J67	
"K"	304 SS	K009	K09	K19	K29	K39	K49	K69	
"K"	316 SS			K18	K28	K38	K48	K68	
"K"	446 SS			K15	K25	K35	K45	K65	
"K"	INC. 600			K17	K27	K37	K47	K67	
"K"	310 SS				K20	K30	K40	K60	
"R"	INC. 600			R17	R27				
"S"	INC. 600			S17	S27				
"T"	304 SS			T19	T29	T39	T49	T69	
"T"	316 SS			T18	T28	T38	T48	T68	
RTD	316 SS				RTD28	RTD38	RTD48	RTD68	

Example of Element Part No. J29 012 GT See Table 2 (Page 18)	
J29	1. Type J Single
	2. 304 SS Sheath
	3. 1/8" OD
012	4. 12" Long
GT	5. Grounded Junction
	6. Teflon Coated

Example of Complete Part No. J29012G-09-16-1036-4	
J29012G	
-From Table 1-(Element)	
J29012G-09-	
-From Table 2-(Element Fitting)	Page 19
J29012G-09-16	
-From Table 3-(Sheath Termination)	Page 20
J29012G-09-16-1036	
-From Table 4-(Extension Leadwire)	Page 21
J29012G-09-16-1036-4	
-From Table 5-(Leadwire Termination)	Page 21

TABLE 2: ELEMENT FITTING

NO FITTING

Order Code	Description
00-	No Element Mounting Fitting

STAINLESS STEEL ONE TIME ADJUSTABLE COMPRESSION FITTING *

01-	1/16", 1/18", 3/16", 1/4" OD Tube x 1/8" NPT SS Ferrule
02-	1/4", 3/8" OD Tube x 1/2" NPT
05-	1/16", 1/8", 1/4", 3/8" OD Tube x 1/4" NPT - SS Ferrule



STAINLESS STEEL RE-ADJUSTABLE COMPRESSION FITTING

Order Code	Description
09-	1/16", 1/18", 3/16" OD Tube x 1/8" NPT Lava Packing Gland
12-	1/4" or 3/8" OD Tube x 1/4" NPT Lava Packing Gland



NOTES: Lava Packing Gland is Standard. For Neoprene or Teflon Gland Specify N or T After Order Code Number

BRASS ADJUSTABLE COMPRESSION FITTING *

Order Code	Description
15-	1/18", 3/16", 1/4" OD Tube x 1/8" NPT - Brass Ferrule



25-	3/16", 1/4", 3/8" OD Tube x 1/4" NPT - Brass ferrul
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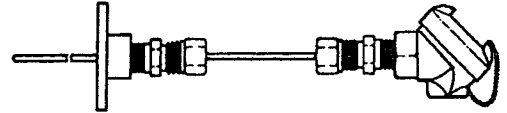
RE- ADJUSTABLE SPRING LOADED WELL FITTING *

Order Code	Description
19-	1/2" NPT Re-adjustable Spring Loaded SS Fitting for use on 3/16" or 1/4" OD Sheaths with 1/2" NPT Internally Threaded Well Assemblies. Specify (x) Dimension after Order Code Number

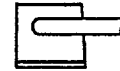


ADJUSTABLE FLANGE

Order Code	Description
14-	Adjustable Flange with Brass Compression Fitting to secure to Sheath



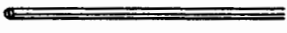
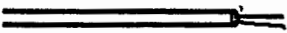
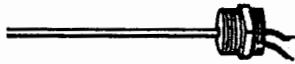
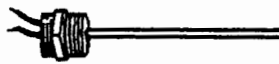
18-	304 SS Weld Pad 1" x 1" 1/4" Thick Horizontal Mount
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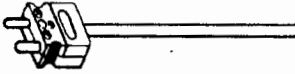



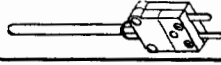

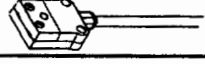

AA =	Special Fitting Please Describe
------	------------------------------------

TABLE 3: SHEATH TERMINATIONS



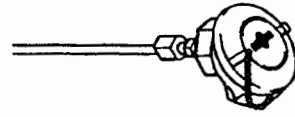
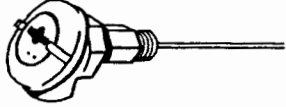
SHEATH TERMINATIONS

Order Code	Description	
01-	Squared End Bulk Material	
02-	1" Stripped Lead	
22-	3" Leads	
23-	1/2" NPT Steel Hex Fitting, 3 Leads	
24-	1/2" NPT Stainless Steel Hex Fitting, 3" Lead	
37-	1/2" NPT Steel Hex Fitting with Stripped Lead	
38-	1/2" NPT, Stainless Steel Hex Fitting with Stripped Lead	

PLUG & JACK TERMINATIONS

Order Code	Description	
03-	Standard Size T/C Plug 1/16" thru 1/4" OD Sheath Only	
04-	Standard Size T/C Plug w/Mating Jack 1/16" thru 1/4" OD Sheath Only	
39-	Standard Size T/C Jack 1/16" thru 1/4" OD Sheath Only	
40-	Standard Size T/C Jack with Mating Plug - 1/16" thru 1/4" OD Sheath Only	
05-	Miniature Size Plug 1/16" thru 3/16" OD Sheath Only	
06-	Miniature Size Plug Jack with 1/16" thru 3/16" OD Sheath Only	
41-	Miniature Size Jack 1/16" thru 3/16" Sheath Only	
42-	Miniature Size Jack with Mating Plug - 1/16" thru 3/16" OD Sheath Only	

HEAD TERMINATIONS

Order Code	Description	
17-	Miniature Plastic Head - 1/4" NPT Process and 1/4" NPT Conduit Openings	
20-	Explosion Proof Head with 1/2" NPT Steel Hex Mounting Fitting - CSA approved	
21-	Explosion Proof Head with 1/2" NPT Stainless Steel Hex Mtg. Ftg. - CSA approved	
25-	Heavy Duty Pyco Cast Iron Head	
31-	Cast Aluminum Screw Cover Head	
34-	Cast Iron Screw Cover Head	
32-	Cast Aluminum Screw Cover Head with 1/2" NPT Steel Hex Mtg. Ftg.	
35-	Cast Iron Screw Cover Head with 1/2" NPT Steel Hex Mtg. Ftg.	
33-	Cast Aluminum Screw Cover Head with 1/2" NPT Stainless Steel Hex Mtg. Ftg.	
36-	Cast Iron Screw Cover Head with 1/2" NPT Stainless Steel Hex Mtg. Ftg.	

LEADWIRE TRANSITIONS

Requires Table 4 and 5 Selections


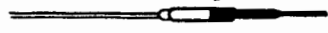
Order Code	Description	
15-	Extension Leadwire Transition Fitting and Relief Spring	
15H	High Temperature Transition Fitting	
16-	Extension Leadwire Transition Fitting Sealed with Heat Shrink Tubing	
19-	Inline Transition Fitting	

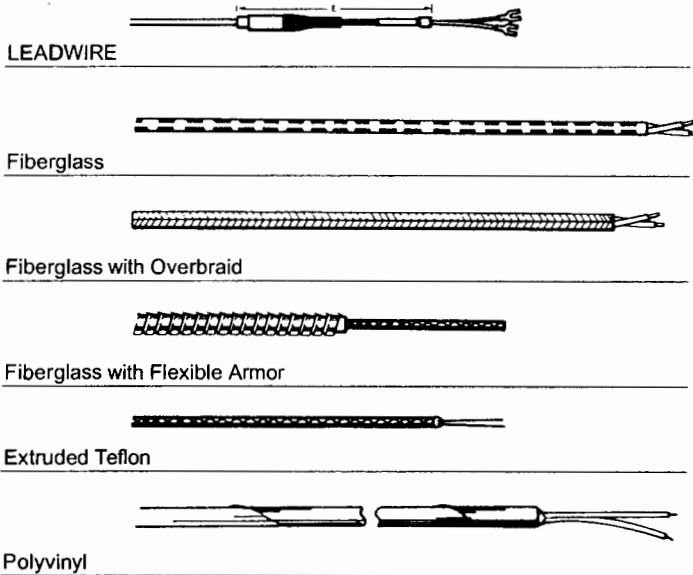
Table 3: Special Terminations. Specify "BB" and describe.

Note: if 4-20mA Transmitter required to be installed in head, use suffix "TR" after complete part #.

TABLE 4: EXTENSION LEADWIRE

Wire Code	Wire	Leadwire Type Insulation	T/C Type Availability	Order Code
1	304 (Solid)	Fiberglass	E-J-K-T	1- - - Insert
2	508 (Stranded)	Teflon w/ Flexible Armored Tubing	E-J-K-T- RTD	2- - - Three
3	307 (Stranded)	Fiberglass Teflon Impregnated	J	3- - - Digit "E"
4	304 (Stranded)	Fiberglass w/ Flexible Armored Tubing	J-K	4- - - Length
5	507 (Stranded)	FEP Teflon	J-K-T-RTD	5- - - (Code in "Inches")
6	502 (Stranded)	Polyvinyl (Singles & Standard Plug Only)	J-K-T	6- - - (Code in "Inches")
8	304 (Stranded)	Fiberglass	J-K	8- - - (Code in "Inches")
9	304 (Stranded)	Fiberglass with Stain. Steel Overbraid	J-K	9- - -

SPECIALS: SPECIFY CC AND DESCRIBE



*All Table 5 options require a transition. See Table 3.

Table 4: Special Leadwire
Specify "CC" and describe

Table 5: Special Terminations
Specify "DD" and describe

TABLE 5: EXTENSION WIRE TERMINATIONS *

Order	Code Description
1-	Leads Not Stripped
2-	Leads Stripped 4"
3-	Leads Stripped 4" with Spade Lugs
4-	Standard Size Plug
5-	Standard Size Plug with Mating Jack
6-	Miniature T/C Plug
7-	Miniature T/C Plug with Mating Jack
8-	1/2" BX Connector on Flexible Armor with 12" Additional Leads stripped 2" w/Spade Lugs
9-	Standard Size Jack
10-	Standard Size 3-Pin Plug
11-	Standard Size 3-Pin Jack
12-	Standard Size 3-Pin Plug with Mating Jack
13-	Standard Size 3-Pin Jack with Mating Plug

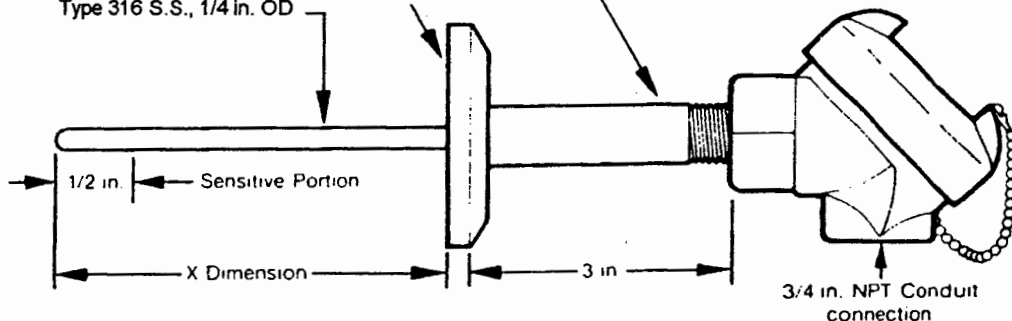
Special Purpose Sensors For Food, Dairy, Beverage, Pharmaceutical And Chemical Industries

"TRIPLE A CERTIFIED"

Thermocouple & RTD's with CIP (clean in place) Sanitary Connections

Type 304 S.S., .840 in. OD
 Sanitary Cap (heliarc welded and polished both sides)
 Type 316 S.S., 1/4 in. OD

Epoxy Coated
 Cast Aluminum
 Screw Cover
 Head Standard



ORDER NUMBER

TYPE	
Specify	Description
JSC	Type J
KSC	Type K
TSC	Type T
RTDSC	RTD

Immersion Length "X"	
Specify	Description
04	4 inch
05	5 inch
55	5½ inch
65	6½ inch
X	Other(specify)

Sanitary Cap Size	
Specify	Tube OD
1	1½"
2	2"
3	2½"
4	3"
5	Other (Describe)

Sanitary Cap Style	
Specify	Tube OD
1	16A Cap-Tri Clover
2	16A Cap-Tri Clover with No. 13-H Nut
3	16APV Cap-Alloy
4	Products 16APV Cap-Alloy
*5	Products with 13-H Nut
6	16 AMP Cap-Tri Clover 3A4 Adaptor
7	16A1-141 Cap Cherry Berrell
8	Other (Describe)

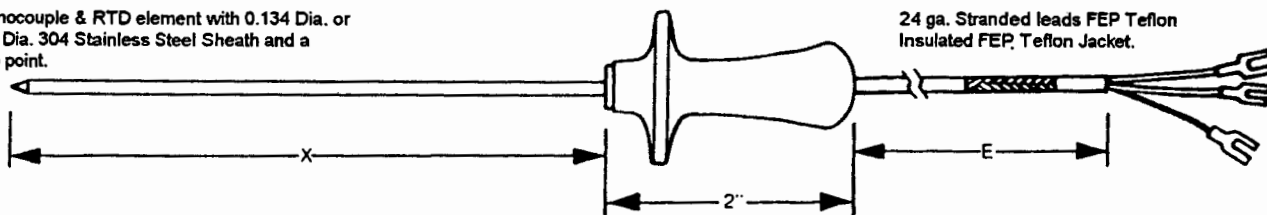
Screw Cover	
Specify	
-33W	Epoxy Head
-55	Polypropylene Head

* Shown in Diagram

Food and Meat Processing RTD Assemblies

Thermocouple & RTD element with 0.134 Dia. or 0.180 Dia. 304 Stainless Steel Sheath and a Sharp point.

24 ga. Stranded leads FEP Teflon Insulated FEP Teflon Jacket.



ORDER NUMBER

TYPE	
Specify	Description
JMP	Type J
KMP	Type K
TMP	Type T
RTDMP	RTD

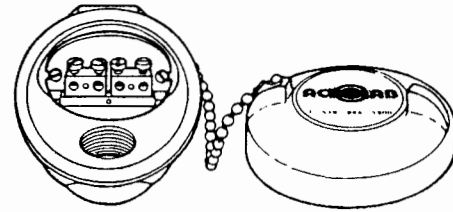
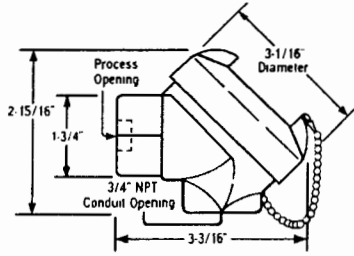
Probe Diameter	
Specify	Description
29	0.134 Dia.
39	0.180 Dia.

"X"
 Dimension in
 Inches

"E"
 Dimension in
 Inches

Code	Terminations options
2	Leads - Tinned ½" Stripped 2"
3	Leads Stripped 2" with spade lugs
BB	Special (Describe)

Thermocouple Heads And Components



DIE CAST ALUMINUM SCREW COVER T/C HEAD

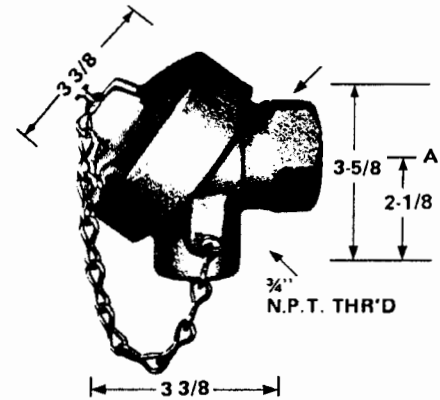
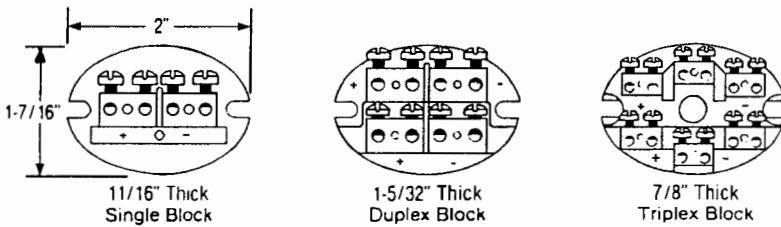
Process Opening Size	Thermocouple Head & Cap without Block	Complete Head and Block Assemblies					
		SINGLE	DUPLEX	TRIPLEX			
				2-Term	3-Term	4-Term	6-Term
1/8" NPT	NO. 301	311	321	331-2	331-3	331-4	331-6
1/4" NPT	302	312	322	332-2	332-3	332-4	332-6
3/8" NPT	303	313	323	333-2	333-3	333-4	333-6
1/2" NPT	304	314	324	334-2	334-3	334-4	334-6
3/4" NPT	305	315	325	335-2	335-3	335-4	335-6
1" NPT	306	316	326	336-2	336-3	336-4	336-6
Pyco							

OPTIONS FOR DIE CAST ALUMINUM AND CAST IRON HEADS

Add Suffix Below to Part No.	Description
B	Head with internal ground screw
W	Protective Epoxy Coating 2 Mil. Thickness - White Only
Logo Part Number	Customer Name Plate Add Logo Number as Suffix
	Part Number Example: No. 334-4-130B

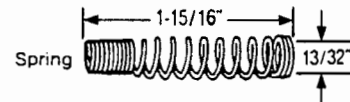
CAST IRON SCREW COVER THERMOCOUPLE HEADS

1/2" NPT	NO. 307	317	327	337-2	337-3	337-4	337-6
3/4" NPT	308	318	328	338-2	338-3	338-4	338-6
1" NPT	309	319	329	339-2	339-3	339-4	339-6
Pyco	310						



REPLACEMENT COMPONENT PARTS

Single Terminal Block	No. 341	*Brass Terminal Block (Triplex)	No. 345 (12/pk.)
Duplex Terminal Block	No. 342	Aluminum Cap w/Gasket	No. 346
Triplex Terminal Block w/2 Brass Terminals	No. 343-2	Cast Iron Cap w/Gasket	No. 347
Triplex Terminal Block w/3 Brass Terminals	No. 343-3	Chain	No. 348
		Head Gasket	No. 349



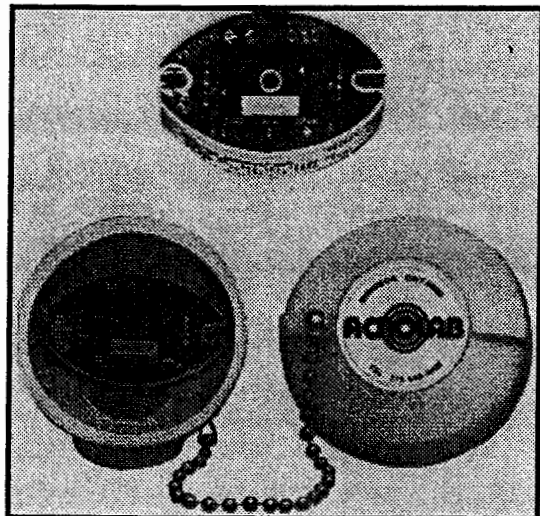
Item	Part No.
3/16" OD sheath	
Spring	No. 350
1/4" OD sheath Spring	No. 351
Ground Screw	No. 352

RTD Temperature Transmitters

GENERAL

The temperature transmitter is designed to produce a linearized 4-20 mA current signal, which is directly proportional to the temperature of the sensing element. A variety of models are available for sensor inputs of different materials, values and temperature coefficients.

FEATURES



- Small size allows universal mounting inside series 300 Screw Cover Heads, series 200 Explosion-Proof Polypropylene Heads, Thermostat Housings, Electrical Handibox Enclosures, and Panel Surface Mounting.
- Linearized 4-20 mA output.
- Degrees Fahrenheit or Celsius ranges
- Screw terminal connections
- Accepts two or three-wire RTD's
- Adjustable zero + span
- Each unit calibrated after a minimum of 48 hours burn-in and checkout time

STANDARD MODEL SPECIFICATIONS

Sensor Input: Platinum RTD (0.00385 T.C.) Platinum

Output Span: 4-20 mA

Supply Voltage: 13 to 40 VDC
(Loop Powered) (Note 1)

Isolation: Non - Isolated

Calibrated Accuracy: $\pm .1\%$ of Span

Ambient Temp. Limits: -30° to 165°F

Power Supply Effect: .001% per volt

Dimensions (Figure 1): 1.5" diameter x 1.080"high

Minimum Current: 3.4 mA

Maximum Current: 30 mA

Upscale Burnout: Standard

Reverse Polarity Protection: Standard

Conformity: .1% of Span (linearized RTD's only)

Nominal Zero Adjustment: $\pm 10\%$

Nominal Span Adjustment: $\pm 10\%$

Connections (Figure 1): Screw Terminals
(2 or 3 wire RTD's)

NOTE 1: Transmitters are designed for a nominal 24 VDC power supply. Use the following formulas to determine maximum resistance loading (RL) allowed for power supply used or to determine supply voltage (V) required for fixed resistance loads.

MINIMUM POWER SUPPLY VOLTAGE

$$V = .02 \times RL + 13 \text{ V}$$

EXAMPLE: 650 Ohm Impedance Load

$$V = .02 \times 550 + 13$$

V = 24 VDC Minimum Power Supply

MAXIMUM RESISTANCE LOAD

$$RL = \frac{V - 13}{.02}$$

Example: 24 VDC Power Supply

$$RL = \frac{24 - 13}{.02}$$

RL = 550 Ohms Maximum Impedance Load

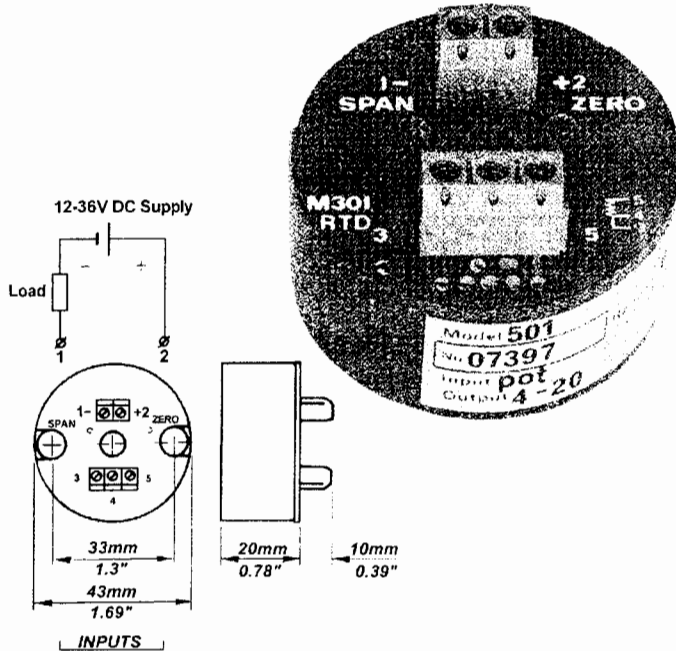
Thermocouple Temperature Transmitters

GENERAL

The temperature transmitter is designed to produce a linearized 4-20 mA current signal, which is directly proportional to the temperature of the sensing element. A variety of models are available for sensor inputs of different materials, values and temperature coefficients.

FEATURES

- 4-20 mA output.
- Low Cost.
- Accuracy- 0.1% of span.
- Low Drift.
- Inputs: Thermocouple, E, J, K, T, R, S, B, N.
- Adjustable span and zero point up to 45% of span
- Measurement range is easily changeable by the user.



STANDARD MODEL SPECIFICATIONS

Output: 4-20 mA

Trim stability: Better than 0.05%

Minimum current: 2.5 mA

Maximum current: 28 mA

Supply voltage: 9-36 VDC

Supply voltage variation effect: Less than 0.001% for 1 volt Change

Temperature stability (drift): Zero-better than 0.01/1°C
Span-better than 0.01%/1°C

Calibration inaccuracy: Less than 0.1% of input span

Self-Heating Effect: Less than 0.2% of input span

Operating temp: -20 + 70°C

Linearity: better than 0.03% of span

Ambient storage temperature: -40 ± 100°C

TYPE M-401 is a thermocouple input transmitter for thermocouple types: E, J, K, T, R, S, B, N.

Type M-501 uses potentiometer resistance. Min. resistance: 100 Ohms Max. resistance: 20k Ohms

Acrolab can also supply 2-wire transmitters for various ranges and different kinds of inputs, such as: mA, mV, etc.

ANSI Letter Designations

Thermocouple and extension wires are specified by ANSI letter designations for calibration. Positive and negative legs are identified by the appropriate letter suffixes P and N, respectively.

ANSI Letter	Description	Popular Generic & Trade Names*
T	TP	Copper
	TN	Constantan, Cupron, Advance
J	JP	Iron
	JN	Constantan, Cupron, Advance
E	EP	Chromel, Tophel, T1
	EN	Constantan, Cupron, Advance
K	KP	Chromel, Tophel, T1, Thermokanthal KP
	KN	Alumel, Nial, T2, Thermokanthal KN
R	RP	Platinum 13% Rhodium
	RN	Pure Platinum
S	SP	Platinum 10% Rhodium
	SN	Pure Platinum
B	BP	Platinum 30% Rhodium
	BN	Platinum 6% Rhodium
N	NP	Nicrosil
	NN	Nisil

*Trade Names: Cupron, Nial and Tophel—AMAX; Advance, T1 and T2—Driver-Harris Co.; Chromel and Alumel—Hoskins Mfg. Co.; Thermokanthal KP and Thermokanthal KN—Kanthal Co.

Limits of Error for Thermocouples & Thermocouple Wire

Thermocouple Type	Temperature Range		Limits of Error	
	°C	°F	Standard °C (whichever is greater)	Special °C (whichever is greater)
T	0 to 350	32 to 700	±1.0 or ±0.75%	±0.5 or 0.4%
J	0 to 750	32 to 1400	±2.2 or ±0.75%	±1.1 or 0.4%
E	0 to 900	32 to 1600	±1.7 or ±0.50%	±1.0 or 0.4%
K	0 to 1250	32 to 2300	±2.2 or ±0.75%	±1.1 or 0.4%
N	0 to 1250	32 to 2300	±2.2 or ±0.75%	±1.1 or 0.4%
R or S	0 to 1450	32 to 2700	±1.5 or ±0.25%	±0.6 or 0.1%
B	800 to 1700	1600 to 3100	±0.50%	—

Limits Of Error For Thermocouple Extension Wires

Extension Wire Type	Temperature Range		Limits of Error	
	°C	°F	Standard °C	Special °C
KX	0 to 200	32° to 392°	±2.2	±1.1
JX	0 to 200	32° to 392°	±2.2	±1.1
EX	0 to 200	32° to 392°	±1.7	±1.1
TX	-60 to +100	-76° to +212°	±1.0	±0.5
NX	0 to 200	32° to 392°	±2.2	—

Thermocouple Wire

Cat No.	Size of Wire		Insulations		Nominal Over-all Size, Inches Minor x Major	Continuous Temperature Rating (°F)
	B & S Gauge	Type of Wire	Each Conductor	Over-all		
DUPLEX-ANSI TYPE K						
K20-1-304	20	Solid	Glass Braid	Glass Braid	.056 x .096	900
K20-3-302	20	Stranded	Double Glass Braided	Glass Braid	.068 x .120	900
K24-1-304	24	Solid	Glass Braid	Glass Braid	.045 x .077	900
K24-1-508	24	Solid	Fused Teflon (TFE) Tape	Fused Teflon (TFE) Tape	.048 x .080	500
K20-1-507	20	Solid	Teflon Extruded	Teflon Extruded	.070 x .120	400
K20-3-S-302	22	Stranded	Double Glass Braid	Glass/Stainless Braid	.100 x .162	900
K20-1-350	20	Solid	Ceramic Fiber	Ceramic Fiber	.096 x .147	2600
DUPLEX-ANSI TYPE T						
T24-1-304	24	Solid	Glass Braid	Glass Braid	.045 x .077	900
T24-1-508	24	Solid	Fused Teflon	Fused Teflon	.048 x .080	500

Thermocouple Wire Cont'd

Cat No.	Size of Wire		Each Conductor	Insulations		Nominal Over-all Size, Inches Minor x Major	Continuous Temperature Rating (°F)
	B & S Gauge	Type of Wire		Over-all			
DUPLEX-ANSI TYPE J							
J20-1-304	20	Solid	Glass Braid	Glass Braid		.056 x .096	900
J20-1-507	20	Solid	Teflon (FEP) Extended	Teflon (FEP) Extruded		.070 x .120	400
J20-3-302	20	Stranded	Double Glass Braid	Glass Braid		.068 x .120	900
J20-3-S-302	20	Stranded	Double Glass Braid	Glass Braid/Stainless Braid		.100 x .162900	
J24-1-304	24	Solid	Glass Braid	Glass Braid		.045 x .077	900
J24-1-513	24	Solid	Fused Kapton Tape	Fused Kapton Tape		.045 x .079	600
J24-1-508	24	Solid	Fused Teflon	Fused Teflon		.048 x .080	500
J20-3-512	20	Stranded	Kapton	Kapton		.055 x .102	600

DUPLEX-ANSI TYPE E

E20-1-304	20	Solid	Glass Braid	Glass Braid		.056x.096	900
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Thermocouple & RTD Extension Wire

DUPLEX-ANSI TYPE KX

K16-5-502	16	Solid	Polyvinyl	Polyvinyl		.122 x .193	221
K16-7-151	16	Stranded	Felted ServTex	ServTex Braid		.188 x .281	550
K16-5-303	16	Solid	Glass Braid	Glass Braid		.087 x .151	400
K20-7-502	20	Stranded	Polyvinyl	Polyvinyl		.093 x .149	221
K20-5-510		Solid	Polyvinyl	Shielded		.032 x .170	221

DUPLEX-ANSI TYPE JX

J16-7-151	16	Stranded	Felted ServTex	ServTex Braid		.188 x .281	550
J20-5-502	20	Solid	Polyvinyl	Polyvinyl		.093 x .149	221
J16-5-151	16	Solid	Felted ServTex	ServTex Braid		.188 x .281	550
J20-7-502	20	Stranded	Polyvinyl	Polyvinyl		.093 x .149	221
J20-5-510		Solid	Polyvinyl	Shielded		.032 x .170	221

DUPLEX-ANSI TYPE TX

T20-5-502	20	Solid	Polyvinyl	Polyvinyl		.093 x .149	221
T20-5-510		Solid	Polyvinyl	Shielded		.032 x .170	221

DUPLEX-ANSI TYPE SX AND RX

S16-5-151	16	Solid	Felted ServTex	ServTex Braid		.174 x .250	550
S16-7-151	16	Stranded	Felted ServTex	ServTex Braid		.174 x .250	550

TRIAD-ANSI TYPE RTD X

RTD20-5-510		Solid	Polyvinyl	Shielded		.032 x .170	221
RTD24-8-702		Stranded	Teflon	Teflon		.032 x .192	400

STANDARD MULTIPAIR T/C EXTENSION CABLE

J/K20-5-904(PR)		Solid	Polyvinyl	Polyvinyl		.032 x .360	221
J/K20-5-908(PR)		Solid	Polyvinyl	Polyvinyl		.032 x .465	221
J/K20-5-912(PR)		Solid	Polyvinyl	Polyvinyl		.032 x .520	221
J/K20-5-916(PR)		Solid	Polyvinyl	Polyvinyl		.032 x .610	221
J/K20-5-920(PR)		Solid	Polyvinyl	Polyvinyl		.032 x .730	221
J/K20-5-924(PR)		Solid	Polyvinyl	Polyvinyl		.032 x .775	221

* Flexible Metal conduit covering available (subject to min. quantity) **Shielding on multicable available (subject to min. quantity)

Color Coding

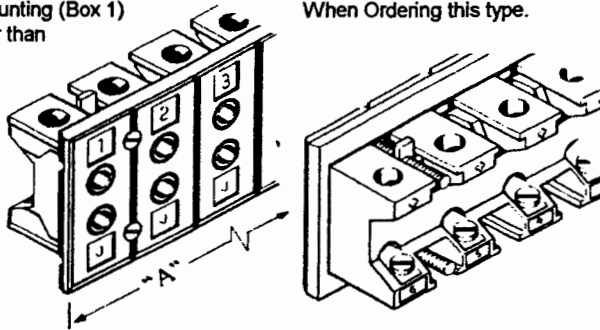
With the exception of very high temperature insulation constructions such as ceramic fiber, vitreous silica fiber, etc., all insulated thermocouple wire and extension wire is color-coded to standard ANSI specifications. A colored tracer may be used to distinguish the type.

T/C	ANSI Type		Magnetic		ANSI Colour Code	
	Single	Yes	No	Single	Overall Extension Wire	Overall T/C Wire
T	TP		x	Blue		
T	TN		x	Red	Blue	Brown
J	JP	x		White		
J	JN		x	Red	Black	Brown
E	EP		x	Purple		
E	EN		x	Red	Purple	Brown
K	KP		x	Yellow		
K	KN	x		Red	Yellow	Brown
R,S	RP,SP		x	Black		
R,S	RN,SN		x	Red	Green	
B	BP		x	Grey		
B	BN		x	Red	Grey	
N	NP		x	Orange		
N	NN		x	Red	Orange	Brown

Accessories

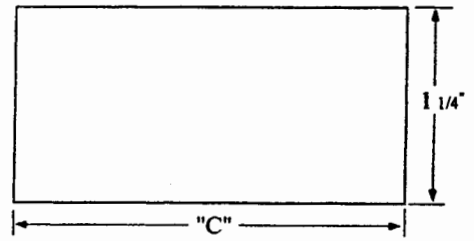
Panels

Specify catalogue No.
 Specify calibration (Box 1) J, K, T, E, RTD
 Specify number of circuits (box 2)
 Specify vertical (V) horizontal (H) mounting (Box 1)
 Specify Numbering sequence if other than beginning at No. 1



Strippanels withstand ambient temperatures up to 300°F. Strippanels for service up to 1000°F. Are available on request. Add "H" to catalogue number When Ordering this type.

STRIPANEL MOUNTING CUTOUT DIMENSIONS



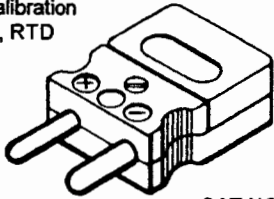
CAT NO. A1032 - - -

Eg: A1032-2-J

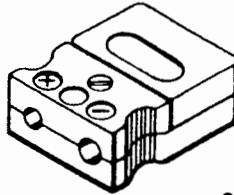
Dimen-	Number of circuits											
sion	2	3	4	5	6	7	8	9	10	11	12	
"A"	1-1/2"	2-1/4"	3"	3-3/4"	4-1/2"	5-1/4"	6"	6-3/4"	7-1/2"	8-1/4"	9"	
"C"	1-5/16"	2-1/16"	2-13/16"	3-9/16"	4-5/16"	5-1/16"	5-13/16"	6-9/16"	7-5/16"	8-1/16"	8-13/16"	

Connectors

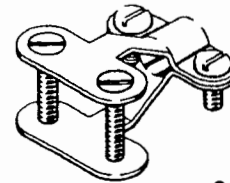
Specify calibration
 J, K, R, T, RTD



CAT NO. A2000 -
 ISA THERMOCOUPLE OR
 RTD PLUG



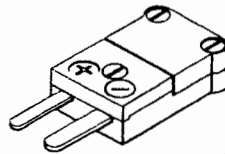
CAT NO. A1000 -
 ISA THERMOCOUPLE OR
 RTD JACK



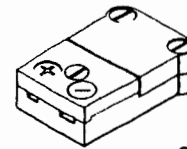
CAT NO. A4000
 CABLE CLAMP



CAT NO. A3000
 BX FITTING

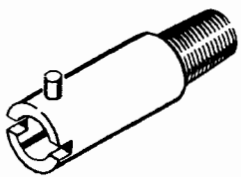


CAT NO. AM6000 -
 ISA MINIATURE
 PLUG — MALE



CAT NO. AM5000 -
 ISA MINIATURE
 JACK — FEMALE

Bayonet Adaptors



CAT NO.	LENGTH	THREAD
A-01	7/8"	1/8-27 NPT
A-02	7/8"	3/8-NF-2
A-03	1-3/8"	1/8-27 NPT
A-04	1-3/8"	3/8-NF-2
A-AA	Special	Describe Thread & length



Has served North American industry for over 50 years with the development and application of advanced temperature sensor technology.

Our commitment from the start has been to supply only the highest quality and most efficient products available.

In our capacity as a manufacturer of the world class "State of the Art" hardware, we realize the importance of dependable, reliable sensors in today's automated environments.

Acrolab is constantly upgrading its product lines and personnel in the latest technological developments ensuring that our customers are supplied with the best available service and sensor technology.



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