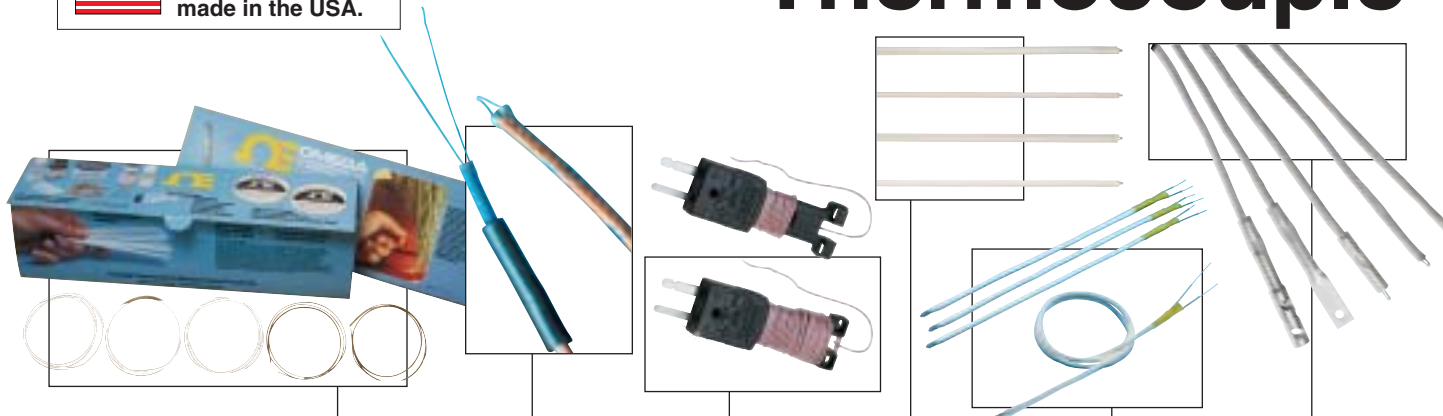




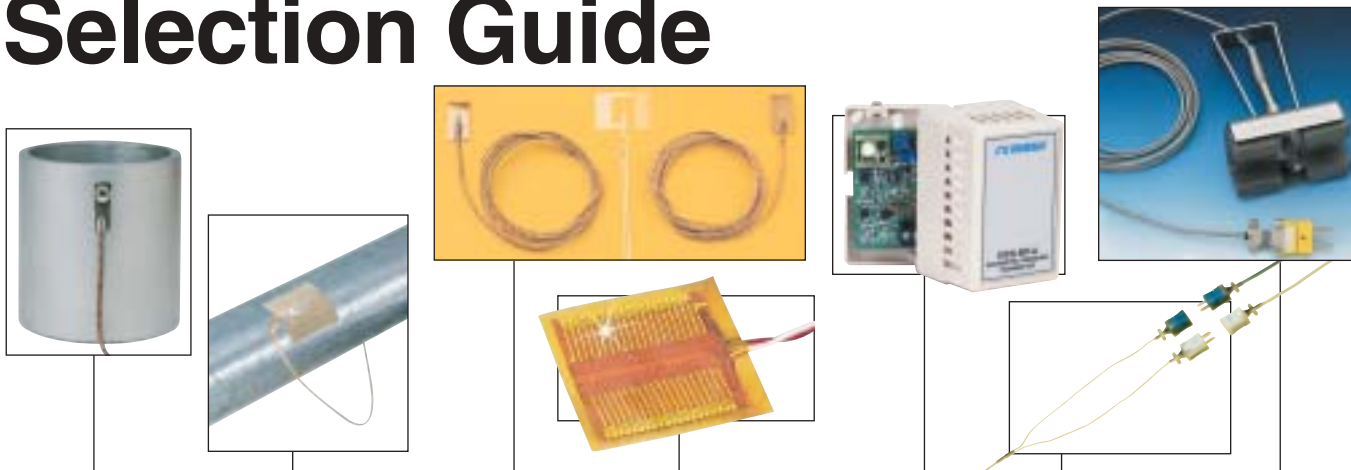
All products in this section are proudly made in the USA.

Thermocouple



Series No.	Unsheathed T/C	5TC	5SC	Bare, SH, DH, FS	XC-20-K	XCIB
Page No.	A-12	A-15	A-16	A-17	A-18	A-19
Price	\$17 pkg of 5	\$33 pkg of 5	\$58 pkg of 5	\$6	\$16	\$27
Configuration	Fine Gage Bare Wire Uninsulated Exposed Junction	Insulated Exposed Junction	Insulated Exposed Junction with Spool Caddy Mini Connector	Bare Wire Thermocouple with Ceramic Bead or Nextel Insulation	Nextel Insulated Exposed Junction	Ceramic Fiber Insulated, Inconel Overbraided
Available Calibration	J, K, T, E, R, S, B, G, C, D	J, K, T, E	J, K, T, E	J, K, T, E	J, K, E	J, K, E
Temperature Range (Configuration and application dependent)	To 2315°C (4200°F)	To 480°C (896°F)	To 480°C (900°F) Connector to 220°C (425°F)	Various; depends diameter of thermocouple	Insulation to 2200°F (1200°C) Thermocouple to rated limits	To 1090°C (1994°F) depending on alloys
Insulation/Sheathing	None	PFA Teflon® or glass braid	PFA Teflon® or glass braid	Ceramic bead insulators or Nextel	High temperature Nextel ceramic	High temperature ceramic fiber with Inconel 600 overbraided
Size (Non-standard lengths readily available)	0.0127 to 0.813 mm (0.0005 to 0.032") dia 150 or 305 mm (6 or 12") lengths standard	0.0127 to 0.813 mm (0.005 to 0.032") dia 900 or 1800 mm (36 or 72") lengths standard	0.127 to 0.254 mm (0.005 to 0.010") dia 900 or 1800 mm (36 or 72") lengths standard	0.510 to 3.25 mm (0.0201 to 0.128") dia 300 mm (12") lengths with 75 mm (3") leads standard	0.511, 0.813, 1.628 mm (0.021, 0.033, 0.064") dia 300 mm (12") lengths with 150 mm (6") incremental add'l lengths	4.76 to 7.94 mm (0.1875 to 0.3125") dia 0.9 or 3 m lengths (3 or 10") standard
Features	Fast response. Very small diameters. Pin-point measurements. Low heat transfer.	Special limits of error wire. Fast response	Molded subminiature connector with integral strain relief. Special limits of error wire. Fast response.	Choice of various ceramic insulators available with most sizes. Fast response.	Insulation rated to 1200°C (2200°F) continuous, 1425°C (2600°F) short term.	5 styles available. Flexible. Abrasion resistant. High temperature rating.
Applications	Biophysics, medical research, scientific instruments, cryogenics, gas chromatography, quickly changing temperatures. Unprotected, not suitable for liquid immersion and applications requiring protected probes.	Gas and surface measurements, applications requiring exposed thermocouple bead. Teflon insulation resists chemical attack, glass insulation rated for high temperatures.	Gas and surface measurements, applications requiring exposed thermocouple and strain relief connector attachments. Teflon insulator resists chemical attack, glass insulation rated for high temperatures.	Inside thermowells. Some models for high temperatures.	High temperature. Can be used as the element in a head and well assembly.	Ovens Furnaces Profiling machinery
Sold As	J, K, T, E sold in packs of 5. R, S, B, G, C, D calibrations sold individually. Contact Sales for special sizes and assemblies.	Packages of 5. Contact Sales for special sizes and assemblies.	Packages of 5. Contact Sales for special sizes and assemblies.	Individually. Contact Sales for special sizes.	Individually.	Individually. Custom lengths available.

Selection Guide

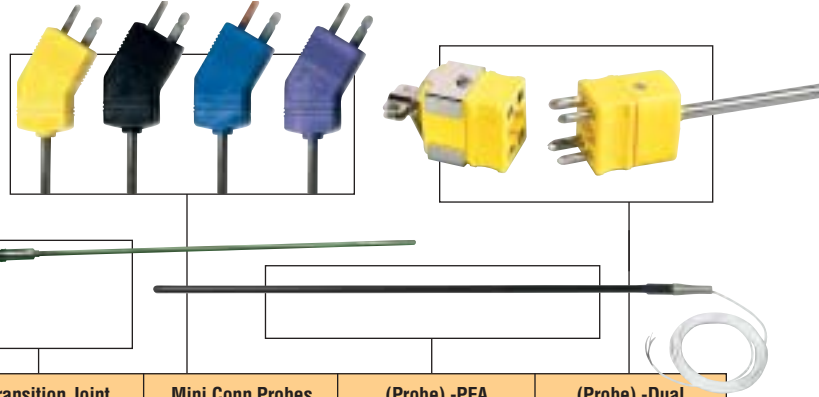
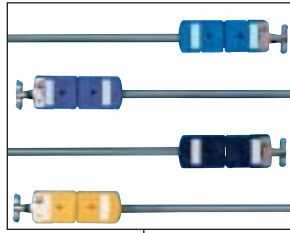


WTK	SA1	C03	HFS	EWS	TRP	MP1
A-21	A-22	A-23	A-25	A-74	A-30	A-27
\$8	\$60 pkg of 5	\$17	\$129	\$36	\$65	\$59
Insulated with Washer Termination Armored Cable Option	Insulated with Self-Adhesive Pad	Insulated with "Cement-On" Pad	Thin Film Heat Flux Sensors	Wall mount sensors/transmitters	Temperature Reference Probe	Magnetic Mount
J, K, T, E	J, K, T, E	J, K, T, E	$\mu\text{V}/\text{BTU}/\text{F}^2 \text{ Hr}$ sensor and K T/C	J, K, T, E (plus other parameters)	J, K, T, E, R, S, B, G, C, D	J, K, T, E
To 480°C (900°F)	-60 to 175°C (-75 to 347°F)	To 540°C (1004°F)	-200 to 200°C (-330 to 400°F)	To 60°C (140°F)	Probe to 980°C (1796°F)	Magnet retains 90% pull to 370°C (700°F)
Glass braid and Teflon®	Teflon®	Polymer/glass laminate	Polyimide Film Carrier	Teflon®	304 Stainless steel sheath material	Stainless steel over-braided glass or Teflon® wire
20 gage wire 305, 610, 914, 1524 mm (12, 24, 36, 60") lengths 3.7 mm to 6.6 mm (0.145 to 0.260") washer dia #6, #8, #10, 1/8" screw sizes (M3.5, M4, M4.5, M6)	Flat, 25 x 19 mm (1.0 x 0.75") 900 mm (36") length Custom lengths available	Flat, 9.5 x 19 mm (0.37 x 0.75") 900 or 1800 mm (36 or 72") lengths Custom lengths available	Flat, 35.1 x 28.5 mm (1.38 x 1.12")	79 x 54 x 45 mm (3.12 x 2.12 x 1.78 ")	3.2 mm (0.125") dia 150 mm (6") probe 300 mm (12") standard lead length	25.4 x 38.1 x 25.4 mm (1 x 1.5 x 1") or 108 x 63.5 x 38.1 mm (4.25 x 2.5 x 1.5")
Washer termination. Attaches to surfaces with various size screws. Armored cable option	Self-adhesive backing. Fast response. Low thermal inertia.	"Cement-On" Pads Fast response. Low thermal inertia.	Self-generating voltage plus thermocouple transducer	Low cost miniature design, 6 models	Made with SLE wire. Comes with mating connectors.	Spring mounted thermocouple in magnetic mount. Single or dual 12 lb pull magnets. Leads, subminiature male connector and cable clamp included.
Surface temperature measurement Bolts to surface.	Surface temperature measurement Easily removed, limited reapplication.	Flat or curved metal, glass, plastic or other smooth surfaces. May be glued to surface.	Measurement of heat gain or loss from any surface.	Office, laboratory or computer room environmental wall sensors.	Calibration accessory. Thermocouple to copper transition at probe tip typically used in ice point chamber	Surface temperatures of magnetic material
Individually. Stripped leads or OSTW type standard size connector. Custom lead lengths available.	Packages of 5. Other lengths available.	Individually. Contact Sales for special sizes and assemblies.	Individually	Individually	Individually	Individually. Single or dual magnet probe. Custom lead lengths available.



All products in this section are proudly made in the USA.

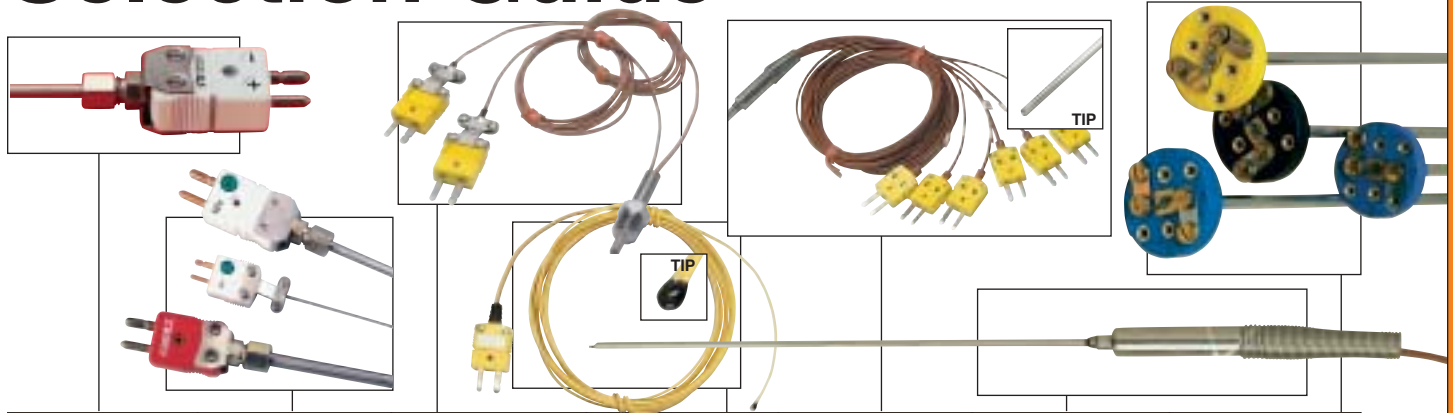
Thermocouple



Series No.	Super OMEGA CLAD® XL	STD Conn Probes	Transition Joint	Mini Conn Probes	(Probe) -PFA	(Probe) -Dual
Page No.	A-38, 38A, 38B	A-31,33,35,37,39,40,44,45	A-53,54,65,67,69	A-44,45,47,49,51,52	A-43	A-41, 42
Base Price	\$24	\$22	\$19	\$24	\$47	\$56
Configuration	Super OMEGA CLAD® XL Transition Joint, Quick connect and Handle styles	Metal Sheathed, Quick Disconnect Probes with Standard Size Connectors	Metal Sheathed, Metal Transition Junction Probes	Metal Sheathed, Quick Disconnect Probes with Miniature Size Connectors	Metal Sheathed PFA Teflon Coated Probes (probes can be ordered bent)	Dual Element with Miniature or Standard Size Connector
Available Calibration	K, N	J, K, T, E, N	J, K, T, E, N	J, K, T, E, N	Various	J, K, T, E
Temperature Range (Configuration and application dependent)	To 1335°C (2440°F)	To 980°C (1796°F)	To 980°C (1796°F)	To 980°C (1796°F)	To 200°C (392°F)	To 980°C (1796°F)
Insulation/Sheathing	MgO insulation with Nickel-chrome based Super OMEGA CLAD® XL Sheathing	MgO insulation with 304 or 321 SS or Inconel 600 sheathing	MgO insulation with 304 or 321 SS or Inconel 600 sheathing	MgO insulation with 304 or 321 SS or Inconel 600 sheathing	Magnesium oxide insulation with stainless steel or Inconel 600 sheathing and PFA Teflon coating	MgO insulation with 304 or Inconel sheathing
Size (Non-standard lengths readily available)	4.8 or 6.3 mm (0.1875 or 0.25") dia 300 mm (12") standard length or 150 mm (6") standard length	0.25 to 6.0 mm (0.010 to 0.250") dia 50, 300, 450 and 600 mm (6, 12, 18 and 24") lengths. Other lengths on request.	0.25 to 6.0 mm (0.010 to 0.250") dia 50, 300, 450 and 600 mm (6, 12, 18 and 24") lengths. Other lengths on request.	0.25 to 6.0 mm (0.010 to 0.250") dia 50, 300, 450 and 600 mm (6, 12, 18 and 24") lengths. Other lengths on request.	As small as 1 mm (0.040") O.D. 1.2 m (48") max. length	1.6 to 6.4 mm (0.0625 to 0.250") dia
Features	High temperature, low thermal drift very stable	Standard male connectors (mating females included) Bendable sheaths with many optional features, eg. grounded, ungrounded, exposed tip, SS or Inconel sheath, molded or non-molded and connectors, weld pads, PFA Teflon® coating, low noise designs, high temperature, EMI suppression, low-cadmium environmentally friendly polymer	Flexible stripped wire or optional terminals	Mini male connectors (mating females included)	Chemically inert. Electrically insulated. Abrasion resistant.	Standard and subminiature connectors
Applications	Excellent oxidation, carburization and chlorination resistance	Immersion in liquid, gas or air, custom tips for soft solid penetration, fast response, surface and air measurement.			Battery electrolyte, plating baths, anodizing baths, severe environments, caustic or corrosive chemical solutions.	Permits 2 temp signals from 1 point. General purpose and immersion. Probes bend to radius of no less than 3x sheath diameter.
Sold As	Individually. Custom lengths available MAXIMUM PERFORMANCE SHEATHING AVAILABLE IN HIGH TEMPERATURE STYLES Available in Type K or Type N. Consult Sales for Specifications and Pricing	Page Model Feature A-34 HGKQIN High temp, Low Noise A-32 GKQIN Low Noise A-37 HKQIN High Temp A-35 KQSS Molded A-39 CAIN Standard A-44 -NHX Ceramic	Page Model Feature A-54 HKMTSS High temp A-53 KMTSS Small dia A-65 KTSS Molded A-67 TJ36 Standard	Page Model Feature A-52 HKMQSS High temp A-44 -SHX Ceramic A-50 HGKMQSS High Temp, Low Noise A-48 GKMQSS Low Noise A-51 KMQSS Standard	Individual metal sheathed probes. PFA coating also available on thermowells. Contact Sales for special requirements.	Individually

All Probe Pages Displaying the XL Logo in Section A are available in Super OMEGA CLAD® XL Material

Selection Guide

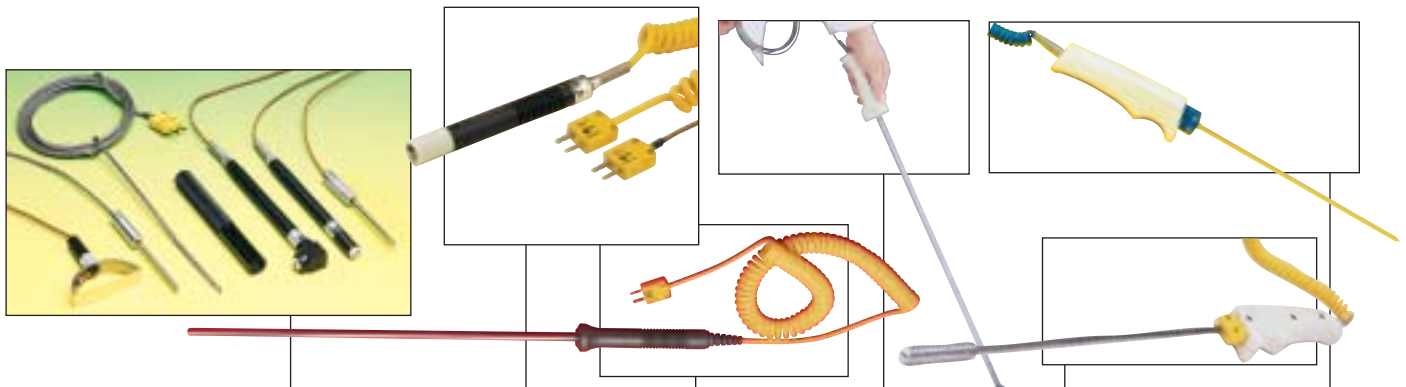


(Probe) -NHX, -SHX	(Exotic)	TC-K-NPT	TC-PVC-K	PP3-36-K	TJFT72	TB-CASS
A-44	A-45	A-62	A-60	A-63	A-69	A-73
\$36.50	\$117	\$39	\$16	\$283	\$32	\$27
Metal Sheathed, Quick Disconnect High Temperature Probes	Metal Sheathed Exotic High Temperature Probes	Specialty Probes	Insulated, Soft Vinyl Covered Tip	Profile Probes	Special propose Transition Junction Probes	Metal Sheathed Probes with Color Coded Terminal Block
J, K, T, E	R, S,B, G, C, D	J, K, T, E	J, K, T, E	J, K, T, E	J, K, T, E	J, K, T, E
Depending on thermocouple type and diameter	To 2300°C (4200°F) in vacuum. To 2200°C (4000° F) in inert or reducing atmosphere. To 1540°C (2800°F) in oxidizing atmosphere	To 480°C (896°F)	-10 to 80°C (14 to 176°F)	Probe to 650°C (1200°F)	Probe to 980°C (1796°F)	Probe to 980°C (1796°F) Block to 220°C (425°F)
MgO insulation with 304 or 321 SS or Inconel 600 sheathing	Berylia, magnesia or alumina insulation with tantalum, molybdenum, platinum rhodium alloy or Inconel 600 sheathing	Mixed	PVC with epoxy coated tip	MgO insulation with 316 SS sheathing	MgO insulation with 304 or 321 SS or Inconel 600 sheathing	Magnesium oxide insulation with stainless steel or Inconel 600 sheathing
0.25 to 6.4 mm (0.010 to 0.250") dia 150, 300, 450 and 600 mm (6, 12, 18 and 24") lengths standard	1.6 to 6.4 mm (0.062 to 0.25") dia Various lengths	Mixed	3.2 mm (0.125") tip dia 3 m (10') length	4.76 mm (0.1875") dia 450 or 900 mm (18 or 36") length 900 mm (36") leads; custom sizes available	1.6 to 6.4 mm (0.062 to 0.250") dia 150, 300, 450 and 600 mm (6, 12, 18 and 24") lengths standard	1.6 to 6.4 mm (0.062 to 0.250") dia 300, 600, 900 mm (12, 24, 36") lengths standard
Includes SHX or NHX ceramic male connectors rated to 650°C (1200°F). Mating female connector included. Standard and miniature sizes	Very high temperature ratings. Choice of quick disconnect, transition junction, high temperature connector or stripped lead termination.	Custom application	Sealed junction tip. Includes male write on connector.	3, 6, 10 sensing points on one probe custom number available	Ungrounded, grounded or exposed junction.	Integral terminal block provides quick wiring.
High temperature requiring quick connection and disconnection of probe, and where sheath and connectors may be subjected to high temperatures.	High temperature measurements in inert, oxidizing, or reducing atmospheres.	Pipe plug; autoclave; penetration; hollow tube; flow through profile	Submersion, soil, wet or moist environments.	Furnaces, reactors, heat exchanges, air ducts.	General purpose and immersion. Probes bend to radius of no less than 3x the diameter of the sheath.	Inside thermowells and/or quick hook-ups for direct immersion compression fitting mounting.
Individually. Custom lengths available. Supplied with mating female connector and cable clamp. Contact Sales for special requirements	Individual probes. Lead wire, standard or mini connectors, heavy duty or ceramic. Contact Sales for special requirements.	Individually	Individually or in packages of 5. Contact Sales for special sizes	Individually custom sizes available	Individually.	Individually. Contact Sales for special requirements.



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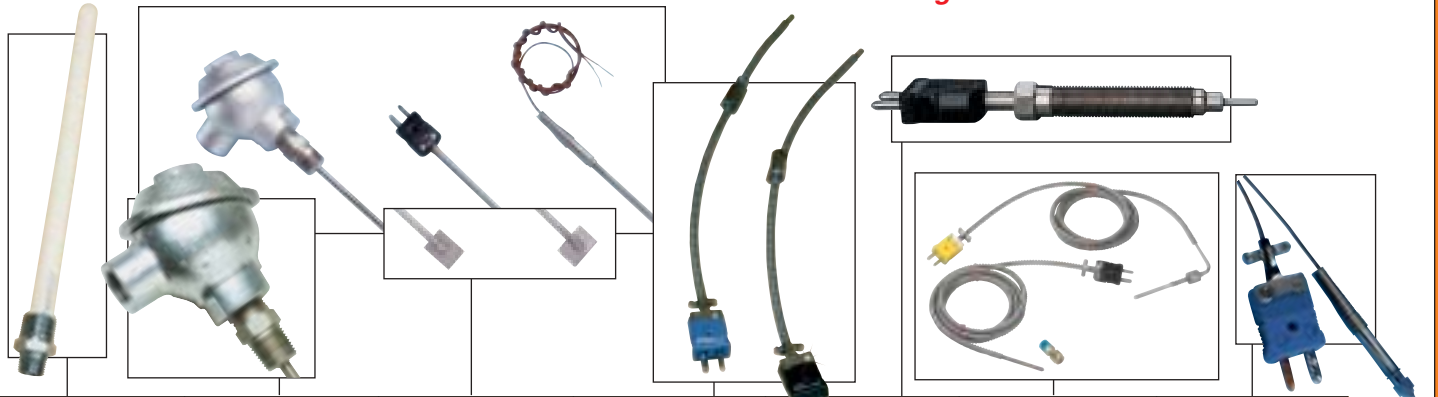
Thermocouple



Series No.	SP-RL	88000	KHSS-116G-RSC	SP-HF-K	HPS-HT-K	HPS-CASS
Page No.	A-77	A-79	A-95	A-97	A-98	A-102
Base Price	\$73	\$110	\$33	\$218	\$115	\$37
Configuration	Various Heavy Duty Surface Probes	Special Purpose Surface Probes	Metal Sheathed Probes with Easy-Grip Molded Handle and Coiled Cable	Metal Sheathed High Temperature Foundry Probes with Integral Handle	Metal Sheathed High Temperature Surface Probe with Integral Handle	Metal Sheathed Probes with Integral Handle
Available Calibration	K, E, J	K, E	J, K, T, E	K	J, K, E	J, K, T, E
Temperature Range (Configuration and application dependent)	Various-Depending on model	Various-Depending on model 200°C (400°F) to 815°C (1500°F)	Probe to 525°C (977°F) Handle to 115°C (239°F)	To 1260°C (2300°F)	To 1090°C (1994°F)	To 980°C (1796°F)
Insulation/Sheathing	Various, including exposed T/C element and stainless steel sheaths	Various, including exposed T/C element and stainless steel sheaths	Magnesium oxide insulation with stainless steel or Inconel 600 sheathing	Glass braid insulation with stainless steel sheathing	Magnesium oxide insulation with stainless steel sheathing	Magnesium oxide insulation with stainless steel or Inconel 600 sheathing
Size (Non-standard lengths readily available)	Various-Depending on model number	Various-Depending on model number	1.6 to 6 mm (0.062 to 0.25") dia 300, 450 or 600 mm (12, 18 or 24") lengths standard	12.7 mm (0.5") dia 25 mm (1.0") dia tip 762 mm (30") probe length standard	12.7 mm (0.5") dia 11.1 mm (0.04") dia tip 300 mm (12") probe length standard	1.6 to 6 mm (0.06 to 0.25") dia 300 mm (12") probe length standard
Features	Six rugged probe styles, Teflon coated lead wire, black and anodized aluminum handle with handle probes.	Variety of sensing heads for hundreds of applications. Models with swivel head design and replaceable elements	Integral molded handle Retractable cable. General purpose probe tip standard; air and penetration probe tips also available. Includes subminiature male connector.	Extra heavy-duty design with rugged aluminum handle. 1.8 m (6') stainless steel overbraided lead wires.	Spring-loaded sensing element. Ceramic tip. Retractable cable with SMP connector.	Integral pistol-grip handle. Retractable cable. Heavy duty.
Applications	General purpose, roller surface, needle tip, flexible tip and overbraid models	General purpose, straight and right angle surfaces, rotating surfaces, insertion, small electronic part surfaces, and more.	General purpose, penetration and air probe tips available	Heavy-duty tips penetrate surface slag of casting to measure casting surface temperature.	High temperature surface measurements, stationary surfaces.	General purpose immersion, custom tips available for penetration, fast response surface and air temperature measurements.
Sold As	Individually with 1.8m (6') Teflon® coated lead wire, SMP subminiature connector	Individually with SMP miniature mail connector, one-foot retractable cable	Probe, handle, cable and connector set. Contact Sales for special requirements.	Probe and handle set. Contact Sales for special requirements.	Probe and handle set. Contact Sales for special requirements.	Probe and handle set. Contact Sales for special requirements.

Selection Guide

NEW! Series of Probes!
Roller, Air, Penetration, Surface
 See Pages A-92A — A-92H



RAT/SAT/BAT	NB1, 2, 3, 4	(Probe) -PD	ADR	SERP	CF, BT	HYP
A-105	A-115	A-118	A-119	A-121	A-123	A-56
\$133	\$42	\$40	\$45	\$45	\$21	\$86
Ceramic tube assemblies	Metal Sheathed Probes with Industrial Protection Head and Integral Terminal Block.	Metal Sheathed Probes with Weld Pad	Metal Sheathed Adjustable Depth Probes	Teflon® and Plastic Extruder Probes	Metal Sheathed Bayonet and Compression Fitting Probes	Metal Sheathed Hypodermic Probes
R, S, B	J, K, T, E	J, K, T, E	J, K, T, E	J, K, T, E	J, K, T, E	J, K, T, E RTD
To 510°C (950°F) for Teflon® models 290°C (554°F) plastic models	To 1650°C (3002°F)	To 1150°C (2102°F)	To 1150°C (2102°F)	To 900°C (1652°F)	To 480°C (896°F)	To 200°C (392°F)
Ceramic Protection Tube	Magnesium oxide insulation with stainless steel or Inconel 600 sheathing.	Magnesium oxide insulation with stainless steel or Inconel 600 sheathing	Glass braid on wire inside stainless steel tip	Braided glass wire with stainless steel housing. Hastelloy tip on Teflon® models	Glass braid on wire inside stainless steel probe	Stainless steel needle
6.4 or 9.5 mm (0.25 or 0.375" dia) 300 mm (12") probe standard length	1.6 to 6.4 mm (0.062 to 0.25") dia probe. Various diameter wells as small as Various lengths 12.7 mm (0.5"). 300 mm (12") length probe standard	1.6 to 6.4 mm (0.062 to 0.25") dia 25.4 x 19 x 3.2 mm (1 x 0.75 x 0.125") pad 300 mm (12") lengths standard	4.7 mm (0.188") dia tip up to 75 mm (3") tip length 1500 mm (60") cable length standard	3.2 mm (0.125") dia tip; 75 or 150 mm (3 or 6") barrel lengths; flush, 6, 13, 19 or 25 mm (0.25, 0.5, 0.75 or 1") tip lengths	4.7 mm (0.188") dia probe 57 and 89 mm (2.25" and 3.5") probe lengths standard for bayonet models. 50 and 100 mm (2 and 4") probe lengths for compression fitting models. Straight or 90° bend probes.	0.203 to 1.83 mm (0.008 to 0.072") dia 13 to 38 mm (0.5 to 1.5") lengths
Includes NS1 Head	Choice of industrial heads with integral terminal blocks. Fixed or spring loaded. Choice of thermowell size and material. Head can house TX91A.	Parallel, 90° or curved weld pad at tip of probe. Variety of terminations.	Flexible armored cable with sliding lock fitting. Spring action catch holds probe firmly in place. Grounded or ungrounded junction.	Rigid or flexible connection. Various tip and barrel lengths. Single or dual elements.	Variety of probe lengths. 6.4 mm (0.25") flexible stainless steel cable 304 or 321 stainless steel construction.	Small, needle-type probes in various diameters and lengths.
High Temperature Oxidizing or Reducing Atmospheres	Heavy-duty, industrial environments. Sheathed or non-sheathed thermocouple elements fit into thermowell if necessary.	Permanent installations, probe welds to surface.	Immersion, adjusts to any depth. Spring loaded tip presses against the bottom of a well for rapid heat transfer	Teflon® or plastic extruders.	Immersion, bored samples, surfaces.	Industrial, laboratory, manufacturing and chemical research. Various size needle probes suit temperature measurements in plants, liquids, semi-solids, food processing and natural sciences. Model HYP-1 is autoclavable. Not suitable for human implantation.
Individually	Individually with threaded fitting and head. Variety of thermowell sizes, designs and materials. Contact Sales for special requirements.	Individually. Flat or curved pads available. Contact Sales for special requirements	Individually with permanently attached or removable lock fittings. Spade lugs or quick disconnect termination.	Individually with OST standard size male connector. Contact Sales for special requirements.	Individual spring-loaded bayonet or compression fitting styles. Contact Sales for special requirements.	Individually in 5 styles. Comes with or without connectors.