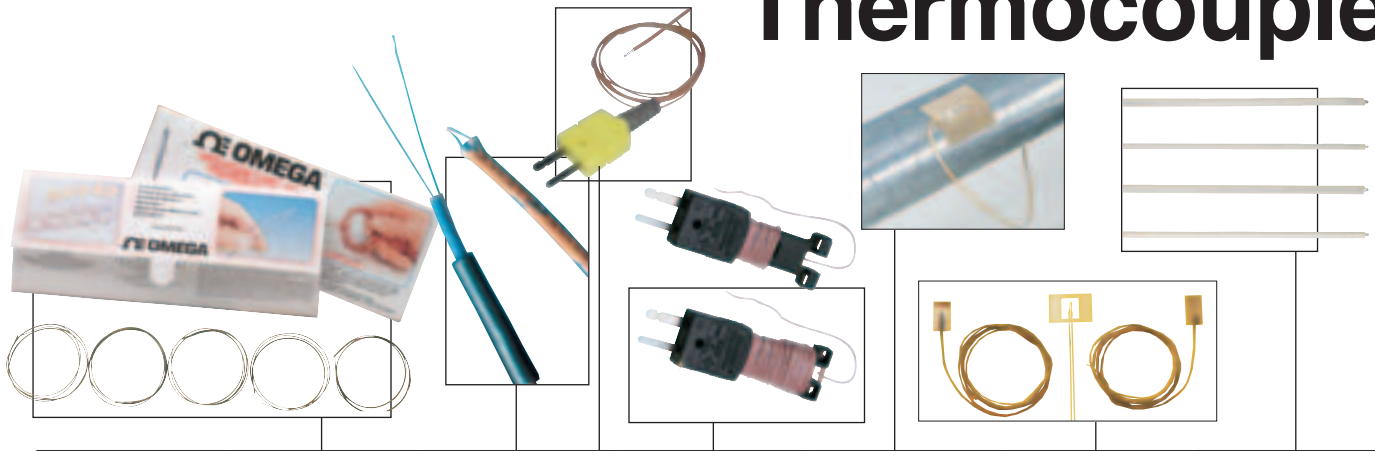
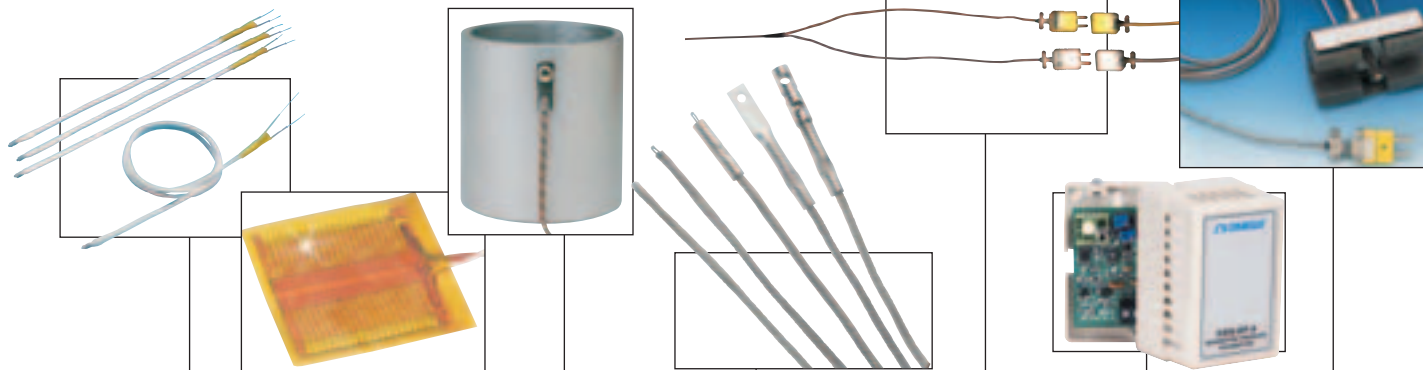


# Thermocouple



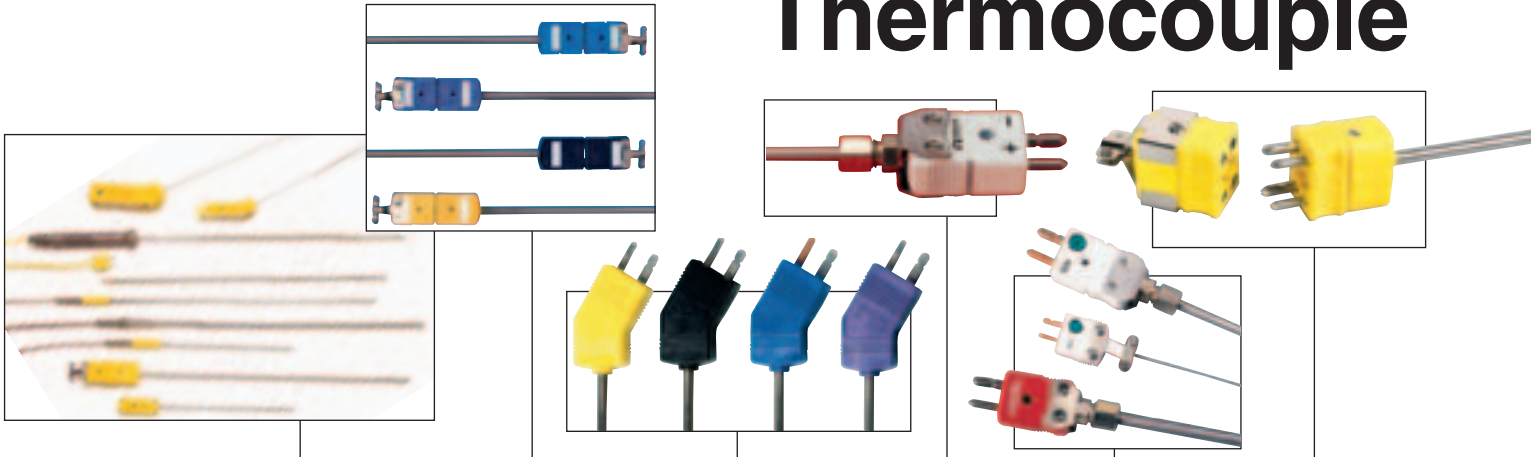
Series No.	Unsheathed T/C	5TC/5SRTC	5SC	SA1	CO1	Bare, SH, DH, FS
Page No.	A-15	A-19	A-23	A-25	A-26	A-28
Price	\$17 pkg of 5	\$33 pkg of 5	\$58 pkg of 5	\$60 pkg of 5	\$17	\$6
Configuration	Fine Gage Bare Wire Uninsulated Exposed Junction	Insulated Exposed Junction	Insulated Exposed Junction with Spool Caddy Mini Connector	Insulated with Self-Adhesive Pad	Insulated with "Cement-On" Pad	Bare Wire Thermocouple with Ceramic Bead or Nextel Insulation
Available Calibration	J, K, T, E, R, S, B, G, C, D, N	J, K, T, E	J, K, T, E	J, K, T, E	J, K, T, E	J, K, T, E, N
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)	-60 to 175°C (-75 to 347°F)	To 540°C (1004°F)	Various; depends on diameter of thermocouple
Insulation/ Sheathing	None	PFA Teflon® or glass braid KAPTON®	PFA Teflon® or glass braid KAPTON®	Teflon®	Polymer/glass laminate	Ceramic bead insulators or Nextel
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 1 or 2 m (40 or 80") lengths standard	0.127 to 0.254 mm (0.005 to 0.010") dia 1 or 2 m (40 or 80") lengths standard	Flat, 25 x 19 mm (1.0 x 0.75") 1 m (40") length  Custom lengths available	Flat, 9.5 x 19 mm (0.37 x 0.75") 1 or 2 m (40 or 80") lengths (37 or 72") Lengths Custom lengths available	0.510 to 3.25 mm (0.0201 to 0.128") dia 300 mm (12") lengths with 75 mm (3") leads standard
Features	Fast response. Very small diameters. Pin-point measurements. Low heat transfer.	Molded subminiature connector with integral strain relief. Special limits of error wire. Fast response. (5SRTC only)	Molded subminiature connector with integral strain relief. Special limits of error wire. Fast response.	Self-adhesive backing. Fast response. Low thermal inertia.	"Cement-On" Pads Fast response Low thermal inertia	Choice of various ceramic insulators available with most sizes. Fast response.
Applications	Biophysics, 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.	Surface temperature measurement Easily removed,	Flat or curved metal, glass, plastic or other smooth surfaces. May be limited reapplication.	Inside thermowells. Some models for high temperatures. glued to surface.
Sold As	J, K, T, E, N 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.	Packages of 5 Other lengths available.	Individually Contact Sales for special sizes and assemblies.	Individually. Contact Sales for special sizes.


# Selection Guide



XC-20-K	HFS	WT	XCIB	TRP	EWS	MP
A-29	A-30	A-32	A-34	A-40	A-94	A-115
\$16	\$130	\$8	\$27	\$65	\$36	\$59
Nextel Insulated Exposed Junction	Thin Film Heat Flux Sensors	Insulated with Washer Termination Armored Cable Option	Ceramic Fiber Insulated, Inconel Overbraid	Temperature Reference Probe	Wall mount sensors/transmitters	Magnetic Mount
J, K, E, N	$\mu$ V/BTU/F <sup>2</sup> Hr sensor and K T/C	J, K, T, E	J, K, E, N	J, K, T, E, R, S, B, G, C, D	J, K, T, E (plus other parameters)	J, K, T, E
Insulation to 2200°F (1200°C) Thermocouple to rated limits	-200°C to 200°C (-330 to 400°F)	To 480°C (900°F)	To 1090°C (1994°F) depending on alloys	Probe to 980°C (1796°F)	To 60°C (140°F)	Magnet retains 90% pull to 370°C (700°F)
High temperature Nextel ceramic	Polyimide Film Carrier	Glass braid and Teflon®	High temperature ceramic fiber with Inconel 600 overbraid	304 Stainless steel sheath material	Teflon®	Stainless steel over-braided glass or Teflon® wire
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	Flat, 35.1 x 28.5 mm (1.38 x 1.12")	20 gage wire from 300 to 1600 mm (12 to 60") lengths 3.7 mm to 6.6 mm (0.145 to 0.260") washer dia #6, #8, #10, 1/4" screw sizes (M3.5, M4, M4.5, M6)	4.76 to 7.94 mm (0.1875 to 0.3125") dia 1 to 3 m (3 to 10') lengths	3.2 mm (0.125") dia 150 mm (6") probe 300 mm (12") standard lead length	79 x 54 x 45 mm (3.12 x 2.12 x 1.78")	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")
Insulation rated to 1200°C (2200°F) continuous, 1425°C (2600°F) short term.	Self-generating voltage plus thermocouple transducer	Washer termination Attaches to surfaces with various size screws. Armored cable option	5 styles available. Flexible. Abrasion resistant. High temperature rating	Made with SLE wire. Comes with mating connectors.	Low cost miniature design, 6 models	Spring mounted thermocouple in magnetic mount. Single or dual 12 lb pull magnets Leads, subminiature male connector and cable clamp included
High temperature. Can be used as the element in a head and well assembly.	Measurement of heat gain or loss from any surface.	Surface temperature measurement Bolts to surface.	Ovens Furnaces Profiling machinery	Calibration accessory. Thermocouple to copper transition at probe tip typically used in ice point chamber	Office, laboratory or computer room environmental wall sensors.	Surface temperatures of magnetic material
Individually.	Individually.	Individually. Stripped leads or OSTW type standard size connector. Custom lead lengths available.	Custom lengths	Individually	Individually	Individually. Single or dual magnet probe. Custom lead lengths available.

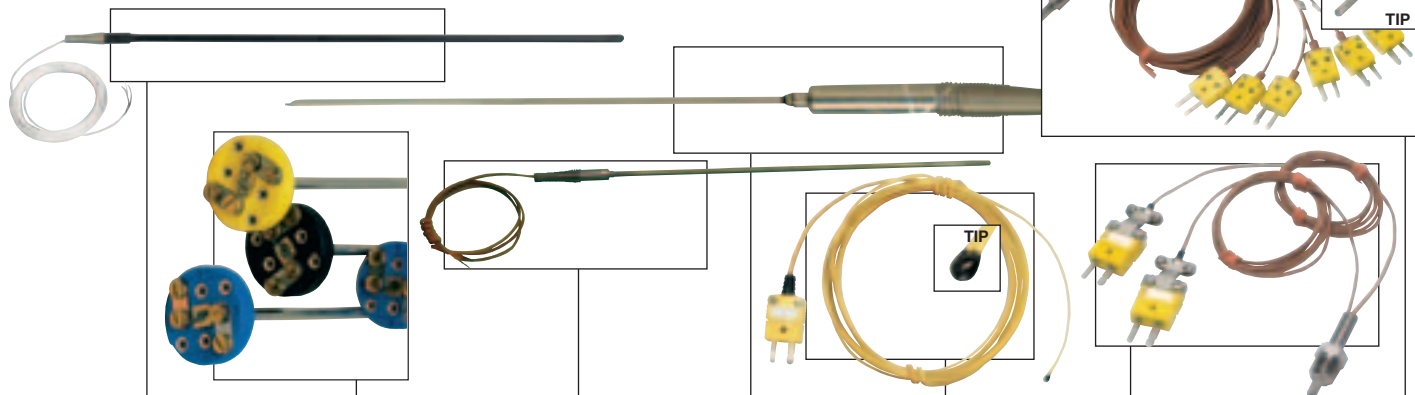
# Thermocouple



Series No.	Super OMEGA CLAD® XL	STD Conn Probes	Mini Conn Probes	(Probe) -NHX, -SHX	Extreme, High Temp	(Probe ) Dual
Page No.	A-45	A-53	A-61	A-69	A-71	A-75
Base Price	\$26	\$22	\$24	\$36.50	\$100	\$56
Configuration	Super OMEGA CLAD® XL Transition Joint, Quick connect and Handle styles	Metal Sheathed, Quick Disconnect Probes with Standard Size Connectors	Metal Sheathed, Quick Disconnect Probes with Miniature Size Connectors	Metal Sheathed, Quick Disconnect High Temperature Probes	Metal Sheathed Exotic High Temperature Probes	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	R, S, B, G, C, D	J, K, T, E, N
Temperature Range (Configuration and application dependent)	To 1335°C (2440°F)	To 980°C (1796°F)	To 980°C (1796°F)	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 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 310SS/316SS	MgO insulation with 304 or 321 SS or Inconel 600 sheathing 310SS/316SS	MgO insulation with 304 or 321 SS or Inconel 600 sheathing	Hafnia, magnesia or alumina insulation with tantalum, molybdenum, platinum rhodium alloy or Inconel 600 sheathing	MgO insulation with 304 or Inconel sheathing 310SS/316SS
Size (Non-standard lengths readily available)	0.25 to 9.5 mm (0.010 to 0.375") dia 300 mm (12') standard length or 150 mm (6")	0.25 to 9.5 mm (0.010 to 0.375") dia 50, 300, 450 and 600 mm (6, 12, 18 and 24") lengths. Other lengths on request	0.25 to 9.5 mm (0.010 to 0.375") 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 150, 300, 450 and 600 mm (6, 12, 18 and 24") lengths standard	1.5 to 6.0 mm (0.062 to 0.25") dia Various lengths	1.5 to 6.0 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	Mini male connectors (mating females included)	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.	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.		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.	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   <small>MAXIMUM PERFORMANCE SHEATHING ELIMINATES HIGH TEMPERATURE DRIFT Available in Type K or Type N. Consult Sales for Specifications and Pricing</small>	<b>Page Model</b> A-54 GKQIN Low Noise A-57 HGKQIN High temp, Low Noise A-63 KQSS Molded A-65 HKQIN High Temp A-67 CAIN Standard A-69 -NHX Ceramic	<b>Page Model</b> A-49 GKMQSS Low Noise A-51 HGKMQSS High Temp, Low Noise A-59 KMQSS Standard A-61 HKMQSS High temp A-69 -SHX Ceramic	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

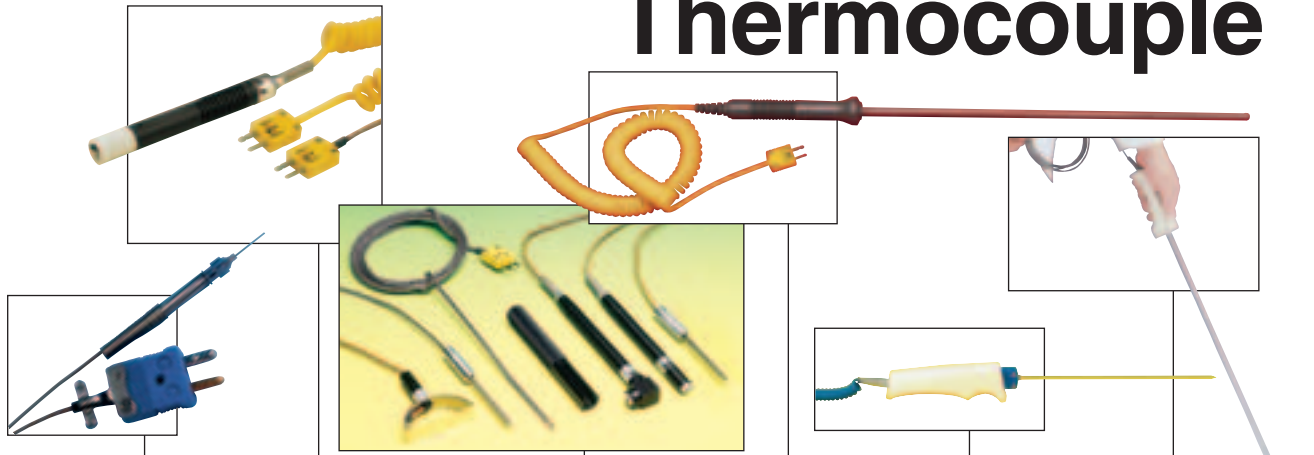
All Probe Pages Displaying the XL Logo in Section A are available in Super OMEGA CLAD® XL Material

# Selection Guide



(Probe) -PFA	TB-CASS	Transition Joint	TJFT72	TC-PVC-K	TC-K-NPT	PP3-36-K
<b>A-77</b>	<b>A-78</b>	<b>A-79</b>	<b>A-88</b>	<b>A-89</b>	<b>A-91</b>	<b>A-92</b>
<b>\$47</b>	<b>\$27</b>	<b>\$28</b>	<b>\$32</b>	<b>\$16</b>	<b>\$60</b>	<b>\$283</b>
Metal Sheathed PFA Teflon Coated Probes (probes can be ordered bent)	Metal Sheathed Probes with Color Coded Terminal Block	Metal Sheathed, Metal Transition Junction Probes	Special propose Transition Junction Probes	Insulated, Soft Vinyl	Specialty Probes	Profile Probes
Various	J, K, T, E, N	J, K, T, E, N	J, K, T, E	J, K, T, E	J, K, T, E	J, K, T, E
To 200°C (392°F)	Probe to 980°C (1796°F) Block to 220°C (425°F)	To 980°C (1796°F)	Probe to 980°C (1796°F)	-10 to 80°C (14 to 176°F)	To 480°C (896°F)	Probe to 650°C (1200°F)
Magnesium oxide insulation with stainless steel or Inconel 600 sheathing and PFA Teflon coating	Magnesium oxide insulation with stainless steel or Inconel 600 sheathing 310SS/316SS	MgO insulation with 304 or 321 SS or Inconel 600 sheathing 310SS/316SS	MgO insulation with 304 or 321 SS or Inconel 600 sheathing 310SS/316SS	PVC with epoxy coated tip	Mixed	MgO insulation with 316SS sheathing
As small as 1 mm (0.40") O.D. 1.2 m (48") max. length	1.5 to 6.0 mm (0.062 to 0.250") dia 300, 600, 900 mm (12, 24, 36") lengths standard	0.25 to 9.5 mm (0.010 to 0.375") dia 50, 300, 450 and 600 mm (6, 12, 18 and 24") lengths. Other lengths on request.	1.5 and 6.0 mm (0.062 to 0.250") dia 150, 300, 450 and 600 mm (6, 12, 18 and 24") lengths standard	3.2 mm (0.125") tip dia 3 m (10') length	Mixed	4.76 mm (0.1875") dia 450 or 900 mm (18 or 36") length 900 mm (36") leads; custom sizes available
Chemically inert. Electrically insulated. Abrasion resistant.	Integral terminal block provides quick wiring.	Flexible stripped wire or optional terminals (See STD and Mini connector probes)	Ungrounded, grounded or exposed junction.	Sealed junction tip Includes male write on connector.	Custom application	3, 6, 10 sensing points on one probe custom number available
Battery electrolyte, plating baths, anodizing baths, severe environments, caustic or corrosive chemical solutions.	Inside thermowells and/or quick hook-ups for direct immersion compression fitting mounting.	Immersion in liquid, gas or air, custom tips for soft solid penetration, fast response, surface and air measurement.	General purpose and immersion. radius of no less than 3x the diameter of the sheath.	Submersion, soil, Probes bend to wet or moist environments.	Pipe plug; autoclave; penetration; hollow tube; flow through profile	Furnaces, reactors, heat exchanges, air ducts.
Individual metal sheathed probes. PFA coating also available on thermowells. Contact Sales for special requirements.	Individually. Contact Sales for special requirements.	<b>Page Model Feature</b> A-80 KTSS Molded A-81 KMTSS High temp A-83 HKTSS Standard A-85 TJ36 Standard	Individually Contact Sales for	Individually or in packages of 5. special sizes	Individually sizes available	Individually custom

# Thermocouple

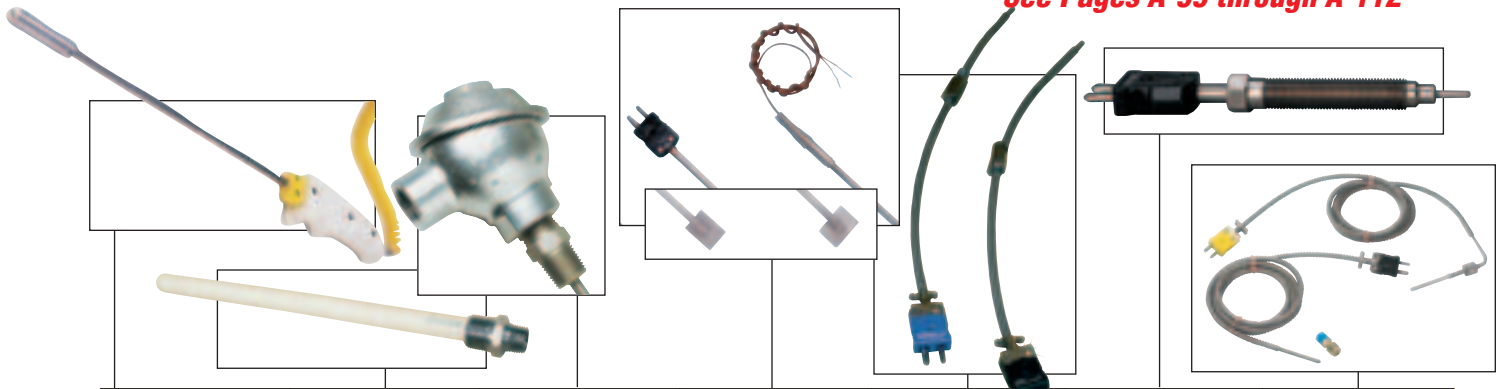


Series No.	HYP	88000	SP-RL	KHSS-116G-RSC	HPS-CASS	SP-HF-K
Page No.	A-36	A-99	A-116	A-119	A-122	A-127
Base Price	\$86	\$110	\$73	\$33	\$37	\$213
Configuration	Metal Sheathed Hypodermic Probes	Special Purpose Surface Probes	Various Heavy Duty Surface Probes	Metal Sheathed Probes with Easy Grip Molded Handle and Coiled Cable	Metal Sheathed Probes with Integral Handle	Metal Sheathed High Temperature Foundry Probes with Integral Handle
Available Calibration	J, K, T, E RTD	K, E	K, E, J	J, K, T, E, N	J, K, T, E, N	J, K
Temperature Range (Configuration and application dependent)	To 200°C (392°F)	Various-Depending on model 200°C (400°F) To 815°C (1500°F)	Various-Depending on model	Probe to 525°C (977°F) Handle to 115°C (239°F)	To 980°C (1796°F)	To 1260°C (2300°F)
Insulation/Sheathing	Stainless steel needle	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	Magnesium oxide insulation with stainless steel or Inconel 600 sheathing	Glass braid insulation with stainless steel sheathing
Size (Non-standard lengths readily available)	0.203 to 1.83 mm (0.008 to 0.072") dia 13 to 38 mm (0.5 to 1.5") lengths	Various-Depending on model number	Various-Depending on model number	1.5 to 9.5 mm (0.062 to 0.375") dia 300, 450 or 600 mm (12, 18 or 24") lengths standard	1.5 mm (0.06") dia 300 mm (12") probe length standard	12.7 mm (0.5") dia 25 mm (1.0") dia tip 762 mm (30") probe length standard
Features	Small, needle-type probes in various diameters and lengths.	Variety of sensing heads for hundreds of applications. Models with swivel head design and replaceable elements	Six rugged probe styles, Teflon coated lead wire, black and anodized aluminum handle with handle probes.	Integral molded handle Retractable cable General purpose probe tip standard; air and penetration probe tips also available. Includes subminiature male connector.	Integral pistol-grip handle Retractable cable. Heavy duty.	Extra heavy-duty design with rugged aluminum handle. 1.8 m (6') stainless steel overbraided lead wires.
Applications	Industrial, laboratory, manufacturing and chemical research. Various size needle probes suit temperature measurements in plants, liquids, semi-solids, food processing and natural sciences. surfaces, and more. Model HYP-1 is autoclavable. Not suitable for human implantation	General purpose, straight and right angle surfaces, rotating surfaces, insertion, small electronic part	General purpose, roller surface, needle tip, flexible tip and overbraid models	General purpose, penetration and air probe tips available	General purpose immersion, custom tips available for penetration, fast response surface and air temperature measurements.	Heavy-duty tips penetrate surface slag of casting to measure casting surface temperature.
Sold As	Individually in 5 styles Comes with or without connectors.	Individually with SMP miniature mail connector, one-foot retractable cable	Individually with 1.8 m (6') Teflon® coated lead wire, SMP subminiature connector	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.



# Selection Guide

**NEW! Series of Probes!**  
**Roller, Air, Penetration, Surface**  
**See Pages A-99 through A-112**



HPS-HT-K	RAT/SAT/BAT	NB1, 2, 3, 4	(Probe) -PD	ADR	SERP	CF, BT
<b>A-128</b>	<b>A-129</b>	<b>A-135</b>	<b>A-141</b>	<b>A-149</b>	<b>A-150</b>	<b>A-153</b>
<b>\$115</b>	<b>\$133</b>	<b>\$42</b>	<b>\$40</b>	<b>\$27</b>	<b>\$45</b>	<b>\$25</b>
Metal Sheathed High Temperature Surface Probe with Integral Handle	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
J, K, E	R, S, B	J, K, T, E, N	J, K, T, E	J, K, T, E	J, K, T, E	J, K, T, E
To 1090°C (1994°F)	To 1650°C (3000°F)	To 1650°C (3000°F) max 610°C (950°F) for Teflon® heads, 290°C (554°F) for plastic heads	To 1150°C (2102°F)	To 1150°C (2102°F)	To 900°C (1652°F)	To 480°C (896°F)
Magnesium oxide insulation with stainless steel sheathing	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
12.7 mm (0.5") dia 11.1 mm (0.04") dia tip 300 mm (12") probe length standard	6.4 or 9.5 mm (0.25 or 0.375" dia) 300 mm (12") probe standard length	1.5 to 6.0 mm (0.062 to 0.25") dia probe. Various diameter wells as small as 12.7 mm (0.5"). 300 mm (12") length probe standard	1.5 to 6.0 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
Spring-loaded sensing element. Ceramic tip. Retractable cable with SMP connector	Includes NB1-2 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.
High temperature surface measurements, stationary surfaces.	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
Probe and handle set. Contact Sales for special requirements	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 OSTW standard size male connector. Contact Sales for special requirements.	Individual spring-loaded bayonet or compression fitting styles. Contact Sales for special requirements.

# How to Specify Wire, Connectors and Probes with ANSI or IEC Color Codes

## Thermocouple Wire

To order IEC Color Coded Wire, add the suffix "I" after the thermocouple type letter

### Examples:

**TT-K-20-50M**  
Teflon® over Teflon® Insulation, Type K, **ANSI** Color Code, 20 Gage wire, 50 meters long

**TT-KI-20-50M**  
Teflon® over Teflon® Insulation, Type K, **IEC** Color Code, 20 Gage wire, 50 meters long



Shown smaller than actual size.

## Connectors

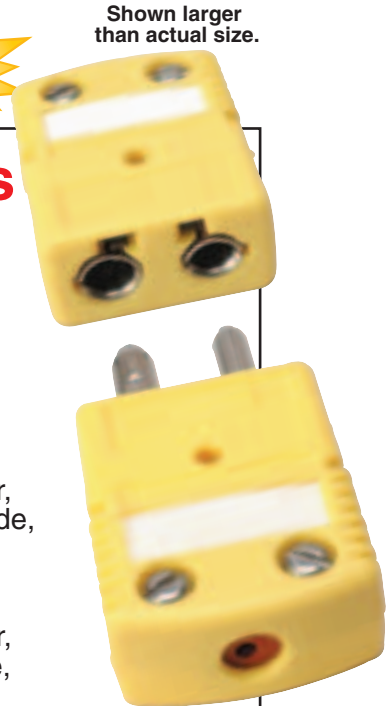
To order IEC Color Coded Connectors, add the suffix "I" after the thermocouple calibration letter

### Examples:

**OSTW-K-MF**  
OST Write-on connector, Type K, **ANSI** Color Code, Male/Female\* Pair

**OSTW-KI-MF**  
OST Write-on connector, Type K, **IEC** Color Code, Male/Female\* Pair

\* Supplied with the exclusive Universal Write-on Female Connector



Shown larger than actual size.

Patented UNIVERSAL Female

At OMEGA®, the mating connector and hardware are always included with probes!

## OMEGA CLAD® Probes

To order IEC Color Coded OMEGA CLAD® Probes, add the suffix "I" before the "M" in the model number\*

### Examples:

**JQIN-M30G-300**  
Type J, Inconel Sheath, 3 mm Diameter **ANSI** Color Code, 300 mm length

**JQIN-IM30G-300**  
Type J, Inconel Sheath, 3 mm Diameter, **IEC** Color Code, 300 mm length

\* Ordering with this code also includes the connector and wire attached to OMEGA CLAD® probes where applicable.



Shown actual size.

## Insulated Wire Thermocouples

To order IEC Color Coded Wire, add the suffix "I" after the thermocouple calibration letter

### Examples:

**5TC-GG-K-20-1M**  
Glass over Glass insulated thermocouples, Type K, **ANSI** Color Code, 20 Gage wire, 1 meter (1000 mm) long

**5TC-GG-KI-20-1M**  
Glass over Glass insulated thermocouples, Type K, **IEC** Color Code, 20 Gage wire, 1 meter (1000 mm) long



Shown smaller than actual size.

**Note:** To order with JIS Color Codes, replace the letter "I" as described in the above examples with the letter "A".  
**Ordering Example:** **JQIN-AM30G-300**, Type J, Inconel Sheath, 3 mm Diameter, JIS Color Code 300 mm length.

# ANSI and IEC Color Codes<sup>†</sup> for Thermocouples, Wire and Connectors

All OMEGA® Thermocouple Wire, Probes and Connectors are available with either ANSI or IEC Color Codes. In this Handbook, model numbers in the To Order tables reflect the ANSI Color-Coded Product. Please see the previous pages for instructions on how to order IEC Color-Coded products.

Connectors			Connectors							
ANSI Code	ANSI MC 96.1 Color Coding		Alloy Combination		Comments Environment Bare Wire	Maximum T/C Grade Temp. Range	EMF (mV) Over Max. Temp. Range	IEC 584-3 Color Coding		IEC Code
	Thermocouple Grade	Extension Grade	+ Lead	- Lead				Thermocouple Grade	Intrinsically Safe	
J			IRON Fe (magnetic)	CONSTANTAN COPPER- NICKEL Cu-Ni	Reducing, Vacuum, Inert. Limited Use in Oxidizing at High Temperatures. Not Recommended for Low Temperatures.	-210 to 1200°C -346 to 2193°F	-8.095 to 69.553			J
K			CHROME <sup>®</sup> GA NICKEL- CHROMIUM Ni-Cr	ALOME <sup>®</sup> GA NICKEL- ALUMINUM Ni-Al (magnetic)	Clean Oxidizing and Inert. Limited Use in Vacuum or Reducing. Wide Temperature Range, Most Popular Calibration	-270 to 1372°C -454 to 2501°F	-6.458 to 54.886			K
T			COPPER Cu	CONSTANTAN COPPER- NICKEL Cu-Ni	Mild Oxidizing, Reducing Vacuum or Inert. Good Where Moisture Is Present. Low Temperature & Cryogenic Applications	-270 to 400°C -454 to 752°F	-6.258 to 20.872			T
E			CHROME <sup>®</sup> GA NICKEL- CHROMIUM Ni-Cr	CONSTANTAN COPPER- NICKEL Cu-Ni	Oxidizing or Inert. Limited Use in Vacuum or Reducing. Highest EMF Change Per Degree	-270 to 1000°C -454 to 1832°F	-9.835 to 76.373			E
N			OME <sup>®</sup> GA-P <sup>®</sup> NICROSIL Ni-Cr-Si	OME <sup>®</sup> GA-N <sup>®</sup> NISIL Ni-Si-Mg	Alternative to Type K. More Stable at High Temps	-270 to 1300°C -450 to 2372°F	-4.345 to 47.513			N
R	NONE ESTABLISHED		PLATINUM- 13% RHODIUM Pt-13% Rh	PLATINUM Pt	Oxidizing or Inert. Do Not Insert in Metal Tubes. Beware of Contamination. High Temperature	-50 to 1768°C -58 to 3214°F	-0.226 to 21.101			R
S	NONE ESTABLISHED		PLATINUM- 10% RHODIUM Pt-10% Rh	PLATINUM Pt	Oxidizing or Inert. Do Not Insert in Metal Tubes. Beware of Contamination. High Temperature	-50 to 1768°C -58 to 3214°F	-0.236 to 18.693			S
U	NONE ESTABLISHED		COPPER Cu	COPPER-LOW NICKEL Cu-Ni	Extension Grade Connecting Wire for R & S Thermocouples. Also Known as RX & SX Extension Wire.					U
B	NONE ESTABLISHED		PLATINUM- 30% RHODIUM Pt-30% Rh	PLATINUM- 6% RHODIUM Pt-6% Rh	Oxidizing or Inert. Do Not Insert in Metal Tubes. Beware of Contamination. High Temp. Common Use in Glass Industry	0 to 1820°C 32 to 3308°F	0 to 13.820			B
G* (W)	NONE ESTABLISHED		TUNGSTEN W	TUNGSTEN- 26% RHENIUM W-26% Re	Vacuum, Inert, Hydrogen. Beware of Embrittlement. Not Practical Below 399°C (750°F). Not for Oxidizing Atmosphere	0 to 2320°C 32 to 4208°F	0 to 38.564	NO STANDARD USE ANSI COLOR CODE		G (W)
C* (W5)	NONE ESTABLISHED		TUNGSTEN- 5% RHENIUM W-5% Re	TUNGSTEN- 26% RHENIUM W-26% Re	Vacuum, Inert, Hydrogen. Beware of Embrittlement. Not Practical Below 399°C (750°F). Not for Oxidizing Atmosphere	0 to 2320°C 32 to 4208°F	0 to 37.066	NO STANDARD USE ANSI COLOR CODE		C (W5)
D* (W3)	NONE ESTABLISHED		TUNGSTEN- 3% RHENIUM W-3% Re	TUNGSTEN- 25% RHENIUM W-25% Re	Vacuum, Inert, Hydrogen. Beware of Embrittlement. Not Practical Below 399°C (750°F)—Not for Oxidizing Atmosphere	0 to 2320°C 32 to 4208°F	0 to 39.506	NO STANDARD USE ANSI COLOR CODE		D (W3)

\* Not official symbol or standard designation

<sup>†</sup> JIS color code also available. See page A-9 for details.



# Four-Point Calibrated Thermocouple Probes

Additional probe calibration services available. See Section I

MEETS OR EXCEEDS SPECIAL LIMITS OF ERROR (SLE) AND EN 60584-2: Tolerance Class 1

OMEGACAL Mobile CAL AVAILABLE  
OMEGACAL Factory CAL AVAILABLE See Section I  
MADE IN USA



Miniature Quick-Disconnect Probes with Cable Clamps

Standard Quick Disconnect Probes with Cable Clamps

Molded Transition Probes

Rugged "Heavy Duty" Transition Probes

Molded Transition Probes

Utility Handle Probes with Retractable Cable and SMPW Miniature Connectors

High Performance Low Noise Probes with Standard and Miniature Connectors and Cable Clamps

Only \$15 additional per probe for "CL5" Calibration

No Set Up Fee!

## Super OMEGACLAD® XL Calibration Points

600°C, 800°C, 1000°C, 1150°C  
(1112°F, 1472°F, 1832°F, 2102°F)

### PATENTED

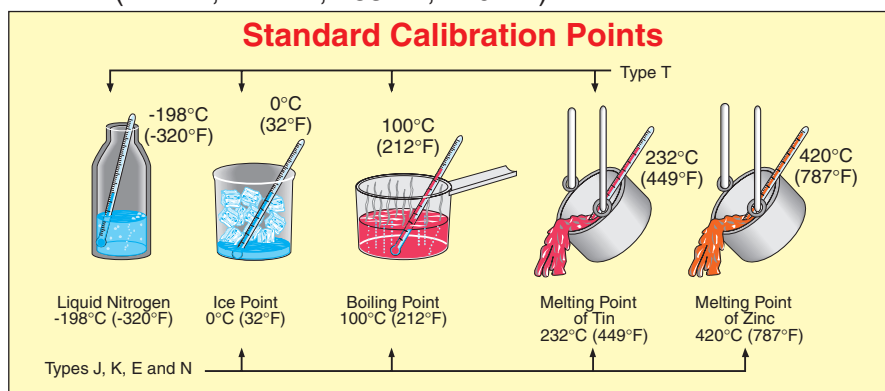
Covered by U.S and International patents and pending applications.

The 30° probe and write-on connector are trademarks of OMEGA Engineering, Inc.

## Individual Calibration Report of Production Lot!

- ✓ For Applications where Extra High Accuracy is Required
- ✓ Each Probe Certified at Four Temperature Standards
- ✓ Calibration Certificate Card Included with Each Probe

### Standard Calibration Points



**CALIBRATED THERMOCOUPLES AVAILABLE FOR FAST DELIVERY!**

### To Order (Follow Steps Below)

1. Select the style probe needed for your application within this section
2. To receive a calibration report detailing the accuracy of your probe at the standard Temperature points shown above add **-CL5** to the end of the probe part number and add **\$15** to the probe price.

**Note:** For a complete listing of thermocouple probe and wire types available with CAL-5 and other calibration certification. See Section I for additional probe calibration information.

**Ordering Example:** KQIN-14-G-12-CL5, Type K quick disconnect probe with molded connector 1/4" diameter 12" long with 4 standard points of calibration, \$42.



OMEGA's ice point™ is a highly accurate 0°C (32°F) thermoelectric "refrigerator" used in the calibration of temperature instruments. Model TRCIII, \$1175. See page K-15.



OMEGA's hot point® thermocouple and RTD calibrator calibrates all temperature sensors to within ±1.5°F. Model CL900-110, \$2995. See page K-25.

## Every Calibrated Probe Supplied with a Calibration Report Card



One Omega Drive, P. O. Box 4047  
Stamford, CT 06907 (203) 359-1660



### Calibration Report Probe I.D. # \_\_\_\_\_

Nominal Temperature		Departure	
°F	°C	°F	°C
-320	-196		
32	0		
212	100		
449	232		
787	419		

Certified By:

Note: To calculate actual temperature

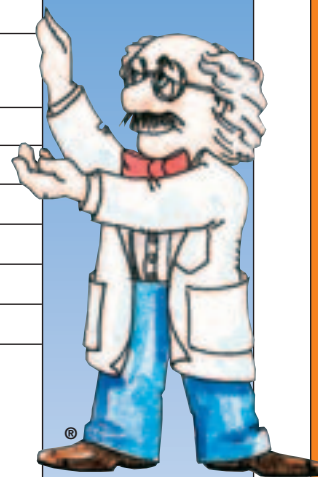
- Add departure when negative (-)
- Subtract departure when positive (+)

EXAMPLE:

Nominal Temperature = 419°C

Departure Temperature = -2°C

Actual Temperature = 417°C



Note: Calibration Report Shown is generic and will only include 4 calibration points as shown in the reference chart below by thermocouple type.

### Ordering Information:

Most of OMEGA's mineral insulated thermocouples are available with 4-point calibration. Please consult Sales for individual probe types not shown on the reverse side of this page. To Order, add the suffix "-CL5" to the probe model number, and add \$15 to the price.

### Ordering Example:

**GKQSS-14U-12-CL5:** an OMEGA standard size low noise thermocouple, Type-K calibration, 1/4" O.D. stainless steel sheath, ungrounded junction, 12" length (\$33 price). This probe is supplied with a calibration card detailing accuracy at the following four nominal temperatures: 0°C (32°F), 100°C (212°F), 231.9°C (449°F) and 419.6°C (787°F). Price: \$33 + 15 = \$48

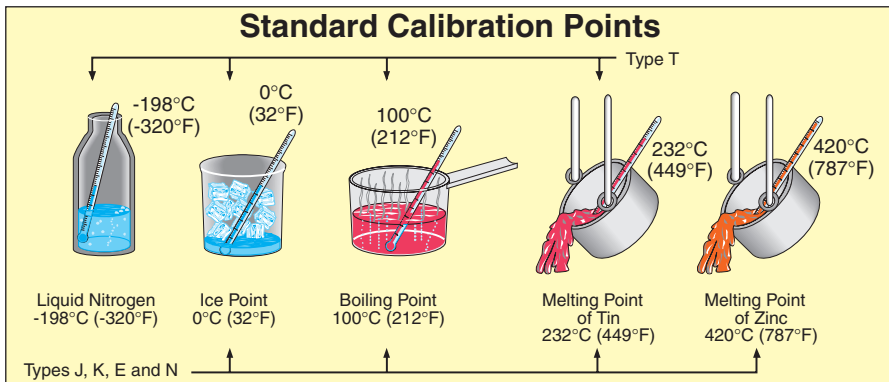


OMEGA's complete in-house calibration lab can calibrate probes and sensors, as well as instrumentation, for temperature, pressure, flow and pH applications.

See Section I for fast, accurate, low cost and NIST traceable calibration, or just dial:

1-800-82-66342®  
1-800-TC-OMEGA

### Standard Calibration Points



# Metric Sizes

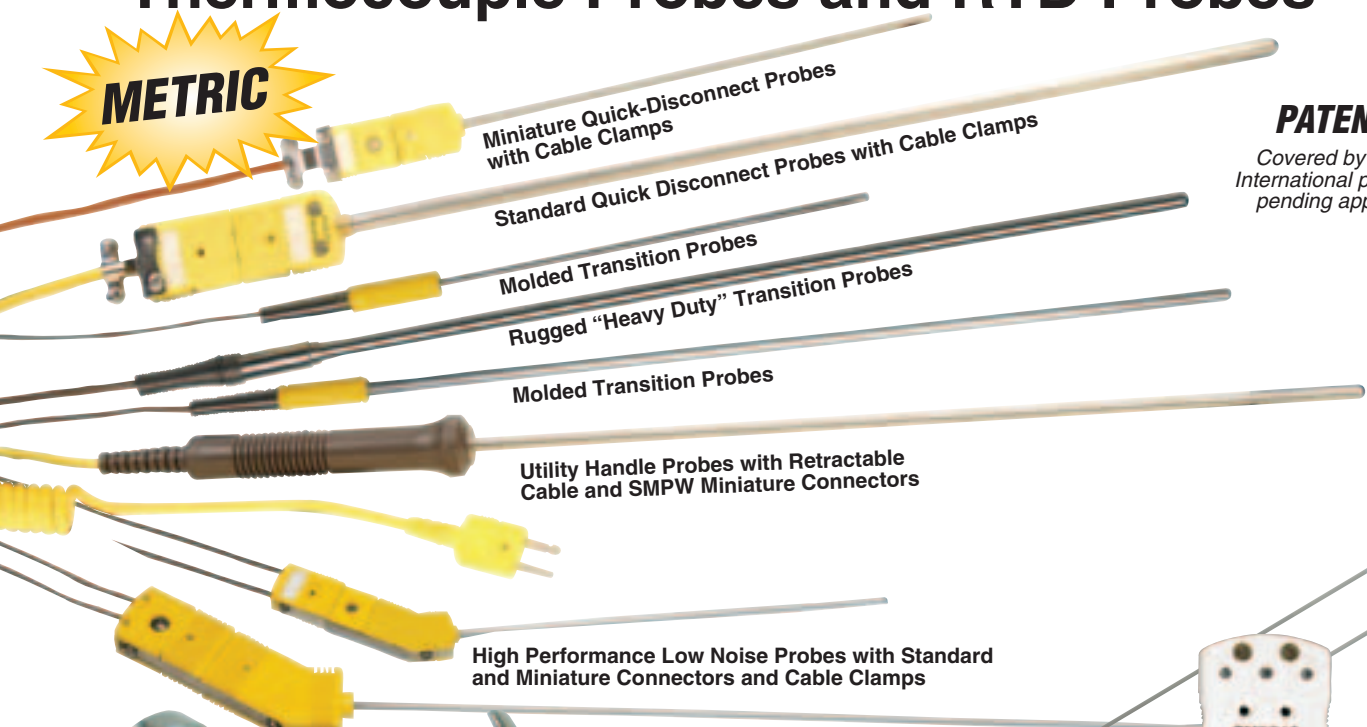
## Now Available for all Mineral Insulated Thermocouple Probes and RTD Probes



ANSI color code shown To order IEC color code see pg. A-9

MEETS OR EXCEEDS SPECIAL LIMITS OF ERROR (SLE) AND EN 60584-2: Tolerance Class 1

**METRIC**



Miniature Quick-Disconnect Probes with Cable Clamps

Standard Quick Disconnect Probes with Cable Clamps

Molded Transition Probes

Rugged "Heavy Duty" Transition Probes

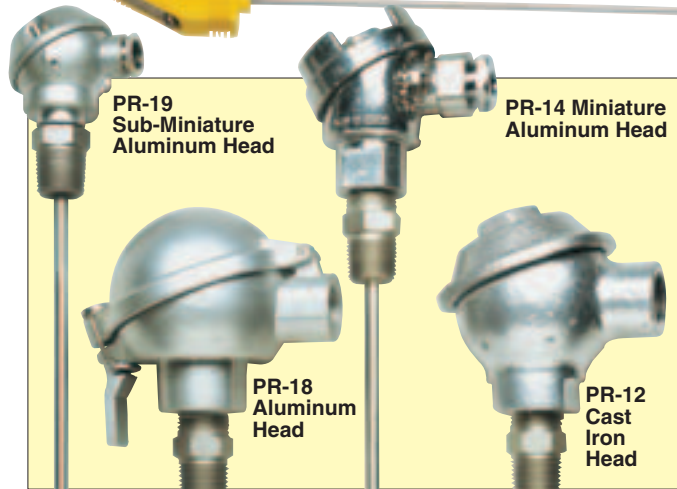
Molded Transition Probes

Utility Handle Probes with Retractable Cable and SMPW Miniature Connectors

High Performance Low Noise Probes with Standard and Miniature Connectors and Cable Clamps

**PATENTED**

Covered by U.S and International patents and pending applications

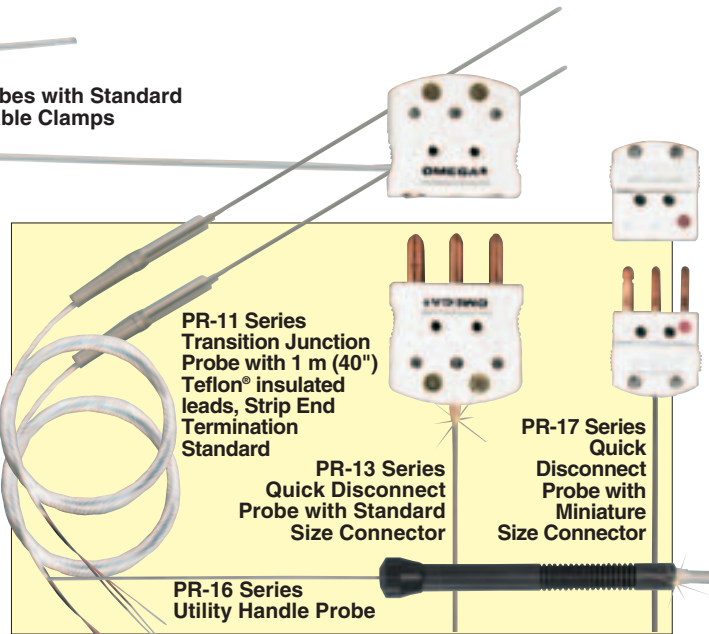


PR-19 Sub-Miniature Aluminum Head

PR-14 Miniature Aluminum Head

PR-18 Aluminum Head

PR-12 Cast Iron Head



PR-11 Series Transition Junction Probe with 1 m (40") Teflon<sup>®</sup> insulated leads, Strip End Termination Standard

PR-13 Series Quick Disconnect Probe with Standard Size Connector

PR-17 Series Quick Disconnect Probe with Miniature Size Connector

PR-16 Series Utility Handle Probe

The following metric size probe is available wherever the standard size is listed. Replace **Standard** size identification with **Metric** value offered.

### Replacement Chart For Probe Diameters

Standard (in.)	Metric (mm)	Remove	Insert
0.010	0.25	010	M025
0.020	0.50	020	M050
0.032	0.75	030	M075
0.040	1.0	032	M100
0.062	1.5	062	M150
0.125	3.0	125	M300
1/16	1.5	116	M15
1/8	3.0	18	M30
3/16	4.5	316	M45
5/16	8.0	516	M80
3/8	9.5	38	M95

OMEGA now offers its complete line of Mineral Insulated temperature probes in Metric sizes. Ordering is easy, simply pick out the desired probe and remove the **Standard** diameter listed and insert the closest **Metric** size from the chart shown on this page.

\*If metric length is required, replace length in inches with length in millimeters.

**Ordering Examples:**

Quick Disconnect Thermocouples listed on pg. A-63:  
**Standard:** KQSS-14G-12. . . . . \$27 **Metric:** KQSS-M60G-300 . . . . . \$27

Quick Disconnect Thermocouples with Miniature Connectors listed on pg. A-59:  
**Standard:** JMQSS-062U-6. . . . . \$26 **Metric:** JMQSS-M150U-150 . . . . . \$26

Industrial Thermocouples with Protection Heads Listed on pg. A-135:  
**Standard:** NB3-ICSS-116G-24 . \$44 **Metric:** NB3-ICSS-M15G-600 . . . \$44

General Purpose RTD Probes Type PR-11 listed On pg. C-8:  
**Standard:** PR-11-2-100-1/4-6-E. \$66 **Metric:** PR-11-2-100-M60-150-E . \$66



# Temperature Calibration Services



**Calibration Services Available!**  
Please See Section I for Details

Computerized probe furnaces are utilized in OMEGA's calibration laboratory along with NIST traceable precision instrumentation to perform accurate temperature calibrations.

- All NIST Traceable**
- All Meet or Exceed ISO10012-1, ANSI/NCSL Z540-1-1994 Standards**
- Fast, Precise Quality Service**
- Individual Probe Calibration**
- Instrument Calibration**
- System Calibration (Probe Connected to Instrument)**
- Five Levels of Calibration Service**
- Mobile Calibration Service Available**

OMEGA uses the different standards over varied temperature ranges to provide the highest quality and reliability on all of its calibration certificates. The standard used depends on the probe being calibrated. OMEGA maintains all of these standards in-house to provide you with the quickest, most convenient and highest quality calibration available anywhere. Some of the standards we use for calibrations performed at our facilities are also available for purchase from OMEGA, for those wishing to do their own in-house calibrations. See Section K.

OMEGA's in-house calibration standards include a complete line of blackbody calibrators for infrared pyrometer calibration. See Section K.



For Calibration Services Call:

**1-800-622-2378®**  
**1-800-622-BEST**

NIST traceable Temperature/Humidity chamber calibrates thermo-hygrometers, temperature and humidity products.