

Thermocouple & PRT Cable / Wire Product Guide



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Which insulation Material?	usable temperature range	Application Note
PVC	-10°C to 105°C	Good general-purpose insulation for "light" environments. Waterproof and very flexible.
PFA (extruded)	-75°C to 250°C	Resistant to oils, acids other adverse agents and fluids. Good mechanical strength and flexibility. PTFE better for steam/elevated pressure environments
PTFE (taped & wrapped)	-75°C to 250/300°C	Resistant to oils, acids other adverse agents and fluids. Good mechanical strength and flexibility.
Glassfibre (varnished)	-60°C to 350/400°C	Good temperature range but will not prevent ingress of fluids. Fairly flexible but does not provide good mechanical protection.
High temperature glass fibre	-60°C to 700°C	Will withstand temperature up to 700°C but will not prevent ingress of fluids. Fairly flexible, not good protection against physical disturbance.
Ceramic Fibre	0 to 1000°C	Will withstand high temperature, up to 1000°C. Will not protect against fluids or physical disturbance.
Glassfibre (varnished) stainless steel overbraid	-60°C to 350/400°C	Good resistance to physical disturbance and high temperature (up to 400°C). Will not prevent ingress of fluids.

For maximum accuracy extension cables should be used and terminals and connectors should be of thermocouple materials to maintain continuity.

The materials are made according to internationally accepted standards as laid down in IEC 584 1,2 which is based on the international Practical Temperature scale ITS 90. Operating temperature maxima are dependent on the conductor thickness of the thermoelements. The thermocouple types can be subdivided in 2 groups, base metal and rare (noble) metal:

-200°C up to 1200°C – These thermocouples use base metals

Type K – Chromel-Alumel: The best known and dominant thermocouple belonging to the group chromium-nickel aluminium is type K. Its temperature range is extended (-200 up to 1100°C). Its e.m.f./ temperature curve is reasonably linear and its sensitivity is 41µV/°C

Type J – Iron-Constantan: Though in thermometry the conventional type J is still popular it has less importance in Mineral Insulated form because of its limited temperature range, - 200C to +750°C. Type J is mainly still in use based on the widespread applications of old instruments calibrated for this type. Their sensitivity rises to 55µV/°C.

Type E – Chromel-Constantan: Due to its high sensitivity (68µV/°C) Chromel-Constantan is mainly used in the cryogenic low temperature range (-200 up to +900°C). The fact that it is non magnetic could be a further advantage in some special applications.

Type N – Nicrosil-Nisil: This thermocouple has very good thermoelectric stability, which is superior to other base metal thermocouples and has excellent resistance to high temperature oxidation.

measurements in air up to 1200°C. In vacuum or controlled atmosphere, it can withstand temperatures in excess of 1200°C. Its sensitivity of 39µV/°C at 900°C is slightly lower than type K (41µV/°C). Interchangeability tolerances are the same as for type K.

Type T – Copper-Constantan: This thermocouple is used less frequently. Its temperature range is limited to -200°C up to +350°C. It is however very useful in food, environmental and refrigeration applications. Tolerance class is superior to other base metal types and close tolerance versions are readily obtainable. The e.m.f./temperature curve is quite non-linear especially around 0°C and sensitivity is 42µV/°C.

0°C up to +1600°C – Platinum-Rhodium (Noble metal) Thermocouples

Type S – Platinum rhodium 10% Rh-Platinum: They are normally used in oxidising atmosphere up to 1600°C. Their sensitivity is between 6 and 12 µV/°C.

Type R – Platinum rhodium 13% Rh-Platinum: Similar version to type S with a sensitivity between 6 and 14µV/°C.

Type B – Platinum rhodium 30% Rh-Platinum rhodium 6% Rh: It allows measurements up to 1700°C. Very stable thermocouple but less sensitive in the lower range. (Output is negligible at room temperature).

Historically these thermocouples have been the basis of high temperature in spite of their high cost and their low thermoelectric power. Until the launching of the Nicrosil-Nisil thermocouples, type N, they remained the sole option for good thermoelectric stability.

Length of cable runs and loop resistance.

The resistivity of extension and compensating cables varies according to the different conductor metals; the limit to cable lengths which can be accommodated by measuring instruments therefore depends on both the thermocouple type and instrument specifications. A general rule for electronic instruments is that up to 100 Ohms loop cable resistance (i.e. total of both legs) will not result in measurement errors.

Interference and Isolation.

With long runs, the cables may need to be screened and earthed at one end (at the instrument) to minimise noise pick-up (interference) on the measuring circuit.

Alternative types of screened cable construction are available and these include the use of copper or mylar screening. Twisted pair configurations are offered and these can incorporate screening as required.

With mineral-insulated cables the use of the sheath for screening may raise problems. In certain forms the measuring point is welded to the sheath in order to reduce the response time; the screen is then connected directly to the sensor input of the instrument and is therefore ineffective. In thermocouples where the measuring point is welded to the protection tube it may be necessary to take special precautions against interference since the sheath tube can in this case act as an aerial.

Even if the measuring point is not welded to the protection tube it is inadvisable to use the sheath of a mineral-insulated thermocouple as a screen. Since it consists of non-insulated material there is a possibility with electrically heated furnaces that it can carry currents between the furnace material and the earthing point. These may result in measurement errors.

Generally, thermocouples in electrical contact with the protection tube can easily suffer interference from external voltages through voltage pick-up. In addition, two such inputs form a current loop through which the two inputs are connected together. Since such current loops form a preferred path for the introduction of interference, thermocouples should under these conditions always be isolated from each other, i.e. the amplifier circuits must have no electrical connection to the remaining electronics. This is already provided on most instruments intended for connection to thermocouples.

Ceramic materials used for insulating the thermocouples inside the protection tube suffer a definite loss of insulation resistance above 800 to 1000°C. The effects described can therefore appear at high temperatures even in thermocouples where the measuring junction is not welded to the protection tube. Here again full isolation is strongly recommended.

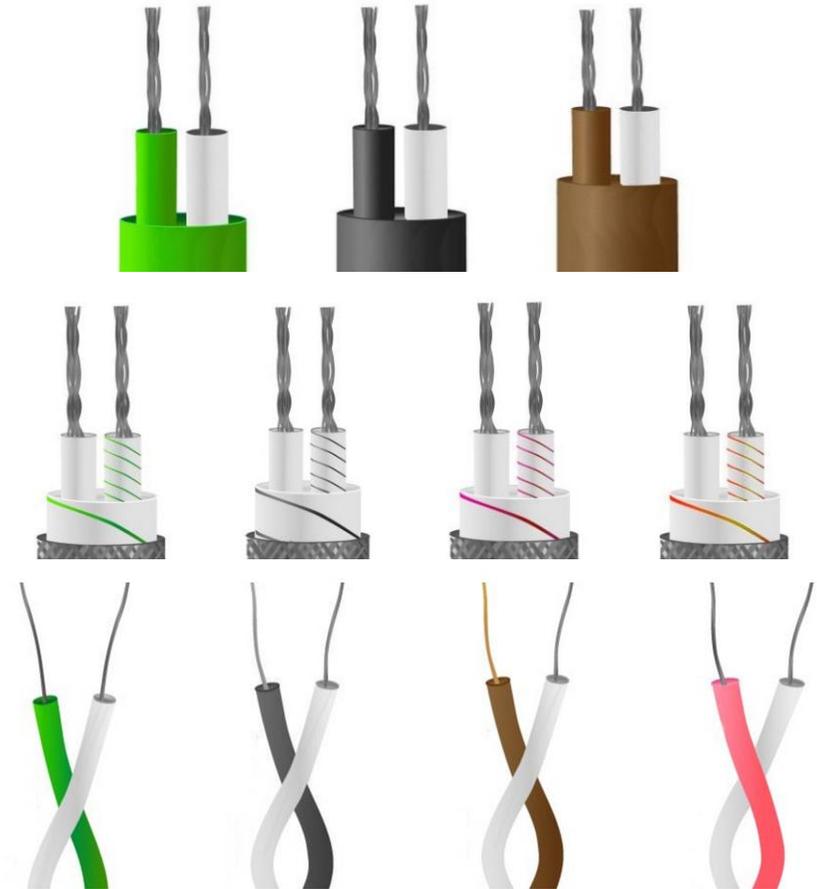
With electrically heated furnaces in the high-temperature range it is also necessary to consider that the increased conductivity of the ceramic insulating materials may cause the supply voltage to leak into the thermocouple. Here again full isolation against supply and earth potential with an insulating voltage exceeding the peak voltage of the supply (heater voltage) is essential.

IEC (European) Colour Coded Thermocouple Cable / Wire

A range of IEC colour coded thermocouple cables / wire to suit various applications.

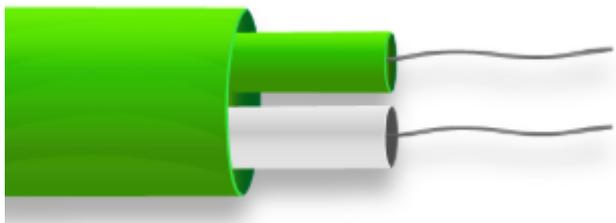
The range consists of the following thermocouple cables:

- **PVC**
- **PFA**
- **PTFE**
- **Glassfibre**
- **Retractable curly leads**



PFA Insulated Thermocouple Cable / Wire IEC

High quality, PFA insulated thermocouple extension cables. PFA insulation is extruded.



PFA Flat Pair Thermocouple Cable / Wire IEC

PFA Insulated Flat Pair Thermocouple Cable / Wire - Laid flat, side by side & PFA sheathed. Tolerance class 1.



PFA Twin Twisted Pair Thermocouple Cable / Wire IEC

PFA Insulated, Twin Twisted Pair Thermocouple Cable / Wire - Single twisted pair Insulation rating -75 to 260°C.

Type K



Type J



Type T



Type N



Type E



Type	Code	Insulation	Conductors	Jacket	10 Metre Reel	25 Metre Reel	50 Metre Reel	100 Metre Reel
					Order Code	Order Code	Order Code	Order Code
K	IEC	PFA	1/0.3mm	Green	XE-2133-010	XE-2133-025	XE-2133-050	XE-2133-100
K	IEC	PFA	1/0.508mm	Green	XE-2519-010	XE-2519-025	XE-2519-050	XE-2519-100
K	IEC	PFA	7/0.2mm	Green	XE-2135-010	XE-2135-025	XE-2135-050	XE-2135-100
J	IEC	PFA	7/0.2mm	Black	XE-2235-010	XE-2235-025	XE-2235-050	XE-2235-100
T	IEC	PFA	1/0.315	Brown	XE-2334-010	XE-2334-025	XE-2334-050	XE-2334-100
T	IEC	PFA	1/0.5mm	Brown	XE-2535-010	XE-2535-025	XE-2535-050	XE-2535-100
T	IEC	PFA	7/0.2mm	Brown	XE-2335-010	XE-2335-025	XE-2335-050	XE-2335-100
N	IEC	PFA	7/0.2mm	Pink	XE-2435-010	XE-2435-025	XE-2435-050	XE-2435-100
E	IEC	PFA	7/0.2mm	Purple	XE-2440-010	XE-2440-025	XE-2440-050	XE-2440-100

Don't forget your Micro-Precision Wire Strippers! Click below to add to your basket.

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Type K



Type J



Type T



Type N



Type	Code	Insulation	Conductors	Jacket	10 Metre Reel	25 Metre Reel	50 Metre Reel	100 Metre Reel
					Order Code	Order Code	Order Code	Order Code
K	IEC	PFA	1/0.2mm	Green / White	XE-2122-010	XE-2122-025	XE-2122-050	XE-2122-100
K	IEC	PFA	1/0.3mm	Green / White	XE-2515-010	XE-2515-025	XE-2515-050	XE-2515-100
K	IEC	PFA	1/0.508mm	Green / White	XE-2516-010	XE-2516-025	XE-2516-050	XE-2516-100
K	IEC	PFA	7/0.2mm	Green / White	XE-2125-010	XE-2125-025	XE-2125-050	XE-2125-100
J	IEC	PFA	1/0.2mm	Black / White	XE-2509-010	XE-2509-025	XE-2509-050	XE-2509-100
J	IEC	PFA	1/0.3mm	Black / White	XE-2510-010	XE-2510-025	XE-2510-050	XE-2510-100
J	IEC	PFA	1/0.508mm	Black / White	XE-2511-010	XE-2511-025	XE-2511-050	XE-2511-100
T	IEC	PFA	1/0.2mm	Brown / White	XE-2322-010	XE-2322-025	XE-2322-050	XE-2322-100
T	IEC	PFA	1/0.3mm	Brown / White	XE-2533-010	XE-2533-025	XE-2533-050	XE-2533-100
T	IEC	PFA	1/0.508mm	Brown / White	XE-2530-010	XE-2530-025	XE-2530-050	XE-2530-100
T	IEC	PFA	7/0.2mm	Brown / White	XE-2534-010	XE-2534-025	XE-2534-050	XE-2534-100
N	IEC	PFA	1/0.2mm	Pink / White	XE-2422-010	XE-2422-025	XE-2422-050	XE-2422-100



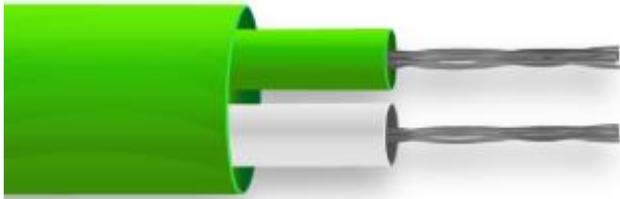
Don't forget your Thermocouple Connectors!

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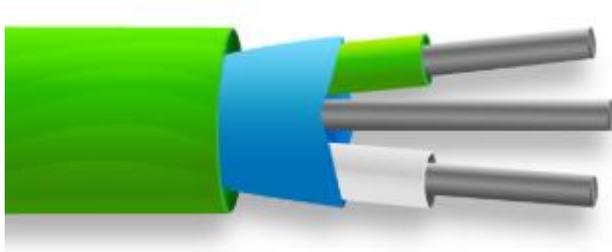
PVC Insulated Thermocouple Cable / Wire IEC

Superior quality, PVC insulated thermocouple extension and compensating cables



PVC Flat Pair Thermocouple Cable / Wire IEC

PVC Insulated Flat Pair Thermocouple Cable - Single pair PVC insulated thermocouple cable / wire.



PVC Mylar Screened Thermocouple Cable / Wire IEC

PVC Insulated, Mylar Screened Thermocouple Cable / Wire - PVC insulated twisted cores. Mylar tape screen with bare copper drain wire.



Type	Code	Insulation	Conductors	Jacket	10 Metre Reel	25 Metre Reel	50 Metre Reel	100 Metre Reel
					Order Code	Order Code	Order Code	Order Code
K	IEC	PVC	7/0.2mm	Green	XE-2100-010	XE-2100-025	XE-2100-050	XE-2100-100
J	IEC	PVC	7/0.2mm	Black	XE-2200-010	XE-2200-025	XE-2200-050	XE-2200-100
T	IEC	PVC	7/0.2mm	Brown	XE-2300-010	XE-2300-025	XE-2300-050	XE-2300-100
T	IEC	PVC	13/0.2mm	Brown	XE-2303-010	XE-2303-025	XE-2303-050	-
N	IEC	PVC	7/0.2mm	Pink	XE-2400-010	XE-2400-025	XE-2400-050	XE-2400-100
E	IEC	PVC	7/0.2mm	Violet	XE-2554-010	XE-2554-025	XE-2554-050	XE-2554-100
U (RCA)	IEC	PVC	7/0.2mm	Orange	XE-2500-010	XE-2500-025	XE-2500-050	-
U (RCA)	IEC	PVC	13/0.2mm	Orange	XE-2503-010	XE-2503-025	XE-2503-050	XE-2503-100
Vx (KCB)	IEC	PVC	7/0.2mm	Green	XE-2550-010	XE-2550-025	XE-2550-050	XE-2550-100
Vx (KCB)	IEC	PVC	13/0.2mm	Green	XE-2553-010	XE-2553-025	XE-2553-050	XE-2553-100



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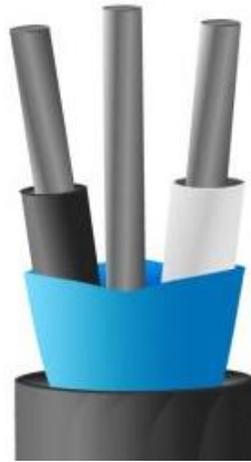
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Type K



Type J



Type T



Type VX (KCB)



Type	Code	Insulation	Conductors	Jacket	10 Metre Reel	25 Metre Reel	50 Metre Reel	100 Metre Reel
					Order Code	Order Code	Order Code	Order Code
K	IEC	PVC	7/0.2mm	Green	XE-2112-010	XE-2112-025	XE-2112-050	XE-2112-100
J	IEC	PVC	7/0.2mm	Black	XE-2212-010	XE-2212-025	XE-2212-050	XE-2212-100
T	IEC	PVC	7/0.2mm	Brown	XE-2213-010	XE-2213-025	XE-2213-050	XE-2213-100
Vx (KCB)	IEC	PVC	13/0.2mm	Green	XE-2562-010	XE-2562-025	XE-2562-050	XE-2562-100



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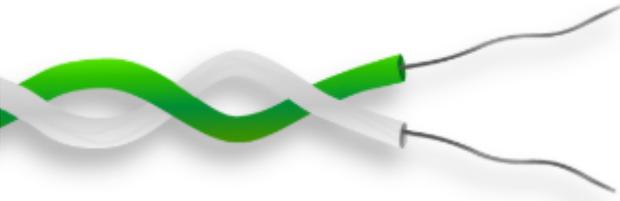
PTFE Insulated Thermocouple Cable / Wire IEC

High quality, PTFE insulated thermocouple extension cables, PTFE is wrapped.



PTFE Flat Pair Thermocouple Cable / Wire IEC

PTFE Insulated Flat Pair Thermocouple Cable / Wire - Laid flat, side by side & PTFE sheathed, Insulation rating -75 to 260°C.



PTFE Twin Twisted Pair Thermocouple Cable / Wire IEC

PTFE Insulated, Twin Twisted Pair Thermocouple Cable / Wire - Tolerance class 1 Insulation rating -75 to 260°C.



PTFE Single Shot Thermocouple Cable

Unique single shot cable construction Resistant to chemicals, oils and fluids. Suitable for aerospace applications and is widely used in autoclaves.

Type K



Type J



Type T



Type	Code	Insulation	Conductors	Jacket	10 Metre Reel	25 Metre Reel	50 Metre Reel	100 Metre Reel
					Order Code	Order Code	Order Code	Order Code
K	IEC	PTFE	1/0.315mm	Green	XE-2517-010	XE-2517-025	XE-2517-050	XE-2517-100
K	IEC	PTFE	7/0.2mm	Green	XE-2155-010	XE-2155-025	XE-2155-050	XE-2155-100
J	IEC	PTFE	7/0.2mm	Black	XE-2255-010	XE-2255-025	XE-2255-050	XE-2255-100
T	IEC	PTFE	1/0.315mm	Brown	XE-2353-010	XE-2353-025	XE-2353-050	XE-2353-100
T	IEC	PTFE	1/0.508mm	Brown	XE-2528-010	XE-2528-025	XE-2528-050	XE-2528-100
T	IEC	PTFE	7/0.2mm	Brown	XE-2355-010	XE-2355-025	XE-2355-050	XE-2355-100

Need to make your own thermocouples?

Click below to view the L60+ Thermocouple & Fine Wire Welder.

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Type K



Type J



Type T



Type N



Type	Code	Insulation	Conductors	Jacket	10 Metre Reel	25 Metre Reel	50 Metre Reel	100 Metre Reel
					Order Code	Order Code	Order Code	Order Code
K	IEC	PTFE	1/0.2mm	Green / White	XE-2142-010	XE-2142-025	XE-2142-050	XE-2142-100
K	IEC	PTFE	1/0.315mm	Green / White	XE-2513-010	XE-2513-025	XE-2513-050	XE-2513-100
K	IEC	PTFE	1/0.508mm	Green / White	XE-2514-010	XE-2514-025	XE-2514-050	XE-2514-100
K	IEC	PTFE	7/0.2mm	Green / White	XE-2518-010	XE-2518-025	XE-2518-050	XE-2518-100
J	IEC	PTFE	1/0.2mm	Black / White	XE-2242-010	XE-2242-025	XE-2242-050	XE-2242-100
J	IEC	PTFE	1/0.315mm	Black / White	XE-2507-010	XE-2507-025	XE-2507-050	XE-2507-100
J	IEC	PTFE	1/0.508mm	Black / White	XE-2508-010	XE-2508-025	XE-2508-050	XE-2508-100
J	IEC	PTFE	7/0.2mm	Black / White	XE-2506-010	XE-2506-025	XE-2506-050	XE-2506-100
T	IEC	PTFE	1/0.2mm	Brown / White	XE-2342-010	XE-2342-025	XE-2342-050	XE-2342-100
T	IEC	PTFE	1/0.315mm	Brown / White	XE-2529-010	XE-2529-025	XE-2529-050	XE-2529-100
T	IEC	PTFE	7/0.2mm	Brown / White	XE-2532-010	XE-2532-025	XE-2532-050	XE-2532-100
N	IEC	PTFE	1/0.2mm	Pink / White	XE-2442-010	XE-2442-025	XE-2442-050	XE-2442-100
N	IEC	PTFE	7/0.2mm	Pink / White	XE-2525-010	XE-2525-025	XE-2525-050	XE-2525-100



Don't forget your Micro-Precision Wire Strippers! Click below to add to your basket.

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Type K



Type T



Type	Code	Insulation	Conductors	Jacket	10 Metre Reel	25 Metre Reel	50 Metre Reel	100 Metre Reel
					Order Code	Order Code	Order Code	Order Code
K	IEC	PTFE	1/0.376mm	Green / White	XE-2144-010	XE-2144-025	XE-2144-050	XE-2144-100
T	IEC	PTFE	1/0.376mm	Brown / White	XE-2145-010	XE-2145-025	XE-2145-050	XE-2145-100



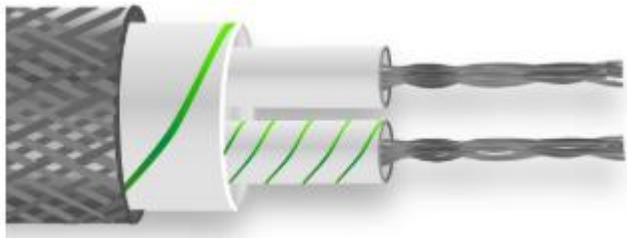
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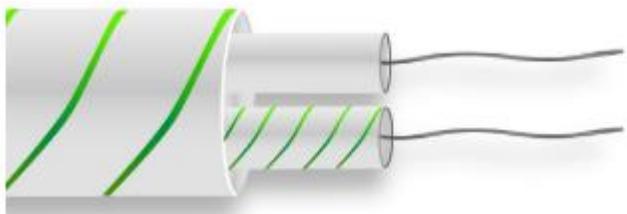
Glassfibre Insulated Thermocouple Cable / Wire IEC

Glassfibre Insulated Thermocouple Cables - Superior silicone varnished glassfibre insulated thermocouple extension cables. Optional stainless steel overbraiding adds mechanical protection and screening.



Glassfibre Flat Pair with Stainless Steel Overbraid Thermocouple Cable / Wire IEC

Glassfibre Insulated Flat Pair Cable / Wire & Stainless Steel Overbraid - Impregnated with silicone varnish, Stainless steel braided overall.



Glassfibre Flat Pair Thermocouple Cable / Wire IEC

Glassfibre Insulated Flat Pair Cable / Wire - Laid flat, side by side and glassfibre braided overall.

Type K



Type J



Type N



Type U



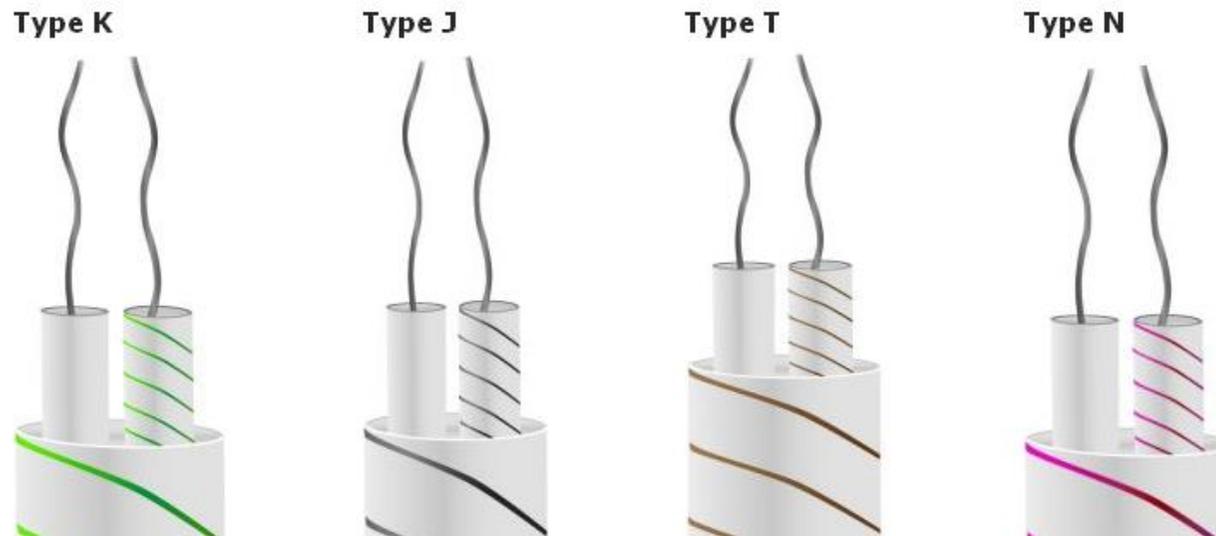
Type	Code	Insulation	Conductors	Colour	10 Metre Reel	25 Metre Reel	50 Metre Reel	100 Metre Reel
					Order Code	Order Code	Order Code	Order Code
K	IEC	Glassfibre with Stainless Steel Overbraid	7/0.2mm	Green / White	XE-2175-010	XE-2175-025	XE-2175-050	XE-2175-100
J	IEC	Glassfibre with Stainless Steel Overbraid	7/0.2mm	Black / White	XE-2275-010	XE-2275-025	XE-2275-050	XE-2275-100
N	IEC	Glassfibre with Stainless Steel Overbraid	7/0.2mm	Pink / White	XE-2526-010	XE-2526-025	XE-2526-050	XE-2526-100
U	IEC	Glassfibre with Stainless Steel Overbraid	7/0.2mm	Orange / White	XE-2536-010	XE-2536-025	XE-2536-050	XE-2536-100

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Type	Code	Insulation	Conductors	Colour	10 Metre Reel	25 Metre Reel	50 Metre Reel	100 Metre Reel
					Order Code	Order Code	Order Code	Order Code
K	IEC	Glassfibre	1/0.2mm	Green / White	XE-2522-010	XE-2522-025	XE-2522-050	XE-2522-100
K	IEC	Glassfibre	1/0.315mm	Green / White	XE-2163-010	XE-2163-025	XE-2163-050	XE-2163-100
K	IEC	Glassfibre	1/0.508mm	Green / White	XE-2520-010	XE-2520-025	XE-2520-050	XE-2520-100
K	IEC	Glassfibre	7/0.2mm	Green / White	XE-2521-010	XE-2521-025	XE-2521-050	XE-2521-100
J	IEC	Glassfibre	1/0.2mm	Black / White	XE-2504-010	XE-2504-025	XE-2504-050	XE-2504-100
J	IEC	Glassfibre	1/0.315mm	Black / White	XE-2263-010	XE-2263-025	XE-2263-050	XE-2263-100
J	IEC	Glassfibre	7/0.2mm	Black / White	XE-2265-010	XE-2265-025	XE-2265-050	XE-2265-100
T	IEC	Glassfibre	1/0.315mm	Brown / White	XE-2363-010	XE-2363-025	XE-2363-050	XE-2363-100
N	IEC	Glassfibre	1/0.315mm	Pink / White	XE-2524-010	XE-2524-025	XE-2524-050	XE-2524-100



Don't forget your Thermocouple Connectors!

Click below to add to your basket.

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Retractable Curly Leads IEC

Polyurethane outer, 2 Metres in length when fully extended and Terminated with a fitted miniature plug



Retractable Curly Leads IEC

Retractable Curly Thermocouple Leads with Polyurethane outer. Available in type K or T. Terminated with a fitted miniature thermocouple plug. Colour coded to IEC.

Type K



Type T



Type	Code	Cable Type	Termination	Jacket	2 Metre Length
					Order Code
K	IEC	Polyurethane outer	Miniature Thermocouple Plug	Green	XE-7030-001
T	IEC	Polyurethane outer	Miniature Thermocouple Plug	Brown	XE-7033-001



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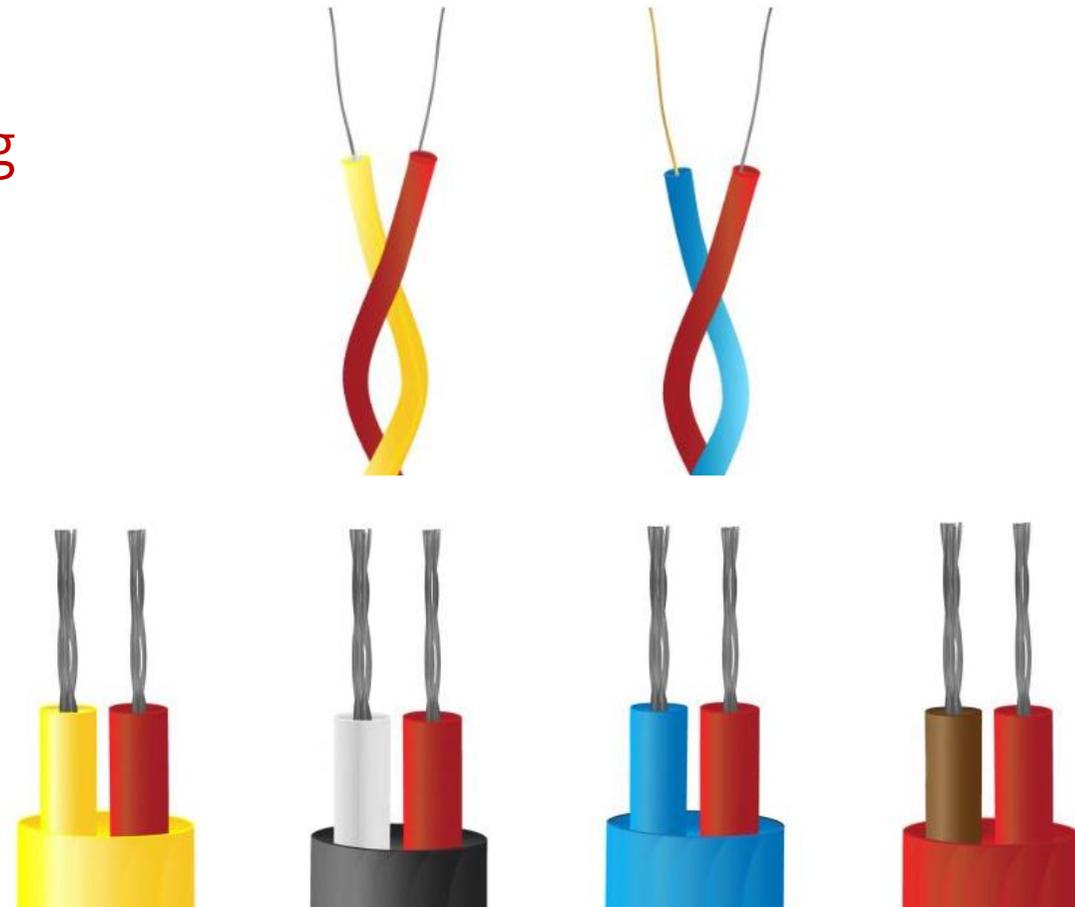


ANSI (USA) Colour Coded Thermocouple Cable / Wire

A range of ANSI colour coded thermocouple cables / wire to suit various applications.

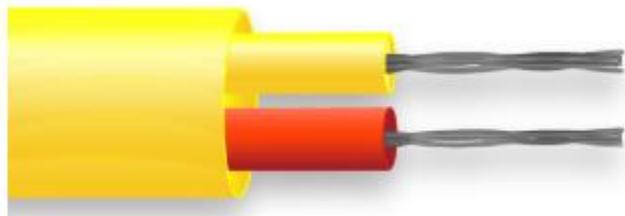
The range consists of the following thermocouple cables:

- PVC
- PFA
- Glassfibre
- Retractable curly leads



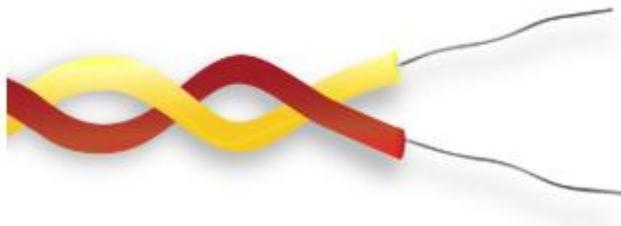
PFA Insulated Thermocouple Cable / Wire ANSI

High quality, PFA insulated thermocouple extension cables. PFA insulation is extruded.



PFA Flat Pair Thermocouple Cable / Wire ANSI

PFA Insulated Flat Pair Thermocouple Cable / Wire - Laid flat, side by side & PFA sheathed. Tolerance class 1.



PFA Twin Twisted Pair Thermocouple Cable / Wire ANSI

PFA Insulated, Twin Twisted Pair Thermocouple Cable / Wire - Single twisted pair Insulation rating -75 to 260°C.

Type K



Type	Code	Insulation	Conductors	Jacket	10 Metre Reel	25 Metre Reel	50 Metre Reel	100 Metre Reel
					Order Code	Order Code	Order Code	Order Code
K	ANSI	PFA	7/0.2mm	Yellow	XE-2800-010	XE-2800-025	XE-2800-050	XE-2800-100



Don't forget your Micro-Precision Wire Strippers! Click below to add to your basket.

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Type K



Type T



Type	Code	Insulation	Conductors	Jacket	10 Metre Reel	25 Metre Reel	50 Metre Reel	100 Metre Reel
					Order Code	Order Code	Order Code	Order Code
K	ANSI	PFA	1/0.2mm	Yellow / Red	XE-2802-010	XE-2802-025	XE-2802-050	XE-2802-100
K	ANSI	PFA	1/0.3mm	Yellow / Red	XE-2801-010	XE-2801-025	XE-2801-050	XE-2801-100
K	ANSI	PFA	7/0.2mm	Yellow / Red	-	XE-2803-025	XE-2803-050	XE-2803-100
T	ANSI	PFA	1/0.2mm	Blue / Red	XE-2805-010	XE-2805-025	XE-2805-050	XE-2805-100
T	ANSI	PFA	1/0.3mm	Blue / Red	XE-2804-010	XE-2804-025	XE-2804-050	XE-2804-100

Need to make your own thermocouples?

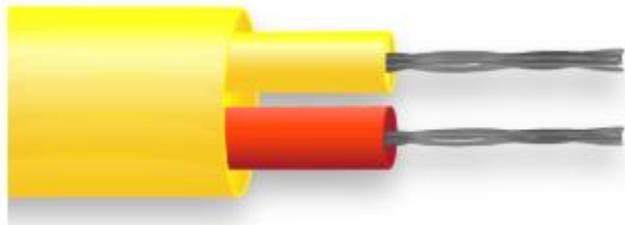
Click below to view the L60+ Thermocouple & Fine Wire Welder.

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PVC Insulated Thermocouple Cable / Wire ANSI

Superior quality, PVC insulated thermocouple extension and compensating cables



PVC Flat Pair Thermocouple Cable / Wire ANSI

PVC Insulated Flat Pair Thermocouple Cable - Single pair PVC insulated thermocouple cable / wire.



PVC Mylar Screened Thermocouple Cable / Wire ANSI

PVC Insulated, Mylar Screened Thermocouple Cable / Wire - PVC insulated twisted cores. Mylar tape screen with bare copper drain wire.

Type K



Type J



Type T



Type Vx



Type	Code	Insulation	Conductors	Jacket	10 Metre Reel	25 Metre Reel	50 Metre Reel	100 Metre Reel
					Order Code	Order Code	Order Code	Order Code
K	ANSI	PVC	7/0.2mm	Yellow	XE-2807-010	XE-2807-025	XE-2807-050	XE-2807-100
J	ANSI	PVC	7/0.2mm	Black	XE-2806-010	XE-2806-025	XE-2806-050	XE-2806-100
T	ANSI	PVC	7/0.2mm	Blue	XE-2808-010	XE-2808-025	XE-2808-050	XE-2808-100
Vx	ANSI	PVC	7/0.2mm	Red	XE-2809-010	XE-2809-025	XE-2809-050	XE-2809-100



Don't forget your Thermocouple Connectors!

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Type K



Type J



Type	Code	Insulation	Conductors	Jacket	10 Metre Reel	25 Metre Reel	50 Metre Reel	100 Metre Reel
					Order Code	Order Code	Order Code	Order Code
K	ANSI	PVC	7/0.2mm	Yellow	XE-2811-010	XE-2811-025	XE-2811-050	XE-2811-100
J	ANSI	PVC	7/0.2mm	Black	XE-2810-010	XE-2810-025	XE-2810-050	XE-2810-100



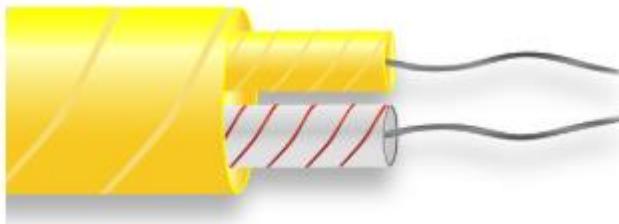
Don't forget your Micro-Precision Wire Strippers! Click below to add to your basket.

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Glassfibre Insulated Thermocouple Cable / Wire ANSI

Glassfibre Insulated Thermocouple Cables - Superior silicone varnished glassfibre insulated thermocouple extension cables. Optional stainless steel overbraiding adds mechanical protection and screening.



Glassfibre Flat Pair Thermocouple Cable / Wire ANSI

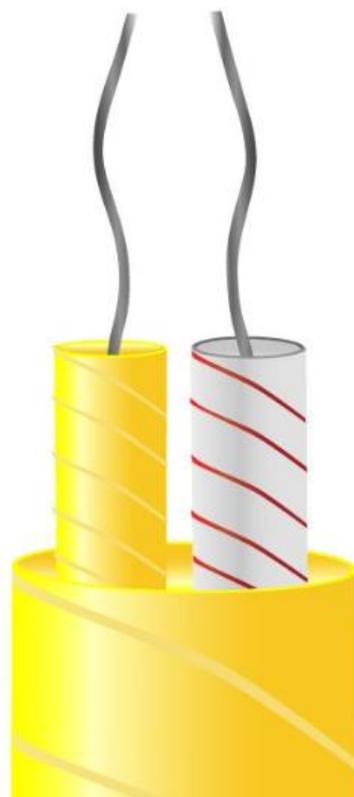
Glassfibre Insulated Flat Pair Cable / Wire - Laid flat, side by side and glassfibre braided overall.



High Temperature Glassfibre Twin Twisted Thermocouple Cable / Wire ANSI

Glassfibre insulated twisted pair - High temperature, Cores Twisted Together, 1/0.711mm Conductor Wire Size.

Type K Glassfibre



Type K High Temperature Glassfibre



Type	Code	Insulation	Conductors	Jacket	10 Metre Reel	25 Metre Reel	50 Metre Reel	100 Metre Reel
					Order Code	Order Code	Order Code	Order Code
K	ANSI	Glassfibre	1/0.315mm	Yellow	XE-2799-010	XE-2799-025	XE-2799-050	XE-2799-100
K	ANSI	High Temperature Glassfibre	1/0.711mm	Yellow / Red	-	-	-	XE-2812-100



Don't forget your Thermocouple Connectors!

Click below to add to your basket.

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Retractable Curly Leads ANSI

Polyurethane outer, 2 Metres in length when fully extended and Terminated with a fitted miniature plug



Retractable Curly Leads ANSI

Retractable Curly Thermocouple Leads with Polyurethane outer. Available in type K or T. Terminated with a fitted miniature thermocouple plug. Colour coded to ANSI.

Type K



Type T



Type	Code	Cable Type	Termination	Jacket	2 Metre Length
					Order Code
K	ANSI	Polyurethane outer	Miniature Thermocouple Plug	Yellow	XE-7031-001
T	ANSI	Polyurethane outer	Miniature Thermocouple Plug	Blue	XE-7034-001



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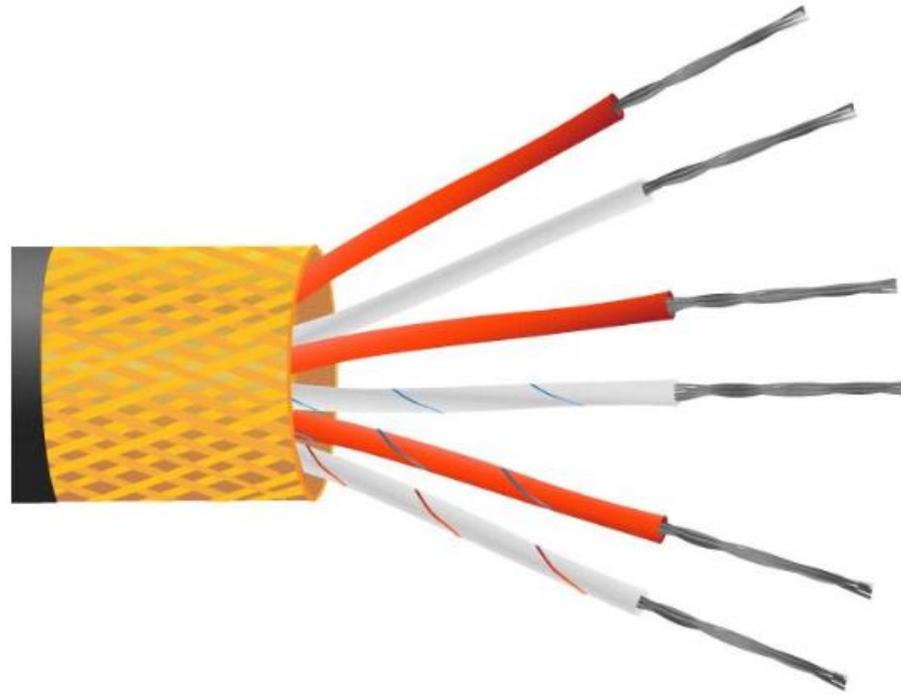
PRT Sensor Cable / Wire

A range of PRT sensor cables / wire to suit various applications.

The range consists of the following Cable types:

- **PVC**
- **PFA**
- **PTFE**
- **Silicone Rubber**
- **Retractable curly leads**





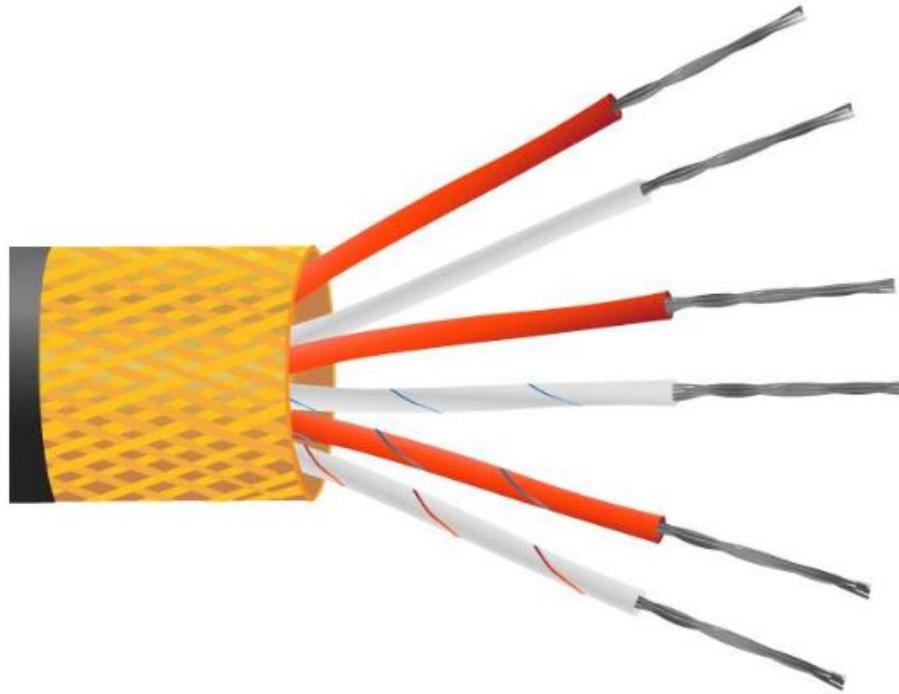
Type	Cores	Insulation	Conductors	10 Metre Reel	25 Metre Reel	50 Metre Reel	100 Metre Reel
				Order Code	Order Code	Order Code	Order Code
PRT	4	PTFE Insulated, Silver Plated Copper Screen	7/0.2mm	XE-2757-010	XE-2757-025	-	-



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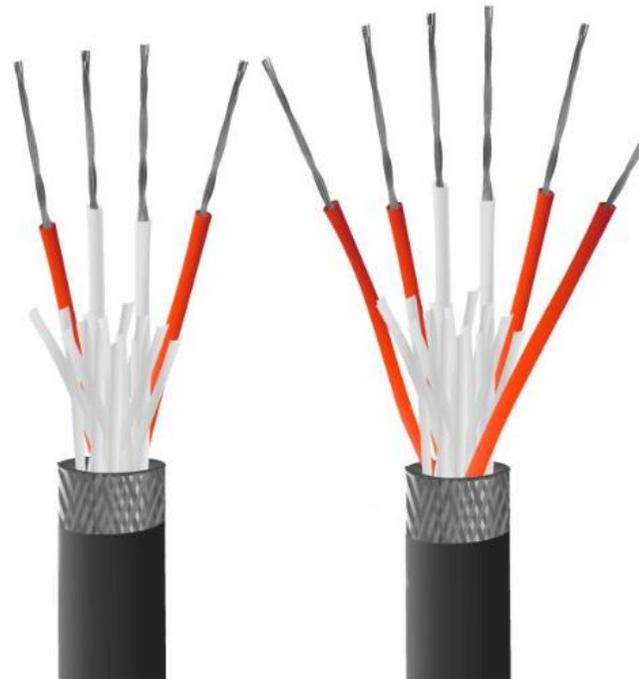
Type	Cores	Insulation	Conductors	10 Metre Reel	25 Metre Reel	50 Metre Reel	100 Metre Reel
				Order Code	Order Code	Order Code	Order Code
PRT	4	PVC Insulated, Tin Plated Copper Screen	7/0.2mm	XE-2714-010	XE-2714-025	XE-2714-050	-

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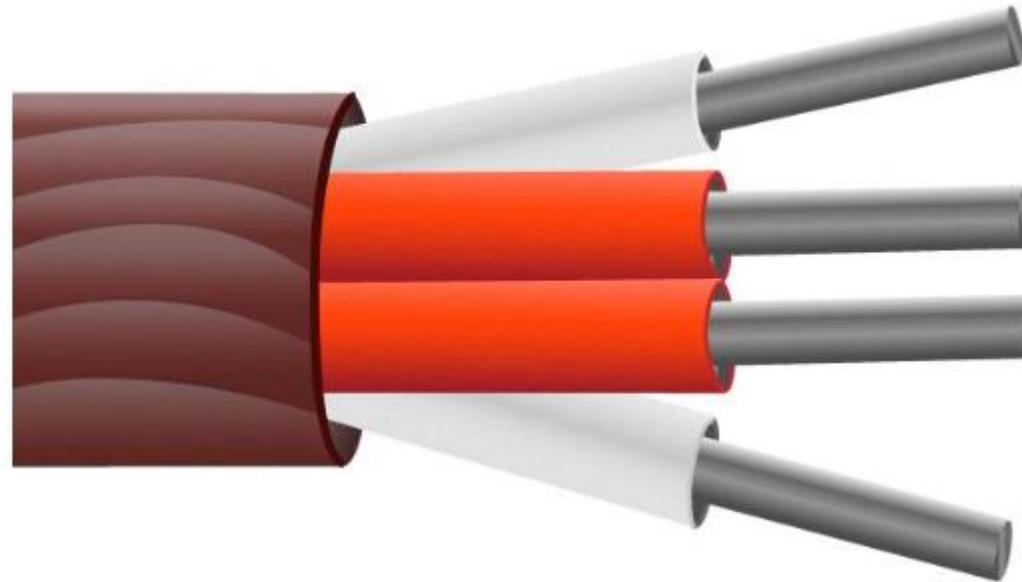
Type	Cores	Insulation	Conductors	10 Metre Reel	25 Metre Reel	50 Metre Reel	100 Metre Reel
				Order Code	Order Code	Order Code	Order Code
PRT	3	PFA Insulated, Tin Plated Copper Screen	7/0.2mm	XE-2735-010	XE-2735-025	XE-2735-050	XE-2735-100
PRT	4	PFA Insulated, Tin Plated Copper Screen	7/0.2mm	XE-2734-010	XE-2734-025	XE-2734-050	XE-2734-100
PRT	6	PFA Insulated, Tin Plated Copper Screen	7/0.2mm	XE-2736-010	XE-2736-025	XE-2736-050	-



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Type	Cores	Insulation	Conductors	10 Metre Reel	25 Metre Reel	50 Metre Reel	100 Metre Reel
				Order Code	Order Code	Order Code	Order Code
PRT	4	silicone rubber insulated	7/0.2mm	XE-2798-010	XE-2798-050	-	-



Don't forget your Micro-Precision Wire Strippers! Click below to add to your basket.

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Retractable Curly Leads PRT

Polyurethane outer, 2 or 5 Metres in length when fully extended and terminated with bare tails



Retractable Curly Leads PRT

Retractable Curly Leads with Polyurethane outer. Terminated with bare tails.

2 or 4 cores.



Type	Cores	Cable Type	Termination	Jacket	2 Metre Length	5 Metre Length
					Order Code	Order Code
PRT	2	Polyurethane outer	Bare Tails	Black	-	XE-7048-001
PRT	4	Polyurethane outer	Bare Tails	Black	XE-7029-001	-

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The L60+ Thermocouple & Fine Wire Welder, **manufactured by Labfacility**, is a compact, simple-to-use instrument designed for thermocouple and fine wire welding.

It is primarily designed for use by sensor manufacturers to produce commercial grade thermocouple junctions; it is ideal for producing large numbers of exposed junction thermocouples for test and development laboratories. The L60 Thermocouple Welder is ideally suited to transducer and RTD extension lead attachment.

Use of the Thermocouple Welder does not require special skills and most operatives will be capable of producing quality work with little practice. The instrument is supplied with a full range of user accessories including a footswitch.

Suitable for use with wires of up to 1.1mm diameter an argon gas shield facility is included but a satisfactory thermocouple junction is produced without the need for argon. The output energy of the L60 Thermocouple Welder can be varied up to 60 Joules.

- Simple to use Thermocouple Welder
- Designed to produce commercial grade thermocouple junctions
- Also suitable for other fine wire work
- Front panel or footswitch operation
- Argon gas shield facility



Order Code

XE-6101-001

Don't forget your Micro-Precision Wire Strippers! Click below to add to your basket.

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Jokari 40024 PWS-PLUS 001 Micro-Precision Wire Stripper



This tool is a quality Product made in Germany by JOKARI. The JOKARI-Krampe GMBH is a leading producer of cable stripping and de-insulating technology. JOKARI produce since more than 40 years specialist tools for a wide range of applications that allow simple, fast, and precise cable stripping. JOKARI provides specialist solutions for stripping electronic, data and network, solar and flat cables.

Micro-strippers strip delicate wires or stranded cables quickly and precisely. In building services, such as the installation of intercom or telecommunications equipment, special tools are required in order not to damage the fine conductors by stripping. JOKARI's micro-precisions wire strippers offer the special solution for fast, safe and precise stripping of delicate wires and strands.

The PWS-PLUS 001 is for stripping electronic, telecommunications and modelling purposes. With adjustable length stopper and integrated cutter for cable diameters of up to 0.8 mm Ø.

The tool has a lightweight design and is Ideal for PVC, TEFLON, KYNAR, TEFLON, MYLAR cables with diameters AWG 36, 34, 32, 30, 28, 26 (0.12, 0.16, 0.20, 0.25, 0.30, 0.40mm Ø).

FEATURES

- With adjustable length stopper, Integrated cutter for wires up to AWG20
- Working range AWG 36, 34, 32, 30, 28, 26 (0.12, 0.16, 0.20, 0.25, 0.30, 0.40mm Ø), blade exchangeable
- TÜV / GS approved
- For stripping electronic, telecommunications and modelling purposes

Order Code

XE-6126-001

TYPE	CONDUCTORS +/-	◀ FORMER STANDARD ▶				Cable Code
		BRITISH BS1843:1952	AMERICAN ANSI/MC 961	GERMAN DIN 43713/43714	IEC 60584-3(2007) BS EN60584-3(2008)	
EX	NICKEL CHROMIUM/CONSTANTAN (Nickel/Chromium/Copper Nickel, Chrome/Constantan, T1 Advance, NiCr/Constantan)					EX
J	IRON*/CONSTANTAN (Iron/Copper Nickel, FE/Konst Iron/Advance, FE Constantan I/C)					JX
K	NICKEL CHROMIUM/ NICKEL ALUMINIUM* (NC/NA, Chromel /Alumel), C/A, T1/T2, NiCr/Ni, NiCr, NiAL)					KX
N	NICROSIL/NISIL					NX NC
T	COPPER CONSTANTAN (Copper/Copper Nickel, Cu/Con, Copper Advance)					TX
Vx	COPPER CONSTANTAN (LOW NICKEL) (Cu/Constantan) Compensating for K (Cu/Constantan)					KCB
U	COPPER/COPPER NICKEL Compensating for Platinum 10% or 13% Rhodium/Platinum (codes 'S' and 'R' respectively) (Copper/Cupronic Cu/CuNi, Copper/No.11 Alloy)					RCA SCA

* Magnetic

FOR THERMOCOUPLE CONNECTORS body colours are similar to outer sheath colours

The Temperature Handbook - A comprehensive guide to Temperature Measurement by Labfacility



The Labfacility Temperature Handbook is a comprehensive text for users of thermocouples, PRTs and thermistors and associated instrumentation. Detailed enough for engineers it is also suitable for technicians and students. Written with a practical bias, the handbook contains considerable reference data and basic theory and is therefore of great value as a training aid for those entering the field of temperature measurement and control.

The handy A5 size book contains 140 pages, 40 of them being reference data and uses 65 illustrations. The current revised thermocouple and Pt100 tables based on ITS90 are featured and the new IEC colour codes for thermocouple insulations are included in full colour in addition to the former ANSI, DIN and BS codes.

The broadened scope of the handbook includes detailed temperature sensor selection guidance, sensor theory and practice and comprehensive applications guidance. Practical aspects treated in depth include thermocouple installation and application, alternative thermocouple types and construction, accuracy and response and interconnection configurations; thermistors; sheath materials and thermowells for the different sensors and temperature calibration.

Additional enhanced chapters describe temperature control, transmitters and instrumentation. The 40 page reference section carries comprehensive data on thermocouple and platinum resistance thermometry, thermocouple and PRT tables, general thermometry data and other reference information including °C/°F conversion tables, fixed points and specification standards.

An installation problem solving guide, comprehensive 9 page glossary of terms and "Frequently Asked Questions" add to the practical value of the text for laboratory and industrial users.

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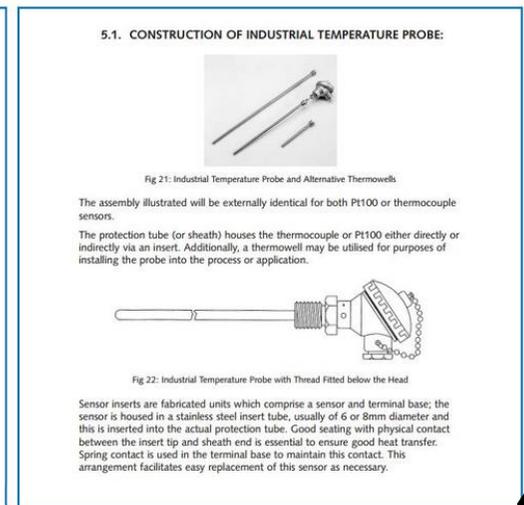
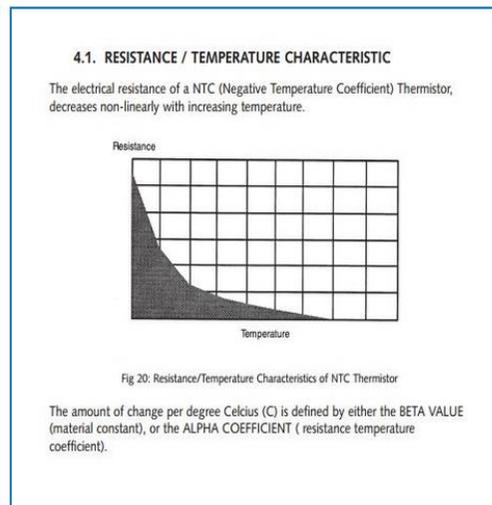
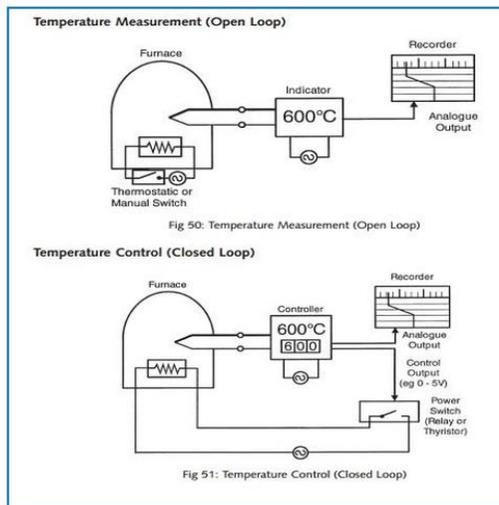
9.1 THERMOCOUPLE THERMOMETRY

9.1.1. Thermocouple Accuracies

Tolerance classes for thermocouples to IEC 584-2 : 1982.

Fe-Con (J)	Class 1	-40 +750°C: ±0.004 . t	or ±1.5°C
	Class 2	-40 +750°C: ±0.0075 . t	or ±2.5°C
	Class 3	-	-
Cu-Con (T)	Class 1	-40 +350°C: ±0.004 . t	or ±0.5°C
	Class 2	-40 +350°C: ±0.0075 . t	or ±1.0°C
	Class 3	-200 + 40°C: ±0.015 . t	or ±1.0°C
NiCr -Ni (K) and NiCrSi-NiSi (N)	Class 1	-40 +1000°C: ±0.004 . t	or ±1.5°C
	Class 2	-40 +1200°C: ±0.0075 . t	or ±2.5°C
	Class 3	-200 + 40°C: ±0.015 . t	or ±2.5°C
NiCr-Con (E)	Class 1	-40 +800°C: ±0.004 . t	or ±1.5°C
	Class 2	-40 +900°C: ±0.0075 . t	or ±2.5°C
	Class 3	-200 + 40°C: ±0.015 . t	or ±2.5°C
Pt10Rh-Pt (S) and Pt13Rh-Pt (R)	Class 1	0 +1600°C: ±[1+(t-1000).0.003]	or ±1.0°C
	Class 2	-40 +1600°C: ±0.0025 . t	or ±1.0°C
	Class 3	-	-
Pt30Rh-Pt6Rh (B)	Class 1	-	-
	Class 2	+600 +1700°C: ±0.0025 . t	or ±1.5°C
	Class 3	+600 +1700°C: ±0.005 . t	or ±4.0°C

Note: t = actual temperature
Use the larger of the two deviation values



Information given here is for general guidance only and is not definitive – it is not intended to be the basis for product installation or decision making.

Q. What is the difference between a Mineral Insulated (MI) and a fabricated sheath?

A. An MI is flexible, a fabricated sheath is rigid.

Q. How accurately can I measure temperature using a standard sensor?

A. To published, internationally specified tolerances as standard, typically $\pm 2.5^{\circ}\text{C}$ for popular thermocouples, $\pm 0.5^{\circ}\text{C}$ for PRT. Higher accuracy sensors can be supplied to order, e.g. $\pm 0.5^{\circ}\text{C}$ for type T thermocouple, $\pm 0.2^{\circ}\text{C}$ for PRT. All of these values are temperature dependent. A close tolerance, 4-wire PRT will give best absolute accuracy and stability.

Q. How do I choose between a thermocouple and a PRT?

A. Mainly on the basis of required accuracy, probe dimensions, speed of response and the process temperature.

Q. My thermocouple is sited a long way from my controller, is this a problem?

A. It could be; try to ensure a maximum sensor loop resistance of 100 Ohms for thermocouples and 4-wire PRTs. Exceeding 100 Ohms could result in a measurement error. Note By using a 4-20mA transmitter near the sensor, cable runs can be much longer and need only cheaper copper wire. The instrument must be suitable for a 4-20mA input though.

Q. Should I choose a Type K or Type N thermocouple?

A. Generally, Type N is more stable and usually lasts longer than Type K; N is a better choice for high temperature work depending on the choice of sheath material.

Q. Does it matter what type of steel I specify for the thermocouple sheath?

A. Often no, sometimes yes. In some cases, reliability depends on the ideal choice of material.

Q. Are there other types of temperature sensor apart from thermocouple and PRT Types?

A. Several, but these two groups are the most common. Alternatives include thermistors, infra-red (non-contact), conventional thermometers (stem & dial types) and many others.

Q. Why are so many different types of thermocouple used?

A. They have been developed over many years to suit different applications world-wide.

Q. What is a duplex sensor?

A. One with two separate sensors in a single housing

Q. Why use a thermowell?

A. To protect the sensor from the process medium and to facilitate its replacement if necessary.

Q. I use many thermocouples in testing and experiments, can I make my own thermocouple junctions?

A. Yes, using a benchtop welder and fine thermocouple wires – it is easy and inexpensive to make unsheathed thermocouples.

Q. Why should I use actual thermocouple connectors instead of ordinary electrical connectors?

A. Good quality thermocouple connectors use thermocouple alloys, polarized connections and colour coded bodies to guarantee perfect, error-free interconnections.

Q. I need to measure quickly changing temperature; what type of sensor should I use?

A. A fast-response (low thermal mass) thermocouple.

Q. There are several different types of extension cable construction; is the choice important?

A. Yes; some are waterproof, some mechanically stronger, some suitable for high or low temperature.

Q. Is a sensor with a calibration certificate more accurate than an uncalibrated one?

A. No. However, the errors and uncertainties compared with a reference sensor are published and corrected values can be used to obtain better measurement accuracy.

Q. How long will my sensor last in the process?

A. Not known but predictable in some cases; this will be a function of sensor type, construction, operating conditions and handling.

Q. Which thermocouple type do I need for my application?

A. This depends on several factors including the nature of the process, heated medium and temperature.

Q. What is the longest thermocouple I can have without losing accuracy?

A. Try to ensure a maximum sensor loop resistance of 100 Ohms for thermocouples and 4 wire PRTs. Exceeding 100 Ohms could result in a measurement error. Note By using a 4-20mA transmitter near the sensor, cable runs can be much longer and need only cheaper copper wire. The instrument must be suitable for a 4-20mA input though.

Q. Do I need a power supply when using a transmitter, and what length of extension lead can I run with a transmitter fitted?

A. A 24Vdc, 20mA supply will be needed if this is not incorporated in the measuring instrument. Long runs of copper cable can be used.

Q. What sensor will I need to work in molten metal or a corrosive atmosphere?

A. There is no simple answer but special grades of Stainless Steel, Inconel 600, Microbell and Ceramics offer alternatives.

Information given here is for general guidance only and is not definitive – it is not intended to be the basis for product installation or decision making.



Product Listing

Automation & Process Control

[Signal Conditioning \(1\)](#)

Cable, Wire & Cable Assemblies

[Cable Management \(1\)](#)
[Multicore Cable \(43\)](#)

Cooling & Thermal Management

[Thermal Interface Materials \(1\)](#)

Fasteners & Mechanical

[Fasteners & Fixings \(8\)](#)
[Pipework \(77\)](#)

Sensors & Transducers

[Sensors \(761\)](#)

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Product Listing

Cable, Wire & Cable Assemblies

[Multiconductor Cable \(3\)](#)

Fasteners & Mechanical

[Fasteners & Fixings \(3\)](#)
[Pipework \(66\)](#)

Sensors & Transducers

[Sensors \(239\)](#)

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Our products are also available on Newark, which is for the North American market.

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