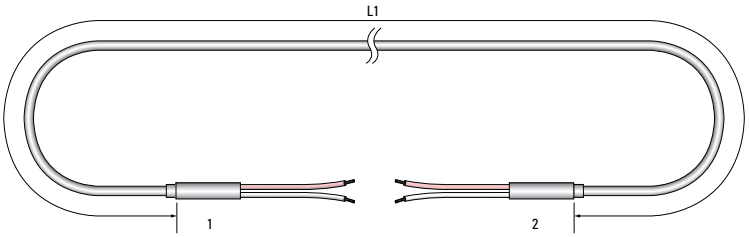
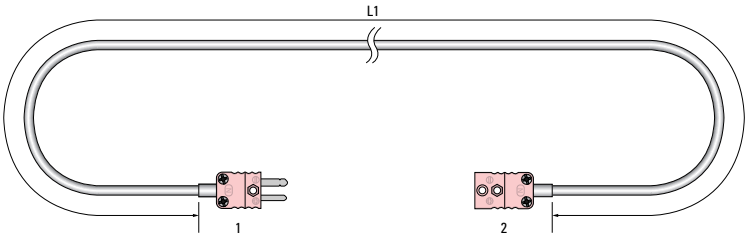
Type 12EXT Mineral Insulated Thermocouple Extensions

- **Steel sheathed mineral Insulated thermocouple extension cables**
- **High integrity construction suited to arduous operating conditions at temperatures from -200°C to +1250°C**
- **High insulation resistance**
- **The cable used to manufacture these assemblies conforms to BS EN 61515: 2016 / IEC 61515: 2016 and BS EN 60584 / IEC 60584 class 2, other tolerances are available on request**
- **Available in K, T, J and N with sheath diameters from 1.5mm to 6.35mm and lengths from a few millimetres to 200 metres or more dependent on the sheath diameter selected**
- **Sheaths can generally be bent, twisted and flattened to suit particular installations without impairing performance**
- **Available with either pot seal terminations (with tails or cable) or with a choice of connector terminations**



Example showing pot seal terminations - available with tails (shown) or cables.



Example showing connectors fitted (terminations can be a mix of pot seal and connectors).

SECTION 1	Thermocouple Type	Temperature Range* (continuous)	Temperature Range* (short term)
K	Nickel Chromium vs Nickel Aluminium	0 to +1100°C	-180 to +1350°C
T	Copper vs Constantan	-185 to +300°C	-250 to +400°C
J	Iron vs Constantan	+20 to +700°C	-180 to +750°C
N	Nicrosil vs Nisil	0 to +1100°C	-270 to +1300°C

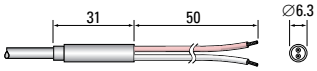
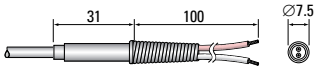
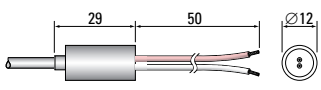
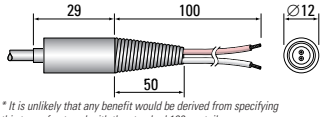
**Depending on sheath material.*

SECTION 3	Sheath Diameter (mm)	Sheath Diameter (inches)
Standard Sizes	1.5mm	0.059"
	1.6mm (1/16")	0.063"
	2.0mm	0.079"
	3.0mm	0.118"
	3.2mm (1/8")	0.125"
	4.5mm	0.177"
	5.5mm	0.216"
	6.0mm	0.236"
	6.35mm (1/4")	0.250

SECTION 2		Sheath Materials: Sheath Specifications	Operational Properties	Max. Temp.
Standard	321	**Grade 321 Stainless Steel** 18/8/1 Ni/Cr/Titanium Stabilised To BS EN 10088, Werkstoff No : 1.4541	Very good corrosion resistance throughout the operating temperature range. Suited to a wide range of industrial applications. Enjoys high ductility.	800°C
	316L	**Grade 316L Stainless Steel** 18/8/1 Ni/Cr/Molybdenum Stabilised To BS EN 10088, Werkstoff No : 1.4404	Good high temperature corrosion resistance and suitable for use in sulphur bearing atmospheres. 316L stainless steel has high oxidation resistance.	800°C
	310	**Grade 310 Stainless Steel** 25/20 Nickel/Chromium To BS EN 10088, Werkstoff No : 1.4845	Good high temperature corrosion resistance and suitable for use in sulphur bearing atmospheres. 310 stainless steel has high oxidation resistance.	1100°C
	600	**Inconel 600*** Nickel/Chromium/Iron alloy To BS EN 10095, Werkstoff No : 2.4816	Used in severely corrosive atmospheres to elevated temperatures. Has good resistance to oxidation. Not recommended for use above 800°C when used with Type R, S or B thermocouples. Do not use in sulphur bearing atmospheres above 550°C.	1100°C
Specialized	800	**Incoloy 800*** Iron/Nickel/Chromium alloy To BS EN 10095, Werkstoff No : 1.4876	Suitable for use in severely corrosive atmospheres to elevated temperatures. Enjoys a good resistance to oxidation and carburisation. Incoloy 800 is resistant to sulphur bearing atmospheres.	1100°C
	114	**Nicrotherm D™** Nickel/Chromium/Silicon/Molybdenum 73/22/1.4/3	For high temperature Type 'K' and almost all Type 'N' applications (optimum benefits with Type 'N'). Very good high temperature strength. Excellent in oxidising, carburising, reducing and vacuum atmospheres. Do not use in sulphur containing atmospheres.	1250°C

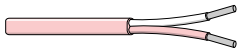
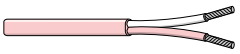
Other sheath materials are available upon request. * Trade Names

SECTION 4 — Types of Pot Seal Termination

	Diagram	Specification
3P1		**Internal Seal with Bare Conductors** for all sheath diameters 3P1 Maximum end seal temperature **135**°C 3P1B Maximum end seal temperature **300**°C 3P1C Maximum end seal temperature **650**°C *Note: Only suitable as a temporary seal for applications adding an alternative seal later*
3P2L		**Crimp on Stainless Steel Pot Seal** for sheath diameters up to 3.0mm 3P2L Pot Seal rated to **135**°C 3P2LA Pot Seal rated to **235**°C 3P2LB Pot Seal rated to **300**°C *see section 6 if extension leads are required*
3P2 TRL		**Stainless Steel Pot Seal with Anti Chafe Spring** for sheath diameters up to 3.0mm 3P2TRL Pot Seal rated to **135**°C 3P2TRLA Pot Seal rated to **235**°C 3P2TRLB Pot Seal rated to **300**°C *see section 6 if extension leads are required*
3P4CL		**Crimp on Stainless Steel Pot Seal** for sheath diameters between 3.0mm & 8.0mm 3P4CL Pot Seal rated to **135**°C 3P4CLA Pot Seal rated to **235**°C 3P4CLB Pot Seal rated to **300**°C *see section 6 if extension leads are required*
3P4 CTRL	 ** It is unlikely that any benefit would be derived from specifying this type of pot seal with the standard 100mm tails.*	**Stainless Steel Pot Seal with Anti Chafe Spring** for sheath diameters between 3.0mm & 8.0mm 3P4CTRL Pot Seal rated to **135**°C 3P4CTRLA Pot Seal rated to **235**°C 3P4CTRLB Pot Seal rated to **300**°C *see section 6 if extension leads are required*

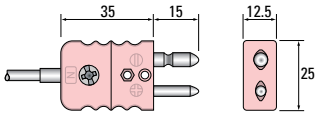
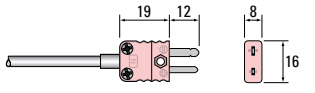
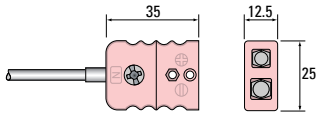
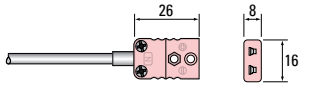
Mineral Insulated Thermocouple Extensions Type 12EXT

SECTION 5 — Extension Cables

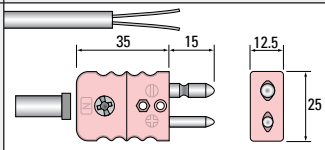
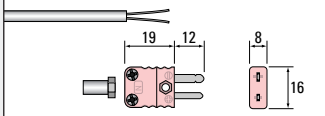
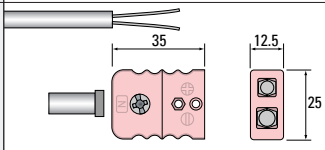
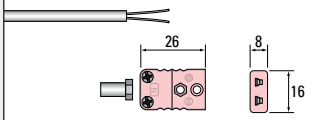
	Diagram	Specification		Diagram	Specification
B20		**PFA Flat Twin (250°C)** One pair of 1/0.5mm solid conductors PFA insulated. Pair laid flat. PFA sheathed overall.	**C40**		**Fibreglass Flat Twin (480°C)** One pair of 7/0.2mm stranded conductors double glass fibre lapped, braided and varnished. Pair laid flat, glass fibre braided and varnished.
B50		**PFA Flat Twin (250°C)** One pair of 7/0.2mm stranded conductors PFA insulated. Pair laid flat. PFA sheathed overall.	**C60**		**Fibreglass Flat Twin with Steel Braid (480°C)** One pair of 7/0.2mm stranded conductors double glass fibre lapped, braided and varnished. Pair laid flat, glass fibre braided and varnished. Stainless steel wire braided overall.

If no cable is required, leave this section of the order code blank and the sensor will be supplied with PFA tails. Other cables are available on request.

SECTION 6 — Fitted Connector Terminations

	Diagram	Specification
3P6		**Standard 2-pin (round) Plug** for sheath diameters between 1.5mm & 6.35mm **3P6** Plug rated to **220°C** *illustrated* **3P6H** Plug rated to **300°C** **3P6UH** Plug rated to **425°C** **3P6C** Plug rated to **600°C**
3P6M		**Miniature 2-pin (flat) Plug** for sheath diameters between 1.5mm & 3.2mm **3P6M** Plug rated to **220°C** *illustrated* **3P6MH** Plug rated to **300°C** **3P6MUH** Plug rated to **425°C** **3P6MC** Plug rated to **600°C**
3P7		**Standard 2-pin (round) Socket** for sheath diameters between 1.5mm & 6.35mm **3P7** Socket rated to **220°C** *illustrated* **3P7H** Socket rated to **300°C** **3P7UH** Socket rated to **425°C** **3P7C** Socket rated to **600°C**
3P7M		**Miniature 2-pin (flat) Socket** for sheath diameters between 1.5mm & 3.2mm **3P7M** Socket rated to **220°C** *illustrated* **3P7MH** Socket rated to **300°C** **3P7MUH** Socket rated to **425°C** **3P7MC** Socket rated to **600°C**

SECTION 6 — Loose Connector Terminations

	Diagram	Specification
3P6L		**Loose Fitted Standard 2-pin (round) Plug*** for sheath diameters between 1.5mm & 6.35mm **3P6L** Plug rated to **220°C** *illustrated* **3P6HL** Plug rated to **300°C** **3P6UHL** Plug rated to **425°C** **3P6CL** Plug rated to **600°C**
3P6 ML		**Loose Fitted Miniature 2-pin (flat) Plug*** for sheath diameters between 1.5mm & 3.2mm **3P6ML** Plug rated to **220°C** *illustrated* **3P6MHL** Plug rated to **300°C** **3P6MUHL** Plug rated to **425°C** **3P6MC** Plug rated to **600°C**
3P7L		**Loose Fitted Standard 2-pin (round) Socket*** for sheath diameters between 1.5mm & 6.35mm **3P7L** Socket rated to **220°C** *illustrated* **3P7HL** Socket rated to **300°C** **3P7UHL** Socket rated to **425°C** **3P7C** Socket rated to **600°C**
3P7 ML		**Loose Fitted Miniature 2-pin (flat) Socket*** for sheath diameters between 1.5mm & 3.2mm **3P7ML** Socket rated to **220°C** *illustrated* **3P7MHL** Socket rated to **300°C** **3P7MUHL** Socket rated to **425°C** **3P7MCL** Socket rated to **600°C**

** Loose fitted connectors allow for the thermocouple extensions to be installed through smaller apertures. A suitable crimp tool, such as our HCT shown below, will be required to fit the connector.*

Order Code - Example with pot seals only

Style No.	Thermocouple Type (see section 1)	Extension Sheath Length (L1 in mm)	Sheath Material (see section 2)	Sheath Diameter (see section 3)	End Seal Termination 1 (see section 4 or 6)	Extension Cable 1 (see section 5)	End Seal Termination 2 (see section 4 or 6)	Extension Cable 2 (see section 5)
12EXT	**N**	**3000**	**310**	**3.0**	**3P2L**	**1 MTR B50NX**	**3P2L**	**2 MTRS B50NX**

Order Code - Example with connectors only

Style No.	Thermocouple Type (see section 1)	Extension Sheath Length (L1 in mm)	Sheath Material (see section 2)	Sheath Diameter (see section 3)	End Seal Termination 1 (see section 4 or 6)	End Seal Termination 2 (see section 4 or 6)
12EXT	**K**	**3000**	**310**	**3.0**	**3P6M**	**3P7M**

Order Code - Example with pot seal and connector combination

Style No.	Thermocouple Type (see section 1)	Extension Sheath Length (L1 in mm)	Sheath Material (see section 2)	Sheath Diameter (see section 3)	End Seal Termination 1 (see section 4 or 6)	Extension Cable 1 (see section 5)	End Seal Termination 2 (see section 4 or 6)
12EXT	**N**	**3000**	**310**	**3.0**	**3P2L**	**1 MTR B20NX**	**3P6**

Crimp Tool for use with Loose Fitted Connectors

Application
The HCT crimp tool can be used with our loose fitted connectors. Loose fitted connectors allow for installation of thermocouples extensions through smaller apertures.

Part codes suitable for use with crimp adaptors:
3P6L, 3P6ML, 3P7L and **3P7ML**

Crimp Tool	HCT
Die Set 1 – Sheath Diameters: 1.5mm to 3.2mm	HCDIE1
Die Set 2 – Sheath Diameters: 4.5mm to 6.35mm	HCDIE2

Die Sets supplied separately