

# Temperature

## Breiarley Mineral Insulated Thermocouples

### Product Data Sheet DS3010

#### Mineral Insulated Thermocouples

Metal sheathed cables with thermocouple conductors which are insulated from each other and the sheath by highly compacted magnesium oxide.

Conductors are safe from environmental contamination, ductile and highly responsive.

The cables are water, oil and gas resistant, extremely robust and are eminently suitable for applications where high or low temperature, corrosion, vibration, pressure and other extreme conditions exist.

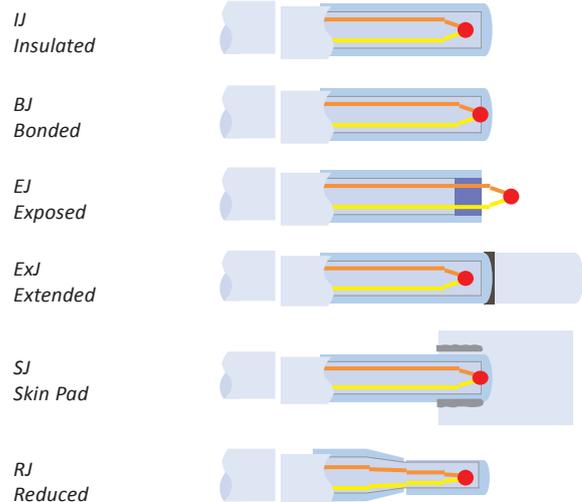
#### Advantages

- Rapid response - due to small thermal capacity of conductor bead and high thermal conductivity of insulant
- Ductile - can be easily bent or formed
- Completely immune from thermal shock
- Small overall diameters
- Very high insulation resistance
- Unaffected by pressure - can be glanded through bulkheads or pressure vessel walls.
- Extensive range of diameter, conductor and sheath combinations.
- Available in simplex or duplex options
- Can be used in standard units in place of insulated wire elements.

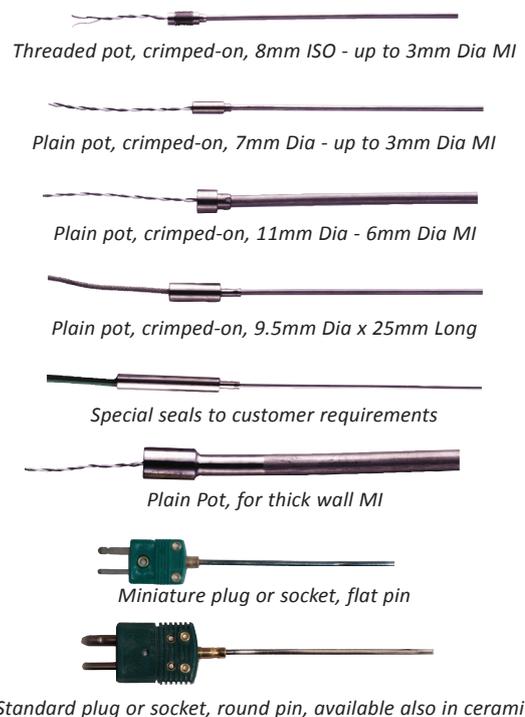
Cold end sealants available to cover temperature range of 105°C - 300°C.

High temperatures can be covered with cement type seals. Standard tails are flexible 75mm long with PTFE covering. Special tail wire can be supplied i.e. with fibre glass, PVC, metal braided coverings etc.

#### Hot End Junctions



#### Cold End Terminations



## Standard Metal Sheath Materials

### TYPE S

#### 18/8/1 Stainless Steel / Chrome / Nickel / Titanium Grade 321

Excellent resistance to corrosion. Retaining good ductility in a wide range of industrial applications. Max temperature 800°C

### TYPE W

#### 25/20 Stainless Steel/Chrome/Nickel Grade 310

Good high temperature corrosion resistance. Suitable for use in sulphur bearing atmospheres but should not be subjected to subsequent manipulations. Max temperature 1100°C

### TYPE I

#### 76/16/7 Inconel / Nickel / Chrome / Iron type 600

Excellent corrosive and oxidation resistant at elevated temperatures. Should not be used in Sulphur bearing atmospheres above 550°C Max temperature 1100°C

### TYPE N

#### 84/14/1 Nicrosil / Nickel / Chrome/ Silicon

Used with type N conductors for 1200°C plus. High oxidation resistance reduces calibration drift at temperature when used in non-carburising atmospheres. Max temperature 1250°C

## Standard Thermocouple Alloy Conductor Types

Code	Conductor Combination	Recommended Operating Temperature Range for Conductor Combinations	
		Continuous °C	Short Term °C
K	Nickel Chromium vs Nickel Aluminium	0 to +1100	-180 to +1350
T	Copper vs Constantan	-185 to +300	-250 to +400
J	Iron vs Constantan	+20 to +700	-180 to +750
N	Nickel-Chromium-Silicon vs Nickel-Silicon-Magnesium	0 to +1100	0 to +1300
E	Nickel Chromium vs Constantan	0 to +800	-

## Sheath Diameters

With reference to Standard Sheath Materials

T/C Type	Cable Diameters (mm)				
	0.5	1.0	1.5	2.0	3.0
T	-	S	S	-	S
N	-	I,N	I,N	I	I,N
J	-	S	I,S	I,S	I,S
K	I,S	I,S,W	I,S,W,N	I,S,W	I,S,W,N
	4.5	5.5	6.0	10.8	
T	S	-	S	-	
N	I	-	I,N	-	
J	I,S	-	I,S	I	
K	I,S,W	I,W	I,S,W,N	I,W	

See above for material type.

## How to order

	Example
Conductor type	Type K
Simplex or duplex	Simplex
Sheath material	25/20
Sheath diameter	3mm
Route or length of insulation	300mm
Type of hot junction	IJ (insulated)
Cold end termination	8mm ISO
Tail type	Flex PTFE
Tail length	75mm
Fittings	Brass Pressure ¼" BSPT

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