TEMPERATURE CONTROL IN CERAMIC MANUFACTURING

Thermocouples and temperature sensor solutions

PEAK SENSORS
temperature measurement & control

TEMPERATURE CONTROL IN CERAMIC MANUFACTURING

Temperature management is essential in ceramic manufacturing to ensure that the process remains reliable producing final products of a high standard.

As temperature sensor specialists with over 20 years experience working within the ceramic industry, we understand how important it is to accurately measure the temperature during the sintering process to ensure you achieve a quality product. This standard of quality can only be achieved with adequate temperature control.

At Peak Sensors we manufacture and supply a complete range of sensors to support the ceramic industry.

We provide many types of thermocouples and supply directly to various ceramic manufacturers, including porcelain, sanitary fixtures, ceramic tiles, insulators, tableware, wear resistant ceramic components, solid oxide fuel cells, and additive manufacturing. Our sensors are used within kilns, ovens, furnaces and other high temperature applications to monitor the temperature during the sintering process. These temperatures are normally very high and can range from 1000˚C to 1600˚C.

A LITTLE MORE ABOUT US...

Peak Sensors is a **temperature sensor specialist** who design, manufacture, and supply temperature sensor probes worldwide. We are **UK manufacturers based in Chesterfield, Derbyshire** and have been manufacturing sensors since 1997, making thermocouples and resistance thermometers to support your process control.

THERMOCOUPLES AND TEMPERATURE SENSORS

Temperature sensors used for monitoring the temperature in kilns, ovens or furnaces when firing green ceramics to form sintered ceramics are called thermocouples. These sensors are typically base-metal or rare-metal and are designed to withstand high temperatures, for example as high as 1000˚C to 1600˚C found in a kiln chamber.

Thermocouples Designed for Ceramic Manufacturing
There are a few different thermocouple types available to suit your ceramic manufacturing process. For example, depending on the firing temperature and how robust the thermocouple needs to be, will determine whether a rare metal, base metal or mineral insulated thermocouple is best suited to your process.

Rare metal thermocouples are made from conductors containing platinum and rhodium. They are suited for measuring high temperatures up to 1700˚C. The probes are rugged for tough industrial use.

A rare metal thermocouple is protected from the process using recrystallised alumina materials in both the insulator and ceramic sheath.

Base metal thermocouples are similar to rare metal thermocouples, however base metal are more cost effective and can withstand a lower maximum temperature of 1200˚C. A mineral insulated thermocouple has a maximum temperature of 1100˚C. These thermocouples can be bent and formed into a variety of shapes without damaging the sensor, to suit your application needs.

Thermocouples commonly used in the Ceramic Industry manufactured by Peak Sensors include:

- Rare Metal Thermocouple Assembly with Ceramic Sheath (RMC)
- Base Metal Thermocouple Assembly with Ceramic Sheath (BMC)
- Base Metal Thermocouple Assembly with Metal Sheath (BMM)
- Mineral Insulated Thermocouple with Head (MTH)
- Basic Thermocouple Insulated Element (BTE).

PEAK SENSORS - Temperature Sensor Specialists | www.peaksensors.com | +44 (0) 1246 261 999

THERMOCOUPLES FOR CERAMIC MANUFACTURING

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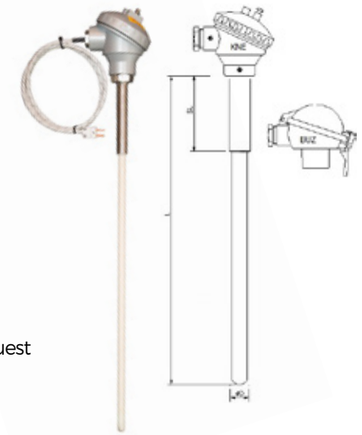
Rare Metal Thermocouple Assembly with Ceramic Sheath

In a rare metal thermocouple assembly with ceramic sheath (RMC) the sensor is protected with a ceramic sheath. Depending on the sheath material chosen the rare metal thermocouple can withstand maximum temperatures between 1000˚C and 1700˚C.

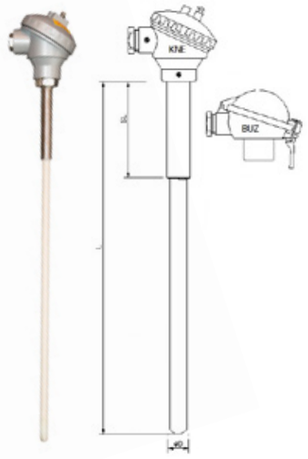


RMC (Rare Metal Thermocouple Assembly with Ceramic Sheath)

Specifications:
- 0˚C to 1700˚C temperature range
- Ceramic protection tube of Ø 12mm, Ø 15mm, Ø 24mm
- Ceramic protection tube made of C799 (Recrystallised Alumina)
- Additional ceramic internal tube on request
- Connecting tube of Ø 22mm, Ø 27mm, Ø 32mm, 150mm length or according to request
- Single or double element option (Simplex or Duplex)
- Type R, S, or B according to BS EN 60584
- The wire diameter for this thermocouple is Ø 0.50mm
- Long lasting grain stabilised wire available on request
- Flange for assembly
- IP68 head options in BUZ and KNE

Base Metal Thermocouple Assembly with Ceramic Sheath

In a base metal thermocouple assembly with ceramic sheath (BMC) the sensor is protected with a ceramic sheath. Depending on the sheath material chosen, a base metal thermocouple can withstand maximum temperatures between 1000˚C and 1200˚C.

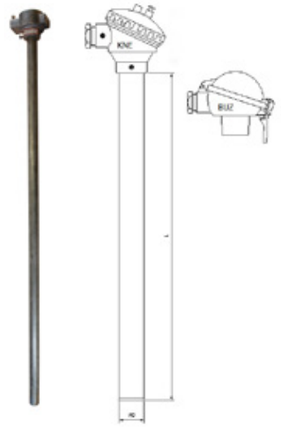


BMC (Base Metal Thermocouple Assembly with Ceramic Sheath)

Specifications:
- 0˚C to 1200˚C temperature range
- Stainless Steel, Alloy 600 shank material options
- Additional ceramic internal tube on request, insulations options available include recrystallised alumina (C799) or aluminous porcelain (C610)
- Single or double element option (Simplex or Duplex)
- Type K or N according to BS EN 60584
- The wire diameter for this thermocouple is Ø 2.96mm
- Flange or compression fitting for assembly
- IP68 head options in BUZ and KNE

Base Metal Thermocouple Assembly with Metal Sheath

In a base metal thermocouple assembly with metal sheath (BMM) the sensor is protected with a metal sheath. Depending on the sheath material chosen the Base Metal Thermocouple can withstand maximum temperatures between 1000˚C and 1100˚C.



BMM (Base Metal Thermocouple Assembly with Metal Sheath)

Specifications:
- 0˚C to 1100˚C temperature range
- Additional ceramic internal tube on request
- Type K or N according to BS EN 60584
- The wire diameter of the thermocouple is Ø 2.96mm
- Flange for assembly
- IP68 head options in BUZ and KNE or alterative heads available

Mineral Insulated Thermocouple with Head

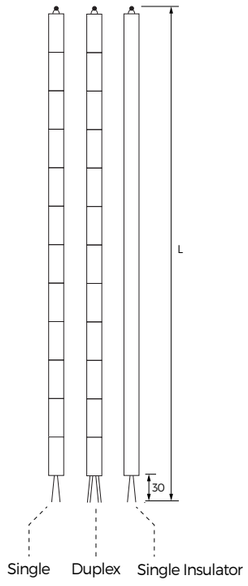
In a mineral insulated thermocouple with head (MTH) the sensor is protected with an outer metal sheath with the inner elements insulated with magnesium oxide powder, tightly packed so no air is trapped inside to provide great thermal conductivity. The sheath of a mineral insulated thermocouple can be easily bent and formed into a variety of shapes to suit your application. Depending on the materials chosen this thermocouple type can withstand a maximum temperature up to 1250˚C.

MTH (Mineral Insulated Thermocouple with Head)

Specifications:
- 0˚C to 1250˚C temperature range
- Common diameters of Ø 3.0mm and Ø 6mm
- Single or double element option (Simplex or Duplex)
- Type K or N according to BS EN 60584
- Transmitter available in the head
- Suitable for simplex and duplex assemblies
- Flange or compression fitting for assembly
- IP68 head options in BUZ and KNE

Basic Thermocouple Insulated Element

A basic thermocouple insulated element provides you the replacement elements insulated in ceramic for further assembly into sheaths or other equipment. The basic thermocouple insulated element withstand maximum temperatures between 1000˚C and 1700˚C.



BTE (Basic Thermocouple Insulated Element)

Specifications:
- 0˚C to 1700˚C temperature range
- Single or double element option (Simplex or Duplex)
- Type K, N, R, S or B according to BS EN 60584
- The wire diameter of the K or N thermocouple is Ø 2.96mm
- The wire diameter of the R, S or B thermocouple is Ø 0.50mm
- Recrystalised alumina (C799) or aluminous porcelain (C610) insulation options available
- Single Strand
- Tail length 30mm

CUSTOM DESIGNS

Please contact us at **pslsales@peaksensors.com** to discuss your requirements.
Our technical team can work with you to develop and manufacture custom designs of thermocouples.

OTHER PRODUCTS AND SERVICES AVAILABLE

- Ceramic sheath and insulators (C799 and C610)
- Cables to route around your plant
- Connection cables for all your applications
- Support with scrap platinum and rhodium recovery

If you are unsure of what thermocouple is the best option for your process, please contact us to discuss your requirements and our technical team will work with you and advise the appropriate solutions.

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