



*The sensor  
makes the difference!*



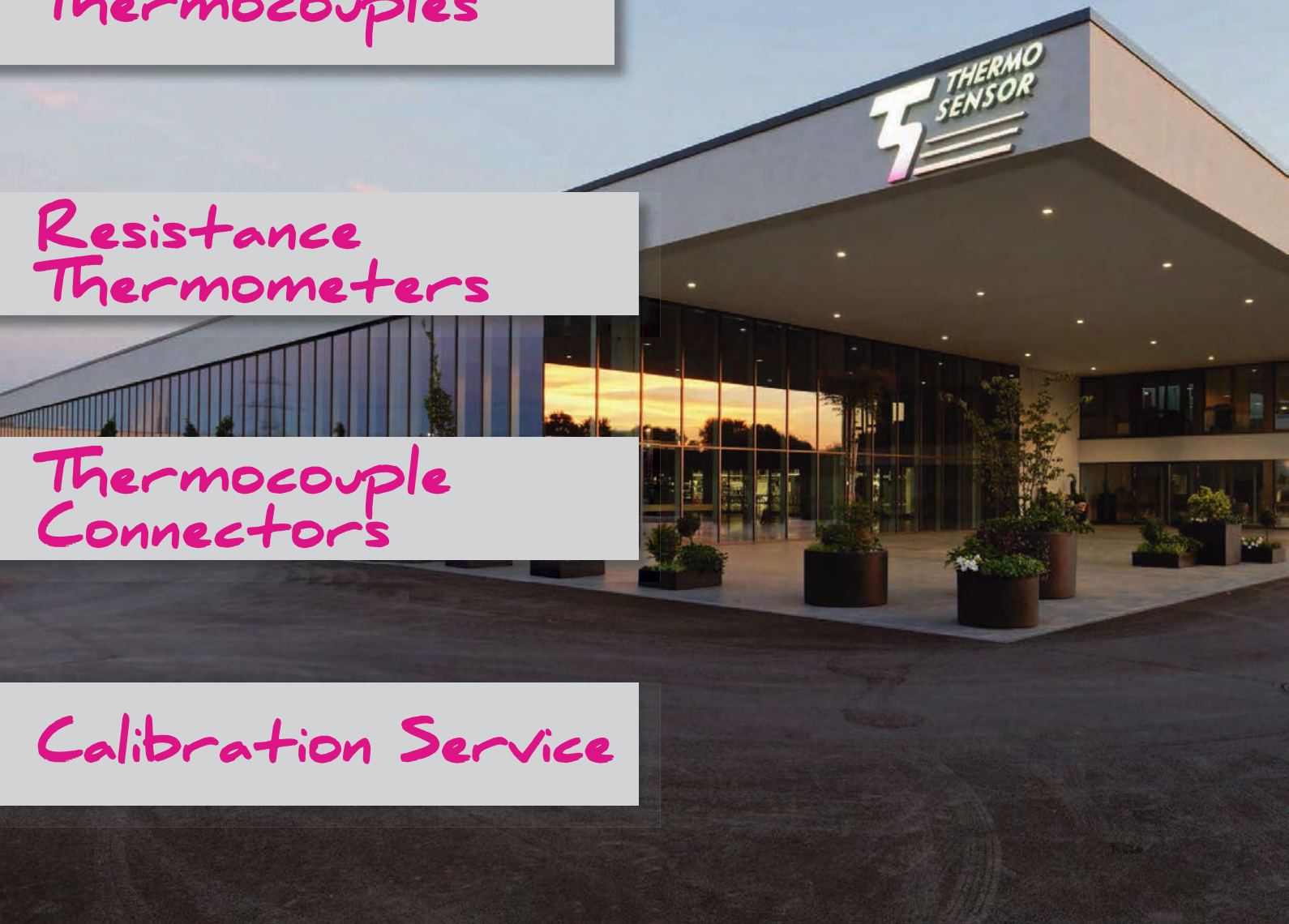
# Thermo Sensor GmbH

Thermocouples

Resistance  
Thermometers

Thermocouple  
Connectors

Calibration Service



TEMPERATURE

MEASURING

TECHNOLOGY

measuring controlling calibration recording testing



## Thermo Sensor – Your partner for temperature measuring

Thermo Sensor is a leading solution provider in the field of temperature, measuring and control technology.

Since its foundation in 1994, the company has been developing and producing thermocouples and resistance thermometers (in standard and special designs) as well as sensors especially built for potentially explosive atmospheres. Thermo Sensor also provides thermocouple connectors, cables, wires and turning parts.

Whatever requirements are placed on temperature measurement, we can fulfil them with our tailor-made solutions.

### Quality Made in Germany

We place great emphasis on our in-house development and production in order to offer our customers the highest possible quality and flexibility.

### Steady growth since foundation

The success speaks for itself: Since the company was founded in year 1994, we have quickly become a recognized specialist in temperature measurement technology. Our steady growth course demonstrates the success of our company and has finally led to the relocation and significant increase in the company's size.

Today, Thermo Sensor is established as a global provider of temperature elements and worldwide companies from all sectors of industry belong to its customer base. We rely on the quality of our products – we are certified according to ISO 9001:2015 and each product is extensively tested before leaving our premises. Since 2021 we have also been certified according to ISO 14001:2015 (environmental management system).

### Customer orientation is a core competence

Our customers benefit from our many years of experience in temperature measurement technology. With cutting-edge manufacturing processes and the specialized expertise of our employees we offer individual solutions, always adapted to the respective measurement task.

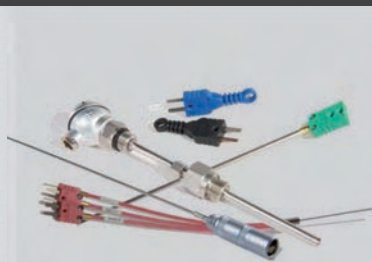
### Thermo Sensor stands for a good customer service

Our employees are on hand to advise you on any problem. We produce demand-oriented and can usually supply our customers with the required sensors within a very short time without minimum purchase or values.





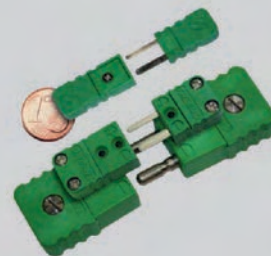
Thermocouples



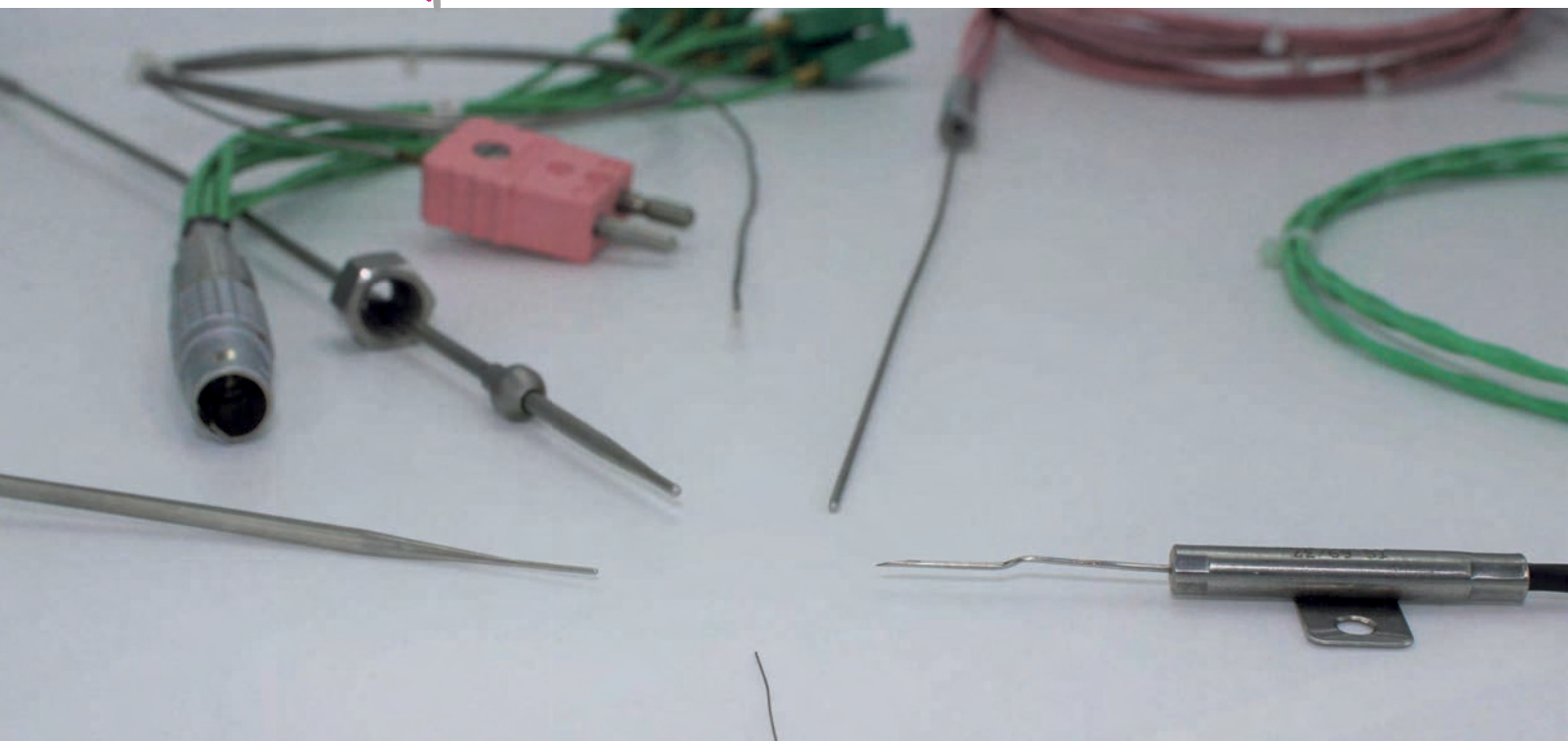
Resistance  
Thermometers



Thermocouple  
Connectors



# Thermocouples



## The right sensor for each measuring task

Thermocouples are used for temperature measurements in solid, liquid or gaseous media up to +1600 °C. They are available in a variety of design and execution options.

Robust and fast-appealing – our customers especially appreciate our thermocouples which guarantee fast and accurate results despite their easy handling.

### Thermoelectric effect

The temperature measurement with the help of Thermocouples is based on the thermoelectric effect according to Seebeck. This indicates that a voltage at free ends of two connected wires from different materials is measurable, provided that the connecting point of the wires has a different temperature than that of the free ends.

Thermo Sensor's thermocouples are available from a diameter of 0.15 mm and are always conform to class 1; on explicit customer request we achieve ½ class 1 (0.75 °C at +100 °C).

### Accuracy guaranteed

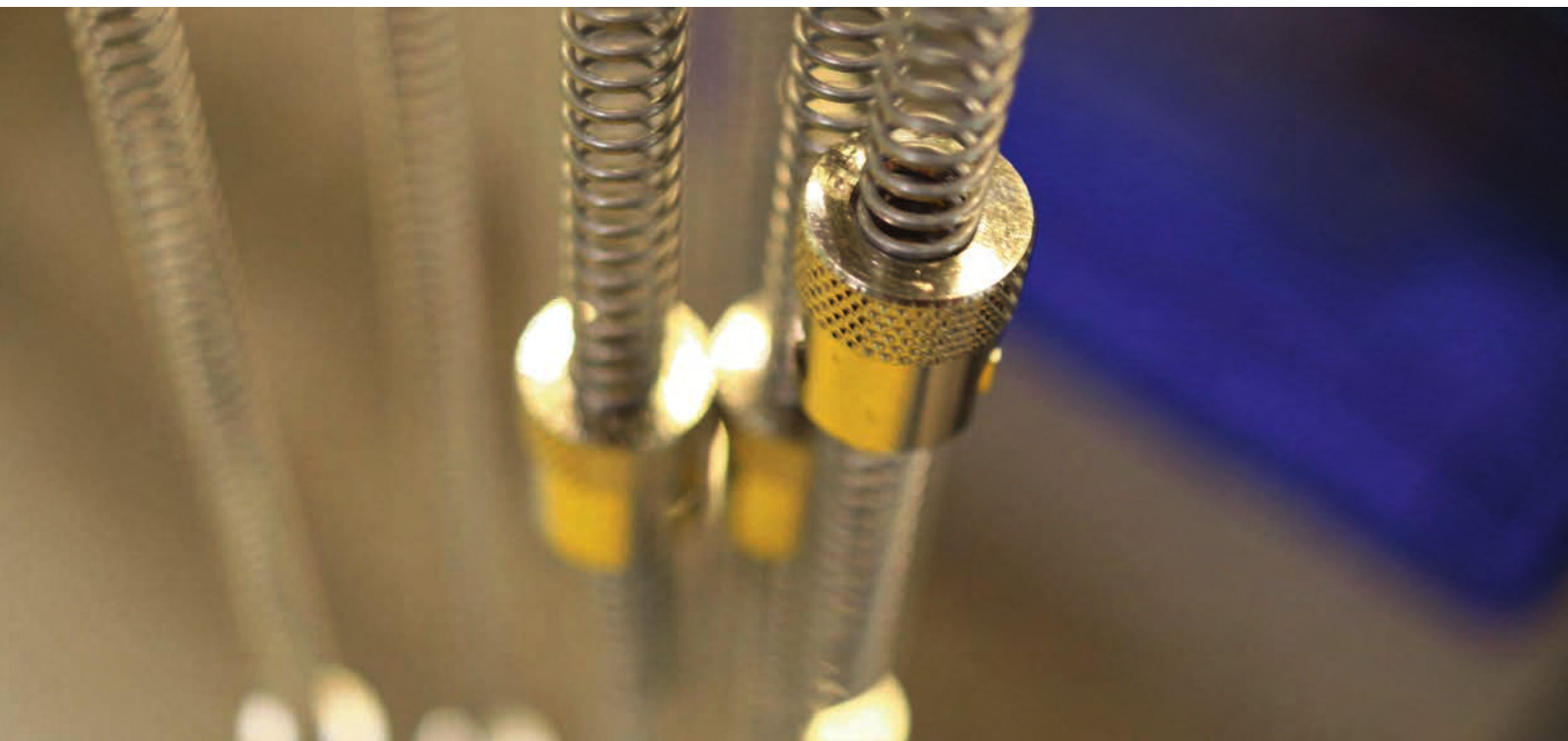
All sensors are tested thoroughly for their accuracy before leaving our premises.

Frequent calibration tests in our excellently equipped and DAkkS accredited calibration laboratory as well as a detailed quality control guarantee the consistent accuracy of our sensors.

### Benefits at a glance:

- Very robust
- Shock-resistant
- Short response times
- High stability
- Suitable for harsh operating conditions





## *The best service for you*

We want to offer our customers maximum service from one source. Thanks to our extensive stock of raw materials we can offer a wide range of accessories for our thermocouples and resistance thermometers directly from stock. Our accessories range from cables, pre-assembled cables, turning parts, such as clamp connections, studs or crush hoods, connection

heads and flanges to protective tubes made of ceramic and stainless steel, transducers as well as sensors and connectors.

Thus, we are able to supply our customers quickly and without minimum order quantities.



# Resistance Thermometers



## The optimal solution for every application

Resistance thermometers from Thermo sensor are used in many industrial sectors for temperature measurement.

Our sensors are particularly distinguished by their high accuracy. For example, we can offer sensors with 1/10 class B (0.03 °C).

Our resistance sensors are long-term stable, because they often have to withstand adverse influences in long-term measurements. They are often used in research and development labs.

### Electrical Resistance

In the case of resistance thermometers, the temperature dependence of the electrical resistance of metals, semiconductors and ceramics is used.

The temperature-related resistance of the test object is recorded by measuring the voltage drop.

### Many different designs

Our resistance sensors are available with a wide range of sensor types (including PT100, Pt500, Pt1000, NTC or PTC) as well as for many different installation possibilities, e. g. with bayonet cap, magnet, adhesive pad, protective tube or as a screw-in sensor.

Depending on the design, temperature area ranges from -200 °C to +800 °C.

The accuracy of our resistance thermometers is ensured by comprehensive functional tests in the final inspection or in the calibration laboratory.

### Advantages

- Highly-precise
- Largely resistant against electrical disturbances
- Long-term stability
- Approximate linear characteristic



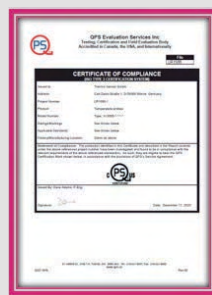


## Explosion protection

In addition to our standard program we offer some thermocouples and resistance sensors in explosion-proof design.

For this we can provide our customers various certificates according to ATEX and IECEx.

Since 2017 we offer sensors for certain applications which are approved according to "e" (increased safety) with protection level "ec" (marking "na" replaced by "ec").



Furthermore we also carry a wide range of sensors with the ignition protection types dust (Ex "t") and intrinsic safety (Ex "ia").



To further expand our range of protection types in the field of intrinsic safety, we can also provide our customers approvals for the United States and Canada (QOS), Brazil (NCC), Russia (EAC) and China (CCC, NEPSI).



# Thermocouple Connectors



## For a good connection with a secure signal

Connectors provide a simple and reliable way to connect components with thermocouple material. They are used wherever sensors are to be connected, extended or replaced.

### Quality Made in Germany

Thermo Sensor is one of the few companies worldwide that maintains its own range of connectors. The genuine transmission of the measurement signals is guaranteed by the exclusive use of class 1 thermocouple materials.

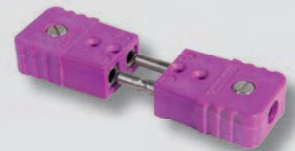
Characterized by different colours, the connectors meet the relevant national and international standards, such as IEC, DIN and ANSI.

### Many different versions

Our connectors are suitable for temperatures up to +220 ° C, short-term up to +250 ° C, and are available in a wide variety of designs and dimensions. Polarity markings are shown on all housings, which together with the reverse polarity protection of the contacts, guarantee a secure and correct connection.

### Standard Connectors

for robust handling and particularly demanding applications.



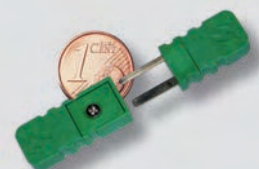
### Miniature Connectors

universally applicable in almost all industrial areas.



### Micro Connectors

for particularly small assembly spaces and sensitive areas.







## Panels

In addition to the standard connectors Thermo Sensor also produces panels for the installation in housings or panels. The panels are available in different types with various fixing options. Thermo Sensor also provides individually tailored and complete assembled multiple panels.

## Multiple extensions

Multiple extensions are used to centrally interconnect several measuring points for a longer, whereas the housing, the connector types and the number of measuring points can be adapted individually to the customer's requirements.

## Ceramic connectors

Ceramic connectors are easily suitable for temperatures up to +650 °C.

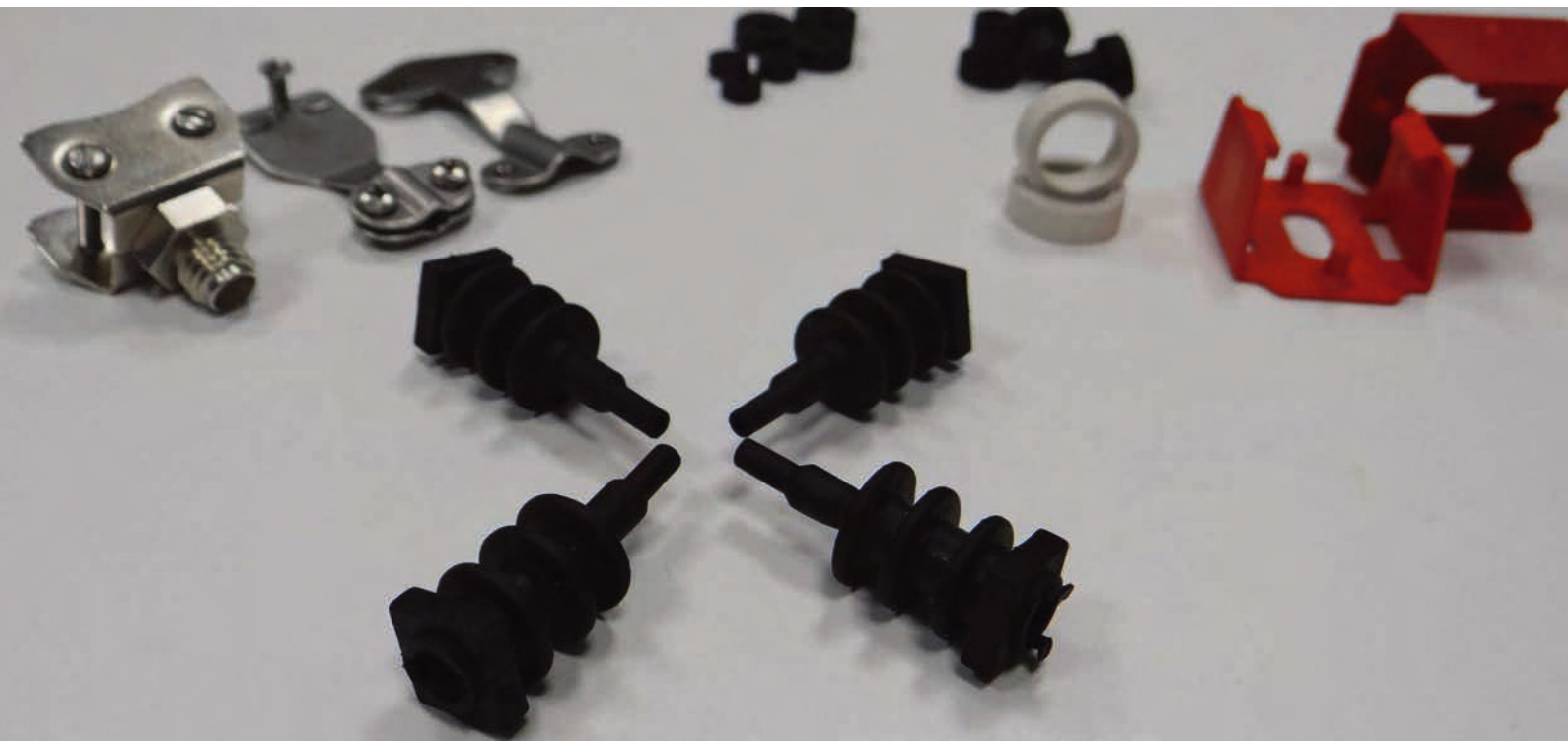


## High-temperature connectors

Especially developed for high-temperature areas our HT-connectors are ideally suitable for applications up to +350 °C.



# Special Connectors and Accessories



## An appropriate solution for each application

The special connectors include connectors with three contacts, panels for direct mounting on printed circuit boards or connectors directly molded onto the cable.

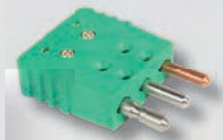
We can also offer connectors for fast wiring in the miniature and standard types.

Thermo Sensor also offers a wide range of accessories for the different connector types: These include strain reliefs, bend reliefs, crimp bushings and neoprene sealing rings as well as locking clips.

Furthermore, we can offer our customers mounting kits, knurled nuts and spring clips.

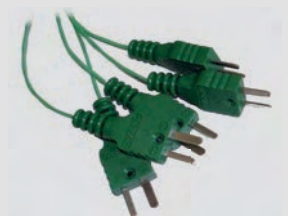
### Connectors with three contacts

for temperatures up to +220 °C, short-term up to +250 °C; the third contact serves as a ground contact.



### Splashed Connectors

Our connectors made of PVC are directly splashed to the cable and are available as miniature type.



### Quick Wiring Miniature Connector

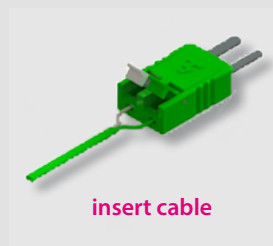
The integrated push & lock system of this special connector allows connection and disconnection of the stripped cable in seconds. This simple type of assembly creates significant time and cost savings.

### Connectors for quick-wiring

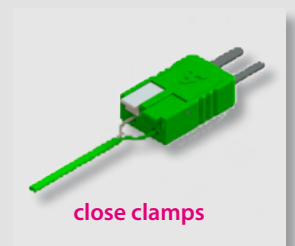
The connectors are equipped with a direct connection to the cable.



open clamps



insert cable



close clamps





## Sensor Systems for special applications



### Waterproof Sensor System

Thermo Sensor has developed a unique thermocouple sensor system, which is especially designed for applications in harsh environments with splash water. It consists of a mounting jack and the correspondent connector with a moulded thermocouple. Due to the systems purpose-built design, all components correspond to the protection class IP 65.



### Thermocouple Sensor System for high-voltage applications

Thermo Sensor has developed a unique thermocouple sensor system which is designed specifically for applications in high-voltage areas. It consists of a mounting jack and the correspondent connector with a moulded thermocouple. Due to the system purpose-built design, all components offer protection against high-voltage for up to 6 kV and comply in mated condition or with dummy connector with the protection class IP65.



# Cables and wires



## Optimal solutions for a safe connection

Our many years of experience and co-operation with specialists in sensor and cable technology enable us to find and provide the optimum solution for every application.

A large selection of our materials is available from stock so that we can supply our customers at short notice and with no minimum order quantity.

In addition to cable assembly, our product range also includes thermocouple and compensating cables, temperature-resistant cables up to  $+1,400^{\circ}\text{C}$ , single and multi-core cables as well as customer-specific solutions.

Connection cables are a connection between the measuring instrument and the temperature sensor. The maximum operating temperature is determined by the insulation material. Depending on the application we can provide you with the optimal combination of insulation material, core cross section, shielding and cable sheath.

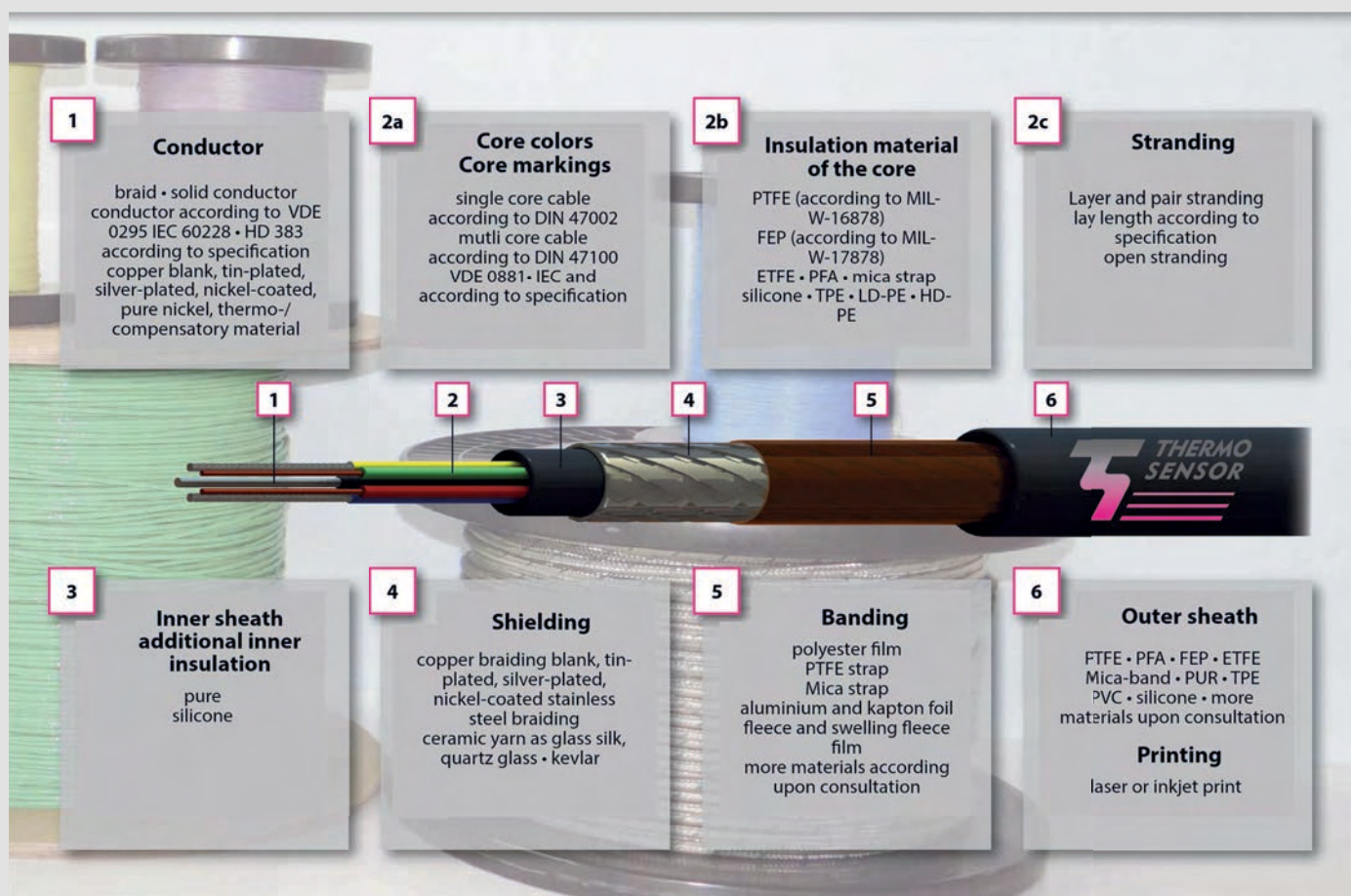
The inner conductors of thermocouple wires consist of original thermocouple material.





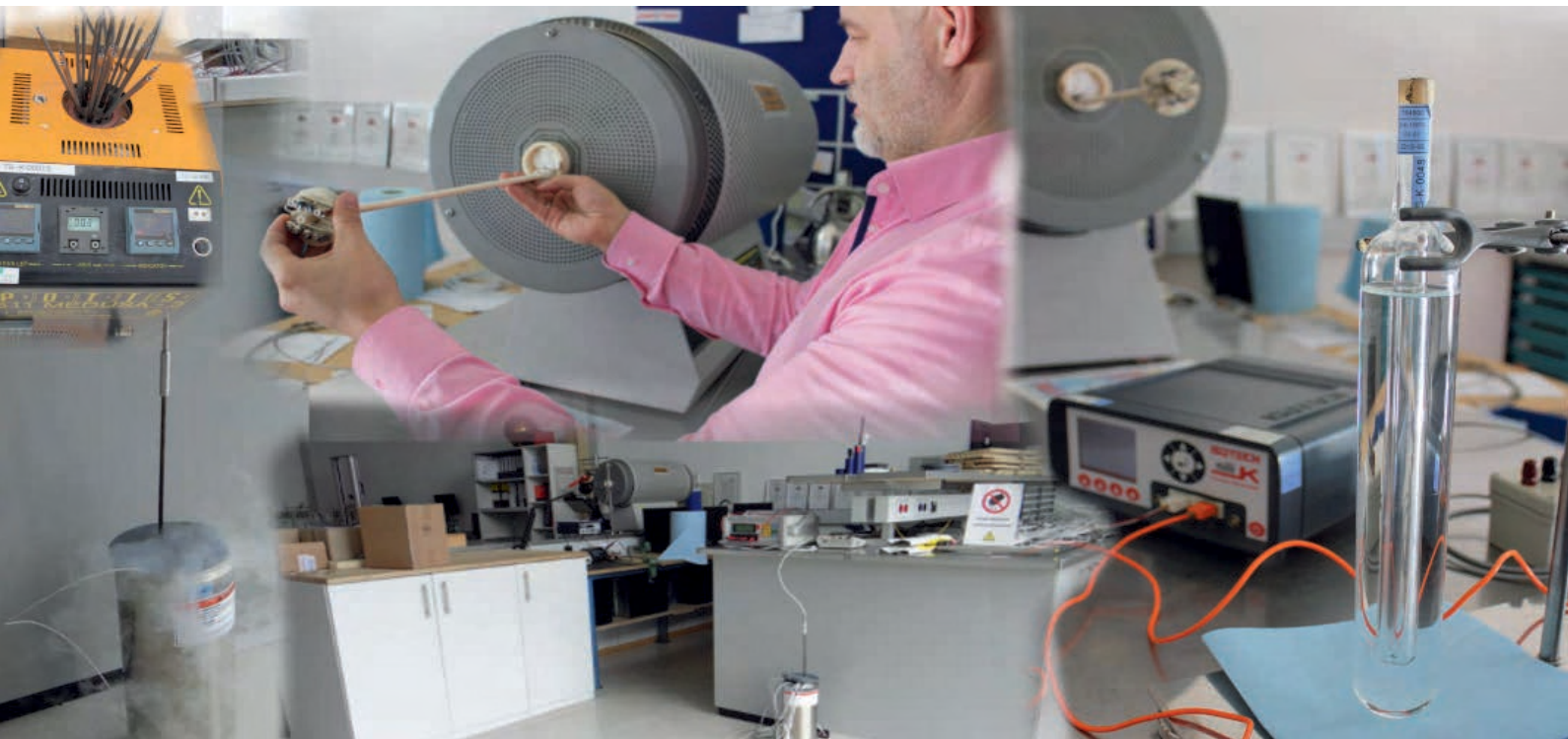


## Various possibilities of cable confection





# Calibration laboratory



## For a precise measuring result

Our calibration laboratory is managed in accordance with DIN EN ISO / IEC 17025 and is accredited by the national accreditation body of the Federal Republic of Germany (DAkKS). The accreditation of our laboratory is valid for the scope of accreditation listed in the document attachment D-K18093-01-00.

At Thermo Sensor, your test equipment is in competent hands right from the start. Our experienced calibration team works on a variety of calibration stations with different calibration methods. We can perform calibrations from  $-196^{\circ}\text{C}$  to  $+1,600^{\circ}\text{C}$  for you. Our daily work includes calibrations of resistance thermometers and thermocouples in both comparison methods and fixed points. Calibration of reference normals at fixed points is not a great challenge thanks to our state-of-the-art laboratory.

For your resistance thermometers, we can also offer you a characteristic curve determination or determination of individual coefficients according to ITS-90 or Callendar-van-Dusen.

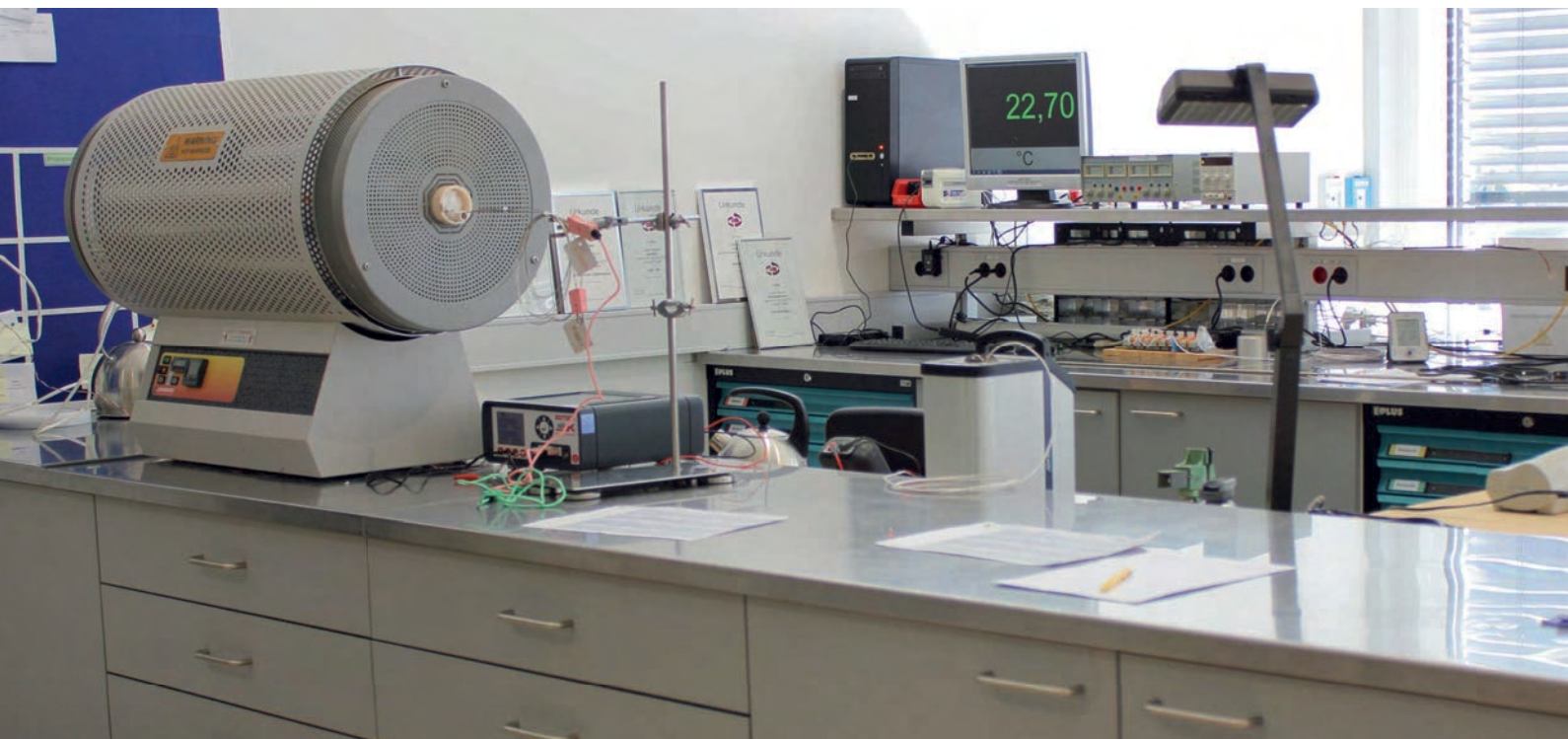
Like our company, the laboratory has grown steadily and has a variety of state-of-the-art measuring instruments and means.

Numerous fixedpoint cells, such as mercury,  $\text{H}_2\text{O}$  (water triple point), gallium, indium, tin, zinc and aluminum make our calibration laboratory a laboratory of the highest technical level. Block calibrators, calibration tube furnaces and liquid baths are also used.

In addition to our calibration service, our qualified personnel can carry out leak tests on request.







## Special highlights of our calibration laboratory

### DAkkS-Calibration

calibration of:

- Resistance thermometer (-196°C, - 80°C to 660°C)
- Thermocouples (-40°C to 1600°C)
- Direct display thermometers

The DAkkS accreditation stands for highest quality standards and reliability!

Calibrations according to AMS 2750 or CQI-9 and factory calibrations between -196 °C to +1600 °C

Highest precision with measurement uncertainties from 5 mK to 25 mK



## Environment



Providing our services means for us ensuring that the entire cycle is economically, ecologically and socially justifiable. This means that the single phases, such as planning, production, use and maintenance, as well as the use of resources, must also meet criteria of sustainability. Beyond compliance with environmental law we are committed to continuously improving the environmental performance within our sphere of influence.







# Thermo Sensor GmbH

customer oriented • innovative • flexible

Please feel free to contact us.  
We will be pleased to advise you.  
Looking forward to hearing from you!

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