

Temperature probes for biomass heating systems



Flame temperature and flue gas measurement

Measurement of the flow and return temperature

Measuring the temperature in buffer tanks

Temperature measurement on the solar system

Outdoor and room temperature measurement

Testo Sensor GmbH is the specialist when it comes to **customised temperature probes** for heating systems with **biomass boilers** or **heat pumps**.

With our wide range of products, you can solve various measurement tasks.

Thanks to our **many years of experience** and **expertise from numerous customer projects**, we are able to design, produce and qualify **application- and customer-specific temperature probes** in **large quantities** and **high quality**. Our customers are the **leading suppliers** in the heating sector.

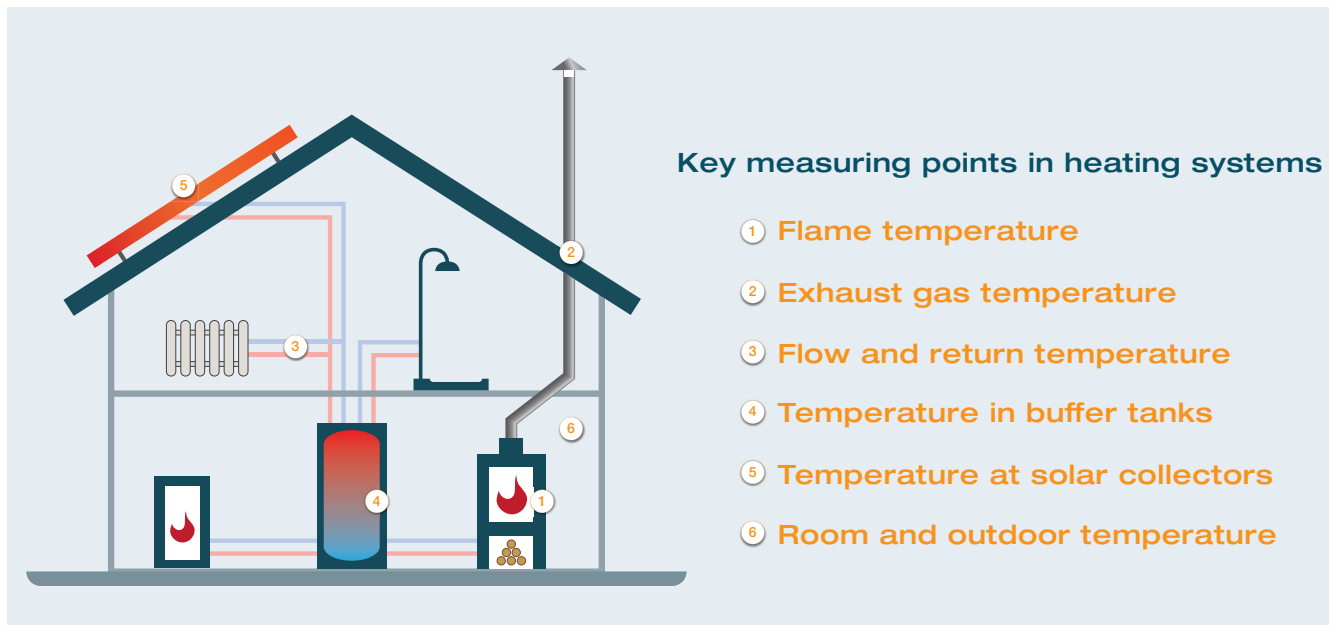
We offer **comprehensive advice** in **all phases of the project** - from the **technical specification**, the **design of the probe**, **series production** through to **final qualification**.

In order to optimally fulfil your **specific requirements**, we offer you **customised logistic solutions**. In addition, we guarantee **attractive and competitive prices** for our products.

We are very proud to offer you not only **high-quality temperature probes**, but also **outstanding customer service**.

Temperature measurement in heating systems

Testo Sensor GmbH is your expert when it comes to **customised temperature probes** that ensure **precise and reliable measurements** in heating systems, whether with **biomass boilers** or **heat pumps**. Our product range includes **specialised probes** for a **wide range of applications**:



- **Flame temperature measurement:** Our advanced probe design provides accurate measurements directly in the combustion chamber, which is important for the efficiency and safety of biomass boilers.
- **Flue gas temperature measurement:** Reliable temperature probes measure critical temperature data in flue gas paths to ensure optimal combustion and emission control.
- **Flow and return temperature measurement:** Our probes provide accurate temperature monitoring in the inlets and outlets of heating systems, which is essential for system efficiency.
- **Buffer tank temperature measurement:** Our probes can be used to accurately measure the temperature in buffer tanks to ensure optimum energy usage.
- **Measuring the temperature in solar collectors:** Our robust temperature probes accurately measure temperatures in solar systems, even in difficult weather conditions, to maximise efficiency and performance.
- **Room and outdoor temperature measurement:** We offer specially developed outdoor and room temperature probes with a variety of designs for comfortable and efficient indoor climate control.

Testo Sensor GmbH designs, produces and qualifies these temperature probes in large quantities and high quality for leading suppliers in the heating sector. We offer comprehensive advice at all stages: from the technical specification and design of the probe to production and qualification. Our customised logistic solutions and competitive prices round off our offer to optimally meet your specific requirements.

KS / 30.01.2024

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You can find our standard portfolio in our
webshop at: www.testo-sensor.shop

What sets us apart as a supplier

As your supplier, we strive to exceed your expectations with **innovative, customised solutions for application-specific temperature measurement**. We offer not just products, but **true partnerships** based on **close collaboration** and **technical expertise**.

Efficiency is our priority: Our **semi-automated production lines** enable **cost-efficient production with consistently high reproducibility**. **Every product** can be traced back to the **exact production hour and line**. This creates maximum transparency and trust.

Quality is our promise: Our effective quality management system is geared towards **zero-defect quality**. This is reflected in an **exceptionally low field failure rate of less than 400 ppm**.

Of course, **we deliver on time**. With **100% delivery reliability** and **suitable buffer stocks**, we ensure that **your orders always arrive on time** and in full. Our logistics can be **seamlessly integrated into your systems** using Kanban, consignment and buffer stocks or SAP EDI.

- 

Close and cooperative partnership with our customers right from the specification phase
- 

Expert advice on technology, quality, purchasing and logistics
- 

Testo Sensor GmbH is specialised in the development of **application-specific OEM temperature probes**
- 

Depth instead of width: We **focus on a few core industries**
- 

We operate a **cost-efficient production with high reproducibility** thanks to **semi-automated production lines**
- 

All temperature probes are traceable to the exact production hour and line
- 

We use an effective QM system for **zero-defect quality** (< 400 ppm field failure rate)
- 

100% delivery reliability with the help of **suitable buffer warehouses**
- 

Logistics connection directly into your system, e.g. Kanban, consignment and buffer warehouse or SAP EDI

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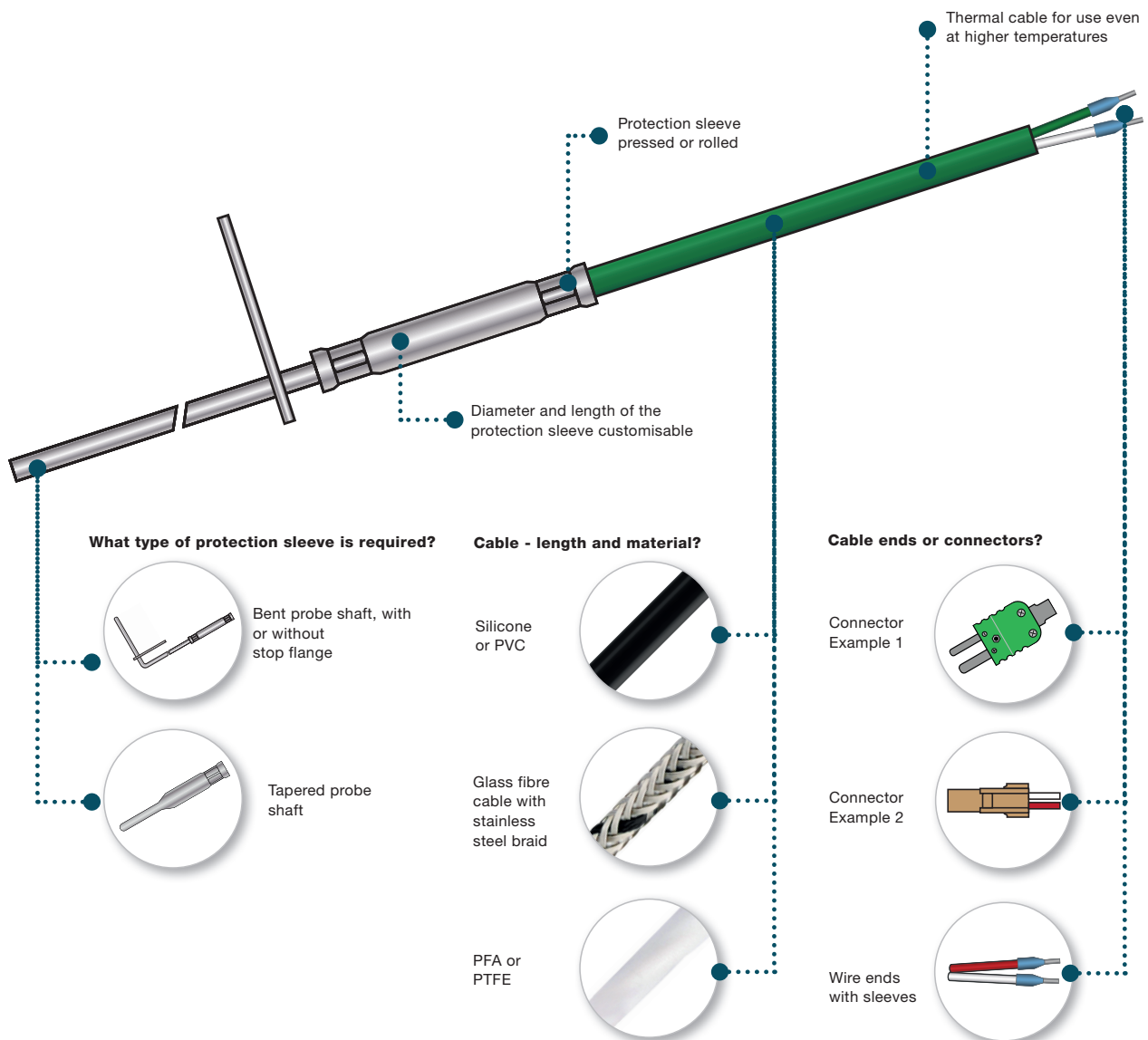
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Flame & exhaust gas temperature probes

Flue gas probes should reliably measure the temperature in the flue gas connection or directly in the combustion chamber, as temperature measurement is of great importance for controlling the system when burning pellets, wood chips and wood, as well as when burning gas and oil.

The configuration of the temperature probes is of crucial importance. Depending on the application, the temperature probes are made of different materials, e.g. to ensure optimum protection against corrosion and abrasion.

To ensure that the probe fits your requirements perfectly, we offer you an extensive selection of customisable options: determine the measuring element, the connection type, the sleeve length and sleeve diameter, the type and material of the sleeve, the cable material, the cable length and whether you want plugs, wire ends or open tinned ends.



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Project examples for exhaust gas and flame probes

| Picture | Description |
|---------|---|
| | <ul style="list-style-type: none"> • Application: Measurement in flue gas pipes • Temperature range: Up to 400 °C • Measuring element: Thermocouple type J, type K or resistance sensors PT100 or PT1000 • Probe design: Sleeve length, sleeve diameter and sleeve shape, cable length, cable material, optional ETFE coating and connector selectable |
| | <ul style="list-style-type: none"> • Application: Measurement in flue gas pipes • Special feature: Bayonet screw-in thread for secure mounting and faster servicing • Temperature range: Up to 400 °C • Measuring element: Thermocouple type J, type K or resistance sensors PT100 or PT1000 • Probe design: Sleeve length, sleeve diameter and sleeve shape, cable length, cable material, optional ETFE coating and connector selectable |
| | <ul style="list-style-type: none"> • Application: Use in combustion chambers to monitor the flame temperature and measurement in the exhaust pipe • Special feature: Stop flange for easy installation and exact positioning at the measuring point, thermocouple can be easily bent • Temperature range: Up to 1.000 °C • Measuring element: Thermocouple type J, type K • Probe design: Sleeve length, sleeve diameter and sleeve shape, cable length, cable material, optional ETFE coating and connector selectable |
| | <ul style="list-style-type: none"> • Application: Use in combustion chambers to monitor the flame temperature • Special feature: High resistance to chemical influences, especially sulphuric acid and high stability at permanently high temperatures and rapid temperature changes due to ceramic probe tube • Temperature range: Up to 1.000 °C • Measuring element: Thermocouple type J, type K • Probe design: Probe length and probe diameter |

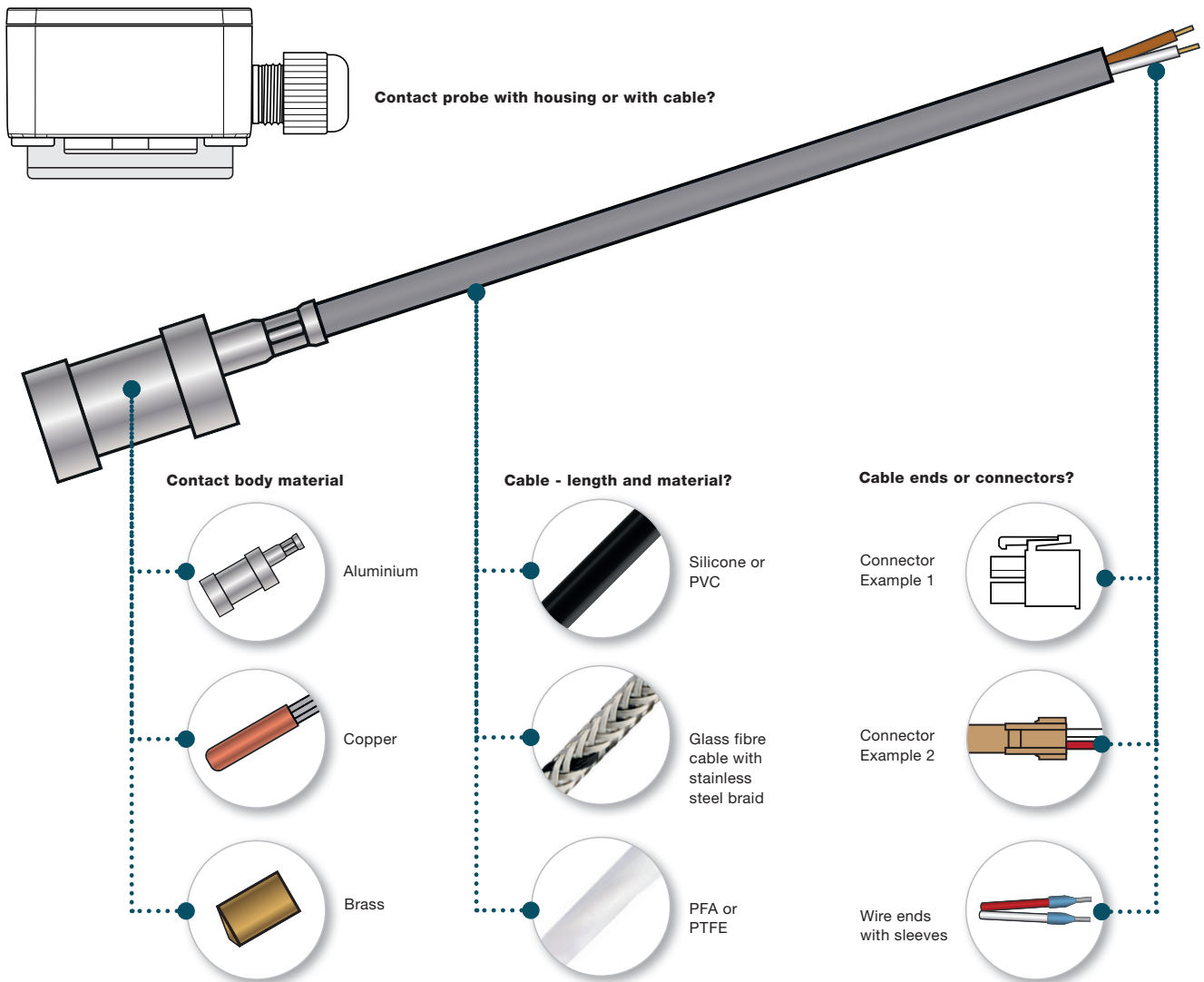
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Contact temperature probes for flow and return

A correctly set flow and return temperature is essential for the efficiency of the entire heating circuit. Our contact probes for pipes are ideal for measuring the temperature of heating systems, especially for the flow and return.

The design and, in particular, the material of the contact probes is crucial for optimum thermal coupling at the measuring point. Each measuring task requires a perfectly adapted geometry in order to increase the contact surface and reduce the response time.

We will be happy to advise you on the optimum geometry for your application and customise the contact probes to your measuring task. We can configure various parameters, including the design of the measuring element, the connection type, the sleeve length and diameter as well as the material of the sleeve and cable. Whether with plugs, wire ends or open tinned ends.



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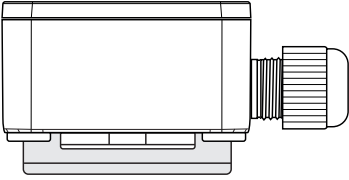



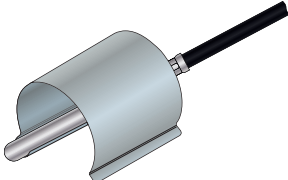
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Project examples for contact temperature probes

| Picture | Description |
|---|--|
|  | <ul style="list-style-type: none"> • Application: Measurement of flow and return temperatures in heating systems • Special feature: Small brass sleeve with minimised contact surface for best heat transfer • Temperature range: Up to 150 °C • Measuring element: NTC, PT100, PT1000 • Probe design: Sleeve length, sleeve diameter and sleeve shape, cable length, cable material and connector selectable |
|  | <ul style="list-style-type: none"> • Application: Measurement of flow and return temperatures in heating systems • Special feature: Housing protects the connection between sensor and cable from external influences such as dirt, moisture and vibrations • Mounting: Using quick release strap and contact body on the bottom of the housing • Temperature range: Up to 90 °C • Measuring element: NTC, PT100, PT1000 |
|  | <ul style="list-style-type: none"> • Application: Measurement of flow and return temperatures in heating systems • Special feature: Contact body made of aluminium, perfect for use on pipes, angled design specially for narrow measuring points • Mounting: Using quick release strap • Temperature range: Up to 150 °C • Measuring element: NTC, PT100, PT1000 |
|  | <ul style="list-style-type: none"> • Application: Measurement of flow and return temperatures in heating systems • Mounting: Using pipe clips • Temperature range: Up to 150 °C • Measuring element: NTC, PT100, PT1000 |
|  | <ul style="list-style-type: none"> • Application: Measurement of flow and return temperatures in heating systems • Mounting: Using pipe clips • Temperature range: Up to 150 °C • Measuring element: NTC, PT100, PT1000 |
|  | <ul style="list-style-type: none"> • Application: Fixing clips with which cable probes can be attached to pipes and be used for surface measurement • Special feature: Available in different diameters, hold the cable probe reliably at the measuring point |
|  | <ul style="list-style-type: none"> • Application: Fixing clips with which cable probes can be attached to pipes and be used for surface measurement • Special feature: Available in different diameters, hold the cable probe reliably at the measuring point |

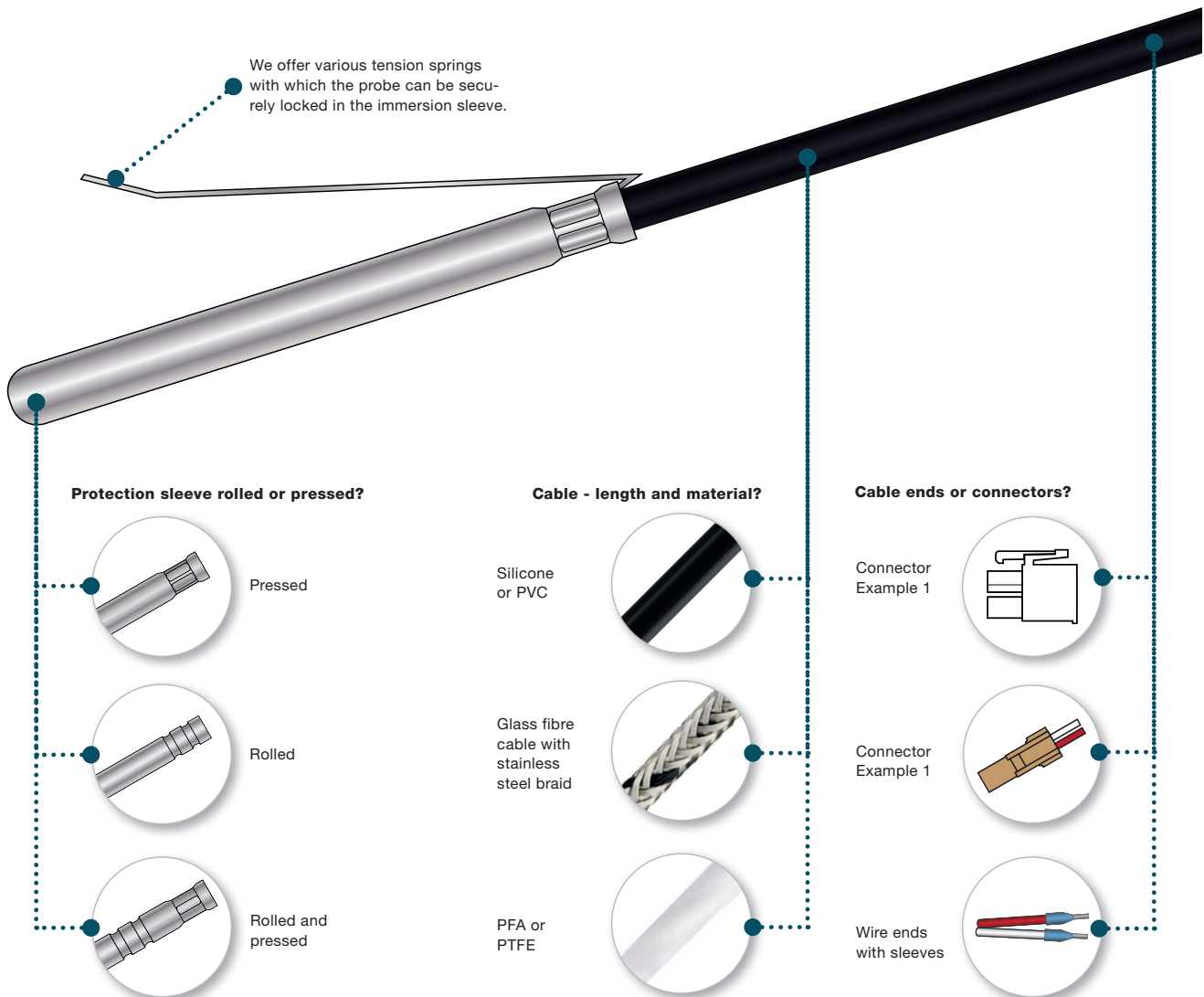
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Temperature probe for the buffer tank

Precise monitoring of the temperature in buffer tanks is crucial for the effectiveness and efficiency of heating systems. The design of our cable probes is carefully customised for temperature measurement in buffer tanks to ensure reliable and accurate temperature detection.

We offer a customised configuration of the cable probes. You can choose between various measuring elements, connection types, sleeve lengths and diameters as well as sleeve and cable materials. In addition, the different options for connectors, wire ends or open tinned ends allow flexible customisation to your requirements.

For use in demanding environments, such as aggressive media, we offer stainless steel sleeves that can be coated with chemically resistant materials such as Halar. These provide additional protection and longevity of the probe under extreme conditions.



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Project examples for buffer temperature probes

| Picture | Description |
|---------|--|
| | <ul style="list-style-type: none"> • Application: Temperature measurement in buffer tanks • Special feature: Depending on the application, the sleeve can only be pressed, rolled or both; the pressure spring ensures a better hold at the measuring point and optimum contact • Temperature range: Up to 90 °C • Measuring elements: NTC, PT100, PT1000 • Probe design: Sleeve length, sleeve diameter and sleeve shape, cable length, cable material and connector can be selected |
| | <ul style="list-style-type: none"> • Application: Temperature measurement in buffer tanks • Special feature: Design for moisture-critical applications with multiple rolling, sleeve length and diameter are adjustable • Mounting: Easy using a pipe clamp, immersion sleeve or cable gland • Temperature range: Up to 90 °C • Measuring elements: NTC, PT100, PT1000 • Probe design: Sleeve length, sleeve diameter and sleeve shape, cable length, cable material and connector can be selected |
| | <ul style="list-style-type: none"> • Application: Integral sensor for measuring the average temperature of buffer tanks • Special feature: Average temperature measurement of a temperature section using nickel wire over a certain length / distance • Temperature range: Up to 90 °C • Measuring elements: NTC, PT100, PT1000 |
| | <ul style="list-style-type: none"> • Application: Integral sensor for measuring the average temperature of buffer tanks • Special feature: Average temperature measurement of a temperature section using nickel wire over a certain length / distance • Temperature range: Up to 90 °C • Measuring elements: NTC, PT100, PT1000 |
| | <ul style="list-style-type: none"> • Comprehensive range of accessories for temperature probes • Immersion sleeves for precise positioning in liquids or gases • Compression fittings for secure, tight connections • Innovative push-in fittings: Easy handling, high reliability and improved connection technology for fast and secure mounting |

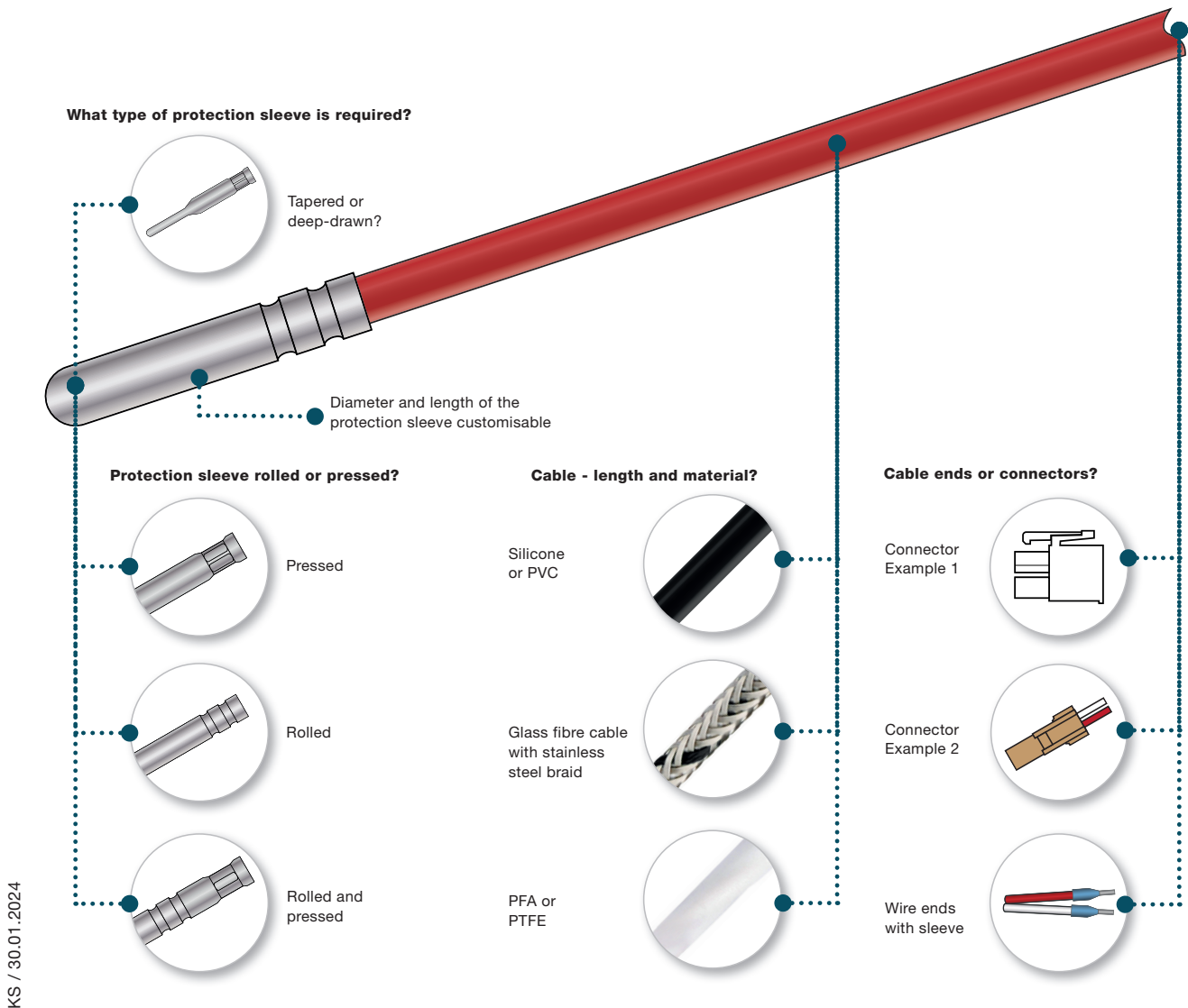
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Temperature probe for use on solar collectors

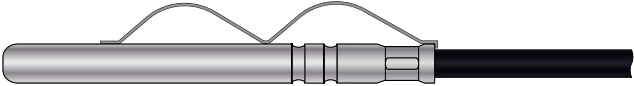




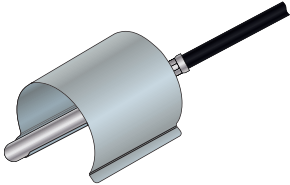
These probes are characterised by their robustness, which makes them ideal for outdoor use. They easily withstand the effects of weather, moisture and direct sunlight. This ensures reliable and long-lasting performance even under the challenging conditions on solar collectors.

To accommodate limited space, we also offer smaller designs that allow easy and flexible installation without compromising measurement accuracy. These compact designs are ideal for applications where space is at a premium but accurate temperature monitoring remains essential.

The probes can be customised in terms of measuring element, connection type, sleeve length and diameter, perfectly matched to the specially designed requirements of solar thermal systems.



Project examples for solar collector probes

| Picture | Description |
|---|--|
|  | <ul style="list-style-type: none"> • Application: Temperature measurement in solar collectors • Special feature: Sleeve is pressed and rolled, the pressure spring ensures a good hold at the measuring point and optimum contact • Temperature range: up to 200 °C • Measuring elements: PT100, PT1000, NTC • Probe design: Sleeve length, sleeve diameter and sleeve shape, cable length, cable material and connector selectable |
|  | <ul style="list-style-type: none"> • Application: Temperature measurement in solar collectors • Special feature: Special internal construction, ideal for solar panels, heat-resistant silicone cable, double rollers for higher moisture resistance (IP68) • Temperature range: up to 200 °C • Measuring elements: PT100, PT1000, NTC • Probe design: Sleeve length, sleeve diameter and sleeve shape, cable length, cable material and connector selectable |
|  | <ul style="list-style-type: none"> • Application: Temperature measurement in solar collectors • Special feature: Design for moisture-critical applications with multiple rolling, sleeve length and diameter are adjustable • Mounting: easy using a pipe clamp, immersion sleeve or cable gland • Temperature range: up to 180 °C • Measuring elements: PT100, PT1000, NTC • Probe design: Sleeve length, sleeve diameter and sleeve shape, cable length, cable material and connector selectable |
|  | <ul style="list-style-type: none"> • Application: Temperature measurement in solar collectors • Special feature: Design for moisture-critical applications with multiple rolling, sleeve length and diameter are adjustable • Mounting: easy using a pipe clamp, immersion sleeve or cable gland • Temperature range: up to 180 °C • Measuring elements: PT100, PT1000, NTC • Probe design: Sleeve length, sleeve diameter and sleeve shape, cable length, cable material and connector selectable |
|  | <ul style="list-style-type: none"> • Application: Temperature measurement in solar collectors • Special feature: available in different diameters, hold the cable probe reliably at the measuring point |
|  | <ul style="list-style-type: none"> • Application: Fixing clips with which cable probes can be attached to pipes and be used for surface measurement • Special feature: available in different diameters, hold the cable probe reliably at the measuring point |

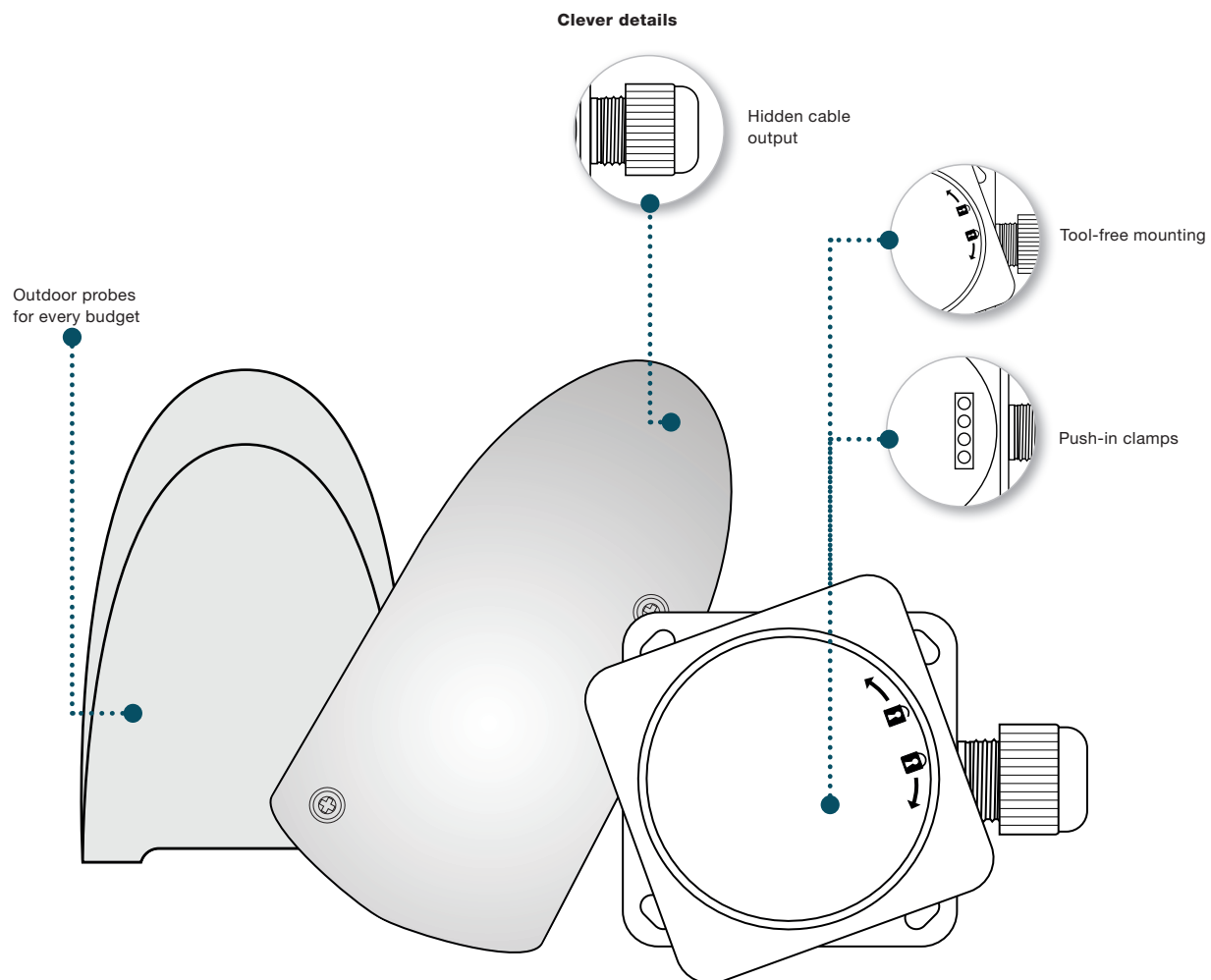
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Air temperature probes for indoor and outdoor use

Precise measurement of the air temperature in indoor and outdoor areas is an essential factor for the performance of heating and air conditioning systems. Our temperature probes are specially designed to reliably measure the ambient temperature. They are ideal for controlling heating systems and monitoring room temperature.

A special feature of our housing temperature sensors is their slow response. This specific design decision enables weather-controlled heating and air-conditioning systems to adapt their performance continuously and harmonised to changes in room temperature.

Testo Sensor offers you a selection of robust sensor housings. Depending on the model, these are protected against dust and water jets, UV-resistant and are characterised by easy mounting. We also offer you the option of customising the measuring element, connection type and other accessories such as connection cables and sun protection.



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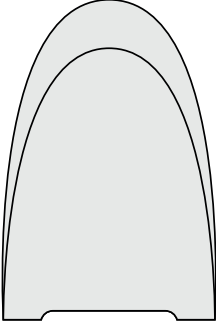

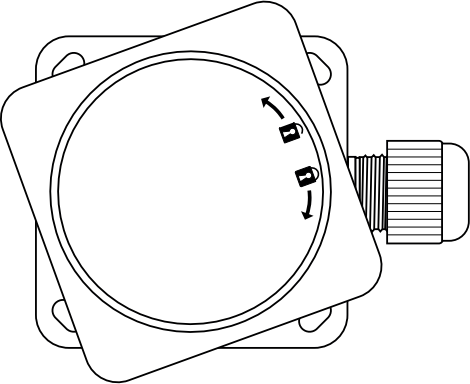

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Project examples for air temperature probes

| Picture | Description |
|---|---|
|  | <ul style="list-style-type: none"> • Application: Measurement of the air temperature indoors or outdoors • Special feature: Easy to attach, unobtrusive housing, easy to install, cost-effective • Housing variants: Available as outdoor probe and room temperature probe (with ventilation slots) • Measuring elements: Pt sensors, NTC, KTY, DS18B20 • Temperature range: Up to 50 °C |
|  | <ul style="list-style-type: none"> • Application: Measurement of the air temperature indoors or outdoors • Special feature: Sealed housing (IP67), UV-resistant, easy to screw on with cable gland and strain relief, clever design under the cover • Housing variants: Available as outdoor probe and room temperature probe (with ventilation slots) • Measuring elements: Pt sensors, NTC, KTY, DS18B20 • Temperature range: Up to 50 °C |
|  | <ul style="list-style-type: none"> • Application: Measurement of the air temperature indoors or outdoors • Special feature: Robust, sealed housing (IP67), UV-resistant with innovative bayonet lock and plug-in terminals for tool-free mounting, easy and time-saving • Housing variants: Available as outdoor probe and room temperature probe (with ventilation slots) • Measuring elements: Pt sensors, NTC, KTY, DS18B20 • Temperature range: Up to 50 °C |
|  | <ul style="list-style-type: none"> • Application: Versatile use in HVAC systems and for room temperature measurements • Special feature: Very robust and versatile thanks to high-quality TPE overmoulding for chemical and corrosion resistance • Temperature range: Up to 90 °C • Measuring elements: Pt100, Pt1000, NTC |

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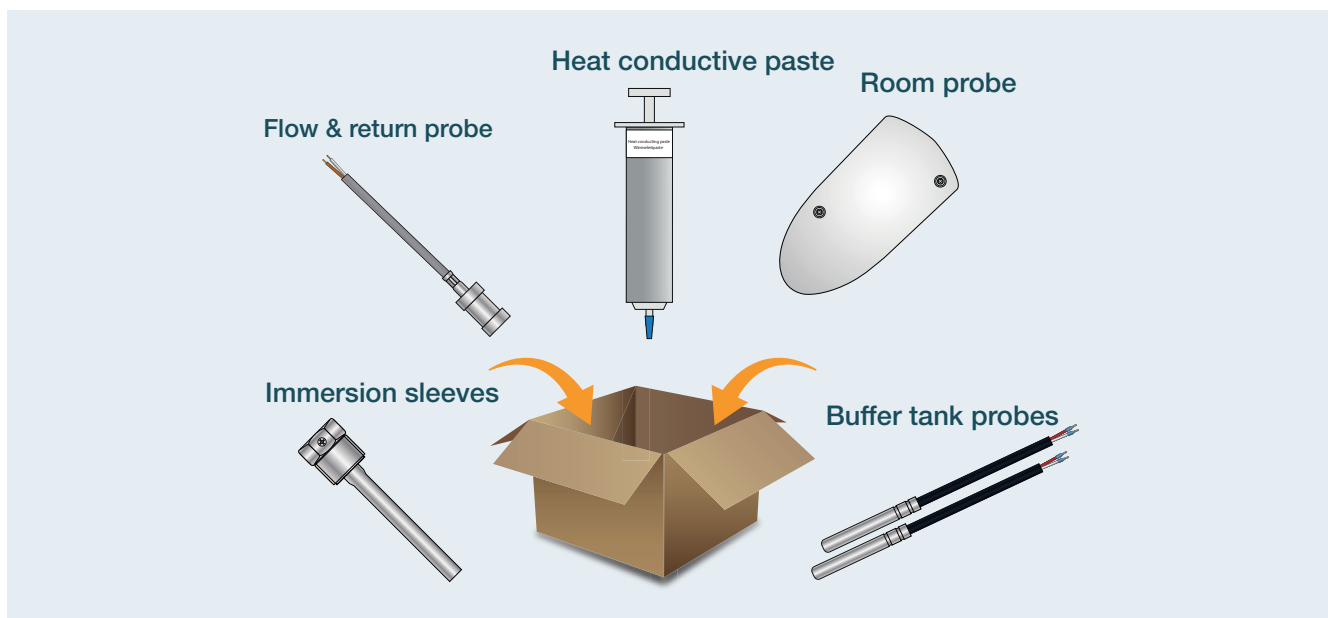
More efficiency and flexibility with our service

At Testo Sensor GmbH, we understand the dynamics of modern supply chains. That's why we not only offer you high-precision temperature probes, but also a customised service package that meets your logistical challenges.

Our offer for you: Complete service for temperature probes

- **High-quality temperature probes:** Our customised temperature probes stand for precision and reliability, perfectly matched to your requirements.
- **Complete mounting kit:** We not only supply the necessary tools, but also heat conductive paste, quick release straps and other accessories - everything you need for efficient mounting.
- **Flexible delivery options:** Whether directly to your installer's site or as a "complete item" to your central warehouse - we customise our delivery to suit your needs. Delivered to the central warehouse, each complete item simplifies further distribution and minimises internal costs.

Your service package could look like this



The benefits are obvious

- **Space and cost savings:** By delivering complete items, you significantly reduce your storage requirements and the number of item numbers to be managed.
- **Maximum flexibility:** You decide whether delivery is made directly to the assembly site or to the central warehouse - for maximum efficiency in your logistics chain.
- **Environmentally friendly:** Our customised delivery options help to reduce CO2 emissions and support your commitment to sustainability.

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

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Quality as a guiding principle

At Testo Sensor GmbH, quality is a promise. Our temperature probes are designed to withstand the harshest conditions to ensure precision even in extreme environmental conditions. They offer a lifetime of over 15 years and are tested to the highest standards through strict quality controls in design and production, including a 100% final inspection. This ensures consistently high quality and fulfils our customers' expectations.

This is how we ensure quality

| Qualification measurement series to ensure the function of our probes over their service life | | |
|---|---|---|
|  | Robust even with temperature changes | Temperature probes are exposed to harsh environmental conditions, such as changing temperatures and high humidity, and should still work reliably in the field for 15 years or more. |
|  | Resistant to heat and humidity | Extremely varying ambient conditions cause immense stress for the temperature probe and the design must be suitably robust and qualified. |
|  | Long-term stable in any weather | Continuous exposure to sunlight, snow, fog, cold and ice shall not impair the function of the temperature probe and compliance with the specification. |
|  | Robust even under high vibration load | Depending on the application, compressors and fans generate strong vibrations which are transmitted to components and cables. Therefore the used temperature probes have to be vibration resistant (20g). |
|  | Reliable in practice: high pull-out force | The robust design ensures the necessary cable pull-out resistance, even under vibration and higher temperatures. |
|  | Efficient through short response time | Depending on the application, short response times may be necessary to ensure efficient control of the system. Our sensor design is optimised for this requirement and we prove response times. |
|  | Corrosion-resistant even in salt spray | Temperature probes are also used in coastal regions. For this reason, the temperature probes must also be able to withstand salty air for a lifespan of 15 years. |

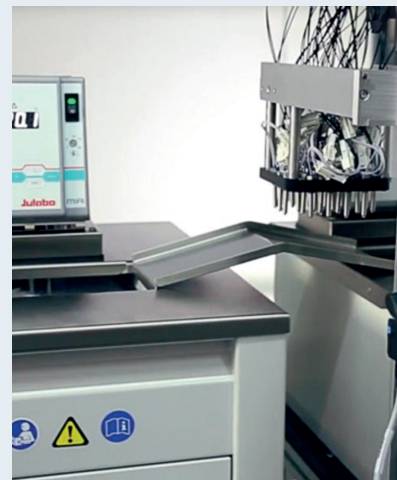
Insights into our in-house laboratory



Pairing test stand



Response time test stand



Lifetime test stand

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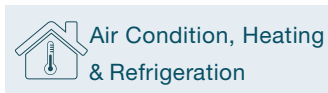
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Testo Sensor GmbH

Testo Sensor GmbH was spun off in 2010 as a subsidiary of Testo SE & Co. KGaA. As a specialist in temperature probes and measurement technology, we focus on the development, manufacture and distribution of application-specific temperature probes for industrial customers.

As a competence partner and OEM (Original Equipment Manufacturer) for our customers, we deliver the complete package: the technical solution, the required zero-defect quality, the appropriate supply logistics and the performance-based price.

We operate in these sectors:



Air Condition, Heating
& Refrigeration



Machinery & Plant
engineering

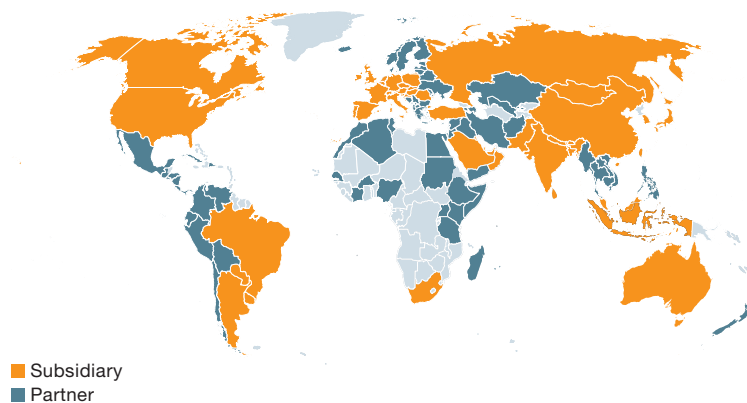


White Goods &
Coffee machines



Probes for
heat meters

Part of the strong Testo group of companies



- Testo is one of the leading manufacturers of measuring instruments in the energy management, heating/air conditioning/ventilation, food and pharmaceutical industries
- 3,400 employees in more than 37 subsidiaries spread over 26 countries worldwide, > 80 sales & service partners on all continents
- A current turnover of more than current turnover of over 400 million euros

Changes, also of a technical nature, reserved. KS / 30.01.2024

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