**INDUSTRIAL SENSORS AND
HANDHELD MEASURING DEVICES**
TEMPERATURE

Precise temperature measurement.

For the highest demands, all media and temperature ranges.

> "The most accurate temperature measurement in production is essential – always in consideration of environmental conditions."

Editorial. Specialists by Competence.

Dear readers,

After time, temperature is the most world's most measured physical variable. The objective of detecting this variable exactly and with long-term stability has been the driving force behind our Center of Competence Greisinger for almost 40 years.

The key strengths are our experience with the development and production of high-quality temperature sensors and display devices and in the high production depth at the location in Regenstauf. We already set high standards in the design phase in order to develop systems that are well-suited for the market and customer. In the process, we incorporate efficiency aspects into the development from the very start. The result of this is innovative solutions for our customers' success.

Our extensive experience offers the possibility of choosing temperature sensors and measuring devices from a wide spectrum of products.

The continuous new and further development in-house ensures that our products are always state of the art.

We produce a comprehensive assortment of temperature probes and sensors with more than 70 employees at the location. The result is countless variation and combination possibilities and areas of application and use, which also cover Ex areas.

With our in-house production, we are capable of flexibly producing everything from small, customised unit counts to larger series. Our sales and product management team enables swift and reliable implementation of our requests at the highest quality level.
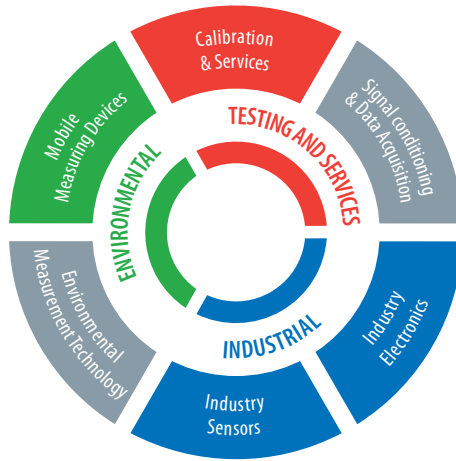
Temperature measurement technology.
Quality Made in Germany.

The Center of Competence Greisinger of GHM GROUP at the Regenstauf location combines long-term competence with the expertise of experience specialists in temperature measurement technology. Market trends are tracked here and taken into account in the development of new technologies.

The focus is the following core segments
○ Industrial temperature sensors
○ Handheld temperature measuring devices – from simple instant thermometers to high-precision measuring systems
○ Calibration service for our devices or third-party manufacturers

We are distinguished by our highest quality standards which our employees have given the utmost priority. They are supported with carefully defined procedures. The continuous process control in the scope of our production certified in accordance with ISO 9001:2015 puts our quality level continuously under the loop.
Not lastly, we underscore our competence in temperature measurement with our DAkkS service centre in accordance with ISO/IEC 17025. The centre calibrates and recalibrates temperature probes and indicators, such as handheld device, indicators, controllers and data loggers. It makes no difference if it involves devices from in-house production or third-party manufacturers.

The products of our Center of Competence Greisinger are used in a wide variety of applications in industry, skilled trades and in wholesale.

This brochure is an overview of our product assortment for temperature measurement technology.

If you are looking for a tailor-made solution for your requirement, do not hesitate to contact us.

Table of contents.
Temperature measurement.

Temperature measurement.
Diversity for every task.

Detection of the measurement variable "temperature" is essential in the widest range of applications. The areas of application are equally diversified – from environmental technology to building technology to industrial process technology. Our spectrum starts at −200 °C and reaches up to 1150 °C. However, even higher temperatures are possible on request. These different requirements demand use of a wide range of materials and components and special protective measures, such as protective tubes and fittings or special versions for use in explosion-prone areas. With our ATEX-compliant sensors, you are on the safe side. Optimal adaptation to typical market conditions and customer-specific requirements has been a driving force behind our development of state-of-the-art temperature sensors and handheld measuring devices.

With the diverse range of applications, thermal and mechanical demands on temperature sensors are wide-ranging and have increased steadily over time. We offer our sensors with various designs, materials and components, such as protective fittings, which are adapted to the relevant measuring task.

Thermocouples and resistance thermometers

The application determines the physical principle
Different thermocouple and resistance thermometer pairs are used depending on temperature range and area of application. Thermocouples that conform to EN 60584 are normally used for measurement in temperatures exceeding 800 °C.

The Pt resistance sensors (Pt100 or Pt1000) are a good choice when the temperature measurement takes place in the range of −200 °C to 850 °C. They are the most precise sensors and have the best long-term stability. They chemical resistance of the platinum also reduces the risk of contamination due to oxidation and other chemical influences.

The thermocouple – small and fast
Because the temperature of the thermocouple is only the connecting point of two different metal alloys, it can be designed with an extremely small format and thus react very quickly. The sturdy construction and use of diverse materials ensure that our sensors cover practically all of our customers' requirements.

Pt resistance sensor – precise and versatile
The area of focus of Pt resistance sensors is precise measurement. The exact rated values and temperature-dependent output characteristics and their tolerances are regulated by EN 60751. The requirements of the relevant applications are covered by our products with design measures and the use of special materials for the housing.

ATEX-compliant and calibrated
We have mastered the challenge of producing sensors for Ex applications, in particular. We offer a wide assortment of sensors in accordance with ATEX. In addition, we measure and calibrate our sensors and indicators in our in-house DAkkS service centre for quality assurance and issue certificates for our entire product assortment, as necessary.

SIL
Suitable for Safety Applications
IEC 61508 / IEC 61511

Ex

ISO 9001:2015

**FDA**

Industrial temperature sensors.
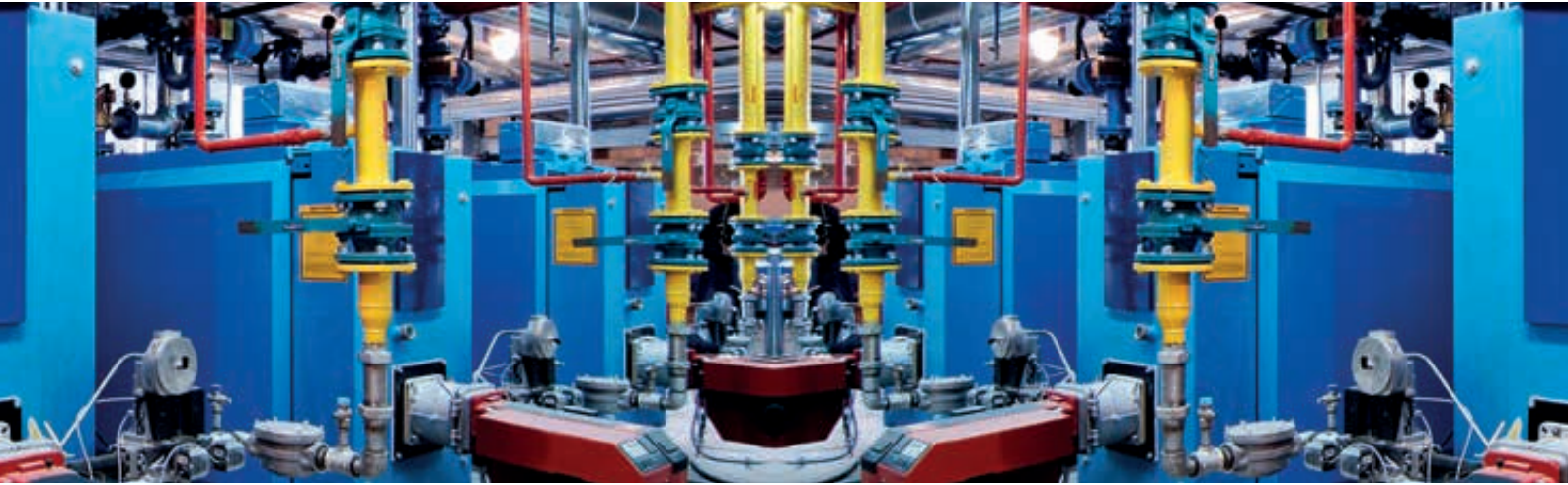
The GTF industrial sensors are available with a large selection of process connections and plug connectors in a wide variety of designs.

The resistance sensors are available in a selection of accuracy classes and with bendable probes, depending on the version. Our sensors based on the type K thermocouple are suitable for temperatures from – 200 °C to 1150 °C. Other thermocouples can also be used.

The smallest probe diameters and probes without cable sleeve are particularly well-suited for constricted installation situations and for processes with minimal destruction, e.g. as required in the food industry. Individual packaging from the probe diameter to materials specifications can be implemented even in small batches.

GTF SERIES – UNIVERSAL AND FAST

GTF 300 Type K measuring probe
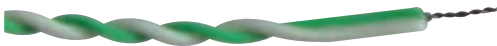
GTF 300
Twisted welded measuring tip

GTF 300 GS-UV
Non-twisted welded measuring tip

GTF 300 GS-SP
Measuring tip with weld bead

○ Wire probe for instant measurement

○ Universal applicability – for handheld measuring devices and for combinations with industrial measuring technology

○ High reaction speed

○ Simple to use

○ Outstanding price-performance ratio

GTF 103 Temperature probe

○ Custom probe length, extension tube, 2, 3 or 4-wire – everything is tailored to customer needs with the GTF 103

○ Also available as a measuring transducer with 4–20 mA – or 0–10 V output

○ Proven, reliable design

○ Also available as Ex variant

Advantage:
○ Interchangeable measuring element enables sensor replacement, e.g. for calibration without process interruption

GTF 103

GTF 103-EX
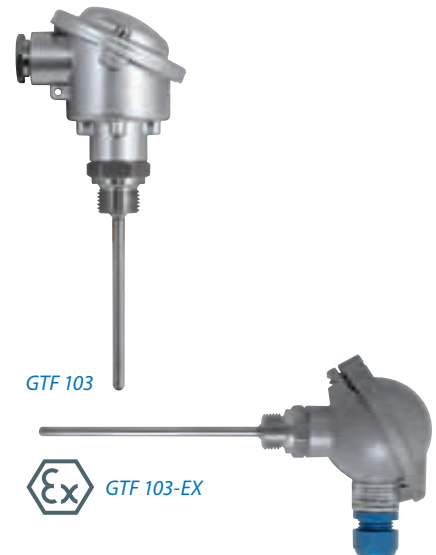
GTF 112 Temperature probe

○ Configured according to customer requirements

○ M12 plug connector

○ Individually selectable measuring range

○ Also available as Ex variant

Advantage:
○ Simple and time-saving installation with M12 plug connector

GTF 112

GTF 112-EX

8100 – VERSATILE USE

8100 A/C Temperature probe

○ Resistance thermometer Pt100 / Pt1000 term. B

○ Cylindrical protective tube, stainless steel 1.4571

○ IP65 protection rating of the connection head

○ Interchangeable measuring element

○ Optional head transmitter

Advantage:
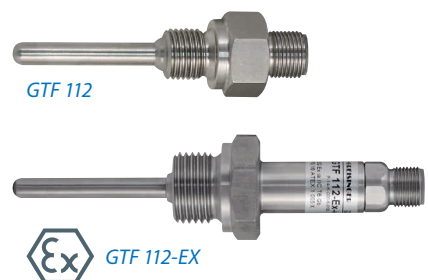○ Interchangeable measuring element enables sensor replacement, e.g. for calibration without process interruption

8100 A/C Temperature probe

Industrial hygienic temperature sensors.

GTL SERIES – SMALL AND PRECISE

Advantages:

The GTL series offers consistent quality and the greatest precision with use of Pt100 technology. The space-saving and compact design enables various electrical connections. Any retrofitting can be carried out without rewiring.

In order to reduce costs, two integrated Pt100 elements can be used as a reference measuring point.

GTL 244 Temperature sensor

○ G ½" hygienic, front flush process connection

○ Hygienic and easily sterilised measurement point

○ Stainless steel and PEEK sensor

○ Thermally decoupled

GTL 369 Temperature probe

*Matching weld-in sleeve
e.g.: GKEV-25/76, GEMK-25/76*

○ Without thread

○ Hygienic and easily sterilised measurement point

○ Entirely stainless steel sensor

GTL 720/737 Pipe-mounted probe

- Simple assembly with pipeline adapter

- Process connection does not come into contact with media

- High measurement accuracy, even without use of thermally conductive paste

- Short reaction time

- Replacement of the sensor without process interruption

- Pt100 sensor with integrated measuring transducer

- Programmable with GTL configuration tool or front-side button

- Backlit local LCD display

- Output 4..20 mA for 2-wire connection

- GTL720 also applicable in Ex applications

Advantages:
- Clamp-on technology reduces costs for installation and commissioning

- Precise, reproducible and fast measuring for quality checks

- Can be used as a mobile unit with handheld terminal for system optimisation

- Single components allow optimised inventory management

- Problem-free cleaning with chemicals and high-pressure cleaners

- Robust design for a long service life

NON-CONTACT TEMPERATURE MEASUREMENT

API weld-in immersion sleeves and APH pipe installation systems
Measurement in closed systems.

- Measuring the temperature in tanks, containers or pipeline systems even with small nominal diameters

- Measuring the processing temperature in superheated steam and pressure lines

- Monitoring of the CIP / SIP cleaning process

- Suitable for use in food production and the pharmaceutical industry

Advantages:
- Sensor replacement without opening the process

- Disassembly without emptying the tank or pipeline

- Calibration without process interruption

For tanks and containers

For tanks, containers and pipelines

Suitable for GTL 4x series, among others

G⅜" union nut process connection – sensor replacement without opening the process

Temperature transmitters / switches.

Our temperature transmitters / switches are distinguished by their modular design. Maximum adaptability is guaranteed as a result. The devices are available in different designs: as a simple probe tube, as a probe tube with process connection or as a probe tube with process connection and extension tube. Models with integrated measuring transducer (GTMU-IF) or with integrated EASYBus connection (EBT-IF) are available.

IF SERIES – HIGH-QUALITY MEASURING TECHNOLOGY IN COMPACT DESIGN

GTMU-IF Temperature measuring transducer

GTMU-IF1

GTMU-IF2

GTMU-IF3
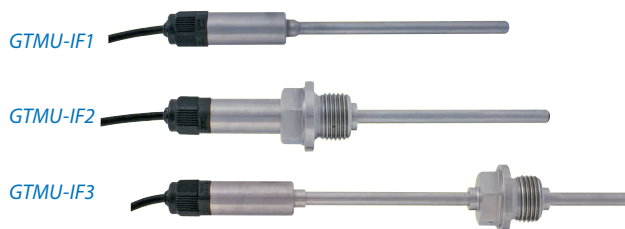
○ Measuring transducer with microcontroller

○ Pt1000 resistance sensor

○ Very high measurement accuracy

○ Compact design

EBT-IF EASYBUS sensor modules for temperature

EBT-IF1

EBT-IF2

EBT-IF3
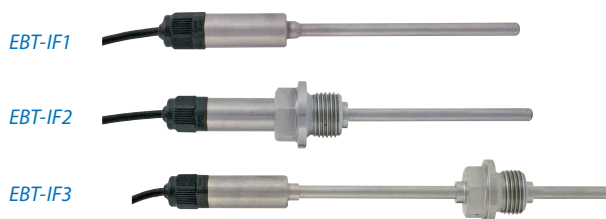
○ EASYBus interface

○ Pt1000 resistance sensor

○ Measuring ranges from −70 to +400°C

○ Assembly according to customer wishes

TEMPERATURE TRANSMITTER WITH LCD

OMNI-T

○ Analogue output 4..20 mA
  or 0..10 V

○ Two programmable switches
  (push-pull)

○ Graphical LC display, backlit,
  transreflective, can be read in
  sunlight and in the dark

○ Programmable parameters
  via rotatable, removable ring

○ Entirely stainless steel housing
  with scratch-proof, chemically
  resistant glass

○ Physical unit in the display
  (selectable)

○ Rotatable electronic head for
  best reading position

○ Optional tropic version (oil-filled)

○ High temperature model (200 °C)
  optionally available

○ Connection to USB interface for
  setting parameters

○ IP 67

○ Lance design and compact design

TEMPERATURE MONITOR

TF1

○ Bimetal thermostat

○ Installation location as desired

○ compact construction

○ 'normally opened' or 'normally
  closed'

○ Range: 40..120 °C / 10 °C steps

○ Tolerance: ±10 K / hysteresis: 20 K

○ Male thread G½" A

Temperature transmitters / switches.

TEMPERATURE DIFFERENCE TRANSMITTER

ETSD

Probe T1 with integrated measuring transducer (lance design)

Probe T2 (passive) (compact design)

M12x1 cable bushes for connection of T1 and T2

○ Simple detection of temperature differences

○ Lance design and compact design

○ 2 probes, differential range up to 50 K

○ 4..20 mA, two-wire

○ Stainless steel material

○ Self-assembly plug, including

○ Large separation between the two sensors is possible (4-wire connection)

○ Infinitely adjustably rotatable cable outlet for clean alignment

○ Different characteristic curves are possible

TEMPERATURE SWITCH

HTK12-I/U/F/S

○ Temperature sensor for the food industry in 12 mm housing

○ User-configurable with plug pins (teach-in)

○ Identical mechanical design also available as flow sensor or level switch

○ Analogue output 4…20 mA (HTK12-I)

○ Analogue output 0…10 V (HTK12-U)

○ Frequency output (HTK12-F)

○ Limit value switch (HTK12-S)

FDA

Accessories for temperature sensors and transmitters.

MU 125 | UT 125 | GIA | 20EB / GIR 230 | GIR 360 | GIA2000 / GIR2002

Universal devices for display and signal monitoring.
The GHM Group offers a comprehensive portfolio for transmission or display of measurement signals in various manners for further use. Various designs are available depending on the application.

MU 125   UT 12

GIA 20EB

GIR 230

GIR 360

GIA2000 / GIR2002

The GHM-Rail series. Everything from a single provider.

TB225 | STL50 | Safety temperature limiter

An entire series of compact solutions
When it comes to signal processing and monitoring of processes, the GHM-Rail series offers a complete product assortment for demanding process and industrial technology. In addition to temperature limiting and monitoring, the series comprises compact solutions for measurement transformation, limit value switching and signal isolation and transformation.

Limiting and protection
The Rail series product range offers direct connection options for resistance thermometers and thermocouples for temperature limiting and monitoring.

The TB225 and the STL50 cover all requirements of automation as a temperature limiter.

EN 14597

For further information, visit **www.ghm-group.de/ghmrail**

Temperature measurement technology.
In a handy format.

Our Greisinger Center of Competence has taken on the task of packaging the increasingly complex world of practical temperature measurement in industry and skilled trade in handy formats. We have combined the results of intense comparison of notes with our customers with our expertise in measurement technology. The focus of our developments is always the user and their applications so that we can offer the right handheld measuring device for every requirement.
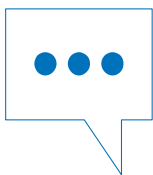
"If you cannot measure it, you cannot improve it."
Lord Kelvin

Billions are spent each year on modern production plants and new production processes. These new processes have the task, among others, of saving energy and raw materials. Our handheld measuring devices support daily processes and safeguarding of smooth processes in production plants in order to maintain and improved product quality.

Many small details support daily measuring tasks and make our handheld measuring devices an indispensable companion. With the continuous development of our devices, we have continuously improved basic features and functions in order to guarantee the best possible suitability for daily use.
They offer the possibility of obtaining an objective evaluation with the delivered data without having to rely on subjective sensory perceptions and make the right decisions.

Handheld measuring devices offer compact measurement technology and, thanks to their mobility, are versatile in use for a wide variety of application conditions. High demands, such as maximum precision requirements or extreme cost pressure are, of course, factored into the product development.

Greisinger offers you an optimised portfolio of handheld measuring devices and accessories. Decide for yourself which measuring device class is right for you.

Handheld measuring devices.
Temperature detection in a handy format.

GHM 3000 SERIES – PROFESSIONAL STANDARD

Application areas
○ High-precision measurements in all
   temperature-critical processes of industry

○ Research and science

○ Education and teaching

○ Quality assurance

○ Service

Advantages:
○ Different equipment variants of devices – individually combinable
   for your requirements

○ Interface for data recording directly on site is always possible with
   Easy Control or EBS 20M software

○ The support enables convenient reading of measurements on the
   table top or carried on the belt

○ Best-in-class price-performance ratio

○ Comfortable data logger and acoustic alarm function available

○ Energy-saving measurement processes guarantee long battery life
   and readiness for use when you need it

GHM 3700 SERIES – HIGH-RESOLUTION PT1000 4-WIRE PRECISION THERMOMETER

Application areas

○ Laboratory reference measurements with maximum accuracy requirements

○ Testing of temperature accuracy of medical devices

○ High-precision measurements in meteorology, agriculture and countless other applications

○ Quality control in countless industrial processes which rely on maximum precision and traceability

The GHM 37 Pt100 precision thermometers are the first choice when it comes to maximum accuracy for an affordable price.

Sophisticated measuring electronics measure with minimal current in order to avoid self-heating of even the smallest sensors. Problematic thermal voltage effects are eliminated entirely with AC measurement.

Of course, 4-wire measuring technology is also used here in order to compensate for all influences of contacts and cables. You have the choice between two basic variants: GMH 3710 with simple functional scope (min / max value detection, Hld function) or GMH 3750 with top equipment logger / alarm / 50-point characteristics.

Advantages:

○ 4-pin plug connector for interchangeable sensors

○ Freely configurable characteristics with 50 support points with GMH 3750

○ Thermal voltage compensation

○ Minimum measurement current

○ Resolution to the 100th degree Celsius with high accuracy of better than 0.1 °C

○ Calibrated to your sensor of choice in the set

○ 0–1 V analogue output for recorder connection

Handheld measuring devices.
Temperature detection in a handy format.

GMH 3200 SERIES – FAST THERMOCOUPLE MEASURING DEVICES FOR EVERY PURPOSE

Application areas

○ Measurements on surfaces: Industry, construction, food

○ Welding and soldering

○ Painting and coating

○ Measurements even in difficult media such as asphalt, aluminium melt, frozen foods, and many more

○ Measurements at extremely high temperatures exceeding 1150 °C

○ Heating / ventilation / air conditioning

GMH 32 industrial thermometers are designed for instant, precise measurements. With an intricate design and high-quality temperature compensation, the devices offer very good precision even in extreme applications. Temperature changes on the device due to fluctuating environmental temperatures, heat radiation, etc. are compensated in the best manner possible.

You have the choice between one or two-channel versions, entry-level versions (only type K) or advanced versions with selectable thermocouple type K, J, N, S, T, E, B and interface. Loggers and alarm versions are also available.

Advantages:

○ Standardised plug connection for selection of your choice of probes from our assortment

○ Two-line daylight-compatible display

○ Comfortable correct surface correction (except for 3221 and 3201)

○ Excellent comparison point compensation

○ GMH 3201 as an affordable standard thermometer with basic scope of function

○ Large selection of probe designs for optimal ergonomics and precision for numerous applications

G 1700 SERIES – COMPACT THERMOMETERS, PT1000, WATERPROOF

Application areas
- Food production and control
- Heating / ventilation / air conditioning (HVAC)
- Research and teaching
- Laboratories
- Quality assurance
- Service

The primary focus in the development of the new G 1000 series was the essential functions of the measurement technology. Pure measurement with a focus on precision, speed and reliability combined with a compact housing enables an impressive price / performance ratio.

The handheld measuring devices also impress with the ergonomic design, dust and water-protected design according to IP 65/67 and the illuminated display.

The G 1000 device series with test reports redefine our entry-level measuring technology class. Equipped with maintenance-free sensors, the G 1000 of easy-to-operate precision measurement devices in a handy format is designed to offer you reliable service for years to come.

Advantages:
- Ergonomic and functional housing, grippy operable with one hand
- Large and easy-to-read 3-line LCD display
- Overhead view at the push of a button
- With backlighting, so it can be read in total darkness or bright daylight
- Robust and waterproof according to IP65/67
- High availability for use with long battery life – easy battery replacement with easy-to-purchase standard batteries
- High-quality and affordable sensors: Pt1000 sensors offer levels of accuracy that are similar to the Pt100, but at a more affordable price

Handle probes. Specially for handheld measuring devices.

GF1 series Probes with compact, high-temperature-resistant silicone handle

Probes with a lightweight ergonomically design handle and flexible cable. The handle probe is waterproof and can be completely immersed without concern.

Advantages:

○ Affordable entry-level probe

○ Very compact and handy

○ Extremely robust and waterproof

○ Versions in type K or Pt1000, with your choice of plug connectors

○ Available as an insertion probe or as and immersion probe

○ Handle and cable withstand up to 250 °C

Ø 6 mm immersion sensor

Ø 3 mm insertion probe – robust version

Ø 1.5 mm needle probe – extremely small yet fast and precise

GTF Handle probe series Immersion probes with plastic handle for elevated demands

The probe is available in a variety of versions:

○ Diameter Ø 1.5 mm to 6 mm

○ Silicone cable and miniature flat plug in thermocouple version (standard)

○ With Pt100 or Pt1000 PVC standard cable with 4-pin or BNC connection

○ Adaptation of the cable material and connections suitable for the application

○ Temperature measurement up to 1150 °C (depending on version)

○ Special versions available on request

Advantages:

○ Glass fibre reinforced plastic handle: extremely robust and temperature-resistant up to 100 °C

○ "Heavy-duty" anti-kink protection and tension relief for the toughest application conditions

○ Suitable for a variety of special versions

GES Insertion probe (GES 20K, 21K 130, 500, 900,...)

**The insertion probe is available in a variety of versions:**

○ Selectable handle: Plastic handle or Teflon handle
   for food applications

○ Diameter Ø 1.5 mm to 6 mm

○ Versions in type K, Pt100 or Pt1000, with your choice
   of plug connectors

○ Temperature measurement up to 1000 °C (depending
   on version)

Advantages:

○ Robust insertion tips

○ Food-compatible materials, Teflon handle available

*GES 500 Ø 3 mm
insertion probe
with a large handle*
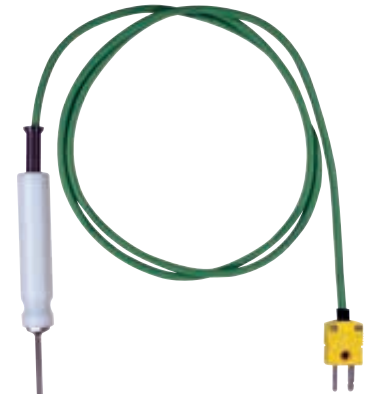
*GES 21K insertion
probe with PTFE handle –
optimised for food*

GOF Surface probe type K

**GOF surface probes are especially well-suited
for instant surface measurement:**

○ Designed for minimal measurement error

○ The GOF 400 is very robust for temperatures of
   up to 400 °C; the GOF 130 is designed for temperatures
   of up to 900 °C

○ The new GOF 501 is affordable, extremely robust
   and especially fast

Advantages:

○ Refined designs help minimise problems associated
   with heat conduction from surface measurement

○ Sophisticated and yet affordable

○ Adaptable to your special requirements – even in
   smaller batches

A variety of different probes is available:
Clip-on probes, air probes, tyre temperature probes, frozen goods
screw-in probes, insertion probes for compost, silage and waste disposal

*GOF 501:
silver contact
surface*

*GOF 130:
miniature contact
springs for high
temperatures*

*GOF 400:
best possible
support for
minimal deviation*

Handle probes. Overview.

GTF Immersion probe		RESISTANCE	
		Pt100	
CONNECTION	MiniDIN 4-wire (GMH 37 series)	●	●
	BNC (G 1700 series)		
	Miniature flat plug connection type K (GMH 32 series and similar)		
	Optional loose ends	●	●
SENSOR TUBE DIAMETER	Standard	Ø 3 mm	Ø 1.6 mm
PROBE TUBE LENGTH	Standard	150 mm	150 mm
	Optional different	●	●
PROBE TUBE MATERIAL	Standard stainless steel: elastic, rigid	●	
	Jacket element (bendable)		●
MEASURING RANGE		−50..+400 °C	−50..+400 °C
SPECIAL APPLICATION			
TYPE		**GTF 401**	**GTF 401-1.6**

GES Insertion probe		RESISTANCE	
		Pt100	Pt1000
PROBE HANDLE		Plastic 100 °C	Teflon, compact
CONNECTION	MiniDIN 4-wire (GMH 37 series)	●	
	BNC (G 1700 series)		●
	Miniature flat plug connection type K (GMH 32 series and similar)		
	Loose ends	●	●
SENSOR TUBE DIAMETER	Standard	Ø 2.2 mm	Ø 1.5 mm
PROBE TUBE LENGTH	Standard	50 mm	100 mm
	Optional different	●	●
PROBE TUBE MATERIAL	Standard stainless steel: elastic, rigid	●	●
	Jacket element (bendable)		
MEASURING RANGE		−50..+400 °C	−70..+250 °C
SPECIAL APPLICATION			Food
TYPE		**GES 401**	**GES 20**

THERMOCOUPLE						
Pt1000			Type K			
●						
	●	●				
			●	●	●	●
●	●	●	●	●	●	●
Ø 3 mm	Ø 3 mm	Ø 1.6 mm	Ø 1.5 mm	Ø 3 mm	Ø 1.5 mm	Ø 6 mm
150 mm	100 mm	100 mm	130 mm	130 mm	150 mm	1000 mm
●	●	●	●	●	●	●
	●		●	●		
●		●			●	●
−200..+600 °C	−70..+250 °C	−70..+250 °C	−65..+550 °C	−65..+1000 °C	−200..+1150 °C	−200..+1000 °C
High-precision reference probe				High-temperature application	High-temperature application	Aluminium melt
GTF 601	**GTF 175**	**GTF 175-1.6**	**GTF 400**	**GTF 900**	**GTF 1200**	**GTF 1000AL**

THERMOCOUPLE									
	Type K								
Plastic 100 °C	Teflon, compact	Teflon, robust	Plastic 100 °C	Plastic 100 °C	Plastic 100 °C	Plastic 100 °C	Plastic 100 °C	Plastic 100 °C	Plastic 100 °C
●									
	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●
Ø 3 mm	Ø 1.5 mm	Ø 3 mm	Ø 1.5 mm	Ø 3 mm	Ø 3 mm	Ø 1.5 mm	Ø 8 mm	Ø 8 mm	Ø 1.1 mm
100 mm	100 mm	100 mm	130 mm	130 mm	1000 mm	100 mm	1250 mm	180 mm	27 mm
●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●
−70..+250 °C	−65..+550 °C	−50..+250 °C	−65..+550 °C	−65..+550 °C	−65..+1000 °C	−65..+400 °C	−65..+200 °C	−65..+550 °C	−50..+200 °C
	Food	Food				Without cable	Compost	Asphalt	Tyre temperature
GES 175	**GES 20K**	**GES 21K**	**GES 130**	**GES 500**	**GES 900**	**GTE 130 OK**	**GKF 125**	**GAF 200**	**GRF 200**

Handle probes. Overview.

GOF Surface probe			RESISTANCE	
			Pt100	Pt1000
PROBE HANDLE			Plastic 100 °C	Plastic 100 °C
CONNECTION	MiniDIN 4-wire (GMH 37 series)		●	
	BNC (G 1700 series)			●
	Miniature flat plug connection type K (GMH 32 series and similar)			
	Loose ends		●	●
SENSOR TUBE DIAMETER	Standard		Ø 3 mm	Ø 3 mm
PROBE TUBE LENGTH	Standard		150 mm	100 mm
	Optional different		●	●
MEASURING RANGE			−50..+200 °C	−70..+250 °C
MEASURING SURFACE				
SPECIAL APPLICATION				
TYPE			**GOF 401**	**GOF 175**

THERMOCOUPLE						
Type K	Type K	Type K	Type K	Type K	Type K	Type K
Plastic 100 °C	Plastic 100 °C	Plastic 100 °C	Plastic 100 °C	Plastic 100 °C	Plastic 100 °C	Plastic 100 °C
●	●	●	●	●	●	●
●	●	●	●	●	●	●
Ø 8 mm	Ø 8 mm	Ø 5 mm	Ø 5 mm	Ø 5 mm	Ø 3 mm	Ø 3 mm
130 mm	130 mm	100 mm	120 mm	120 mm	130 mm	130 mm
●	●	●	●	●	●	●
−65..+550 °C	−65..+550 °C	−65..+400 °C	−65..+400 °C	−65..+400 °C	−65..+500 °C	−65..+550 °C
Spring tip	Spring tip	Steel tape	Steel tape	Steel tape		
	Angled 90°		Short angled 90°	Long angled 90°	Silver blank	Elastic copper plate
GOF 130	**GOF 900 HO**	**GOF 400 VE**	**GOF 200 HO**	**GOF 400 HO**	**GOF 501**	**GOF 130 CU**

2018: NEWLY ACCREDITED IN ACCORDANCE WITH ISO/IEC 17025

Calibration service. Temperature calibration made by Greisinger.

Long-term calibration partner – with any eye on the future

○ All ISO production processes require traceable reference devices

○ Increasing requirements in the medical field, in food production and testing technology require traceable equipment

○ Research and science

○ Laboratories

Certificates refine our temperature measuring devices and probes. This documents and verifies your traceability to national standards.

This traceability also differentiates "professional measuring devices" made by the GHM GROUP from the unbelievable number of low-cost thermometers in the market. We deliver measuring tools for professionals and demanding companies.
By combining development, production and calibration service under one roof, we are ideally positioned to fulfil this requirement and have verified this with thousands of certificates issued.
In order to remain successful in the future, we invest constantly in competence and equipment.
The result: DAkkS accreditation of our calibration laboratory in Regenstauf according to ISO/IEC 17025.

Calibration certificates can be ordered with new devices from the factory in order to verify traceability. Recurrent calibrations are necessary for many processes – you just send us your probes and display units for calibration.

Why must temperature sensors be calibrated periodically?

Changes to the displayed measurements occur over the service life of a sensor – predominantly due to ageing of sensors and display devices. These changes depend essentially on the thermal, mechanical and chemical stress on the sensors and electronics. Because the requirements for many process increase continuously with respect to product quality and productivity, measurement changes are counter-productive and can entail additional risks. In addition, the demands on documentation of the process and the monitoring of measuring devices are increasing steadily. Recurrent calibration of the sensors provides information about the difference between actual and displayed temperature and provides information about the behaviour of measurement changes with periodic calibration. Recognition and adjustment provides the basis for continuous product quality and process efficiency. Overall process costs are reduced, risks are minimized and profitability is increased with recurrent calibration.

Available certificates

○ ISO factory calibration certificate

○ DAkkS calibration certificate

DAkks services in the accredited area

Our DAkkS services in the accredited area of temperature guarantees consistently high quality in calibration due to regular external certification and re-accreditation. The combination with the new accrediting according to ISO-IEC 17025 in 2018 authorises us to issue DAkkS calibration certificates for the following sensors, devices and systems:
○ Resistance sensors and thermometers
○ Direct-display thermometers
○ Temperature transmitters, data loggers with thermocouple sensor

Accreditation applies only for the scope of accreditation listed in the certificate D-K-21043-01-00

Affordable entry-level: ISO certificates

In addition to the first-class DAkkS calibration, we offer cost-optimized ISO certificates – which is fully adequate for many applications in quality assurance of production processes.

Advantages of calibration by GHM

We offer calibrations in a range of – 196 ˚C to +1200 °C. We offer these services for all of our sensors and even third-party products. The calibration can be carried out individually according to specific quality requirements with selection of the appropriate calibration points per system.

Our laboratory is outstandingly equipped with water triple-point cells, block calibrators, liquid baths and high-precision reference measuring devices. Our experienced staff of the DAkkS services can advise you for all tasks relating to calibration of temperature systems. The manufacturer knows their devices best: therefore, the highest possible quality and feasibility of special request are achieved in the most direct route.

In addition:
Calibration services for pressure, conductivity and air humidity are available in-house.

○ We ensure swift processing times, also available with express service, so that your reference devices are ready to use again quickly and downtimes are minimised
○ Device service and small repairs are carried out efficiently
○ Consultation is provided quickly by qualified personnel on site.

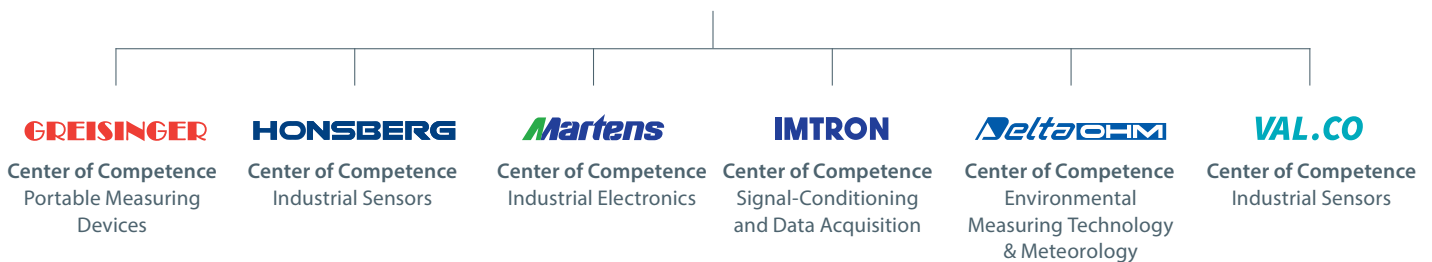# Your ideas and requests are our inspiration.
Challenge us.

The GHM Messtechnik GmbH Group was founded in 2009. However, the history of the traditional brands that are bundled under the umbrella brand goes back much further. In its current formation as the GHM GROUP, the enterprise is still obligated to the shared philosophy of the founders: Absolute customer orientation, speed, and first-class product quality!

Innovation with method: An increasing number of tasks in terms of the global economy and in technology reach the limits of feasibility and beyond. We meet this challenge with a broad-based enterprise structure

The Centers of Competence under the umbrella of the GHM GROUP cover a wide range of market-specific solutions for all important areas of application with their respective areas of expertise.

With the GHM GROUP our customers benefit from over 200 years of combined experience. With this expertise, our engineers at the various "Centers of Competence" are quickly and flexibly in a position to develop solutions that meet the specific requirements of our customers and are in-line with market demand.

It is an advantage of our enterprise, which is unrivalled.

GHMGROUP
Specialists by Competence.

GREISINGER	**HONSBERG**	**Martens**	**IMTRON**	**DeltaOHM**	**VAL.CO**
Center of Competence Portable Measuring Devices	**Center of Competence** Industrial Sensors	**Center of Competence** Industrial Electronics	**Center of Competence** Signal-Conditioning and Data Acquisition	**Center of Competence** Environmental Measuring Technology & Meteorology	**Center of Competence** Industrial Sensors

INDUSTRIAL

○ Sensors for a variety of process variables such as temperature, flow, level and pressure
○ Transmitters and isolators for various input/ output variables
○ Indicators and controllers in various formats and performance classes

ENVIRONMENTAL

○ Measuring stations for climate and environmental data with the connection to cloud-systems
○ Mobile measurement technology for climate, water and gas analysis

TESTING & SERVICES

○ Test bench measurement technology wit up to 40,000 measurement in the secondary
○ Stationary and mobile systems for universal use
○ Modular systems for individual adaption to the process needs

GHMGROUP
Specialists by Competence.

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