

# GREISINGER

Member of GHM GROUP



## Professional Measurement Measuring | Controlling | Regulating

### Product catalog 2019

[www.greisinger.de](http://www.greisinger.de)

Members of GHM GROUP:

**GREISINGER**  
**HONSBERG**  
**Martens**  
**IMTRON**  
**DeltaOHM**  
**VAL.CO**

# GREISINGER. Specialist for handheld devices.

*„For more than thirty-five years, quality measuring devices from Greisinger have effectively met the needs of demanding customers. A mature measuring technology must also be accompanied by the ability to respond sensitively to the market.“*



**Roland Bäuml**

Site Director Greisinger | Member of the Managing Board

*Roland Bäuml*

**GREISINGER**  
Member of GHM GROUP



Further information see our website

<https://www.ghm-group.de/en/ghm-group/competence-center/greisinger/>

# GHM GROUP. Specialists by Competence.



## We measure and control it

The GHM GROUP has stood for precision measuring and control technology since 1963. Our customers enjoy the expertise and experience of a corporate group that has been cautiously built from smaller, very successful measuring technology manufacturers from Germany and northern Italy. As a medium-sized corporate group, we unite a depth of added value and knowledge based on 200 years of combined experience. From development of specialized measuring processes to the complete production of sensors and mechanical key elements to data loggers and firmware and software programming, we build measuring devices that cover a wide range of applications. The emphases of our solution are the growth areas of general machine construction, building technology, measurement data recording and communication, as well as the food production industry, meteorology, and general environmental measuring technology.

With a consistently focused customer orientation, modern company structures, and management that can react to market developments more quickly and with a more customer-oriented approach, we combine the expertise and professionalism of our more than 300 employees with the alertness and flexibility of a highly specialized task force.

GHM GROUP – Specialists by Competence.

**HONSBERG**

**Delta OHM**

**GREISINGER**

**VAL.CO**

**IMTRON**

**Martens**

1963

1978

1980

1982

1984

1988

**Honsberg Instruments, Remscheid, Germany**

*As a traditional, family-operated company, Honsberg is one of the market leaders in flow measurement technology for cooling lubricant monitoring and other technical oils.*

**Delta OHM, Padova, Italy**

*Market leader in Italy for the measurement variable light and noise; one of the world's most important manufacturers of high-precision environmental measuring technology; state-of-the-art calibration and research laboratories*

**Greisinger electronic, Regenstauf, Germany**

*Manufacturer of durable and extremely cost effective handheld measuring devices, sensors, and electronics; products are used in all areas of industry*

**VAL.CO, Milan, Italy**

*Manufacturer of industrial sensors for fill, flow rate and temperature applications; specialist in the Italian and European market*

**Imtron Messtechnik, Owingen, Germany**

*Manufacturer of measurement data recording systems; development of test stands for the automotive industry and energy measurement technology with planned preventative maintenance*

**Martens Elektronik, Hamburg, Germany**

*Supplier of customer-specific industrial electronics and analysis technology; manufacturer of technologically high-quality measurement technology, also for the international market*

HANDHELD INSTRUMENTS

SOFTWARE

ACCESSORIES

ALARM / PROTECTION, LEVEL

## Our company develops consistently. In one direction: towards the future



### Innovation with method

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.**





1993

Subsidiary in CZ – Greisinger s.r.o.

1994

Subsidiary in NL – Honsberg BV

2009

Founding of GHM Messtechnik Group with the companies Greisinger, Honsberg and Martens

2010

Integration of Imtron in the group

2011

Founding of GHM Måleteknik ApS in Denmark

2015

Integration of Delta OHM in the group

2016

Founding of GHM Messtechnik SA (Pty) Ltd South Africa

2017

GHM GROUP umbrella brand, founding of GHM Do Brasil, GHM France and GHM India  
Integration of the VAL.CO in the group



16   
WORLDWIDE LOCATIONS



> 40 Mio.  
MILLION IN SALES  
PER YEAR



> 2 000

HIGH-QUALITY  
DEVICE TYPES



> 300  
HIGHLY QUALIFIED AND  
AMBITIOUS EMPLOYEES



- High-quality measuring technology
- production products in the mid-range price segment
- Customer-specific adaptation or development of measuring technology products
- Design and delivery of OEM products
- Production entirely in Germany
- ISO calibration – including third-party devices
- Customer support from office staff and field staff
- Spare parts and repair service

### QUALITY STANDARD AND CERTIFICATION

High-quality technical products at a fair price have made use a permanent fixture in the measuring device market. We have been on a continuously upward trend for more than 35 years. The use of state of the art machinery and devices with efficient, high-performance production processes enables the high 'Made in Germany' product quality at competitive prices.

All our products are developed and produced in Germany - that is one reason for the high-quality standard of our products. Our quality management system is certified according to ISO 9001:2008 and additionally for potentially explosive atmospheres according to DIN EN 13980:2003.

Conformity with Directive 94/9/EC ('ATEX Directive') has been mandatory for Ex products in the Member States of the EC since 01/07/2003. Our development, manufacturing and sales have been certified in accordance with Directive 94/9/EC since 01/05/2003. Several products have already been tested and approved in accordance with this standard.





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## Measurement data made obvious

Greisinger devotes a great deal of effort to compact designs. The specialist for handheld devices combines technology and measurement precision in products with substance.

As a Center of Competence for temperature sensors and handheld measuring devices as well as indicators and regulators, the Greisinger location in Regenstauf bundles the extensive know-how of experienced specialists under one roof. Current market trends are tracked here and taken into account in the development of new technologies.

In this regard, our traditional enterprise can build on more than 35 years of experience. Our first products – at that time the first temperature sensor for monitoring haystacks – precisely met the requirements of the market and formed the basis of our subsequent success. In the meantime, our product portfolio has been significantly extended: In addition to numerous measuring transducers, as well as indicators and the associated sensors, first and foremost we develop and produce high-quality handheld measuring devices.

Originally developed for the harshest and roughest conditions of our industrial customers, we have, however,

also made our devices available to a broad clientele via the retail trade. Over one hundred thousand devices delivered yearly and thousands of satisfied customers are our motivation to build ever-better measuring devices.

In our manufacturing and quality control we ensure that all machines and equipment are always state of the art. As part of the GHM GROUP, we participate in the continuous improvement measures to further optimize our processes and procedures. Thus, in the future we will also be capable of offering outstanding “Made in Germany” product quality at competitive prices.

### Fields of expertise

- compact, robust, and powerful handheld measurement technology “Made in Germany”
- wide product range for a wide variety of measured values
- application-oriented special measuring devices
- private-label products for customer-specific individualization
- on customer request, factory calibration in our in-house calibration laboratory



PRODUCT OVERVIEW

GENERAL INFORMATION

Sales International ..... 7  
 OEM- / customer-specific designs ..... 10-11  
 Legend / Connectors ..... 12  
 Calibration certificates ..... 13-15

MOBILE MEASUREMENT

HANDHELD INSTRUMENTS (WITH SENSORS / ACCESSORIES)

Temperature ..... 16-17  
 PT 100 / PT100 measuring probe ..... 18-20  
 PT 1000 / PT1000 measuring probe ..... 20-26  
 Thermocouples / Type K measuring probe ..... 27-34  
 Infrared ..... 35-37  
 Air humidity / Flow rate ..... 38-42  
 Material humidity ..... 43-51  
 Optional accessories ..... 47-48  
 Water analysis ..... 52-53  
 Conductivity ..... 54-58  
 pH / Redox ..... 59-64  
 pH electrodes ..... 65-66  
 Dissolved oxygen (in water) ..... 67-71  
 Multisensor water analysis handheld measuring device ..... 72-73  
 Gas analysis ..... 74  
 Air oxygen ..... 75-78  
 Residual oxygen ..... 79  
 Carbon monoxide (CO) ..... 80  
 Indoor air quality ..... 81  
 Pressure ..... 82-95  
 Optional accessories ..... 86  
 Pressure sensors ..... 88-89  
 Sound level meter / Photo- and Radiometer / Anemometer / Rotation speed ..... 96-105  
 Simulators ..... 106-107

SOFTWARE 108-110

ACCESSORIES 111-115

ALARM / PROTECTION, LEVEL 116

Protection devices, alarm devices (Liquid level, Leakage) ..... 117-122

EX-PROTECTION

Measuring instruments (Pressure) ..... 84, 87-88, 91-92



HANDHELD INSTRUMENTS

SOFTWARE

ACCESSORIES

ALARM / PROTECTION, LEVEL

OEM / CUSTOMER VERSIONS



## We modify our equipment. According to your wishes and requirements.

### Customer-specific developments

If there is no device in our standard product proposal fulfilling your individual requirements, there is the possibility to develop a device according to your specifications.

*Please note that the customer versions are associated with a little extra costs or depending on the amount of ordered pieces.*



Beispiele für eine Gerätebedruckung

# 1.

### Select housing

You can select a device series that suits their purpose.

**Compact series:** low cost, ease of use, classic design

**1000 series:** High quality new handheld instrument combines with water tightness and display lighting

**3000 series:** Bestseller, best price-performance in practical housing

**5000 series:** Best quality and accuracy in the water and impact-resistant casing with display lighting

**Device case:** Accessories can be printed too



5000 series with silicone protection cover

3000 series

1000 series

Compact series

Device case

## OEM / CUSTOMER VERSIONS

# 2.



### Choose a color

Choose a color that suits your corporate presentation, logo and can be also match with the later printing.



### Overview standard colours:

Housing	black	yellow	red	blue	orange	light grey	basalt grey
1000 series	•	•	•	•		•	
Compact series	•	•	•	•		•	
3000 series	•	•	•	•	•	•	
5000 series			• <sup>1)</sup>	• <sup>1)</sup>		•	•

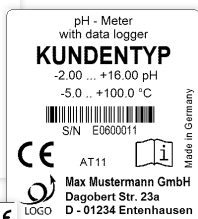
<sup>1)</sup> Colour of silicone protection cover

# 3.

### Logo placement

Do you wish to have your company logo, name or an image on the device?

Please leave us your data as EPS / TIFF or JPEG, 300 dpi and of sufficient size sent by an email. We work in our printing department a sketch and a proposal over size and positioning. Even high-resolution photo-quality images can be applied through digital printing process.



# 4.

### Specify type plate and version of the manual.

Should we become an OEM supplier for your brand?

Then we enter your manufacturer information here and assist you with the CE Declaration of Conformity.

Our sales and product manager team supports you in the correct market introduction and conformity evaluation of your product. Alternatively, we can simply remain visible as the manufacturer - which minimises expenses as long as the application and intended use are observed.



LEGEND



**Made in Germany**



**ISO Calibration certificate**  
available at surcharge



**ACCREDIA Calibration certificate**  
available at surcharge



**Min-/Max-Alarm**  
continuous checking of adjustable alarm boundaries (deactivate-able)  
3 alarm settings:  
off: alarm inactive  
on: alarm via display, internal buzzer and interface  
no Sound: alarm only via display and interface  
Switching function:  
External devices can be switched (on / off) or monitored for alarm in combination with switching module GAM3000 (optionally available)



**Auto-Hold**  
Automatic freezing of a constant measuring value



**Automatic Power-Off-Function**  
- 1 ... 120 min (or deactivated)  
- adjustable between 1 ... 120 min or continuous operation  
- If Auto-Off-Function is activated, device is automatically switched off after a selected period (0 ... 120 min) if it is meanwhile not used.



**AutoRange**  
The conductivity measurement gets automatically switched to the optimal measuring range. Can be deactivated in the menu.



**HACCP (Hazard Analysis and Critical Control Points-Konzept)**  
suitable for food applications according to HACCP



**Background illumination**



**Hold function**  
The current measured value gets "frozen" on keystroke.



**Logger function**  
manual: fetch data via buttons or interface  
cyclic: fetch data via interface, adjustable cycle time: 1 s ... 1 h  
The logger is started or stopped by keypad or interface.  
The software GSOFT3050 (see accessories) is available for comfortable read-out of logger data.



**Alarm:** Freely adjustable alarm boundaries, pulsating alarm sound (depends on measured value)



**Min / max value memory**  
Highest and lowest measured values are saved.



**Offset correction (zero point)**  
The characteristic can be shifted parallel by an adjustable offset value.



**Offset and slope correction**  
A digital offset and slope correction can be adjusted.



**Tare function**  
Displayed value as well as min- and max-values are set to zero.



**Real-time clock**  
Clock with day, month and year

POSSIBLE CONNECTORS



Miniature DIN-type plug  
used in:  
GMH 3710/50, GMH 3611/51,  
GMH 3692/95, GMH 3111/51/56



Banana-jack connection  
used in:  
Temperature inputs of pH devices,  
GMH 3511/31/51, GMH 5530/50, GPHU 014 MP



BNC-connector  
used in:  
G 1700, GMH 3831/51, GMH 3511/31/51,  
GMH 5530/50, GPH 114



7-pol. bajonett connector  
used in:  
GMH 5130/50/55, GMH 5430/50,  
GMH 5630/50/90/95



NST1200-connector  
used in:  
GTH 1150/70, GMH 1150/70,  
GMH 3211/21/31/51, GIM 3590,  
GMH 3330/50, GMH 3831/51



S7-connector  
used in:  
GE 171, GE 108,  
GE 173, GR 175



4-pol. bajonett connector  
used in:  
5000er device series



Jack connector 3,5 mm  
used in:  
GMH 175, GFTB 200, GFTH 200



7-pole diode connector  
used in:  
GLMU 200/400



M8 plug connector  
used in:  
EASYLog, T-Logg



M12 plug connector  
Used in:  
GTF 111/112, GTL (food sensors),  
GLMU 400MP-Uni



power supply 5.5 x 1.5  
used in:  
3000er device series



Angle plug  
Uses include:  
Transmitter



Jack connector 2,5  
used in:  
discontinued products,  
e. g. GDH ... AN Serie, GPRT 1400



Cinch connector  
used in:  
discontinued products,  
e. g. GPH 014, GPRT 1400





# CALIBRATION CERTIFICATES

HANDHELD INSTRUMENTS

SOFTWARE

ACCESSORIES

ALARM / PROTECTION LEVEL

## CALIBRATION CERTIFICATES DAKKS

DAkks calibration certificates are issued for very high-quality calibrations and for calibration of reference devices or when stipulated by standards and regulations. DAkks-DKD calibration certificates are issued with reference devices which must be traceable through a chain to the Laboratories of the German Calibration Service. DAkks-DKD calibration certificates can only be issued if the calibration laboratories accredited in accordance with the standard DIN EN ISO 17025. With recurring external certification and re-accreditation, it is ensured that a consistently high quality of calibration is maintained. The cost-intensive and personnel-intensive measures entail higher prices, but ensure the necessary reliability of the measurement results.

Successful DAkks appraisal of the Greisinger location for the temperature variable. The calibration laboratory has worked in accordance with DIN EN ISO/IEC 17025 since 2018.



**Temperature**

**DAkks-T**  
Calibration certificate (incl. 1 measurement point)  
(Please specify an inspection point)

**further measurement points**  
(from -100 ... +1400 °C)  
(Please specify an inspection point)

**additional measurement point**  
-196 °C

---

**ACCREDITATION APPLIES ONLY FOR THE SCOPE OF ACCREDITATION LISTED IN THE CERTIFICATE D-K-21043-01-00.**

Deutsche Akkreditierungsstelle  
D-K-21043-01-00

**Pressure**

**DAkks-P**  
*Art. no. 602731*  
Calibration certificate over pressure -1 ... 100 bar  
(incl. 9 points increasing and decreasing)

**DAkks-PA**  
*Art. no. 602758*  
Calibration certificate absolute pressure 0 ... 70 bar  
(incl. 9 points increasing and decreasing)  
*Further measuring ranges upon request*

**Humidity (incl. 1 temperature value)**


**DAkks-FE**  
*Art. no. 602871*  
Calibration certificate for devices with external sensor  
(Testing points: 15 % RH and 70 % RH / at 23 °C)

**DAkks-F**  
*Art. no. 602870*  
Calibration certificate for devices with fixed attached sensor  
(Testing points: 20 % RH, 50 % RH and 80 % RH / at 23 °C)  
*Further testing points upon request*

**Conductivity**

**DAkks-LF**  
incl. 3 points  
**3 μS / cm - 1000 μS / cm**  
**1 mS / cm - 150 mS / cm**  
**every further point**  
*Further measuring ranges upon request*



At our Delta Ohm location in Padua, Italy, we can issue calibration certificates which are only available from a small number of recognised laboratories in all of Europe. The calibration laboratory is equipped with state-of-the-art measuring technology, is accredited in accordance with the standard DIN EN 17025 and is regularly certified by ACCREDIA. On the basis of the worldwide recognition of calibration services by the umbrella organisation ILAC\*, the validity of the calibration certificate is guaranteed by the ILAC in Germany and throughout Europe, as well as about 100 other countries. The calibration certificate is issued in German. We offer the listed ACCREDIA calibration certificates for handheld measuring devices marked with the 

\*ILAC (International Laboratory Accreditation Cooperation) has an association for laboratory accreditation for over 40 years which represents its members in over 70 countries and regional organisations. The ILAC MRA recognition arrangement obligates all members to recognise calibration results produced by nationally accredited laboratories (such as DAkkS or ACCREDIA).

Further information:  
<http://ilac.org/about-ilac/>



Delta Ohm air speed calibration laboratory, Padua

## CALIBRATION CERTIFICATES ACCREDIA

### Lighting strength

**ACCREDIA-B1**  
Art. no. 611508  
7 measuring points from 50 ... 4000 lux

**ACCREDIA-B2**  
Art. no. 611509  
Radiometer UV A  
10 ... 50 Wm<sup>-2</sup>

**ACCREDIA-B3**  
Art. no. 611510  
Luminance  
5 measuring points from 10000 ... 30000 cdm<sup>-2</sup>

**ACCREDIA-B4**  
Art. no. 611511  
Pyranometer (solar radiation strength)  
1 measuring point

### Air speed

**ACCREDIA-G1**  
Art. no. 611512  
Impeller anemometer up to Ø 60 mm and heat wire sensor  
1 ... 25 m/s  
Measuring points: approx. 1, 2,5, 5, 10, 25 m/s

**ACCREDIA-G2**  
Art. no. 611513  
Impeller anemometer Ø 60 mm or greater, ultrasonic and dynamic pressure sensors, shell anemometer  
1 ... 25 m/s  
Measuring points: approx. 1, 2,5, 5, 10, 25 m/s

### Acoustics

Calibration for integrated sound level meter (IEC 61672) and calibrator (IEC 60942)

**ACCREDIA-A1**  
Art. no. 611514  
Devices manufactured by Delta Ohm (siehe Page 96/97)

**ACCREDIA-A2**  
Art. no. 611693  
Any manufacturer

## ISO CALIBRATION CERTIFICATES

### Lighting strength

**ISO-WPB1**  
Art. no. 611515  
ISO certificates  
7 measuring points from 50 ... 4000 lux

**ISO-WPB2**  
Art. no. 611516  
ISO certificates Radiometer UV A  
10 ... 50 Wm<sup>-2</sup>

**ISO-WPB3**  
Art. no. 611517  
ISO certificates Luminance  
5 measuring points from 10000 ... 30000 cdm<sup>-2</sup>

**ISO-WPB4**  
Art. no. 611518  
ISO certificates  
Pyranometer (solar radiation strength)  
1 measuring point

### Air speed

**ISO-WPG1**  
Art. no. 611519  
ISO certificates Impeller anemometer up to Ø 60 mm and heat wire sensors, 1 ... 25 m/s  
Measuring points: approx. 1, 2,5, 5, 10, 25 m/s

**ISO-WPG2**  
Art. no. 611520  
ISO certificates  
Impeller anemometer Ø 60 mm or greater, ultrasonic and dynamic pressure sensors, shell anemometer  
1 ... 25 m/s  
Measuring points: approx. 1, 2,5, 5, 10, 25 m/s

### Acoustics

Calibration for integrated sound level meter (IEC 61672) and calibrator (IEC 60942)

**ISO-WPA1**  
Art. no. 611521  
ISO certificates  
Devices manufactured by Delta Ohm (see page 96/97)

Octave band filter - third-octave band filter calibration (according to IEC 60942) and microphone calibration (sensitivity, frequency) on request

Due to the wide variety of calibration possibilities, it is not possible to list all possible variations in this catalogue. Please ask us or request a quotation.




For the storage of the devices, we recommend the use of a safe-keeping case.

ISO

## ISO CALIBRATION CERTIFICATES

ISO calibration certificates (factory calibration certificates) are issued by GHM Greisinger according to the same measures as DAKKS calibration certificates, but without the expense for external certification, so these certificates can be issued at a reasonable price. In addition, there are measurements for which no accreditation can take place in DAKKS-DKD. In such cases, the ISO calibration is an important alternative. ISO calibration certificates are issued with measurement standards which are subject to regular inspection of measuring and testing equipment, thus ensuring the traceability of the measurement standards used in the process. The calibration includes, if applicable, adjustment of the measurement device (only with Greisinger devices).

Calibration certificates are available for all handheld instruments marked with the symbol . Also possible for measuring transmitters resp. combinations of display instruments and sensors/transmitters. Calibration certificates are not included in the scope of delivery of measuring devices.



## Temperature

## ISO WPT

incl. 1 measurement point -100 ... +1400 °C  
(Please specify an inspection point)

## additional measurement point

(from -30 ... +500 °C)

(Please specify an inspection point)

## additional measurement point

(-100 ... -30 and +500 ... +1300 °C)

(Please specify an inspection point)

## additional measurement point

-196 °C

## ISO-WPT2A

Art. no. 602583

ISO Certificate of calibration with standard values:  
0 °C / +70 °C

## ISO-WPT2B

Art. no. 602584

ISO Certificate of calibration with standard values:  
0 °C / +37 °C

## ISO-WPT3

Art. no. 602596

ISO Certificate of calibration with standard values:  
-20 °C / 0 °C / +70 °C

## ISO-WPT-IR

Infrared temperature ISO calibration

Infrared base price

-20 ... +4 °C per test point

+5 ... +450 °C per test point

## Pressure

## ISO-WPD5

Art. no. 602514

ISO certificates: 5 points ascending, 5 points descending

-1 ... +600 bar

## ISO-WPD10

Art. no. 602565

ISO certificates:

10 points ascending, 10 points descending

over 600 bar on request

## Humidity

## ISO-WPF4

Art. no. 602543

ISO certificates incl. standard-measuring values (approx.  
20 % / 40 % / 60 % / 80 % RH increasing and decreasing;  
measurement point Temperature: approx. +23 °C)

## ISO-80CL

Art. no. 607734

ISO certificates with standard test values of humidity / temperature / pressure for EASYLOG 80CL (measuring values (approx. 20 / 40 / 60 / 80 % bei 23 °C), pressure 5 points increasing and 5 points decreasing

## Atmospheric Oxygen

## ISO-WPO3

Art. no. 602816

ISO certificates with 3 points:

0 / 20,9 / 100 % O<sub>2</sub>

*Note: a replacement of the sensor, before issue the WPO3, is recommended for sensors with an age of one year!*

## Conductivity

## ISO-WPL3

Art. no. 602622

ISO certificates with 3 points:

~147 µS/cm, ~1413 µS/cm, ~12,90 mS/cm

## ISO-WPL10

Art. no. 602623

ISO certificates with 10 points from approx. 2 µS, 74 µS,

147 µS, 720 µS, 1413 µS, 2,77 mS, 6,70 mS, 12,90 mS,

24,8 mS, 111,3 mS and approx. 195 mS/cm

## Ultrapure Water - Conductivity

## ISO-WPL3-RW

Art. no. 602624

ISO certificates with 3 standard-measuring values:  
each approx. 2,50 µS/cm; 7,00 µS/cm; 15,00 µS/cm

## pH

## ISO-WPPP3

Art. no. 602767

ISO certificates with 3 standard-measuring values:  
4,00 pH, 6,87 pH, 9,18 pH

## ISO-WPPP10

Art. no. 602768

ISO certificates with 10 points from  
1,09 pH ... 12,75 pH

## SERVICE OFFERING

Many devices are delivered with a test report. The reports are created automatically during production and do not provide any information about the traceability of the measurement. Alternatively, the following test reports can be created for measurements which do not require traceability.

## Test reports

## ISO-GCO

Art. no. 603841

Test report for carbon monoxide measuring devices.

Measuring points at 0 ppm CO, 300 ppm CO

## ISO-GMH38XX

Art. no. 604463

Test report for material moisture.

Measuring devices GMH 38xx, GMR 100

## Express (including shipment)

## Temperature measuring devices

-90 ... +500 °C, max. 3 devices, 2 work days

## Pressure measuring devices

-1 ... +600 bar, max. 3 devices, 2 work days

## Humidity measuring devices

approx. 20 % / 40 % / 60 % / 80 % r.F., max. 3 devices,  
3 work days

Larger numbers of devices or additional measurements possible on request.

EXPRESS ORDERS ONLY POSSIBLE AFTER PRIOR  
ENQUIRY UNDER EXPRESS@GREISINGER.DE

# TEMPERATURE

HANDHELD INSTRUMENTS

SOFTWARE

ACCESSORIES

ALARM / PROTECTION, LEVEL



	GMH 3710	GMH 3750	GMH 2710-T / -E	GMH 2710-K / -G	GMH 2710-F / -I	G 1700	G 1710 / 20 / 30	HD 2178.2	GTH 200 air
<b>APPLICATION:</b>									
Reference- / precision measurement	•	•	•	•	•	•	•	•	
Quality management	•	•	•	•	•	•	•	•	
Difference measurement									
Surface measurement								•	
Core temperature measurement	•	•		•	•	•	•	•	
High-temperature measurement	•	•						•	
Food, HACCP	•	•	•	•	•	•	•	•	
Water-proof			•	•	•	•	•		
<b>EQUIPMENT:</b>									
Sensor element	Pt100	Pt100	Pt1000	Pt1000	Pt1000	Pt1000	Pt1000	1 x Pt100/1000 1 x Thermo	Pt1000
Max. measuring range [°C]	-200 ... +850	-200 ... +850	-200 ... +200	-200 ... +250	-70 ... +250	-200 ... +450	-70 ... +250	-200 ... +650 (Pt) -200...+1300 (TE)	-25 ... +70
Min. Resolution [°C]	0.01	0.01	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Plug-in probe	•	•				•		•	
Measurement inputs	1	1	1	1	1	1	1	2	1
Min/Max, Hold, Auto-Off	•	•	•	•	•	•	•	•	•
Alarm (buzzer) / Data logger		•				• / -	• / -	- / •	
<b>DEVICE INFORMATION:</b>									
Catalogue page	Page 18	Page 18	Page 26	Page 26	Page 26	Page 21	Page 24	Page 30	Page 20



## INFORMATION

### Background knowledge in temperature measurement

#### Resistance: Pt100, Pt1000

The sensor element's ohmic resistance changes with temperature. This can be evaluated by the displaying device and afterwards converted to the corresponding temperature. Especially for Pt100 one distinguishes between 2-, 3- and 4-wire connection. The 3- and 4-wire connection allows for automatic compensation of measuring error caused by the serial cable resistance.

#### Features:

- Highest accuracies possible
- High reproducibility of results with exchanged sensors, especially for Pt100 and Pt1000
- Standard measuring method for reference measurements

#### CONCLUSION:

a little slower, but highly precise  
Particularly, optimised design in addition to seconds speed  
- see our 1.5 mm needle probe

#### Thermocouple: Type K, Type N, Type S,...

The contact of two different metal compositions (e.g. NiCr and NiAl) results in a voltage between contact spot (probe) and the displaying device, which is almost proportional to the temperature difference.

This voltage is almost proportional to the temperature difference and gets evaluated and converted to a temperature by the displaying device.

#### Features:

- Very small sensors are possible, therefore:
  - Very short response times possible
  - Highly suitable for surface measurements
- Temperatures up to 1750 °C can be measured (depending on design of probe and type of used thermocouple)

#### CONCLUSION:

very fast, very flexible and wide measuring range



GMH 3201	GMH 3211	GMH 3221	GMH 3231	GMH 3251	HD 32-8-16	GTH 1150	GMH 1150	GTH 1170
					•			
•	•	•	•	•	•			•
			•	•	•			
•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•

#### EQUIPMENT:

K	J, K, N, S, T, E, B	K	J, K, N, S, T, E, B	K, J, T, N, R, S, B, E	K	K	K
-220 ... +1372	-220 ... +1750	-220 ... +1372	-220 ... +1750	-200 ... +1800	-50 ... +1150	-50 ... +1150	-65 ... +1150
0.1	0.1	0.1	0.1	0.1	0.05	1	1
•	•	•	•	•	•	•	•
1	1	2	2	2	16	1	1
•	•	•	•	•	•		•
				•			

#### DEVICE INFORMATION:

Page 27	Page 27	Page 27	Page 27	Page 27	Page 28	Page 29	Page 29	Page 29
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## PT100 - HIGH-PRECISION THERMOMETER



AUTO OFF

AUTORANGE

ISO

HOLD

MIN MAX

0/S-CORR



## HIGHLIGHTS:

- Reference meter for any calibration requirement
- Highest accuracy
- Resolution (0.01 °C)
- Incl. calibration protocol

## ADDITIONAL FUNCTIONS BEI GMH 3750:



## GMH 3710

Art. no. 600332

Pt100 4-Wire High Precision Thermometer

## GMH 3750

Art. no. 600335

Pt100 4 wire - High Precision Thermometer with data logger

## Application:

Reference measuring device in liquids, soft media, air / gases.

## Specifications:

<b>Measuring range:</b>	-199.99 ... +199.99 °C or -200.0 ... + 850.0 °C -199.99 ... +199.99 °F or -328.0 ... +1562.0 °F
<b>Resolution:</b>	0.01 °C or 0.1 °C 0.01 °F or 0.1 °F
<b>Linearisation:</b>	Curve according to DIN EN 60751. GMH 3750 add. supports an userdefined curve.
<b>Accuracy: (±1 digit) (at nominal temperature = 25 °C)</b>	≤0.03 °C / 0.06 °F at resolution 0.01° ≤0.1 °C / 0.2 °F at resolution 0.1°
<b>Temperature drift:</b>	≤0.002 °C / K
<b>Probe connection:</b>	via 4-pin miniature DIN-plug, Pt100, 4-wire, in acc. to DIN EN 60751
<b>Nominal temperature:</b>	25 °C
<b>Working temperature:</b>	-25 ... +50 °C
<b>Relative humidity:</b>	0 ... +95 % RH (non-condensing)
<b>Storage temperature:</b>	-25 ... +70 °C
<b>Display:</b>	two 4½ digit LCDs (12.4 mm or 7 mm high), as well as additional arrows.
<b>Pushbuttons:</b>	6 membrane keys
<b>Output:</b>	3-pin jack connector Ø 3.5 mm, choice between serial interface or analog output
<b>Serial interface:</b>	direct connection to RS232 or USB interface of a PC via electrically isolated interface adapter GRS 3100 or GRS 3105 resp. USB 3100 N (p.r.t. accessories).
<b>Analog output:</b>	0 ... 1 V, freely adjustable (resolution 13 bit, accuracy 0.05 % at nominal temperature)
<b>Power supply:</b>	9 V-battery, as well as additional d.c. connector for external 10.5 ... 12 V voltage supply
<b>Power consumption:</b>	approx. 1 mA, approx. 300 h
<b>Housing:</b>	Impact-resistant ABS plastic housing, membrane keyboard, transparent panel, integrated pop-up clip
<b>Dimensions:</b>	142 x 71 x 26 mm (H x W x D)
<b>Weight:</b>	approx. 155 g
<b>Scope of supply:</b>	Device, battery, calibration protocol, manual

## additional at GMH 3750:

## Userdefined sensor curve:

50 interpolation points (GMH 3750 only)

## Logger function (GMH 3750 only):

manual: 99 data sets (fetch data via buttons or interface)

cyclic: 16.384 data sets (fetch data via interface)

adjustable cycle time: 1 s ... 1 h

The logger is started or stopped by keypad or interface. The software GSOFT3050 (see accessories) is available for comfortable read-out of logger data.

## Accessories and spare parts:

## MINIDIN 4S

Art. no. 601111

Mini-DIN plug, 4-pin, with lock and for self installation

## USB 3100 N

Art. no. 601092

Interface Converter GMH3xxx &lt;=&gt;PC, USB

## GSOFT 3050

Art. no. 601336

Windows software for GMH 3000 and GMH 5000 with logger (p.r.t. page 110)

## GNG 10 / 3000

Art. no. 600273

Plug in power supply for devices of the series GMH 3XXX

## ST-R1

Art. no. 601066

Protection bag, leather (p.r.t. page 111)

## GKK 1100

Art. no. 601060

Case with punched lining for universal application

## GMHKonfig

(visit our homepage: Download -&gt; Software)

## Software description:

Comfortable software to edit the user defined sensor curve of the GMH 3750.

(e.g. for calibration laboratories etc.)

## Note:

Please note that for the interface communication with the device a interface converter (USB 3100 N) is necessary (p.r.t. page 115).

SUITABLE PT100 MEASURING PROBE (4-WIRE)

Accuracy Pt100:

Sensor accuracy acc. to DIN EN 60751	
<b>DIN cl. B:</b> (area of validity: -50 ... +500 °C)	±0.3 °C at 0 °C
<b>DIN cl. A:</b> (area of validity: -30 ... +300 °C)	±0.15 °C at 0 °C
<b>DIN cl. AA = 1/3 DIN cl. B:</b> (area of validity: 0 ... +150 °C)	±0.1 °C at 0 °C
<b>1/10 DIN cl. B:</b> (area of validity: -50 ... +100 °C)	±0.03 °C at 0 °C

Upcharges special designs: (Deviations are possible based on the construction)

- longer probe tube:** upcharge per further starting 100 mm
- longer cable (PVC):** upcharge per further starting 100 mm
- other cable material upon request**
- teflon covered probe tube**  
(for probes up to 200 mm)  
(for probes used in acids and salt water, upper temperature range 250 °C)
- waterproof probe handle** (only possible with PVC cable -20 ... +105 °C)
- higher sensor accuracy:** DIN cl. AA, for Pt100, tolerances: 0.1 °C at 0 °C
- higher sensor accuracy:**  
1/10 DIN cl. B, for Pt100-probes, tolerances: 0.03 °C at 0 °C
- basic fee for custom made probe**



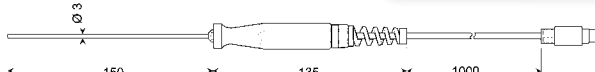
**GTF 401**

Art. no. 600377  
Immersion probe for liquids / gases  
-50 ... +400 °C, DIN cl. B



**GTF 401 DIN cl. AA**

Art. no. 600378  
Immersion probe for liquids / gases  
-50 ... +400 °C, DIN cl. AA (±0.1 °C at 0 °C)

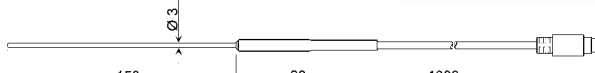


non-corrosive stainless steel tube (V4A) Ø 3 mm, plastic handle, anti-buckling glanding, approx. 1 m 4-wire PVC cable, 4-pin miniature DIN-type plug  
**Response time T<sub>90</sub>** water 0.4 m/s approx. 10 s, air 2 m/s approx. 40 s



**GTF 35**

Art. no. 600391  
Immersion probe for liquids / gases  
-50 ... +400 °C, DIN cl. B



non-corrosive stainless steel tube (V4A) Ø 3 mm, shrink sleeving, approx. 1 m 4-wire PVC cable, 4-pin miniature DIN-type plug  
**Response time T<sub>90</sub>** water 0.4 m/s approx. 10 s, air 2 m/s approx. 40 s



**GES 401**

Art. no. 600384  
Insertion probe for soft media  
-50 ... +400 °C, DIN cl. B



**GES 401 DIN cl. AA**

Art. no. 600385  
Insertion probe for soft media  
-50 ... +400 °C, DIN cl. AA (±0.1 °C at 0 °C)



stainless steel tube (V4A) Ø 3 mm with needle type prod, plastic handle, anti-buckling glanding, approx. 1 m 4-wire PVC cable, 4-pin miniature DIN-type plug  
**Response time T<sub>90</sub>** water 0.4 m/s approx. 10 s, air 2 m/s approx. 40 s



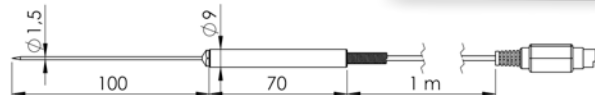
**GES 20-P4 DIN KI. A**

Art. no. 414061  
Core temperature- / food probe with compact teflon handle  
-70 ... +250 °C, Pt100 cl. A



**GES 20-P4 DIN cl. B**

Art. no. 413543  
Core temperature- / food probe with compact teflon handle  
-70 ... +250 °C, Pt100 cl. B



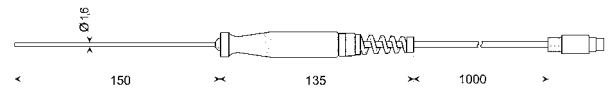
V4A tube with narrow insertion tip with 1.5 mm diameter, small Teflon handle, stainless steel anti-kink protection, 1 m Teflon cable, 4 pin mini-DIN plug connector  
**Response time T<sub>90</sub>** water 0.4 m/s <1 s, air 2 m/s approx. 12 s

- Advantages of sheath element Pt100:**
- high temperature resistance
  - sheath cable is bendable
  - high shock resistance
  - high service life



**GTF 401 / 1.6**

Art. no. 602066  
Immersion probe with sheath element Pt100  
-50 ... +400 °C, DIN cl. B



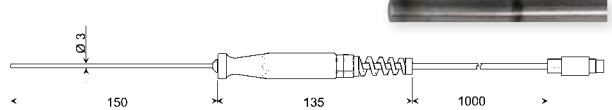
V4A sheath tube bendable, Ø 1.6 mm, plastic handle, antikink connection, approx. 1 m 4-pole cable, mini-DIN plug

**Response time T<sub>90</sub>** water 0.4 m/s <2 s, air 2 m/s approx. 25 s



**GTF 401 1/10 DIN**

Art. no. 600379  
Immersion probe with sheath element Pt100  
-50 ... +400 °C, 1/10 DIN class B (±0.03 °C at 0 °C)



stainless steel tube (V4A) Ø 3 mm, plastic handle, anti-buckling glanding, approx. 1 m 4-wire PVC cable, 4-pin miniature DIN-type plug

**Response time T<sub>90</sub>** water 0.4 m/s <5 s, air 2 m/s approx. 60 s



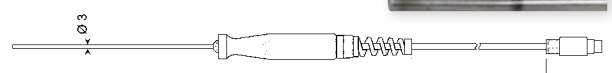
**GTF 601**

Art. no. 600387  
Immersion probe with sheath element Pt100  
-200 ... +600 °C, DIN cl. B



**GTF 601 DIN cl. AA**

Art. no. 600388  
Immersion probe with sheath element Pt100  
-200 ... +600 °C, DIN cl. AA (±0.1 °C at 0 °C)



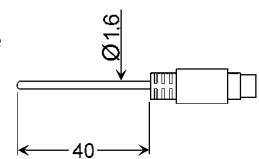
V4A-fleccible jacket tube, Ø 3 mm, plastic handle, anti-buckling glanding, approx. 1 m 4-wire PVC cable, 4-pin miniature DIN-type plug

**Response time T<sub>90</sub>** water 0.4 m/s <5 s, air 2 m/s approx. 60 s



**GLF 401 Mini**

Art. no. 600395  
Environmental temperature probe without cable,  
-25 ... +70 °C, DIN cl. A



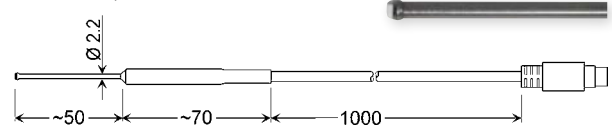
V4A tube Ø 1.6 mm, FL = approx. 40 mm, 4-pin mini DIN-type plug

**Response time T<sub>90</sub>** air 2 m/s approx. 25 s



**GOF 401 Mini**

Art. no. 600396  
Surface probe, frontal ceramic surface  
-50 ... +200 °C, DIN cl. B



Frontal Pt100 ceramic plate 2 x 2.3 mm, V4A tube Ø 2.2 mm, approx. 1 m 4-wire PVC cable, 4-pin miniature DIN-type plug

**Response time T<sub>90</sub>** approx. 15 s

## CALIBRATED SYSTEMS PT 100

**General:**

The overall error of a measuring consists of the sum of the instrument error and the probe error. To minimize the overall error, we offer calibrated and optimized systems below. Due to their excellent system accuracy they are especially suitable for quality assurance according to ISO9000ff, as reference instruments in manufacturing processes, laboratory, service and maintenance, etc. The system optimization is done via a special characteristic curve which is determined for each temperature probe separately and stored in the instrument (GMH 3750) or with probe adjusting via offset and slope input (GMH 3710). Because of the low measuring current there is no self heating effect of the sensor and the measurement is thermoelectrically compensated.

**GMH 3750 / SET1**

Art. no. 602690

Measuring set incl. ISO certificate of calibration

**Specifications:****Optimized measuring range:** -20 ... +70 °C**Temperature probe:** GTF 401 DIN cl. AA, Pt100, 4-wire**System accuracy:** better than 0.07 °C (at opt. range)**Calibration points:** -20 °C / 0 °C / +70 °C**GMH 3750 / SET2**

Art. no. 602691

Measuring set incl. ISO certificate of calibration

**Specifications:****Optimized measuring range:** 0 ... +250 °C**Temperature probe:** GTF 401 DIN cl. AA, Pt100, 4-wire**System accuracy:** better than 0.3 °C (at opt. range)**Calibration points:** 0 °C / 100 °C / 250 °C**GMH 3710 / SET1**

Art. no. 602687

Geräteset inkl. ISO-Kalibrierschein und Koffer

**Specifications:****Optimized measuring range:** -20 ... +70 °C**Temperature probe:** GTF 401 DIN cl. AA, Pt100, 4-wire**System accuracy:** better than 0.1 °C (at opt. range)**Calibration points:** -20 °C / 0 °C / +70 °C**GMH 3710 / DKD1**

Art. no. 602689

Messest inkl. DAKS-Kalibrierschein nach DIN 17025

**Specifications:****Optimized measuring range:** -20 ... +70 °C**Temperature probe:** GTF 401 DIN cl. AA, Pt100, 4-wire**System accuracy:** better than 0.1 °C (at opt. range)**Calibration points:** -20 °C / 0 °C / +70 °C**Scope of supply:**

Measuring device GMH 3750 or GMH 3710, temperature probe GTF 401 DIN Kl. AA, plastic case GKK 3500 and ISO certificate of calibration with 3 calibration points.

## ROOM THERMOMETER



QUICK MEASUREMENT OF ROOM TEMPERATURE



COMFORTABLE HANDLING WITH ONLY ONE HAND

**GTH 200 air**

Art. no. 600251

Precision lounge thermometer

**General:**

The exposed but yet protected temperature sensor provides fast and precise measurements of  $\pm 0.2$  °C (at 20 °C). The device has undergone a streamlining process and is optimized to its key features, ensuring a comfortable and efficient handling with only one hand.

**Application:**

The room thermometer GTH 200 air is an essential tool for fast and precise temperature measurements in

- calibration rooms
- production / computer rooms
- living space
- laboratories, etc.

**Specifications:****Measuring range:** -25.0 ... +70.0 °C**Resolution:** 0.1 °C**Accuracy:** ( $\pm 1$  digit) (at nominal temperature)  $\pm 0.5$  % of meas. value  $\pm 0.1$  °C**Sensor:** Pt 1000, DIN class AA**Response time  $T_{90}$ :** approx. 5 s**Display:** 4½ digit, 11 mm high LCD-display**Nominal temperature:** 25 °C**Working temperature:** -20 ... +70 °C**Relative humidity:** 0 ... 95 % RH (non-condensing)**Storage temperature:** -25 ... +70 °C**Power supply:** 9 V battery**Power consumption:** max. 0.1 mA**Battery life:** approx. 6000 operating hours with alkaline battery**Housing:** impact-resistant ABS housing**Dimensions:** approx. 106 x 67 x 30 mm (H x W x D), additionally the sensor head at the front side, 35 mm long,  $\varnothing$  14 mm, resulting total length 141 mm**Weight:** approx. 135 g incl. battery**Scope of supply:** device, battery, manual



## PRECISE PT 1000 UNIVERSAL THERMOMETER



## HIGHLIGHTS:

- Modern and functional housing
- 3-line display / overhead display at the push of a button
- Backlighting
- Alarm function
- Waterproof (IP65 / IP67)
- Durable, long battery life

G 1710, G 1720, G 1730 WITH PERMANENTLY CONNECTED SENSOR SEE PAGE 24



Connection

DURABLE AND AFFORDABLE

## G 1700

Art. no. 609826

Waterproof alarm thermometer for exchangeable probes BNC, without sensor

## General:

The primary focus in the development of the new GMH 1000 series was placed on the essential functions of the measurement technology. Pure measurement with a focus on precision, speed and reliability packaged in a compact housing distinguish an impressive price/performance ratio. Made in Germany.

The new handheld measuring devices also impress with their ergonomic design, dust and water-protected design in accordance with IP 65/67 and the illuminated display. The compact thermometer is available with a practical BNC connection for interchangeable sensors. The device redefines our entry-level measurement class - calibration log included.

## Application:

The highest-precision measurements in liquids and in air, for measurement of core temperatures (with insertion sensor); laboratories, quality assurance, service, food, etc.

## Specifications:

<b>Measuring range:</b>	-200.0 ... +450.0 °C (-328.0 ... +842.0 °F) with plug-in sensor (Observe the permissible range of application of the sensor that is used!)
<b>Accuracy (device): (at nominal temperature = 25 °C)</b>	-20 ... +100 °C: ±0.1 K ±1 digit otherwise 0.1 % of m. v. ±2 digits
<b>Operating conditions:</b>	-20 ... +50 °C; 0 ... 95 % RH (non-condensing)
<b>Display:</b>	3-line unit incl. battery change indicator, with background light, protected by an unbreakable pane, overhead display at the push of a button
<b>Power supply:</b>	2 x AA battery, >5000 h operating time
<b>Sensor:</b>	Pt1000 2-wire can be used with BNC connection
<b>Protection rating:</b>	IP65 / IP67 (only with sensors identified as waterproof in the connected state)
<b>Housing:</b>	break-proof ABS housing
<b>Dimensions:</b>	108 x 54 x 28 mm (H x W x D) without sensor connection
<b>Weight:</b>	130 g (without sensor)
<b>Scope of supply:</b>	Device, calibration protocol, 2 x battery, manual

## Accessories and spare parts:

## GF 1T-T3-B-BNC

Art. no. 609549

Pt1000 handheld sensor, Pt1000 Class B, with BNC connector, Ø 3 mm, p.r.t. page 22

## GF 1T-E3-B-BNC

Art. no. 609639

Pt1000 handheld sensor, Pt1000 Class B, with BNC connector, Ø 3 mm, p.r.t. page 23

## GF 1T-E1.5-B-BNC

Art. no. 609645

Extra-thin Pt1000 insertion sensor, Pt1000 Class B, with BNC connector, Ø 1.5 mm, p.r.t. page 23

## ST-G1000

Art. no. 611373

Device protection bag with 1 round cut-out

## GB AA

Art.-Nr: 610049

Spare battery Mignon (AA) 1,5 V (2 batteries required)

Further sensors see page 21-23

## SUITABLE PT1000 - MEASURING PROBES, 2-WIRE

## Accuracy Pt1000:

sensor accuracy acc. to DIN EN 60751

**DIN cl. B:** (area of validity: -50 ... +500 °C)

±0.3 °C at 0 °C

**DIN cl. A:** (area of validity: -30 ... +300 °C)

±0.15 °C at 0 °C

**DIN cl. AA = 1/3 DIN cl. B:** (area of validity: 0 ... +150 °C)

±0.1 °C at 0 °C

## Upcharges special designs: (Deviations are possible based on the construction)

## longer probe tube

upcharge per further starting 100 mm

## longer cable (silicone)

upcharge per further starting meter

## other cable material upon request

## Probe tube with Teflon coating

(for probes up to 200 mm)

(for probes used in acids and salt water, upper temperature range 250 °C)

## casted waterproof probe handle

(only possible with PVC cable -20 ... +105 °C)

## higher sensor accuracy:

DIN cl. AA, for Pt1000, tolerances: 0.1 °C at 0 °C

## higher sensor accuracy:

1/10 DIN cl. B, for Pt1000-probes, tolerances: 0.03 °C at 0 °C

## basic fee for custom made probe

All types of probes also available for Pt100 2- / 3- or 4-wire connection  
We manufacture all types of probes according to your special desires - low priced and fast. Please contact us.

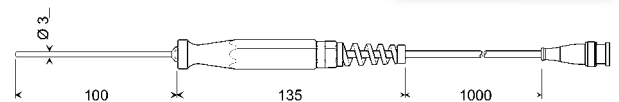


## GTF 175-BNC

Art. no. 607165

Immersion probe for liquids / gases

-70 ... +250 °C, Pt1000 cl. B



non-corrosive V4A tube, Ø 3 mm, plastic handle, anti-buckling glanding, 1 m highly flexible silicone cable, BNC connector

**Response time T<sub>90</sub>:** water 0.4 m/s <2 s, air 2 m/s approx. 40 s

## Advantages of sheath element Pt1000:

- high temperature resistance
- sheath cable is bendable
- high shock resistance
- high service life

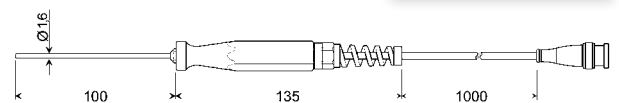


## GTF 175 / 1.6-BNC

Art. no. 611323

Immersion probe with sheath element Pt1000

-70 ... +250 °C, Pt1000 cl. B



stainless steel tube (V4A), flexible, Ø 1.6 mm, plastic handle, anti-buckling glanding, 1 m highly flexible silicone cable, BNC connector

**Response time T<sub>90</sub>:** water 0.4 m/s <2 s, air 2 m/s approx. 25 s

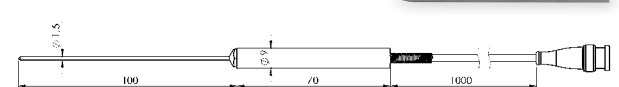


## GES 20-T-B-BNC

Art. no. 607377

Core temperature- / food probe with compact teflon handle

-200 ... +250 °C, Pt1000 cl. B



V4A tube with Ø 1.5 mm slim insertion tip, small teflon handle, stainless steel kink protection, 1 m Teflon cable, BNC connector

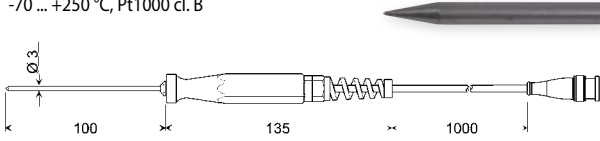
**Response time T<sub>90</sub>:** water 0.4 m/s <1 s, air 2 m/s approx. 12 s

SUITABLE PT1000 - MEASURING PROBES, 2-WIRE

-70°C  
+250°C

**GES 175-BNC**

Art. no. 611324  
Insertion probe for soft media  
-70 ... +250 °C, Pt1000 cl. B



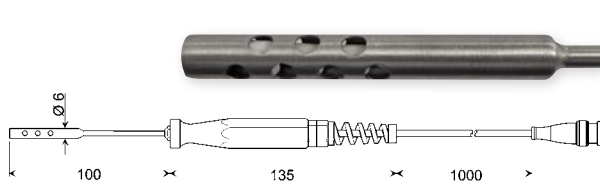
V4A tube Ø 3 mm with slim insertion tip, plastic handle, anti-buckling glanding, 1 m highly flexible silicone cable, BNC connector

**Response time T<sub>90</sub>:** water 0.4 m/s <2 s, air 2 m/s approx. 40 s

-70°C  
+250°C

**GLF 175-BNC**

Art. no. 607162  
Air / gas probe for clean media  
-70 ... +250 °C, Pt1000 cl. B



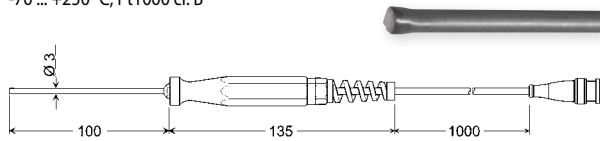
(for dirty measurands use GTF 175), punched V4A protection tube, fast miniaturized Pt1000 mounted freely in tube, resulting in fast response, plastic handle, anti-buckling glanding, 1 m highly flexible silicone cable, BNC connector

**Response time T<sub>90</sub>:** air 2 m/s approx. 15 s

-70°C  
+250°C

**GOF 175-BNC**

Art. no. 607163  
Surface probe for solid surface  
-70 ... +250 °C, Pt1000 cl. B



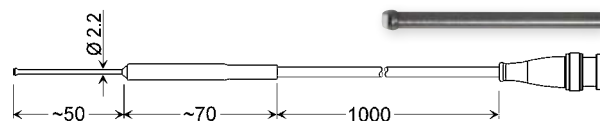
2 x 2.3 mm ceramic Pt1000 sensor mounted at the tip, V4A tube, quadratic 3 x 3 mm at the tip, plastic handle, anti-buckling glanding, 1 m highly flexible silicone cable, BNC connector

**Response time T<sub>90</sub>:** approx. 15 s

-70°C  
+120°C

**GOF 175 Mini-BNC**

Art. no. 610399  
Surface probe for solid surface  
-70 ... +120 °C, Pt1000 cl. B



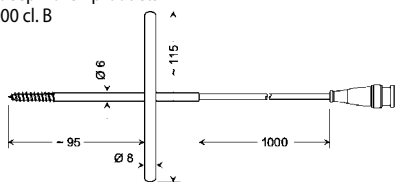
2 x 2.3 mm ceramic Pt1000 sensor mounted at the tip, V4A tube Ø 2.2 mm, 1 m highly flexible silicone cable, BNC connector

**Response time T<sub>90</sub>:** approx. 15 s

-70°C  
+250°C

**GGF 175-BNC**

Art. no. 610397  
Screw in probe for deep frozen products  
-70 ... +250 °C, Pt1000 cl. B



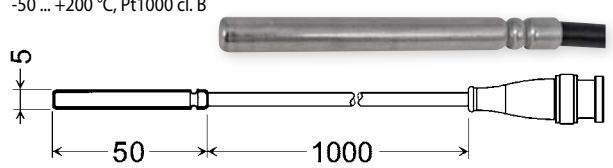
to screw into deep-frozen products, etc. no predrilling required. V4A tube, 6 mm Ø with screw prod, 1 m highly flexible silicone cable, BNC connector

**Response time T<sub>90</sub>:** approx. 15 s

-50°C  
+200°C

**GTF 2000-BNC**

Art. no. 607164  
Air / pipe probe  
-50 ... +200 °C, Pt1000 cl. B



V4A-sensor sleeve Ø 5 mm, 1 m highly flexible silicone cable, BNC connector, each beginning meter upcharge

**Response time T<sub>90</sub>:** water 0.4 m/s <10 s, air 2 m/s approx. 60 s

**Variant:**

**GTF 2000-WD**

Art. no. 476007  
Water proof type, construction like described before, but cable of PVC and tube enclosed water proof. Max. 105 °C!



**HIGHLIGHTS:**

- Lightweight, manageable handle with optimised ergonomics and flexible cable
- Waterproof: can be completely immersed
- Temporary temperature resistance of up to 250 °C

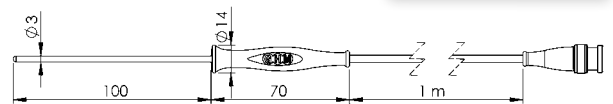
-70°C  
+250°C

**GF 1T-T3-B-BNC**

Art. no. 609549  
compact Pt1000 temperature probe with silicone handle  
-70 ... +250 °C, Pt1000 cl. B

**GF 1T-T3-AA-BNC**

Art. no. 609550  
compact Pt1000 temperature probe with silicone handle  
-70 ... +250 °C, Pt1000 cl. AA



Immersion probe Ø 3 mm made of V4A tube, black silicone handle from -50 ... +250 °C, 1 m Silicone cable from -50 ... +230 °C continuously / +250 °C for 2 h, sensor probe and silicone handle IP67, BNC connector

**Response time T<sub>90</sub>:** water 0.4 m/s <2 s, air 2 m/s approx. 40 s

**Variants:**

**GF 1T-T3-B-LE**

Art. no. 609547  
Pt1000 handheld sensor, Pt1000 cl. B, with loose ends

**GF 1T-T3-AA-LE**

Art. no. 609548  
Precision Pt1000 handheld sensor, Pt1000 cl. AA, with loose ends

HANDHELD INSTRUMENTS

SOFTWARE

ACCESSORIES

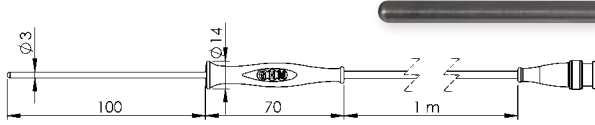
ALARM / PROTECTION, LEVEL

## SUITABLE PT1000 - MEASURING PROBES, 2-WIRE

-200°C  
+250°C

**GF 1T-T3-B-BNC-MB4**

Art. no. 611763  
Pt1000 handheld probe for low temperatures  
-200 ... +250 °C, Pt1000 cl. B



Immersion probe  $\varnothing$  3 mm made of V4A tube, black silicone handle -50 ... +250 °C, 1 m silicone cable, -50 ... +230 °C permanently / +250 °C for 2 h, probe tip and silicone handle IP67, BNC plug

**Response time  $T_{90}$ :** water 0.4 m/s < 2 s, air 2 m/s approx. 40 s

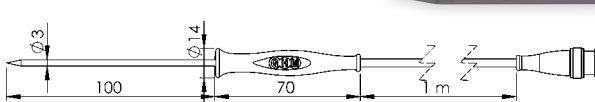
-70°C  
+250°C

**GF 1T-E3-B-BNC**

Art. no. 609639  
Insertion sensor,  $\varnothing$  3 mm  
-70 ... +250 °C, Pt1000 cl. B

**GF 1T-E3-AA-BNC**

Art. no. 609640  
Insertion sensor,  $\varnothing$  3 mm  
-70 ... +250 °C, Pt1000 cl. AA



Insertion probe  $\varnothing$  3 mm made of V4A tube, black silicone handle from -50 ... +250 °C, 1 m silicone cable from -50 ... +230 °C continuously / +250 °C for 2 h, sensor probe and silicone handle IP67, BNC connector,

**Response time  $T_{90}$ :** water 0.4 m/s < 2 s, air 2 m/s approx. 40 s

**Variants:****GF 1T-E3-B-LE**

Art. no. 609637  
Pt1000 insertion sensor, Pt1000 cl. B, with loose ends

**GF 1T-E3-AA-LE**

Art. no. 609638  
Precision Pt1000 insertion sensor, Pt1000 Cl. AA, with loose ends

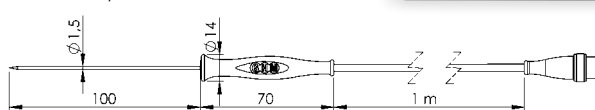
-70°C  
+250°C

**GF 1T-E1.5-B-BNC**

Art. no. 609645  
Extra-thin Pt1000 insertion sensor,  $\varnothing$  1.5 mm  
-70 ... +250 °C, Pt1000 cl. B

**GF 1T-E1.5-A-BNC**

Art. no. 609646  
Extra-thin Pt1000 insertion sensor,  $\varnothing$  1.5 mm  
-70 ... +250 °C, Pt1000 cl. A



Insertion probe  $\varnothing$  1.5 mm made of V4A tube, black silicone handle from -50 ... +250 °C, 1 m silicone cable from -50 ... +230 °C continuously / +250 °C for 2 h, sensor probe and silicone handle IP67, BNC connector

**Response time  $T_{90}$ :** water 0.4 m/s < 1 s, air 2 m/s approx. 12 s

**Variants:****GF 1T-E1.5-B-LE**

Art. no. 609643  
Extra-thin Pt1000 insertion sensor, Pt1000 Cl. B, with loose ends

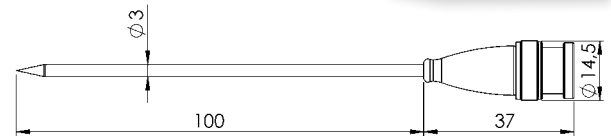
**GF 1T-E1.5-A-LE**

Art. no. 609644  
Extra-thin Pt1000 insertion sensor, Pt1000 Cl. A, with loose ends

-70°C  
+250°C

**GF 2T-E3-B-BNC**

Art. no. 609926  
Pt1000 insertion sensor, BNC connector, without cable  
-70 ... +250 °C, Pt1000 cl. B



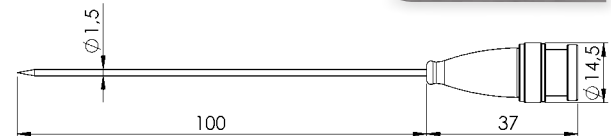
Insertion probe  $\varnothing$  3 mm made of V4A tube, IP67 in connected state, BNC connector with EPDM grommet up to +75 °C

**Response time  $T_{90}$ :** water 0.4 m/s < 2 s, air 2 m/s approx. 40 s

-70°C  
+250°C

**GF 2T-E1.5-A-BNC**

Art. no. 609824  
Pt1000 insertion sensor, BNC connector, without cable  
-70 ... +250 °C, Pt1000 cl. A



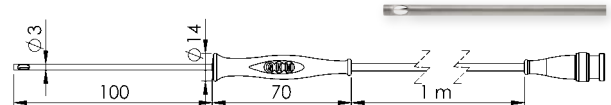
Insertion probe  $\varnothing$  1.5 mm made of V4A tube, IP67 in connected state, BNC connector with EPDM grommet up to +75 °C

**Response time  $T_{90}$ :** water 0.4 m/s < 1 s, air 2 m/s approx. 12 s

-70°C  
+250°C

**GF 1T-L3-B-BNC**

Art. no. 611297  
Pt1000 air sensor for clean media  
-70 ... +250 °C, Pt1000 cl. B



(use GF 1T-T3 for contaminated media), perforated V4A tube  $\varnothing$  3 mm, quick-reaction Pt1000 freely arranged, black silicone handle, up to +250 °C, 1 m silicone cable, up to +230 °C permanently / +250 °C for 2 h, BNC plug

**Response time  $T_{90}$ :** air 2 m/s approx. 15 s

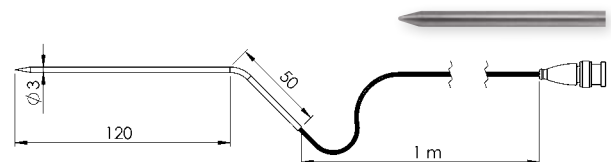
**Variant:****GF 1T-L3-B-LE**

Art. no. 611298  
Pt1000 air sensor, Pt1000 Class B, with loose ends

-70°C  
+400°C

**GF 3T-E3-BNC**

Art. no. 611301  
Barbecue insertion probe up to 400 °C  
-70 ... +400 °C, Pt1000 cl. B



Insertion probe  $\varnothing$  3 mm made of bent V4A tube, 1 m glass fibre insulated cable with stainless steel branding up to +350 °C continuously / +400 °C for 2 h, BNC plug

**Response time  $T_{90}$ :** water 0.4 m/s approx. 10 s, air 2 m/s approx. 40 s

**Variant:****GF 3T-E3-B-LE**

Art. no. 611302  
Pt1000 grill sensor, Pt1000 Class B, with loose ends

## PRECISE UNIVERSAL THERMOMETER



## HIGHLIGHTS:

- Modern and functional housing
- 3-line display / overhead display at the push of a button
- Backlighting
- Alarm function
- Waterproof (IP65 / IP67)
- Durable, long battery life
- High-quality sensors: complete with Pt1000 handheld sensor (up to 250 °C incl. handle and cable)

G 1700 WITH BNC CONNECTION FOR CHANGEABLE PROBES SEE PAGE 21

DURABLE AND AFFORDABLE

**G 1710**

Art. no. 609828

Waterproof alarm thermometer with immersion probe, Ø 3 mm

**G 1720**

Art. no. 609829

Waterproof alarm thermometer with insertion probe, Ø 3 mm

**G 1730**

Art. no. 609832

Waterproof alarm thermometer with insertion probe, Ø 1.5 mm

**General:**

The primary focus in the development of the new GMH 1000 series was placed on the essential functions of the measurement technology. Pure measurement with a focus on precision, speed and reliability packaged in a compact housing distinguish an impressive price/performance ratio. Made in Germany.

The new handheld measuring devices also impress with their ergonomic design, dust and water-protected design in accordance with IP 65/67 and the illuminated display. The compact thermometer is available as a complete device including sensor with maximum overall precision. The device redefines our entry-level measurement class - calibration log included. The matching sensors can be used at temperatures of up to 250 °C (incl. handle and cable) and are distinguished by their compact design and small tube diameter. Integrated: High-quality Pt1000 sensors.

**Application:**

The highest-precision measurements in liquids and in air, for measurement of core temperatures (with insertion sensor); sensor handle and cable temperature range of up to 250 °C (permanent use temperature of 230 °C); laboratories, quality assurance, service, food, etc.

**Specifications:**

<b>Measuring range:</b>	-70.0 ... +250.0 °C (-94.0 ... +482.0 °F)
<b>Accuracy: (at nominal temperature = 25 °C)</b>	-20 ... +100 °C: ±0.1 K ±1 digit -70 ... +250 °C: ±0.2 % of m. v. ±2 digit
<b>Operating conditions:</b>	-20 ... +50 °C; 0 ... 95 % RH (non-condensing)
<b>Display:</b>	3-line unit incl. battery change indicator, with background light, protected by an unbreakable pane, overhead display at the push of a button
<b>Power supply:</b>	2 x AA battery, >5000 h operating time
<b>Sensor</b>	
<b>G 1710:</b>	Immersion sensor Ø 3 mm, Pt1000 permanent 2-wire connection, V4A, 1 m cable
<b>G 1720:</b>	Durable insertion sensor Ø 3 mm, Pt1000 permanent 2-wire connection, V4A, 1 m cable
<b>G 1730:</b>	Extra-thin insertion sensor Ø 1.5 mm, Pt1000 permanent 2-wire connection, V4A, 1 m cable
<b>Response time T<sub>90</sub>:</b>	Ø 3 mm: water 0.4 m/s <2 s; Ø 1.5 mm: water 0.4 m/s <1 s
<b>Protection rating:</b>	IP65 / IP67
<b>Housing:</b>	Break-proof ABS housing
<b>Dimensions:</b>	108 x 54 x 28 mm (H x W x D) without sensor connection
<b>Weight:</b>	130 g (without sensor)
<b>Scope of supply:</b>	Device with integrated sensor, calibration log, 2 x battery, manual

**Accessories and spare parts:****ST-G1000**

Art. no. 611373

Protection bag, leather

**GB AA**

Art.-Nr: 610049

Spare battery Mignon (AA) 1,5 V (2 batteries required)

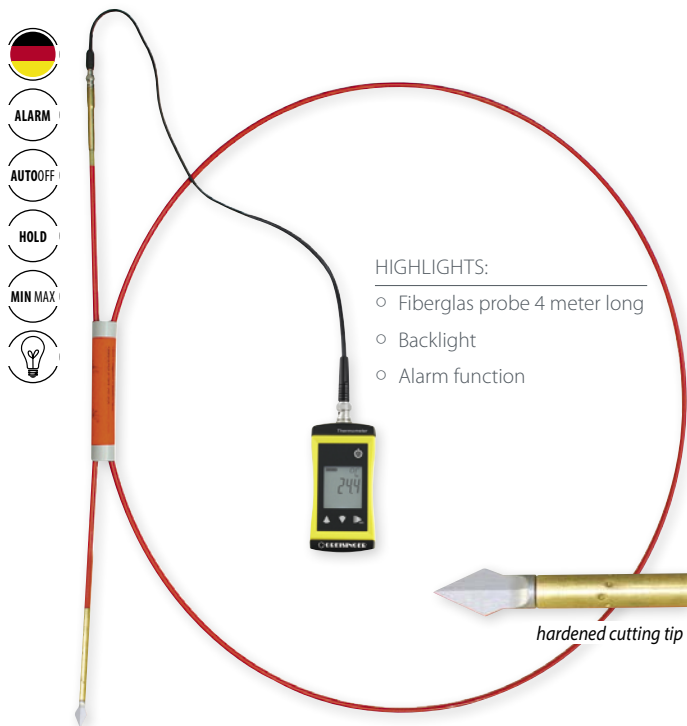


SUCCESSOR TO THE GTH 175 PRODUCTS

THEY ARE STILL AVAILABLE ON REQUEST - CONTACT US IMMEDIATELY!



## HAY THERMOMETER



## HIGHLIGHTS:

- Fiberglass probe 4 meter long
- Backlight
- Alarm function

## HayTemp 1700

Art. no. 611377

Hay temperature measuring device

## General:

Stored hay or straw, etc. is prone to overheating (depreciation) or even self-ignition, because of biological processes. This problem is even emphasized with higher moisture contents. Therefore a regular temperature check is crucial. The HayTemp 1700 optimally supports farmers as well as firefighters.

## Application:

Hay or straw measurements at depth up to 4 m.

## Specifications:

<b>Device:</b>	G 1700
<b>Probe connection:</b>	BNC, Pt1000, 2-wire
<b>Measuring rod:</b>	Fiberglass probe, approx. 4 m long, approx. 10 mm Ø, 1 measuring point at probe tip
<b>Cutting tip:</b>	screwable, double-edged tip with integrated temperature sensor
<b>Weight:</b>	Measuring rod with cutting tip approx. 600 g
<b>Scope of supply:</b>	Device, fiberglass rod, probe tip Pt1000, BNC cable (1.5 m), battery, manual

## Accessories and spare parts:

## G 1700

Art. no. 609826

Waterproof alarm thermometer for exchangeable probes BNC

## Fiberglasrohr

Art. no. 604407

4 m, without probe and without tip

## Sondenspitze

Art. no. 606889

With integrated temperature sensor

## Kabel BNC/BNC

Art. no. 602855

Connection cable with 1.5 m length

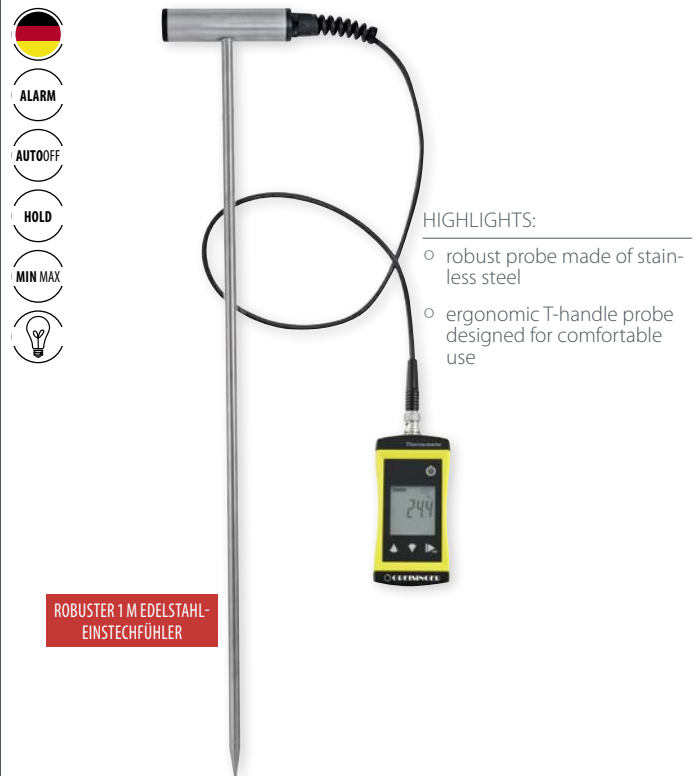
## ST-G1000

Art. no. 611373

Protection bag, leather

Instruments for hay and straw humidity measurements: see BaleCheck page 58!

## SOIL THERMOMETER



## HIGHLIGHTS:

- robust probe made of stainless steel
- ergonomic T-handle probe designed for comfortable use

ROBUSTER 1 M EDELSTAHL-  
EINSTECHFÜHLER

## SoilTemp 1700

Art. no. 611374

robust soil / compost thermometer

## General:

The universal display device combined with an extremely robust, but yet ergonomic T-handle probe made of stainless steel allows multiple measurements in soils or bulk materials.

## Application:

Silo checking, measurements in soils, waste dumps, silages, compost, etc.

## Specifications:

<b>Device:</b>	G 1700
<b>Probe connection:</b>	BNC, Pt1000, 2-wire
<b>Measuring range:</b>	-50.0 ... +250.0 °C
<b>Measuring rod:</b>	Stainless steel, 1000 mm x Ø 10 mm, 1 m connection cable with BNC plug, 350 g, probe handle designed for comfortable use
<b>Scope of supply:</b>	Device, GTF 40 T-1000, battery, manual

## Accessories and spare parts:

## G 1700

Art. no. 609826

Waterproof alarm thermometer for exchangeable probes BNC

## GTF 40 T-620

Art. no. 606803

Stainless steel insertion probe, t-handle, FL 620 mm, with 1 m cable and BNC plug

## GTF 40 T-1000

Art. no. 606791

Stainless steel insertion probe, t-handle, FL 1000 mm, with 1 m cable and BNC plug

## GTF 40 T-1500

Art. no. 606792

Stainless steel insertion probe, t-handle, FL 1500 mm, with 1 m cable and BNC plug

## ST-G1000

Art. no. 611373

Protection bag, leather

WATER-PROOF HACCP THERMOMETER WITH PT1000 PROBE



HIGHLIGHTS:

- o Easy handling
- o Battery life time > 6000 hours
- o Device and probe are Water-proof and very robust
- o Incl. calibration protocol

**GMH 2710-T**

Art. no. 602034

Temperature measuring device incl. universal probe

**GMH 2710-E**

Art. no. 602036

Temperature measuring device incl. insertion probe, Ø 3 mm

**GMH 2710-K**

Art. no. 602038

Temperature measuring device incl. Teflon insertion probe, Ø 3 mm

**GMH 2710-G**

Art. no. 602040

Temperature measuring device incl. mini Teflon probe, Ø 1.5 mm

**GMH 2710-F**

Art. no. 604035

Single-hand temperature measurement device with integrated immersion probe, Ø 3 mm, bendable

**GMH 2710-I**

Art. no. 604611

Single-hand temperature measurement device with integrated insertion probe, Ø 3 mm, bendable

**General:**

Accurate measurements for laboratories, quality management, and monitoring of production processes

**Application:**

Food (HACCP), medical / pharmaceutical science, chemistry, aquaristics, fish farming, aquaculture, etc.

**GMH 2710-F/-I:**

Optimal for measurements at places difficult to access, e.g.

- storage temperature control (especially food)
- temperature control for food measurements (HACCP)
- incoming inspection
- temperature measurements as part of legionellae tests

These measurements may cause problems with ordinary thermometers.

**Specifications:**

**Measuring range:**

**GMH 2710-T / -E** -199.9 ... +200.0 °C

**GMH 2710-K / -G** -199.9 ... +250.0 °C

**GMH 2710-F / -I** -70 ... +250 °C

**Resolution:** 0.1 °C

**Accuracy:**

**at -20.0 ... +100.0 °C** ±0.1 °C ±1 digit

**at -70.0 ... +200.0 °C** ±0.1 % of meas. value ±2 digit, sensor calibrated with device

**Probe:**

Pt1000, 2-wire, isolated, water- and steam-proof, permanently connected to device

**GMH 2710-T**

plastic handle 135 mm long  
1 m PVC cable (max 100 °C) Ø 3 mm / length: 100 mm

**GMH 2710-E**

plastic handle 135 mm long, additionally with slim insertion tip for all soft media. 1 m PVC cable (max 100 °C) Ø 3 mm / length: 100 mm

**GMH 2710-K**

design type with big Teflon handle and 1 m Teflon cable, with slim insertion tip, handle and cable are resistant to temperatures up to 250 °C air temperature. Stainless steel kink protection, Ø 3 mm / length: 100 mm

**GMH 2710-G**

design type with small Teflon handle and 1 m Teflon cable, with slim insertion tip, handle and cable are suitable for permanent application at temperatures up to 250 °C. Stainless steel kink protection, Ø 1.5 mm / length: 100 mm

**GMH 2710-F**

V4A mantle tube, bendable, Ø 3 mm, length 150 mm

**GMH 2710-I**

V4A mantle tube with needle-shaped insertion tip, bendable, Ø 3 mm, length 150 mm

**Response time T<sub>90</sub>:**

Ø 3 mm: water 0.4 m/s < 2 s;  
Ø 1.5 mm: water 0.4 m/s < 1 s

**Display:**

two 4-digit LCD (12.4 mm and 7 mm)

**Nominal temperature:**

+25 °C

**Working temperature:**

-25 ... +50 °C

**Storage temperature:**

-30 ... +70 °C

**Power supply:**

2 x AAA batteries

**Battery life:**

>6000 hours

**Protection rating:**

IP65 / IP67

**Housing:**

made of impact-resistant ABS

**Dimensions:**

154 x 81 x 31 mm (H x W x D)

**Weight:**

215 g (incl. battery and probe)

**Scope of supply:**

device incl. probe, battery, calibration protocol, manual

**Accessories and spare parts:**

**K 50 BL**

Art. no. 601352

Silicone protection cover blue

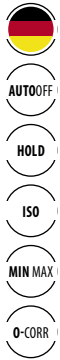
**K 50 RE**

Art. no. 607456

Silicone protection cover red



## PRECISION QUICK-RESPONSE THERMOMETER FOR THERMOCOUPLES



VERY QUICK RESPONSE TIMETIME!



GMH 3211 connection

**NEW!**

### GMH 3201

Art. no. 474930

Precision quick response thermometer Type K

### GMH 3211

Art. no. 611381

Precision quick response thermometer, universal

#### HIGHLIGHTS:

- Serial interface (except GMH 3221)
- Correction factor for surface measuring can be switched on / off (except GMH 3221)

#### GMH 3221, GMH 3231 AND GMH 3251:

- 2 plug-in probes can be connected and read simultaneously
- Temperature differences

#### ADDITIONAL FUNCTIONS

##### GMH 3221 / 3231:



##### GMH 3251:



SUITABLE PROBES P.R.T. P. 32



GMH 3221 connection



GMH 3231 / 51 connection

### GMH 3221

Art. no. 611384

Precision quick response thermometer, 2 channel Type K

### GMH 3231

Art. no. 611382

Precision quick response thermometer, 2 channel universal

### GMH 3251

Art. no. 611383

Precision quick response thermometer, 2 channel, logger

Specifications:	GMH 3201	GMH 3211	GMH 3221	GMH 3231	GMH 3251
<b>Thermocouples:</b>	K	K, J, T, N, S, E, B	K	K, J, T, N, S, E, B	K, J, T, N, S, E, B
<b>Measuring channels:</b>	1 thermocouple input (type K balancing material)		2 thermocouple inputs (type K balancing material)		
<b>Measuring ranges</b>					
<b>Type K:</b>	-220.0 ... +1372.0 °C	-220.0 ... +1372.0 °C	-220.0 ... +1372.0 °C	-220.0 ... +1372.0 °C	-220.0 ... +1372.0 °C
<b>Type J:</b>	-	-200.0 ... +1100.0 °C	-	-200.0 ... +1100.0 °C	-200.0 ... +1100.0 °C
<b>Type T:</b>	-	-200.0 ... +400.0 °C	-	-200.0 ... +400.0 °C	-200.0 ... +400.0 °C
<b>Type N:</b>	-	-200.0 ... +1300.0 °C	-	-200.0 ... +1300.0 °C	-200.0 ... +1300.0 °C
<b>Type S:</b>	-	-50.0 ... +1768.0 °C	-	-50.0 ... +1768.0 °C	-50.0 ... +1768.0 °C
<b>Type E:</b>	-	-60.0 ... +850.0 °C NEW	-	-60.0 ... +850.0 °C NEW	-60.0 ... +850.0 °C NEW
<b>Type B:</b>	-	+300 ... +1750 °C NEW	-	+300 ... +1750 °C NEW	+300 ... +1750 °C NEW
<b>Accuracy: (at nominal temperature)</b>	±(0.5 °C +0.2 % of m.v.)	±(0.5 °C +0.2 % of m.v.) (J, K, N, T, E) ±(0.8 °C +0.4 % of m.v.) (S, B)	±(0.5 °C +0.2 % of m.v.)	±(0.5 °C +0.2 % of m.v.) (J, K, N, T, E) ±(0.8 °C +0.4 % of m.v.) (S, B)	
<b>Analog output:</b>	no	no	no	no	0 ... 1 V
<b>Alarm:</b>	no	no	no	no	CH1, CH2, CH1+2, DIF
<b>Data logger:</b>	no	no	no	no	<b>manual:</b> 1.000 data sets <b>cyclic:</b> 10.000 data sets
<b>Probe connections (miniature flat plug):</b>	1	1	2	2	2
<b>Serial interface:</b>	-	3-pin jack connector Ø 3.5 mm	-	3-pin jack connector Ø 3.5 mm	3-pin jack connector Ø 3.5 mm
<b>Difference measurement:</b>	Temperature difference probe 1 - probe 2 can be displayed if 2 probes are connected.				
<b>Compensation value for surface measurements:</b>	-	adjustable	-	adjustable	adjustable
<b>Power supply:</b>	9 V battery	9 V battery, d.c. connector	9 V battery	9 V battery, d.c. connector	9 V battery, d.c. connector
<b>Battery life:</b>	approx. 500 h	approx. 500 h	approx. 300 h	approx. 300 h	approx. 300 h

## PRECISION QUICK-RESPONSE THERMOMETER FOR THERMOCOUPLES

### General specifications:

<b>Resolution:</b>	0.1 °C or 1 °C
<b>Working temperature:</b>	-25 ... +50 °C
<b>Display:</b>	two 4½-digit LCDs (12.4 mm and 7 mm high)
<b>Serial interface (except GMH 3201 and GMH 3221):</b>	3-pole jack socket Ø 3.5 mm, direct connection to RS232 or USB interface of a PC via electrically isolated interface adapter GRS 310x or USB 3100 N (p.r.t. accessories).
<b>Data logger (GMH 3251 only):</b>	<b>manual:</b> 1.000 data sets (fetch data via buttons or interface) <b>cyclic:</b> 10.000 data sets (fetch data via interface) adjustable cycle time: 1 s ... 1 h The logger is started or stopped by keypad or interface. The software GSOF 3050 (see accessories) is available for comfortable read-out of logger data, see page 110.
<b>Housing:</b>	Impact-resistant ABS plastic housing, membrane keyboard, transparent panel, integrated pop-up clip
<b>Dimensions:</b>	142 x 71 x 26 mm (H x W x D)
<b>Nominal temperature:</b>	25 °C ±5 K
<b>Weight:</b>	approx. 155 g
<b>Scope of supply:</b>	device, battery, calibration protocol, manual

### Features (except GMH3201 and -21):

A correction factor can be entered for each probe connection for surface measurements. This optimally corrects the temperature difference of the measured surface relative to the environmental temperature in order to receive the most precise surface measurements possible, even in applications where infrared thermometers have their shortcomings, e.g. on shiny metallic surfaces!

### Accessories and spare parts:

#### GB 9 V

Art. no. 601115

Spare battery 9V, type IEC 6F22

#### GNG 10/3000

Art. no. 600273

Plug-in power supply (220 / 240 V, 50 / 60 Hz), output voltage: 10.5 V / 10 mA, suitable for devices with power supply socket

#### ST-RN

Art. no. 601074

Nappa leathern device protection bag with 2 round cut-outs for sensor connection (1 x round, 1 x rectangular)

#### ST-N2

Art. no. 601072

Nappa leathern device protection bag with 2 rectangular cut-outs for sensor connection

#### GKK 1100

Art. no. 601060

Case with punched lining for universal application, 340 x 275 x 83 mm (W x H x D)

## 16 CHANNEL PRECISION QUICK-RESPONSE THERMOMETER FOR THERMOCOUPLES



### HIGHLIGHTS:

- simultaneous display of 4 inputs
- 800.000 measuring data storable
- for thermocouples type K, J, T, N, R, S, B, E

16 INTERCHANGEABLE SENSORS CONNECTABLE



### HD32-8-16

Art. no. 700077

Precision-Thermocouple-Thermometer with 16 inputs and logger

### General:

Ideal for complex temperature measuring tasks in which multiple temperature values must be measured, recorded and displayed at the same time.

### Application:

Testing systems, drying and baking ovens, air conditioning control units, production and manufacturing processes, temperature monitoring in concrete or asphalt on roads and buildings

### Specifications:

<b>Thermocouples:</b>	K, J, T, N, R, S, B, E	
<b>Resolution:</b>	0.05 °C or 0.1 °C	
<b>Measuring range: (depends on thermocouple)</b>	Type K: -200 °C ... +1370 °C Type J: -100 °C ... +750 °C Type T: -200 °C ... +400 °C Type N: -200 °C ... +1300 °C	Type R: +200 °C ... +1480 °C Type S: +200 °C ... +1480 °C Type B: +200 °C ... +1800 °C Type E: -200 °C ... +750 °C
<b>Accuracy: (depends on thermocouple)</b>	±0.1 ... ±0.4 °C	
<b>Number of inputs:</b>	16	
<b>Operating conditions:</b>	-5 ... +50 °C working temperature, -25 ... +65 °C storage temperature, 0 ... 90 % relative humidity	
<b>Logger function:</b>	800.000 data sets	
<b>Display:</b>	LCD display with background illumination, 128 x 64 pixel, simultaneous display of 4 inputs	
<b>Serial interface:</b>	Communication via galvanically isolated 9-pin USB connecting cable	
<b>Power supply:</b>	4 x 1.5 V alkaline batteries, via external 12 V DC mains adapter or via PC interface	
<b>Housing:</b>	ABS, IP64	
<b>Dimensions:</b>	220 x 180 x 50 mm	
<b>Weight:</b>	1100 g	
<b>Scope of supply:</b>	Device, DeltaLog9 Software, carrying strap, batteries, manual	

### Accessories and spare parts:

#### SWD-10

Art. no. 700039

Plug in power supply for devices of the HD-handhelds, 12 V DC 1.0 A

#### CP22

Art. no. 700078

Interface Converter HD32-8 <=>PC, USB

### Note:

Connection cable for PC and temperature sensors (page 31) must be ordered separately.



## QUICK RESPONSE THERMOMETER TYPE K



GTH 1150

GMH 1150

**GTH 1150**

Art. no. 611499

Type K fast thermometer accessories not included, for plug-in probes

**GMH 1150**

Art. no. 600045

Type K fast thermometer, accessories not included, for plug-in probes

**Application:**

Quick response measurements on surfaces, in liquids, soft media, air/gases, at the smallest objects etc. For all applications where a resolution of 1 °C is sufficient.

**Specifications:**

<b>Measuring range:</b>	-50 ... +1150 °C
<b>Resolution:</b>	1 °C
<b>Accuracy:</b> (at nominal temperature = 25 °C)	≤1 % ±1 digit (from -20 ... +550 and 920 ... 1150 °C) ≤1.5 % ±1 digit (from 550 ... 920 °C) from -20 ... -50 °C according to attached correction table
<b>Probe connection:</b>	Thermoelectric-voltage-free miniature socket, suitable for all type K (NiCr-Ni) measuring sensors with mini flat plug
<b>Display:</b>	3½ digit, approx. 13 mm high LCD
<b>Working temperature:</b>	0 ... 45 °C
<b>Storage temperature:</b>	-20 ... +70 °C
<b>Power supply:</b>	9 V battery (included), Additional at GMH 1150: d.c. connector for external 10.5 ... 12 V direct voltage supply. (suitable power supply: GNG10/3000)
<b>Battery life:</b>	approx. 700 operating hours
<b>Dimensions:</b>	GTH 1150: approx. 106 x 67 x 30 mm (H x W x D). Impact resistant ABS plastic housing GMH 1150: approx. 142 x 71 x 26 mm (H x W x D). Impact-resistant ABS plastic housing, membrane keyboard, transparent panel, integrated pop-up clip
<b>Weight:</b>	approx. 150 g (GTH 1150), approx. 160 g (GMH 1150)
<b>Scope of supply:</b>	Device, battery, manual

**Accessories and spare parts:****GTF 300**

Art. no. 600039

wire probe

**additional type K probes (NiCr-Ni) p.r.t. page from 31****GB 9 V**

Art. no. 601115

Spare battery 9V, type IEC 6F22

**GNG 10 / 3000**

Art. no. 600273

Plug in power supply for devices of the series GMH 3XXX

**ST-KN**

Art. no. 601080

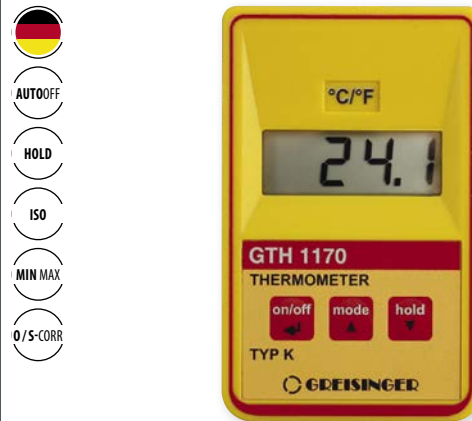
device protection bag, suitable for GTH 1150

**ST-N1**

Art. no. 601070

device protection bag, suitable for GMH 1150

## PRECISION QUICK RESPONSE THERMOMETER TYPE K

**GTH 1170**

Art. no. 600000

Precision quick response thermometer, universal, accessories not included, for plug-in probes

**Application:**

Quick response measurements on surfaces, in liquids, air/gases etc.

**Specifications:**

<b>Measuring range:</b>	-65.0 ... +199.9 °C or -65 ... +1150 °C (-85.0 ... +199.9 °F or -85 ... +1999 °F)
<b>Resolution:</b>	0.1 °C or 1 °C (0.1 °F or 1 °F)
<b>Accuracy: ±1 digit (at nominal temperature)</b>	-65.0 ... +199.9 °C: ±0.05 % of m.v. ±0.2 % FS -65 ... +1150 °C: ±0.1 % of m.v. ±0.2 % FS
<b>Temperature drift:</b>	0.01 %/K
<b>Point of comparison:</b>	±0.3 °C
<b>Probe connection:</b>	Thermoelectric-voltage-free miniature socket, suitable for all type K (NiCr-Ni) measuring sensors with mini flat plug
<b>Display:</b>	3½ digit, LCD display approx. 13 mm high
<b>Working temperature:</b>	-25 ... +50 °C
<b>Storage temperature:</b>	-25 ... +70 °C
<b>Power supply:</b>	9 V battery
<b>Measuring interval:</b>	approx. 3 meas. / s
<b>Battery life:</b>	approx. 2000 operating hours
<b>Dimensions:</b>	approx. 106 x 67 x 30 mm (H x W x D), impact resistant ABS plastic housing
<b>Weight:</b>	approx. 135 g (GTH 1170)
<b>Scope of supply:</b>	Device, battery, manual

**Accessories and spare parts:****additional type K probes (NiCr-Ni) p.r.t. page from 31****GB 9 V**

Art. no. 601115

Spare battery 9V, type IEC 6F22

**ST-KN**

Art. no. 601080

device protection bag, suitable for GTH 1150

**GTH 1170-GTF 900-WPT**

Art. no. 602675

Complete Solution incl. immersion probe GTF 900 and ISO certificate of calibration WPT (with meas. points: 0 / 100 / 250 / 500 °C) and case GKK 1100.



## THERMOMETER/DATALOGGER WITH PT100 AND THERMOCOUPLE INPUT



## HIGHLIGHTS:

- Input for Pt100 sensor (SICRAM plug) and thermocouple
- Data logger function
- USB connection and software for realtime monitoring

SUITABLE THERMOCOUPLES OF TYPE K, J, T, N, E AND CORRESPONDING SENSOR SPECIFICATIONS STARTING ON PAGE 32

## HD 2178.2

Art. no. 474932

Thermometer with two inputs (1 x Pt100, 1x thermocouple) and logger

## General:

The HD2178.2 can be used with Pt 100 sensors and with thermocouples. Pt 100 sensors with SICRAM plugs (8-pin DIN 45326 plug) can be connected to connection B. The SICRAM plug already has all of the sensor data, including serial number and calibration data. A thermocouple of the type K, J, T, N and E with miniature flat plug can be connected to connection A. The data logger stores up to 80,000 measurements, which can be transferred conveniently via USB cable and supplied software. Battery operation, large display and durability make the HD2178.2 a perfect all-rounder. Of course, the HD2178.2 also offers MAX, MIN, AVG, REL and HOLD functions.

## Application:

With the large variety of available sensors (as contact, immersion, insertion or air temperature sensors), a multitude of applications in the widest range of sectors opens up.

## Specifications:

<b>Display:</b>	LCD, 52 x 42 mm
<b>Operating temperature:</b>	-5 ... +50 °C (Instrument)
<b>Protection rating:</b>	IP 66
<b>Power supply:</b>	4 batteries 1.5 V type AA (Optional mains adapter)
<b>Unit of measurement:</b>	°C or °F
<b>Security of stored data:</b>	Unlimited, independent of battery charge conditions
<b>Measured values storage:</b>	2000 pages each one containing 40 samples, quantity 80000 samples in total
<b>Storage interval:</b>	1, 5, 10, 15, 30 s; 1, 2, 5, 10, 15, 20, 30 min; 1 h
<b>USB interface:</b>	USB 2.0, type B mini USB connection
<b>Housing:</b>	Material: ABS plastic, rubber
<b>Dimensions:</b>	185 x 90 x 40 mm
<b>Weight:</b>	470 g (complete with batteries)
<b>Scope of supply:</b>	Device including batteries, case for HD 2178.2, DeltaLog 9 software. Measuring probes, connecting cable and mains adapter are not included in the scope of supply.

Pt100 sensor with SICRAM plug selection  
(Additional versions available on request, including ball temperature)

Example: TP 472 I (immersion sensor)



Immersion probe, -196 ... +500 °C, ±0.25 °C (-196 ... +300 °C), ø 3mm, sensor length 300 mm, cable length 2 m

## Accessories and spare parts:

## CP23

Art. no. 475163

USB connection cable, USB 2.0, Mini USB socket type B

## SWD10

Art. no. 700039

Plug in power supply for devices of the HD-handhelds, 12 V DC 1.0 A

## Recommended accessories (PT100 sensor with SICRAM plug):

## additional type K probes (NiCr-Ni) p.r.t. page from 31

## TP 472 I

Art. no. 475642

Immersion probe Ø3 mm, FL = 300 mm, -196 ... +500 °C, Pt100, cable length 2 m, measuring range: -196 ... +500 °C, Accuracy: ±0.25 °C (-196 ... +300 °C), ±0.5 °C (+300 ... +500 °C)

## TP 472 I.0

Art. no. 415039

Immersion probe, Pt100, Ø 3 mm, length 230 mm, cable length 2 m, measuring range: -50 ... +300 °C, Accuracy: ±0.25 °C (-50 ... +300 °C)

## TP 473 P.I

Art. no. 475643

Insertion probe Ø4 mm, FL = 150 mm, -50 ... +400 °C, Pt100, cable length 2 m, Measuring range: -50 ... +400 °C, Accuracy: ±0.25 °C (-50 ... +300 °C), ±0.5 °C (+300 ... +400 °C)

## TP 473 P.O

Art. no. 475644

Insertion probe Ø4 mm, FL = 150 mm, -50 ... +300 °C, Pt100, cable length 2 m, Measuring range: -50 ... +300 °C, Accuracy: ±0.25 °C (-50 ... +300 °C)

## TP 474 C.O

Art. no. 475645

Surface probe, frontal contact surface 5 mm, Pt100, Ø 4 mm, length 230 mm, cable length 2 m, Measuring range: -50 ... +300 °C, Accuracy: ±0.3 °C (-50 ... +300 °C)

## TO 475 A.0

Art. no. 475646

Air probe Ø4 mm for clean media, Pt100, length 230 mm, cable length 2 m, Measuring range: -50 ... +250 °C, Accuracy: ±0.3 °C (-50 ... +250 °C)

## TP47

Art. no. 475648

Sicram Plug for connection of Pt sensors, without SICRAM connection (4-wire direct Pt 100, 2-wire Pt 1000)

## TYPE K - MEASURING PROBE (NICR-NI) WITH DIN-TYPE FLAT-PIN PLUG

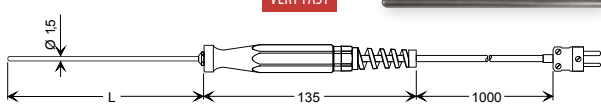
## Accuracy Thermocouples:

Sensor accuracy acc. to DIN EN 60584-1:2014-07

**Class 1 for Type K:**  $\pm 1.5^\circ\text{C}$  at range  $-40 \dots +375^\circ\text{C}$ **Class 1 for Type N:**  $\pm 1.5^\circ\text{C}$  at range  $-40 \dots +375^\circ\text{C}$ **Class 1 for Type S:**  $\pm 1^\circ\text{C}$  at range  $0 \dots 1100^\circ\text{C}$ **basic fee for custom made probe****basic fee for custom made probe GF1TK / GF2TK / GF3TK****We reserve the right to a minimum quantity surcharge for custom-made items** $\frac{-65^\circ\text{C}}{+550^\circ\text{C}}$ **GTF 400**

Art. no. 600502

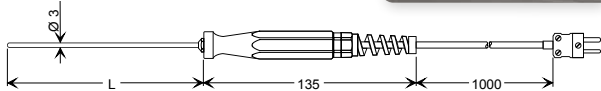
Immersion probe for liquids / gases

 $-65 \dots +550^\circ\text{C}$ 

inexpensive, fast, elastic (rigid)  
non-corrosive V4A tube  $\varnothing 1,5$  mm,  $L=130$  mm, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature flat plug

**Response time  $T_{90}$ :** water 0.4 m/s  $< 1$  s $\frac{-65^\circ\text{C}}{+1000^\circ\text{C}}$ **GTF 900**

Art. no. 600505

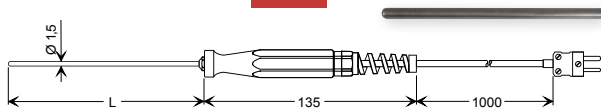
Immersion probe for liquids / gases up to  $1000^\circ\text{C}$  $-65 \dots +1000^\circ\text{C}$ 

inexpensive, elastic (rigid)  
non-corrosive V4A tube  $\varnothing 3$  mm,  $L=130$  mm, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature flat plug

**Response time  $T_{90}$ :** water 0.4 m/s  $< 2$  s, air 2 m/s approx. 40 s $\frac{-200^\circ\text{C}}{+1150^\circ\text{C}}$ **GTF 1200**

Art. no. 600507

Immersion probe with sheathed thermocouple, for highest temperatures

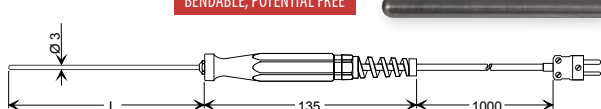
 $-200 \dots +1150^\circ\text{C}$ 

Inconel 600 jacket tube  $\varnothing 1.5$  mm, flexible,  $L=150$  mm, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature flat plug

**Response time  $T_{90}$ :** water 0.4 m/s approx. 3 s $\frac{-200^\circ\text{C}}{+1150^\circ\text{C}}$ **GTF 1200/300**

Art. no. 600510

Immersion probe with sheathed thermocouple, for highest temperatures

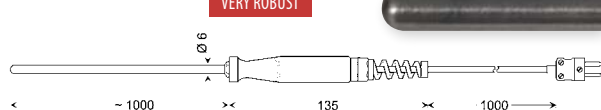
 $-200 \dots +1150^\circ\text{C}$ 

Inconel 600 jacket tube  $\varnothing 3$  mm, flexible,  $L=300$  mm, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature flat plug

**Response time  $T_{90}$ :** water 0.4 m/s approx. 5 s $\frac{-200^\circ\text{C}}{+1000^\circ\text{C}}$ **GTF 1000 AL**

Art. no. 600512

Immersion probe, sheathed thermocouple for aluminum smelting etc.

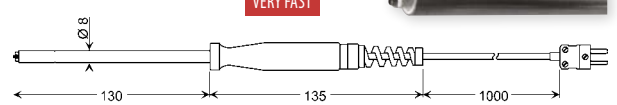
 $-200 \dots +1000^\circ\text{C}$ 

for aluminium melt, non-ferrous metal, etc.  
V4A tube  $\varnothing 6 \times 1.4$  mm,  $L=1000$  mm rigid, additional internal mantle thermocouple, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature flat plug

**Response time  $T_{90}$ :** water 0.4 m/s approx. 30 s $\frac{-65^\circ\text{C}}{+900^\circ\text{C}}$ **GOF 130**

Art. no. 600490

Surface probe with type K coil spring

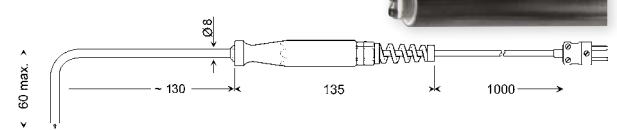
 $-65 \dots +900^\circ\text{C}$ 

for any solid surface;  
2 laser welded NiCr-Ni resilient springs, V4A-tube  $\varnothing 8$  mm, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature flat plug

**Response time  $T_{90}$ :** approx. 5 s $\frac{-65^\circ\text{C}}{+900^\circ\text{C}}$ **GOF 900 HO**

Art. no. 600500

Surface probe with type K coil spring, gebogen

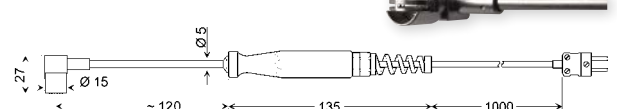
 $-65 \dots +900^\circ\text{C}$ 

for any solid surface  
2 laser welded NiCr-Ni resilient springs, bendable V4A-tube, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature flat plug

**Response time  $T_{90}$ :** approx. 5 s $\frac{-65^\circ\text{C}}{+400^\circ\text{C}}$ **GOF 200 HO**

Art. no. 600492

Surface probe with tc spring, fast, angled

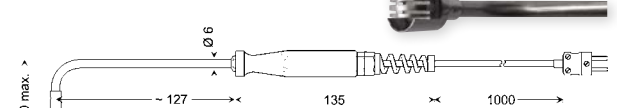
 $-65 \dots +400^\circ\text{C}$ 

for fastest measurements in small gaps  
Small elbow-type, flexible thermocouple tapes, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature flat plug

**Response time  $T_{90}$ :** approx. 2 s $\frac{-65^\circ\text{C}}{+400^\circ\text{C}}$ **GOF 400 HO**

Art. no. 600494

Surface probe with tc spring, fast, angled

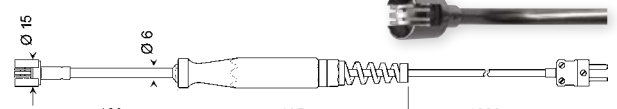
 $-65 \dots +400^\circ\text{C}$ 

for fastest measurements  
Small elbow-type, flexible thermocouple tapes, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature flat plug

**Response time  $T_{90}$ :** approx. 2 s $\frac{-65^\circ\text{C}}{+400^\circ\text{C}}$ **GOF 400 VE**

Art. no. 600496

Surface probe with tc spring, fast

 $-65 \dots +400^\circ\text{C}$ 

for fastest measurements, flexible thermocouple tapes, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature flat plug

**Response time  $T_{90}$ :** approx. 2 s**MH 400VE**

Art. no. 607502

Magnet holder, heat resistant up to  $100^\circ\text{C}$ 

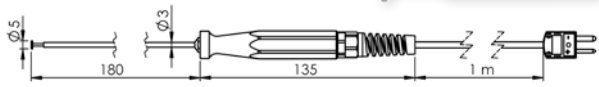
TYPE K - MEASURING PROBE (NICR-NI) WITH DIN-TYPE FLAT-PIN PLUG

-65 °C  
+500 °C

**GOF 501**

Art. no. 475077

Surface probe for solid with silver measuring surface  
-65 ... +500 °C



for any straight and solid surface; fixed silver plate, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature flat plug

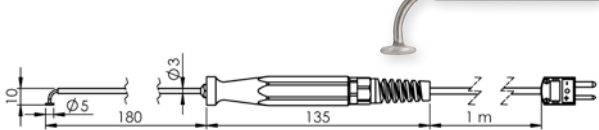
**Response time T<sub>90</sub>:** approx. 3 s

-65 °C  
+500 °C

**GOF 501 HO**

Art. no. 475072

Surface probe with silver measuring surface, angled  
-65 ... +500 °C



for any straight and solid surface, small elbow-type, fixed silver plate, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature flat plug

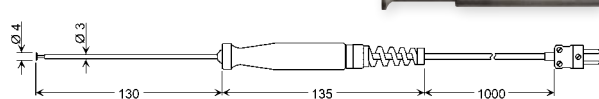
**Response time T<sub>90</sub>:** approx. 3 s

-65 °C  
+500 °C

**GOF 130 CU**

Art. no. 600486

Surface probe for solid surfaces, fast  
-65 ... +500 °C



for any straight and solid surface  
Spring-loaded copper plate, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature flat plug

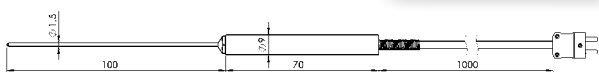
**Response time T<sub>90</sub>:** approx. 5 s

-65 °C  
+550 °C

**GES 20-K**

Art. no. 602591

Core temperature- / food probe with compact teflon handle  
-65 ... +550 °C



Use for canteen kitchen, bakeries, butcher's shops, etc.  
V4A tube with Ø 1.5 mm slim insertion tip, small Teflon handle, stainless steel kink protection, 1 m Teflon cable, miniature flat plug

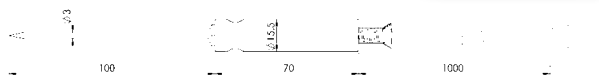
**Response time T<sub>90</sub>:** water 0.4 m/s < 1 s, air 2 m/s approx. 12 s

-50 °C  
+250 °C

**GES 21-K**

Art. no. 600074

Core temperature- / food probe  
-50 ... +250 °C, potential free



Use for canteen kitchen, bakeries, butcher's shops, etc.  
V4A tube Ø 3 mm with needle-shaped insertion tip, big white teflon handle, stainless steel kink protection, 1 m Teflon cable, miniature flat plug

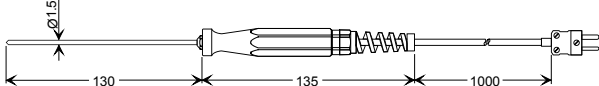
**Response time T<sub>90</sub>:** water 0.4 m/s < 2 s, air 2 m/s approx. 40 s

-65 °C  
+550 °C

**GES 130**

Art. no. 600514

Insertion probe for soft media  
-65 ... +550 °C



V4A tube with Ø 1.5 mm slim insertion tip, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature flat plug

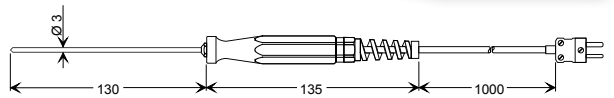
**Response time T<sub>90</sub>:** water 0.4 m/s approx. 1 s, air 2 m/s approx. 1.5 s

-65 °C  
+550 °C

**GES 500**

Art. no. 600516

Insertion probe for soft media  
-65 ... +550 °C



V4A tube with Ø 3 mm with needle-shaped insertion tip, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature flat plug

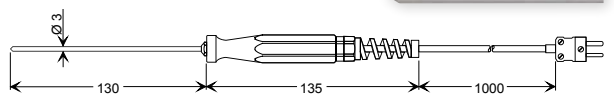
**Response time T<sub>90</sub>:** water 0.4 m/s < 2 s

-65 °C  
+1000 °C

**GES 900**

Art. no. 600518

Insertion probe for soft media  
-65 ... +1000 °C



Spring-loaded V4A tube with slim Ø 3 mm insertion tip, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature flat plug

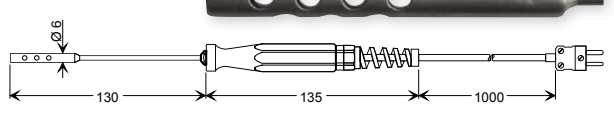
**Response time T<sub>90</sub>:** water 0.4 m/s approx. 5 s

-65 °C  
+600 °C

**GTL 130**

Art. no. 602304

Air / gas probe  
-65 ... +600 °C



for room temperature, flue gases, etc.  
perforated V4A protective tube, fused thermocouple wires arranged behind, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature flat plug

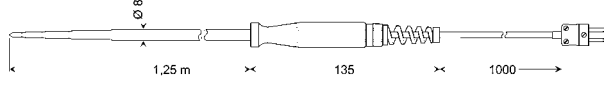
**Response time T<sub>90</sub>:** air 2 m/s approx. 15 s

-65 °C  
+200 °C

**GKF 125**

Art. no. 600520

Probe for compost, grain  
-65 ... +200 °C



split-second response time, yet highly resilient  
V4A tube Ø 8 mm reduced to Ø 3 mm at the front, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature flat plug

**Response time T<sub>90</sub>:** water 0.4 m/s approx. 6 s

-50 °C  
+250 °C

**GTF 40 K-620**

Art. no. 610829

Stainless steel insertion probe, t-handle  
-50 ... +250 °C, Type K, class 1, FL 620 mm

**GTF 40 K-1000**

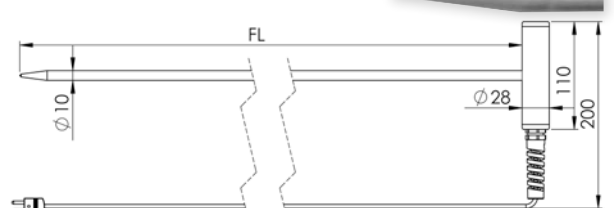
Art. no. 475184

Stainless steel insertion probe, t-handle  
-50 ... +250 °C, Type K, class 1, FL 1000 mm

**GTF 40 K-1500**

Art. no. 475185

Stainless steel insertion probe, t-handle  
-50 ... +250 °C, Type K, class 1, FL 1500 mm



Stainless steel tube with 10 mm diameter and insertion tip, robust and ergonomic stainless steel T-handle, anti-buckling glanding, 1 m silicone cable, miniature flat plug

**Response time T<sub>90</sub>:** water 0.4 m/s approx. 6 s

HANDHELD INSTRUMENTS

SOFTWARE

ACCESSORIES

ALARM / PROTECTION, LEVEL

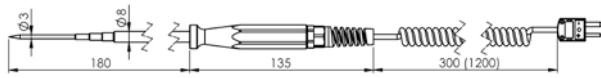


## TYPE K - MEASURING PROBE (NICR-NI) WITH DIN-TYPE FLAT-PIN PLUG

$\frac{-65^{\circ}\text{C}}{+550^{\circ}\text{C}}$

**GAF 200**

Art. no. 600522  
Injection or asphalt probe  
-65 ... +550 °C



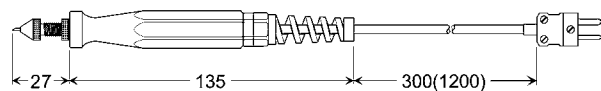
for liquid or soft media etc.  
V4A tube 8 mm dia. reduced to 3 mm, plastic handle, anti-buckling glanding, spiral cable stretchable to 1.2 m, DIN-type flat-pin plug

**Response time  $T_{90}$ :** water 0.4 m/s approx. 6 s

$\frac{-50^{\circ}\text{C}}{+200^{\circ}\text{C}}$

**GRF 200**

Art. no. 604663  
Tire probe  
-50 ... +200 °C



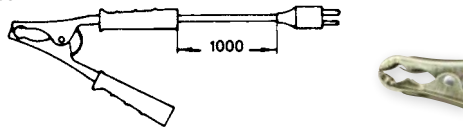
fast response insertion probe with stop screw (needle adjustable 0 ... approx. 14 mm). Suitable for measuring temperature of tires and other soft media. Plastic handle, anti-buckling glanding, spiral cable (approx. 1.2 m drawn out), miniature flat plug

**Response time  $T_{90}$ :** approx. 5 s

$\frac{-65^{\circ}\text{C}}{+150^{\circ}\text{C}}$

**GTZ 300**

Art. no. 603287  
Clip-on probe, type K  
-65 ... +150 °C



for temperature measurements at tube surfaces  
for tubes up to approx. 25 mm  $\varnothing$ , 1 m silicone cable, miniature flat plug

**Response time  $T_{90}$ :** approx. 3 s

$\frac{-65^{\circ}\text{C}}{+300^{\circ}\text{C}}$

**GTF 300**

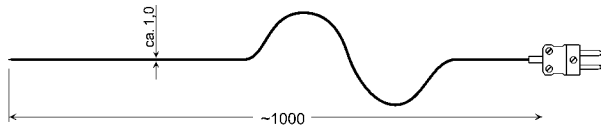
Art. no. 600039  
Wire probe for quick-response measurements  
Measuring tip twisted/fused

**GTF 300-UV**

Art. no. 600081  
Wire probe for quick-response measurements  
Measuring tip non-twisted/fused

**GTF 300-SP**

Art. no. 605973  
Wire probe for quick-response measurements  
Measuring tip with weld bead  
-65 ... +300 °C, insulation permanent up to +250 °C



for air, gases, diminutive surfaces  
Teflon-insulated twisted  $\varnothing$  0.2 mm thermocouple wires, fused measuring tip, very flexibel, miniature flat plug

**Response time  $T_{90}$ :** water 0.4 m/s approx. 0.3 s

$\frac{-65^{\circ}\text{C}}{+400^{\circ}\text{C}}$

**GTF 300 GS**

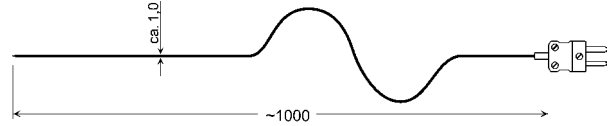
Art. no. 602554  
Wire probe, glass fibre insulated for quick-response measurements  
twisted measuring tip

**GTF 300 GS-UV**

Art. no. 607893  
Wire probe, glass fibre insulated for quick-response measurements  
Measuring tip non-twisted/fused

**GTF 300 GS-SP**

Art. no. 606208  
Wire probe, glass fibre insulated for quick-response measurements  
Measuring tip with weld bead  
-65 ... +400 °C



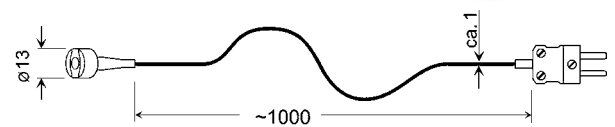
for air, gases, diminutive surfaces (not for liquids)  
glass filament insulated  $\varnothing$  0.2 mm thermocouple wires, miniature flat plug

**Response time  $T_{90}$ :** water 0.4 m/s approx. 0.3 s  
Additional charge for any length per m

$\frac{-65^{\circ}\text{C}}{+250^{\circ}\text{C}}$

**GMF 250**

Art. no. 600071  
Magnetic surface probe  
-65 ... +250 °C



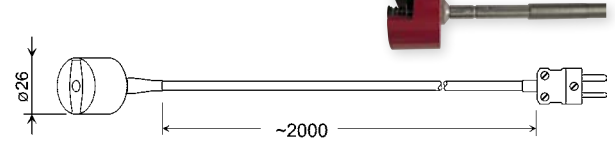
self-adhesive on magnetic materials, spring-loaded CU plate  $\varnothing$  5 mm, 1 m Teflon-insulated twisted cable, miniature flat plug

**Response time  $T_{90}$ :** approx. 5 s

$\frac{-65^{\circ}\text{C}}{+200^{\circ}\text{C}}$

**GMF 200**

Art. no. 601377  
Magnetic surface probe  
-65 ... +200 °C



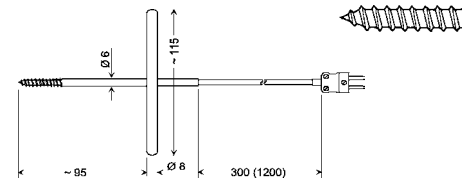
self-adhesive on magnetic materials (higher magnetic holding force), spring-loaded CU plate  $\varnothing$  5 mm, resilient 2 m long silicone cable, miniature flat plug

**Response time  $T_{90}$ :** approx. 5 s

$\frac{-65^{\circ}\text{C}}{+200^{\circ}\text{C}}$

**GGF 200**

Art. no. 603418  
Screw in probe for deep frozen products  
-65 ... +200 °C



to screw into deep-frozen products, etc. no predrilling required, V4A-tube, 6 mm  $\varnothing$  with screw prod, spiral cable (approx. 1.2 m drawn out), DIN-type flat-pin plug

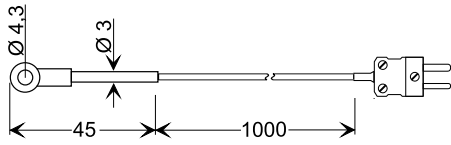
**Response time  $T_{90}$ :** approx. 15 s

TYPE K - MEASURING PROBE (NICR-NI) WITH DIN-TYPE FLAT-PIN PLUG

-50 °C  
+250 °C

**GKF 250**

Art. no. 600141  
Cable lug probe  
-50 ... +250 °C



For tightening with suitable screw (standard M4), 1 m Teflon cable, miniature flat plug

**Response time T<sub>90</sub>:** approx. 10 s

-50 °C  
+500 °C

**GLS 500**

Art. no. 602962  
Soldering tip probe  
-50 ... +500 °C (for short time)



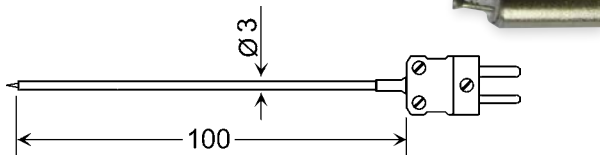
for direct connection to instrument  
2 laser-fused spring-loaded spiral springs made of NiCr-Ni, ceramic tube approx. 6 mm in diameter, miniature flat plug

**Response time T<sub>90</sub>:** approx. 2 s

-65 °C  
+400 °C

**GTO 130 OK**

Art. no. 600134  
Air / gas probe without cable  
-65 ... +400 °C



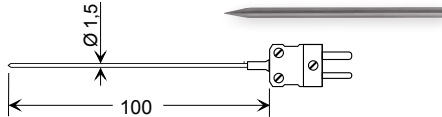
changeable probe without cable, limited suitable also for surfaces  
Type K-wire Ø 0.5 mm, welded and grinded flat, V4A-tube Ø 3 mm, DIN-type flat-pin plug, rigid connection

**Response time T<sub>90</sub>:** approx. 2 s

-65 °C  
+400 °C

**GTE 130 OK**

Art. no. 601483  
Insertion probe without cable  
-65 ... +400 °C



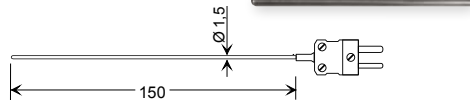
interchangeable probe without cable for soft media  
Spring-loaded V4A tube with slim Ø 1.5 mm insertion tip, miniature flat plug with a rigid connection

**Response time T<sub>90</sub>:** water 0.4 m/s < 1 s

-200 °C  
+1150 °C

**GTT-15-150**

Art. no. 607552  
Jacket thermocouple type K (NiCr-Ni), Immersion probe  
-200 ... +1150 °C



for air, gases, and liquids  
Sheathed thermocouple with Inconel 600 jacket tube Ø 1.5 mm, bendable, miniature flat plug with a rigid connection

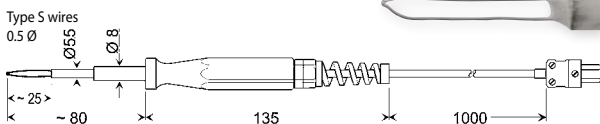
**Response time T<sub>90</sub>:** water 0.4 m/s approx. 3 s

+50 °C  
+1550 °C

**GBF 1550**

Art. no. 603037  
Burner probe type S  
+50 ... +1550 °C

FOR HIGHEST TEMPERATURES



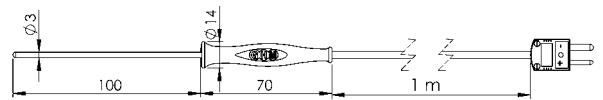
Probe tip may be directly exposed into the flame  
V4A tube Ø 8 mm, with reduced Ø 5.5 mm ceramic tube, plastic handle, silicone cable, miniature flat plug

**Response time T<sub>90</sub>:** approx. 2 s

-65 °C  
+550 °C

**GF 1TK-T3**

Art. no. 609695  
compact type K temperature probe with silicone handle, Ø 3 mm immersion sensor; -65 ... +550 °C, type K, class 1



Immersion probe Ø 3 mm made of V4A tube, black silicone handle -50 ... +250 °C, 1 m silicone cable -50 ... +200 °C, probe and silicone handle IP67, mini flat connection

**Response time T<sub>90</sub>:** Water 0.4 m/s < 2 s, air 2 m/s approx. 40 s

**Variant:**

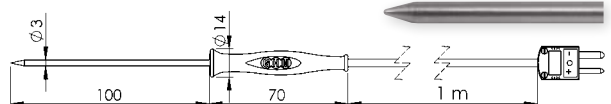
**GF 1TK-T3-LE**

Art. no. 609696  
compact type K temperature probe with silicone handle with loose ends

-65 °C  
+550 °C

**GF 1TK-E3**

Art. no. 609697  
compact type K temperature probe with silicone handle, Ø 3 mm insertion sensor; -65 ... +550 °C, type K, class 1



Insertion probe Ø 3 mm made of V4A tube, black silicone handle -50 ... +250 °C, 1 m silicone cable -50 ... +200 °C, probe and silicone handle IP67, mini flat connection

**Response time T<sub>90</sub>:** Water 0.4 m/s < 2 s, air 2 m/s approx. 40 s

**Variant:**

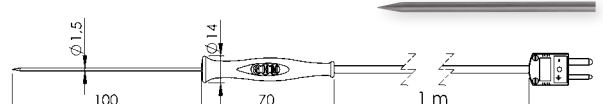
**GF 1TK-E3-LE**

Art. no. 609698  
compact type K temperature probe with silicone handle with loose ends

-65 °C  
+550 °C

**GF 1TK-E1.5**

Art. no. 609699  
compact type K temperature probe with silicone handle, Ø 1.5 mm extra-thin insertion sensor  
-65 ... +550 °C, type K, class 1



Insertion probe Ø 1.5 mm made of V4A tube, black silicone handle -50 ... +250 °C, 1 m silicone cable -50 ... +200 °C, probe and silicone handle IP67, mini flat connection

**Response time T<sub>90</sub>:** water 0.4 m/s < 1 s, air 2 m/s approx. 15 s

**Variant:**

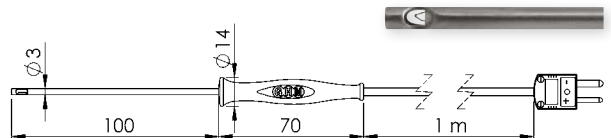
**GF 1TK-E1.5-LE**

Art. no. 609700  
compact type K temperature probe with silicone handle with loose ends

-65 °C  
+400 °C

**GF 1TK-L3**

Art. no. 611299  
compact type K temperature probe with silicone handle, Ø 3 mm air sensor for clean media  
-65 ... +400 °C, type K, class 1



(use GF 1TK-T3 for contaminated media), perforated V4A tube Ø 3 mm, freely arranged measuring element, black silicone handle -50 ... +250 °C, 1 m silicone cable -50 ... +200 °C, mini flat connection

**Response time T<sub>90</sub>:** air 2 m/s approx. 15 s

**Variant:**

**GF 1TK-L3-LE**

Art. no. 611300  
compact type K temperature probe with silicone handle with loose ends

HANDHELD INSTRUMENTS

SOFTWARE

ACCESSORIES

ALARM / PROTECTION, LEVEL

## INFRARED



GIM 530 MS

ST 512

APPLICATION:	GIM 530 MS	ST 512
Precision measurement	•	
Fast scanning of surfaces	•	•
Food	•	•
Quality management	•	•
<b>EQUIPMENT:</b>		
Measuring range [°C]	-32 ... +530	-50 ... +1000
Laser	single	dual
<b>Additional probe connection</b>		
Optical resolution (Distance / Spot size)	20:1	30:1
Emissivity	0.100 .. 1.000	0.10 .. 1.00
General functions	Min/Max, Hold, Offset	Min/Max, Hold
Alarm	optical, acoustical	
<b>Data storage and visualisation / interface</b>		
<b>DEVICE INFORMATION:</b>		
Catalogue page	Page 36	Page 37

## INFORMATION

### Infrared measurement

Infrared measurements can be used to measure the temperature of a surface on a device under test without the need to come into contact with that surface (except objects with a shiny metal surface; glass suitable under certain conditions). The IR sensor measures the infrared radiation emitted by the device under test. The measurement is supported by a laser which designates the surface measured by the optical measuring system.

### Properties:

- Ultrafast and contactless surface measurement
- For measurement tasks that cannot be accomplished using PT100 or type K devices (e.g. abrasive chemicals, small components, ...)

## INFRARED THERMOMETER WITH PRECISION GLASS OPTIC



## HIGHLIGHTS:

- Adjustable visible and audible alarm
- Constant measuring area in between the distance of 13 to 140 mm
- Targeting laser for exact aiming of the object to be measured
- Fast scanning of hot and cold spots within 0.3 s



## GIM 530 MS

Art. no. 601229

Infrared thermometer with laser

## General:

User-friendly industrial design combined to state of the art technology are setting a new standard in professional and all day non-contact temperature measuring. The large temperature range of -32 ... +530 °C, the targeting laser and the optical resolution of 20:1 allow very precise measuring of surfaces in a variety of applications. Simply aim at the target with the laser, push the trigger and the value is displayed within 0.3 seconds plus several other informations.

## Application:

- Electrical and mechanical service and maintenance
- Heating, ventilation, air-conditioning - finding thermal bridges etc.
- Motor vehicle diagnosis, electricity, home improvement
- Checking food temperature during keeping warm or storing

## Specifications:

<b>Measuring range:</b>	-32 ... +530 °C (-20 ... +980 °F)
<b>Resolution:</b>	0.1 °C (0.1 °F)
<b>Temperature display:</b>	°C or °F selectable
<b>System accuracy:</b>	(at ambient temperature = 23 °C ±5 °C)
±1 % or ±1 °C	0 ... 530 °C (highest value shall be valid)
±1 °C ±0.07 °C/°C	0 ... -32 °C
<b>Repeat accuracy:</b>	±0.5 % or ±0.7 °C from 0 °C ... 530 °C (highest value shall be valid) ±0.7 °C ±0.05 °C/°C from 0 °C ... -32 °C
<b>Optical resolution (D:S):</b>	20 : 1
<b>Response time (t<sub>99</sub>):</b>	0.3 s
<b>Spectral range:</b>	8 ... 14 μm
<b>Emission rate:</b>	0.100 ... 1.000, free selectable
<b>Laser:</b>	<1 mW laser class IIa
<b>Configuration:</b>	Min/Max/Scan/Hold/Offset/°C/°F
<b>Display illumination:</b>	yes
<b>Alarm function:</b>	optical and acoustic HIGH-/LOW-alarm
<b>Working temperature:</b>	0 ... 50 °C
<b>Storage temperature:</b>	-20 ... +60 °C (without battery)
<b>Power supply:</b>	9V alkaline battery
<b>Battery life:</b>	approx. 20 hours for use with laser and illumination
<b>Abmessung:</b>	190 x 38 x 45 mm (L x W x D)
<b>Weight:</b>	approx. 150 g
<b>Scope of supply:</b>	Device, battery, manual, device bag made of nylon

## Accessories and spare parts:

## GKK 252

Art. no. 601056

small case (235 x 185 x 48 mm) with foam lining

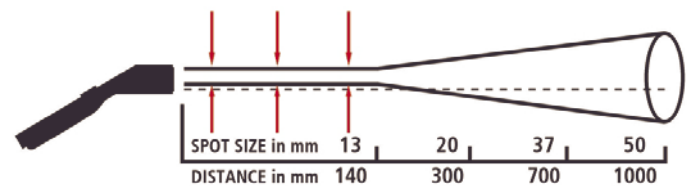
## ISO-WPT-Infrarot

p.r.t. page 15



## Display

- current temperature value
- MIN-/MAX-value: current and last
- HIGH-/LOW-alarm
- HOLD-function
- emission rate
- symbol for display illumination and laser



optical diagram:  
ratio: spot size / distance



## INFRARED THERMOMETER



## HIGHLIGHTS:

- Dual laser
- Alarm function

## ST 512

Art. no. 600004

Infrared thermometer with dual-laser

## Application:

- **Monitoring of circuit boards:** overheated parts
- **Heating / ventilation / air-conditioning:** detecting bad isolation, untight pipes, energy consumption, general service measurements, etc.
- **Electrical systems, machines, power engines:** detecting hot spots at electric connections, temperature rises at motors, bearings, pumps, compressors, etc.
- **Food processing and monitoring:** food temperature, process temperature, etc.
- **Medical technology, biological and chemical analysis:** contact-free temperature measurements within seconds, no longer problems with dangerous, aggressive or similar media
- **Industry, engineering, craft:** Surface temperature measurements of rotating parts (barrels, drums, shafts, printing machines, plastic welding, bitumen, concrete, etc.)

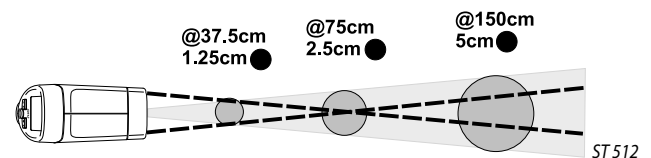
## Specifications:

<b>Measuring range:</b>	-50 ... +1000 °C	
<b>Resolution:</b>	0.1 °C	
<b>Accuracy:</b>	-50 ... -23 °C      ±7 °C (typical) (at ambient temperature = -23 ... -2 °C      ±4 °C 23 °C ... 25 °C)      -2 ... +94 °C      ±2.5 °C 94 ... 204 °C      ±(1.0 % of meas. value + 1 °C) 204 ... 426 °C      ±(1.5 % of meas. value + 1 °C) 426 ... 1000 °C      ±(3 % of meas. value + 1 °C)	
<b>Reproducibility:</b>	±0.5 % of meas. value or ±1 °C	
<b>Response time (t<sub>93</sub>):</b>	150 ms	
<b>Emission rate:</b>	0.10 ... 1.00, selectable	
<b>Spectral range:</b>	8 ... 14 μm	
<b>Optical resolution (D / S):</b>	approx. 30:1	
<b>Sight:</b>	dual laser	
<b>Power supply:</b>	9 V battery	
<b>Display:</b>	LCD-display with function indicator symbols and background illumination	
<b>Operating conditions:</b>	0 ... 50 °C, 10 ... 90 % RH	
<b>Storage temperature:</b>	-10 ... +60 °C	
<b>Features:</b>	HOLD, Min-/Max, °F, LOCK, Alarm	
<b>Alarm function:</b>	selectable min / max alarm, with integrated buzzer	
<b>Dimensions:</b>	146 x 104 x 43 mm	
<b>Weight:</b>	163 g	
<b>Scope of supply:</b>	Device, battery, manual	

## Accessories and spare parts:

ISO-WPT-Infrarot

p.r.t. page 15



# HUMIDITY / FLOW RATE



HANDHELD INSTRUMENTS

SOFTWARE

ACCESSORIES

ALARM / PROTECTION, LEVEL



GMH 3330  
+ TFS 0100 E

GMH 3350  
+ TFS 0100 E

GFTH 95

GFTH 200

GFTB 200

APPLICATION:	GMH 3330 + TFS 0100 E	GMH 3350 + TFS 0100 E	GFTH 95	GFTH 200	GFTB 200
Air conditioning / Ambient air monitoring	•	•	•	•	•
Meteorology					•
Room climate	•	•			•
Flow measurement	•	•			
Air pressure measuring					•
Calculation of:					
Dew point Td	•	•		•	•
Wet bulb temperatur Twb				•	•
Moisture content x / Absolute humidity d					•
Dew point distance / Enthalpy	•	•			
EQUIPMENT:					
Plug-in probe	•	•		• (Temperature)	
Min/Max, Hold, Auto-Off	•	•		•	•
Serial interface	•	•			•
Alarm		•			•
Data logger		•			
DEVICE INFORMATION:					
Catalogue page	Page 39	Page 39	Page 42	Page 42	Page 41

## HUMIDITY, TEMPERATURE AND FLOW RATE MEASURING DEVICE



## HIGHLIGHTS:

- Calculation of dew point temperature, dew point distance and enthalpy
- Additional temperature input (type K)

## ADDITIONAL FUNCTIONS GMH 3350:

**GMH 3330**

Art. no. 600343

Humidity, temperature and flow rate measuring device, probe not included

**GMH 3350**

Art. no. 600345

Humidity, temperature and flow rate measuring device, probe not included, with data logger

**General:**

The GMH 33xx devices are universal precision hygrometer / Thermometer and flow meter with additional Thermocouple input in one. The plug-in probes are interchangeable without recalibration, because your calibration data are on an integrated memory stick (TFS ...) or they are interchangeable by the high mechanical precision (STS ...). The thermocouple input T2 is optimized to be able to quickly absorb surface temperatures to e.g. to display the dew point directly.

**Application:**

- Heating / Ventilation Air Conditioning (HVAC)
- Indoor air, meteorology, laboratory, research and teaching
- Energy assessment / optimization of buildings
- Identify research in structural damage

**Specifications:****Measuring range:**

**Relative humidity:** 0.0 ... 100.0 % RH  
**Ambient temperature:** -40.0 ... +120.0 °C (depending on TFS-probe)  
**Surface temperature:** -80.0 ... +250.0 °C  
**Flow rate:** depending on STS probe (next page)

**Resolution:** 0.1 % RH, 0.1 °C / 0.1 °F, 0.01 m/s

**Accuracy (device) (±1 digit) (at nominal temperature = 25 °C)**

**Relative humidity:** ±0,1 %  
**Ambient temperature (Pt1000):** ±0.2 %  
**Surface temperature (NiCr-Ni):** 0.5 % of m.v. ±0.5 °C

**Flow rate:** ±0.1 %

**Probes:** No calibration required for exchange of humidity/temperature or flow rate probe.  
**(p.r.t. next page)**

**Probe connection:** 6-pin screened Mini-DIN-socket

**NiCr-Ni connection:** for miniature flat-pin plug

**Display:** two 4½ digit LCDs (12.4 mm or 7 mm high), as well as additional functional arrows.

**Working temperature:** -25 ... +50 °C

**Relative humidity:** 0 ... 95 % RH (non-condensing)

**Storage temperature:** -25 ... +70 °C

**Pushbuttons:** 6 membrane keys

**Interface:** serial interface, direct connection to RS232 or USB interface of a PC via electrically isolated interface adapter GRS 3100 or GRS 3105 resp. USB 3100 N (p.r.t. accessories).

**Power supply:** 9 V battery as well as additional d.c. connector for external 10.5 ... 12 V direct voltage supply. (suitable power supply: GNG10/3000)

**Battery life:** approx. 120 h (incl. TFS0100)

**Calculation of dew point:** based upon humidity and temperature

**Calculation of dew point distance:** by means of a surface measurement

**Calculation of enthalpy:** thermal content h of the air

**Adjustment-function for atmospheric humidity measurements**

**NiCr-Ni-temperature measuring:** any standard NiCr-Ni-probe (type K) can be plugged in. Recommendation: GOF 400 VE (p.r.t. p. 31). A compensation value can be set for surface measurement if necessary.

**Flow measurements:** Two different systems for averaging are integrated:  
**continuous averaging:** the average value displayed is calculated using the last measurements during the averaging time set.

**averaging upon request:**

by starting the current measuring value will be displayed for the averaging time. As soon as the time has expired the average value will be displayed, the device is in HOLD mode.

**selectable averaging time:** 1 ... 30 s

**Logger function (GMH 3350):** **manual:** 99 data sets (fetch data via buttons or interface)

**cyclic:** 5,400 data sets (fetch data via interface) adjustable cycle time: 1 s ... 1 h

The logger is started or stopped by keypad or interface. The software GSOF3050 (see accessories) is available for comfortable read-out of logger data.

**Housing:**

Impact-resistant ABS plastic housing, membrane keyboard, transparent panel, integrated pop-up clip

**Dimensions:** 142 x 71 x 26 mm (H x W x D)

**Weight:** approx. 160 g (incl. battery)

**Scope of supply:** Device, battery, manual

**Accessories and spare parts:****GNG 10/3000**

Art. no. 600273

Plug in power supply for devices of the series GMH 3XXX

**USB 3100 N**

Art. no. 601092

Interface Converter GMH3xxx &lt;=&gt;PC, USB

**GSOF 3050**

Art. no. 601336

Windows software for GMH 3000 and GMH 5000 with logger for the setting, data read-out and printing of all logger data stored

**ST-RN**

Art. no. 601074

Device protection bag with cut out for sensor connection

**GKK 3500**

Art. no. 601052

Device case soft lining e.g. for 2x GMH 3000 or 5000

**GKK 3600**

Art. no. 601062

Case with punched lining for universal application

## COMPLETE SOLUTION

**GMH 3330-TFS 0100E-WPF4**

Art. no. 602682

Complete Solution with humidity-/temperature probe TFS 0100 E and incl. certificate of calibration WPF4 (~20 % / ~40 % / ~60 % / ~80 % RH ascending / descending) and case GKK 3500.

## MEASURING PROBES HUMIDITY / TEMPERATURE

**TFS 0100 E**

Art. no. 601488

(0.0 ... 100.0 % RH)

Humidity / Temperature probe für GMH 3330 &amp; 3350, exchangeable without any loss in accuracy

**General:**

Hand sensor for universal application; cap with integral stainless steel gauze filter for good mechanical protection and despite optimum airflow also for fast measurements in ambient air

**Specifications:****Measuring ranges****Humidity:** 0.0 ... 100.0 % RH (rec. range of application: 11 ... 90 % RH)**Temperature:** -40.0 ... +120.0 °C  
(attention: working temperature of electronics!)**Accuracy (at nominal temperature = 25 °C)****Humidity:** ±2.5 % RH (in the range of 10 ... 90 % RH)**Temperature:** ±0.5 °C**Sensors****Humidity:** capacitive polymer humidity sensor**Temperature:** Pt1000, DIN cl. AA**Electronics:**

PC board with amplifier and data memory for sensor data (calibration, etc.) integrated in probe handle.

**Working temperature:**handle and electronics: -25 ... +60 °C  
sensor head and tube: -40 ... +100 °C  
(for short time up to +120 °C)**Relative humidity:**

0 ... +100 % RH

**Dimensions:**Probe tube: Ø 14 x 119 mm,  
plastic handle: Ø 19 x 135 mm, approx. 1.2 m PVC  
connection cable with 6-pin Mini-DIN-plug**Weight:**

approx. 90 g

**Scope of supply:**

Sensor, manual

**Variant:****TFS 0100 E-POR**

Art. no. 603438

Humidity / Temperature probe für GMH 3330 &amp; 3350 with plastic paper filter for use in dusty environments and also in powder colors and granulates



## MEASURING PROBES SURFACE TEMPERATURE

**GOF 400VE**

Art. no. 600496

(p.r.t. page 31)

Surface probe with tc spring, fast, quick-response surface probes for walls, floors etc.

**GTF 300**

Art. no. 600039

(p.r.t. page 33)

Quick-response basic thermocouple probe for universal applications (surface measurement)

## MEASURING PROBES FLOW SPEED / WATER

**STS 005**

Art. no. 602396

(0.05 ... 5.00 m/s)

Flow speed meas. probe for GMH3330 &amp; GMH3350, exchangeable without any loss in accuracy

**Specifications:****Sensor type:** windmill-type anemometer**Measuring range:** 0.05 ... 5.00 m/s (water)**Accuracy:** ±1 % of range ±3 % of meas. value  
(at nominal temperature = 25 °C)**Permiss. angle flow:** ±20°, without additional measuring faults**Working temperature:** 0 ... +70 °C**Relative humidity:** 0 ... +100 % RH (non-condensing)**Dimensions:** Probe head: Ø 11 x 15 mm, tube: Ø 15 mm, overall length 165 mm, required insertion opening: Ø 16 mm, approx. 5 m PVC connection cable with 6-pin Mini-DIN-plug**Weight:** approx. 75 g**Scope of supply:** Sensor, manual**Accessories and spare parts:****STE 005**

Art. no. 602406

Spare snap-on head for STS 005



## MEASURING PROBES FLOW / AIR

**STS 020**

Art. no. 602397

(0.55 ... 20.00 m/s)

Flow measuring probe with snap-on head, calibrated and exchangeable.

**Specifications:****Sensor type:** windmill-type anemometer**Measuring range:** 0.55 ... 20.00 m/s (air)**Accuracy:** ±1 % of range ±3 % of meas. value  
(at nominal temperature = 25 °C)**Permiss. angle flow:** ±20°, without additional measuring faults**Working temperature:** -10 ... +80 °C**Relative humidity:** 0 ... +100 % RH (non-condensing)**Dimensions:** Probe head: Ø 11 x 15 mm, tube: Ø 15 mm, overall length 165 mm, required insertion opening: Ø 16 mm, approx. 5 m PVC connection cable with 6-pin Mini-DIN-plug**Weight:** approx. 75 g**Scope of supply:** Sensor, manual**Accessories and spare parts:****STE 020**

Art. no. 602519

Spare snap-on head for STS 020





## CLIMATE MEASURING DEVICE – PRECISION HYGRO- / THERMO- / BAROMETER

**GFTB 200**

Art. no. 600161

Hygro-/Thermo-/Barometer

**General:**

The GFTB 200 is designed for measuring air pressure, air humidity and temperature within seconds. It reaches remarkable accuracy because of its high precision sensors. The dew point temperature monitoring with GFTB 200 provides efficient protection from moisture damage potentially caused by condensation water and therefore helps preventing mold infestation. The integrated alarm function can be used to acoustically remind the user to ventilate in order to optimally and efficiently use heating energy. The integrated interface together with the software EBS 20M (optional) allow the use as mobile weather station with additional long-term recording. The GFTB 200 can precisely and clearly display the air condition with parameters like wet bulb temperature, absolute humidity and moisture content of the air.

**Application:**

mobile weather station, housing space, indoor swimming pools, offices and production rooms, laboratories, storage rooms, museums, gallery, churches, cooling and climate technology, construction, building physics, loss assessment

**Specifications:****Measuring ranges**

<b>Temperature:</b>	-25.0 °C ... +70.0 °C
<b>Air humidity:</b>	0.0 ... 100.0 % RH (recommended range: 11 ... 90 % RH)
<b>Air pressure:</b>	10.0 ... 1100.0 mbar

**Calculated parameters**

<b>Dew point temperature Td:</b>	-40.0 ... +70.0 °C
<b>Wet bulb temperature Twb:</b>	-27.0 ... +70.0 °C
<b>Mixing ratio x:</b>	0.0 ... 280.0 g/kg
<b>Absolute humidity d:</b>	0.0 ... 200.0 g/m <sup>3</sup>

**Resolution:** 0.1 % RH; 0.1 °C or 0.1 °F, 0.1 mbar

**Accuracy: (±1 digit) (at nominal temperature = 25 °C)**

<b>Temperature:</b>	±0.5 % of m.v ±0.1 °C (Pt1000 DIN cl. AA)
<b>Air humidity:</b>	±2.5 % RH (at range 11 ... 90 %)
<b>Air pressure:</b>	±1.5 mbar (750 ... 1100 mbar)

**Messfühler**

<b>Temperature:</b>	Pt1000
<b>Air humidity:</b>	capacitive polymer humidity sensor
<b>Air pressure:</b>	piezo-resistive sensor hybrid

**Response time:** T<sub>90</sub> = 10 s

**Display:** 4½ -digit, approx. 11 mm high LCD-display with additional displays

**Pushbuttons:** 3 keys for ON/OFF, min/max value display, hold

**Nominal temperature:** 25 °C

**Working conditions**

<b>Electronics:</b>	-25 ... +70 °C; 0 ... 80 % RH (non-condensing)
<b>Sensors:</b>	-25 ... +70 °C; 0 ... 100 % RH

**Power supply:** 9 V battery

**Battery life:** approx. 400 d at 1 measuring / 60 s (mode SLOW)  
approx. 180 d at 1 measuring / s (mode FAST)

**HIGHLIGHTS:**

- alarm function with integrated buzzer
- PC interface
- additional display for further parameters, e.g. dew point temperature and absolute humidity
- precisely detects all environmental conditions in laboratories

**Interface:**

Serial interface, via electrical isolated interface converter USB 3100 N (accessories) directly connectable to PC.

**Configurable display:**

choice between automatically displaying all values rotationally (cycle of 2 or 4 s) or manual selection, units not needed can be excluded

**Offset and Scale:**

digital offset- and scale adjustment of measurements

**Tendency indicator:**

Air pressure rising/falling (for barometer)

**Sea level correction:**

Barometric values can be converted to sea level (therefore the input of the current altitude is needed).

**Housing:**

made of impact-resistant ABS

**Dimensions:**

approx. 106 x 67 x 30 mm (H x W x D), additionally the sensor head at the front side, 35 mm long, Ø 14 mm; resulting total length 141 mm

**Weight:**

approx. 130 g incl. battery

**Scope of supply:**

Device, battery, calibration protocol, manual

**Variant:****GFTB 200-KIT**

Art. no. 600890

Hygro-/Thermo-/Barometer with USB-interface kit

- USB interface converter USB 3100 N
- multi channel software EBS20M to record all device units

**Accessories and spare parts:****GKK 252**

Art. no. 601056

Case (235 x 185 x 48 mm) with foam lining

**ISO-WPF4**

Art. no. 602543

ISO certificates humidity, for ISO9000ff (p.r.t. page 15)

**ISO-WPFD5**

Art. no. 602514

ISO certificates pressure, for ISO9000ff (p.r.t. page 15)

**HIGHLIGHTS:**

- easy and fast search for thermal bridges
- targeting laser for precise location even of inaccessible areas
- audible alarm below dewpoint

**GFTB 200 SET**

Art. no. 600163

Measurement set GFTB200 incl. infrared thermometer GIM 530 MS and case GKK 3600

**General:**

The additional infrared thermometer contained in the GFTB 200 SET makes it easy to check mould-problem areas on walls etc. The wall can easily be scanned by means of the laser beam within very short time. When wall temperature falls below the critical dewpoint (this is, when the wall gets wet), the device alerts with an audible signal.

**Note:** for technical data for the infrared thermometer GIM530MS please refer to catalog page 36.

## HUMIDITY/TEMPERATURE MEASURING DEVICE

**GFTH 95**

Art. no. 600245  
Hygro-/Thermometer

**Application:**

Quick-response humidity and temperature measurements in EDP rooms, museums, galleries, churches, office complexes, workshops, storage rooms, swimming-baths, private buildings, greenhouses, for refrigeration engineering, air conditioning, for building sites / technology, for inspectors or rendering of expert opinions etc.

**Specifications:****Measuring range**

°C:	-20.0 ... +70.0 °C
% RH:	10 ... 95 % RH (recommended range: 30 ... 80 %)
Resolution:	0.1 °C or 0.1 % RH

**Accuracy: (±1 digit) (at nominal temperature = 25 °C)**

Temperature:	±0.5 % of m.v. ±0.1 °C
Humidity:	±3 % RH (for range 30 ... 80 %)

**Measuring probe**

Temperature:	Pt 1000
Humidity:	capacitive polymer humidity sensor
Response time:	T <sub>90</sub> = 15 s
Display:	3½-digit, 13 mm high LCD-display
Pushbuttons:	slide switch for selection of measuring range

**Nominal temperature:** 25 °C

**Operating conditions**

**Electronic:** -20 ... +70 °C; 0 ... 80 % RH (non-condensing)

**Sensors:** -20 ... +70 °C; 0 ... 100 % RH

**Power supply:** 9 V battery

**Battery life:** approx. 3000 h

**Housing:** impact resistant ABS-housing

**Dimensions:** approx. 106 x 67 x 30 mm (H x W x D), plus sensor head protruding at the longer side 35 mm long and 14 mm Ø, overall length 141 mm.

**Weight:** approx. 135 g incl. battery

**Scope of supply:** Device, battery, manual

**Accessories and spare parts:****GB 9 V**

Art. no. 601115  
Spare battery 9V, type IEC 6F22

**GKK 252**

Art. no. 601056  
case (235 x 185 x 48 mm) with foam lining

**ISO-WPF4**

Art. no. 602543  
ISO certificates for ISO9000ff (p.r.t. page 15)

## HUMIDITY / TEMPERATURE / DEW POINT MEASURING DEVICE

**GFTH 200**

Art. no. 600249  
Hygro-/Thermometer

**General:**

Because of the low power consumption and the integrated min-/max-value memory the GFTH 200 is perfectly suitable for long term climate surveillances.

**Specifications:****Measuring range**

Temperature:	-25.0 ... +70.0 °C; -13.0 ... +158.0 °F
% RH:	0.0 ... 100.0 % RH (recommended range: 11 ... 90 % RH)
Td (Dewpoint):	-40.0 ... +70.0 °C or -40.0 ... +158.0 °F

**Resolution:** 0.1 % RH, 0.1 °C or 0.1 °F

**Accuracy (±1 digit) (at nominal temperature = 25 °C)**

Temperature (internal):	±0.5 % of m.v. ±0.1 °C
Temperature (external):	0.1 °C (device) + probe accuracy
Humidity:	±2.5 % RH (for range 11 ... 90 %)

**Measuring probe**

Temperature:	Pt 1000
Humidity:	capacitive polymer humidity sensor
Response time:	T <sub>90</sub> = 10 s

**Terminal for external probe:** for connection of any Pt1000-probes with 3.5 mm mono plug (for suitable probes p.r.t. page 21-23)

**Display:** 3½-digit, 13 mm high LCD-display

**Pushbuttons:** 3 keys for On/Off, min-/max-value display and hold. Slide switch for selection of measuring range.

**Nominal temperature:** 25 °C

**Operating conditions**

**Electronic:** -25 ... +70 °C; 0 ... 80 % RH (non-condensing)

**Sensors:** -25 ... +70 °C; 0 ... 100 % RH

**Power supply:** 9 V battery

**Battery life:** >2 years at 1 measuring / 60 s approx. 120 days at 1 measuring / s (mode FAST)

**Housing:** impact resistant ABS-housing

**Dimensions:** approx. 106 x 67 x 30 mm (H x W x D), plus sensor head protruding at the longer side 35 mm long and 14 mm Ø, overall length 141 mm.

**Weight:** approx. 135 g incl. battery

**Scope of supply:** Device, battery, manual

**HIGHLIGHTS:**

- External Pt1000 temperature probe connectable
- Relative humidity, temperature and dew point in just one instrument

**Accessories and spare parts:****GOF 175 Mini**

Art. no. 600436  
Surface probe for solid surface

**further temperature probe refer to page 21**

**GKK 252**

Art. no. 601056  
Case (235 x 185 x 48 mm) with foam lining

**ISO-WPF4**

Art. no. 602543  
ISO certificates for ISO9000ff (p.r.t. page 15)

## COMPLETE SOLUTION

**GFTH 200-WPF4**

Art. no. 602678  
Complete solution incl. ISO-WPF4 (~20 % / ~40 % / ~60 % / ~80 % RH increasing and decreasing) and case GKK 252.



EASY SEARCH FOR THERMAL BRIDGES

**GFTH 200 SET**

Art. no. 600285  
Measuring set incl. infrared thermometer GIM 530 MS and case GKK 3600

**General:**

The additional infrared thermometer contained in the **GFTH 200 SET** makes it easy to check mould-problem areas on walls etc. The wall can easily scanned by means of the laser beam within very short time. When wall temperature falls below the critical dewpoint (this is, when the wall gets wet), the device alerts with an audible signal.

**Advantages GFTH 200 SET:**

- targeting laser for precise location even of inaccessible areas
  - audible alarm below dewpoint
  - fast evaluation of mould-problem areas
- Scope of supply:** GFTH 200, GIM 530 MS, battery, GKK 3600, manual

GIM 530 MS:  
for technical data for this instrument please refer to page 36.

# MATERIAL MOISTURE



	GMK 210	GMK 100	GMI 15	GMR 110	GMH 3810	GMH 3831 + suitable electrode	GMH 3851 + suitable electrode	BaleCheck 100	BaleCheck 200
<b>APPLICATION:</b>									
Carpenter, joiners, DIY		•	•	•	•	•			
Boat & Caravan (wood & GFK)	•								
Certified glue lam						•	•		
Foelwood, wooden log				•	•	•	•		
Wood chips						•	•		
Plaster, screed, concrete, bricks, lime mortars		•	•	•	•	•	•		
Construction-damage assessment / Water damage restoration		•	•	•	•	•	•		
Hay bale / bale of straw / Corn (barley, wheat)						•	•	•	•
<b>EQUIPMENT:</b>									
<b>Method</b>	capacitive (non-destructive)				resistive (resistance)				
<b>Sensor / Probe</b>	integrated		integrated		external		external GSF 40	external GSF 40TF	
<b>Characteristics</b>	14	18	4		494		4	494	
<b>User curves</b>							4		
<b>General functions</b>	Hold, Auto-Off	Hold, Auto-Off	Hold, Auto-Off	Hold, Auto-Off, Sort	Hold, Auto-Off, Sort	Hold, Auto-Off, Sort	Hold, Auto-Off	Hold, Auto-Off, Sort	
<b>Serial interface / analog output</b>					• / 0 ... 1 V		• / 0 ... 1 V		• / 0 ... 1 V
<b>Data logger</b>							•		
<b>DEVICE INFORMATION:</b>									
<b>Catalogue page</b>	Page 45	Page 45	Page 44	Page 50	Page 49	Page 46	Page 46	Page 51	Page 51

HANDHELD INSTRUMENTS

SOFTWARE

ACCESSORIES

ALARM / PROTECTION, LEVEL





## Material Moisture Measurement with GREISINGER-handheld instruments

### METHODS

#### Resistive measuring method

(GMR 110, GMH 3810, GMH 3831, GMH 3851)

The electrical resistance often depends on the material moisture. Therefore the devices measure the (possibly extremely high) values of resistance and convert them to the displayed value by means of integrated characteristic curves. The temperature has to be compensated especially at the measurement of wood – all GREISINGER-instruments have an integrated temperature compensation. In most cases the contact is realised by nails that are driven into the material are used to contact.

#### Capacitive measuring method

(GMK 210, GMK 100, GMI 15)

The dielectric properties of an object are often a good indicator for its material moisture. The dielectric coefficient of water is considerably higher than that of dry lumbers or building materials. Therefore the total dielectric coefficient of the measuring object can be easily used to get its material moisture. For the measurement the device has to be applied on the material. Precondition therefore: planar surfaces, no metallic elements.

#### Relative humidity

(i.e. GMH 3330 + TFS 0100 E)

Another method is to measure the material moisture indirectly by means of the relative humidity: The humidity in a sealed hole within a material depends on the material moisture. By means of a so-called sorption isotherm or a corresponding table the material moisture can be calculated from the humidity.

#### Dry method

The oven dry method can be used for reference point measurement with highest accuracy. The moist material is weighed and afterwards dried at increased temperature until no weight loss is detectable anymore. The material moisture can be calculated from the moist and arid weight.

### UNITS

#### Material moisture $u$ (also „atro“):

relating to dry mass  
material moisture  $u$  [%] =  
 $(\text{mass wet} - \text{mass dry}) / \text{mass dry} * 100$   
Particularly important for carpenters, joiners, etc.

#### Moisture content $w$ :

material moisture related to wet total mass  
moisture content  $w$  [%] =  
 $(\text{mass wet} - \text{mass dry}) / \text{mass wet} * 100$   
Particularly important for the evaluation of combustibles.

#### „Digit“ (GMI 15)

The displayed value is relative, that means without a physical unit. This can be used to get comparative moisture information of the same materials. Lower values indicate less moisture, higher values indicate therefore more moisture.

For further information on this topic please see the devices' manuals and our homepage [www.greisinger.de](http://www.greisinger.de)

## INDICATOR FOR MOISTURE IN WOOD AND BUILDINGS



### HIGHLIGHTS:

- nondestructive measurement
- easy and fast moisture rating

### GMI 15

Art. no. 600059

Indicator for moisture in wood and buildings

#### General:

Device for high-speed determination of moisture in buildings, contracting work etc. The GMI 15 allows detection of moisture in wood down to a depth of approx. 3 cm and in concrete or wash floor down to a depth of approx. 4 cm. Detection of moisture behind ceramic tiles and/or various wall or floor coverings. To check moisture simply place device on the surface to be measured - no injection into the measuring object required. The displayed values by „digit“ are relative, that means the values can be well compared.

#### Application:

Humidity indication for i.e. estate agents (for fast control state of buildings), property management, house owners, architects, building experts, building contractors, etc.

#### Note:

The GMI 15 is an indicator for the fast estimation - it does not replace precision instruments like the GMH 3810, GMH 3831, GMH 3851 or GMK 100

#### Specifications:

**Display:** 3½-digits, 13 mm high LCD

#### Display range

**Concrete / floor** 0 ... 5 = dry  
6 ... 9 = humid, normal humidity level  
10 ... = wet

**Wood / fibre glass reinforced polyester:** 0 ... 3 ~ 0 ... 12 % : dry  
3 ... 6 ~ 12 ... 20 % : air-dry  
6 ... 11 ~ 20 ... 30 % : wind-dry  
11 ... ~ 30 % ... : wet

**Power supply:** 9 V battery

**Battery life:** approx. 60 h

**Working temperature:** 0 ... 50 °C (material not frozen)

**Storage temperature:** -20 ... +70 °C

**Relative humidity:** 0 ... 80 % RH (non-condensing)

**Housing:** Impact resistant ABS plastic housing

**Dimensions:** approx. 106 x 67 x 30 mm (H x W x D)

**Weight:** approx. 150 g (ready for use)

**Scope of supply:** Device, battery, manual



## MEASURING DEVICE MOISTURE



## HIGHLIGHTS:

- Moisture display in percent
- Acoustical and visual moisture rating
- 18 material characteristics for wood and building materials
- 2 different measurement depth
- For wood and building moisture

## GMK 100

Art. no. 600105

Measuring device moisture in wood and buildings

## General:

The GMK 100 is a capacitive material moisture measuring device with direct moisture display in percent. It is optimally suited for home and handcraft. Depending on the application, it is possible to display the material moisture "u" or the water content "w". The humidity is measured by a measuring plate on the back of the device. With a side-mounted switch the measuring depths can be changed. With the help of measurements in different depth a statement could be made if for example the material dries already or if the moisture is just on the surface of the material.

## Application:

Humidity measurement and indication of wood, concrete, screed, plaster, etc.

## Specifications:

**Display:** 2 displays for material and measured value, in % material moisture or in % moisture content, backlight

## Moisture rating

**Visual:** Rating of the moisture in 6 levels from WET to DRY

**Acoustic:** Signal tone

**Measurement depths:** 10 mm and 25 mm

**Curves:** 18 characteristic curves for wood (with assignment tabel for wood species) and popular materials, additionally reference curve (rEF) for high-resolution relative measurements

**Working temperature:** -5 ... +50 °C (not frozen)

**Storage temperature:** -25 ... +70 °C

**Power supply:** 9 V battery

**Battery life:** max. 2000 h without backlight

**Power backlight:** approx. 2.5 mA (Auto-Off)

**Housing:** impact-resistant ABS plastic housing, plastic foil keyboard, clear screen

**Dimensions:** approx. 106 x 67 x 30 mm (H x W x D)

**Weight:** approx. 145 g (ready for use)

**Scope of supply:** Device, battery, calibration protocol, manual

## Accessories and spare parts:

## PW 25

Art. no. 601368

Testing probe to control the device

## MEASURING DEVICE MOISTURE



## HIGHLIGHTS:

- Moisture display in percent
- Acoustical and visual moisture rating
- 14 material characteristics for wood and GFK
- 2 different measurement depth for Caravan & Boat
- Search mode for quickly locating humidity and the like

## GMK 210

Art. no. 600107

Moisture measuring device for caravan and boat

## General:

The GMK 210 is a capacitive material moisture measuring device with direct moisture display in percent. It is optimally suited for home and handcraft. Depending on the application, it is possible to display the material moisture "u" or the water content "w". The humidity is measured by a measuring plate on the back of the device. With a side-mounted switch the measuring depth can be changed. With the help of measurements in different depth a statement could be made if for example the material dries already or if the moisture is just on the surface of the material.

## Application:

Humidity measurement and indication of wood and GFK (glass fiber reinforced plastic)

## Specifications:

**Display:** 2 displays for material and measured value, in % material moisture or in % moisture content, backlight

## Moisture rating

**Visual:** Rating of the moisture in 6 levels from WET to DRY

**Acoustic:** Signal tone

**Measurement depths:** 10 mm and 25 mm

**Curves:** 14 characteristic curves for wood (with assignment tabel for wood species) and GFK, insulating materials i.e. Styropor; additionally reference curve for high-resolution relative measurements

**Working temperature:** -5 ... +50 °C (not frozen)

**Storage temperature:** -25 ... +70 °C

**Power supply:** 9 V battery

**Battery life:** max. 2000 h without backlight

**Power backlight:** approx. 2.5 mA (Auto-Off)

**Housing:** impact-resistant ABS plastic housing, plastic foil keyboard, clear screen

**Dimensions:** approx. 106 x 67 x 30 mm (H x W x D)

**Weight:** approx. 145 g (ready for use)

**Scope of supply:** Device, battery, calibration protocol, manual

## Accessories and spare parts:

## PW 25

Art. no. 601368

Testing probe to control the device

## PRECISION MATERIAL MOISTURE MEASURING DEVICE FOR WOOD, BUILDING MATERIALS, STRAW, HAY, PAPER, TEXTILES, ETC.



466 WOOD TYPE CHARACTERISTICS  
28 CONSTRUCTION MATERIALS

## HIGHLIGHTS:

- serial interface or analog output 0 ... 1 V, freely scalable
- 4 programmable characteristics (GMH 3851)
- incl. calibration protocol

## ADDITIONAL FUNCTIONS GMH 3851:



CONFORM TO EN 14080 : 2013 EN 16351 : 2015  
SUITABLE E.G. FOR GLUED TIMBER CONSTRUCTION AND LAMINATED  
TIMBER (MPA CERTIFIED AND LISTED)



## GMH 3831

Art. no. 609289

Resistive material-moisture and temperature measuring device, w/o accessories

## GMH 3851

Art. no. 602009

Resistive material-moisture and temperature measuring device, w/o accessories, with data logger and programmable characteristic curves memory

## General:

The GMH 3831 and GMH 3851 offer decisive advantages in handling, user-friendliness, functional range and accuracy. The absolute moisture of 494 material types is displayed directly and can be automatically converted to water content. The cumbersome usage of calculation tables becomes a thing of the past. Additionally you get a moisture rating (wet ... dry) of the measured material.

## Application:

Precision measurements in cut-wood, chip board, veneer, sawdust, wood chips, wood wool, flax, straw, hay, concrete, bricks, wash floor, plaster, limestone mortar, cement mortar, paper, carton, textiles, wood chips, professional firewood humidity measurement, etc.

## User:

architect, expert, inspector, building contractor, painter, carpenter, parquet joiner, floor tiler, wood works, timber desiccation plant, building repair company, textile industry etc.

## Specifications:

## Measuring principle

**Moisture:** Resistive material moisture measurement acc. to DIN EN 13183-2:2002

**Temperature:** **extern:** thermocouple, type K (NiCr-Ni)  
**intern:** NTC

**Characteristic curves:** 494 material characteristics

## Measuring range

**Moisture:** 0.0 ... 100.0 % u (material moisture)  
0.0 ... 50.0 % w (water content, wet basis)  
(depends on selected characteristic)

**Temperature:** -40.0 ... +200.0 °C (-40.0 ... +392.0 °F)

**Moisture rating:** 9 steps (dry ... wet)

**Resolution:** 0.1 % or 0.1 °C (0.1 °F)

## Device accuracy: (at nominal temperature)

**Wood:** ±0.2 % material moisture (deviation from corresponding characteristic curve in range 6 ... 30 %)

**Building material:** ±0.2 % material moisture  
(deviation from corresponding characteristic curve)

**Temperature:** (external) ± 0.5 % of m.v. ± 0.3 °C

**Temperature compensation:** automatic or manual

## Sensor connection

**Moisture:** BNC

**Temperature:** thermovoltage-free type K (NiCr-Ni) socket

**Permitted working temperature:** -5 ... +50 °C (not frozen)

<b>Display:</b>	two 4-digit LCD displays (12.4 mm and 7 mm high), additional indicator arrows
<b>Output:</b>	3-pole jack connector Ø 3.5 mm, either with serial interface or analog output
<b>Serial interface:</b>	connectable to RS232 or USB interface of PCs via electrically isolated interface converter GRS 3100, GRS 3105 or USB 3100 N (accessories).
<b>Analog output:</b>	0 ... 1 V, freely scalable
<b>Average value:</b>	of 3 measurements, e.g. for professional firewood moisture measurements
<b>Power supply:</b>	9 V battery, additional socket for external 10.5 ... 12 V direct current power supply (adequate PSU: GNG10/3000).
<b>Battery life:</b>	approx. 120 h
<b>Housing:</b>	Impact-resistant ABS plastic housing, membrane keyboard, transparent panel, integrated pop-up clip
<b>Dimensions:</b>	142 x 71 x 26 mm (H x W x D)
<b>Weight:</b>	155 g
<b>Scope of supply:</b>	Device, battery, calibration protocol, manual

## additional functions GMH 3851:

**User specific characteristics:** 4, freely programmable

**Interpolation points per curve:** 20

By means of the gratis software GMHKonfig the interpolation points can be comfortably edited and stored to the instrument (Required accessories: interface converter)

**Sort** limitation of different materials (up to 8)

## Data logger:

This instrument is essential for the documentation of material state by quality assurance systems, etc. By means of the integrated data logger there can be up to 10.000 measuring values recorded and processed on demand. Additionally it is possible to individually program 4 material curves (e.g. with dry oven or CM-method). This instruments finally makes paper correction tables unnecessary.

## Logger function

- manual:

99 data sets (fetch data via buttons or interface)

- cyclic:

10.000 data sets (fetch data via interface)

adjustable cycle time: 30 s ... 1 h

The logger is started or stopped by keypad or interface. The software GSOFT3050 (see accessories) is available for comfortable read-out of logger data.

## Accessories and spare parts:

## GSOFT 3050

Art. no. 601336

Windows software for GMH 3000 and GMH 5000 with logger

## GRS 3100

Art. no. 601097

Interface Converter GMH3xxx <=>PC, RS232

## USB 3100 N

Art. no. 601092

Interface Converter GMH3xxx <=>PC, USB

additional accessories: see next page

## OPTIONAL ACCESSORIES

1



**GMK 38**  
Art. no. 601261  
Measuring cable, BNC to 2x banana plug, length 90 cm

2



**GHE 91\***  
Art. no. 601263  
Impact electrode, to drive in Ø 2.5 mm steel pins without auxiliary aids

3



**GSE 91\***  
Art. no. 601266  
Impact electrode, to drive in 2.5 mm Ø 2.5 mm steel pins

4



**GEG 91**  
Art. no. 601268  
Handle for retrofit of impact electrode

5



**GSG 91\***  
Art. no. 601270  
impact electrode with handle, to drive in Ø 2.5 mm steel pins or for GMS 300/91

6



**GST 91**  
Art. no. 601273  
Steel pins  
9 steel nails (3 pieces each, 12, 16 and 23 mm long) in plastic case, Ø 2.5 mm



**GST 91/40**  
Art. no. 601275  
Steel pins  
10 steel nails, 40 mm long, Ø 2.5 mm, in plastic case

7



**GST 45i**  
Art. no. 601277  
Steel pins  
2 Teflon isolated steel nails, 45 mm long, Ø 2.5 mm

**GST 60i**  
Art. no. 601279  
Steel pins, as above, 60 mm long

8



**GOK 91**  
Art. no. 601287  
Surface measuring caps (pair, to be screwed on GSG 91/GSE 91)

9



**GMS 300/91**  
Art. no. 601289  
measuring pins 300 mm long (pair, to be screwed on GSG 91/GSE 91), for wood chips, wood wool, paper, carton, etc.

10



**GST 15B\***  
Art. no. 601281  
Steel pins  
2 steel nails with bore hole, 15 mm long, Ø 3.8 mm (for direct connection of measuring cable GMK 38)

11



**GST 25B\***  
Art. no. 601283  
Steel pins, as above, Ø 3.8 x 25 mm

12



**GST 40B\***  
Art. no. 601285  
Steel pins, as above, Ø 3.8 x 40 mm

13



**GBSK 91\***  
Art. no. 601293  
brush-type probe (pair, banana socket Ø 4 mm), depth down to approx. 100 mm

14



**GBSL 91\***  
Art. no. 601294  
Short brush-type probe, (pair, banana socket Ø 4 mm), depth down to approx. 300 mm

15



**GEF 38\***  
Art. no. 601296  
Flat electrode (pair, banana socket Ø 4 mm), for screed, paper, etc.

16



**GLP 91**  
Art. no. 601299  
Conducting paste 100 ml, for surface measurements and depth indication in walls, wash floors etc. with brush probes

15



**GSP 91\***  
Art. no. 601301  
Sensor for surface measurements on paper, textiles etc.



**GSP 91 ES**  
Art. no. 601303  
Spare sensor element for GSP 91

16



**GMZ 38\***  
Art. no. 605783  
Moisture tongs, for measurements of veneers or thin wood (up to approx. 10 mm)

17



**GSF 50 (110 cm)**  
Art. no. 601306  
**GSF 50K (43 cm)**  
Art. no. 601308  
Material moisture insertion probe, (without temperature sensor) for measurement up to a depth of 40 cm or 107 cm, incl. 1 m connection cable.  
Suitable for: wood chips, wood wool, straw, hay, grain, saw dust, etc.

18



**GSF 50TF (110 cm)**  
Art. no. 601312  
**GSF 50TFK (43 cm)**  
Art. no. 601313  
Material moisture insertion probe, with temperature sensor, for measurement up to a depth of 40 cm or 107 cm, incl. 1 m connection cable.  
Suitable for: wood chips, wood wool, straw, hay, grain, saw dust, etc.

19



**GSF 40 (67 cm)**  
Art. no. 601316  
Material moisture insertion probe, without temperature sensor, for measurement of pressed bales up to a depth of 60 cm, incl. 1 m connection cable. Suitable for: pressed hay or straw bales, grain

\* Measuring cable GMK 38 necessary for GHE 91, GSE 91, GSG 91, GST 15B / 25B / 40B, GBSK 91, GBSL 91, GEF 38, GSP 91, GMZ 38

OPTIONAL ACCESSORIES

20



**GSF 40TF (67 cm)**

Art. no. 601319

Material moisture insertion probe, with temperature sensor, for measurement of pressed bales up to a depth of 60 cm, incl. 1 m connection cable. Suitable for: pressed hay or straw bales, grain

21



**GTF 38**

Art. no. 601347

Material moisture temperature probe Ø 2.2 mm, to be inserted in measuring pins holes, potential free, recommended for wood moisture measurements

22



**GES 38**

Art. no. 601350

NiCr-Ni injection probe potential free, Ø 4 x 150 mm, 1 m cable (recommended for wood moisture measurements)

23



**GPAD 38**

Art. no. 601328

Testing adapter (with 2 test points) for GMH 38xx and GMR 110

24



**GKK 3500**

Art. no. 601052

Plastic case (394 x 294 x 106 mm) with cut-outs for device and accessories (device and accessories are not included)

25



pict.: GMH3831 in ST-RN

**ST-RN**

Art. no. 601074

Protection bag with blanked out sensor connections (suitable for GMH 3831, GMH 3851)

ACCESSORIES-SETS



SET OHNE GERÄT

**SET 38 HF**

Art. no. 602071

Material moisture accessory set for GMH 3831/51 (without instrument), Wood moisture

**Content:**

- GKK 3500 (case)
- GMK 38 (measuring cable)
- GSE 91 (impact electrode)
- GST 91 (measuring nails)
- GTF 38 (temperature probe)

**Application:**

Wood



SET OHNE GERÄT

**SET 38 MPA**

Art. no. 602075

Material moisture accessory set for GMH 3831/51 (without instrument), MPA wood moisture, accessories tested like wood glulam subject to mandatory approval by MPA

**Content:**

- GKK 3500 (case)
- GMK 38 (measuring cable)
- GHE 91 (reciprocating piston electrode)
- GST 91 (measuring nails)
- GTF 38 (temperature probe)

**Application:**

wood, gluelam, production of laminated timber



SET OHNE GERÄT

**SET 38 BF**

Art. no. 602073

Material moisture accessory set for GMH 3831/51 (without instrument), Wood and building moisture set

**Content:**

- GKK 3500 (case)
- GMK 38 (measuring cable)
- GSE 91 (impact electrode)
- GST 91 (measuring nails)
- GTF 38 (temperature probe)
- GMS 300/91 (measuring rods)
- GBSK 91 (wire brush)
- GLP 91 (conductive paste)

**Application:**

wood, concrete, screed, plaster



## MOISTURE COMPLET SET

**GMH 38-LW1-TF**

Art. no. 606470

**GMH 38-LW1-TFK**

Art. no. 606462

**GMH 38-LW2-TF**

Art. no. 606471

**GMH 38-LW2-TFK**

Art. no. 606463

moisture meter set for agriculture

**General:**

Measuring device for fast moisture analysis in lumps and bulks. Universally applicable tool damage prevention and quality assurance.

The more than 1 m long insertion probe with integrated temperature sensor is very good for measuring in hay and straw lump and bulk suitable. Material humidity and temperature can be easily determined by piercing the object.

**Application:**

- Hay, flax
- Straw, cereals
- Wood chips
- Wheat
- Barley

the simple humidity indication is done in nine steps.

**Specifications:**

<b>Device:</b>	GMH 3831 or GMH 3851, see page 46
<b>Einsteckfühler:</b>	GSF 50, GSF 50K, GSF 50TF, GSF 50TFK, see page 47
<b>Scope of supply</b>	
<b>GMH 38-LW1-TF:</b>	GMH 3831, GSF 50 TF, battery, manual
<b>GMH 38-LW1-TFK:</b>	GMH 3831, GSF 50 TFK, battery, manual
<b>GMH 38-LW2-TF:</b>	GMH 3851, GSF 50 TF, battery, manual
<b>GMH 38-LW2-TFK:</b>	GMH 3851, GSF 50 TFK, battery, manual



## RESISTIVE MATERIAL-MOISTURE MEASURING DEVICE

**HIGHLIGHTS:**

- 494 characteristic curves
- incl. calibration protocol

FOR WOOD AND  
BUILDING MATERIALS

**GMH 3810**

Art. no. 600350

Resistive material moisture measuring device with integrated probes

**General:**

The measuring pins integrated on the reinforced front numerous measurements can be done without additional accessories. For measuring of very hard materials we suggest the components shown at the accessories section.

**Specifications:****Measuring principle:**

**Moisture:** resistive material-moisture-measuring according to DIN EN 13183-2:2002

**Temperature internal:** NTC

**Curves:** 494 material characteristics

**Measuring range:**

**Moisture:** 0.0 ... 100.0 % moisture content  
0.0 ... 50.0 % water content  
(depending on characteristic curve)

**Temperature:** -25.0 ... +50.0 °C (-13.0 ... +122.0 °F)

**Estimation:** in 9 steps (dry ... wet)

**Resolution:** 0.1 % or 0.1 °C (0.1 °F)

**Accuracy device: (at nominal temperature = 25 °C)**

**wood:** ±0.2 % moisture content  
(deviation from characteristic curve at range 6 ... 30 %)

**building material:** ±0.2 % moisture content (deviation from characteristic curve)

**Temperature compensation:** automatically or manual

**Measuring probe:** 2 pin holders M6 x 0.75 with 19 mm pins (12 mm utilisable)

**Perm. working temperature:** -5 ... +50 °C (not frozen)

**Storage temperature:** -25 ... +70 °C

**Relative humidity:** 0 ... 95 % RH (non-condensing)

**Display:** two 4-digit LCDs

**Sort:** the material selection is restricted to up to 8 favorites

**Power supply:** 9 V battery

**Battery life:** approx. 120 h

**Housing:**

Impact-resistant ABS plastic housing, membrane keyboard, transparent panel, integrated pop-up clip

**Dimensions:**

142 x 71 x 26 mm (H x W x D)

**Weight:**

175 g

**Scope of supply:**

Device, battery, calibration protocol, manual

**Accessories and spare parts:****GST 3810**

Art. no. 601392

Replacement pins (10 pieces) for GMH 3810 / GMR 110

**GMK 3810**

Art. no. 603070

1 m connection cable with 2 x banana plugs and 2 adapters. Allows connection of accessories (except GSF38..., GTF38 and GES38) on GMH3810 / GMR110.



## RESISTIVE MATERIAL-MOISTURE MEASURING DEVICE



COMFORTABLE CHARACTERISTIC CURVE- AND RATED DISPLAY



AUTOMATIC TEMPERATURE COMPENSATION



rear side of device

## HIGHLIGHTS:

- Material tables on rear side of device
- Integrated, exchangeable measuring needles
- Moisture rating (wet/dry) via bar graph
- Display of material moisture or water content
- Integrated temperature compensation
- Characteristic curve display

## GMR 110

Art. no. 600101

Resistive material moisture measuring device with integrated probes

## General:

Compact and robust measuring device for fast evaluation of material moisture in firewood, timber, flake board, inlay, plaster, cement and lots more. A suitable characteristic is selected with help of material table on the rear side of the device before measuring. The material is contacted by pressing the measuring needles into it. The measured value is displayed only a short time afterwards. The device is especially designed for precise firewood and timber measurements, however, a lot of additional building materials can be rated.

## Specifications:

**Measuring principle:** resistive material moisture measurement acc. to DIN EN 13183

**Characteristic curves:** 3 different wood groups (h.01, h.02, h.03) for a total of 130 wood types and 8 different building material curves (c.01, c.02, c.03, c.04, c.05, c.06, c.07, c.08)

**Measuring range:** 0.0 ... 100 % material moisture (depends on selected characteristics)

**Moisture rating:** in 6 steps (wet ... dry)

**Resolution:** 0.1 % (<20 %), 1 % (>20 %)

**Accuracy: (at nominal temperature = 25 °C)**

**Wood:** ±0.2 % material moisture (Deviation to wood characteristic curve in range 6 ... 20 %)

**Building materials:** ±0.2 % material moisture (Deviation to corresponding characteristic curve)

**Temperature compensation:** automatically or manual

**Measuring probe:** 2 needle holder M6 x 0.75 with 19 mm measuring needles (12 mm usable length)

**Perm. working temperature:** -5 ... +50 °C (not frozen)

**Storage temperature:** -25 ... +70 °C

**Relative humidity:** 0 ... 95 % RH (non-condensing)

**Display:** 2 LCD displays for characteristic and measuring value

**Power supply:** 9V battery

**Battery life:** approx. 170 h

**Housing:** Impact-resistant ABS plastic housing, membrane keyboard, transparent panel

**Dimensions:** 110 x 67 x 30 mm + needles 26 mm

**Weight:** approx. 155 g

**Scope of supply:** device, 2 needle protection caps, battery, calibration protocol, manual

## Characteristic curves:

## 3 wood groups:

- h.01 spruce, pine
- h.02 maple, birch, beech, larch (EUR), ash (EUR), fir
- h.03 oak, ash (AM), poplar, douglas fir

*a lot of additional wood types can be determined with the table of the instruction manual*

## 8 building material curves:

- c.01 cement screed, concrete
- c.02 anhydrite screed
- c.03 plaster, lime mortar
- c.04 cement mortar
- c.05 gas concrete
- c.06 lime sand brick
- c.07 clay brick
- c.08 gypsum plaster

## Accessories and spare parts:

## GST 3810

Art. no. 601392

Replacement pins (10 pieces) for GMH 3810 / GMR 110

## GMK 3810

Art. no. 603070

1 m connection cable with 2 x banana plugs and 2 adapters. Allows connection of accessories (except GSF38..., GTF38 and GES38) on GMH3810 / GMR110.

*additional special accessories at page 48.*

## GB 9V

Art. no. 601115

Spare battery 9V, type IEC 6F22

## GKK 252

Art. no. 601056

Case (235 x 185 x 48 mm) with foam lining



## HAY AND STRAW HUMIDITY MEASURING DEVICE



## HIGHLIGHTS:

- robust 60 cm V4A measuring rod
- characteristics for hay, straw and grain

**BaleCheck 100**

Art. no. 600103

Hay and Straw Moisture Meter (incl. measuring rod and protective bag)

**General:**

The BaleCheck 100 is a professional measuring device for measuring the moisture in bales of pressed hay and straw. It allows to easily determine the suitability for storage and quality of hay and straw – important especially in agriculture, stock breeding and horse keeping. The slim but robust measuring rod should be used for measurements in different depths. If the maximal moisture is <16.0 % u, the material can be stored or spent without hesitation.

**Application:**

- agriculture
- processing or storing of hay or straw
- hay and straw trading
- stock breeding
- horse keeping

**Specifications:**

<b>Measuring range:</b>	0.0 ... 100 % u (material moisture) 0.0 ... 50 % w (water content)
<b>Resolution:</b>	0.1 % (till 19.9 %) and 1 % (from 20 %)
<b>Characteristics:</b>	hay, straw, grain, reference characteristics
<b>Moisture rating:</b>	6-step bar graph (wet ... dry)
<b>Temperature compensation:</b>	manual
<b>Display:</b>	2 displays for characteristics and measuring value
<b>Operating conditions:</b>	-25 ... +50 °C (device), 0 ... +100 °C (rod), 0 ... 95 % RH (non-condensing)
<b>Measuring rod:</b>	V4A stainless steel, 600 mm x Ø 10 mm, 1 m connection cable with BNC-plug, 260 g, design of probe handle offers comfortable operation
<b>Power supply:</b>	9 V battery
<b>Battery life:</b>	approx. 170 h
<b>Housing:</b>	impact-resistant ABS
<b>Dimensions:</b>	110 x 67 x 30 mm (H x W x D)
<b>Weight:</b>	155 g
<b>Scope of supply:</b>	Device, measuring rod GSF 40, protective bag, battery, calibration protocol, manual

HAY AND STRAW HUMIDITY MEASURING DEVICE  
INCL. TEMPERATURE MEASUREMENT

## HIGHLIGHTS:

- fast temperature measurement integrated
- robust 60 cm V4A measuring rod
- characteristics for hay, straw and grain

**BaleCheck 200**

Art. no. 600354

Hay and Straw Moisture Meter incl. temperature measurement, measuring rod 620 mm

**General:**

The BaleCheck 200 is a professional measuring device for measuring the moisture in bales of pressed hay and straw. It allows to very precisely determine the suitability for storage and quality of hay and straw as well as grain – important especially in agriculture, stock breeding and horse keeping. The slim but robust measuring rod should be used for measurements in different depths. If the maximal moisture is <16.0 % u, the material can be stored or spent without hesitation. The additional temperature measurement makes an automatic temperature compensation possible and supports fire prevention (proof of due diligence).

**Application:**

- fire prevention
- agriculture
- processing / storing / trading of hay or straw
- stock breeding, horse keeping

**Specifications:**

<b>Measuring range:</b>	0.0 ... 100.0 % u (material moisture) 0.0 ... 50.0 % w (water content) -40.0 ... +200.0 °C (device)
<b>Resolution:</b>	0.1 %, 0.1 %
<b>Characteristics:</b>	hay, straw, grain, reference characteristics, approx. 480 additional material moisture characteristics
<b>Moisture rating:</b>	9-step bar graph (wet ... dry)
<b>Temperature compensation:</b>	automatic or manual
<b>Display:</b>	two 4-digit LCD displays (12.4 mm and 7 mm)
<b>Operating conditions:</b>	-25 ... +50 °C (device), 0 ... +100 °C (rod), 0 ... 95 % RH (non condensing)
<b>Measuring rod:</b>	V4A stainless steel, 600 mm x Ø 10 mm, 1 m connection cable with BNC-/type K- plug, temperature 0 ... 100 °C, 260 g
<b>Features:</b>	interface, analog output (0 ... 1 V), power supply terminal (10.5 ... 12 VDC)
<b>Sort:</b>	the material selection is restricted to up to 8 favorites
<b>Power supply:</b>	9 V battery
<b>Battery life:</b>	approx. 120 h
<b>Housing:</b>	impact-resistant ABS
<b>Dimensions:</b>	142 x 71 x 26 mm (H x W x D)
<b>Weight:</b>	155 g
<b>Scope of supply:</b>	Device, measuring rod GSF 40 TF with temperature sensor, protective bag, battery, calibration protocol, manual

**Varianten:****BaleCheck 200 - 1000**

Art. no. 607147

Hay and Straw Moisture Meter incl. measuring rod 1000 mm

**BaleCheck 200 - 1500**

Art. no. 607146

Hay and Straw Moisture Meter incl. measuring rod 1500 mm

# WATER ANALYSIS



	GMH 5430	GMH 5450	GMH 3431	GMH 3451	G 1410	G 1420
<b>APPLICATION:</b>						
Waters measuring, fishkeeping, aquafarming (fresh- / marine waters)	•	•	•	•	•	
Drinking water-, process monitoring, ground measurements	•	•	•	•	•	
Cleaning processes	•	•	•	•	•	•
Ultrapure water	•	•				•
Food production and -control	•	•	•	•	•	
Quality management	•	•	•	•	•	•
Water-proof	•	•			•	•
Electrodes for replacement	•	•				
<b>EQUIPMENT:</b>						
Measuring range						
Conductivity / Temperature	•	•	•	•	•	•
esp. Resistance	•	•	•	•		•
TDS / Salinity	•	•	•	•	•	
Sensor connection	7-pole bayonet	7-pole bayonet	fixed	fixed	fixed	fixed
Electrode	2- or 4-pol.	2- or 4-pol.	2-pole graphite	4-pole graphite	2-pole graphite	2-pole graphite
<b>General functions:</b>						
Min/Max, Hold, Auto-Off	•	•	•	•	•	•
Illumination	•	•			•	•
		Calibration memory				
Interface	•	•	•	•		
Alarm / Data logger		•		•		
<b>DEVICE INFORMATION:</b>						
Catalogue page	Page 54	Page 54	Page 57	Page 57	Page 58	Page 58

HANDHELD INSTRUMENTS

SOFTWARE

ACCESSORIES

ALARM / PROTECTION, LEVEL





GMH 5530    GMH 5550    GMH 3511    GMH 3531    GMH 3551    G1500    G1501    GMH 5630    GMH 5650    GMH 3611    GMH 3651    G1610    G7500

**APPLICATION:**

Waters measuring, fishkeeping, aquafarming (fresh- / marine waters)	•	•	•	•	•	•	•	•	•	•	•	•	•
Drinking water-, process monitoring, ground measurement	•	•	•	•	•	•	•	•	•	•	•	•	•
Food production and -control	•	•	•	•	•	•	•	•	•	•	•	•	•
Precision measurement	•	•	•	•	•	•	•	•	•	•	•	•	•
Laboratory (GLP)	•	•	•	•	•	•	•	•	•	•	•	•	•
Quality management	•	•	•	•	•	•	•	•	•	•	•	•	•
Water-proof	•	•				•	•	•	•		•	•	•
incl. air pressure measuring							•	•	•	•			•

**EQUIPMENT:**

Measuring range pH, mV mg/l, % O <sub>2</sub> Temperature	• / rH	•	• / rH	•	pH	•	• / ppm, hPa	• / ppm, hPa	•	• / ppm, hPa
Connections	BNC-socket	BNC-socket	BNC-socket	BNC-socket	BNC-socket	7 pin bayonet connection	6-pin Mini-DIN-socket	Electrode permanently connected to device	BNC-socket	
Temperature	2 banana-jack	2 banana-jack	2 banana-jack	2 banana-jack	2 banana-jack	2 banana-jack	2 banana-jack	2 banana-jack	2 banana-jack	
Temperature compensation	automatic and manual (Pt1000, NTC 10k)	automatic and manual (Pt1000)	automatic and manual (Pt1000)	automatic	manual	automatic	automatic	automatic	automatic	
General functions: Min/Max, Hold, Auto-Off adjustable calibration interval	•	•	•	•	•	•	•	•	•	
Interface	•	•	•	•	•	•	•	•	•	USB 2.0
Analog output		•	•	•	•	•	•	•	•	
Calibration history		•	•	•	•	•	•	•	•	
Alarm / Data logger	•	•	•	•	•	•	•	•	•	•

**DEVICE INFORMATION:**

Catalogue page	Page 61	Page 61	Page 59	Page 59	Page 59	Page 63	Page 64	Page 67	Page 67	Page 70	Page 70	Page 69	Page 72
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## WATER-PROOF HANDHELD DEVICE FOR CONDUCTIVITY MEASUREMENT



WATER-PROOF - GERÄT  
UND STECKVERBINDUNGEN

**GMH 5430**

Art. no. 600035

Waterproof conductivity handheld device without electrode

**GMH 5450**

Art. no. 600037

Waterproof conductivity handheld device with logger, without electrode

**Application:****Mobile use for:**

industry and craft

- measurements of waters and aquaristics, fish farming
- drinking water monitoring, process control, soil measurements
- food production and control
- quality management

**Additional applications at laboratory:**

- medicine, pharmacy, chemistry

**Specifications:****Measuring range**

Number of measuring ranges: 5

**Smallest range:** 0.000 ... 5.000 µS/cm \* or 0.0 ... 500.0 µS/cm \*\***Biggest range:** 0 ... 5000 µS/cm \* or 0 ... 1000 mS/cm \*\***Resistivity:** 0.005 ... 500.0 kOhm \* cm (depends on cell constant)**TDS:** 0 ... 5000 mg/l (depends on cell constant)**Salinity:** 0.0 ... 70.0 (g salt / kg water)**Temperature:** -5.0 ... +100.0 °C, Pt1000 or NTC 10 k**Supported cell constants:** 4.000 ... 15.000 / cm - 0.4000 ... 1.5000 / cm - 0.04000 ... 0.15000 / cm - 0.004000 ... 0.015000 / cm**Accuracy (at nominal temperature = 25 °C)****Conductivity:** ±0.5 % of m.v. ±0.1 % FS (depends on electrode)**Temperature:** ±0.2 K**Connection****Conductivity, temperature:** 1 x 7-pole bayonet connector for connection of different measuring cells, supported temperature sensors: Pt1000 or NTC (10 k)**Interface / ext. supply:** 4-pole bayonet connector for serial interface and supply (with accessory: USB adapter USB 5100)**Analog output: (GMH 5450 only)** 0 ... 1 V, freely adjustable, connection with 4-pole bayonet connector, resolution 13 bit, accuracy 0.05 % at nominal temperature**Data logger: (GMH 5450 only)** cyclic: 10.000 data sets, adjustable cycle time: 1 s ... 60 min  
manual: 1000 data sets (with measuring point input, 40 adjustable measuring point texts or measuring point numbers)**Display:** 4 ½ digit 7-segment, illuminated (white)**Operating conditions:** Device: -25 ... +50 °C, 0 ... 95 % RH (non-condensing)**Storage temperature:** -25 ... +70 °C**Background illumination:** duration adjustable (off, 5 s ... 2 min)**HIGHLIGHTS:**

- Measurement of conductivity, resistance, salinity, TDS
- Large double display with background illumination
- Automatic cell correction with reference solutions
- Incl. calibration protocol

**ADDITIONAL FUNCTIONS GMH 5450:**

<b>Power supply:</b>	2 x AAA battery (included), power consumption 6.25 mA
<b>Battery life:</b>	approx. 160 h (without background illumination)
<b>Protection rating:</b>	IP65 / IP67
<b>Housing:</b>	Impact-resistant ABS plastic housing, integrated pop-up clip
<b>Dimensions:</b>	160 x 86 x 37 mm (H x W x D) incl. silicone protection cover
<b>Weight:</b>	approx. 250 g incl. battery and protection cover
<b>Scope of supply:</b>	Device, K 50 BL, battery, calibration protocol, manual

depends on cell constant of used electrode

\* cell constant 0.01 / cm

\*\* cell constant 0.1 ... 1.2 / cm (standard)

**Additional functions:****Cell correction**

Manually or automatically with reference solution

**Automatic temperature compensation**

As conductivity depends strongly on temperature, each conductivity value is only valid at the corresponding temperature. Therefore the device supports temperature compensation, i.e. referring the conductivity to a reference temperature (selectable: 20 °C or 25 °C).

**Supported types of compensation:**nLF: Non-linear function of natural waters acc. to DIN EN 27888 (ISO 7888)  
(Reference temperature 25 °C)

Lin: adjustable linear compensation

off: no compensation

**Salinity measurement**

Salinity means the sum of the concentrations of all dissolved salts in water. The unit is g / kg. (equals PSU = Practical Salinity Unit).

**TDS measurement (total dissolved solids)**

TDS means the mass concentration of dissolved media in a liquid. The unit is mg / l.

**GLP (Good Laboratory Practice)**

adjustable calibration intervals

GMH 5450: Calibration memory: latest 16 calibrations

**Accessories and spare parts:**

GKL 10... conductivity control solution see next page

**EBS 20M**

Art. no. 601158

Measuring data acquisition software for EASYBus &amp; GMH (p.r.t. page 109)

**GSOFT 3050**

Art. no. 601336

Windows software for GMH 3000 and GMH 5000 with logger, p.r.t. page 110

**USB 5100**

Art. no. 601095

Electrically isolated interface converter, supplied via USB

**GNG 5 / 5000**

Art. no. 602287

Plug in power supply for devices of the series GMH 5XXX, p.r.t. page 115

**GKK 5001**

Art. no. 611606

with cut-outs for 1 device of the GMH 5xxx-/7500 series and accessories for water analysis (395 x 295 x 106 mm), p.r.t. page 112

## CONDUCTIVITY ELECTRODES

PURE AND ULTRA  
PURE WATER**LF 200 RW**

Art. no. 602841

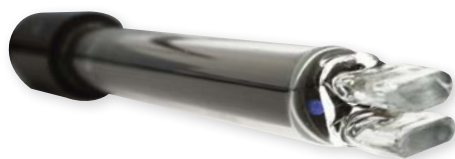
Conductivity cell for GMH 5400 / G 7500-Series, stainless steel

**Application:**

Pure and ultra pure water

**Specifications:**

<b>Measuring range:</b>	0 ... 200 $\mu$ S/cm
<b>Temperature range:</b>	-5 ... +100 °C
<b>Cell constant *:</b>	approx. 0.1
<b>Temperature measurement:</b>	NTC 10 k
<b>Shaft:</b>	Stainless steel, $\varnothing$ 12 mm x 75 mm
<b>Electrode:</b>	2-pole stainless steel
<b>Cable length:</b>	1 m
<b>Scope of supply:</b>	Measuring cell, manual

FOR ALCOHOL,  
FUEL, DIESEL**LF 210**

Art. no. 602969

Conductivity cell for GMH 5400 / G 7500-Series, glass / platinum

**Application:**

Alcohol, fuel, diesel

**Specifications:**

<b>Measuring range:</b>	0 ... 1000 $\mu$ S/cm
<b>Temperature range:</b>	-5 ... +100 °C
<b>Cell constant *:</b>	approx. 1
<b>Temperature measurement:</b>	NTC 10 k
<b>Shaft:</b>	Glass, $\varnothing$ 12 mm x 120 mm
<b>Electrode:</b>	2-pole glass / platinum
<b>Cable length:</b>	1 m
<b>Scope of supply:</b>	Measuring cell, manual

HD-22-3 with sensor

**Accessories and spare parts:****HD-22-3**

Art. no. 700040

freely positionable laboratory sensor holding arm for sensors  $\varnothing$ 12mm**GKL 100**

Art. no. 601396

Conductivity control solution (100 ml bottle with 1413  $\mu$ S/cm according to DIN EN 27888)**GKL 101**

Art. no. 601398

Conductivity control solution (250 ml bottle with 84  $\mu$ S/cm)**GKL 102**

Art. no. 601400

Conductivity control solution (100 ml bottle with 50 mS/cm)

**GWZ-01**

Art. no. 603499

Flow-through chamber for sensors with  $\varnothing$  12 mm, tube connection  $\varnothing$  6 mm

FOR UNIVERSAL APPLICATION

**LF 400**

Art. no. 602968

Conductivity cell for GMH 5400 / G 7500-Series, 4-pole graphite

**Application:**

for Universal application, Economy Class

**Specifications:**

<b>Measuring range:</b>	0 ... 200 mS/cm
<b>Temperature range:</b>	0 ... 100 °C
<b>Cell constant *:</b>	approx. 0.55
<b>Temperature measurement:</b>	NTC 10 k
<b>Shaft:</b>	Epoxide, $\varnothing$ 12 mm x 120 mm
<b>Electrode:</b>	4-pole graphite
<b>Cable length:</b>	2 m
<b>Scope of supply:</b>	Measuring cell, manual

FOR TIGHT TOLERANCES,  
ROBUST AND PRECISE**LF 425**

Art. no. 602840

Conductivity cell for GMH 5400 / G 7500-Series, 4-pole graphite

**Application:**

Tight tolerances, robust and precise, High End Class

**Specifications:**

<b>Measuring range:</b>	0 ... 1000 mS/cm
<b>Temperature range:</b>	-10 ... +80 °C (90 °C - max. 5 min.)
<b>Cell constant *:</b>	approx. 0.42
<b>Temperature measurement:</b>	Pt 1000
<b>Shaft:</b>	PVC-C, $\varnothing$ 16 mm x 145 mm
<b>Electrode:</b>	4-pole graphite
<b>Cable length:</b>	1 m
<b>Scope of supply:</b>	Measuring cell, manual

\* Note:

The particular cell constant (appears in calibration protocol and electrode's label) has to be entered to device. Then it is ready-to-use.

CONDUCTIVITY MEASUREMENT SET



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HANDHELD INSTRUMENTS INCL. ELECTRODE



**GMH 5430-SET**

Art. no. 611611

Waterproof conductivity handheld device, measurement set

**GMH 5450-SET**

Art. no. 611246

Waterproof conductivity handheld device with logger, measurement set

**General:**

With our ready-to-use conductivity measurement set, you have everything you need for your work in a practical case and with the set price, you save 10 % in comparison with the prices for the individual components.

**Application:**

No matter which sector you work in, our comprehensive SET-GMH 5450 never lets you down and stows away in the tidy practical case

**Specifications:**

**Measuring range device**

**Number of measuring ranges:** 5

**Smallest range:** 0.000 ... 5.000 µS/cm or 0.0 ... 500.0 µS/cm

**Biggest range:** 0 ... 5000 µS/cm or 0 ... 1000 mS/cm

**Resistivity:** 0.005 ... 500.0 kOhm cm (depends on cell constant)

**TDS:** 0 ... 5000 mg/l (depends on cell constant)

**Salinity:** 0.0 ... 70.0 (g salt / kg water)

**Temperature:** -5.0 ... +100.0 °C, Pt1000 or NTC 10 k

**Electrode LF 425**

**Measuring range:** 0 ... 1000 mS/cm

**Temperature range:** -10 ... +80 °C (90 °C - max. 5 min.)

**Cell constant:** approx. 0.42

**Temperature measurement:** Pt 1000

**Shaft:** PVC-C, Ø 16 mm x 145 mm

**Electrode:** 4-pole graphite

**Application:** Tight tolerances, robust and precise for highest demands, High End Class

**Cable length:** 1 m

**Dimensions:** 450 x 360 x 123 mm (case)

**Weight:** approx. 1800 g

**Scope of supply:** Device incl. silicone protection cover, measuring cell LF 425, case GKK 5001, battery, calibration protocol, manuals  
**SET-GMH 5450 only:** Software, interface converter

**Accessories and spare parts:**

**GMH 5430**

Art. no. 600035  
 Waterproof conductivity handheld device without electrode

**GMH 5450**

Art. no. 600037  
 Waterproof conductivity handheld device with logger, without electrode

**LF 425**

Art. no. 602840  
 Conductivity electrode 4-pole graphite

**GSOFT 3050**

Art. no. 601336  
 Windows software for GMH 3000 and GMH 5000 with logger, (p.r.t. page 110)

**USB 5100**

Art. no. 601095  
 Electrically isolated interface converter, supplied via USB

**GKK 3700**

Art. no. 601064  
 Case with punched lining for universal application (450 x 360 x 123 mm)

**GKK 5001**

Art. no. 611606  
 with cut-outs for 1 device of the GMH 5xxx-/7500 series and accessories for water analysis (395 x 295 x 106 mm), p.r.t. page 112

**GMH 5430-400**

Art. no. 602752

Conductivity meter including measuring cell, precisely adjusted

**GMH 5450-400**

Art. no. 602754

Conductivity meter including measuring cell, precisely adjusted, with data logger

**GMH 5430-425**

Art. no. 602753

Conductivity meter including measuring cell, precisely adjusted

**GMH 5450-425**

Art. no. 602755

Conductivity meter including measuring cell, precisely adjusted, with data logger

**General:**

All sets get preadjusted and are ready-for-use. They do not include a case.

**Accessories and spare parts:**

**GKK 5001**

Art. no. 611606  
 with cut-outs for 1 device of the GMH 5xxx-/7500 series and accessories for water analysis (395 x 295 x 106 mm), p.r.t. page 112

HANDHELD INSTRUMENTS

SOFTWARE

ACCESSORIES

ALARM / PROTECTION, LEVEL



## CONDUCTIVITY MEASURING DEVICE



2-pole measuring cell GMH 3431



4-pole measuring cell GMH 3451

## HIGHLIGHTS:

- Display of resistivity, salinity or TDS (total dissolved solids)
- Conform to the regulations of the drinking water ordinance (TrinkwV 2001) and DIN EN 27888

## ADDITIONAL FUNCTIONS GMH 3451:

**GMH 3431**

Art. no. 601917

Conductivity handheld device with 2 pole measuring cell

**GMH 3451**

Art. no. 601919

Conductivity handheld device with measuring cell and data logger

**General:**

Intelligent set with 2-pole measuring cell for tap water, etc., 4-pole worry-free package also suitable for continuous measurement in high conductivity ranges (e.g. salt water)

**Specifications:****Measuring range**

<b>Conductivity:</b>	0.0 ... 200.0 $\mu\text{S}/\text{cm}$ 0 ... 2000 $\mu\text{S}/\text{cm}$ 0.00 ... 20.00 $\text{mS}/\text{cm}$ 0.0 ... 200.0 $\text{mS}/\text{cm}$ 0 ... 400 $\text{mS}/\text{cm}$ (GMH 3451 only) manually selectable or AutoRange
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**Temperature:** -5.0 ... +100.0 °C

**Resistivity:** 0.005 ... 100.0  $\text{k}\Omega\text{m}^* \text{cm}$

**Salinity:** 0.0 ... 70.0 g / kg water

**TDS:** 0 ... 1999 mg/l

**Accuracy ( $\pm 1$  digit) (at nominal temperature = 25 °C)**

**Conductivity:**  $\pm 0.5$  % of m.v.  $\pm 0.3$  % FS or  $\pm 2$   $\mu\text{S}/\text{cm}$

**Temperature:**  $\pm 0.2$  % of m.v.  $\pm 0.3$  K

**Cell correction:** adjustable 0.800 ... 1.200  $\text{cm}^{-1}$  manually or automatically with selectable reference solution

**Temperature compensation:** automatically or off, by temperature sensor integrated to electrode

**Type of compensation:** nLF: Non-linear function of natural waters acc. to DIN EN 27888 (ISO 7888) (Reference temperature selectable: 20 °C or 25 °C)  
Lin: linear compensation from 0.3 ... 3.0 %/K (Reference temperature selectable: 20 °C or 25 °C)  
off: no compensation.

**Display:** two 4-digit LCD displays (12.4 and 7 mm high) for current conductivity (resistivity, salinity, TDS) and temperature, or for min-, max- value, hold function, etc. and additional indicator arrows

**Measuring cell:** Conductivity measuring cell with integrated temperature sensor in shaft. Electrode material: graphite. Shaft material: PPE, PS (GMH 3431), Epoxide (GMH 3451). The graphite electrodes are the optimum solution for sewage and can be cleaned easily. GMH 3431: 2-pole; GMH 3451: 4-pole

**Warranty for sensor element:** 12 months

**Working conditions:** device: -25 ... +50 °C, 0 ... 95 % RH; measuring cell: -5 ... +80 °C (permanent), up to +100 °C (short-term)

<b>Relative humidity:</b>	0 ... +95 % RH (non-condensing)
<b>Interface:</b>	serial interface; connectable to RS232 or USB interface of PCs via electrically isolated interface converter GRS 3100, GRS 3105 or USB 3100 N (accessories).
<b>Pushbuttons:</b>	6 membrane keys for ON/OFF-switch, selection of meas. range, min- and max-value memory, hold-function, etc.
<b>Power supply:</b>	9 V-battery as well as additional PSU connector (internal pin $\varnothing$ 1.9 mm) for external 10.5 ... 12 V DC supply. (suitable power supply: GNG10/3000)
<b>Battery life:</b>	approx. 150 h
<b>Housing:</b>	Impact-resistant ABS plastic housing, membrane keyboard, transparent panel, integrated pop-up clip
<b>Dimensions:</b>	Device: 142 x 71 x 26 mm (H x W x D) Dimensions (electrode shaft): approx. 120 mm long, $\varnothing$ approx. 12 mm, 1 m of fixed connection cable between electrode and device
<b>Weight:</b>	approx. 230 g (incl. battery and measuring cell)
<b>Scope of supply:</b>	Device incl. measuring cell, battery, calibration protocol, manual

**Additional functions:**

**Salinity determination:** Salinity is understood to be the sum of concentrations of all salts dissolved in water. Displayed in g/kg.

**TDS-determination (total dissolved solids):** The dry residue of filtrate is understood to be the concentration of substances dissolved in a liquid. Displayed in mg/l.

**Additional functions GMH 3451:**

**Analog output:** 0 ... 1 V, freely scalable, connection via 3-pole jack socket,  $\varnothing$  3.5 mm, resolution 13 bit, accuracy 0.05 % at nominal temperature

**4-pole measuring cell:** Better long-term stability at high conductivity values (>20  $\text{mS}/\text{cm}$ ) and for harsh environments, stable measuring values even in polluted media (e.g. sewage, salt water)

**Data logger:** cyclic 10.000 data sets, manual: 1.000 data sets (with measuring point input, 40 adjustable measuring point texts or measuring point numbers)

**Variants:**

**GMH 3431-LTG**

Art. no. 608399

**GMH 3451-LTG**

Art. no. 610028

for organic matter (alcohol, petrol, diesel) up to 1000  $\mu\text{S}/\text{cm}$  with glass shaft, platinum electrodes, 1.35 m PUR-cable permanently connected to device

**Accessories and spare parts:**

**GKL 100**

Art. no. 601396

Conductivity control solution (100 ml bottle with 1413  $\mu\text{S}/\text{cm}$ , acc. to DIN EN 27888)



## PRECISE CONDUCTIVITY MEASURING DEVICE



## HIGHLIGHTS:

- Modern and functional housing
- Outstanding price/performance ratio
- 3-line display / overhead display at the push of a button
- Backlighting
- Waterproof (IP67)
- Durable, long battery life
- High-quality measuring cell for wider range of application included
- rapid measurement detection

SUCCESSOR TO THE  
GLF 100... PRODUCTS

THEY ARE STILL AVAILABLE  
ON REQUEST - CONTACT US  
IMMEDIATELY!

**G 1410-1002**

Art. no. 474039

Universal conductivity measuring device  
Device, measuring cell LF 202, 2 pole graphite, fix mounted,  
in suitcase GKK1002

**G 1420-1002**

Art. no. 474040

high resolution ultrapure water conductivity measuring  
device; Device, measuring cell LF 200 RW, 2 pole stainless  
steel, fix mounted, in suitcase GKK1002

**G 1410**

Art. no. 610006

Universal conductivity measuring device of up to  
100 mS/cm, incl. graphite measuring cell

**G 1420**

Art. no. 610007

high resolution ultrapure water conductivity measuring  
device up to 100 µS/cm, incl. stainless steel measuring cell

**General:**

The primary focus in the development of the new GMH 1000 series was placed on the essential functions of the measurement technology. Pure measurement with a focus on precision, speed and reliability packaged in a compact housing distinguish an impressive price/performance ratio, Made in Germany.

The new handheld measuring devices also impress with their ergonomic design, dust and water-protected design in accordance with IP 65/67 and the illuminated display. The compact conductivity measuring device as a G 1410 is a precise and durable wide-range measuring cell for universal use from DI water to salt water. As a G 1420, it has a specialised measuring cell for high-resolution clean/cleanest water applications.

**Application:**

Freshwater and salt water aquariums, reverse osmosis and similar filters, cleaning processes, cooling/lubricating processes, plant cultivation and agriculture; laboratories, quality assurance, service

**Operation:**

4 long-lasting, easy-to-operate buttons

**Additional functions:**

automatic measuring range shifting, automatic temperature compensation

**Operating conditions:**

**Device:** -20 ... +50 °C, 0 ... 95 % RH (non condensing)  
**measuring cell:**  
-5 ... +80 °C (shorttime 100 °C)

**Power supply:**

2 x AA battery,  
>1000 h operating time

**Protection rating:**

IP65 / IP67

**Housing:**

Break-proof ABS housing

**Dimensions:**

108 x 54 x 28 mm (H x W x D)  
without sensor connection

**Weight:**

approx. 200 g (G 1410)  
approx. 230 g (G 1420)

**Scope of supply:**

Device with measuring cell,  
calibration log, 2 x battery, manual

Specifications:	G 1410	G 1420
	Wide-range measuring device, incl. graphite measuring cell	Cleanest water version, incl. stainless steel measuring cell
<b>Measurement:</b>	Conductivity, salinity, TDS	conductivity, specific resistance:
<b>Measuring range:</b>	With automatic measuring range shifting	
<b>Conductivity:</b>	0 ... 2000 µS/cm 0.00 ... 20.00 mS/cm 0.0 ... 100.0 mS/cm	0.000 ... 2.000 µS/cm 0.00 ... 20.00 µS/cm 0.0 ... 100.0 µS/cm
<b>Specific resistance:</b>	--	0.0100 ... 0.2000 MOhm*cm 0.010 ... 2.000 MOhm*cm 0.01 ... 20.00 MOhm*cm
<b>TDS:</b>	0 ... 2000 mg/l	--
<b>Salinity (PSU):</b>	0.0 ... 50.0 g/kg	--
<b>Temperature:</b>	-5.0 ... +105.0 °C	-5.0 ... +105.0 °C
<b>Accuracy</b>		
<b>Conductivity:</b>	±0.5 % of m.v. ±0.5 % FS	Typ. ±1 % of m.v. ±0.5 % FS
<b>Temperature:</b>	±0.3 °C	±0.3 °C
<b>Temperature compensation:</b>	off: deactivated nLF: non-linear, according to EN 27888	off: deactivated nLF: non-linear, according to EN 27888 LIN: linear with variable coefficients NaCl: For weak NaCl solutions in accordance with EN 60746-3
<b>Reference temperatures:</b>	20 and 25 °C	20 and 25 °C
<b>Sensors / measuring inputs:</b>	permanently connected 2-pole measuring cell with integrated temperature sensor	
<b>Measuring cell:</b>	2-pole measuring cell, Ø 12 mm (graphite), cable 1.2 m (others available for surcharge)	2-pole measuring cell, Ø 12 mm (stainless steel 1.4404, 1.4435), cable 1.2 m (others available for surcharge)
<b>Display:</b>	3-line unit with battery status indicator, background light, protected by an unbreakable pane, overhead display at the push of a button	

**Accessories and spare parts:****GKL 100**

Art. no. 601396

Conductivity control solution  
(100 ml bottle with 1413 µS/cm, in accordance with DIN EN 27888)

**GKL 101**

Art. no. 601398

Conductivity control solution  
(250 ml bottle with 84 µS/cm)

**GKL 102**

Art. no. 601400

Conductivity control solution  
(100 ml bottle with 50 mS/cm)

**HD-22-3**

Art. no. 700040

freely positionable laboratory sensor holding arm for sensors Ø12mm

**GWZ-01**

Art. no. 603499

Flow-through chamber for sensors with Ø 12 mm, tube connection Ø 6 mm

**ST-G1000**

Art. no. 611373

Protection bag, leather

**GB AA**

Art.-Nr: 610049

Spare battery Mignon (AA) 1,5 V (2 batteries required)

**GKK 1002**

Art. no. 411907

Case G1000 series water analysis small

## PH / ORP / TEMPERATURE MEASURING DEVICES



## HIGHLIGHTS:

- ORP mode allows for automatic conversion to hydrogen system electrodes
- temperature compensation
- Automatic buffer detection
- Rating function of electrode's quality
- New: analog output for all variants

## ADDITIONAL FUNCTIONS GMH 3551:

**GMH 3511**

Art. no. 604953

pH-/Redox-/Temperature measuring instrument w/o accessories

**GMH 3531**

Art. no. 602076

pH-/Redox-/Temperature measuring instrument w/o accessories

**GMH 3551**

Art. no. 602817

pH-/Redox-/Temperature measuring instrument with logger w/o accessories

**Specifications:****Measuring ranges**

<b>Temperature:</b>	-5.0 ... +150.0 °C or 23.0 ... +302.0 °F
<b>pH:</b>	0.00 ... 14.00 pH
<b>Redox (ORP):</b>	-1999 ... +2000 mV Based on hydrogen system: -1792 ... +2207 mV <sub>H</sub> (DIN 38404)
<b>rH:</b>	0.0 ... 70.0 rH (not GMH 3511)
<b>Accuracy (device) ±1 digit at nominal temperature = 25 °C</b>	
<b>Temperature:</b>	±0.2 °C (at range -5 ... +100 °C)
<b>pH:</b>	±0.01 pH
<b>Redox (ORP):</b>	±0.1 % FS (mV or mV <sub>H</sub> )
<b>rH:</b>	±0.1 rH (not GMH 3511)

**Sensor connections**

<b>Temperature:</b>	2 x 4 mm banana socket for Pt1000, 2-wire
<b>pH, Redox:</b>	BNC socket
<b>Display:</b>	two 4-digit LCD displays (12.4 and 7 mm high)

**Working temperature:** 0 ... +50 °C**Storage temperature:** -20 ... +70 °C

**Interface:** serial interface; connectable to RS232 or USB interface of PCs via electrically isolated interface converter GRS 3100, GRS 3105 or USB 3100 N (accessories).

**Power supply:** 9 V battery, additional socket for external 10.5 ... 12 V direct current power supply (adequate PSU: GNG10/3000)

**Battery life:** approx. 300 h**Housing:**

Impact-resistant ABS plastic housing, membrane keyboard, transparent panel, integrated pop-up clip

**Dimensions:**

142 x 71 x 26 mm (H x W x D)

**Weight:**

approx. 170 g

**Scope of supply:**

Device, battery, calibration protocol, manual

**Functions:****Automatic temperature compensation:**

In operation mode „pH“ an automatic temperature compensation (ATC) is possible in the range 0 ... 105 °C if a temperature probe is connected. Otherwise a manual input of temperature is possible.

**pH calibration:**

Buffer selection, temperature compensation and sensor rating according to calibration result (from 10 ... 100 %) is done automatically.

**GMH 3511:** 2-point calibration with Greisinger buffer capsules (GPH 4, 7, 10)**GMH 3531, GMH 3551:** Either 1-, 2- of 3- point calibration with Greisinger standard buffer, buffer according to DIN19266 (A, C, D, F, G) or manual buffer selection.**Calibration interval (not for GMH 3511):**

The device asks for a recalibration after a selectable time period (1 ... 365 days or inactive)

**GMH 3551:** Calibration history additional**ORP measurement (Redox):**

There are 2 choices:

„mV“: standard ORP or mV measurement  
 „mV<sub>H</sub>“: temp. compensated conversion to hydrogen system acc. to DIN38404 part 6, table 1 based on the standard ORP electrode (e.g. GE105 with Ag/AgCl system and 3 mol KCl) used.

**rH measurement (not GMH 3511):**

Calculation of the rH value by means of a ORP measurement and by manually entering the pH-value. The pH-value may also be taken from a previous pH measurement.

**Analog output:**

0 ... 1 V, not changeable 0 ... 1 V  $\Delta$  0 ... 14 pH or -2000 ... +2000 mV, connection via 3-pole jack socket  $\varnothing$  3.5 mm, resolution 13 bit, accuracy 0.05 % at nominal temperature

**GMH 3551:** Analog output freely scalable**Data logger (GMH 3551 only):**

cyclic 10,000 data sets, manual: 1,000 data sets (with measuring point input, 40 adjustable measuring point texts or measuring point numbers)

**Accessories and spare parts:****GMH 55 ES**

Art. no. 603066

pH additional set for GMH 35xx and GMH 55xx pH-electrode GE 100 BNC, temperature probe GF 1T-T3-B-BS (Pt1000), case GKK 3500, GAK 1400

**GF 1T-T3-B-BS**

Art. no. 611088

compact Pt1000 temperature probe with silicone handle, Pt1000 cl. B, with 2 banana plugs

**GE 100-BNC**

Art. no. 600704

pH-electrode, BNC plug

**GE 117-BNC**

Art. no. 600730

pH-electrode incl. Pt1000, pressure resistant

**GNG 10/3000**

Art. no. 600273

Plug in power supply for devices of the series GMH 3XXX

**GKK 3001**

Art. no. 611605

with cut-outs for 1 device of the GMH 3xxx series and accessories for water analysis (395 x 295 x 106 mm)

**USB 3100 N**

Art. no. 601092

Interface Converter GMH3xxx  $\Rightarrow$  PC, USB, electrically isolated**EBS 20M**

Art. no. 601158

Measuring data acquisition software for EASYBus &amp; GMH, see page 109

GMH3511 SETS



GMH 3511-SET

COMFORTABLE MEASUREMENT

GMH3531 SETS



GMH 3531-SET125

FOR LABORATORY AND FIELD

GMH3551 SETS



GMH 3551-SET100

WITH DATA LOGGER

**GMH 3511-SET**

Art. no. 605021

pH-/Redox-/Temperature measuring instrument  
Device complete with pH electrode GE 114, GF1T-T3-B-BS, 5x GPH4, 5x GPH7, 2x GPF100

**GMH 3511-G125**

Art. no. 475740

pH-/Redox-/Temperature measuring instrument  
Device complete with pH electrode GE 125 (PT1000)

**General:**

For comfortable measurement of pH value and temperature. Even easier operation with a menu reduced to 5 points in GMH 3511.

Minimum measurement effort with maintenance-free gel electrodes and automatic temperature compensation.

**Specifications:**

see GHM 3511

**Accessories and spare parts:**

**GE 114-BNC**

Art. no. 604701

pH-electrode

**GE 125-BNC**

Art. no. 600731

waterproof pH-electrode incl Pt1000, BNC plug

**GKK 3001**

Art. no. 611605

with cut-outs for 1 device of the GMH 3xxx series and accessories for water analysis (395 x 295 x 106 mm)

**GMH 3531-SET125**

Art. no. 474240

pH-/Redox-/Temperature measuring instrument  
Device complete GE 125, 5x GPH4, 5x GPH7, 2x GPF100, GKK 3001

**GMH 3531-SET100**

Art. no. 604591

pH-/Redox-/Temperature measuring instrument  
Device complete GE 100, GF1T-T3-B-BS, 5x GPH4, 5x GPH7, 2x GPF100, GKK 3001

**General:**

Functional scope for elevated demands in the laboratory and field.

Minimum measurement effort with maintenance-free gel electrodes and automatic temperature compensation.

**Specifications:**

see GHM 3531

**Accessories and spare parts:**

**GE 100-BNC**

Art. no. 600704

pH-electrode, BNC plug

**GE 125-BNC**

Art. no. 600731

waterproof pH-electrode incl Pt1000, BNC plug

**GKK 3001**

Art. no. 611605

with cut-outs for 1 device of the GMH 3xxx series and accessories for water analysis (395 x 295 x 106 mm)

**GMH 3551-SET125**

Art. no. 474903

pH-/Redox-/Temperature measuring instrument with logger; Device complete GE 125, 5x GPH4, 5x GPH7, 2x GPF100, GKK 3001

**GMH 3551-SET100**

Art. no. 475742

pH-/Redox-/Temperature measuring instrument with logger; Device complete GE 100, GF1T-T3-B-BS, 5x GPH4, 5x GPH7, 2x GPF100, GKK 3001

**General:**

Sets with very good equipment with integrated data logger

**Specifications:**

see GHM 3551

**Accessories and spare parts:**

**GE 100-BNC**

Art. no. 600704

pH-electrode, BNC plug

**GE 125-BNC**

Art. no. 600731

waterproof pH-electrode incl Pt1000, BNC plug

**GKK 3001**

Art. no. 611605

with cut-outs for 1 device of the GMH 3xxx series and accessories for water analysis (395 x 295 x 106 mm)



## WATERPROOF HANDHELD MEASURING DEVICE FOR PH / REDOX



WATER-PROOF DEVICE AND  
PLUG CONNECTIONS

**GMH 5530**

Art. no. 600041

Waterproof pH-/Redox-/Temperature measuring instrument, without electrode

**GMH 5550**

Art. no. 600043

waterproof pH-/Redox-/Temperature measuring instrument with logger, without electrode

**Application:**

- Waters measuring, fishkeeping, aquafarming
- Drinking water monitoring, process control, soil measuring
- Food production and monitoring
- Laboratory: Medicine, pharmaceuticals, chemistry
- Quality management

**Specifications:****Measuring ranges**

<b>pH:</b>	-2.000 ... 16.000 pH (resolution selectable)
<b>Redox / mV:</b>	-2000.0 ... 2000.0 mV (resolution selectable) for hydrogen system DIN38404: -1792 ... +2207 mV <sub>H</sub> )
<b>Temperature:</b>	-5.0 ... +150.0 °C; 23.0 ... 302.0 °F
<b>rH:</b>	0.0 ... 70.0 rH

**Accuracy**

<b>pH:</b>	±0.005 pH
<b>Redox / mV:</b>	±0.05 % FS (mV or mV <sub>H</sub> )
<b>Temperature:</b>	±0.2 °C (in the range of -5.0 ... 100.0 °C)
<b>rH:</b>	±0.1 rH

**Connections**

<b>pH, Redox:</b>	BNC-female connector, compatible to standard BNC-plugs and waterproof BNC-plugs, additional banana-jack (4 mm) for separate reference electrode, input resistance: 10 <sup>12</sup> Ohm
<b>Temperature:</b>	2 banana-jacks (4 mm) for temperature probes (Pt1000 or NTC 10K)
<b>Interface / Supply:</b>	4-pole bayonet connector for serial interface and supply (with accessory USB 5100)
<b>Operating conditions:</b>	-25 ... +50 °C; 0 ... 95 % RH (non-condensing)
<b>Display:</b>	two 4 ½ digit 7-segment displays (15 mm and 12 mm)
<b>pH-Calibration</b>	
<b>Automatically:</b>	1-, 2- or 3- point calibration, GREISINGER standard buffer or buffer to DIN19266 (A, C, D, F, G)
<b>Manual:</b>	1-, 2- or 3- point calibration
<b>Power supply:</b>	2 x AAA-battery, power consumption: <1.0 mA
<b>Battery life:</b>	1000 hours

**Housing:** impact resistant ABS housing with pop-up clip**Protection rating:** IP65 / IP67**Dimensions:** 160 x 86 x 37 mm (H x W x D) incl. protection cover**Weight:** 250 g incl. battery and protection cover**Scope of supply:** Device, battery, calibration protocol, manual**HIGHLIGHTS:**

- GLP-features (Good Laboratory Practice)
- Big dual display with background illumination
- High resolution (0.001pH / 0.1 mV)
- Incl. calibration protocol

**ADDITIONAL FUNCTIONS GMH 5550:****Additional functions:****Additional Display for pH-Electrode and Battery:** Bar graph display**Background illumination:** duration adjustable (off, 5 s ... 2 min)**Automatic Temperature Compensation:** There is an automatic temperature compensation (ATC) in the range of 0 ... 105 °C for operation mode "pH" and if a temperature probe is connected. Without connected probe the temperature can be input manually.**pH-Calibration:** 1-, 2- or 3- point calibration with characteristics bend for GREISINGER standard buffer, buffer to DIN 19266 or manual buffer input. The used buffer is detected automatically. The temperature dependency of the buffer is automatically compensated. Permissible electrodes' data: Asymmetry: ±55 mV / Slope: 45 ... 62 mV/pH  
The condition of pH-Electrode is checked at each calibration.**Redox-Measurement (ORP):** 2 choices:

„mV“ Standard-Redox-, ORP or mV- measurement

„mV<sub>H</sub>“ Conversion to hydrogen systems according to DIN38404 part 6**rH-Measurement:** The rH-value is calculated from a measured Redox-value and a manually input pH-value.**Calibration interval:**

The device asks for a recalibration after a selectable time period (1 ... 365 days or inactive)

**Calibration memory (GMH 5550 only):**

last 16 calibrations

**Analog output (GMH 5550 only):**

0 ... 1 V, freely adjustable, connection with 4-pole bayonet connector, resolution 13 bit, accuracy 0.05 % at nominal temperature

**data logger (GMH 5550 only):**

with measuring point input, adjustable cycle time: 1 s ... 1 h

recording time: 416 days at interval 1 h,

data logger: cyclic: 10000 data sets, manual: 1000 data sets

**Accessories and spare parts:****EBS 20M**

Art. no. 601158

Measuring data acquisition software for EASYBus &amp; GMH, p.r.t. page 109

**GSOFT 3050**

Art. no. 601336

Windows software for GMH 3000 and GMH 5000 with logger (p.r.t. page 110)

**USB 5100**

Art. no. 601095

Electrically isolated interface converter with supply of device via USB

**GNG 5 / 5000**

Art. no. 602287

Plug in power supply for devices of the series GMH 5XXX (p.r.t. page 115)

**GKK 5001**

Art. no. 611606

with cut-outs for 1 device of the GMH 5xxx-/7500 series and accessories for water analysis (395 x 295 x 106 mm), p.r.t. page 112

PH MEASUREMENT SET



**GMH 5530-SET**

Art. no. 611614

Waterproof pH-/Redox-/Temperature measuring instrument  
Device, GE125-L02, PHL 4, PHL 7, PHL 10, KCL3M, GRL100, GKK 2019

**GMH 5550-SET**

Art. no. 611254

waterproof pH-/Redox-/Temperature measuring instrument with logger:  
Device, GE125-L02, PHL 4, PHL 7, PHL 10, KCL3M, GRL100, Software, USB 5100, GKK 2019

**GMH 5530-G125**

Art. no. 475746

Waterproof pH-/Redox-/Temperature measuring instrument,  
Device complete with pH electrode GE 125 (PT1000)

**GMH 5550-G125**

Art. no. 475747

waterproof pH-/Redox-/Temperature measuring instrument with logger,  
Device complete with pH electrode GE 125 (PT1000)

**General:**

With our ready-to-use pH measurement set, you have everything you need for your work in a practical case and with the set price, you save 23 % in comparison with the prices for the individual components

**Application:**

No matter which sector you work in, our comprehensive SET-GMH 5550 never lets you down and stows away in the tidy practical case

**Specifications:**

**Measuring ranges**

<b>pH:</b>	-2.000 ... 16.000 pH (resolution selectable)
<b>Redox / mV:</b>	-2000.0 ... 2000.0 mV (resolution selectable) for hydrogen system DIN38404: -1792 ... +2207 mV <sub>H</sub> )
<b>Temperature:</b>	-5.0 ... +150.0 °C; 23.0 ... 302.0 °F
<b>rH:</b>	0.0 ... 70.0 rH
<b>Dimensions:</b>	450 x 360 x 140 mm (case)
<b>Weight:</b>	approx. 5700 g

**Scope of supply:**

Device with silicone protective sleeve, pH electrode, 3 x buffer solution, KCL electrolyte, pepsin cleaning solution, case, battery, calibration protocol, manual  
**SET-GMH 5550 only:**  
Software, interface converter

**Accessories and spare parts:**

**GMH 5550**

Art. no. 600043

waterproof pH-/Redox-/Temperature measuring instrument with logger, without electrode (p.r.t. page 61)

**GSOFT 3050**

Art. no. 601336

Windows-software for handheld instruments with logger (p.r.t. page 110)

**USB 5100**

Art. no. 601095

galvanically isolated interface converter with device power supply via USB

**GKK 2019**

Art. no. 611147

Device case 2 layers, for 1x GMH 5000 and 3 ready to use buffer solutions (450 x 360 x 140 mm)

PH / REDOX ACCESSORIES

Supplementary set  
GMH 55 ES



**Accessories and spare parts:**

**GMH 55 ES**

Art. no. 603066

pH additional set for GMH 35xx and GMH 55xx including pH-electrode (GE 100 BNC), temperature probe (GF 1T-T3-B-BS), case (GKK 3500), working and calibration set (GAK 1400)

**GE 125-BNC**

Art. no. 600731

waterproof pH-electrode with integrated Pt1000 temperature sensor incl. waterproof BNC-plug and two banana plugs (p.r.t. page 65)

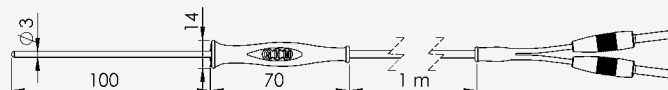


**GF 1T-T3-B-BS**

Art. no. 611088

compact Pt1000 temperature probe with silicone handle  
-70 ... +250 °C, Pt1000 cl. B

immersion probe Ø 3 mm made of V4A tube, black silicone handle up to +250 °C, 1 m, silicone cable up to +230 °C permanently / +250 °C for 2 h, 2 x Ø 4 mm banana plug  
**Response time T<sub>90</sub>:** water 0.4 m/s < 2 s, air 2 m/s approx. 40 s



**GE 100-BNC**

Art. no. 600704

pH-electrode (p.r.t. page 65)



**GR 105-BNC**

Art. no. 607798

ORP / redox electrode (p.r.t. page 66)



**PHL 4**

Art. no. 601369

pH buffer solution, ready to use (pH 4.01 / 25 °C), 250 ml

**PHL 7**

Art. no. 601371

pH buffer solution, ready to use (pH 7.00 / 25 °C), 250 ml

**PHL 10**

Art. no. 601373

pH buffer solution, ready to use (pH 10.01 / 25 °C), 250 ml



**KCL 3 M**

Art. no. 602477

3 mol KCL electrolyte for refill or storage (filled in the protective cap) of electrodes with 3 mol KCL electrolyte. 100 ml plastic vial.

**CaCl**

Art. no. 603254

Electrolyte for soil-pH measuring, 1000 ml

**GRL 100**

Art. no. 601422

HCL/Pepsin cleaning solution, 100 ml



**GRP 100**

Art. no. 601424

Redox test solution 220 mV, 100 ml



**GAK 1400**

Art. no. 603523

pH Working and calibration set

**Scope of supply:**  
5 buffer capsules each GPH 4.0, GPH 7.0 and GPH 10.0, 3 x 100 ml-plastic bottle GPF 100, 1 x 3 mol KCL-electrolyte KCL3M and 1 x Pepsin-cleaning agent GRL 100. GAK 1400 is required if no buffer solutions are existing



## PRECISE PH MEASURING DEVICE



DURABLE AND AFFORDABLE



## HIGHLIGHTS:

- Modern and functional housing
- 3-line display / overhead display at the push of a button
- Backlighting
- Waterproof (IP65 / IP67)
- Durable, long battery life
- BNC connection for alternating electrodes



Connection G 1500

## G 1500

Art. no. 609850

Waterproof pH-meter incl. pH electrode GE 114 WD

## G 1500-SET

Art-Nr: 474035

Waterproof pH-meter

Device complete with pH electrode GE 114 WD, GAK 1400 and suitcase GKK 1001

## General:

The primary focus in the development of the new G 1000 series was placed on the essential functions of the measurement technology.

Pure measurement with a focus on precision, speed and reliability packaged in a compact housing distinguish an impressive price/performance ratio. Made in Germany. The new handheld measuring devices also impress with their ergonomic design, dust and water-protected design in accordance with IP 65/67 and the illuminated display. The compact pH-meter is an alternative to pH sticks and elaborate middle-class devices.

## Application:

Aquariums and aquaculture, plant cultivation and agriculture, laboratories, quality assurance, service, foods, etc.

## Specifications:

<b>Measuring range:</b>	0.00 ... 14.00 pH
<b>Resolution:</b>	0.01 pH
<b>Accuracy (device):</b>	±0.02 pH ±1 digit (at nominal temperature 25 °C)
<b>Display:</b>	3-line unit, with background light, protected by an unbreakable pane, overhead display at the push of a button
<b>Sensors / measuring inputs:</b>	pH electrode connectible via BNC, Standard GE 114 WD Temperature compensation which can be set on the device Electrode range of application: 0 ... 60 °C
<b>Working temperature:</b>	Display unit -20 ... +50 °C
<b>Power supply:</b>	2 x AA battery, approx. 3000 h operating time
<b>Housing:</b>	Break-proof ABS housing
<b>Dimensions:</b>	108 x 54 x 28 mm (H x W x D) without sensor connection
<b>Weight:</b>	approx. 130 g (without electrode)
<b>Scope of supply:</b>	Device, electrode, calibration log, 2 x battery, manual <b>G 1500-SET only:</b> GAK 1400, case GKK 1001

## Accessories and spare parts:

## G 1500-GL

Art. no. 609851

Device without electrode

## GE 114-BNC-WD

Art. no. 610460

pH-electrode with waterproof BNC-connector, IP 67

## GE 114-BNC

Art. no. 604701

pH-electrode

## GE 100-BNC

Art. no. 600704

pH-electrode

for additional electrodes, see the next page

## GKK 1002

Art. no. 411907

Case G1000 series water analysis small

## GKK 1003

Art. no. 411917

Case for 2x G1000 series water analysis and 2x PHL4 450 x 360 x 106 mm (W x H x D)

## GKK 1100

Art. no. 601060

Case with punched lining for universal application (340 x 275 x 83 mm), suitable to accommodate accessories

## GKK 1001

Art. no. 611604

Case G1000 series water analysis universal 395 x 295 x 106 mm (W x H x D)

## PHL 4

Art. no. 601369

pH buffer solution, ready to use (pH 4.01 / 25 °C), 250 ml

## PHL 7

Art. no. 601371

pH buffer solution, ready to use (pH 7.00 / 25 °C), 250 ml

## PHL 10

Art. no. 601373

pH buffer solution, ready to use (pH 10.01 / 25 °C), 250 ml

## GAK 1400

Art. no. 603523

pH Working and calibration set:

## Scope of supply:

5 buffer capsules each  
GPH 4.0, GPH 7.0 and  
GPH 10.0, 3 x 100 ml-  
plastic bottle GPF 100,  
1 x 3 mol KCL-electrolyte  
KCL3M and 1 x Pepsin-  
cleaning agent GRL 100.  
GAK 1400 is required if  
no buffer solutions are existing

## ST-G1000

Art. no. 611373

Protection bag, leather

## GB AA

Art.-Nr: 610049

Spare battery Mignon (AA) 1,5 V (2 batteries required)



## PRECISE PH MEASURING DEVICE



ROBUST UND PREISWERT



GE 114-WD

GE 125

## HIGHLIGHTS:

- Modern and functional housing
- 3-line display / overhead display at the push of a button
- Backlighting
- Waterproof (IP65 / IP67)
- Durable, long battery life
- BNC connection for alternating electrodes
- with Redox (ORP) and temperature measurement
- Alarm function



Connection G 1501

## G 1501

Art-Nr: 611725

Waterproof pH/ORP-meter with Pt1000 input and alarm with pH electrode GE 114-WD

## G 1501-G125

Art-Nr: 414689

Waterproof pH/ORP-meter with Pt1000 input and alarm, Device complete with pH electrode GE 125 (PT1000)

## General:

The primary focus in the development of the new GMH 1000 series was placed on the essential functions of the measurement technology.

Pure measurement with a focus on precision, speed and reliability packaged in a compact housing distinguish an impressive price/performance ratio, Made in Germany. The new handheld measuring devices also impress with their ergonomic design, dust and water-protected design in accordance with IP 65/67 and the illuminated display. The compact pH-meter is an alternative to pH sticks and elaborate middle-class devices.

The G 1501 also enables Redox (ORP) measurement (with temperature-compensated conversion of the Ag/AGCl reference system to a hydrogen system in accordance with DIN 38404 part 6, table 1) and automatic temperature compensation with connected Pt 1000 temperature sensor for pH and  $mV_H$  measurements. An optical and visual alarm signal (min/max) is also included.

## Application:

Aquariums and aquaculture, plant cultivation and agriculture, laboratories, quality assurance, service, foods, etc.

## Specifications:

<b>Measuring range:</b>	0.00 ... 14.00 pH
<b>Resolution:</b>	0.01 pH
<b>Accuracy (device):</b>	$\pm 0.02$ pH $\pm 1$ digit (at nominal temperature 25 °C)
<b>Temperature:</b>	
<b>Measuring input:</b>	2 x 4 mm banana for Pt 1000, 2-wire
<b>Measuring range:</b>	-5.0 ... +105.0 °C or 23.0 ... 221.0 °F
<b>Accuracy:</b>	$\pm 0.2$ °C $\pm 1$ digit (at nominal temperature 25 °C)

## Redox (ORP)

**Measuring input:** BNC socket (Redox or pH measurement adjustable via menu)

**Measuring range:** -1500 ... 1500 mV or  
-1293 ... 1707  $mV_H$

**Accuracy:**  $\pm 0.1$  % FS  $\pm 1$  digit  
(at nominal temperature 25 °C)

**Display:** 3-line unit, with background light, protected by an unbreakable pane, overhead display at the push of a button

**Sensors / measuring inputs:** pH electrode connectable via BNC, Standard GE 114 WD  
Temperature compensation which can be set on the device  
Electrode range of application: 0 ... 60 °C

**Working temperature:** Display unit -20 ... +50 °C

**Power supply:** 2 x AA battery, approx. 3000 h operating time

**Housing:** Break-proof ABS housing

**Dimensions:** 108 x 54 x 28 mm (H x W x D) without sensor connection

**Weight:** approx. 130 g (without electrode)

**Scope of supply:** Device, electrode, calibration log, 2 x battery, manual

## Accessories for G 1501:

## G 1501-GL

Art. no. 611483

Device without electrode

## GF 1T-T3-B-B5

Art. no. 611088

compact Pt1000 temperature probe with silicone handle

## GR 105-BNC

Art. no. 607798

ORP / redox electrode with BNC connection

## GRP 100

Art. no. 601424

Redox test solution 220 mV, 100 ml

General accessories see page 66



## G 1501-SET

Art-Nr: 611385

Waterproof pH/ORP-meter with Pt1000 input and alarm, Complete set for pH/temperature measurement Device compl. with pH electrode GE 114-WD + GF1T 3mm + GPH4.0/5+ GPH7.0/5 + 2x GPF100

## G 1501-SET 114

Art-Nr: 474037

Waterproof pH/ORP-meter with Pt1000 input and alarm, Device complete with pH electrode GE 114 WD, T-probe GF1T-T3-B-B, GAK 1400 and suitcase GKK 1001

## G 1501-SET 125

Art-Nr: 474038

Waterproof pH/ORP-meter with Pt1000 input and alarm, Device complete with pH electrode GE 125, GAK 1400 and suitcase GKK 1001

## General:

Affordable set for temperature-compensated pH measurement

## Application:

The measuring devices can be used in aquarium, water and surface water monitoring, plant husbandry, agricultural, laboratory, quality assurance, service and food applications.

## Accessories and spare parts:

see page 66

## GF 1T-T3-B-B5

Art. no. 611088

compact Pt1000 temperature probe with silicone handle, Pt1000 class B, with 2 banana plugs

## GAK 1400

Art. no. 603523

pH Working and calibration set:

consisting of:

5 of each of GPH 4.0, GPH 7.0 and GPH 10.0 buffer capsules, 3 x 100 ml plastic bottle GPF 100, 1 x 3 mol KCL electrolyte KCL3M and 1 x pepsin cleaning solution GRL 100.



## GKK 1001

Art. no. 611604

Case G1000 series water analysis universal 395 x 295 x 106 mm (W x H x D)



PH ELECTRODES



	GE 100	GE 101	GE 104	GE 108	GE 114	GE 117	GE 120	GE 125	GE 126	GE 151	GE 171	GE 173
<b>Measuring range</b>	0 ... 14 pH 0 ... 80 °C	2 ... 11 pH 0 ... 60 °C	0 ... 14 pH 0 ... 80 °C	0 ... 14 pH 0 ... 80 °C	0 ... 14 pH 0 ... 60 °C	0 ... 14 pH 0 ... 80 °C	0 ... 14 pH 0 ... 60 °C	0 ... 14 pH 0 ... 70 °C	0 ... 14 pH -5 ... +80 °C	0 ... 14 pH 0 ... 80 °C	0 ... 14 pH 0 ... 140 °C	0 ... 14 pH 0 ... 80 °C
<b>Conductivity</b>	>100 µS/cm	>100 µS/cm	>20 µS/cm	>100 µS/cm	>200 µS/cm	>100 µS/cm	>200 µS/cm	>200 µS/cm	>100 µS/cm	>100 µS/cm	>100 µS/cm	>50 µS/cm
<b>Temperature measuring</b>	no	no	no	no	no	integr. Pt1000 4 mm banana	no	integr. Pt1000 4 mm banana	no	no	no	no
<b>Water-proof</b>	no	no	no	no	optional	no	no	ja	no	no	no	no
<b>Pressure resistant</b>	no	no	no	6 bar	no	6 bar	no	1 bar	5.5 bar	no	10 bar	6 bar
<b>Cable</b>	1 m <sup>1)</sup>	1 m <sup>1)</sup>	1 m <sup>1)</sup>	2 m <sup>1)</sup>	1 m	2 m <sup>2)</sup>	1 m	2 m	5 m	1 m <sup>1)</sup>	ohne	1 m <sup>1)</sup>
<b>Electrolyte</b>	3 mol/l KCl	3 mol/l KCl	3 mol/l KCl	gel electrolyte	gel electrolyte	gel electrolyte	gel electrolyte	gel electrolyte	gel electrolyte	3 mol/l KCl	gel electrolyte	gel electrolyte
<b>Diaphragm</b>	2 x ceramic	2 x ceramic	moving joint	2 x ceramic	1 x Pellon	2 x ceramic	2 x ceramic	1 x ceramic	2 x ceramic	1 x ceramic	2 x ceramic	joint
<b>Thread</b>	without	without	without	PG 13.5	without	PG 13.5	without	without	1/2" NPT	without	PG 13.5	PG 13.5
<b>Electrode shaft</b>	tyril, Ø 12 mm x 120 mm	glass, Ø 12 or 6 mm x 120 mm	glass, Ø 12 mm x 120 mm	PSU, Ø 12 mm x 120 mm	epoxide, Ø 12 mm x 120 mm	PSU, Ø 12 mm x 120 mm	PVC, Ø 22 mm x 110 mm	epoxide, Ø 12 mm x 120 mm	ABS, Ø 26.4 mm x 147 mm	glass, Ø 12 mm x 120 mm	glass, Ø 12 mm x 120 mm	glass, Ø 12 mm x 120 mm
<b>Features</b>	universal electrode	tip Ø 6 mm, small sample volume	for low-ion media	low-maintenance	Low-cost low-maintenance	temperature compensated	insertion electrode, blade Ø 13 mm x 60 mm	submersible, water-proof IP67 (also BNC-plug)	extremely low-maintenance	chemicals-resistant glass shaft	for extreme conditions, sterilizable, autoclavable	for process chemistry, bio-chemistry, alkal-resistant

<b>Connection:</b>												
<b>BNC</b>												
Art. no.	600704	600693	602063	600713	604701	600730	600698	600731	610987	600727	-	600735
<b>S7*)</b>												
Art. no.	-	-	-	606089	-	-	-	-	-	-	606375	606572

\*) Note: cable GEAK-2S7-BNC or GEAK-5S7-BNC is needed for connection S7, for devices with cinch connection adapter GAD 1 BNC is necessary. Electrodes are consumption objects. Lifetime under careful treatment: >2 years; warranty: 12 months

**Options:**  
**Longer cable for <sup>1)2)</sup>**  
 (available cable lengths: up to 5 m)  
**Special designs**  
 (electrodes with thread, other lengths, special applications etc.)

**Accessories and spare parts:**  
**Kabel-BNCM/BNCF**  
 Art. no. 606158  
 Extension cables for electrodes with BNC connector, Cable length: 3 m



**Diaphragm:**  
 The diaphragm makes the electric connection between reference system and sample. Additionally it should prevent the spoiling of the reference electrolyte by the measured medium.  
**Ceramic diaphragm**  
 Porous ceramic rods ensure low leak rates.  
**Application:**  
 General applications in clean till lightly soiled media.  
**Joint / movable joint**  
 The roughened surface between the cut glass of the electrode and a cut glass sleeve permits a electrolyte flow of several ml/h.  
**Application:**  
 low-ion or heavily soiled samples  
**Pellon diaphragm**  
 A permeable diaphragm made of Pellon texture is used for fast response times and stable measuring values  
**Application:**  
 Clean till lightly soiled media.



**Reference electrolyte:**  
 The reference electrolyte offers a constant voltage of the reference system and makes the electrical connection between sample and reference electrode.  
**Liquid electrolyte**  
 Mainly 3 mol/l KCl is used. Liquid electrolytes offer fast response times in general and can be replaced if contaminated.  
**Gel electrolyte**  
 The electrolyte is solidified for low-maintenance electrodes able to measure irrespective to its position. Under normal measurement conditions no noticeable electrolyte leakage is observable.  
**Electrodes with S7 connection:**  
 The electrodes are offered with an S7 industrial screw plug fitted, also known as industrial-S8 Plug head. In contrast to S7 lab plug head this one is for direct installation in fittings with PG 13.5 suitable thread.

APPLICATION AREAS: ELECTRODES

APPLICATION	GE 100	GE 101	GE 104	GE 108	GE 114	GE 117	GE 120	GE 125	GE 151	GE 171	GE 173	GE 126	GR 105	GR 175
Sewage											•	•		
Aquarium water	•		•	•	•	•			•			•	•	•
Soil testing		•												
Emulsions		•	•											
On-site measurements				•	•	•		•					•	
Fish farming	•		•	•	•	•		•	•			•	•	•
Galvanic baths											•			•
Beverages								•	•		•		•	•
Low-ion media			•								•			
Cosmetics			•											
Food sample		•					•							
Sea water	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Online measuring											•	•		•
Process chemistry									•	•	•			•
Swimming pool water	•			•	•	•		•			•	•	•	•
Suspensions		•	•											•
Drinking water	•		•	•	•	•		•			•	•	•	•
Water-based lacquers			•								•			

Note: The set information are to provide general recommendations. It needs to be checked, which electrodes for each area of application are suitable.

ORP ELECTRODES



GR 105-BNC

Art. no. 607798  
ORP / redox electrode with BNC connection



GR 175-BNC

Art. no. 607801  
ORP electrode with BNC connection

GR 175-S7

Art. no. 607802  
ORP electrode incl. S7 connector - without connecting cable \*)

Specifications:	GR 105	GR 175
Measuring unit:		ORP
Measuring range:		±2000 mV, 0 ... 80 °C
Conductivity:		>100 µS/cm
Temperature measurement:		no
Water-proof:		no
Pressure resistant:	no	6 bar
Cable:	1 m <sup>1)</sup>	without / 1 m
Electrolyte:	3 mol/l KCL	gel electrolyte
Diaphragm:	2 x ceramic	1 x ceramic
Metal electrode:	Platin dome Ø 5 mm	
Thread:	without	PG 13.5
Electrode shaft:	tyril, Ø 12 mm x 120 mm	glass, Ø 12 mm x 120 mm
Minimal depth of immersion:	15 mm	
Scope of supply:	ORP electrode, manual	

Options:

Longer cable for <sup>1)2)</sup>  
(available cable lengths: up to 5 m)

Accessories:

GRP 100  
Art. no. 601424  
Redox test solution 220 mV, 100 ml



ELECTRODES - ACCESSORIES

Buffer capsules and buffer solutions:

<b>GPH 4,0 / 5</b> pH buffer capsules (5 pieces), pH 4.0	Art. no. 602614
<b>GPH 4,0 / 10</b> pH buffer capsules (10 pieces), pH 4.0	Art. no. 602615
<b>GPH 7,0 / 5</b> pH buffer capsules (5 pieces), pH 7.0	Art. no. 602616
<b>GPH 7,0 / 10</b> pH buffer capsules (10 pieces), pH 7.0	Art. no. 602617
<b>GPH 10,0 / 5</b> pH buffer capsules (5 pieces), pH 10.0	Art. no. 602618
<b>GPH 10,0 / 10</b> pH buffer capsules (10 pieces), pH 10.0	Art. no. 602619
<b>GPH 12,0 / 5</b> pH buffer capsules (5 pieces), pH 12.0	Art. no. 602620
<b>GPH 12,0 / 10</b> pH buffer capsules (10 pieces), pH 12.0	Art. no. 602621

All buffer capsules are traceable to NIST standards and have ±0.02 pH at 25 °C.

<b>PHL 4</b> pH buffer solution, ready to use (pH 4.01 / 25 °C), 250 ml	Art. no. 601369
<b>PHL 7</b> pH buffer solution, ready to use (pH 7.00 / 25 °C), 250 ml	Art. no. 601371
<b>PHL 10</b> pH buffer solution, ready to use (pH 10.01 / 25 °C), 250 ml	Art. no. 601373
<b>PHL 4-1000</b> pH buffer solution, ready to use, (pH 4.01 / 25 °C), 1000 ml	Art. no. 415029
<b>PHL 7-1000</b> pH buffer solution, ready to use, (pH 7.00 / 25 °C), 1000 ml	Art. no. 415030
<b>PHL 10-1000</b> pH buffer solution, ready to use, (pH 10.01 / 25 °C), 1000 ml	Art. no. 415031

**KCL 3 M** Art. no. 602477 3 mol KCL electrolyte for refilling and storage (fill into protective cap) of electrodes with 3 mol KCl electrolyte, injection bottle, 100 ml

**CaCl** Art. no. 603254  
1000 ml, solution for measuring the pH value of soil

**GRL 100** Art. no. 601422  
HCL/Pepsin cleaning solution, 100 ml

Accessories and spare parts:

GEAK-2S7-BNC

Art. no. 601996  
Adapter cable pH S7-BNC, 2 m

GEAK-5S7-BNC

Art. no. 601998  
Adapter cable pH S7-BNC, 5 m

VD120

Art. no. 601380  
injection aid for injection electrode GE101

GAD 1 BNC

Art. no. 601382  
Adapter for the plug-in of electrodes with Cinch plug to devices with BNC socket.

GPF 100

Art. no. 601417  
Plastic bottle with wide neck, 100 ml

GAK 1400

Art. no. 603523  
pH Working and calibration set: GPH 4,0, GPH 7,0, GPH 10,0 (5 capsules of each type); 3 x GPF 100; 1 x KCL 3M; 1 x GRL 100

GWA1Z

Art. no. 602914  
pressure accessories, plastic adapters PG13.5 to G1"

PG 13.5

Art. no. 603205  
Thread Adapter, pluggable, Pg 13,5 for sensors with shaft Ø 12 mm

GWA 11 PG

Art. no. 605379  
pressure accessories, plastic adapters from PG11 external thread to PG 13.5 internal thread incl. sealing and PG11 counter nut, material: polyamide, fiber glass reinforced, O-ring: NBR, temperature range: -10 ... +100 °C

HD-22-3

Art. no. 700040  
freely positionable laboratory sensor holding arm for sensors Ø12mm

SDW 500

Art. no. 606171  
Deionized water in refillable 500 ml bottle

## WATERPROOF HANDHELD MEASURING DEVICE FOR MEASURING DISSOLVED OXYGEN IN WATER



## HIGHLIGHTS

- Waterproof and durable (protective silicone case)
- Large double display with background lighting
- New oxygen sensor GWO 5610
- Environmental pressure compensation with integrated barometer

## ADDITIONAL HIGHLIGHTS GMH 5650

- Data logger and alarm function
- Analogue output, pressure connection

## ADDITIONAL FUNCTIONS GMH 5650:

**GMH 5630**

Art. no. 606880

Handheld instrument for dissolved oxygen without accessories

**GMH 5650**

Art. no. 606882

Handheld instrument for dissolved oxygen with data logger without accessories

**Application:**

Oxygen monitoring in aquaculture and aquaria. Testing of well water, sewer systems and in wastewater treatment plants, also suitable for harsh environments. Delivery can take place ready for use (filled) or dry. Electrodes delivered try are long lasting and ready for use within about 1 h after filling.

Specifications:	GMH 5630	GMH 5650
<b>Measuring channels:</b>	O <sub>2</sub> , T, air pressure (integrated)	O <sub>2</sub> , T, air pressure (integrated) / measuring depth *1)

**Measuring ranges**

<b>O<sub>2</sub>-concentration:</b>	0.00 ... 70.00 mg/l (ppm) (Variable resolution)
<b>O<sub>2</sub>-saturation:</b>	0.0 ... 600.0 % O <sub>2</sub> (Variable resolution)
<b>O<sub>2</sub>-partial pressure:</b>	0 ... 1200 hPa O <sub>2</sub> (0.0 ... 427.5 mmHg)
<b>Temperature:</b>	0.0 ... 50.0 °C
<b>Air pressure:</b>	10 ... 1200 hPa abs      300 ... 5000 hPa abs
<b>Measuring depth:</b>	-      0 ... 40.0 m water column *1)

**Accuracy**

<b>Oxygen:</b>	±1.5 % of m.v. ±0.2 mg/l (0 ... 25 mg/l) or ±2.5 % of m.v. ±0.3 mg/l (25 ... 70 mg/l)
<b>Temperature:</b>	0.0 ... 50.0 °C
<b>Air pressure:</b>	10 ... 1200 hPa abs      300 ... 5000 hPa abs

**Sensor:** GWO 5610, active diaphragm type with platinum cathode, Ø 12 mm, standard cable length 2 m, 7 pin bayonet connection

<b>Response time:</b>	90 % in 10 s
<b>Service life:</b>	approx. 3 years, depending on usage and care

<b>Display:</b>	4 ½ digit, 7-segment, illuminated (white)
<b>Working temperature:</b>	Device: -25 ... +50 °C Sensor: 0 ... 40 °C
<b>Sensor operating pressure:</b>	max. 3 bar corresponds to max. 30 m water depth
<b>Inward flow:</b>	min. 20 cm/s
<b>Power supply:</b>	2 x AAA-battery, power consumption: 0.9 mA
<b>Battery life:</b>	approx. 1000 h (without lighting)
<b>Protection rating:</b>	IP65 / IP67
<b>Housing:</b>	Impact-resistant ABS, with stand/hanging bracket
<b>Dimensions:</b>	160 x 86 x 37 mm (H x W x D) including protective silicone case
<b>Weight:</b>	approx. 250 g, including battery and protective case
<b>Scope of supply:</b>	Device incl. batteries (2 x AAA), protective silicone case, calibration protocol, manual, quick guide

**Additional Functions:****Salinity correction:** 0.0 ... 70.0**Pabs / height correction:** Automatic with integrated sensor**Measuring depth (GMH 5650 only):** Hydrostatic depth measurement \*1)**Output / external supply:** OUT jack: 38400 baud interface, 5 V external supply**Additional with GMH 5650:** Analogue output 0 ... 1 V, adjustable**Calibration:** 1 point air, easy calibration to air at the push of a button**Additional with GMH 5650:** 1 point water, 2 point or 3 point (air and zero point and 100 % O<sub>2</sub>)**GLP:** Calibration interval**Additional with GMH 5650:** Calibration history**Data logger (only GMH 5650):** Cyclical: 10,000, Single: 1000, single value logger with measuring point input**Alarm (only GMH 5650):** 2 alarm channels (O<sub>2</sub> and temperature) with separate alarm thresholds alarm notification horn / visual / interface

\*1) A simple hydrostatic depth measurement can be made with special accessories. For instance, oxygen profiles in waste water can be recorded very conveniently together with the logger function.

**GMH 5630-L02**

Art. no. 607470

Handheld instrument for dissolved oxygen including sensor GWO 5610, 2 m cable

**GMH 5650-L02**

Art. no. 607474

Handheld instrument for dissolved oxygen with data logger including sensor GWO 5610, 2 m cable

**Varianten:****GMH 5630-L04**

Art. no. 606881

Handheld instrument for dissolved oxygen with sensor with 4 m cable length

**GMH 5630-L10**

Art. no. 607471

Handheld instrument for dissolved oxygen with sensor with 10 m cable length

**GMH 5630-L30**

Art. no. 607472

Handheld instrument for dissolved oxygen with sensor with 30 m cable length

**GMH 5650-L04**

Art. no. 606883

Handheld instrument for dissolved oxygen with data logger with sensor with 4 m cable length

**GMH 5650-L10**

Art. no. 607478

Handheld instrument for dissolved oxygen with data logger with sensor with 10 m cable length

**GMH 5650-L30**

Art. no. 607479

Handheld instrument for dissolved oxygen with data logger with sensor with 30 m cable length

**Accessories and spare parts:****GKK 5001**

Art. no. 611606

with cut-outs for 1 device of the GMH 5xxx-/7500 series and accessories for water analysis (395 x 295 x 106 mm), p.r.t page 112

## DISSOLVED OXYGEN SENSOR



## HIGHLIGHTS:

- Significantly lower inward flow required than with the predecessor model
- Dry storage possible for long-term storage needs
- Compact 12 mm diameter retained!

## GWO 5610-L02

Art. no. 607386

replacement sensor for dissolved oxygen, GMH 56 & GMH 75, Sensor with 2 m cable

## General:

Standard, for laboratory use, electrode is delivered filled, dry delivery available on request

## Accessories and spare parts:

## GWO 5610-L04

Art. no. 607764

replacement sensor for dissolved oxygen, GMH 56 & GMH 75 with 4 m cable (field use)

## GWO 5610-L10

Art. no. 607765

replacement sensor for dissolved oxygen, GMH 56 & GMH 75 with 10 m cable (field use)

## GWO 5610-L30

Art. no. 607766

replacement sensor for dissolved oxygen, GMH 56 & GMH 75 with 30 m cable (field use)

## GSKA 3600

Art. no. 601414

Protection hat for depth measuring for sensors Ø 12 mm, PVC

## GSKA 3610

Art. no. 607267

Protection hat for depth measuring for sensors Ø 12 mm, red brass



## GWOK 02

Art. no. 608012

Spare membrane head for GWO 5610

## GAS 5610

Art. no. 608032

Working set, includes 3 GWOK 5610, 1 KOH100, 1 Pipette

## KOH 100

Art. no. 603356

spare electrolyte KOH 100 ml

## GCAL 3610

Art. no. 611371

Calibration vessel for dissolved oxygen sensors with Ø 12 mm



## GKK 5001

Art. no. 611606

with cut-outs for 1 device of the GMH 5xxx-/7500 series and accessories for water analysis (395 x 295 x 106 mm), p.r.t page 112

## MEASUREMENT SET FOR DISSOLVED OXYGEN



## GMH 5630-SET

Art. no. 611613

Measurement set

Device, GWO5610-L02, GWOK 02, KOH 100, GSKA 3610, GKK 5001

## GMH 5650-SET

Art. no. 611255

Measurement set

Device, GWO5610-L02, GWOK 02, KOH 100, GSKA 3610, Software, USB 5100, GKK 5001

## General:

With our ready-to-use measurement set for dissolved oxygen, you have everything you need for your work in a practical case and with the set price, you save 13 % in comparison with the prices for the individual components

## Application:

No matter which sector you work in, our comprehensive set never lets you down and stows away in the tidy practical case

## Specifications:

**Measuring channels:** O<sub>2</sub>, T, air pressure (integrated) / measuring depth

## Measuring range:

**O<sub>2</sub>-concentration:** 0.00 ... 70.00 mg/l (ppm) (Variable resolution)

**O<sub>2</sub>-saturation:** 0.0 ... 600.0 % O<sub>2</sub> (Variable resolution)

**O<sub>2</sub>-partial pressure:** 0 ... 1200 hPa O<sub>2</sub> (0.0 ... 427.5 mmHg)

**Temperature:** 0.0 ... 50.0 °C

**Air pressure:** 300 ... 5000 hPa abs

**Measuring depth:** 0 ... 40.0 m water column

**Dimensions:** 450 x 360 x 123 mm (case)

**Weight:** approx. 1900 g

**Scope of supply:** Device incl. protective silicone case, sensor, protective cap, 2 pipettes, spare membrane cap, spare electrolyte, case, battery, calibration protocol, manuals  
**SET-GMH 5650 only:** Software, interface converter

## Accessories and spare parts:

## GMH 5630

Art. no. 606880

Handheld instrument for dissolved oxygen without accessories

## GMH 5650

Art. no. 606882

Handheld instrument for dissolved oxygen with data logger without accessories

## GWO 5610-L02

Art. no. 607386

replacement sensor for dissolved oxygen, GMH 56 & GMH 75 with 2 m cable

## GSKA 3610

Art. no. 607267

Protection hat for depth measuring for sensors Ø 12 mm, red brass

## GSOFT 3050

Art. no. 601336

Windows software for GMH 3000 and GMH 5000 with logger, p.r.t. page 110

## USB 5100

Art. no. 601095

Interface converter GMH 5xxx <=>PC, Galvanic isolation

## GWOK 02

Art. no. 608012

Spare membrane head for GWO 5610

## KOH 100

Art. no. 603356

spare electrolyte KOH 100 ml

## GKK 5001

Art. no. 611606

with cut-outs for 1 device of the GMH 5xxx-/7500 series and accessories for water analysis (395 x 295 x 106 mm), p.r.t page 112



## PRECISE DISSOLVED OXYGEN MEASURING DEVICES (DO)



DURABLE AND AFFORDABLE



## HIGHLIGHTS:

- Modern and functional housing
- 3-line display / overhead display at the push of a button
- Backlighting
- Waterproof (IP65 / IP67)
- Durable, long battery life
- Including galvanic oxygen sensor
- Easy calibration to air at the push of a button

**G 1610**

Art. no. 610003

Waterproof handheld for dissolved oxygen incl. sensor, 2 m cable

**G 1610-4**

Art. no. 408380

Waterproof handheld for dissolved oxygen incl. sensor, 4 m cable

**General:**

The primary focus in the development of the new GMH 1000 series was placed on the essential functions of the measurement technology. Pure measurement with a focus on precision, speed and reliability packaged in a compact housing distinguish an impressive price/performance ratio, Made in Germany.

The new handheld measuring devices also impress with their ergonomic design, dust and water-protected design in accordance with IP 65/67 and the illuminated display. The Oxymeter with maintenance-friendly galvanised sensor is an entry-level device suitable for everyday use. Concentrations in mg/l(ppm) and saturation in percentage can be read directly without using tables.

Calibration with environmental air takes place at the push of a button. Use of a GSKA protective cap is recommended for field use in bodies of water in order to protect the membrane.

**Application:**

Freshwater and salt water aquariums, aquaculture / fish breeding, monitoring of wells and bodies of water

**Specifications:**

**Measuring range / Resolution:** 0.0 ... 20.0 mg/l (or ppm) O<sub>2</sub> concentration  
0 ... 200 % O<sub>2</sub> saturation

**Accuracy**

**Oxygen:** ±1,5 % of m.v. ±0.2 mg/l or ±1,5 % of m.v. ±2 % O<sub>2</sub> saturation

**Temperature:** ±0.3 °C

**Sensors / measuring inputs:** Galvanic sensor (active membrane type), KOH electrolyte 2 m or 4 m cable, permanently connected to the device, with integrated temperature sensor

**Response time T<sub>95</sub>:** 10 s at nominal temperature

**Operating pressure:** max. 3 bar (~30 m water depth)

**Sensor range of application:** 0 ... 40 °C

**Compensation**

**Temperature:** automatic with integrated temperature measurement

**Air pressure:** Compensation possible with manual input (normally not necessary)

**Salinity:** with manual entry

**Display:** 3-line unit with battery status indicator, background light, protected by an unbreakable pane, overhead display at the push of a button

**Operation:** 4 long-lasting, easy-to-operate buttons

**Additional functions:** stability recognition, automatic adjustment to environmental air

**Display unit environment:** -20 ... +50 °C, 0 ... 95 % RH

**Power supply:** 2 x AA battery, battery life >3000 h

**Protection rating:** IP65 / IP67

**Housing:** Break-proof ABS housing

**Dimensions:** 108 x 54 x 28 mm (H x W x D) without sensor

**Weight:** approx. 240 g (device incl. sensor)

**Scope of supply:** Device, sensor, GWOK 02 spare membrane cap and KOH 100 spare electrolyte, 2 x battery, manual

**Accessories and spare parts:****GWOK 02**

Art. no. 608012

Spare membrane head for GWO 5610

**KOH 100**

Art. no. 603356

spare electrolyte KOH 100 ml

**GSKA 3600**

Art. no. 601414

Protection hat for depth measuring for sensors Ø 12 mm, PVC

**GSKA 3610**

Art. no. 607267

Protection hat for depth measuring for sensors Ø 12 mm, red brass

**GCAL 3610**

Art. no. 611371

Calibration vessel for dissolved oxygen sensors with Ø 12 mm

**ST-G1000**

Art. no. 611373

Device protection bag with 1 round cut-out

**GB AA**

Art.-Nr: 610049

Spare battery Mignon (AA) 1,5 V (2 batteries required)

**GKK 1002**

Art. no. 411907

Case G1000 series water analysis small

**GKK 1003**

Art. no. 411917

Case for 2x G1000 series water analysis and 2x PHLx 450 x 360 x 106 mm (W x H x D)

**G 1610-1002**

Art. no. 474287

Waterproof handheld for dissolved oxygen incl. sensor

Device with fix mounted sensor 4 m: GWO5610-L02 and case GKK 1002

## OXYGEN MEASURING DEVICES FOR DISSOLVED OXYGEN IN LIQUIDS



## HIGHLIGHTS:

- Automatic air pressure compensation
- Salinity correction
- Simple calibration in atmospheric air

MEAS. UNITS: O<sub>2</sub>-CONCENTRATION O<sub>2</sub>-SATURATION  
AND O<sub>2</sub>-PARTIAL PRESSURE (GMH3651 ONLY)

## ADDITIONAL FUNCTIONS GMH 3651:



## GMH 3611

Art. no. 605922

Handheld instrument for dissolved oxygen incl. sensor, sensor with 4 m cable

## GMH 3651

Art. no. 605924

Handheld instrument for dissolved oxygen with data logger incl. sensor, sensor with 4 m cable

## Specifications:

## Measuring range: (device)

**O<sub>2</sub>-concentration:** 0.00 ... 70.00 mg/l (ppm)  
(resolution selectable)

**O<sub>2</sub>-saturation:** 0.0 ... 600.0 % O<sub>2</sub>  
(resolution selectable)

**O<sub>2</sub>-partial pressure:** 3651: 0 ... 1200 hPa O<sub>2</sub>  
(0.0 ... 427.5 mmHg)

**Temperature:** 0.0 ... 50.0 °C

**Pressure:** 3611: 10 ... 1200 hPa abs.  
3651: 300 ... 5000 hPa abs. or  
0 ... 100.0 m water column\*  
(with pressure port)

## Accuracy: (at nominal temperature = 25 °C)

**Oxygen:** ±1.5 % of m.v. ±0.2 mg/l  
(0 ... 25 mg/l) or  
±2.5 % of m.v. ±0.3 mg/l  
(25 ... 70 mg/l)

**Temperature:** ±0.1 °C ±1 digit

**Pressure:** ±0.5 % FS ±1 digit  
±3 hPa or 0.1 % of m.v.  
±2 hPa (750 ... 1100 hPa)

**Sensor connection:** 6-pin screened Mini-DIN-socket

**Sensor:** Active membrane type.  
Electrode-Ø front: approx. 12 mm,  
overall length: approx. 220 mm,  
anti buckling glanding, neck collar:  
Ø approx. 20 mm, 4 m connection  
cable with Mini-DIN-plug

**Response time:** 95 % in 10 s,  
depends on temperature

**Operation life:** approx. 3 years, depends on  
maintenance

**Working temperature:** 0 ... +40 °C

**Working pressure:** max. 3 bar  
Operating pressure sensor GWO  
3600 max. 3000 hPa rel. or 4000  
hPa pay attention to abs.!

**Flow rate:** min. 30 cm/s

**Display:** 2 x 4 digit LCDs (12.4 / 7 mm high)

**Interface:** serial interface, direct connection  
to RS232 or USB interface of a PC  
via electrically isolated interface  
converter.

**Power supply:** 9 V-battery as well as additional d.c.  
connector for external 10.5 ... 12 V  
direct voltage supply. (suitable  
power pack: GNG10/3000)

**Battery life:** approx. 500 h

**Housing:** impact-resistant ABS, membrane  
keyboard, transparent panel, inte-  
grated pop-up clip for table top or  
suspended use.

**Dimensions:** 142 x 71 x 26 mm (H x W x D)

**Weight:** approx. 300 g (incl. battery and  
probe)

**Scope of supply:** Device incl. electrode, GWOK01  
and KOH electrolyte, battery,  
calibration protocol, manual

## Additional functions:

**Temperature compensation:**  
automatic via temperature sensor integrated in electrode.

**Air pressure compensation:**  
automatic via integrated pressure sensor. Display of current  
air pressure.

**Correction of salinity:**  
autom. salinity value can be set via keyboard from  
0.0 ... 70.0

**Calibration:**  
1-point calibration: extremely simple quick calibration in  
atmospheric air.  
additional at GMH 3651: 2- and 3-point-calibration

**Calibration interval:**  
The device asks for a recalibration after a selectable time  
period (1 - 365 days or inactive).  
GMH 3651: additional calibration history

**Analog output (GMH 3651 only):**  
0 ... 1 V, freely adjustable

**Alarm (GMH 3651 only):**  
2 Alarm (O<sub>2</sub> and temperature) with separate alarm limits,  
Alarm horn / visual / interface

**Data logger (GMH 3651 only):**  
cyclic: 10.000 data sets, manual: 1.000 data sets  
(with measuring point input, 40 adjustable measuring  
point texts or measuring point numbers)

## Variants:

## GMH 3611-L10

Art. no. 606233

Handheld instrument for dissolved oxygen with sensor  
with 10 m cable length

## GMH 3611-L30

Art. no. 415157

Handheld instrument for dissolved oxygen with sensor  
with 30 m cable length

## GMH 3651-L10

Art. no. 606105

Handheld instrument for dissolved oxygen with data  
logger with sensor with 10 m cable length

## GMH 3651-L30

Art. no. 606106

Handheld instrument for dissolved oxygen with data  
logger with sensor with 30 m cable length

## Accessories and spare parts:

see next page

\* There is the possibility for hydrostatic depth measurements  
with special accessories (upon request / pressure connection).  
This allows in combination with the logger function e.g. com-  
fortable recordings of oxygen profiles in waters.

## ACCESSORIES

## Accessories and spare parts:

**GMH 3611-GL**

Art. no. 606310

Handheld instrument for dissolved oxygen without accessories

**GMH 3651-GL**

Art. no. 606312

Handheld instrument for dissolved oxygen with data logger without accessories

**GWO 3600-L04**

Art. no. 603895

replacement sensor for dissolved oxygen, GMH 36 / OXY 36 with 4 m cable

**GWO 3600-L10**

Art. no. 603258

replacement sensor for dissolved oxygen, GMH 36 / OXY 36 with 10 m cable

**GWO 3600-L30**

Art. no. 603259

replacement sensor for dissolved oxygen, GMH 36 / OXY 36 with 30 m cable

**GWOK 01**

Art. no. 601411

Spare membrane head for GWO 3600

**GAS 3600**

Art. no. 603497

Working set(3 spare Membrane heads and 100 ml of KOH electrolytes)

**GSKA 3600**

Art. no. 601414

Protection hat for depth measuring for sensors Ø 12 mm, PVC

**GSKA 3610**

Art. no. 607267

Protection hat for depth measuring for sensors Ø 12 mm, red brass

**KOH 100**

Art. no. 603356

spare electrolyte KOH 100 ml

**GCAL 3610**

Art. no. 611371

Calibration vessel for dissolved oxygen sensors with Ø 12 mm

**GKK 3001**

Art. no. 611605

Case for GMH 3000 series water analysis / universal with cut-outs for 1 device of the GMH 3xxx series and accessories for water analysis (395 x 295 x 106 mm)

GCAL 3610 on the sensor

## OXYGEN MEASURING DEVICE SETS

NEW!

**GMH 3611-SET04**

Art. no. 474202

Handheld instrument for dissolved oxygen  
Device, sensor 4 m: GWO 3600-L04, spare GWOK 01, KOH 100, protection GSKA3610, case GKK3001**GMH 3651-SET04**

Art. no. 474203

Handheld instrument for dissolved oxygen with data logger  
Device, sensor 4 m: GWO 3600-L04, spare GWOK 01, KOH 100, protection GSKA3610, case GKK3001

## Specifications:

## Measuring range: (device)

**O<sub>2</sub>-concentration:** 0.00 ... 70.00 mg/l (ppm)  
(resolution selectable)**O<sub>2</sub>-saturation:** 0.0 ... 600.0 % O<sub>2</sub>  
(resolution selectable)**O<sub>2</sub>-partial pressure:** 3651: 0 ... 1200 hPa O<sub>2</sub>  
(0.0 ... 427.5 mmHg)**Temperature:** 0.0 ... 50.0 °C**Pressure:** 3611: 10 ... 1200 hPa abs.  
3651: 300 ... 5000 hPa abs. or  
0 ... 100.0 m water column\*  
(with pressure port)

## Accuracy: (at nominal temperature = 25 °C)

**Oxygen:** ±1.5 % of m.v. ±0.2 mg/l  
(0 ... 25 mg/l) or  
±2.5 % of m.v. ±0.3 mg/l  
(25 ... 70 mg/l)**Temperature:** ±0.1 °C ±1 digit**Pressure:** ±0.5 % FS ±1 digit  
±3 hPa or 0.1 % of m.v.  
±2 hPa (750 ... 1100 hPa)

further specifications p.r.t. GMH 3611 and GMH 3651

## MULTISENSOR WATER ANALYSIS HANDHELD MEASURING DEVICE



ISO

AUTOHOLD

AUTOOFF

HOLD

MIN MAX



NEW!

## HIGHLIGHTS:

- simultaneous measurement of pH/oxygen or pH/conductivity and the corresponding temperatures
- integrated galvanic isolation enables simultaneous measurement with affordable standards sensors
- the display enables convenient reading of several values simultaneously and the measurement curve in diagram form
- the data logger can be read directly via USB – with standard smartphone cable or software
- simple and convenient battery charging via USB connection

**G 7500**

Art. no. 414318

MultiSensor water analysis handheld instrument

**G 7500-PH/O2**

Art. no. 414787

MultiSensor water analysis handheld instrument

Device, GE125-L02+accessories, GW0 5610-L02+accessories, GKK 2021

**G 7500-PH/CON**

Art. no. 414788

MultiSensor water analysis handheld instrument

Device, GE125-L02+accessories, LF425-L02+accessories, GKK 2021

**G 7500-PH/CON/O2**

Art. no. 414789

MultiSensor water analysis handheld instrument

Device, GE125-L02+accessories, LF425-L02+accessories, GW05610-L02+accessories, GKK 2021

**General:**

The G 7500 is a comfortable multi-channel water analysis device for simultaneous measurement of two measurement variables and the corresponding temperature. All significant electrochemical measurements can be combined:

- pH/ Redox + conductivity/salinity
- pH/ Redox + dissolved oxygen

The backlit graphic display shows all parameters in plain text in German or English; other languages can be integrated (additional charges indicated on request). Large display or measurement diagram can also be represented. Use of our proven standard plug connectors guarantees that you can use our standard sensors – without additional costs due to complicated technology in the sensors. The device is distinguished by its impressive performance and the affordable system price (refer also to our sets). The state-of-the-art device platform uses the standard USB cable to charge the internal batteries (interchangeable) and read the data logger without the need for additional software or adapters. The logger is read conveniently like a USB 2.0 memory stick.

**Application:**

Therefore, you have applications such as surface water monitoring, neutralisation processes or agricultural measurements ready to hand in a compact format.

- monitoring of bodies of water
- drinking water preparation
- sewage treatment plants
- fish husbandry and aquaculture
- vertical/ urban farming
- conventional agriculture

**Specifications:****Input no.1 pH/ Redox****Connection:** BNC waterproof**Measuring range:** -2.00 ... +16.00 pH ( $\pm 0.25$  % FS @ 25 °C)  
or -1500 ... +1500 mV Redox voltage ( $\pm 0.25$  % FS @ 25 °C)**Temperature:** -10.0 ... +150.0 °C (Pt1000)  
 $\pm 0.25$  % FS connection via 4 mm banana or O<sub>2</sub>/LF sensor**Temperature compensation:** Manual, automatic**Input no. 2****Connection:** 7-pole bayonet jack**Temperature:** -10.0 ... +110.0 °C (NTC or Pt1000) measuring range (Pt 1000)  
-10.0 ... +110.0 °C measuring range (NTC 10k)  
-10.0 ... +110.0 °C (integrated in O<sub>2</sub>/LF sensor)**Conductivity****Measuring range:** 0  $\mu$ S/cm ... 500 mS/cm ( $\pm 0.5$  % FS @ 25 °C)  
Salinity/PSU: 0.0 ... 70.0 g/kg  
Cell constant 0.3 ... 1.6000 1/cm**Temperature compensation** Off, linear (0.300 ... 3.000 %/K), NLF (according to DIN EN 27888), Reference temperature: 20 °C or 25 °C (adjustable)**Dissolved oxygen****Measuring range:** Oxygen saturation: 0.0 ... 500.0 % sat  
Oxygen concentration: 0.0 ... 50.0 mg/l  
Oxygen partial pressure: 0 ... 1013 mbar O<sub>2</sub>  
(accuracy depending on sensor and calibration with flow >20 cm/s, add.  $\pm 1.5$  % FS @ 25 °C, 100 % sat, O<sub>2</sub>)



## MULTISENSOR WATER ANALYSIS HANDHELD MEASURING DEVICE



A multi-channel measuring device was developed based on our proven G 1000/ GMH 3000/ GMH 5000 individual-parameter devices. This combines multi-channel measurement with the proven housing of the GMH 5000 series.

Numerous applications demand simultaneous measurement of multiple measured variables. For example, simultaneous measurement of pH and oxygen is desired when monitoring bodies of water – the G 7500 determines both measurements in one device. A very interesting application area for the combination of pH and conductivity is the current trend market of vertical farming/ urban farming.

A daylight-compatible backlit graphic display is used for optimal visualization. At the same time, simple measurement and easy calibration are guaranteed with the plain text display with various language settings. There are no longer any limitations on the measurement recording, because the buffer size of the data logger is very large. Our proven sensor connections are installed in the devices. As a result, system costs are kept in check and the flexibility of the free sensor selection adapted to your emphases is guaranteed.

<b>Temperature compensation:</b>	Automatically via connected sensor
<b>Pressure compensation</b>	Manual, automatic via int. sensor: 500 ... 1100 hPa $\pm$ 4 hPa
<b>Salinity compensation:</b>	Manual PSU 0 ... 70 g/kg
<b>Additional functions:</b>	Text-base user guidance (DE/EN), Charging via USB jack (3 x AAA batteries integrated, interchangeable)
<b>Display:</b>	LCD (180 x 128 pixel), monochromatic, adjustable backlighting
<b>Interface:</b>	USB 2.0, Micro USB jack
<b>Calibration:</b>	pH 1...5 point calibration (PHL buffer, DIN buffer) LF cell constant O <sub>2</sub> : Water-saturated air
<b>Data logger:</b>	Yes (8 GB with FAT file system)
<b>Alarm:</b>	Yes, acoustic alerting (horn) Visual (red LCD background)
<b>Power supply:</b>	3 x NiMH AAA (max. 750 mAh)
<b>Current requirement:</b>	On: approx. 75 mA in operation; Off: approx. <0.1 mA
<b>Housing:</b>	Impact-resistant ABS, with stand/hanging bracket
<b>Protection rating:</b>	IP67
<b>Dimensions:</b>	160 x 86 x 37 mm (H x W x D) incl. protection cover
<b>Weight:</b>	300 g incl. battery and protection cover
<b>Scope of supply:</b>	Device with 3 AAA batteries, quick reference guide, operating manual and test report as pdf on mass storage device

**Accessories and spare parts:****GW05610-L04**

Art. no. 607764

replacement sensor for dissolved oxygen, GMH 56 &amp; GMH 75, Sensor with 4 m cable

**GWOK 02**

Art. no. 608012

Spare membrane head for GWO 5610

**KOH 100**

Art. no. 603356

spare electrolyte KOH, 100 ml

**GCAL 3610**

Art. no. 611371

Calibration vessel for dissolved oxygen sensors with  $\varnothing$  12 mm**LF452-L02**

Art. no. 608773

Conductivity cell for GMH 5400 / G 7500-Series, 4-pole graphite measuring cell,  $\varnothing$  16 mm**LF400-L02**

Art. no. 602968

Conductivity cell for GMH 5400 / G 7500-Series, 4-pole graphite measuring cell

**GKL-100**

Art. no. 601396

Conductivity control solution, Control solution 1413  $\mu$ S/cm, 100 ml bottle**GKL-102**

Art. no. 601400

Conductivity control solution, Control solution 50 mS/cm, 100 ml bottle

**GE117-BNC-L02**

Art. no. 600729

pH-electrode incl. Pt1000, pressure resistant, BNC plug

**GE125-BNC-L02**

Art. no. 600731

Waterproof pH electrode with Pt1000 to 4 mm banana

**PHL 4**

Art. no. 601369

pH buffer solution, ready to use, Buffer solution pH 4 in 250 ml dosing bottle

**PHL 7**

Art. no. 601371

pH buffer solution, ready to use, Buffer solution pH 7 in 250 ml dosing bottle

**PHL 10**

Art. no. 601373

pH buffer solution, ready to use, Buffer solution pH10 in 250 ml dosing bottle

**GRL100**

Art. no. 601422

HCL/Pepsin cleaning solution, 100 ml

**GKK 5001**

Art. no. 611606

kompakter Koffer für Feldeinsatz 395 x 295 x 106 mm (W x H x D)

# GAS ANALYSIS



	GMH 5690	GMH 5695	GMH 3692 + Sensor	GMH 3695 + Sensor	ResOx	GOX 100	GOX 100T	GCO 100	HD21-ABE-17
<b>APPLICATION:</b>									
Measurement of atmospheric oxygen	•	•	•	•	•	•	•		
O <sub>2</sub> -concentration (oxygen)	•		•	•	•	•	•		
Atmospheric pressure / Pressure connection	•/-	•/•	•/-	•/•	•/•	-/-	-/-	-/-	•/-
Relative humidity									•
Temperature	•	•	•	•	•				•
O <sub>2</sub> -partial pressure	•	•	•	•	•				
CO-concentration (carbon monoxide)								•	•
Protective gases	•	•	•	•	•				
Diving *	•		•				•	•	
Exhaust gas monitoring								•	•
<b>EQUIPMENT:</b>									
Measuring ranges concentration	0 ... 100 % O <sub>2</sub>	0 ... 100 % O <sub>2</sub>	0 ... 100 % O <sub>2</sub>	0 ... 100 % O <sub>2</sub>	0 ... 100 % O <sub>2</sub>	0 ... 100 %	0 ... 100 %	0 ... 1000 ppm CO 0 ... 60 % COHb	0 ... 500 ppm CO 0 ... 5000 ppm CO <sub>2</sub>
O <sub>2</sub> -partial pressure	0 ... 1100 hPa	0 ... 1100 hPa	0 ... 1100 hPa	0 ... 1100 hPa	0 ... 1100 hPa				
Temperature	-5 ... +50 °C	-5 ... +50 °C	-5 ... +50 °C	-5 ... +50 °C	-5 ... +50 °C				-20 ... +60 °C
Ambient pressure	10 ... 1200 hPa	300 ... 5000 hPa	10 ... 1200 hPa	300 ... 5000 hPa	300 ... 5000 hPa				750 ... 1100 hPa 0 ... 100 % RH
Sensor	external sensor, order separately		external sensor, order separately		complete set		in external sensor housing	Internal sensor	Internal sensors
Sensor connection	7-pole bajonett		6-pole mini-DIN socket		7-pole bajonett		0.7 m cable with jack plug	-	-
General functions					Set with gas pump		MOD display		
Min/Max, Hold, Auto-Off	•		•		•	•	•	Max, Hold, Auto-Off	•
Background illumination	•				•				•
Alarm / Interface	•	•	•	•	•			•	•
Logger		•		•	•				•
<b>DEVICE INFORMATION:</b>									
Catalogue page	Page 75	Page 75	Page 76	Page 76	Page 79	Page 78	Page 78	Page 80	Page 81

\* not suited for „under water“-applications (rebreather, etc.)

## WATERPROOF HANDHELD MEASURING DEVICE

**GMH 5690**

Art. no. 607466

Handheld instrument for gaseous oxygen without sensor

**GMH 5695**

Art. no. 607468

Handheld instrument for gaseous oxygen with datalogger without sensor

**Application:**

Protective gas measurements for

- Welding and soldering
- Food production/packaging technology (MAP, see also the Resox 5695-H/-L)
- For storage of foods, semiconductor components, etc.
- Immersion gas testing: Checking of oxygen concentration in nitrox, trimix or similar gas compositions

**Note:** Not suitable for use in 'underwater applications' (rebreather, etc.)

Specifications:	GMH 5690	GMH 5695
<b>Measuring channels:</b>	O <sub>2</sub> , T, air pressure (integrated)	O <sub>2</sub> , T, air pressure (integrated, with external connection)
<b>Measuring ranges</b>		
<b>O<sub>2</sub> concentration:</b>	0.0 ... 100.0 % O <sub>2</sub> Vol. or 0.00 ... 100.00 % O <sub>2</sub> Vol. (resolution can be selected in menu)	
<b>O<sub>2</sub> partial pressure:</b>	0 ... 1100 hPa O <sub>2</sub> / 0 ... 825 mmHg O <sub>2</sub> , 0.0 ... 1100.0 hPa O <sub>2</sub> / 0.0 ... 825.0 mmHg O <sub>2</sub> (resolution can be selected in menu)	
<b>Temperature:</b>	-5.0 ... +50.0 °C	
<b>Air pressure:</b>	10 ... 1200 hPa abs	300 ... 5000 hPa abs *)
<b>Accuracy: (device at nominal temperature = 25 °C)</b>		
<b>O<sub>2</sub> concentration:</b>	±0.1 % ±1 digit	
<b>Temperature:</b>	±0.1 °C ±1 digit	
<b>Air pressure:</b>	±3 hPa or 0.1 % of m.w. (higher applies)	
<b>Compatible sensors:</b>	GG05 / GO05 with elements GOEL 370, 381 etc.	GGAS / GG05 / GO05 with elements GOEL 370, 381 etc.
<b>Connections</b>		
<b>Sensor:</b>	7-pin bayonet connection	7-pin bayonet connection Port for pressure connection *)
<b>Output / ext. Power supply:</b>	OUT jack: - 38400 baud interface  - 5 V external supply	OUT jack: - 38400 baud interface - Analogue output 0 ... 1 V, adjustable - 5 V external supply
<b>Display:</b>	4 ½ digit, 7-segment, illuminated (white)	
<b>Operating conditions:</b>	-25 ... +50 °C; 0 ... 95 % RH (non-condensing, sensor min. -5 °C)	
<b>Power supply:</b>	2 x AAA battery, power consumption: 0.9 mA	
<b>Battery life:</b>	approx. 1000 h (without lighting)	

**HIGHLIGHTS**

- High display resolution (0.01 % O<sub>2</sub> concentration)
- Waterproof and durable (protective silicone case)
- Large double display with background lighting
- Multi-point calibration for precision measurements
- Environmental pressure compensation with integrated barometer
- Alarm function

**ADDITIONAL HIGHLIGHTS GMH 5695**

- Data logger
- Analogue output
- Pressure connection

**ADDITIONAL FUNCTIONS GMH 5695:**SUITABLE SENSORS  
SEE PAGE 77

THE DEVICE IS ONLY INTENDED FOR CONTROL.  
IT IS NOT A REPLACEMENT FOR A MONITORING  
DEVICE SUBJECT TO AUTHORISATION!

<b>Protection rating:</b>	IP65 / IP67
<b>Housing:</b>	Impact-resistant ABS, with stand/hanging bracket
<b>Dimensions:</b>	160 x 86 x 37 mm (H x W x D) including protective silicone case
<b>Weight:</b>	approx. 250 g, including battery and protective case
<b>Scope of supply:</b>	Handheld measuring device incl. batteries (2 x AAA), protective silicone case, manual, quick guide

\*) Optimal air pressure compensation with GGA 570 /GGA 581

**Additional functions:**

- Backlighting:** Adjustable light duration (off, 5 s ... 2 min.)
- Calibration:** 1 point air, 2 point or 3 point (air and zero point and 100 % O<sub>2</sub>)
- GLP:** Calibration interval
- GMH 5695 only:** Calibration history
- Data logger (GMH 5695 only):** Cyclical: 10,000, Single: 1000  
Single value logger with measuring point input
- Alarm:** 2 alarm channels (O<sub>2</sub> and temperature) with separate alarm thresholds  
Alarm notification horn/visual/interface

**Accessories and spare parts:**

- Matching sensors see page 77/78
- GKK 3600**  
Art. no. 601062  
Case with punched lining for universal application (394 x 294 x 106 mm)
- USB 5100**  
Art. no. 601095  
Interface converter GMH 5xxx <=>PC
- GSOFT 3050**  
Art. no. 601336  
Windows software for GMH 3000 and GMH 5000 with logger

## AIR OXYGEN MEASURING DEVICE



WIDE RANGE OF APPLICATION

## HIGHLIGHTS:

- Alarm detector with integrated horn
- Automatic compensation of ambient air via integrated barometer

## ADDITIONAL FUNCTIONS GMH 3695:

- pressure connection

SUITABLE SENSORS SEE  
PAGE 77

THE DEVICE IS ONLY INTENDED FOR CONTROL.  
IT IS NOT A REPLACEMENT FOR A MONITORING  
DEVICE SUBJECT TO AUTHORISATION!

## GMH 3692

Art. no. 605919

Handheld instrument for gaseous oxygen w/o sensor

## GMH 3695

Art. no. 605921

Handheld instrument for gaseous oxygen with datalogger w/o sensor

## Application:

**Bio chemistry:**

Oxygen monitoring in breeding chambers for cell cultures. Monitoring of fermenting process of fruits in fermentation plants etc.

**Medicine:**

Monitoring of oxygen concentration in respirators; checking of breathing, monitoring of oxygen concentration in incubators, oxygen tents etc.

**Food technology:**Monitoring of residual oxygen in packages (e.g. coffee, tea, etc.).  
Monitoring of oxygen content during production processes.**Air conditioning and ventilation technology:**

Oxygen measurements, air quality monitoring, measuring of oxygen concentration in enclosed air conditioning systems, etc.

**Sport:**

Checking of oxygen content in compressed air bottles (diving, etc.).

**Note:** not suited for „under water“-applications (rebreather, etc.)

## Specifications:

## Measuring ranges

**O<sub>2</sub> concentration:** 0.0 ... 100.0 % O<sub>2</sub> (gaseous)  
0 ... 1100 hPa O<sub>2</sub>**Temperature:** -5.0 ... +50.0 °C**Air pressure:** **GMH 3692:** 10 ... 1200 hPa; **GMH 3695:** 300 ... 5000 hPa

## Accuracy: (device) (at nominal temperature = 25 °C)

**O<sub>2</sub> concentration:** ±0.1 % ±1 digit**Temperature:** ±0.1 °C ±1 digit**Air pressure:** ±3 hPa or 0.1 % v. m.w. (whichever is higher)

## Oxygen sensor:

for suitable sensors p.r.t. page 76  
Observe permissible operating pressure of oxygen sensor  
e.g. GOEL 370/381: 500 ... 2000 hPa abs.

## Sensor connection:

6-pin screened Mini-DIN-socket.  
**GMH 3695:** additional pressure ports

## Display:

two 4 digit LCDs (12.4 mm or 7 mm high), as well as additional arrows.

## Pushbuttons:

6 membrane keys for ON/OFF-switch, selection of meas. range, min- and max- value memory, hold-function, calibration etc.

## Working temperature:

0 ... +50 °C

## Relative humidity:

0 ... +95 % RH (non-condensing)

## Storage temperature:

-20 ... +70 °C

## Interface:

serial interface, direct connection to RS232 or USB interface of a PC via electrically isolated interface converter GRS 3100 or GRS 3105 resp. USB 3100 N (p.r.t. accessories).

## Power supply:

9 V battery as well as additional d.c. connector for external 10.5 ... 12 V direct voltage supply. (suitable power supply: GNG10/3000)

## Battery life:

approx. 300 h

## Housing:

Impact-resistant ABS plastic housing, membrane keyboard, transparent panel, integrated pop-up clip

## Dimensions:

142 x 71 x 26 mm (H x W x D)

## Weight:

approx. 160 g (incl. battery)

## Scope of supply:

Device, battery, calibration protocol, manual

## Additional functions:

**Temperature compensation:**

automatic via temperature sensor, integrated in probe housing

**Air pressure compensation:**The O<sub>2</sub> concentration will be compensated according to the absolute atmospheric pressure set.**Calibration:****1-point calibration:**

extremely simple quick calibration in atmospheric air (press button to compensate unit to 20.9 %).

**2-/3-point calibration:**

first point at atmospheric air (20.9 %), second and third point 0 or 100 %.

**Calibration interval:**

The device asks for a recalibration after a selectable time period (1 ... 365 days or inactive).

**GMH 3695:** additional calibration history**Analog output (GMH 3695 only):**

0 ... 1 V, freely scalable

**Pressure nozzles (GMH 3695 only):**

for pressure compensation

**Data logger (GMH 3695 only):**cyclic: 8000 data sets, adjustable cycle time: 1 s ... 60 min  
manual: 1000 data sets, with measuring point input

## Accessories and spare parts:

Suitable sensors

p.r.t. next page

**GKK 3000**

Art. no. 601048

Device case soft lining for 1x GMH 3000 (275 x 229 x 83 mm)

**USB 3100 N**

Art. no. 601092

Interface Converter GMH3xxx &lt;=&gt;PC, USB, electrical isolated

**GRS 3105**

Art. no. 601099

5-point interface converter GMH3xxx &lt;=&gt;PC, RS232

**GSOFT 3050**

Art. no. 601336

Windows software for GMH 3000 and GMH 5000 with logger

**ST-R1**

Art. no. 601066

Protection bag, leather



## ATMOSPHERIC OXYGEN SENSORES FOR GMH 569X AND GMH 369X

## CLOSED SENSOR TYPE GGO



CLOSED

**GGO 581**

Art. no. 610029

Atmospheric oxygen sensores, closed sensor type, incl. GOEL 381, precise even at 20.2 % and 35 %, suitable for GMH 569x

**GGO 570**

Art. no. 607480

Atmospheric oxygen sensores, closed sensor type, incl. GOEL 370 recommended for high CO<sub>2</sub> concentrations of up to 35 % O<sub>2</sub>, immersion gas, longlife, suitable for GMH 569x

**GGO 381**

Art. no. 610030

Atmospheric oxygen sensores, closed sensor type, incl. GOEL 381, precise even at 20.2 % and 35 %, suitable for GMH 369x

**GGO 370**

Art. no. 601224

Atmospheric oxygen sensores, closed sensor type, incl. GOEL 370 recommended for high CO<sub>2</sub> concentrations of up to 35 % O<sub>2</sub>, immersion gas, longlife, suitable for GMH 369x

**General:**

- suitable for under and over pressure
- for using in gas-tight systems

**Application:**

Suitable for measuring in normal atmosphere and in systems without or with slight under or over pressure. The sensor type features a screw thread and can be built in gas-tight in almost every system directly resp. with tube-adapter.

longer cable length 4 m and 10 m on demand

## OPEN SENSOR TYPE GOO



OPEN

**GOO 581**

Art. no. 610033

Atmospheric oxygen sensor, open sensor type, incl. GOEL 381, precise even at 20.2 % and 35 %, suitable for GMH 569x

**GOO 570**

Art. no. 607482

Atmospheric oxygen sensor, open sensor type, incl. GOEL 370 recommended for high CO<sub>2</sub> concentrations of up to 35 % O<sub>2</sub>, immersion gas, longlife, suitable for GMH 569x

**GOO 381**

Art. no. 610034

Atmospheric oxygen sensor, open sensor type, incl. GOEL 381, precise even at 20.2 % and 35 %, suitable for GMH 369x

**GOO 370**

Art. no. 601228

Atmospheric oxygen sensor, open sensor type, incl. GOEL 370 recommended for high CO<sub>2</sub> concentrations of up to 35 % O<sub>2</sub>, immersion gas, longlife, suitable for GMH 369x

**General:**

- suitable for air- or gas-stream
- quick temperature compensation

**Application:**

Because of the special sensor construction the measuring gas streams optimally around the sensor and escapes through holes in the housing into the air. No pressure build-up at slight streaming of the probe, that falsify the result of measurement. Particularly suitable for measuring of gas out of gas-bottle etc. Even measuring indoor-gas concentration is possible.

longer cable length 4 m and 10 m on demand

Note: not suited for „under water“-applications (rebreather, etc.)

## CLOSED SENSOR TYPE WITH PRESSURE CONNECTION GGA

FOR DEVICES WITH PRESSURE CONNECTION

**GGA 581**

Art. no. 610031

Atmospheric oxygen sensor with pressure connection, incl. GOEL 381, precise even at 20.2 % and 35 %, suitable for GMH 569x

**GGA 570**

Art. no. 607486

Atmospheric oxygen sensor with pressure connection, incl. GOEL 370 recommended for high CO<sub>2</sub> concentrations of up to 35 % O<sub>2</sub>, immersion gas, longlife, suitable for GMH 569x

**GGA 381**

Art. no. 610032

Atmospheric oxygen sensor with pressure connection, incl. GOEL 381, precise even at 20.2 % and 35 %, suitable for GMH 369x

**GGA 370**

Art. no. 607484

Atmospheric oxygen sensor with pressure connection, incl. GOEL 370 recommended for high CO<sub>2</sub> concentrations of up to 35 % O<sub>2</sub>, immersion gas, longlife, suitable for GMH 369x

**General:**

For devices with external pressure port (GMH 5695 / 3695) is this housing optimal. Especially for systems with high or low pressure or with existing back pressure by flow.

**Application:**

It can be screwed airtight (Attention: Observe permissible operating pressure!). The device-pressure port is connected to the sensor pressure port. The device measures and compensates for the actual pressure at the sensor.

longer cable length 4 m and 10 m on demand

Specifications:	GGA/GGO/GOO 570/370	GGA/GGO/GOO 581/381
<b>Sensor element:</b>	GOEL 370	GOEL 381
	Oxygen-partial pressure probe, mounted in external sensor housing replaceable (temperature sensor mounted in housing)	
<b>Specific features:</b>	Long service life For protective gases with a high O <sub>2</sub> concentration and oxygen content <35 vol. % O <sub>2</sub>	for the lowest O <sub>2</sub> concentrations; For protective gases, in general, precise and very small measurements and above 35 vol. % O <sub>2</sub>
<b>Measuring range</b>		
<b>Partial oxygen pressure:</b>	0 ... 1100 hPa O <sub>2</sub>	0 ... 1100 hPa O <sub>2</sub>
<b>Oxygen concentration:</b>	0.0 ... 100.0 % O <sub>2</sub>	0.0 ... 100.0 % O <sub>2</sub>
<b>Response time: T<sub>90</sub></b>	<10 s	<10 s
<b>Accuracy (at 25 °C, 1013 hPa)</b>		<1.5 % O <sub>2</sub>
<2 % O <sub>2</sub>	±0.2 % O <sub>2</sub>	±0.1 % O <sub>2</sub>
<25 % O <sub>2</sub>	±0.5 % O <sub>2</sub>	±0.5 % O <sub>2</sub>
>25 % O <sub>2</sub>	±0.5 % O <sub>2</sub>	no information
<b>Operating conditions:</b>	0 ... 45 °C 0 ... 95 % RH (non-condensing)	0 ... 45 °C 0 ... 95 % RH (non-condensing)
<b>Ambient pressure:</b>	0.6 ... 1.75 bar abs.	
<b>Over-/under-pressure:</b>	max. 0.25 bar (pressure difference sensor membrane to ambient - sensor screwed-in)	
<b>Storage temperature:</b>	-15 ... +60 °C	
<b>Operation life:</b>	on air: >4 years (warranty for sensor element: 12 months)	on air: >2 years (warranty for sensor element: 12 months)
<b>Connection:</b>	<b>GGA/GGO/GOO 3...:</b> approx. 1.2 m cable with Mini-DIN-plug. <b>GGA/GGO/GOO 5...:</b> approx. 1 m cable with 7-pole bayonet connector	
<b>Dimensions of housing:</b>	GGA.../GGO...: approx. Ø 36 mm x 95 mm (150 mm incl. anti-buckl. glanding), GOO...: approx. Ø 40 mm x 105 mm (160 mm incl. anti-buckl. glanding) Housing with M16 x 1-screw thread (sensor can be connected to line tubes by means of an additional adapter)	
<b>Weight:</b>	approx. 135 g (GGO...) or approx. 145 g (GOO.../GGA...)	
<b>Scope of supply:</b>	GGA.../GGO...: sensor, flow diverter, T-piece GOO...: sensor, flow diverter	

ACCESSORIES

**GOEL 370**

Art. no. 601490

Spares sensor element (acidic electrolyte)



**General:**

Integrated into GGO 370, GGA 370, GGO 370 (for GMH 3690/91/92/95) or GGO 570, GGA 570, GGO 570 (for GMH 5690/95); Universal sensor element with special precautions particularly for diving gas and protective gases from 0.2 ... 35 % O<sub>2</sub>, even for applications with elevated CO<sub>2</sub> concentration.

Note: not suited for „under water“-applications (rebreather, etc.)

**GOEL 381**

Art. no. 610035

Spares sensor element (alkaline electrolyte)



**General:**

Integrated into GGO 381, GGA 381, GGO 381 (for GMH 3690/91/92/95) or GGO 581, GGA 581, GGO 581 (for GMH 5690/95); Fast sensor element especially for diving gas and protective gases from 0.0 ... 100 % O<sub>2</sub>. For application without permanently higher CO<sub>2</sub> concentration

Note: not suited for „under water“-applications (rebreather, etc.)

**Accessories and spare parts:**

**GZ-11**

Art. no. 603144

Flow rate adapter to measure the oxygen concentration with 6/4 mm tube



**ESA 369**

Art. no. 603058

Spare tube-adapter M16x1, for tubes with a inner-diameter of 15 mm



**ZOT 369**

Art. no. 603094

T-piece to plug on ESA 369 / ESA 100



SUPPLEMENT FOR GAS ANALYSIS AND AIR QUALITY MEASURING DEVICES

**GS 150**

Art. no. 610005

Gas sampling pump for gas sampling



**HIGHLIGHTS:**

- Easy to use
- Durable membrane pump
- Quiet
- Low quantity of conveyed gas
- Mobile operation with battery
- Battery charge indicator

**Application:**

E.g. in combination with residual oxygen measuring devices for protective gas applications, etc.

**Specifications:**

<b>Functional principle:</b>	Motorised membrane pump with input/output ports, battery-operated
<b>Max. negative pressure:</b>	approx. -360 mbar
<b>Delivery rate:</b>	open: approx. 280 ml / min, with GDZ 29: approx. 150 ml / min
<b>Connection:</b>	Universal pressure port for 6/4 mm hoses (inside Ø 4 mm)
<b>Range of application:</b>	10 ... 50 °C
<b>Applicable gases:</b>	Non-corrosive, dust-free gases, a condensate trap is recommended for gases with high humidity
<b>Operation:</b>	On / Off slide switch
<b>Environmental conditions:</b>	10 ... 50 °C, 0 ... 95 % RH
<b>Battery /service life:</b>	9V block battery, approx. 10 h
<b>Battery charge indicator:</b>	2 Leds: full / low
<b>Scope of supply:</b>	Device, battery, manuals

**Accessories and spare parts:**

**GDZ-29**

Art. no. 601599

Filter-Membrane incl. Luer-Locks (GDZ-32 und GDZ-33), prevents contamination with even the finest particles or liquids

COMPACT AIR OXYGEN MEASURING DEVICE



FOR DIVING APPLICATIONS

**GOX 100**

Art. no. 600142

Compact air oxygen meas. device for universal applications

**General:**

- 1-button calibration
- Automatic power-off
- Min-/max- value memory
- Incl. sensor GOEL 370

Note: not suited for „under water“-applications (rebreather, etc.)

**GOX 100T**

Art. no. 600157

Compact air oxygen meas. device for diving applications

**General:**

- 1-button calibration
- MOD-Display (Maximum Operating Depth)
- HOLD function
- Incl. sensor GOEL 370

Note: not suited for „under water“-applications (rebreather, etc.)

**Specifications:**

<b>Measuring range:</b>	0.0 ... 100.0 % O <sub>2</sub>
<b>Accuracy typ.:</b>	±0.1 % O <sub>2</sub> ±1 digit, calibrated device (range from 15 ... 40 % O <sub>2</sub> )
<b>MOD (GOX 100T):</b>	0 ... 100 m / 0 ... 199 ft
<b>Sensor connection:</b>	0.55 m jack-connector cable
<b>Sensor:</b>	Electrochemical oxygen-partial pressure probe, mounted in external sensor housing, M16x1 connection thread.
<b>Warranty:</b>	12 month
<b>Working pressure:</b>	0.5 ... 2.0 bar abs.
<b>Over-/under-pressure:</b>	max. 0.25 bar (pressure difference)
<b>Working temperature:</b>	0 ... 45 °C (sensor), -20 ... +50 °C (device)
<b>Relative humidity:</b>	0 ... 95 % RH
<b>Power supply:</b>	9 V battery
<b>Power consumption:</b>	approx. 120 µA (over 2500 h)
<b>Display:</b>	3½-digit, 13 mm high LCD-display
<b>Housing:</b>	ABS enclosure
<b>Dimensions:</b>	approx. 106 x 67 x 30 mm (H x W x D)
<b>Weight:</b>	approx. 185 g
<b>Scope of supply:</b>	Device incl. sensor, tube-adaper, t-piece, battery, manual

**Varianten:**

**GOX 100-LACK**

Art. no. 602047

Compact air oxygen meas. device with encapsulated PC board (for applications where condensation is possible)

**GOX 100-T-LACK**

Art. no. 604660

Compact air oxygen meas. device with encapsulated PC board (for applications where condensation is possible)

## RESIDUAL OXYGEN MEASURING SYSTEM RESOX



IMPROVED SUCCESSOR TO OUR  
POPULAR GOG SET

## HIGHLIGHTS:

- With data logger and interface
- Pressure-compensated measurement – particularly important for rigid packages!
- Intelligent complete measuring system in a practical carry case

## ResOx 5695-H

Art. no. 610040

Residual oxygen measuring system with datalogger (for gases with elevated CO<sub>2</sub> percentage GOEL 370)

## ResOx 5695-L

Art. no. 610041

Residual oxygen measuring system with datalogger (with recommended sensor element GOEL 381)

## General:

New measuring system with gas pump for more measuring comfort - can now also be used in rigid packages and packages with low quantities of gas.

## Application:

Quality control for MAP food packaging and comparable applications

## QUICK MEASUREMENT:

- Apply adhesive seal
- Puncture with needle
- Switch on the pump
- Read the minimum value after approx. 20 s

## Specifications:

**Measuring channels:** O<sub>2</sub>, T, air pressure

## Measurement ranges

**O<sub>2</sub>:** 0.0 ... 100.0 % O<sub>2</sub> or displayed in hPa O<sub>2</sub> / mmHg O<sub>2</sub>

**Temperature:** 0.0 ... 50.0 °C

**Air pressure:** 300 ... 5000 hPa (Sensor: 500 ... 2000 hPa)

**Additional functions:** Min / max function – for comfortable measurement of the limit value; Pressure compensation in the gas path – negative pressure in the package/on the sensor is compensated for

**Applicable sensors:** GOEL 370, 381 etc.

## Connections on the device

**Sensor:** 7-pin bayonet  
Pressure port for hoses with inside Ø 4 mm

**Output / ext. power supply:** OUT socket: - 38400 baud interface  
- Analogue output 0 ... 1 V, adjustable  
- External 5 V power supply

**Calibration:** Quick calibration on air at the push of a button or 2-point / 3-point (air +0 % and 100 %)

**GLP:** Calibrating interval, calibration history

**Data logger:** Cyclical: 10000, Single: 1000  
Single value logger with measuring point entry

**Pump:** Motorised membrane pump with input/output ports, battery-operated

**Max. negative pressure:** approx. -360 mbar

**Delivery rate:** with GDZ 29 Filter: approx. 80 ml / min

**Connection:** Pressure port for hoses with inside Ø 4 mm

**Additional features:** Waterproof device and sensor (IP65, IP67), protective armouring, backlighting

**Scope of supply:** Ready-to-operate system: Display GMH 5695, incl. battery, sensor housing with pressure connection incl. sensor, gas pump GS 150 incl. battery, connection lines, hoses/T-piece, 2 GDZ 29 filters, 2 GOG-N puncture needles Ø 0.9 mm, 1 GOG-B: 45 pcs. adhesive seal, carry case

## Accessories and spare parts:

## GOG-A

Art. no. 603043

Adhesive cellular foam (40 pcs.)

## GOG-B

Art. no. 610013

Gasket sticker (45 pieces)

## GOG-N

Art. no. 603047

Puncture needle, Ø 0.9 mm (5 pcs.)

## GDZ-29

Art. no. 601599

Filter membrane, including Luer locks (GDZ-32 and GDZ-33)

## GS 150

Art. no. 610005

Gas sampling pump

## GOEL 370

Art. no. 601490

Spares sensor element, universal range, immersion gas, long-life

## GOEL 381

Art. no. 610035

Spares sensor element

## USB 5100

Art. no. 601095

Interface converter GMH 5xxx <=>PC

## GSOFT 3050

Art. no. 601336

Windows software for GMH 3000 and GMH 5000 with logger

## COMPACT CO-MEASURING DEVICE



## HIGHLIGHTS:

- 3 display units selectable (ppm, mg/m<sup>3</sup> and % CO Hb)
- Alert at exceeding the maximum concentration at work (MAK/AGW)
- incl. interface
- incl. calibration protocol

THE DEVICE IS ONLY INTENDED FOR CONTROL.  
IT IS NOT A REPLACEMENT FOR A MONITORING  
DEVICE SUBJECT TO AUTHORISATION!

## GCO 100

Art. no. 600062

Compact CO - measuring device with alarm

## General:

Carbon monoxide (CO) is created by the combustion of carbon. Depending on the effectiveness of the combustion (oxygen supply) and the temperature of the combustion more or less CO gas is created. The gas is inflammable and highly toxic. It is invisible, tasteless and scentless.

**Even smallest concentrations are dangerous for humans!**

Therefore a directive exists in Germany, which limits the maximum concentration of CO gas at work (MAK / AGW) to 30 ppm.

## Application:

- Control of the air quality (e.g. at work place)
- Checking of heating systems, gas central-heating, fireplace
- Control of the air at maintenance work (tunnel, flue gas tract, ...)
- Detection of CO in the breath of smoker (% CO Hb)
- Cognition of CO poisoning i.e. at burnt offering (fire fighters, ...)

## Specifications:

<b>Measuring principle:</b>	electrochemical CO measuring cell
<b>Measuring range:</b>	0 ... 1000 ppm CO concentration
<b>Display ranges:</b>	0 ... 1000 ppm CO concentration 0 ... 1250 mg/m <sup>3</sup> CO concentration 0 ... 60.0 % CO Hb (estimation via exhaled breath gas)
<b>Resolution:</b>	1 ppm, 1 mg/m <sup>3</sup> or 0.1 % CO Hb
<b>Sensor element:</b>	integrated in device, measuring inlet at front plate, with inner thread for accessories screw in
<b>Life time:</b>	>5 years at proper usage at air suggested test interval: every 6 months (depending on precision requirements)

## Accuracy: (at range 0 ... 500 ppm)

<b>Linearity:</b>	<±5 % of measured value ±1 digit
<b>Repeatability:</b>	<±5 % of measured value ±1 digit

## Interference (extract)

	Concentration (ppm)	Residence time (min.)	Display (ppm)
<b>Sulphur dioxide</b>	50	600	<1
<b>Nitrogen dioxide</b>	50	900	-1
<b>Nitric oxide</b>	50	5	8
<b>Hydrogen</b>	100	5	20
<b>Carbon dioxide</b>	5000	5	0

<b>Display:</b>	approx. 11 mm high, 4½-digit LCD-display
<b>Pushbuttons:</b>	3 membrane keys
<b>Nominal temperature:</b>	25 °C
<b>Operating conditions:</b>	-10 ... +50 °C, 15 ... 90 % RH (non-condensing)
<b>Storage temperature:</b>	-10 ... +50 °C
<b>Interface:</b>	Serial interface, direct connection to RS232 or USB interface of a PC via electrically isolated interface adapter

<b>Power supply:</b>	9V battery as well as additional d.c. connector for external 10.5 ... 12 V direct voltage supply. (suitable power supply: GNG 10/3000)
<b>Battery life:</b>	>1000 h
<b>Housing:</b>	Impact-resistant ABS plastic housing, membrane keyboard, transparent panel, integrated pop-up clip
<b>Dimensions:</b>	142 x 71 x 26 mm (H x W x D)
<b>Weight:</b>	approx. 155 g
<b>Scope of supply:</b>	Device, battery, calibration protocol, manual

## Accessories and spare parts:

## ESA 100

Art. no. 603013

Tube adapter, flowdiverter to screw in front plates.

## ZOT 369

Art. no. 603094

T-piece to plug on ESA 369 / ESA 100

## GRV 100

Art. no. 603093

unidirectional valve to be plugged on ZOT 369 T-piece

## MSK 100

Art. no. 603012

Mouth peace, plastic

## GAS 100

Art. no. 603587

Extension set for inhaled air control  
(consisting of ESA 100, ZOT 369, GRV 100 and 5 x MSK 100)

## GZ-10

Art. no. 603133

Test gas cap GCO (for controlled flow with test gas)

## GZ-02

Art. no. 606710

Gas bottle with 12l test gas: 30 ppm CO

## GZ-03

Art. no. 606711

Gas bottle with 12l test gas: 300 ppm CO

## GZ-04

Art. no. 603570

Gas valve unit MiniFlo for gas bottles with 12l

## GB 9 V

Art. no. 601115

Spare battery 9V, type IEC 6F22

## GKK 3000

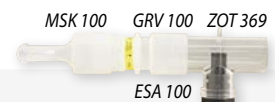
Art. no. 601048

Device case soft lining for 1x GMH 3000 (275 x 229 x 83 mm)

## USB 3100 N

Art. no. 601092

Interface Converter GMH3xxx &lt;=&gt;PC, USB, electrical isolated





## INDOOR AIR QUALITY MONITORS



AIR QUALITY

## HIGHLIGHTS:

- Indoor air quality permitting calculation of automatic ventilation rate by CO<sub>2</sub> analysis correlate to the real presence of people in the rooms

## HD21-ABE-17

Art. no. 409559

Indoor air quality monitors

## General:

HD21-AB-17 IAQ Monitor is a bench-top/portable instrument manufactured by Delta Ohm for the analysis of indoor air quality (IAQ, Indoor Air Quality).

**The instrument simultaneously measures the parameters:**

- Carbon Dioxide CO<sub>2</sub>
- Carbon Monoxide CO
- Atmospheric Pressure
- Temperature
- Relative Humidity

**and it calculates:**

- Dew Point
- Wet Bulb Temperature
- Absolute Humidity
- Mixing Ratio
- Enthalpy

These regulations apply to all confined spaces that could be used by people. Kitchens, baths, changing rooms and swimming pools are included, due to their high humidity. You should take into account, in regard to air quality, possible chemical, physical and biological contaminants. The instruments have a wide Dot Matrix graphic display with a resolution of 160 x 160 dots.

**The instruments typical applications are:**

- Measurement of IAQ (Indoor Air Quality) and comfort conditions in schools, offices and indoor spaces.
- Analysis and study of the Sick Building Syndrome, and of the resulting consequences.
- Checking the HVAC (Heating, Ventilation and Air Conditioning) system efficiency.
- Examination of IAQ conditions in factories to optimize microclimate and improve productivity.
- Building Automation checks.

## Specifications:

## Device

<b>Dimensions:</b>	300 x 90 x 40 mm (H x W x D) (with probe)
<b>Material:</b>	ABS, rubber
<b>Display:</b>	Backlight, Dot Matrix, 160 x 160 dots, visible area 52 x 42 mm

## Operating conditions

<b>Working temperature:</b>	-5 ... +50 °C
<b>Storage temperature:</b>	-25 ... +65 °C
<b>Working relative humidity:</b>	0 ... 85 % RH without condensation
<b>Protection rating:</b>	IP30
<b>Instrument uncertainty:</b>	±1 digit @ 20 °C

## Power supply

<b>Mains adapter (Code SWD-10):</b>	12 V DC/1 A
<b>Batteries:</b>	4 x 1.2 V Ni-MH rechargeable batteries AA type
<b>Autonomy:</b>	8 h of continuous use in measure mode

## Serial interface

<b>Socket:</b>	mini-USB
<b>Type:</b>	USB 1.1 or 2.0 not insulated
<b>Storage capacity:</b>	67.600 recordings

## Scope of supply:

IAQ Monitor datalogger kit. Complete with: DeltaLog10 software (version 0.1.5.3 and later), monitor, and data processing on Personal Computer, 4 x 1.2 V NiMH rechargeable batteries, manual, case, with USB cable and mains adapter

CO<sub>2</sub> Carbon Dioxide

<b>Sensor:</b>	NDIR Dual Wavelength (two frequencies)
<b>Measuring range:</b>	0 ... 5.000 ppm
<b>Sensor working range:</b>	-5 ... +50 °C
<b>Accuracy:</b>	±50 ppm ±3 % of measurement
<b>Resolution:</b>	1 ppm
<b>Temperature dependence:</b>	0.1 % f.s./°C
<b>Response time (T<sub>90</sub>):</b>	<120 s (air speed = 2 m/s)

## CO Carbon Monoxide

<b>Sensor:</b>	Electrochemical cell
<b>Measuring range:</b>	0 ... 500 ppm
<b>Sensor working range:</b>	-5 ... +50 °C
<b>Accuracy:</b>	±3 ppm ±3 % of measurement
<b>Resolution:</b>	1 ppm
<b>Response time (T<sub>90</sub>):</b>	<50 s
<b>Service life:</b>	>5 years in normal environment conditions

## Atmospheric Pressure (Patm)

<b>Type of sensor:</b>	Piezo-resistive
<b>Measuring range:</b>	750 ... 1.100 hPa
<b>Accuracy:</b>	±1.5 hPa @ 25 °C
<b>Resolution:</b>	1 hPa
<b>Temperature drift:</b>	±3 hPa with temperature -20 ... +60 °C

## Relative Humidity (RH)

<b>Type of sensor:</b>	Capacitive
<b>Sensor protection:</b>	Stainless steel grid filter (on request 10 µm sintered filter P6 in AISI 316 or 20 µm sintered filter P7 in PTFE)
<b>Measuring range:</b>	0 ... 100 % RH
<b>Sensor working range:</b>	-20 ... +60 °C
<b>Accuracy:</b>	±1.5 % RH (0 ... 90 % RH) ±2 % RH (elsewhere) for T=15 ... 35 °C ±(1.5 +1.5 % of the measure) % RH for T= -20 ... +60 °C
<b>Resolution:</b>	0.1 °C
<b>Temperature dependence:</b>	±2 % on all temperature range
<b>Hysteresis and repeatability:</b>	1 % RH
<b>Response time (T<sub>90</sub>):</b>	<20 s (air speed = 2 m/s) without filter

## Temperature T

<b>Sensortyp:</b>	NTC 10 kΩ
<b>Measuring range:</b>	-20 ... +60 °C
<b>Accuracy:</b>	±0.2 °C ±0.15 % of measurement
<b>Resolution:</b>	0.1 °C
<b>Response time (T<sub>90</sub>):</b>	<30 s (air speed = 2 m/s)

## Accessories:

## SWD-10

Art. no. 700039

Stabilized power supply at -100-240 V AC/12V DC/-1 A mains voltage.

## CP-23

Art. no. 475163

Connection cable with type B MiniUSB connector on instrument's side and USB 2.0 connector on PC's side.

## BAT-40

Art. no. 700051

Spare batteries with built-in temperature sensor.

## MINICAN-12-A-0

Art. no. 475309

Gas can with testgas for CO and CO<sub>2</sub> calibration at 0 ppm, Gas cylinder with 20 l test gas: N<sub>2</sub>

## HD-37-36

Art. no. 700053

Anschlussrohr-Set für CO-Kalibrierung

## HD-37-37

Art. no. 700054

Connection tube kit between HD21-ABE and MINICAN, for CO<sub>2</sub>-calibration

## HD-33-0

Art. no. 700055

Humidity reference cell incl. adapter, 33 % r.h.

# PRESSURE



	GMH 5130 GMH 5150 GMH 5155	GMH 3111 GMH 3151 GMH 3156	GMH 3161-12 GMH 3181-12	GMH 3161-002 / -01 / -07... / -13	GMH 3181-002 / -01 / -07... / -13	GDH 200-07 GDH 200-13	GDH 200-14	GPB 3300 GTD 1100 GDH 200-11	GDSB 1000
<b>APPLICATION:</b>									
Relative pressure meas. (over, under- and pressure difference)	• • •	• • •		•	•	• •			•
Absolute pressure measuring	• • •	• • •	• •				•	• • •	•
Heating, ventilation, climate	• • •	• • •	• •	•	•	• •	•	• • •	•
Measuring in liquids	• • •	• • •							•
Vacuum measuring	• • •	• • •	• •				•	• • •	•
Meteorology			• •				•	• •	
Altitude measuring (sports)								•	
Water-proof application	• • •								
Ex-protection		• • •	• •	•	•				
<b>EQUIPMENT:</b>									
Plug-in probe	1 1 2	1 1 2							1
Min/Max, Zero	• • •	• • •	• •	•	•	• •	•	• • •	•
Alarm / Data logger / Analog output	• •	• •	•		•				
<b>DEVICE INFORMATION:</b>									
Catalogue page	Page 83	Page 84 / 85	Page 92	Page 91 - 93	Page 91 - 93	Page 93	Page 94	Page 95	Page 87

HANDHELD INSTRUMENTS

SOFTWARE

ACCESSORIES

ALARM / PROTECTION, LEVEL

## WATER-PROOF HANDHELD DEVICE FOR PRESSURE MEASUREMENT WITH EXTERNAL CHANGEABLE PROBES



WATER-PROOF DEVICE AND  
PLUG-IN CONNECTIONS



GMH 5130 / 50



GMH 5155

## HIGHLIGHTS:

- Peak value detection (1000 measurements / s)
- Large double display with background illumination
- Calibrated and fully interchangeable pressure probes
- incl. calibration protocol

## ADDITIONAL FUNCTIONS GMH 5150 AND 5155:



## ADDITIONAL FUNCTIONS GMH 5155:

- 2 GMSD/MSD-probes connectable.
- Difference measurement of two probes

SUITABLE PRESSURE PROBES  
P. R. T. PAGE 88 / 89

## GMH 5130

Art. no. 600027

Waterproof handheld device for pressure measurement with 1 sensor connection, without sensor

## GMH 5150

Art. no. 600031

Waterproof handheld device for pressure measurement with 1 sensor connection, analog output and data logger, without sensor

## GMH 5155

Art. no. 600033

Waterproof handheld device for pressure measurement with 2 sensor connections, analog output and data logger, without sensors

## General:

This handheld instrument is a valuable tool for demanding pressure measurements. Extremely robust plug connections, the silicone protection cover, backlight and a water-proof design allow its usage in harsh industrial and field environments.

## Application:

- Industry and craft, HVAC: heating, ventilation, air-conditioning
- Leakage test / pressure test
- Chimney draft measurement: under pressure, leakage test at buildings (i.e. 4 Pascal test)
- Measurements of gas and oil firings
- Automobile trade, hydraulic analysis (peak pressure)

Specifications:	GMH 5130
<b>Sensor connections:</b>	1
<b>Suitable probes:</b>	GMSD / MSD sensors, available ranges (resolutions) from -1.999 ... 2.500 mbar (0.001 mbar) to 0 ... 1000 bar (1 bar)
<b>Display range max.:</b>	-19999 ... +19999 digit
<b>Display unit: *</b>	depends on measuring range selection and sensor: mbar, bar, Pa, kPa, MPa, mmHg, inHg, PSI, mH <sub>2</sub> O
<b>Measuring frequency:</b>	4 measurements / s or 1000 measurements / s with peak value memory
<b>Average filter:</b>	adjustable: 1 ... 120 s
<b>Accuracy:</b>	±0.1 % FS ±1 digit
<b>Connections</b>	
<b>Sensor:</b>	1 x 7-pole bayonet connector
<b>Output / external supply:</b>	4-pole bayonet connector for serial interface, supply (with accessories: USB adapter USB 5100)
<b>Display:</b>	4 ½ digit 7-segment, illuminated (white)
<b>Operating conditions:</b>	-25 ... +50 °C, 0 ... 95 % RH (non-condensing)
<b>Storage temperature:</b>	-25 ... +70 °C
<b>Power supply:</b>	2 x AAA-battery, battery life 500 h (without illumination, 4 measurings / s)
<b>Housing:</b>	impact resistant ABS housing with pop-up clip
<b>Protection class:</b>	IP65 / IP67
<b>Dimensions:</b>	160 x 86 x 37 mm (H x W x D) incl. silicone protection cover (red)
<b>Weight:</b>	approx. 250 g incl. battery and protection cover
<b>Scope of supply:</b>	Device, battery, calibration protocol, manual

Specifications:	GMH 5150 and GMH 5155
<b>Sensor connections:</b>	1, GMH 5155: 2
<b>Suitable probes:</b>	GMSD / MSD sensors, available ranges (resolutions) from -1.999 ... 2.500 mbar (0.001 mbar) to 0 ... 1000 bar (1 bar)
<b>Display range max.:</b>	-19999 ... +19999 digit
<b>Display unit:</b>	depends on measuring range selection and sensor: mbar, bar, Pa, kPa, MPa, mmHg, inHg, PSI, mH <sub>2</sub> O, user
<b>Measuring frequency:</b>	4 measurements / s or 1000 measurements / s with peak value memory
<b>Average filter:</b>	adjustable: 1 ... 120 s
<b>Accuracy:</b>	±0.1 % FS ±1 digit
<b>Connections</b>	
<b>Sensor:</b>	1 x 7-pole bayonet connector GMH 5155 only: 2 x 7-pole bayonet connector
<b>Output / external supply:</b>	4-pole bayonet connector for serial interface, supply (with accessories: USB adapter USB 5100)
<b>Analog output:</b>	0 ... 1 V, freely adjustable, connection with 4-pole bayonet connector, resolution 12 bit
<b>Display:</b>	4 ½ digit 7-segment, illuminated (white)
<b>Operating conditions:</b>	-25 ... +50 °C, 0 ... 95 % RH (non-condensing)
<b>Storage temperature:</b>	-25 ... +70 °C
<b>Power supply:</b>	2 x AAA-battery, battery life 500 h (without illumination, 4 measurings / s)
<b>Housing:</b>	impact resistant ABS housing with pop-up clip
<b>Protection class:</b>	IP65 / IP67
<b>Dimensions:</b>	160 x 86 x 37 mm (H x W x D) incl. silicone protection cover (red)
<b>Weight:</b>	approx. 250 g incl. battery and protection cover
<b>Scope of supply:</b>	Device, battery, calibration protocol, manual

## Additional functions:

**Additional Display for Battery:** Bar graph display

**Background Illumination:** duration adjustable (off, 5 s ... 2 min.)

**Adjustment:** offset / slope adjustable in menu

**User-defined displayed unit: (user, GMH 5150/55)**  
conversion to any unit with help of linear factor

**Leakage test function (GMH 5150/55):**  
leak rate display, leak rate alarm (/s, /min, /h)

**Air velocity / flow volume (GMH 5150/55):**  
Pitot tube measurement (accessories)

**peak-detect (Peak value memory):**  
The min- / max- value memory stored unfiltered pressure peaks ≥ 1 ms

**Logger function:**  
with measuring point input, adjustable cycle time: 1 s ... 1 h, recording time: 416 days at intervall 1 h, data logger: cyclic: 10.000 data sets (GMH 5150), 8.000 data sets (GMH 5155); manual: 1.000 data sets (with measuring point input, 40 adjustable measuring point texts or measuring point numbers)

\* = Note to the pressure unit selection:

The choice of a specific pressure unit is possible, if its whole measuring range is displayable within the display of the device and the sensor is supporting these resolution.



ACCESSORIES

Accessories and spare parts:

**GMSD ... - K51**

pressure sensors (p.r.t. page 87) Application field: non-aggressive gases for over / under pressure and difference pressure meas. or absolute pressure meas.



**MSD ...**

pressure sensors / stainless steel (p.r.t. page 88) Application field: air, aggressive gases for over / under pressure and relative pressure meas. or absolute pressure meas.



**MSD-K51**

Art. no. 603809

Connecting cable for MSD sensor to GHM 51xx, 1 m

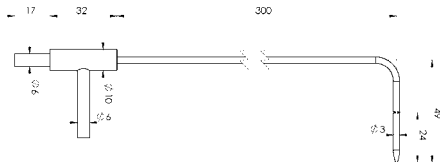
**Prandtl-Staurohr**

Art. no. 604150

(made of stainless steel)

for air velocity / flow volume measurement Ø = 3 mm, NL = 300 mm, max. 600 °C

GMSD 2,5 MR-K51 or GMSD 25 MR-K51 are required



**GDZ-01**

Art. no. 601541

PVC tube 6/4 (6 mm outer Ø, 4 mm inner Ø) (5 bar at 23 °C)



**GDZ-30**

Art. no. 601601

Adapter G1/2" inner to tube 6/4

**EBS 20M**

Art. no. 601158

Measuring data acquisition software for EASYBus & GMH (p.r.t. page 109)

**GSOFT 3050**

Art. no. 601336

Windows software for GMH 3000 and GMH 5000 with logger for operation of logger devices (p.r.t. page 110)

**USB 5100**

Art. no. 601095

Interface converter GMH 5xxx <=> PC

**GNG 5 / 5000**

Art. no. 602287

Plug in power supply for devices of the series GMH 5XXX (p.r.t. page 115)

**GKK 3500**

Art. no. 601052

Device case soft lining e.g. for 2x GMH 3000 or 5000 (394 x 294 x 106 mm)



ISO

AUTO OFF

HOLD

MIN MAX

O/S-CORR

TARA

HAND-HELD PRESSURE MEASURING DEVICE



HIGHLIGHTS:

- One device for any measuring range (2.500 mbar ... 1000 bar)
- Calibrated and fully interchangeable pressure probes

SUITABLE PRESSURE PROBES  
P.R.T. PAGE 88 / 89



**GMH 3111**

Art. no. 600374

Hand-held pressure measuring device with 1 sensor input, without sensor

**GMH 3111-EX**

Art. no. 600380

Hand-held pressure measuring device with 1 sensor input, without sensor, Ex

Specifications:	
<b>Max. display range:</b>	-19999 ... +19999 digit
<b>Measuring range:</b>	corresponding to used probe
<b>Überlast:</b>	corresponding to used probe
<b>Resolution:</b>	corresponding to used probe
<b>Accuracy: (device)</b>	±0.1 % FS ±1 digit (at nominal temperature = 25 °C)
<b>Pressure units: *</b>	mbar, bar, Pa, kPa, MPa, mmHg, PSI, mH <sub>2</sub> O, can be selected
<b>Probe connection:</b>	1 sensor socket 6-pin lockable Mini-DIN-socket(s) for GMSD/MSD-sensors. Automatic probe detection and setting of measuring range upon plugging in of probe.
<b>Display:</b>	2 x 4½ digit LCD
<b>Output:</b>	Interface
<b>serial interface:</b>	direct connection to RS232 or USB interface of a PC via electrically isolated interface converter GRS 3100, GRS 3105 or USB 3100 N.
<b>Power supply:</b>	9 V battery, d.c. connector for external 10.5 ... 12 V direct voltage supply. (suitable power supply: GNG10/3000)
<b>Sensor adjustment:</b>	digital offset and scale input
<b>Measuring cycle:</b>	4 measurements / s
<b>Battery life:</b>	approx. 120 h
<b>Operating conditions:</b>	-25 ... +50 °C, 0 ... 95 % RH, <b>GMH 3111-EX:</b> -10 ... +50 °C, 0 ... 95 % RH
<b>Housing:</b>	impact-resistant ABS plastic housing, foil keypad, clear viewing pane; <b>GMH 3111 only:</b> integrated pop-up clip for table top or suspended use.
<b>Dimensions:</b>	142 x 71 x 26 mm (H x B x D)
<b>Weight:</b>	approx. 150 g, <b>GMH3111-EX:</b> approx. 190 g (incl. leather case)
<b>Scope of supply:</b>	Device, battery, calibration protocol, manual

Note to Ex-design types:

**Technical changes compared to standard instrument (valid for all GMH31xx-EX)**

**Ex qualification** Ex II 2 G Ex ib IIC T4 Gb

**Ref. document:** EPS 09 ATEX 1 227 X

**Standards:**

The device meets the standards for electric resources in explosion endangered areas according to EN 60079-0 : 2012, EN 60079-11 : 2012

**Sensor:**

(GMH 3111-EX, GMH 3151-EX, GMH 3156-EX)  
All GMSD sensors with option „Ex type“ can be used.

**Interface:**

suitable interface adapter are USB 3100 N, GRS 3100 and GRS 3105

**Please note:** The operation of the interface is not allowed within the Ex area!

**Working temperature:** -10 ... +50 °C

**Power supply:** 9 V battery, d.c. connector

**Please note:** the use of d.c. connector is not allowed within the Ex area! Just d.c. connectors of type GNG10/3000 can be used.

**Alarm function:**

(GMH 3151-EX, GMH 3156-EX, GMH 3181-EX)  
The device is without a horn, in the alarm settings are only the parameter „no so“ and „off“ adjustable.

**Scope of supply:**

device with associated leather case



**\* Note to the pressure unit selection: (information for all GMH 31xx)**

The choice of a specific pressure unit is possible, if its whole measuring range is displayable within the display of the device and the sensor is supporting these resolution.



## PRESSURE MEASURING DEVICE WITH LOGGER



## LOGGER FUNCTION



GMH 3151



GMH 3156

## HIGHLIGHTS:

- 4½-digit display, probes with higher resolution up on request
- Peak value memory 1000 measurements / s
- Analog output 0 ... 1 V
- Digital adjustable
- Integrated horn

## ADDITIONAL FUNCTIONS GMH 3156:

- 2 GMSD/MSD-probes connectable.
- Difference measurement of two probes

SUITABLE PRESSURE PROBES  
P.R.T. PAGE 88 / 89

**GMH 3151**

Art. no. 600381

Hand-held pressure measuring device with 1 sensor input, logger, without sensor

**GMH 3156**

Art. no. 600386

Hand-held pressure measuring device with 2 sensor inputs, logger, without sensor

**GMH 3151-EX**

Art. no. 600383

Hand-held pressure measuring device with 1 sensor input, logger, without sensor, Ex (see previous page for information on Ex versions)

**GMH 3156-EX**

Art. no. 600394

Hand-held pressure measuring device with 2 sensor inputs, logger, without sensor, Ex (see previous page for information on Ex versions)

**Specifications:**

<b>Max. display range:</b>	-19999 ... +19999 digit
<b>Measuring range:</b>	corresponding to used probe
<b>Overload:</b>	corresponding to used probe
<b>Resolution:</b>	corresponding to used probe
<b>Accuracy (device):</b>	±0.1 % FS ±1 digit (at nominal temperature = 25 °C)
<b>Pressure units*:</b>	mbar, bar, Pa, kPa, MPa, mmHg, PSI, mH <sub>2</sub> O, can be selected.
<b>Probe connection:</b>	1, <b>GMH 3156/-EX:</b> 2 6-pin screened lockable Mini-DIN-socket(s) for GMSD/MSD-sensors. Automatic probe detection and setting of measuring range upon plugging in of probe.
<b>Display:</b>	2 x 4½ digit LCD
<b>Output:</b>	serial interface or AAG
<b>Serial interface:</b>	direct connection to RS232 or USB interface of a PC via electrically isolated interface converter GRS 3100, GRS 3105 or USB 3100 N.
<b>Analog output:</b>	0 ... 1 V, freely adjustable (resolution 12 bit)
<b>Power supply:</b>	9 V-battery, d.c. connector * for external 10.5 ... 12 V direct voltage supply. (i. e. GNG10/3000)
<b>Sensor adjustment:</b>	digital offset and scale input
<b>Measuring cycle: „slow“</b>	4 measurements / s
<b>„fast“ / „peak-detect“</b>	≥1000 measurements / s
<b>peak-detect:</b>	The min- / max- value memory stored unfiltered pressure peaks ≥1 m

**Logger functions**

<b>manually data sets:</b>	99 data sets
<b>cycle data sets:</b>	10000 <b>GMH 3156/-EX:</b> 4000 (max. 64 recording sequences)

**adjustable cycle time:** 1 ... 3600 s**Averaging function:** x**Battery life:** approx. 180 h (4 measurements / s)  
approx. 40 h (1000 measurements / s)**Operating conditions:** -25 ... +50 °C, 0 ... +95 % RH (non-condensing),  
**GMH 315x-EX:**  
-10 ... +50 °C, 0 ... 95 % RH (non-condensing)**Housing:** impact-resistant ABS plastic housing, foil keypad, clear viewing pane  
**GMH315x-EX only:**  
pop-up clip for table top or suspended use.**Dimensions:** 142 x 71 x 26 mm (H x W x D)**Weight:** approx. 150 g,  
**GMH 315x-EX:** approx. 190 g (incl. case)**Scope of supply:** Device, battery, calibration protocol, manual**Additional functions:****Averaging function:** integrates the meas. values during a selectable period of time and then calculates the average display value.**Sea-Level-correction:** when connecting an abs. pressure probe the barom. air pressure can also be displayed corrected to sea level, „zero“. (Air pressure compensation achieved by entering the meters above sea level, „zero“)**Logger Functions:**- manual: 99 data sets  
- cyclic: 10000 data sets (GMH 3151)  
4000 data sets (GMH 3156)

(max. 64 Aufzeichnungsreihen), adjustable cycle time: 1 ... 3600 s; The logger is started or stopped by keypad or interface. The software GSOFT3050 (see accessories) is available for comfortable read-out of logger data.

**\* Note to the pressure unit selection: (information for all GMH 31xx)**

The choice of a specific pressure unit is possible, if its whole measuring range is displayable within the display of the device and the sensor is supporting these resolution.

## TUBE, TUBE CLIPS, ADAPTER, COUPLINGS, ETC.



## for GMH31xx, GMSD, MSD, GDHs and pressure measuring transducers

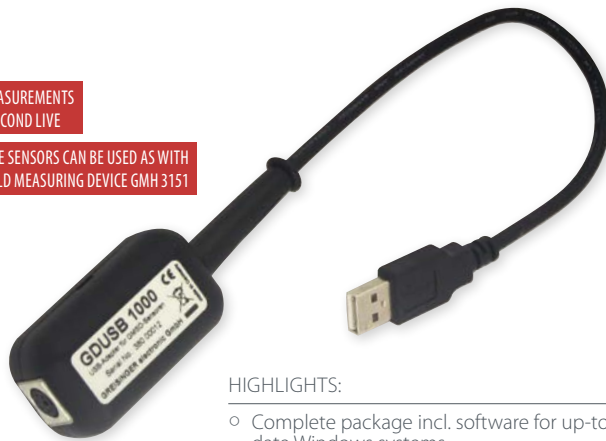
- GDZ-01**  
Art. no. 601541  
PVC-tube 6/4 (6 mm outside-Ø, 4 mm inside-Ø) (5 bar @ 23 °C)
- GDZ-02**  
Art. no. 601543  
PE (polyethylene) 6/4 (6 mm outside-Ø, 4 mm inside-Ø) (10 bar @ 23 °C)
- GDZ-03**  
Art. no. 601545  
PUR (polyurethane) 6/4 (6 mm outside-Ø, 4 mm inside-Ø) (9 bar @ 23 °C)
- GDZ-04**  
Art. no. 601547  
PA (polyamide) 6/4 (6 mm outside-Ø, 4 mm inside-Ø) (25 bar @ 23 °C)
- GDZ-05**  
Art. no. 601549  
Screw-type glanding for 6/4 tube with outside thread G1/8"
- GDZ-06**  
Art. no. 601551  
Increaser glanding for 6/4 tube with inside thread G1/8"
- GDZ-08**  
Art. no. 601555  
Double adapter for 6/4 tube to 6/4 tube
- GDZ-09**  
Art. no. 601557  
Coupling adapter (NW5) made of brass with inside thread G1/4" (suitable for GDZ-12)
- GDZ-10**  
Art. no. 601559  
Coupling adapter (NW5) made of brass for tube with 6 mm inside-Ø (suitable for GDZ-12)
- GDZ-11**  
Art. no. 601561  
Coupling adapter (NW5) made of brass with outside thread G1/4" (suitable for GDZ-12)
- GDZ-12**  
Art. no. 601564  
Coupler socket (NW5) made of brass (single-hand use) with inside thread G1/4"
- GDZ-13**  
Art. no. 601566  
Increaser/reducer made of brass with G1/2" outside thread and G1/8" inside thread
- GDZ-14**  
Art. no. 601567  
Screw-in nozzle for 6/4 tube with outside thread G1/8"
- GDZ-15**  
Art. no. 601570  
Screw-in nozzle for tube with 6 mm inside-Ø with outside thread G1/4"
- GDZ-16**  
Art. no. 601572  
Screw-in nozzle for 6/4 tube with outside thread G1/4"
- GDZ-17**  
Art. no. 601574  
Screw-in connection for 6/4 tube with outside thread G1/4"
- GDZ-18**  
Art. no. 601576  
Tube clamp for 6/4 tube
- GDZ-19**  
Art. no. 601578  
Tube clamp for 8/6 tube (8 mm outside-Ø and 6 mm inside-Ø)
- GDZ-20**  
Art. no. 601580  
Screw-on connection made of brass for 6/4 tube with inside thread G1/4"
- GDZ-21**  
Art. no. 601582  
T-piece for 6/4 tubes
- GDZ-22**  
Art. no. 601584  
Coupling adapter (NW5) made of brass with tube connection 6/4 (suitable for GDZ-12)
- GDZ-23**  
Art. no. 601586  
G1/2" female to G1/4" male adapter, brass
- GDZ-27**  
Art. no. 601594  
Manometer profile gasket (thickness 3 mm, Cu)
- GDZ-28**  
Art. no. 601597  
Flat gasket (thickness 5 mm, Cu) for thread G1/2"
- GDZ-29**  
Art. no. 601599  
Filter-Membrane incl. Luer-Locks (GDZ-32 and GDZ-33)
- GDZ-30**  
Art. no. 601601  
Adapter G1/2" inside thread to tube 6/4
- GDZ-31**  
Art. no. 606070  
Silicone tube 8/5 (8 mm outer / 5 mm inner) (2 bar at 23 °C) temperature-resistant up to 200 °C, very flexible
- GDZ-32**  
Art. no. 607951  
Luer-lock male to hose 6/4
- GDZ-33**  
Art. no. 607952  
Luer-lock female to hose 6/4
- GWA 1214**  
Art. no. 603979  
Adapter G1/4" inside thread to G1/2" outside thread
- GOG-N**  
Art. no. 603047  
needle, Ø 0.9 mm - suitable to Luer-Lock male (5 pieces) (without picture)

## UNIVERSAL PRESSURE MEASUREMENT SYSTEM



1000 MEASUREMENTS  
PER SECOND LIVE

THE SAME SENSORS CAN BE USED AS WITH  
HANDHELD MEASURING DEVICE GMH 3151



SUITABLE PRESSURE PROBES  
P.R.T. PAGE 88 / 89

## HIGHLIGHTS:

- Complete package incl. software for up-to-date Windows systems
- Live display before and live diagram display

## GDUSB 1000

Art. no. 600271

Complete package for high-speed live data acquisition for GMSD/MSD sensors incl. software for high-speed live measurement data logging GDUSB FastView

## General:

The GDUSB 1000 adapter allows to connect a standard pressure sensor of type GMSD / MSD directly to the USB interface of a PC. It provides 4 channels, i.e. currently measured value, average value, max and min value. There are two operation modes:

## Fast mode:

Up to 1000 measured values per second. The provided software displays the data and records for later usage. The software can be configured to start or stop the recording with several selectable trigger conditions

## Standard mode:

Up to 32 measurements per second. A GDUSB 1000 in standard mode can be responded similarly to GMH handheld devices or EASYBus modules. Then a long term recording can be archived with the software EBS 20M / EBS 60M (2 measurements per second).

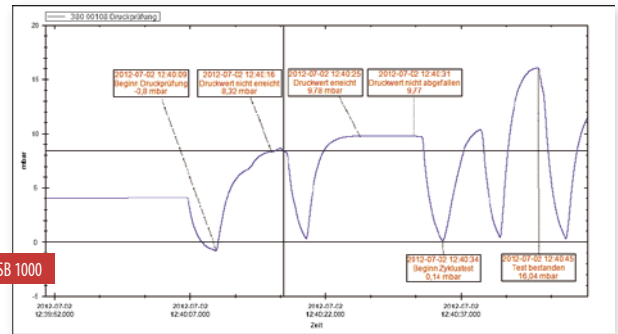
## Application:

- Test rigs and laboratory experiments
- Detection of pressure peaks
- Monitoring system pressure curves e.g. for process technology, engineering, etc.
- Live displaying of measuring data of several GDUSB 1000
- Data evaluation and logging, for optimization of processes and other statistics
- Multi-channel measurements with high recording rate
- Test setups or on-site recordings with GDUSB 1000

## Specifications:

<b>Measuring range:</b>	depends on connected sensor
<b>Max. range:</b>	-19999 ... +19999 digit
<b>Pressure units:</b>	mbar, bar, Pa, kPa, MPa, mmHg, PSI, mH <sub>2</sub> O, selectable, depending on connected sensor
<b>Measuring rate:</b>	1000 measurements / s (= 1 ms)
<b>Accuracy:</b>	±0.2 % FS (at nominal temperature = 25 °C)
<b>Recording interval:</b>	1 ms (FAST mode) ... 10 s, adjustable via software
<b>Connections</b>	
<b>PC:</b>	standard USB plug (type A)
<b>GMSD / MSD:</b>	6-pole screened mini-DIN socket with locking
<b>Power supply:</b>	supplied by USB interface
<b>Dimensions:</b>	56 x 31 x 24 mm
<b>Cable length (USB):</b>	approx. 20 cm
<b>Weight:</b>	39 g (device only)
<b>Scope of supply:</b>	Device, manual, software- and driver-CD

## HIGH-SPEED LIVE MEASUREMENT



## GDUSB FastView

Software for high-speed live measurement data logging of fast pressure measurements

## Functions:

- Several GDUSB 1000 usable at one PC at the same time
- Measuring rates up to 1000 measurements per second
- Live display with current value and measurement diagram, even for highest measuring rates
- Different measuring rates for each sensor selectable
- Safe storage of measurement and sensor data in a SQL based data base
- Fast diagram display
- Comment function for measured values
- Data export as CSV file and as picture
- Multi-language software (German, English, French, Italian, Czech)
- 32-bit or 64-bit application

## System requirements:

1GHz CPU, 1GB RAM, 100 MB HDD, 1 available USB Port  
Microsoft Windows 7 SP1 (32 or 64 bit)  
(not executable with Windows RT, ARM or Intel Itanium based Windows systems)

*This software uses open-source components under LGPL conditions.  
The license terms of this software provide further information.*

## PLASTIC PRESSURE SENSORS WITH TUBE CONNECTION



FOR AIR AND NON  
AGGRESSIVE GASES

**General:**

for use with  
**GMH 31xx, GDU5B:** Type GMSD ... -K31,  
**GMH 51xx:** Type: GMSD ... -K51

**Application:**

air and non aggressive gases  
*Plastic pressure sensors are not suitable for water / liquids.*

## SENSORS FOR MEASURING PRESSURE DIFFERENCE GMSD...

for differential pressure measuring (both pressures are connected) as well as for relative pressure measuring (pressure / vacuum, one terminal is left open)

	GMSD 2.5 MR ..	GMSD 25 MR ..	GMSD 350 MR ..	GMSD 2 BR ..	GMSD 10 BR ..
<b>Measuring range:</b>	-1.999 ... +2.500 mbar	-19.99 ... +25.00 mbar	-199.9 ... +350.0 mbar	-1000 ... +2000 mbar	-1.00 ... +10.00 bar
<b>Overload:</b>	max. 200 mbar	max. 300 mbar	max. 1 bar	max. 4 bar	max. 10.34 bar
<b>Resolution:</b>	0.001 mbar (0.1 Pa)	0.01 mbar (1 Pa)	0.1 mbar	1 mbar	10 mbar
<b>Accuracy (typ.)</b>					
<b>Hysteresis / linearity:</b>	±0.2 % FS	±0.2 % FS	±0.2 % FS	±0.2 % FS	±0.2 % FS
<b>Temperature influence (from 0 ... 50 °C):</b>	±1.0 % FS	±0.5 % FS	±0.4 % FS	±0.4 % FS	±0.4 % FS
<b>OPTION higher probe accuracy:</b>			±0.1 % / ±0.2 % FS	±0.1 % / ±0.2 % FS	±0.1 % / ±0.2 % FS
<b>GMSD ... - K31</b>					
Art. no.	601039	601148	601154	601170	601183
<b>GMSD ... - K51</b>					
Art. no.	601038	601149	601157	601171	601184

## ABSOLUTE PRESSURE SENSORS GMSD...

for absolute pressure measuring (one terminal is without functionality)

	GMSD 1.3 BA ..	GMSD 2 BA ..	GMSD 7 BA ..
<b>Measuring range:</b>	0 ... 1300 mbar abs.	0 ... 2000 mbar abs.	0.00 ... 7.00 bar abs.
<b>Overload:</b>	max. 4 bar abs.	max. 4 bar abs.	max. 10.34 bar abs.
<b>Resolution:</b>	1 mbar	1 mbar	10 mbar
<b>Accuracy (typ.)</b>			
<b>Hysteresis / linearity:</b>	±0.2 % FS	±0.2 % FS	±0.2 % FS
<b>Temperature influence (from 0 ... 50 °C):</b>	±0.4 % FS	±0.4 % FS	±0.4 % FS
<b>OPTION higher probe accuracy:</b>	±0.1 % FS (hysteresis, linearity); ±0.2 % FS (temperature influence 0 ... 50 °C)		
<b>GMSD ... - K31</b>			
Art. no.	601192	601196	601200
<b>GMSD ... - K51</b>			
Art. no.	601193	601197	601201

**Specifications:**

<b>Sensor:</b>	piezoresistive pressure sensor
<b>Pressure connection:</b>	2 connection pins for tubes 6 x 1 mm (6 mm inside-Ø and 4 mm outside-Ø)
<b>Electronics:</b>	PC board with amplifier and data memory for sensor data (measuring range / calibration etc.) integrated in sensor housing
<b>Working temperature:</b>	0 ... +50 °C
<b>Relative humidity:</b>	0 ... +95 % RH (non-condensing)
<b>Storage temperature:</b>	-25 ... +70 °C
<b>Housing:</b>	ABS plastic with suspension eye, dimensions do not incl. connection pin: 68 x 32.5 x 15 mm (H x W x D), dimensions with connection pin: 68 x 32.5 x 27.5 mm.
<b>Weight:</b>	approx. 75 g (...K51: approx. 82 g)
<b>Device connection</b>	
<b>GMSD ... - K31:</b>	1.2 m PVC connection cable, screened with integral 6-pin
<b>GMSD ... - Ex:</b>	Mini-DIN-plug, lockable
<b>GMSD ... - K51:</b>	1 m PVC connection cable, screened with 7-pin bayonet plug
<b>Scope of supply:</b>	Device, calibration protocol, manual

**Options:****Ex-protection****Higher probe accuracy**

by multi point calibration  
Additional individual linearisation points are stored in sensor memory. (not possible for GMSD 2,5 MR and GMSD 25 MR!)

**ISO-WPD5**

Art. no. 602514  
ISO certificates: 5 points ascending, 5 points descending



STAINLESS STEEL PRESSURE SENSORS G $\frac{1}{2}$  INCHFOR AIR, AGGRESSIVE GASES  
AND LIQUIDSFOLLOW-ON TYPE FÜR GMSD-  
STAINLESS-STEEL-SENSORS**MSD...**exchangeable handheld instruments pressure sensors st. steel G $\frac{1}{2}$ B  
Connection cable MSD-K31 or MSD-K51 has to be ordered separately (accessories)**General:**

for use with GMH31xx, GMH 51xx and GDUSB 1000

**Application:**

Air, aggressive gases, aggressive liquids / water, etc.

Abs. pressure	Measuring range	Overload	Resolution
<b>MSD 1 BAE</b> Art. no. 600583	0 ... 1000 mbar abs.	max. 5 bar abs.	1 mbar
<b>MSD 2.5 BAE</b> Art. no. 600585	0 ... 2500 mbar abs.	max. 10 bar abs.	1 mbar
<b>MSD 4 BAE</b> Art. no. 600587	0 ... 4000 mbar abs.	max. 17 bar abs.	1 mbar
<b>MSD 6 BAE</b> Art. no. 600592	0 ... 6000 mbar abs.	max. 35 bar abs.	1 mbar
<b>MSD 10 BAE</b> Art. no. 600594	0 ... 10,00 bar abs.	max. 35 bar abs.	10 mbar
<b>MSD 16 BAE</b> Art. no. 600596	0 ... 16.00 bar abs.	max. 80 bar abs.	10 mbar
<b>MSD 25 BAE</b> Art. no. 600598	0 ... 25.00 bar abs.	max. 50 bar abs.	10 mbar
Rel. pressure	Measuring range	Overload	Resolution
<b>MSD 100 MRE</b> Art. no. 600600	0.0 ... 100.0 mbar rel.	max. 1 bar rel.	0.1 mbar
<b>MSD 250 MRE</b> Art. no. 600604	0.0 ... 250.0 mbar rel.	max. 2 bar rel.	0.1 mbar
<b>MSD 400 MRE</b> Art. no. 600606	0.0 ... 400.0 mbar rel.	max. 2 bar rel.	0.1 mbar
<b>MSD -1/1.5 BRE</b> Art. no. 600608	-1000 ... +1500 mbar rel.	max. 10 bar rel.	1 mbar
<b>MSD -1/3 BRE</b> Art. no. 600610	-1000 ... +3000 mbar rel.	max. 17 bar rel.	1 mbar
<b>MSD 1 BRE</b> Art. no. 600612	0 ... 1000 mbar rel.	max. 5 bar rel.	1 mbar
<b>MSD 2,5 BRE</b> Art. no. 600614	0 ... 2500 mbar rel.	max. 10 bar rel.	1 mbar
<b>MSD 4 BRE</b> Art. no. 600616	0 ... 4000 mbar rel.	max. 17 bar rel.	1 mbar
<b>MSD 6 BRE</b> Art. no. 600618	0 ... 6000 mbar rel.	max. 35 bar rel.	1 mbar
<b>MSD 10 BRE</b> Art. no. 600620	0.00 ... 10.00 bar rel.	max. 35 bar rel.	10 mbar
<b>MSD 25 BRE</b> Art. no. 600622	0.00 ... 25.00 bar rel.	max. 50 bar rel.	10 mbar
<b>MSD 40 BRE</b> Art. no. 600624	0.00 ... 40.00 bar rel.	max. 80 bar rel.	10 mbar
<b>MSD 60 BRE</b> Art. no. 600627	0.00 ... 60.00 bar rel.	max. 120 bar rel.	10 mbar
<b>MSD 100 BRE</b> Art. no. 600629	0.0 ... 100.0 bar rel.	max. 200 bar rel.	0.1 bar
<b>MSD 160 BRE</b> Art. no. 600631	0.0 ... 160.0 bar rel.	max. 320 bar rel.	0.1 bar
<b>MSD 250 BRE</b> Art. no. 600639	0.0 ... 250.0 bar rel.	max. 500 bar rel.	0.1 bar
<b>MSD 400 BRE</b> Art. no. 600633	0.0 ... 400.0 bar rel.	max. 800 bar rel.	0.1 bar
<b>MSD 600 BRE</b> Art. no. 600635	0.0 ... 600.0 bar rel.	max. 1200 bar rel.	0.1 bar
<b>MSD 1000 BRE</b> Art. no. 600637	0 ... 1000 bar rel.	max. 1500 bar rel.	1 bar

**MSD 25 MRE****MSD -20/60 MRE**not suited for aggressive media, water, etc., no Ex design and no option  
„higher accuracy“ available

Rel. pressure	Measuring range	Overload	Resolution
<b>MSD 25 MRE</b> Art. no. 606904	0.00 ... 25.00 mbar	max. 500 mbar	0.01 mbar
<b>MSD -20/60 MRE</b> Art. no. 606765	-20.00 ... +60.00 mbar	max. 500 mbar	0.01 mbar

**Specifications:**

<b>Sensor:</b>	stainless steel pressure sensor (parts coming into contact with media). Suitable for aggressive media, water, etc.. (does not apply to MSD 25 MRE and MSD -20/60 MRE)
<b>Accuracy: (typ. values)</b>	±0.2 % FS (hysteresis and linearity) ±0.02 % FS / K (TC for zero or slope)
<b>Electronics:</b>	PC board with amplifier and data memory for sensor data (meas. range, etc.) integrated in sensor housing, sealed sensor electronic
<b>Reaction time:</b>	1 ms
<b>Medium temperature:</b>	-25 ... +100 °C (compensated range: 0 ... 80 °C); -25 ... +80 °C at MSD 25 MRE and MSD -20/60 MRE
<b>Working temperature:</b>	-20 ... +80 °C
<b>Storage temperature:</b>	-40 ... +80 °C
<b>Pressure connection:</b>	connection thread G1/2B (other on request)
<b>Cable connection:</b>	M16 built-in plug
<b>Housing:</b>	CrNi-steel or elgiloy (parts coming into contact with media) length: 88.5 mm, Ø 27 mm, approx. 220 g
<b>Protection rating:</b>	IP 67 (Sensor)
<b>Scope of supply:</b>	pressure sensor, calibration protocol, manual; <b>Note: Connection cable has to be ordered separately.</b>

**Options:****Higher probe accuracy**  
by multi point calibration. Additional individual linearisation points are stored in sensor memory. (not available for MSD 25 MRE and MSD -20 / 60 MRE)**ISO-WPDS**

Art. no. 602514

ISO certificates: 5 points ascending, 5 points descending

**Accessories:****MSD-K31**

Art. no. 600657

Connecting cable for MSD sensor to GMH 31xx and GDUSB 1000  
1.2 m PVC connection cable, screened with integral 6-pin Mini-DIN-plug and M16-socket (IP 54)**MSD-K51**

Art. no. 603809

Connecting cable for MSD sensor to GMH 51xx  
1 m PVC connection cable, screened with 7-pin bayonet plug cable and plug connection water proof acc. to IP 67 and M16-socket**MSD-K31-xx**

Longer connection cable (as MSD-K31); Length 2 ... 10 m please specify

**MSD-K51-xx**

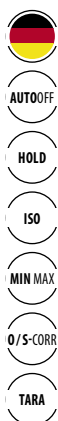
Longer connection cable (as MSD-K51); Length 2 ... 10 m please specify

**Ex-Protection:****MSD ... - ex**  
Stainless steel pressure sensor (without cable) with Ex-protection**MSD-K31-Ex**

Art. no. 600871

Connecting cable for MSD-Ex sensor to GMH 31xx-ex  
Connection to GMH 31xx, 1 m connection cable, screened with integral 6-pin Mini-DIN-plug and M12-socket

## HAND-HELD MEASURING DEVICES WITH INTEGRATED SENSOR



## HIGHLIGHTS:

- Integrated pressure sensor
- Sturdy metal connection pin
- Tare function / zero point offset
- Model with protection available

## ADDITIONAL FUNCTIONS GMH 3181-...:



Type specific data:	GMH 3161 - ...	GMH 3181 - ...	GMH 3161 - ... -EX	GMH 3181 - ... -EX
<b>Display:</b>	2 x 4½-digit LCD	2 x 4½-digit LCD	2 x 4½-digit LCD	2 x 4½-digit LCD
<b>Sensor:</b>	Piezoresistive differential pressure sensor internally built into the instrument. Suitable for air and non-aggressive gases. (Note: Not suited for water!)			
<b>Pressure connection:</b>	2 pressure port for universal 6 x 1 mm (4 mm hose inside diameter) or 8 x 1 mm (6 mm hose inside diameter) plastic tubing			
<b>Output:</b>	interface	interface or AAG	interface*	interface or AAG*
<b>Serial interface:</b>	x	x	x	x
<b>Analog output:</b>	--	0 ... 1 V, freely adjustable (resolution 12 bit)	--	0 ... 1 V, freely adjustable (resolution 12 bit)
<b>Power supply:</b>	9 V battery, d.c. connector suitable 9V-battery, d.c. connector for external 10.5 ... 12 V direct voltage supply. (suitable power supply: GNG10/3000)			
<b>Sensor adjustment:</b>	digital offset and scale input			
<b>Peak value memory:</b>	--	≥1 ms	--	≥1 ms
<b>Measuring cycle:</b>	„slow“ 4 measurements / s	4 measurements / s	4 measurements / s	4 measurements / s
	„fast“ (with filter) --	≥1000 measurements / s	--	≥1000 measurements / s
	„peak-detect“ -- (Spitzenwertspeicher)	≥1000 measurements / s The min- / max- value memory stored unfiltered pressure peaks ≥1 ms	--	≥1000 measurements / s The min- / max- value memory stored unfiltered pressure peaks ≥1 ms
<b>Averaging function:</b>	--	x	--	x
<b>Battery life:</b>	approx. 500 h	approx. 500 h (slow mode) approx. 120 h (fast = 1000 Hz)	approx. 500 h	approx. 500 h (slow mode) approx. 120 h (fast = 1000 Hz)
<b>Operating conditions:</b>	-25 ... +50 °C, 0 ... +95 % RH (non-condensing)		-10 ... +50 °C, 0 ... 95 % RH (non-condensing)	
<b>Housing:</b>	142 x 71 x 26 mm (H x W x D) (without pressure connection pin - pin approx. 16 mm protruding at front side of device), Impact-resistant ABS plastic housing, membrane keyboard, transparent panel, integrated pop-up clip			
<b>Weight:</b>	approx. 165 g	approx. 170 g	approx. 205 g (incl. leather case)	approx. 210 g (incl. leather case)
<b>Scope of supply:</b>	Device, battery, calibration protocol, manual	Device, battery, calibration protocol, manual	Device, battery, manual	Device, battery, manual

\* Please refer to note to Ex-design types (p. 84)

## Additional functions:

**Serial interface:** direct connection to RS232 or USB interface of a PC via electrically isolated interface adapter GRS 3100, GRS 3105 or USB 3100 N.

## GMH 3181:

**Low power logger mode:** (only in measuring cycle „slow“) Only one measurement carried out at the end of the respective logger cycle. The battery life is considerably prolonged. For long-term recordings (e.g. leaktest).

**Averaging function:** integrates the meas. values during a selectable period of time and then calculates the average display value.

**Controlling function:** with the help of the switching module GAM3000 (optionally) electric equipment can be switched on/off or alarm monitored (see accessories)

## Logger functions:

- manual: 99 data sets

- cyclic: 10000 data sets (max. 64 recording sequences),  
adjustable cycle time: 1 ... 3600 s

**Note to the pressure unit selection: (information for all GMH31xx):**

The choice of a specific pressure unit is possible, if its whole measuring range is displayable within the display of the device and the sensor is supporting these resolution.

FINEST MANOMETER / MANOMETER FOR OVER / UNDER PRESSURE AND PRESSURE DIFFERENCE



-500.0 ... +500.0 Pa (±500.0 Pa\*2)

**GMH 3161-002**

Art. no. 600469

Pressure hand-held measuring device with integr. sensor

**GMH 3181-002**

Art. no. 600470

Pressure hand-held measuring device with integr. sensor

**GMH 3161-002-EX**

Art. no. 606685

Pressure hand-held measuring device with integr. sensor, Ex-protection (Ex II 2 G Ex ib IIC T4 Gb)



**GMH 3181-002-EX**

Art. no. 609063

Pressure hand-held measuring device with integr. sensor, Ex-protection (Ex II 2 G Ex ib IIC T4 Gb)



**Specifications:**

**Measuring range:** -500.0 ... +500.0 Pa (-5.000 ... +5.000 mbar)

**Overload:** max. 250 hPa (mbar)

**Resolution:** 0.1 Pa (0.001 mbar)

**Additional pressure units:** kPa, PSI, mmHg, mH<sub>2</sub>O

**Accuracy: (typ. values)**

**Hysteresis and linearity:** 0.3 % FS

**Temperature-influence from 0-50 °C** 0.4 % FS

**Option higher accuracy available:** no

**Pressure connection:** 2



-100 ... +2500 Pa (±2500 Pa\*1)

**GMH 3161-01**

Art. no. 600397

Pressure hand-held measuring device with integr. sensor

**GMH 3181-01**

Art. no. 600411

Pressure hand-held measuring device with integr. sensor

**GMH 3161-01-EX**

Art. no. 607458

Pressure hand-held measuring device with integr. sensor, Ex-protection (Ex II 2 G Ex ib IIC T4 Gb)



**GMH 3181-01-EX**

Art. no. 600796

Pressure hand-held measuring device with integr. sensor, Ex-protection (Ex II 2 G Ex ib IIC T4 Gb)



-1,00 ... +70,00 mbar (±70,00 mbar\*1)

**GMH 3161-07H**

Art. no. 600405

Pressure hand-held measuring device with integr. sensor

**GMH 3181-07H**

Art. no. 600417

Pressure hand-held measuring device with integr. sensor

**GMH 3161-07H-EX**

Art. no. 610042

Pressure hand-held measuring device with integr. sensor, Ex-protection (Ex II 2 G Ex ib IIC T4 Gb)



**GMH 3181-07H-EX**

Art. no. 604074

Pressure hand-held measuring device with integr. sensor, Ex-protection (Ex II 2 G Ex ib IIC T4 Gb)



**Specifications:**

	... - 01	... - 07H
<b>Measuring range:</b>	-100 ... 2500 Pa (-1.00 ... 25.00 mbar)	-1.00 ... +70.00 mbar
<b>Overload:</b>	max. 100 mbar	max. 1000 mbar
<b>Resolution:</b>	1 Pa (0.01 mbar)	0.01 mbar
<b>Additional pressure units:</b>	bar, kPa, PSI, mmHg, mH <sub>2</sub> O	bar, Pa, kPa, PSI, mmHg, mH <sub>2</sub> O
<b>Accuracy: (typ. values)</b>		
<b>Hysteresis and linearity:</b>	±0.3 % FS	±0.1 % FS
<b>Temperature-influence from 0-50 °C</b>	±0.4 % FS	±0.4 % FS
<b>Option higher accuracy available:</b>	no	already integrated
<b>Pressure connection:</b>	2	



-10,0 ... +350,0 mbar (±350,0 mbar\*1)

**GMH 3161-07**

Art. no. 600400

Pressure hand-held measuring device with integr. sensor

**GMH 3181-07**

Art. no. 600413

Pressure hand-held measuring device with integr. sensor

**GMH 3161-07-EX**

Art. no. 604435

Pressure hand-held measuring device with integr. sensor, Ex-Schutz (Ex II 2 G Ex ib IIC T4 Gb)



**GMH 3181-07-EX**

Art. no. 601386

Pressure hand-held measuring device with integr. sensor, Ex-Schutz (Ex II 2 G Ex ib IIC T4 Gb)



-10,0 ... +420,0 mbar (-7,5 ... +315,0 mmHg)

**GMH 3161-07B**

Art. no. 600402

Pressure hand-held measuring device with integr. sensor

**GMH 3181-07B**

Art. no. 600415

Pressure hand-held measuring device with integr. sensor

**GMH 3161-07B-EX**

Art. no. 609064

Pressure hand-held measuring device with integr. sensor, Ex-Schutz (Ex II 2 G Ex ib IIC T4 Gb)



**GMH 3181-07B-EX**

Art. no. 604724

Pressure hand-held measuring device with integr. sensor, Ex-Schutz (Ex II 2 G Ex ib IIC T4 Gb)



**Specifications:**

	... - 07	... - 07B
<b>Measuring range:</b>	-10.0 ... +350.0 mbar	-10.0 ... +420.0 mbar (-7.5 ... 315.0 mmHg)
<b>Overload:</b>	max. 1 bar	max. 1 bar
<b>Resolution:</b>	0.1 mbar	0.1 mbar (0.1 mmHg)
<b>Additional pressure units:</b>	bar, kPa, MPa, PSI, mmHg, mH <sub>2</sub> O	bar, kPa, MPa, PSI, mH <sub>2</sub> O
<b>Accuracy: (typ. values)</b>		
<b>Hysteresis and linearity:</b>	±0.2 % FS (±0.1 % FS) <sup>3</sup>	±0.1 % FS
<b>Temperature-influence from 0-50 °C</b>	±0.4 % FS	±0.4 % FS
<b>Option higher accuracy available:</b>	yes	already integrated
<b>Pressure connection:</b>	2	

For type specific data please refer to page 90.

\*1 measuring range possible by changing the pressure connection ports

\*2 without changing the pressure connection ports

\*3 Option higher accuracy

**MANOMETER FOR OVER/UNDER PRESSURE AND PRESSURE DIFFERENCE**



**-100 ... +2000 mbar (±2000 mbar\*1)**

**GMH 3161-13**

Art. no. 600409  
Pressure hand-held measuring device with integr. sensor

**GMH 3181-13**

Art. no. 600421  
Pressure hand-held measuring device with integr. sensor

**GMH 3161-13-EX**

Art. no. 600647  
Pressure hand-held measuring device with integr. sensor, Ex-protection (Ex II 2 G Ex ib IIC T4 Gb)

**GMH 3181-13-EX**

Art. no. 602263  
Pressure hand-held measuring device with integr. sensor, Ex-protection (Ex II 2 G Ex ib IIC T4 Gb)

**Specifications:**

**Measuring range:** -100 ... 2000 mbar (optional: -1000 ... 2000 mbar)

**Overload:** max. 4 bar

**Resolution:** 1 mbar

**Additional pressure units:** bar, kPa, MPa, PSI, mmHg, mH<sub>2</sub>O

**Accuracy: (typ. values)**

**Hysteresis and linearity:** ±0.2 % FS; (±0.1 % FS)\*3

**Temperature-influence from 0 ... 50 °C:** ±0.4 % FS

**Option higher accuracy available:** yes

**Pressure connection:** 2

**Variants: Measuring range -1000 ... +2000 mbar \*2**

**GMH 3161-13-00-MB**

Art. no. 600527  
Pressure hand-held measuring device with integr. sensor,

**GMH 3161-13-EX-MB**

Art. no. 607243  
Pressure hand-held measuring device with integr. sensor

**GMH 3181-13-00-MB**

Art. no. 600529  
Pressure hand-held measuring device with integr. sensor

**GMH 3181-13-MB-00-EX**

Art. no. 432507  
Pressure hand-held measuring device with integr. sensor

For type specific data please refer to page 90.

\*1 measuring range possible by changing the pressure connection ports

\*2 without changing the pressure connection ports

\*3 Option higher accuracy

**VAKUUM- OR BAROMETER**



**0 ... 1300 mbar abs.**

**HIGHLIGHTS:**

- can be operated completely in a vacuum

**FOR ABSOLUTE PRESSURE MEASUREMENT**

**GMH 3161-12**

Art. no. 600407  
Pressure hand-held measuring device with integr. sensor

**GMH 3181-12**

Art. no. 600419  
Pressure hand-held measuring device with integr. sensor

**GMH 3161-12-EX**

Art. no. 610043  
Pressure hand-held measuring device with integr. sensor, Ex-protection (Ex II 2 G Ex ib IIC T4 Gb)

**GMH 3181-12-EX**

Art. no. 610044  
Pressure hand-held measuring device with integr. sensor, Ex-protection (Ex II 2 G Ex ib IIC T4 Gb)

**Specifications:**

**Measuring range:** 0 ... 1300 mbar abs.

**Overload:** max. 4 bar abs.

**Resolution:** 1 mbar

**Pressure units** mbar, bar, kPa, MPa, PSI, mmHg, mH<sub>2</sub>O

**Accuracy: (typ. values)**

**Hysteresis and linearity:** ±0.2 % FS; (±0.1 % FS)\*3

**Temperature-influence from 0 ... 50 °C:** ± 0.4 % FS

**Option higher accuracy available:** yes

**Druckanschlüsse:** 1

**Special function:**

**SeaLevel-Correction:**

The barometric air pressure can also be displayed relative to sea level 'zero'. (The air pressure correction takes place with entry of the height above 'zero' in metres)

For type specific data please refer to page 90.

\*3 Option higher accuracy

**COMPLETE SOLUTIONS**



**GMH 3161-07-WPD5**

Art. no. 602684  
Complete Solution incl. certificate of calibration ISO-WPD5 (5 points ascending / descending) and case GKK 3000.

**GMH 3161-12-WPD5**

Art. no. 602685  
Complete Solution incl. certificate of calibration ISO-WPD5 (5 points ascending / descending) and case GKK 3000.

**GMH 3161-13-WPD5**

Art. no. 602686  
Complete Solution incl. certificate of calibration ISO-WPD5 (5 points ascending / descending) and case GKK 3000.

**ACCESSORIES**

**Options:**

**Higher sensor accuracy** by multi point calibration  
Note: not possible for all device types!

**ISO-WPD5**

Art. no. 602514  
ISO certificates: 5 points increase, 5 points decrease

**ISO-WPD10**

Art. no. 602565  
ISO Certificate of calibration: 10 points increase, 10 points decrease.

**Accessories and spare parts:**

**GNG 10/3000**

Art. no. 600273  
Plug in power supply for devices of the series GMH 3XXX

**GRS 3100**

Art. no. 601097  
Interface Converter GMH3xxx <=>PC, RS232

**USB 3100 N**

Art. no. 601092  
Interface Converter GMH3xxx <=>PC, USB

**GDZ-01**

Art. no. 601541  
PVC-tube (5 bar) 6/4 (6 mm outside-Ø, 4 mm inside-Ø)

**GDZ-08**

Art. no. 601555  
Double adapter for 6/4 tube to 6/4 tube

**GDZ-18**

Art. no. 601576  
tube clamp for 6/4 tube

**GDZ-21**

Art. no. 601582  
T-piece for 6/4 tubes

**GKK 3000**

Art. no. 601048  
Device case soft lining for 1x GMH 3000 (275 x 229 x 83 mm)

for miscellaneous accessories p.r.t. page 86



## FINE MANOMETER



FOR OVER/UNDER PRESSURE  
OR PRESSURE DIFFERENCE

## GDH 200-07

Art. no. 601254

Fine manometer 0.00 ... 19.99 / 199.9 mbar ( $\pm 199.9$  mbar)<sup>\*1</sup>

## Functions:

- Differential and relative pressure measurement
- Autorange
- Excellent zero point stabilisation
- Manual slope adjustment
- 4 selectable measuring units: Pa, mbar, mmHg, PSI
- automatic off-function: 1 ... 120 min

## Specifications:

<b>Measuring range:</b>	0.00 ... 19.99 or 20.0 ... 199.9 mbar (hPa) 0.00 ... 19.99 or 20.0 ... 150.0 mmHg 0.000 ... 1.999 PSI / 0 ... 1999 Pa
<b>Resolution:</b>	automatic change 0.1 / 0.01
<b>Overload:</b>	max. 500 mbar
<b>Accuracy:</b>	(at nominal temperature = 25 °C and automatic zero point-adjustment)
<b>Measuring range: up to 200 mbar</b>	$\pm 0.2$ % f.s. hysteresis and linearity, $\pm 0.4$ % f.s. temperature drift from 0 ... 50 °C
<b>Measuring range: up to 20 mbar</b>	$\pm 1$ % f.s. hysteresis and linearity, $\pm 2$ % f.s. temperature drift from 0 ... 50 °C
<b>Sensor:</b>	piezoresistive relative pressure sensor
<b>Pressure connection:</b>	2 pressure port sockets made of nickel-plated brass, for pressure tubings 6 x 1 mm (4 mm inner-diameter)
<b>Operating conditions:</b>	-25 ... +50 °C, 0 ... 95 % RH (non-condensing)
<b>Display:</b>	3½ digit LCD display, approx. 13 mm high
<b>Pushbuttons:</b>	3 membrane keys
<b>Power supply:</b>	9 V battery
<b>Battery life:</b>	approx. 1200 h
<b>Housing:</b>	impact resistant ABS plastic housing, approx. 106 x 67 x 30 mm (H x W x D) +16 mm pressure port sockets
<b>Weight:</b>	approx. 135 g (incl. battery)
<b>Zero point-adjustment:</b>	automatically
<b>Slope-adjustment:</b>	manually
<b>Scope of supply:</b>	Device, battery, calibration protocol, manual

<sup>\*1</sup> measuring range possible by changing the pressure connection ports  
Tubes, clamps, adapters, accessories, etc. p.r.t. page 86

## MANOMETER



FOR OVER/UNDER PRESSURE  
OR PRESSURE DIFFERENCE

## GDH 200-13

Art. no. 601256

Pressure gauge 0.0 ... 199.9 / 1999 mbar ( $\pm 1999$  mbar)<sup>\*1</sup>

## Functions:

- Differential and relative pressure measurement
- Autorange
- Excellent zero point stabilisation
- Manual slope adjustment
- 3 selectable measuring units: mbar, mmHg, PSI
- automatic off-function: 1 ... 120 min

## Specifications:

<b>Measuring range:</b>	0.0 ... 199.9 or 200 ... 1999 mbar (hPa) 0.0 ... 199.9 or 200 ... 1500 mmHg 0.00 ... 19.99 PSI
<b>Resolution:</b>	automatic change 1 / 0.1
<b>Overload:</b>	max. 4000 mbar
<b>Accuracy:</b>	(at nominal temperature = 25 °C and automatic zero point-adjustment)
<b>Measuring range: up to 2000 mbar</b>	$\pm 0.2$ % f.s. hysteresis and linearity, $\pm 0.4$ % f.s. temperature drift from 0 ... 50 °C
<b>Measuring range: up to 200 mbar</b>	$\pm 1$ % f.s. hysteresis and linearity, $\pm 2$ % f.s. temperature drift from
<b>Sensor:</b>	piezoresistive relative pressure sensor
<b>Pressure connection:</b>	2 pressure port sockets made of nickel-plated brass, for pressure tubings 6 x 1 mm (4 mm inner-diameter)
<b>Operating conditions:</b>	-25 ... +50 °C, 0 ... 95 % RH (non-condensing)
<b>Display:</b>	3½ digit LCD display, approx. 13 mm high
<b>Pushbuttons:</b>	3 membrane keys
<b>Power supply:</b>	9 V battery
<b>Battery life:</b>	approx. 1200 h
<b>Housing:</b>	impact resistant ABS plastic housing, approx. 106 x 67 x 30 mm (H x W x D) +16 mm pressure port sockets
<b>Weight:</b>	approx. 135 g (incl. battery)
<b>Zero point-adjustment:</b>	automatically
<b>Slope-adjustment:</b>	manually
<b>Scope of supply:</b>	Device, battery, calibration protocol, manual

<sup>\*1</sup> measuring range possible by changing the pressure connection ports  
Tubes, clamps, adapters, accessories, etc. p.r.t. page 86

## VACUUM- / BAROMETER OR MANOMETER



## GDH 200-14

Art. no. 601258

Vacuum / Barometer with pressure port, 0 ... 11000 mbar abs.

## Functions:

- Sea level-adjustment possible
- suitable for relative pressure measurement (-1 ... 10 bar) by use the zero function
- Manual slope and offset adjustment
- 4 selectable measuring units: mbar, mmHg, bar, PSI
- automatic off-function: 1 ... 120 min

## Specifications:

<b>Measuring range:</b>	0 ... 11000 mbar (hPa) abs. 0 ... 8250 mmHg abs. 0.000 ... 11.000 bar abs. 0.00 ... 160.00 PSI abs.
<b>Resolution:</b>	1 mbar, 1 mmHg, 0.001 bar, 0.02 PSI
<b>Overload:</b>	max. 13 bar abs.
<b>Accuracy: (at nominal temperature = 25 °C)</b>	±3 mbar or 0.10 % of m.v. (whichever is higher); ±0.3 % f.s. temperature drift from 0 ... 50 °C
<b>Sensor:</b>	piezoresistive absolute pressure sensor
<b>Pressure connection:</b>	Pressure connection ports in nickel-plated brass, for pressure tubings 6 x 1 mm (4 mm inner-diameter)
<b>Operating conditions:</b>	-25 ... +50 °C, 0 ... 95 % RH (non-condensing)
<b>Display:</b>	4½ digit LCD display, approx. 12 mm high
<b>Pushbuttons:</b>	3 membrane keys
<b>Power supply:</b>	9 V battery
<b>Battery life:</b>	approx. 7500 h
<b>Sea level correction:</b>	Barometric values can be converted to sea level (therefore the input of the current altitude is needed).
<b>Housing:</b>	impact resistant ABS plastic housing, approx. 106 x 67 x 30 mm (H x W x D) +16 mm pressure port sockets
<b>Weight:</b>	approx. 135 g (incl. battery)
<b>Zero point-adjustment:</b>	manually
<b>Slope-adjustment:</b>	manually
<b>Scope of supply:</b>	Device, battery, calibration protocol, manual

## Variant:

## GDH 200-14-QC6

Art. no. 415125

Vacuum / Barometer with pressure port  
Quick-connect hose coupling

Tubes, clamps, adapters, accessories, etc. p.r.t. page 86

## VACUUM- / BAROMETER



## GDH 200-11

Art. no. 474063

Vacuum / Barometer with pressure port

## Specifications:

<b>Measuring range:</b>	10.0 ... 1200.0 mbar abs. (Resolution: 0.1 mbar) 7.5 ... 900.0 mmHg abs. (Resolution: 0.1 mmHg)
<b>Max. Overload:</b>	4000 mbar abs.
<b>Accuracy: (at nominal temperature)</b>	
<b>@25 °C, 750 mbar:</b>	1.5 min. +1.5 max. mbar
<b>-20 ... +85 °C, 300 ... 1100 mbar:</b>	-2.5 min. +2.5 max. mbar
<b>Long-term stability:</b>	typ. ±1 mbar/year
<b>25 °C, 700 ... 1100 mbar:</b>	-1.5 min. +1.5 max. mbar
<b>0 ... 50 °C, 300 ... 1100 mbar:</b>	-2.0 min. +2.0 max. mbar
<b>-20 ... +85 °C, 300 ... 1100 mbar:</b>	-3.5 min. +3.5 max. mbar
<b>25 °C, 100 ... 300 mbar:</b>	-5 min. +5 max. mbar
<b>25 °C, 10 ... 100 mbar:</b>	-10 min. +10 max. mbar
<b>Pressure connection:</b>	Pressure connection ports in nickel-plated brass, for pressure tubings 6 x 1 mm (4 mm inner-diameter) or 8 x 1 mm (6 mm inner-diameter)
<b>Nominal temperature:</b>	25 °C
<b>Operating conditions:</b>	-25 ... +50 °C, 0 ... 80 % RH (non-condensing)
<b>Storage temperature:</b>	-25 ... +70 °C
<b>Display:</b>	4½ digit LCD display, approx. 13 mm high
<b>Pushbuttons:</b>	3 membrane keys for ON/OFF, min/max value query, offset comparison, etc.
<b>Measuring frequency:</b>	1 measuring / s
<b>Sea level correction:</b>	Barometric values can be converted to sea level (therefore the input of the current altitude is needed).
<b>Zero point-adjustment:</b>	manually
<b>Slope-adjustment:</b>	manually
<b>Power supply:</b>	9 V battery
<b>Battery life:</b>	>5000 h
<b>Housing:</b>	impact resistant ABS plastic housing, front-side IP65
<b>Dimensions:</b>	approx. 106 x 67 x 30 mm (H x W x D) +16 mm pressure port sockets
<b>Weight:</b>	approx. 145 g (incl. battery)
<b>Scope of supply:</b>	Device, battery, manual

## Variant:

## GDH 200-11-QC6

Art. no. 415124

Vacuum / Barometer with pressure port,  
10.0 ... 1200.0 mbar abs. (hPa)**Pressure connection:** Quick-connect hose coupling

## BAROMETER



## GPB 3300

Art. no. 600129

Barometer 300.0 ... 1100.0 mbar abs.

## Functions:

- Manual offset and slope adjustment
- Sea level-adjustment possible
- 2 measuring units selectable: mbar, mmHg
- Auto-off-function: 1 ... 120 min

## Specifications:

<b>Measuring range:</b>	300.0 ... 1100.0 mbar (hPa) abs. 225.0 ... 825.0 mmHg abs.
<b>Max. Overload:</b>	4000 mbar or 3000 mmHg
<b>Accuracy: (at nominal temperature)</b>	±2.0 mbar (typ. at 0 ... 50 °C)
<b>Sensor:</b>	absolute pressure sensor, integrated in housing
<b>Nominal temperature:</b>	25 °C
<b>Operating temperature:</b>	-25 ... +50 °C, 0 ... 95 % RH (non-condensing)
<b>Display:</b>	4½-digit, 12 mm high LCD-display
<b>Pushbuttons:</b>	3 membrane key for ON/OFF, min-/max-value memory, tara, etc.
<b>Power supply:</b>	9 V battery
<b>Battery life:</b>	approx. 5000 h
<b>Zero point-adjustment:</b>	manually
<b>Slope-adjustment:</b>	manually
<b>Sea level correction:</b>	Barometric values can be converted to sea level (therefore the input of the current altitude is needed).
<b>Housing:</b>	impact resistant ABS housing
<b>Dimensions:</b>	approx. 106 x 67 x 30 mm (H x W x D)
<b>Weight:</b>	approx. 135 g (incl. battery)
<b>Scope of supply:</b>	Device, battery, manual

## Accessories and spare parts:

## GKK 252

Art. no. 601056

Case with punched lining for universal application (235 x 185 x 48 mm)

## GB 9 V

Art. no. 601115

Spare battery 9V, type IEC 6F22

## ALTIMETER / BAROMETER / THERMOMETER / PRECISION BAROMETER



FOR PROFESSIONAL USAGE IN MEASUREMENT TECHNOLOGY AS WELL AS IN SPARE TIME SPORTS

## GTD 1100

Art. no. 600132

Precision barometer / Altimeter  
300.0 ... 1100.0 mbar abs. + Altimeter

## General:

Device for simple determination of a building size (steeples, skyscrapers, bridges, etc.)

## Application:

hiking, hang gliding, cycling, motorsports, etc.

## Specifications:

## Measuring range

<b>Temperature:</b>	-10.0 ... +50.0 °C or 14.0 ... +122.0 °F.
<b>Air pressure:</b>	300.0 ... 1100.0 mbar abs. or 225.0 ... 825.0 mmHg abs.
<b>High:</b>	-500 ... -200 m, res. 1 m or -1640 ... -655 ft, res. ~5 ft -200 ... +2000 m, res. 0,5 m or -654 ... +1999 ft, res. ~2 ft 2000 ... 9000 m, res. 1 m or 2000 ... 19999 ft, res. ~5 ft
<b>Measuring units:</b>	hPa / mbar, mmHg, °C, °F, m, ft
<b>Max. Overload:</b>	pressure: 4000 mbar or 3000 mmHg

## Accuracy: (at nominal temperature = 25 °C)

<b>Temperature:</b>	±1% FS ±1 digit
<b>Absolute pressure:</b>	±1.5 mbar ±1 digit (750 ... 1100 mbar), with certificate of calibration: ±0.5 mbar ±1 digit

**Sensor:** absolute pressure sensor, integrated in housing**Operating conditions:** -10 ... +50 °C; 0 ... 80 % RH (non condensing)**Storage temperature:** -20 ... +70 °C**Measuring frequency:** 1 measuring / s**Display:** approx. 12 mm high, 4½-digit LCD-display**Sum function:** The covered altitude can be displayed (ascent, descent, total)**Tendency indicator:** Air pressure rising / falling**Sea level correction:** Barometric values can be converted to sea level (therefore the input of the current altitude is needed).**Pushbuttons:** keypad (3 push-buttons) for On/off, min/max-value, tara-function, zero-, slope-, and sea level-adjustment slide switch for unit selection.

<b>Power supply:</b>	9 V battery
<b>Battery life:</b>	approx. 6.000 h
<b>System notifications:</b>	permanent self-diagnosis and error indication
<b>Housing:</b>	impact resistant ABS housing
<b>Dimensions:</b>	approx. 106 x 67 x 30 mm (H x W x D)
<b>Weight:</b>	approx. 135 g (incl. battery)
<b>Scope of supply:</b>	Device, battery, manual

## Functions:

- manual offset and slope-adjustment
- sea level-adjustment possible
- tendency-meter, summing-function (ascendency, descendency, overall)
- over 6.000 operating hours

## Accessories and spare parts:

## GB 9 V

Art. no. 601115

Spare battery 9V, type IEC 6F22

## ISO-WPD 5

Art. no. 602514

ISO certificates: 5 points rising, 5 points falling

## GKK 252

Art. no. 601056

Case with punched lining for universal application (235 x 185 x 48 mm)

Calibration certificate, p.r.t. page 15

## INTEGRATING SOUND LEVEL METER



## HIGHLIGHTS:

- Acoustic normative IEC61672, IEC 61260, IEC61094-4

## HD-2010-UC-1

Art. no. 700060

integrating sound level meter

## General:

HD-2010-UC-1 is an integrating portable sound level meter performing statistical analysis. The instrument has been designed combining maximum low cost and simplicity of use. Attention has been paid to the possibility of adjusting the instrument and adding options at any time to the HD-2010-UC-1 so to extend its applications. The user can upgrade the firmware directly by means of the Noise Studio programme supplied with the instrument. HD-2010-UC-1 is equipped with a backlit graphic display.

## Application:

- Assessment of the environmental noise level
- Optional "advanced data logging"
- Optional capture and analysis of sound events
- Statistical analysis with the calculation of 3 percentile level and optional full statistical analysis
- Noise monitoring ("Advanced data logger" option required)
- Identification of impulsive noises
- Measurements in workplaces (Analysis of the noise and vibrations exposure)
- Selection of personal protective equipment (SNR and HML methods)
- Production quality control
- Measurement of machine noise, sound power measurements
- Vehicles noise emission

With HD-2010-UC-1 sound level meter it is possible to measure the sound pressure level by programming 3 parameters with the possibility of freely selecting the frequency weightings and the time constants. The measured sound levels can be recorded in the large non-volatile memory in order to be transferred to a PC using the supplied Noise Studio software package.

The class 1 HD-2010-UC-1 sound level meter with the "Advanced Data Logger" option is suitable for performing noise monitoring and acoustic mapping and, also assessments of the acoustic climate with capture and analysis of sound events function. When measuring traffic noise in the proximity of airports, railways and roads, the sound level meter can be used as a multi-parameter sound recorder, combining statistical analyzer features. Remote electrical calibrations and diagnostic tests can be executed by using its remote control capabilities.

## Specifications:

<b>½" Microphone:</b>	UC52 free field, pre-polarized, condenser type
<b>Dynamic range:</b>	30 dBA ... 143 dB peak
<b>Linearity range:</b>	80 dB
<b>Acoustic Parameters:</b>	Spl, L <sub>eq</sub> , L <sub>eq</sub> L, SEL, L <sub>EP,d</sub> , L <sub>max</sub> , L <sub>min</sub> , L <sub>pk</sub> , Dose, L <sub>n</sub>
<b>Frequency weightings:</b>	simultaneous A, C, Z (only C and Z for L <sub>pk</sub> )
<b>Time weightings:</b>	simultaneous FAST, SLOW, IMPULSE
<b>Integration:</b>	from 1 s ... 99 h with erasing function (Back-Erase)
<b>Statistical Analysis:</b>	It displays up to 3 percentile levels, from L <sub>1</sub> to L <sub>99</sub> Probability distribution and percentile level calculation from L <sub>1</sub> to L <sub>99</sub> • Parameter: L <sub>1</sub> , L <sub>50</sub> , L <sub>95</sub> weighted A, C or Z (only C or Z for L <sub>pk</sub> ) • Sampling frequency: 8 samples/s • Classification: Classes of 0.5 dB
<b>Display:</b>	Graphic LCD backlit display 128 x 64 • 3 parameters in numeric format
<b>Memory:</b>	• 4 MB internal, memory for more than 500 records
<b>Input / Output:</b>	• RS232 serial and USB interfaces • AC output (LINE) • DC output

## PC Programs:

Noise Studio (provided with the instrument): PC interface for data download, set up and instrument management. Licensed software modules to be enabled by hardware key.  
• NS4 "Monitor" module. PC based real time acquisition. Synchronized audio recording. Remote monitoring and data capture. Remote connection also via Modem. The program allows programming of measurements and calibrations with timer and performs events audio recording with programmable triggers levels.

## Operating conditions:

• Working temperature -10 ... +50 °C, 25 ... 90 % RH, (without condensation), 65 ... 108 kPa. Protection rating: IP64

## Power supply:

• 4 alkaline or rechargeable NiMH type AA batteries or external 9 ... 12V dc 300 mA

## Dimensions:

445 x 100 x 50 mm equipped with preamplifier (H x W x D)

## Scope of supply:

Class 1 sound level meter HD-2010-UC-1, HD2010PNE2 preamplifier, UC52/1 free field prepolarized microphone, windscreen, USB connection cable. Noise Studio PC software, carrying case and paper instruction manual. Supplied with DAKS individual calibration Certification, according to IEC 61672.

## NECESSARY ACCESSORY:

## HD-2020

Art. no. 700062

Class 1 sound level calibrator according to IEC 60942:2003 (Page 97)

## Accessories:

## HD 2110-USB

Art. no. 700038

serial connection cable, for PC connection: USB 2.0 type A

## SWD-10

Art. no. 700039

Plug in power supply for devices of the HD-handhelds, 12V DC 1.0 A

## CPA/10

Art. no. 700061

Microphone extension cable 10 m

## HD 40.1

Art. no. 700056

Portable thermal printer with SWD-10 power supply and 5 paper rolls

## HD 2110-RS

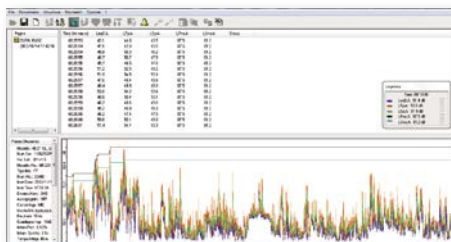
Art. no. 700057

serial connection cable, printer connection: 9-pin Sub-D jack

## RCT

Art. no. 475423

spare paper, 4 rolls thermopaper, 57 mm width



Noise Studio: NS4 "Monitor" module; PC based noise acquisition with synchronized audio recording (for later playback).

## Noise Studio NS4

Art. no. 475424

NS4 Monitor module (demo version incl. in HD2010 scope of supply)

## General:

This software module allows to control the sound level meter with PC in remote location. The main features are:

- Real time display of acquired data, in graphical and tabular form
- Possibility to remotely connect to the sound level meter via modem
- Acquisition of sound level data directly into the mass memory of the PC (monitor function)
- Management of diagnostic and calibration functions
- Automatic acquisition and monitoring programme
- Possibility to log synchronized audio along with the sound level meter measurements, by using the easy trigger function

## IMPORTANT INFORMATION:

Device supply with calibration certificate. Customer must be specified when ordering.



## ACOUSTIC CALIBRATOR

ACCREDIA

ISO



### HIGHLIGHTS:

- The 1000 Hz frequency allows calibrating sound level meters with any weighting
- Independent of atmospheric pressure
- The 114 dB sound level allows performing calibrations even in high background noise environments
- Simple to use

HD-2020

### HD 2020

Art. no. 700062

Class 1 sound level calibrator, according to IEC 60942:2003

#### General:

The HD-2020 sound level calibrator is a portable, battery operated sound source, suitable for sound level meters (portable and laboratory) and acoustic stations. It allows calibrating ½" microphones with mechanical dimensions according to IEC 61094-1. The calibration pressure levels of 94 dB and 114 dB can be selected by the keypad. If the microphone is absent or not inserted correctly into the calibrator cavity, the sound level will blink on the display. The clock/calendar allows you to set the number of years and months of validity of the calibration from the date of adjusting: at the expiration time, an appropriate symbol flashes on the display.

#### Specifications:

<b>Coupling cavity:</b>	for standard 1/2" microphones (12.7 ±0.03 mm) according to IEC 61094-1 and IEC 61094-4
<b>Frequency:</b>	1.000 Hz
<b>Frequency tolerance:</b>	1 % in the range -10 ... +50 °C and 10 ... 90 % RH
<b>Sound pressure level:</b>	94.0 dB and 114.0 dB ±0.2 dB at 1 kHz (referred to 101.3 kPa, 23 °C ±3 °C and 65 % RH)
<b>Reference conditions:</b>	20 °C, 50 % RH, 101,3 kPa, 10 mm <sup>3</sup> cartridge volume
<b>Reaction speed:</b>	10 s
<b>Total distortion:</b>	<1 %
<b>Ambient condition influence</b>	
<b>Temperature and humidity influence:</b>	<0.3 dB in the range -10 ... +50 °C and 10 ... 90 % RH
<b>Static pressure influence:</b>	<0.1 dB in the range -65 ... 108 kPa
<b>Operating conditions</b>	
<b>Working temperature:</b>	-10 ... +50 °C
<b>Relative humidity:</b>	≤90 % RH
<b>Storage temperature:</b>	-25 ... +70 °C
<b>Microphone equivalent volume:</b>	5 ... 250 mm
<b>Power supply:</b>	9 V alkaline battery IEC type 6LR61. 9 V rechargeable batteries are also allowed.
<b>9 V battery autonomy:</b>	48-hour continuous functioning with good quality alkaline batteries
<b>Display:</b>	3½ LCD, battery symbol
<b>Watch / date-indicator:</b>	internal with 3 V lithium buffer battery
<b>Case material:</b>	ABS
<b>Dimensions:</b>	83 x 43 x 53 mm (H x W x D)
<b>Protection rating:</b>	IP64
<b>Effects of electro-magnetic fields:</b>	<0.3 dB
<b>Scope of supply:</b>	HD-2020 calibrator, 1x 9 V alkaline battery, manual. ACCREDIA individual calibration certification included.

#### IMPORTANT INFORMATION:

Device supply with calibration certificate. Custome must be specified when ordering.

## PHOTO-RADIOMETER

ACCREDIA

ISO



### HIGHLIGHTS:

- Measurement of many different light values, lighting strength, luminance, radiation strength
- Wide range of sensors, interchangeable sensors

ILLUMINANCE, LUMINANCE PHOTONS FLOW UVA-, UVB-, UVC-IRRADIANCE IRRADIANCE IN SPECTRAL BAND OF BLUE LIGHT GLOBAL SOLAR RADIATION

### HD 2302.0

Art. no. 700063

Photo-Radiometers

#### General:

It measures illuminance, luminance, PAR and irradiance (across VIS-NIR, UVA, UVB and UVC spectral regions or measurement of irradiance effective according to the UV action curve). The probes are equipped with the SICRAM automatic detection module: in addition to detection, the unit of measurement selection is also automatic. The factory calibration data are already memorized inside the instruments.

#### Application:

Measurement of lighting strength and radiation strength in workplaces with high exposure and/or adjacent traffic routes and work stations. Additional applications for museum and not destructive testing, for tanning / aesthetic centers, photovoltaic and aging chamber

#### Specifications:

<b>Instrument</b>	
<b>Dimensions:</b>	140 x 88 x 38 mm (H x W x D)
<b>Material:</b>	ABS
<b>Display:</b>	2 x 4½ digits plus symbols - 52 x 42 mm (visible area)
<b>Operating conditions</b>	
<b>Working temperature:</b>	-5 ... +50 °C
<b>Storage temperature:</b>	-25 ... +65 °C
<b>Working relative humidity:</b>	0 ... 90 % RH without condensation
<b>Protection rating:</b>	IP67
<b>Power</b>	
<b>Batteries:</b>	3 1.5 V type AA batteries
<b>Autonomy:</b>	200 h with 1800 mAh alkaline batteries
<b>Power absorbed with the instrument off:</b>	20 µA
<b>Measuring unit:</b>	lux – fcd – µmol/m <sup>2</sup> ·s – cd/m <sup>2</sup> – W/m <sup>2</sup> – µW/cm <sup>2</sup> – µW/lumen
<b>Connections:</b>	Input module for the probes 8-pole male DIN45326 connector
<b>Scope of supply:</b>	Instrument HD-2302-0, 3 1.5 V alkaline batteries, manual, case. <b>The probes must be ordered separately.</b>

#### Accessories:

- LP 471-PHOT
- LP 471-LUM2
- LP 471-PAR
- LP 471-UVA
- LP 471-UVB
- LP 471-UVC
- LP 471-P-A
- LP 471-BLUE
- LP 471-SILI-PYRA

Specification see following pages

PHOTOMETRIC AND RADIOMETRIC PROBES



ILLUMINANCE

**LP 471-PHOT**

Art. no. 700064

Probe for the measure of Illuminance

**Application:**

Measurement of lighting strength at workplaces / work stations, traffic and escape routes

**Specifications:**

<b>Measuring range (lux):</b>	0.10 ... 199.99	... 1.999.9	... 19.999	... 199.99·10 <sup>3</sup>
<b>Resolution (lux):</b>	0.01	0.1	1	0.01·10 <sup>3</sup>
<b>Spectral range:</b>	in agreement with standard photopic curve V(λ)			
<b>α (temp. coefficient) f<sub>6</sub> (T):</b>	<0.05 % K			
<b>Calibration uncertainty:</b>	<4 %			
<b>f<sub>1</sub> (in agreement with photopic response V(λ)):</b>	<6 %			
<b>f<sub>2</sub> (response according to the cosine law):</b>	<3 %			
<b>f<sub>3</sub> (linearity):</b>	<1 %			
<b>f<sub>4</sub> (instrument reading error):</b>	<0.5 %			
<b>f<sub>5</sub> (fatigue)</b>	<0.5 %			
<b>Class:</b>	B			
<b>Working temperature:</b>	0 ... 50 °C			



LUMINANCE

**LP 471-LUM 2**

Art. no. 700065

Probe for the measure of Luminance

**General:**

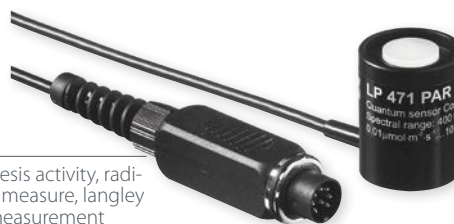
Spectral response according to the photopic curve, angular field 2°. Measuring range: 1.0 cd / m<sup>2</sup> ... 2.000·10<sup>3</sup> cd / m<sup>2</sup>.

**Application:**

Sensor measures luminance like a human eye, e. g. monitors and lamps, etc. Diaphanoscop, X Ray plates reader, PC monitors light radiations and reflection by white surfaces

**Specifications:**

<b>Measuring range (cd / m<sup>2</sup>):</b>	1.0 ... 1.999.9	... 19.999	... 199.99·10 <sup>3</sup>	... 1999.9·10 <sup>3</sup>
<b>Resolution (cd / m<sup>2</sup>):</b>	0.1	1	0.01·10 <sup>3</sup>	0.1·10 <sup>3</sup>
<b>Optical angle:</b>	2°			
<b>Spectral range:</b>	in agreement with standard photopic curve V(λ)			
<b>α (temp. coefficient) f<sub>6</sub> (T):</b>	<0.05 % K			
<b>Calibration uncertainty:</b>	<5 %			
<b>f<sub>1</sub> (in agreement with photopic response V(λ)):</b>	<8 %			
<b>f<sub>3</sub> (linearity):</b>	<1 %			
<b>f<sub>4</sub> (instrument reading error):</b>	<0.5 %			
<b>f<sub>5</sub> (fatigue):</b>	<0.5 %			
<b>Class:</b>	C			
<b>Drift after 1 year:</b>	<1 %			
<b>Working temperature:</b>	0 ... 50 °C			
<b>Reference Standards:</b>	CIE n.69 – UNI 11142			



PHOTONS FLOW

HIGHLIGHTS:

- Photosynthesis activity, radiation (PAR) measure, langley radiation measurement

**LP 471-PAR**

Art. no. 700066

Quanten-radiometrische Sonde

**General:**

For measuring the photons flow in the chlorophyll field PAR (Photosynthetically active radiation 400 ... 700 nm), μmol m<sup>-2</sup>s<sup>-1</sup> measure, cosine correction diffusor. Measuring range 0.10 μmol m<sup>-2</sup>s<sup>-1</sup> ... 10·10<sup>3</sup> μmol m<sup>-2</sup>s<sup>-1</sup>

**Application:**

Plants, agriculture, greenhouses

**Specifications:**

<b>Measuring range (μmol·m<sup>-2</sup>·s<sup>-1</sup>):</b>	0.10 ... 199.99	200.0 ... 1.999.9	2.000 ... 10.000
<b>Resolution (μmol·m<sup>-2</sup>·s<sup>-1</sup>):</b>	0.01	0.1	1
<b>Spectral range:</b>	400 ... 700 nm		
<b>Calibration uncertainty:</b>	<5 %		
<b>f<sub>2</sub> (response according to the cosine law)</b>	<6 %		
<b>f<sub>3</sub> (Linearity):</b>	<1 %		
<b>f<sub>4</sub> (instrument reading error):</b>	±1 digit		
<b>f<sub>5</sub> (fatigue):</b>	<0.5 %		
<b>Drift after 1 year:</b>	<1 %		
<b>Working temperature:</b>	0 ... 50 °C		

HIGHLIGHTS:

- Control of UV lamps in cosmetic tanning systems
- To check the control of cosmetic tanning systems
- Measurement of UVA radiation strength with penetration testing according to DIN EN ISO 3059 (crack/surface testing)



UVA IRRADIANCE

**LP 471-UVA**

Art. no. 700067

Probe for the measure of UVA irradiance

**General:**

Radiometric probe for measuring the irradiance in the UVA spectral range 315 ... 400 nm, peak at 360 nm, quartz diffusor for cosine correction. Measuring range: 1.0·10<sup>-3</sup> W / m<sup>2</sup> ... 2.000 W / m<sup>2</sup>.

**Application:**

Timing Light to ward off eye problems. For casting and welding control, Polymerization of varnishes, resins, adhesives

**Specifications:**

<b>Measuring range (W/m<sup>2</sup>):</b>	1.0·10 <sup>-3</sup> ... 999.9·10 <sup>-3</sup>	1.000 ... 19.999	20.00 ... 199.99	200.0 ... 1.999.9
<b>Resolution (W/m<sup>2</sup>):</b>	0.1·10 <sup>-3</sup>	0.001	0.01	0.1
<b>Spectral range:</b>	315 ... 400 nm (Peak 360 nm)			
<b>Calibration uncertainty:</b>	<5 %			
<b>f<sub>3</sub> (linearity):</b>	<1 %			
<b>f<sub>4</sub> (instrument reading error):</b>	±1 digit			
<b>f<sub>5</sub> (fatigue):</b>	<0.5 %			
<b>Drift after 1 year:</b>	<2 %			
<b>Working temperature:</b>	0 ... 50 °C			

## PHOTOMETRIC AND RADIOMETRIC PROBES



## HIGHLIGHTS:

- Psoriasis light treatment by UVB lamps

UVB IRRADIANCE

**LP 471-UVB**

Art. no. 700068

Probe for the measure of UVB irradiance

**General:**

Radiometric probe for measuring the irradiance in the UVB spectral range 280 ... 315 nm, peak at 305 ... 310 nm, quartz diffuser for cosine correction.  
Measuring range:  $1.0 \cdot 10^{-3} \text{ W/m}^2$  ...  $2.000 \text{ W/m}^2$ .

**Application:**

Polymerization of varnishes, resins, adhesives. Quality control by UV Lamps. For Offset and lithography & electronic, Casting and welding control, Timing light to ward off eye problems

**Specifications:**

<b>Measuring range (W/m<sup>2</sup>):</b>	1.0·10 <sup>-3</sup> ... 999.9·10 <sup>-3</sup> 1.000 ... 19.999 20.00 ... 199.99 200.0 ... 1.999.9			
<b>Resolution (W/m<sup>2</sup>):</b>	0.1·10 <sup>-3</sup>	0.001	0.01	0.1
<b>Spectral range:</b>	280 ... 315 nm (Peak 305 nm ... 310 nm)			
<b>Calibration uncertainty:</b>	<5 %			
<b>f<sub>3</sub> (linearity):</b>	<2 %			
<b>f<sub>4</sub> (instrument reading error):</b>	±1 digit			
<b>f<sub>5</sub> (fatigue):</b>	<0.5 %			
<b>Drift after 1 year:</b>	<2 %			
<b>Working temperature:</b>	0 ... 50 °C			



## HIGHLIGHTS:

- Control of UV Lamps during pasteurization, air and water sterilization

UVC IRRADIANCE

**LP 471-UVC**

Art. no. 700069

Probe for the measure of UVC irradiance

**General:**

For measuring in the UVC spectral range 220 ... 280 nm, peak at 260 nm, quartz diffuser for cosine correction.  
Measuring range:  $1.0 \cdot 10^{-3} \text{ W/m}^2$  ...  $2.000 \text{ W/m}^2$ .

**Specifications:**

<b>Measuring range (W/m<sup>2</sup>):</b>	1.0·10 <sup>-3</sup> ... 999.9·10 <sup>-3</sup> 1.000 ... 19.999 20.00 ... 199.99 200.0 ... 1.999.9			
<b>Resolution (W/m<sup>2</sup>):</b>	0.1·10 <sup>-3</sup>	0.001	0.01	0.1
<b>Spectral range:</b>	220 ... 280 nm (Peak 260 nm)			
<b>Calibration uncertainty:</b>	<5 %			
<b>f<sub>3</sub> (linearity):</b>	<1 %			
<b>f<sub>4</sub> (instrument reading error):</b>	±1 digit			
<b>f<sub>5</sub> (fatigue):</b>	<0.5 %			
<b>Drift after 1 year:</b>	<2 %			
<b>Working temperature:</b>	0 ... 50 °C			



IRRADIANCE IN SPECTRAL BAND OF BLUE LIGHT

**LP 471-BLUE**

Art. no. 700070

Probe for the measure of irradiance in spectral band of blue light

**General:**

The radiometric probe LP471-BLUE measures irradiance (W/m<sup>2</sup>) in spectral band of blue light. The probe consists of a photodiode plus an appropriate filter and it is provided with diffuser for proper measure in accordance with the cosine law.

**Application:**

The spectral response curve of the probe allows to measure the radiation effective for damages caused by blue light (curve B(λ)) according to the standards ACGIH / ICNIRP in the spectral range from 380 ... 550 nm. The radiation optics in this portion of the spectrum can produce photochemical damage to the retina. Another field of application is the monitoring of the probe irradiance from blue light used in the treatment of neonatal jaundice.

**Specifications:**

<b>Measuring range (W/m<sup>2</sup>):</b>	1.0·10 <sup>-3</sup> ... 999.9·10 <sup>-3</sup> 1.000 ... 19.999 20.00 ... 199.99 200.0 ... 1.999.9			
<b>Resolution (W/m<sup>2</sup>):</b>	0.1·10 <sup>-3</sup>	0.001	0.01	0.1
<b>Spectral range:</b>	380 ... 550 nm. Action curve for damages of Blue light B(λ)			
<b>Calibration uncertainty:</b>	<10 %			
<b>f<sub>2</sub> (response according to the cosine law):</b>	<6 %			
<b>f<sub>3</sub> (linearity):</b>	<3 %			
<b>f<sub>4</sub> (instrument reading error):</b>	±1 digit			
<b>f<sub>5</sub> (fatigue):</b>	<0.5 %			
<b>Drift after 1 year:</b>	<2 %			
<b>Working temperature:</b>	0 ... 50 °C			

## PHOTOMETRIC AND RADIOMETRIC PROBES



## HIGHLIGHTS:

- Non destructive material measurement by ISO 3059:2001

ILLUMINANCE AND  
UVA IRRADIANCE

## LP 471 P-A

Art. no. 700071

Combined probe LP 471 P-A with two sensors for the measure of illuminance and UVA irradiance

## General:

Combined probe for measuring illuminance (lux), with standard photopic response, and irradiance ( $\mu\text{W}/\text{cm}^2$ ) in the UVA spectral range (315 ... 400 nm, with peak at 360 nm). Both the sensors are equipped with diffuser for the correction according to the cosine law. Illuminance measuring range: 0.10 ... 200·10<sup>3</sup> lux  
Irradiance measuring range: 1.0 mW/m<sup>2</sup> ... 2.000 W/m<sup>2</sup>.

This probe provides the ratio between UVA irradiance and illuminance in  $\mu\text{W}/\text{lumen}$  (quantity of interest in museums). The probe is equipped with SICRAM module and cable 2 m long.

## Application:

Lighting conditions and protection from UVA radiation in museums. Measurement of lighting strength and UVA radiation strength with penetration testing according to DIN EN ISO 3059 (crack/surface testing), ...

## Specifications Illuminance:

**Measuring range (lux):** 0.10 ... 199.99 ... 1.999.9 ... 19.999 ... 199.99·10<sup>3</sup>

**Resolution (lux):** 0.01 0.1 1 0.01·10<sup>3</sup>

**Spectral range:** in agreement with standard photopic curve V( $\lambda$ )

**$\alpha$  (temp. coefficient)  $f_6$  (T):** <0.05 % K

**Calibration uncertainty:** <4 %

**$f_1$  (in agreement with photopic response V( $\lambda$ )):** <6 %

**$f_2$  (response according to the cosine law):** <3 %

**$f_3$  (linearity):** <1 %

**$f_4$  (instrument reading error):** <0.5 %

**$f_5$  (fatigue):** <0.5 %

**Class:** B

**Drift after 1 year:** <1 %

**Working temperature:** 0 ... 50 °C

**Reference standards:** CIE n.69 – UNI 11142

## Specifications UVA Irradiance:

**Measuring range ( $\mu\text{W}/\text{cm}^2$ ):** 0.10 ... 199.99 ... 1.999.9 ... 19.999 ... 199.99·10<sup>3</sup>

**Resolution ( $\mu\text{W}/\text{cm}^2$ ):** 0.01 0.1 1 0.01·10<sup>3</sup>

**Spectral range:** 315 ... 400 nm (Peak 360 nm)

**Calibration uncertainty:** <5 %

**$f_2$  (response according to the cosine law):** <6 %

**$f_3$  (linearity):** <1 %

**$f_4$  (instrument reading error):**  $\pm 1$  digit

**$f_5$  (fatigue):** <0.5 %

**Drift after 1 year:** <2 %

**Working temperature:** 0 ... 50 °C



GLOBAL SOLAR RADIATION

## LP 471-SILI-PYRA

Art. no. 700072

Probe for the measure of global solar radiation

## General:

Solarmeter with silicon photodiode for measuring the global solar irradiance, diffuser for cosine correction. Spectral range 400 ... 1100 nm.

Measuring range: 1.0·10<sup>-3</sup> ... 2.000 W/m<sup>2</sup>. The probe is equipped with a SICRAM module and a 5 m cable.

## Application:

Efficiency control of photovoltaic panels in home and industrial solar power applications.

## Specifications:

**Measuring range (W/m<sup>2</sup>):** 1.0·10<sup>-3</sup> ... 999.9·10<sup>-3</sup> 1.000 ... 19.999  
20.00 ... 199.99 200.0 ... 1.999.9

**Resolution (W/m<sup>2</sup>):** 0.1·10<sup>-3</sup> 0.001 .01 0.01

**Spectral range:** 400 ... 1.100 nm

**Calibration uncertainty:** <3 %

**$f_2$  (response according to the cosine law):** <3 %

**$f_3$  (linearity):** <1 %

**$f_4$  (instrument reading error):**  $\pm 1$  digit

**$f_5$  (fatigue):** <0.5 %

**Drift after 1 year:** <2 %

**Working temperature:** 0 ... 50 °C



## 3-CHANNEL MULTI-FUNCTION DATA LOGGER

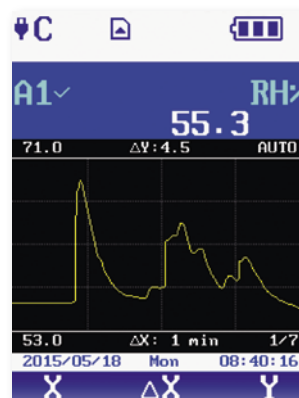


## HIGHLIGHTS:

- Three independent sensor inputs with automatic probe recognition
- Graphic colour display
- Data logger with SD card
- Automatic creation of PDF logs
- Mobility with rechargeable batteries



Connections



## HD 31

Universeller 3-Kanal Multifunktions Datenlogger mit grafischem Display

## General:

Universal 3-channel multi-function data logger with graphic display

The HD 31 is a universal data logger with the capacity to connect up to 3 "SICRAM" probes. All relevant data (serial number, type, calibration data) is stored in the SICRAM plugs, so the probes can be connected in any arbitrary manner. The connected probe is recognised automatically by the HD 31. Additional variables can be derived from the measured values. For example, the dewpoint temperature, wet-bulb temperature, absolute humidity, etc. can be calculated from the temperature and humidity. There is a total of 36 different measured variables available.

Large-format colour display for presentation of three measurements in numerical form or a real-time graphic.

The data is stored in CSV format on an SD card (buffer storage for several months, even if multiple measured variables are logged each second). The HD 31 can be connected via the optional USB cable directly to a PC and is recognised as a mass storage device. The HD 31 also generates automatic PDF logs, which are also stored on the SD card.

## Application:

The variety of measuring sensors and the derived measured variables enable a wide spectrum of applications, such as heating, ventilation and air conditioning or clean room applications. The following measuring variables can be detected:

- Temperature
- Relative humidity
- Pressure (absolute, relative or differential pressure)
- Air speed
- Lighting strength (Lux)
- Irradiance (W/m<sup>2</sup>)
- CO<sub>2</sub>

Numerous variables can be calculated from the aforementioned measurements and stored. This includes, for example, the absolute humidity in g/m<sup>3</sup> (from temperature and relative humidity) or with measurement in ventilation ducts of the volume flow (from the speed and the dimensions of the ventilation duct), etc

There are also SICRAM modules available for connection of external sensors with analogue output signals:

## VP 473:

SICRAM plug module for signal recording of external measuring transducers with voltage output, measuring range  $\pm 20$  VDC, input impedance 1 M $\Omega$

## IP 472:

SICRAM plug module for signal recording of external measuring transducers, measuring range 0 ... 24 mA, input impedance 25  $\Omega$

## VP 472:

SICRAM plug module for connection of pyranometers and albedometers with non-amplified signal output (adjustable sensitivity from 5 ... 30  $\mu$ V per W/m<sup>2</sup>)

Our product data sheet available online at [www.ghmgroup.de](http://www.ghmgroup.de) provides a complete overview

## Specifications (basic unit HD31):

<b>Power supply:</b>	Rechargeable internal 3.7 V Lithium battery, capacity 2250 mA/h, JST 3-pole connector. (optional SWD05 power supply)
<b>Battery autonomy:</b>	18 hours of continuous operation with three Pt100 probes (The effective autonomy depends on the number and type of connected sensors)
<b>Logging interval:</b>	1, 5, 10, 15, 30 s; 1, 2, 5, 10, 15, 20, 30 min; 1 h
<b>Storage capacity:</b>	SD memory card with capacity up to 4 GB. The logging duration depends on the number of logged quantities and on the capacity of the SD card employed.
<b>Inputs:</b>	3 SICRAM connections (8-pin, DIN 45326) for connection of measuring sensors with intelligent SICRAM plugs (up to 36 measured variables)
<b>Accuracy:</b>	$\pm 0.02$ % of the measure (Based on HD31 basic device)
<b>Clock stability:</b>	1 min / month maximum drift
<b>Display:</b>	Color graphic LCD. Visible area 43 x 58 mm
<b>USB Connection:</b>	mini USB connector, USP Port (HID)



Hartgummi Schutzhülle (55 SHORE) mit Aufsteller und Magnet für den Einsatz in rauen Umgebungen

### 3-CHANNEL MULTI-FUNCTION DATA LOGGER

<b>RS232C connection:</b>	1 serial RS232C output with RJ12 connector for connecting to a serial printer
<b>Auto-Off:</b>	Configurable after 2, 5, 10, 15, 20 or 30 min
<b>Operating conditions:</b>	-10 ... +60 °C, 0 ... 85 % RH without condensation (Instrument)
<b>Storage temperature:</b>	-25 ... +65 °C (Instrument)
<b>Protection rating:</b>	IP64
<b>Housing:</b>	ABS plastic, 55 SHORE hard rubber (sides and protective casing)
<b>Dimensions:</b>	165 x 88 x 35 mm (without protective casing)
<b>Weight:</b>	approx. 400 g (including battery and protective casing)
<b>Scope of supply:</b>	Batteries, SD card, DeltaLog 9 software, CP31, HD31.28 and case. Connection module, measuring sensors and mains adapter are optional and not included in the scope of supply.

**Accessories and spare parts:**

<b>CP23</b>	Art. no. 700050 USB connection cable, USB 2.0, Mini USB socket type B
<b>SWD05</b>	Stabilised mains adapter, 100 ... 240 VAC, 5 VDC, output type A USB plug
<b>HD31.28</b>	Protective casing, durable SHORE 55 rubber, stand and magnet

SELECTION OF SENSORS: THE FOLLOWING IS ONLY AN SAMPLING OF THE AVAILABLE MEASURING SENSORS. FOR A COMPLETE OVERVIEW OF THE AVAILABLE MEASURING SENSORS FOR THE VARIOUS PARAMETERS, VISIT [WWW.GHM-GROUP.DE](http://WWW.GHM-GROUP.DE)

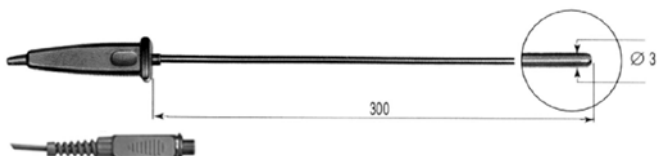
#### TEMPERATURE SENSORS:

Temperature sensors with thermocouples and Pt100/1000 are available. They are available either as a complete sensor with SICRAM plug or as a SICRAM module for connection of external sensors (including thermocouples of the type K, J, T, E, N, R, S, B).



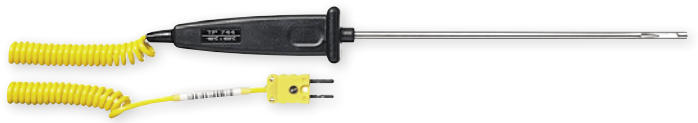
**Example:**  
**TP 472 I (Pt100, immersion sensor)**

Immersion probe, -196 ... +500 °C, ±0.25 °C (-196 ... +300 °C), Ø 3 mm, sensor length 300 mm, cable length 2 m

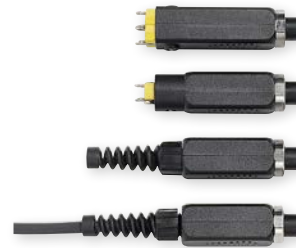


**Example:**  
**TP 744 I (type K, air sensor)**

Air sensor, up to 400 °C, Ø 4 mm, sensor length 180 mm, cable length 2 m



**SICRAM modules TP 471, TP 471 Do, TP 471 D and TP 471 D1** for connection of external sensors

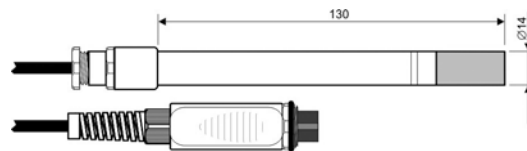


#### COMBINED HUMIDITY AND TEMPERATURE SENSORS

There are currently nine different sensors available with SICRAM plugs. Temperature measuring range, up to 180 °C depending on the version, humidity measuring range 0 ... 100 % RH

**Example:**  
**TP 478 ACR (Pt100, capacitive)**

Measuring range: -40 ... +150 °C, 0 ... 100 % RH, sensor length 130 mm, cable length 5 m



#### PRESSURE SENSORS (ABSOLUTE, RELATIVE AND DIFFERENTIAL PRESSURE)

**PP 471:**  
SICRAM module for connection of pressure sensors from the TP 704 / TP 705 series (absolute, relative and differential pressure, measuring range from 10 mbar to 500 bar depending on the probe)

**PP 472:**  
SICRAM probe for measurement of barometric pressure (600 ... 1100 mbar, ±0.3 mbar, operating range -10 ... +60 °C.

**PP 473 S1 ... S8:**  
SICRAM probes (differential pressure, measuring range from 10 mbar ... 2000 bar depending on the probe)

### 3-CHANNEL MULTI-FUNCTION DATA LOGGER

#### AIR SPEED SENSORS:

After various measuring processes (heat wire or impeller anemometer and pitot probes).

##### Heat wire probes:

Direction-dependent (measuring range 0.1 ... 40 m/s) or omnidirectional for measurement of thermal comfort (0.1 ... 5 m/s)



##### Impeller probes:

Measuring range 0.6 ... 25 m/s (Ø 100 mm) or 0.4 ... 20 m/s (Ø 60 mm)



##### Pitot dynamic pressure probes:

Measuring ranges, 2 ... 40 m/s to 2 ... 130 m/s, depending on probe version (T1 to T4) and SICRAM differential pressure module (AP 473 S1...S4)



... Refer to HD 31 data sheet for details..

#### PHOTOMETRIC AND RADIOMETRIC PROBES:

Wide assortment of photometric and radiometric probes (ready for connection with SICRAM plugs) for measurement of:

- Lighting strength (Lux)
- Luminance (cd/m<sup>2</sup>)
- UVA, UVB, UVC irradiance (W/m<sup>2</sup>)
- U<sub>eff</sub> irradiance, weighted (W/m<sup>2</sup>)
- Irradiance in the visible and NIR range, 400 ... 1050 nm (W/m<sup>2</sup>)
- "PAR" photosynthetically active radiation (W/m<sup>2</sup>)
- Irradiance of blue light, 380 ... 550 nm (W/m<sup>2</sup>)
- Global solar radiation (W/m<sup>2</sup>)



##### LP 471 PYRA02.5

for measurement of solar radiation (Class 2 pyranometer according to WMO. Further pyranometers according to Class 1, secondary standard or low-cost version with silicone sensor on request)



#### CO<sub>2</sub> PROBE

CO<sub>2</sub> probe (NDIR) with SICRAM plug, measuring range 0 ... 5000 ppm CO<sub>2</sub>, operating temperature -5 ... +50 °C



Please visit our website [www.ghm-group.de](http://www.ghm-group.de) for complete information about our HD 31 multi-function data logger. You will also find a complete overview of all compatible probes for the specified parameters.

ANEMOMETER (AND THERMOMETER)

THERMAL ANEMOMETER PROBES / IMPELLER PROBES



HD-2303-0



AP-471-S1

AP-471-S2

AP-472-S2

**HD 2303.0239,90**

Art. no. 700073

Anemometer

**General:**

The HD-2303-0 is designed for use in the fields of air conditioning, heating, ventilation and environmental comfort. It uses hotwire or vane probes to measure air speed, flow rate, and temperature inside pipelines and vents. Temperature only is measured by immersion, penetration air or contact probes. The temperature sensor used can be chosen from the Pt100, Pt1000. The probes are equipped with the SICRAM module, with the factory calibration data stored inside.

**Specifications:**

**Instrument**

<b>Dimensions:</b>	140 x 88 x 38 mm (H x W x D)
<b>Material:</b>	ABS
<b>Display:</b>	2 x 4½ digits plus symbols, Visible area: 52 x 42 mm

**Operating conditions**

<b>Working temperature:</b>	-5 ... +50 °C
<b>Storage temperature:</b>	-25 ... +65 °C
<b>Working relative humidity:</b>	0 ... 90 % RH, without condensation
<b>Protection rating:</b>	IP67

**Power supply**

<b>Batteries:</b>	3 1.5 V type AA batteries
<b>Battery operation:</b>	200 h with 1800 mAh alkaline batteries
<b>Power absorbed with instrument off:</b>	<20 µA

**Measuring unit:** °C – °F – m/s – km/h – ft/min – mph – knot – l/s  
m³/min – m³/h – ft³/s – ft³/min

**Connections**

<b>Input module for the probes:</b>	8-pole male DIN45326 connector
-------------------------------------	--------------------------------

**Measurement of temperature by Instrument**

<b>Pt100 measurement range:</b>	-200 ... +650 °C
<b>Pt1000 measurement range:</b>	-200 ... +650 °C
<b>Resolution:</b>	0.1 °C
<b>Accuracy:</b>	±0.1 °C

**Scope of supply:** Instrument HD-2303-0, 3 1.5 V alkaline batteries, manual, case.  
**Probes must be ordered separately.**

**AP 471-S1**

Art. no. 700074

Anemometer probes for air speed

**AP 471-S2**

Art. no. 700075

Anemometer probes for air speed

Specifications:	AP-471-S1	AP-471-S2
<b>Type of measure:</b>	Air speed, calculated flow rate, air temperature	
<b>Type of sensor</b>		
<b>Speed:</b>	NTC thermistor	Omnidirectional NTC thermistor
<b>Temperature:</b>	NTC thermistor	NTC thermistor
<b>Measurement range</b>		
<b>Speed:</b>	0.1 ... 40 m/s	0.1 ... 5 m/s
<b>Temperature:</b>	-25 ... +80 °C	-25 ... +80 °C
<b>Measurement resolution</b>		
<b>Speed:</b>	0.01 m/s – 0.1 km/h – 1 ft/min – 0.1 mph – 0.1 knot	
<b>Temperature:</b>	0.1 °C	
<b>Measurement accuracy</b>		
<b>Speed:</b>	±0.2 m/s (0 ... 0.99 m/s) ±0.4 m/s (1.00 ... 9.99 m/s) ±0.8 m/s (10.00 ... 40.0 m/s)	±0.2 m/s (0 ... 0.99 m/s) ±0.3 m/s (1.00 ... 5.00 m/s)
<b>Temperature:</b>	±0.8 °C (-10 ... +80 °C)    ±0.8 °C (-10 ... +80 °C)	
<b>Minimum speed:</b>	0.1 m/s	
<b>Air temperature compensation:</b>	0 ... 80 °C	
<b>Sensor working conditions:</b>	Clean air, RH <80 %	
<b>Battery life:</b>	Approx. 20 hours @ 20 m/s with alkaline batteries	Approx. 30 hours @ 5 m/s with alkaline batteries
<b>Unit of Measurement</b>		
<b>Speed:</b>	m/s – km/h – ft/min – mph – knot	
<b>Flow rate:</b>	l/s – m³/s – m³/min – m³/h – ft³/s – ft³/min	
<b>Pipeline section for flow rate calculation:</b>	0.0001 ... 1.9999 m²	
<b>Cable length:</b>	~ 2 m	
<b>Scope of supply:</b>	Hot-wire telescopic probe	Omnidirectional hot-wire probe

**AP 472-S2**

Art. no. 700076

Anemometer probes for air speed, Impeller

Specifications:	
<b>Type of measure:</b>	Air speed, calculated flow rate
<b>Diameter:</b>	60 mm
<b>Type of measurement</b>	
<b>Speed:</b>	Vane
<b>Measurement range</b>	
<b>Speed (m/s):</b>	0.5 ... 20
<b>Temperature (°C):</b>	-25 ... +80 (*)
<b>Resolution</b>	
<b>Speed:</b>	0.01 m/s – 0.1 km/h – 1 ft/min – 0.1 mph – 0.1 knot
<b>Accuracy</b>	
<b>Speed:</b>	±(0.4 m/s +1.5 % f.s.)
<b>Minimum speed:</b>	0.5 m/s
<b>Unit of Measurement</b>	
<b>Speed:</b>	m/s – km/h – ft/min – mph – knot
<b>Flow:</b>	l/s – m³/s – m³/min – m³/h – ft³/s – ft³/min
<b>Pipeline section for flow rate calculation:</b>	0.0001 ... 1.9999 m²
<b>Cable length:</b>	~ 2 m
<b>Scope of supply:</b>	Vane probe

(\*) The indicated value refers to the vane's working range.



PHONOMETER



**GSH 8922**

Art. no. 602739

Phonometer

**General:**

Compensation of the background-noise for measuring sound-sources in the fore-ground. Weighting of the sound level via two weighting-filters according to the IEC standard. Assignment of the max/min value during one measuring period.

**Specifications:**

<b>Measuring range:</b>	30 ... 130 dB (6 ranges) 30 ... 80, 40 ... 90, 50 ... 100, 60 ... 110, 70 ... 120, 80 ... 130 dB manual or automatic selection of range
<b>Resolution:</b>	0.1 dB
<b>Accuracy:</b>	±1.5 dB
<b>Norms:</b>	ANSI S1.4 and IEC 651 Typ 2
<b>Frequency rate weighted:</b>	31.5 Hz ... 8 kHz
<b>Evaluation weight filter:</b>	2, selectable
<b>Type A:</b>	evaluation of the spectrum in accordance with the perceptive faculties of the human ear. (Sound insulation establishment, environmental analysis)
<b>Type C:</b>	linear evaluation of spectrum (sonic-analysis of engines or machines)
<b>Weight of time factor:</b>	fast or slow
<b>Microphone:</b>	6 mm Electret condensator
<b>Display:</b>	3½-digit LCD-backlight display, additionally quasi-analog bar graph
<b>Analog output:</b>	AC: 0.707 Vrms, DC: 10 mV DC / dB
<b>Working temperature:</b>	4 ... +50 °C
<b>Relative humidity:</b>	10 ... 90 % RH
<b>Storage temperature:</b>	-20 ... +60 °C
<b>Interface:</b>	RS232, (2400BD8N1)
<b>Power supply:</b>	9 V battery, external 9 V power supply
<b>Operating time:</b>	20 hours (with alkaline)
<b>Housing:</b>	256 x 80 x 38 mm (H x W x D)
<b>Weight:</b>	approx. 240 g (device)
<b>Scope of supply:</b>	Device with analog output, battery, case, manual

ROTATION SPEED MEASURING DEVICE



VELOCITY AND LENGTH MEASUREMENT  
VIA MEASURING WHEEL

**rotaro 3**

Art. no. 603861

Speed Indicator via light and reflecting label or measuring tip

**Application:**

The handheld tachometer rotaro 3 is useful at the installation and setup of plants and machinery as well as for service application, monitoring production processes or use at development laboratory. The rotaro 3 can measure rotary speed of for example motors, turbines, pumps as well as stirring devices, centrifuges and haulage installations, foil or textile manufacturing units, coil and transformer winding machines, machine tools, etc. Furthermore it can measure running speed and length of foils and band of all kind.

**Specifications:**

<b>Measuring range:</b>	<b>rpm:</b> 1.00 ... 99.999 min <sup>-1</sup> (optical measurement) 1 ... 19.999 min <sup>-1</sup> (mechanical measurement)
<b>Velocity:</b>	∅ 0.1 m: 0.10 ... 1999 m / min ∅ 6": 0.10 ... 1524 m / min (other units possible: m / s, ft / min, in / min ...)
<b>Length:</b>	0 ... 99999 m / ft / in
<b>Accuracy</b>	<b>rpm:</b> ±0.02 % of m.v. (±1 digit)
<b>Measuring distance:</b>	max. 600 mm
<b>Measuring principle:</b>	optical / mechanical
<b>Memory function:</b>	min- / max- value memory, average and last value
<b>Power-off:</b>	automatically after 30 s
<b>Display:</b>	5-digit LCD display with 10 mm height of digits and floating point at range change
<b>Power supply:</b>	2 x AA battery or accumulator
<b>Working temperature:</b>	0 ... 50 °C
<b>Storage temperature:</b>	-20 ... +70 °C
<b>Housing:</b>	plastic ABS
<b>Approval:</b>	CE
<b>Dimensions:</b>	175 x 60 x 28 mm (H x W x D)
<b>Weight:</b>	250 g
<b>Scope of supply:</b>	Rotation speed measuring device incl. reflecting labels, measuring tip, hollow tip, measuring wheels (∅ 0.1 m and ∅ 6"), extension shaft, calibration certificate, case, battery, manual

ROTATION SPEED MEASURING DEVICE



VIA LIGHT AND REFLECTING LABEL

**ecotach**

Art. no. 603673

Speed Indicator via light and reflecting label

**Application:**

The handheld tachometer ecotach is useful at the installation and setup of plants and machinery as well as for service application, monitoring production processes or use at development laboratory. It can measure rotary speed of for example motors, turbines, pumps as well as stirring devices, centrifuges and haulage installations.

**Specifications:**

<b>Measuring range:</b>	1 ... 60.000 rpm
<b>Accuracy:</b>	±0.02 % of m.v. (±1 digit)
<b>Measuring distance:</b>	max. 450 mm
<b>Measuring principle:</b>	optical
<b>Power-off:</b>	automatically after 30 s
<b>Display:</b>	5-digit LCD display for measuring value with floating point, measuring unit, trigger signal, low-battery warning, notification when battery is low
<b>Power supply:</b>	2 x AA battery or accumulator
<b>Working temperature:</b>	0 ... 50 °C
<b>Housing:</b>	plastic ABS
<b>Approval:</b>	CE
<b>Dimensions:</b>	145 x 60 x 28 mm (H x W x D)
<b>Weight:</b>	147 g
<b>Scope of supply:</b>	Rotation speed measuring device incl. reflecting labels, transportation slip case, battery, manual

# SIMULATORS

HANDHELD INSTRUMENTS

SOFTWARE

ACCESSORIES

ALARM / PROTECTION, LEVEL



GHM Sensor Simulator  
SIM-1

HD-9609

**APPLICATION:**

DMS simulation	•	
Voltage simulation	•	
Current simulation	•	
TC simulation	•	
Pt100 simulation	•	
Current measurement	•	
Voltage measurement	•	
pH simulation		•
Redox simulation		•

**EQUIPMENT:**

Connections	7-pin Binder	BNC
Battery	Li-Ion	9 V DC alkaline battery
Display	Graphic LCD	LCD, 2 lines, 3 1/2 digits

**DEVICE INFORMATION:**

Catalogue page	Page 107	Page 107
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## INFORMATION

The GHM sensor simulator is used for fast verification of metrological devices such as DMS and temperature measuring amplifiers. Even sensors with a voltage or current interface can be simulated. Instead of Sensor, a GHM sensor simulator is connected and thus the complete measurement chain from the sensor cable over the amplifier to digital detection tested. The simple and intuitive operation and the graphical display allow easy useage without training periods. Due to battery operation and compact dimensions the GHM sensor simulator is suitable particularly for the mobile use on the test bench. The additional complete measurement of the voltage and current signals the GHM sensor simulator into a unique instrument for using the test bench as well as in the laboratory.

## SIMULATOR



## GHM SensorSimulator SIM-1

Art. no. 201164  
Simulator

## GHM SensorSimulator SIM-1F

Art. no. 201366  
Simulator with frequency output

## General:

The GHM SensorSimulator issues various current and voltage signals. With additional return measurement of feed voltages and currents from connected measuring amplifiers, the GHM SensorSimulator can also provide optimal, true-to-the-original simulation of sensors like Pt100, various thermocouples and strain gauge sensors. An optional frequency output is available.

## Application:

It can be used to compare and check displays and measuring transducers or transformers or complete measuring distances. Voltages and currents can also be measured with the device.

## Specifications:

<b>Accuracy:</b>	see under Sensors
<b>Connections:</b>	7-pin Binder socket for signal input and output, Mini USB for voltage supply / charge function
<b>Display:</b>	Graphic LCD, monochrome, adjustable background light (180 x 128 pixels)
<b>Operation:</b>	Keypad
<b>Supported languages:</b>	German / English
<b>Dimensions:</b>	86 x 160 x 37 mm (W x H x D)
<b>Weight:</b>	250 g (including battery)
<b>Supply voltage:</b>	5 V DC (micro-USB)
<b>Akku:</b>	Li-Ion battery
<b>Ambient temperature:</b>	0 ... 50 °C
<b>Simulation function</b>	
<b>Voltage source:</b>	Simulation range: $\pm 10$ V Accuracy: $\pm 1$ %
<b>Signal current:</b>	Simulation range: $\pm 25$ mA Accuracy: $\pm 1$ %
<b>Strain gauge bridges:</b>	Simulation ranges: 0, 0.5, 1, 2, 4, 5, 10, 25, 50 mV/V Accuracy: $\pm 1$ % Feed: 2.5 V, 5 V, 10 V
<b>Thermocouples</b>	
<b>Type K</b>	
<b>Simulation ranges:</b>	-100 ... +1000 °C (Increments: -100 ... +100 °C: 10 °C 100 ... 500 °C: 25 °C 500 ... 1000 °C: 50 °C)

## HIGHLIGHTS:

- Simulation of various sensors, such as strain gauge, Pt100, TC
- Transmitter and measuring function for voltages and currents
- Simple, self-explanatory use in German and English
- Robust protective silicone case
- Graphic LCD
- Compact dimensions
- Battery-operated



**Accuracy:** with simulated compensation:  $\pm 1$  %; with internal temperature measurement:  $\pm 3$  K

## Type J

**Simulation ranges:** -100 ... +1000 °C  
(Increments: -100 ... 100 °C: 10 °C  
100 ... 500 °C: 25 °C  
500 ... 1000 °C: 50 °C)

**Accuracy:** with simulated compensation:  $\pm 1$  %; with internal temperature measurement:  $\pm 3$  K

## Type N

**Simulation ranges:** -100 ... +1250 °C  
(Increments: -100 ... +100 °C: 10 °C  
100 ... 500 °C: 25 °C  
500 ... 1250 °C: 50 °C)

**Accuracy:** with simulated compensation:  $\pm 1$  %; with internal temperature measurement:  $\pm 3$  K

## Type S

**Simulation ranges:** -50 ... +1600 °C  
(Increments: -50 ... +100 °C: 10 °C  
100 ... 500 °C: 25 °C  
500 ... 1600 °C: 50 °C)

**Accuracy:** with simulated compensation:  $\pm 1$  %; with internal temperature measurement:  $\pm 3$  K

## Pt100

**Simulation ranges:** -100 ... +850 °C  
(Increments: -100 ... +100 °C: 10 °C  
100 ... 500 °C: 25 °C  
500 ... 850 °C: 50 °C)

**Accuracy:**  $\pm 1$  %

## Frequency (option F)

**Simulation ranges:** 1 Hz ... 500 kHz  
(Increments: 1 ... 10 Hz: 1 Hz  
10 ... 100 Hz: 10 Hz  
100 Hz ... 1 kHz: 100 Hz  
1 ... 10 kHz: 1 kHz  
10 ... 100 kHz: 10 kHz  
100 ... 500 kHz: 100 kHz)

**Level (adjustable):**  $\pm 10$  V

**Accuracy:**  $\pm 1$  %

## Measurement function:

**Voltage source:** Measuring range:  $\pm 30$  V  
Accuracy:  $\pm 0.5$  %

**Current:** Measuring range:  $\pm 30$  mA  
Accuracy:  $\pm 0.5$  %

**Scope of supply:** GHM SensorSimulator, battery, charger, manual

## PH AND MV SIMULATOR



## HIGHLIGHTS:

- Checking and calibrating pH and redox ORP instrument
- Simple to use

## HD-9609

Art. no. 700046  
pH- und mV-Simulator

## General:

The simulator HD-9609 is a portable instrument for checking and calibrating pH and mV measuring instruments. The characteristics of this instrument satisfy any checking and calibrating requirements for both portable and panel-mounted instruments; it can be used in laboratories, in industry or for check out on field. Despite its many functions, the instrument is simple to be used: a large display, with dual indication, and a series of symbols allow it to be used even by unskilled personnel.

## Specifications:

<b>pH simulation:</b>	0 ... 14 pH
<b>pH resolution:</b>	0.1 pH
<b>pH accuracy (20 ... 25 °C):</b>	0.002 pH
<b>mV simulation:</b>	$\pm 1.999$ mV
<b>mV resolution:</b>	1 mV
<b>mV accuracy:</b>	$\pm 100$ $\mu$ V
<b>Noise (0 ... 10 Hz):</b>	1 $\mu$ V peak/peak
<b>Simulation of temperature compensation:</b>	-20 ... +150 °C (-4 ... +302 °F)
<b>Output impedance:</b>	100 k $\Omega$ 1 %, 1 G $\Omega$ 5 %
<b>Display:</b>	LCD 2 lines, 3 1/2 digits. Figure height approx. 12.5 mm.
<b>Symbols:</b>	pH, mV, °C, °F, HI imp., LO imp., 0.1 pH, 1 pH, 1 mV, 10 mV
<b>Working temperature:</b>	-5 ... +50 °C (-23 ... +122 °F)
<b>Power supply:</b>	9 V DC alkaline battery. Low battery indication.
<b>Consumption (instrument only):</b>	5 mA lit up, 20 $\mu$ A turned off
<b>Autonomy:</b>	about 200 h
<b>Dimensions:</b>	187 x 72 x 38 mm (H x W x D)
<b>Scope of supply:</b>	Gerät HD-9609, Adapterkabel CP-9509BNC, CP-9509-T, Transportkoffer

## Accessories:

**CP9509/BNC**  
Art. no. 700047  
Adapter cable, L = 1 m, BNC plug both sides

**CP9509/T**  
Art. no. 700048  
Adapter cable, L = 1 m, BNC plug



SOFTWARE



HANDHELD INSTRUMENTS

SOFTWARE

ACCESSORIES

ALARM / PROTECTION, LEVEL



APPLICATION:	EBS 20M EBS 60M	EASYControl net	GSOFT 3050	GDUSB FastView
GMH 3xxx and GMH 5xxx	•	•	•	
GDUSB 1000				•
Several interfaces usable at the same time	• *	• *		• ***
Live measuring value recoding and displaying	•	•		•
Number of data points (recommendation)	up to 1 Mio.	from 1 Mio.		up to 10 Mio.
Change alarm boundaries		•		
Change correction (offset, slope)			•	
Network compatible (Simultaneous access to data by several PCs)		•		
Access via SQL queries possible		•		
Pilot EBB Out		• **		
Subject to a charge	•	•	•	
Application	Lab, test rig	Long-term monitoring	Read-out data logger	Lab, test rig

\* Arbitrarily combined interfaces, GMH 3xxx/5xxx and EASYBus can be used simultaneously.  
 \*\* Interface-spanning, alarm of GMH 3xxx/5xxx can be assigned to EBB-Out of EASYBus.  
 \*\*\* Recommended up to 5 GDUSB 1000 at full measuring speed, depending on CPU performance.



## SOFTWARE FOR MEASUREMENT DATA ACQUISITION



## HIGHLIGHTS:

- Real time monitoring of measuring data
- Simultaneous use of several serial interfaces

**EBS 20M**

Art. no. 601158

Measuring data acquisition software for EASYBus &amp; GMH, 20 channel

**EBS 60M**

Art. no. 601160

Measuring data acquisition software for EASYBus &amp; GMH, 60 channel

**General:**

This software makes up a low-price and comfortable multi-channel acquisition program for measuring data. The program is suitable for recording, monitoring, visualization and documentation.

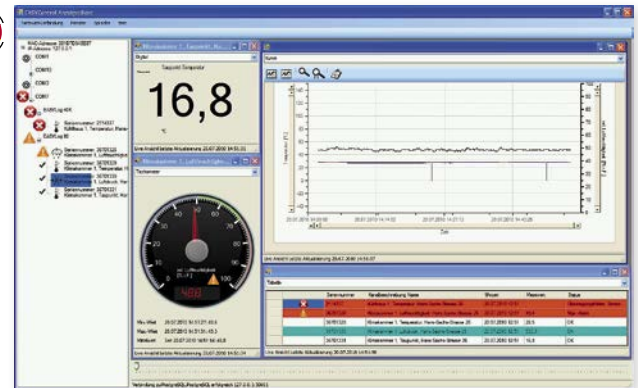
**Application:**

- On-site recording
- Process and system control, monitoring of climate and buildings
- Real time monitoring of measuring data i.e. for data evaluation and logging for cost listings, overview of consumption, optimisation of processes, and other statistics

**Specifications:**

<b>Program version:</b>	Application with user interface
<b>Data backup:</b>	File (SQLite)
<b>Export formats:</b>	*.csv
<b>Languages:</b>	German English
<b>Access control:</b>	-
<b>Remote access:</b>	-
<b>Alarms:</b>	optical in the interface
<b>Devices:</b>	EASYBus devices (via EASYBus level converter) GMH 3000 series (via GRS 3100 or USB 3100N) GMH 5000 series (via USB 5100) GDUSB 1000 (in standard mode)
<b>Several interfaces:</b>	usable at the same time
<b>Recording interval:</b>	from 0.5 s
<b>Live display:</b>	Yes
<b>Reading of data loggers:</b>	No
<b>System requirements:</b>	Microsoft Windows 7 SP1 (32 or 64 Bit) Not executable with Windows RT, Windows 10 in S Modus, ARM or Intel Itanium based Windows systems
<b>Scope of supply:</b>	DVD, manual

## EASYBUS-SOFTWARE



## HIGHLIGHTS:

- Visualisation via LAN
- User accounts
- Simultaneous use of several serial interfaces
- Create reports from measured data

**EASYControl net**

Art. no. 601152

Network-compatible measurement data detection

**General:**

This software allows cost-efficient network-compatible data logging and monitoring systems. The visualization can be done by any computer in the network.

**Application:**

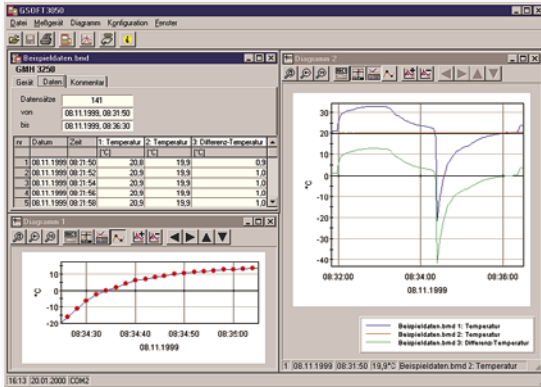
Long-term monitoring of climate cabinets and cooling cabinets.  
When a visualisation of distributed measuring points should take place.

**Specifications:**

<b>Program version:</b>	Application with user interface
<b>Data backup:</b>	Database (PostgreSQL)
<b>Export formats:</b>	*.doc (Word) *.xls (Excel) *.pdf (Adobe Reader)
<b>Languages:</b>	German English
<b>Access control:</b>	Dedicated user login
<b>Remote access:</b>	In the local network
<b>Alarms:</b>	optical in the interface Relay control via EBB Out
<b>Devices:</b>	EASYBus devices (via EASYBus level converter) GMH 3000 series* (via GRS 3100 or USB 3100N) GMH 5000 series* (via USB 5100)
<b>Several interfaces:</b>	usable at the same time
<b>Recording interval:</b>	from 5 s
<b>Live display:</b>	Yes
<b>Reading of data loggers:</b>	No
<b>System requirements:</b>	Microsoft Windows 7 SP1 (32 or 64 Bit) Not executable with Windows RT, Windows 10 in S Modus, ARM or Intel Itanium based Windows systems
<b>Scope of supply:</b>	DVD, manual

\* Only devices with a unique serial number (printed on the type plate)

## LOGGER-SOFTWARE



## HIGHLIGHTS:

- Operation of the logger function
- Diagram display
- Export function

## GSOFT 3050

Art. no. 601336

Windows software for GMH 3000 and GMH 5000 with logger

## General:

Software for starting, stopping and reading of GMH 3000 series and GMH 5000 series devices with data logger. The data can be visualised, saved and prepared for further processing.

## Application:

Reproduction of heating systems, laboratory tests, test stands and mobile data recording.

## Specifications:

<b>Program version:</b>	Application with user interface
<b>Data backup:</b>	File (binary)
<b>Export formats:</b>	*.csv
<b>Languages:</b>	German English French Czech
<b>Access control:</b>	-
<b>Remote access:</b>	-
<b>Alarms:</b>	-
<b>Devices:</b>	GMH 3000 series with data logger (via GRS 3100 or USB 3100N) GMH 5000 series with data logger (via USB 5100)
<b>Recording interval:</b>	Depending on the data logger
<b>Live display:</b>	No
<b>Reading of data loggers:</b>	Yes
<b>System requirements:</b>	Windows 7 SP1 or later (32 or 64 bit edition) Cannot run on Windows RT, Windows 10 in S mode, on ARM or Intel Itanium based Windows systems
<b>Scope of supply:</b>	DVD, manual

## SOFTWARE CONNECTION

GMH 3000-DLL  
(windows library)GDUSB 1000-DLL  
(windows library) (w/o picture)Protocol description  
(www.greisinger.de) (w/o picture)

GMH 3xxx, GMH 5xxx	•		•
EASYBus and EASYLog			•
TLogg			•
GDUSB 1000		•	
Start, stop, delete, read-out logger	•		
Program examples	Visual Studio, Excel VBA	Visual Studio	
subject to costs	•	•	

## GMH 3000.DLL

Art. no. 603027

Windows function library for GMH ,

For interface communication GMH3xxx / GMH5xxx &lt;-&gt; PC

PROTECTION BAGS



ST-R2



ST-KO



ST-KF



ST-G1000



**ST-R1**

Art. no. 601066

Nappa leathern device protection bag with 1 round cut-out for sensor connection

suitable for:

GMH 3111, GMH 3151, GMH 3161-12, GMH 3181-12, GMH 3211, GMH 3431, GMH 3451, GMH 3611, GMH 3651, GMH 3692, GMH 3710, GMH 3750

**ST-R1-US**

Art. no. 605929

Nappa leathern device protection bag with 1 round cut-out for sensor connection with strap

**ST-KO**

Art. no. 601078

device protection bag, without cutouts

suitable for:

GTD 1100, GPB 3300

**ST-KN**

Art. no. 601080

device protection bag with rectangular cut-out for sensor connection

suitable for:

GTH 1150, GTH 1170



**ST-R2**

Art. no. 601068

Nappa leathern device protection bag with 2 round cut-outs for sensor connection

suitable for:

GMH 3156, GMH 3161-002, GMH 3161-01, GMH 3161-07, GMH 3161-13, GMH 3181-002, GMH 3181-01, GMH 3181-07, GMH 3181-13

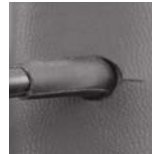
**ST-KR**

Art. no. 601082

device protection bag with round cut-out (central)

suitable for:

GTH 175, GOX 20, GOX 100, GLF 100, GLF 100 RW



**ST-R3**

Art. no. 605931

Nappa leathern device protection bag with 2 round cut-outs for sensor connection

suitable for:

GMH 3511/31/51

**ST-KF**

Art. no. 601084

device protection bag with punched-out slot for a sensor head

suitable for:

GFTH 95, GFTH 200, GFTB 200, GTH 200 air



**ST-N1**

Art. no. 601070

Nappa leathern device protection bag with 1 rectangular cut-out for sensor connection

suitable for:

GMH 1150, GMH 1170

**ST-KD**

Art. no. 601086

device protection bag with 2 round cut-outs

suitable for:

GDH 200-07, GDH 200-13, GDH 200-14, GMR 110



**ST-N2**

Art. no. 601072

Nappa leathern device protection bag with 2 rectangular cut-outs for sensor connection

suitable for:

GMH 3221/31/51

**ST-G1000**

Art. no. 611373

Device protection bag with 1 round cut-out for sensor connection

suitable for:

G 1000-Serie



**ST-RN**

Art. no. 601074

Nappa leathern device protection bag with 2 round cut-outs for sensor connection (1 x round, 1 x rectangular)

suitable for:

GMH 3330, GMH 3350, GMH 3831, GMH 3851

Devices and accessories are not included in scope of supply.

DEVICE CASE



**GKK 1000**

Art. no. 611603  
Case for G1000 series / temperature with cut-outs for 1 device of the GMH 1xxx series (235 x 185 x 48 mm)



**GKK 1001**

Art. no. 611604  
Case G1000 series water analysis universal with cut-outs for 1 device of the GMH 1xxx series and accessories for water analysis (395 x 295 x 106 mm)



**GKK 1002**

Art. no. 411907  
Case G1000 series water analysis small with cut-outs for 1 device of the GMH 14xx-/15xx-/16xx series incl. sensor in standard length



**GKK 1003**

Art. no. 411917  
Case for 2x G1000 series water analysis and 2x PHLx 450 x 360 x 106 mm (W x H x D)



**GKK 3001**

Art. no. 611605  
Case for GMH 3000 series water analysis / universal with cut-outs for 1 device of the GMH 3xxx series and accessories for water analysis (395 x 295 x 106 mm)



**GKK 3500**

Art. no. 601052  
Device case soft lining e.g. for 2x GMH 3000 or 5000



GKK 5001 insert

**GKK 5001**

Art. no. 611606  
Case for GMH 5000 / G7500 series water analysis / universal with cut-outs for 1 device of the GMH 5xxx-/7500 series and accessories for water analysis (395 x 295 x 106 mm)



**GKK 2019**

Art. no. 611609  
Device case 2 layers, for 1x GMH 5000 and 3 ready to use buffer solutions



**GKK 2021**

Art. no. 414760  
Device case 2 layers, for 1x GMH 5500/7500 and 3 PHL buffer solutions 450 x 360 x 140 mm (W x H x D)

HANDMESSGERÄTE

SOFTWARE

ZUBEHÖR

ALARM / SCHUTZ, NIVEAU



UNIVERSAL CASE



**GKK 252**  
 Art. no. 601056  
 Case with punched lining for universal application  
 (235 x 185 x 48 mm)



**GKK 3100**  
 Art. no. 601058  
 Case with punched lining for universal application  
 (275 x 229 x 83 mm)



**GKK 1100**  
 Art. no. 601060  
 Case with punched lining for universal application  
 (340 x 275 x 83 mm)



**GKK 3600**  
 Art. no. 601062  
 Case with punched lining for universal application  
 (394 x 294 x 106 mm)



**GKK 3700**  
 Art. no. 601064  
 Case with punched lining for universal application  
 (450 x 360 x 123 mm)



Farbe kann abweichen

**GKK 4400**  
 Art. no. 602067  
 Universal case for up to 10 devices or accessories, foam  
 for water analysis (closed cell structure), with bottle and  
 electrode retainer.  
 Dimensions: 500 x 405 x 140 mm (W x H x D)



GKK 5240 with foam lining  
 for individual adaption

**GKK 5240**  
 Art. no. 602068  
 Universal case, water protected  
 suitable for universal applications due to possibility of  
 individual adaption of its foam lining, pressure balance  
 possible.  
 Dimensions: 520 x 415 x 200 mm

SILICONE PROTECTION COVER



K 50 BL

K 50 RE

**K 50 BL**  
 Art. no. 601352  
 Silicone protection cover blue blue,  
 suitable for: G 7500, GMH 5xxx, GMH 2710

**K 50 RE**  
 Art. no. 607456  
 Silicone protection cover blue red,  
 suitable for: G 7500, GMH 5xxx, GMH 2710

MAGNETIC MOUNT



**NEW!**

**MH-S**

Art. no. 475187

magnetic holder with screw clamp, incl. 2 magnetic plates



**MH-T**

Art. no. 475188

magnetic holder with pedestal, incl. 2 magnetic plates



**MH-W**

Art. no. 475189

magnetic wall holder, self-adhesive, incl. 2 magnetic plates

**Accessories:**

**MH-MP**

Art. no. 475190

magnetic plate, 2 piece set, self-adhesive



MOUNT



**GMH 1300**

Art. no. 601091

Magnetic mount for hanging up the devices GMH 3000 & GMH 5000 with integrated suspension clip

HD-22-3 with probe



**HD-22-3**

Art. no. 700040

freely positionable laboratory sensor holding arm for sensors Ø12mm

PORTABLE THERMAL PRINTER



**HD 40.1**

Art. no. 700056

Portable thermal printer, that is connected to instruments or PC through the RS232 serial input.

**Specifications:**

<b>Printing method:</b>	Thermal
<b>Resolution:</b>	203 DPI (8 dot / mm)
<b>Printing speed:</b>	Up to 90 mm / s (depending on battery charge and ambient conditions)
<b>Dimensions:</b>	53 x 165 x 105 mm (H x W x D)
<b>Material:</b>	ABS
<b>Scope of supply:</b>	Device, 4 x NiMH 1.2 V rechargeable batteries, SWD-10 power supply, manual, 5 thermal paper rolls

**Accessories:**

**HD-2110-CSNM**

Art. no. 700041

RS232C 8-pole MiniDin - 9-pole D Sub female null-modem cable for connecting the printer to instruments with MiniDIN connector

**HD2110-RS**

Art. no. 700057

M12 - 9-pole D Sub connectors cable for connecting the printer to instruments with M12 connector

**SWD-10**

Art. no. 700039

100-240 V AC/12 V DC-1 A mains battery charger.

**BAT-40-1**

Art. no. 475817

Spare battery pack for HD-40-1 printer with in-built temperature sensor.

**RCT**

Art. no. 475423

spare paper

The kit includes 4 thermal paper rolls 57 mm wide and 32 mm diameter.

**GCLIP1000**

Art. no. 475820

Metal-clip self adhesive for G1000 - series

REMOTE OPERATION



LAN 3200

WLAN 3200

**LAN 3200**

Art. no. 609253

Gigabit Ethernet to USB converter

**General:**

For inquiring EASYBus modules, GMH handheld devices with interface or GDU5B 1000 via network. 2 USB ports for direct connection of EBW 3, USB 3100 N or GDU5B 1000 (up to 15 with USB hub). Connection of EBW 1, EBW 64 or EBW 240 via USB adapter (included to scope of supply)

**Scope of supply:** LAN 3200, power supply unit, USB adapter, manual, driver CD

**WLAN 3200**

Art. no. 610289

Gigabit-Ethernet or Wireless-LAN to USB converter

**General:**

For accessing EASYBus modules, GMH handheld devices with interface or GDU5B 1000 via local network or via WiFi. With 1 USB port for direct connection of one or more EBW 3, USB 3100N or GDU5B 1000 (up to 15 with an USB hub). With an USB to serial converter for connection of an EBW 1, EBW 64 or EBW 240.

**Weight:** 118 g

**Dimensions:** 100 x 100 x 25,5 mm (W x D x H)

**Scope of supply:** WLAN 3200, power supply unit, USB adapter, manual, CD

## POWER SUPPLY

**GB-AA**

Art. no. 610049

Spare battery Mignon (AA) 1,5 V

**GB 9 V**

Art. no. 601115

Spare battery 9V, type IEC 6F22

**GAK 9 V**

Art. no. 601118

NiMH accu 9V

**AAA-AKKU**

Art. no. 601121

AAA akku, 1,5V, 2 pcs, NiMH akku

**GNG 10**

Art. no. 600272

Plug in power supply

(220 / 240 V, 50 / 60 Hz), output voltage: 10.5 V / 10 mA, suitable for devices with 2.5 mm jack connector

**GNG 5 / 5000**

Art. no. 602287

Plug in power supply for devices of the series GMH 5XXX

(220 / 240 V, 50 / 60 Hz), output voltage: 5 V DC, suitable for devices with BNC

**GNG 10 / 3000**

Art. no. 600273

Plug in power supply for devices of the series GMH 3XXX

(220 / 240 V, 50 / 60 Hz), output voltage: 10.5 V / 10 mA, suitable for devices with power supply socket

## PLUG AND CABLE

**MINIDIN 4S**

Art. no. 601111

Mini-DIN plug, 4-pin, with lock and for self installation, for GMH 3700 series

**AAG2M**

Art. no. 601112

2 m analog output cable for GMH3xxx-series, 2 x banana plug and 3.5 mm jack connector

**AAG 5000**

Art. no. 603871

Cable for analog output, with cable length 1 m, connectors: 1 x bayonet socket LTW 4-pole, 1 x loose ends, with ferrules

Application: GMH 5xxx.

## INTERFACE

**USB 3100 N**

Art. no. 601092

Interface converter GMH 3xxx &lt;=&gt; PC, for electrically isolated connection of a GMH 3xxx to the USB-interface of your PC. (Converter supplying from PC interface)

**USB 5100**

Art. no. 601095

Interface converter GMH 5xxx &lt;=&gt; PC, for electrically isolated connection of a GMH 5xxx to the USB-interface of your PCs. (Converter supplying from PC interface)

**USB 5200**

Art. no. 607177

USB level converter for GMH 5000 Handheld Instruments (such as USB 5100). With additional analog output, can be set on the device.

**GRS 3100**

Art. no. 601097

Interface converter GMH 3xxx &lt;=&gt; PC for electrically isolated connection of a GMH 3xxx to the RS232-interface.

**GRS 3105**

Art. no. 601099

5-point interface converter GMH 3xxx &lt;=&gt; PC, connection of 5 GMH 3xxx to the RS232-interface of your PC. (Converter supply achieved via permanently connected power supply) Device delivered with 9-pin Dsub extension cable and 5 connection cables VEKA3105.

**VEKA 3105**

Art. no. 601101

Spare connection cable, 2 m, GMH 3xxx &lt;=&gt; GRS 3105

**GSA 25S-9B**

Art. no. 601105

Connection adapter (25-pin Dsub-adapter &lt;=&gt; 9-pin Dsub-socket)

**GSA 9S-25B**

Art. no. 601107

Connection adapter (9-pin Dsub-adapter &lt;=&gt; 25-pin Dsub-socket)

**USB-Adapter**

Art. no. 601109

for connection of a RS232-interface converter to the USB-interface



# ALARM / PROTECTION, LEVEL

HANDELD INSTRUMENTS

SOFTWARE

ACCESSORIES

ALARM / PROTECTION, LEVEL



ALSCHU 300 FG  
ALSCHU 300 SP



ALSCHU 485

ALSCHU 485 OE  
ALSCHU 485 OE / 3P



GEWAS 181 A  
GEWAS 183 A  
GEWAS 181 A - 1/2" - 3/4" - 1"



GEWAS 300 FG  
GEWAS 300 SP

**APPLICATION:**

Universal application

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Level controller

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Water leak detector

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Electrodes incl.

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Alarm buzzer

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Switching output

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Water supply is switched off

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•

**DEVICE INFORMATION:**

Catalogue page

Page 117

Page 117

Page 117

Page 121

Page 119



ALSCHU 480  
ALSCHU 480 P



GEWAS 200

GEWAS 191 N



GEWAS 191 AN



RWI-016 PPK  
RWI-016 PVK  
RWI-015 HKL

**APPLICATION:**

Universal application

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Level controller

Water leak detector

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Level Switch

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Electrodes incl.

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Alarm buzzer

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Switching output

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**DEVICE INFORMATION:**

Catalogue page

Page 122

Page 119

Page 120

Page 120

Page 118



## ELECTRODE CONTROLLER / LEVEL CONTROLLER



ALSCHU 300 FG



ALSCHU 300 SP

**ALSCHU 300 FG**

Art.-Nr. 600476

Electrode controller in field frame for wall mounting, device without sensor

**ALSCHU 300 SP**

Art.-Nr. 600479

Electrode controller in snap-on housing for DIN rail mounting, device without sensor

**Application:**

Automatic control of drainage pumps and wastewater lifting plants, overflow and low liquid level control, automatic filling and draining of tanks, level control of liquid reservoirs, aquariums, storage tanks, etc.

The ALSCHU 300... is especially suitable for detection of conducting media (water, etc.). It is less applicable for badly or non conducting media (oils or fatty liquids), conducting foaming liquids or media causing electrically isolating deposits on the electrodes.

**Measuring method:**

The measuring method for level detection is based on the conductive principle, i.e. the electrical conductivity of the media is monitored. If the switching amplifier detects a value below the set conductivity the state "media detected" is output, otherwise "no media". Depending on number and design of the connected level sensors the device can be used for level detection (min-/max-detection) or as 2-point controller.

**Specifications:****Power supply:** 18 V ... 250 V AC/DC wide-range power supply**Power consumption:** <2 VA**2 signal inputs:****Triggering level:** <80 kΩ**Response time:** 2 s**1 Relay output:****Contact:** change-over contact, potential-free**Switching voltage:** ≤250 V AC**Switching current:** ≤5 A (ohmic load)**Protection class:** IP20 (ALSCHU 300 SP) or IP65 (ALSCHU 300 FG)**Working temperature:** -20 ... +60 °C, <75 % RH (non condensing)**Storage temperature:** -40 ... +80 °C**Condensation:** not allowed**Functions / displays:****Red / green LED:** display for switching state of relay, switching state of sensors, status (supply) of device**Housing:****ALSCHU 300 SP:** 22.5 x 75 x 110 mm (W x H x D)**ALSCHU 300 FG:** 100 x 100 x 60 mm (W x H x D) without PG cable glands**Scope of supply:** Device, manual**Accessories and spare parts:**

Sensors see page 118

## ELECTRODE CONTROLLER / LEVEL CONTROLLER

**ALSCHU 485**

Art.-Nr. 603479

Electrode control device for filling or emptying, incl. two 2-pin. electrodes

**ALSCHU 485 OE**

Art.-Nr. 603807

Electrode control device for filling or emptying, without electrodes - connection for two 2-pin. electrodes

**ALSCHU 485 OE/3P**

Art.-Nr. 603808

Electrode control device for filling or emptying, connection for 3-pin electrodes

**Application:**

Automatic control of drain pumps and sewage removal plants, overflow and dry running protection, automatic filling and emptying of containers, basins, tanks, control of liquid level in storage tanks, aquariums, etc.

**Specifications:****Control device:** Flashing LED indicating control state. Selector switch for emptying or filling. Plug-in socket for electrodes.**Power supply:** control device 230 V 50 Hz (approx. 1 VA), automatic by connecting grounded adaptor plug.**Control output:** via grounded adaptor plug with earthing and socket outlet with earthing, electrode control. Direct switching capacity approx. 1200 VA at 230 V 50 Hz (approx. 5 A ohmic load). Extra high protective capacity by external triggering of a contactor or semiconductor relay.**Electrode connection****ALSCHU 485:** 2 x 2.5 mm jack sockets, 2 electrodes with stainless steel pins, plastic body with PVC cable (2 m long) included (surcharge see GNS-15 page 122)**ALSCHU 485 OE:** 2 x 2.5 mm jack sockets**ALSCHU 485 OE/3P:** 3-pole screw terminal**Dimensions housing:** 112 x 71 x 48 mm (L x W x D)**Scope of supply:** Device, manual, only ALSCHU 485: 2 electrodes**Accessories and spare parts:**

Sensors see page 118



## WATER MONITOR WITH ONE SIGNAL INPUT AND ONE RELAY OUTPUT



GEWAS 300 FG



GEWAS 300 SP

**GEWAS 300 FG**

Art.-Nr. 600472

Water monitor in field frame for wall mounting, device without sensor

**GEWAS 300 SP**

Art.-Nr. 600474

Water monitor in snap-on housing for DIN rail mounting, device without sensor

**General:**

The measuring method for level detection is based on the conductive principle, i.e. the electrical conductivity of the media is monitored. If the switching amplifier detects a value below the set conductivity the state "media detected" is output, otherwise "no media".

**Application:**

Versatile alarm and protection device for DIN rail or surface mounting with universal input (screw-type terminals) for several external sensors. Sensors with switching threshold <100 kOhm can be connected (e.g. water probes, floating switches, level probes, magnetic contacts, etc.). In case of an alarm the connected device (e.g. pump, machine) is switched off by a change-over contact. The GEWAS 300 FG additionally provides an alarm. The internal or an external push-button resets the alarm state.

The GEWAS 300 ... is especially suitable for detection of conducting media (water, etc.). It is less applicable for badly or non conducting media (oils or fatty liquids), conducting foaming liquids or media causing electrically isolating deposits on the electrodes.

**Specifications:****Power supply:** 18 V ... 250 V AC/DC, wide-range power supply**Power consumption:** <2 VA**1 signal inputs****Triggering level:** <80 kΩ**Response time:** 2 s**1 Relay output****Contact:** change-over contact, potential-free**Switching voltage:** ≤250 V AC**Switching current:** ≤5 A (ohmic load)**external alarm output:** **GEWAS 300 FG only:** 8 V, 3 kHz, ≤5 mA**Protection class:** **GEWAS 300 SP:** IP20  
**GEWAS 300 FG:** IP65**Working temperature:** -20 ... +60 °C**Storage temperature:** -40 ... +80 °C**Condensation:** not allowed**Functions / displays:****Red / green LED:** display for switching state of relay, switching state of sensors, status (supply) of device, status of battery**Acoustic alarm:** **GEWAS 300 FG only:** internal alarm buzzer with battery back-up**Battery back-up:** **GEWAS 300 FG only:** Monitoring and acoustic alarm are ensured even e.g. during power failures**Alarm reset:** for deletion of the alarm  
**GEWAS 300 SP:** connection for external push-button  
**GEWAS 300 FG:** push-button at front side**Housing:** **GEWAS 300 SP:** 22,5 x 75 x 110 mm (W x H x D)  
**GEWAS 300 FG:** 100 x 100 x 60 mm (W x H x D), without PG cable glands**Scope of supply:** Device, manual**Accessories and spare parts:**

Sensors see page 120

## PROTECTION DEVICE FOR UNIVERSAL APPLICATION



PANEL MOUNTED DEVICE WITH SWITCHING OUTPUT

**GEWAS 200**

Art.-Nr. 600279

Panel-mounted alarm protection device with volt-free relay output (snap-on mounting for top hat rail in special snap-on housing), without sensor

**General:**

The GEWAS 200 is a versatile DIN rail alarm and protection device. Its universal input (screw terminals) allows a lot of different external sensors to be connected. That includes sensors with a switching threshold <100 kOhm like water sensors, float switches, level switches, magnetic contacts, etc. A connected device (i.e. pump, machine) is switched on or off via potential-free change-over contact in case of an alarm. The alarm is reset by the use of an internal / external reset button.

**Specifications:****Power supply:** 220 / 240 V 50 / 60 Hz**Power consumption:** approx. 3 VA**Sensor input:** 2-pole screw terminal**Switching threshold:** input resistance <100 kOhm  
(e. g. NPN no active, relay, reed contact, etc.)**Switching output:** potential-free change-over contact**Switching power:** 250 V AC, 10 A (ohmic load), max. 2400 VA  
150 V DC, 2 A (ohmic load), max. 240 W**red / green LED:** LED (green) for operation display  
LED (red) for alarm condition**Mounting:** universal foot base for all common DIN EN rails**Working conditions:** -20 ... +50 °C and 0 ... 80 % RH**Dimensions:** 49 x 96 x 59 mm (L x W x H)**Scope of supply:** Device, manual**Options:****GEWAS 200 KL**

Art.-Nr. 600306

Device with screw terminal (2-pole) to connect an external reset button

**GEWAS 200 AL**

Art.-Nr. 601041

Device with automatic alarm reset

**Accessories and spare parts:****GWF-1**

Art.-Nr. 601712

water sensor without plug, cable 2 m

**GSS-1**

Art.-Nr. 606016

level probe (plug-in float switch), 2 m cable for electrically non-conductive media (normally open/normally closed function can be selected by customer)

**GNS-1**

Art.-Nr. 602531

plug-in level probe 2-pin (stainless steel electrodes), cable 2 m

**GWF-2**

Art.-Nr. 601778

Textile-tape water sensor, 2 m, without plug



## WATER SENSORS

**GWF-1**

Art.-Nr. 601712

Water sensor without plug, 2 m cable

**Variants:****GWF-1/5m**

Art.-Nr. 601717

Water sensor without plug, 5 m cable

**GWF-1/10m**

Art.-Nr. 601723

Water sensor without plug, 10 m cable

**Suitable for:**

GEWAS 200, GEWAS 300 FG



FOR ULTRAPURE WATER

Textile tape at the reverse side of device

**GWF-2**

Art.-Nr. 601778

Textile-tape water sensor, 2 m, without plug

**Specifications:**

**Housing:** made of ABS with two mounting holes and PG gland

**Dimensions:** 65 x 35 x 50 mm (L x W x H), without PG gland

**Scope of supply:** Device

**Suitable for:**

GEWAS 200, GEWAS 300 FG, GEWAS 300 SP

**GWF-2S**

Art.-Nr. 601779

Textile-tape water probe, plug-in-ready for purest water, 2 m cable

## WATER LEAK DETECTOR WITH SOLENOID VALVE



NO MORE WATER DAMAGE

**GEWAS 191 N**

Art.-Nr. 601742

Water leak detector with solenoid valve, complete and ready for use

**GEWAS 191 AN**

Art.-Nr. 601744

Water leak detector with solenoid valve, complete and ready for use with switch-off mechanism for supervised device in case of alarm (up to 16 A, 230 V 50 Hz)

**General:**

If a water film of more than 0.5 mm occurs at the water sensor the control unit automatically gives an acoustic alarm and switches the solenoid valve off. The design type GEWAS 191 AN turns off additionally the device connected to the control unit, too.

**Application:**

Washing machine, dish washer, surgeries (e.g. dentists' surgeries, water-cooled devices etc.), hospitals, industry, research, laboratories, any other devices and machines with water connection (e.g. hot drinks dispensers, cooling devices etc.)

**Specifications:**

**Power supply:** 220/240 V 50/60 Hz (control unit)

**Power consumption:** approx. 3 VA

**Control output:** via power socket at device housing (only for GEWAS 191 AN) the socket of GEWAS 191 N always provides mains voltage

**max. switching current:** max. 16 A (ohmic load)

**Water sensor:** highly sensitive plug-in water probe, 2 m cable. Alarm triggered as of ½ mm water film. Several water probes can be plugged-in and used simultaneously by means of socket outlet adaptor GAZ 1. 2 m, 5 m or 10 m plug-in extension cable available.

**Solenoid valve:** glass fiber reinforced polyamide (as customary for washing machines). Safety-low voltage 12 V DC.

**Connections:** Screw connection ¼" for direct fastening to water tap and the standard dish washer / washing machine connection hose ½" with ¾" wing or coupling nut to the solenoid valve outlet. In case of power breakdown the valve closes automatically.

**Working pressure:**

6 bar servo-controlled; Minimal pressure difference between in- and outlet: inlet pressure min. 0.5 bar higher than outlet pressure

**Device housing with electronics:**

enclosed case (not suitable for use in humid environment), electronics, signal buzzer, plug connections for valve and water sensor. Housing with earthing pin plug connection and socket outlet with earthing contact. Looping-in socket outlet with earthing contact used for GEWAS 191 N; alarm controlled socket outlet with earthing contact used for GEWAS 191 AN

**Working conditions:** 0 ... 50 °C, 0 ... 90 % RH (non-condensing)

**Dimensions:** control unit: 126 x 79 x 54 mm (L x W x H)  
solenoid valve: 82 x 102 x 41 mm

**Scope of supply:** Water leak detector with solenoid valve, controller, water probe, signal buzzer, manual

**Accessories and spare parts:****GMV191**

Art.-Nr. 601664

Spare solenoid

**GWF-1S**

Art.-Nr. 601706

Plug-in water sensor, 2 m

**GWF-1S / 5m**

Art.-Nr. 601708

Plug-in water sensor, 5 m

**GWF-1S / 10m**

Art.-Nr. 601710

Plug-in water sensor, 10 m

**GAZ-1**

Art.-Nr. 602748

Branch adapter (required for each additional water sensor)

**VEKA 2**

Art.-Nr. 601726

Extension cable, 2 m

**VEKA 5**

Art.-Nr. 601727

Extension cable, 5 m

**VEKA 10**

Art.-Nr. 601731

Extension cable, 10 m



## LEAK-WATER DETECTOR

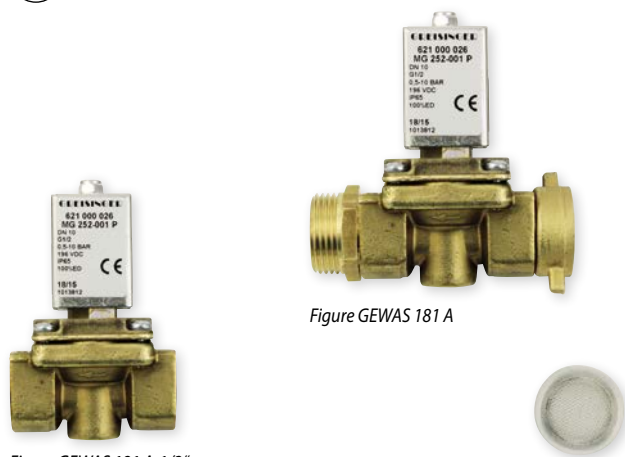


Figure GEWAS 181 A

Figure GEWAS 181 A-1/2"

NO MORE WATER  
DAMAGE**GEWAS 181 A**

Art.-Nr. 601734

Leak-water detector with 1/2" brass solenoid valve with 3/4" connections for hand installation, water sensor, alarm buzzer and switch-off of connected units 16 A, 230 V~

**GEWAS 183 A**

Art.-Nr. 602999

Leak water detector without solenoid valve, with water sensor, alarm buzzer and switch-off of connected devices 16 A, 230 V~

**GEWAS 181 A - 1/2"**

Art.-Nr. 601736

Leak water detector with 1/2" brass solenoid valve (flow quantity: approx. 20 l/min, installation length approx. 55 mm) for installation in the line, water sensor, alarm buzzer and switch-off of connected devices 16 A, 230 V~.

**GEWAS 181 A - 3/4"**

Art.-Nr. 601738

Leak water detector with 3/4" brass solenoid valve (flow quantity: approx. 91.5 l/min, installation length approx. 80 mm) for installation in the line, water sensor, alarm buzzer and switch-off of connected devices 16 A, 230 V~

**GEWAS 181 A - 1"0**

Art.-Nr. 601740

Leak water detector with 1" brass solenoid valve (flow quantity: approx. 141.5 l/min, installation length approx. 95 mm) for installation in the line, water sensor, alarm buzzer and switch-off of connected devices 16 A, 230 V~

**Application:**

Any devices or machines with water connection. For direct mounting of solenoid valve in pipelines.

**Mode of action:**

If a water film of more than 0.5 mm occurs at the water sensor the control unit automatically gives an acoustic alarm and switches the solenoid valve and the device connected to the control unit off.

**Solenoid valve:**

Brass solenoid valve, energy-saving circuitry for hand installation (1/2" with 3/4" glanding - suitable for any 1/2" tap or 1/2" tube) or with 1/2", 3/4" or 1" internal thread on both sides for line installation. De-energised when closed, for pressure loads from 0.5 ... 10 bar. Servo-controlled, i.e. free water outlet has to be provided resp. infeed pressure has to exceed outfeed pressure by 0.5 bar (solenoid not suitable for closed circuits such as heating systems).

**Specifications:**

<b>Power supply:</b>	220 / 240 V 50 / 60 Hz (control unit)
<b>Power consumption:</b>	approx. 2.5 Watt (control unit, approx. 6 W incl. solenoid valve)
<b>Control output:</b>	via power socket of safety plug adapter
<b>max. switching current:</b>	max. 16 A (ohmic load)
<b>Water sensor:</b>	Highly sensitive, plug-in water sensor, 2 m of cable, alarm triggered as of 1/2 mm water film. Simultaneous plug in of several water sensors via socket-outlet adaptor GAZ1. Plug-in extension cable (2 m, 5 m or 10 m long) available.
<b>Solenoid valve:</b>	Hence, valve operable in permanent mode; due to energy-saving circuit valve will not run hot even without cooling agent. Valve permanently fixed to control device (approx. 1 m of connecting cable). Valve body can be removed from coil after loosening of one nut.

<b>Max. working pressure:</b>	10 bar, servo-controlled (pressure difference inlet/outlet >0.5 bar)
<b>Working voltage:</b>	200 V DC or 100 V DC in energy saving mode
<b>Working temperature:</b>	0 ... 50 °C
<b>Dimensions:</b>	control device: 110 x 65 x 45 mm (L x W x H), with suspension hook
<b>Scope of supply:</b>	Device, solenoid valve (not GEWAS 183 A), water sensor, manual

**Accessories and spare parts:****GMV-1/2" L**

Art.-Nr. 601645

Spare solenoid valve 1/2" for direct cable connection, approx. 1 m cable, loose ends

**GMV-1/2" H**

Art.-Nr. 601646

Spare solenoid valve 1/2" manual mounting, approx. 1 m cable, loose ends

**GMV-3/4"**

Art.-Nr. 601648

Spare solenoid valve 3/4" for direct cable connection, approx. 1 m cable, loose ends

**GMV-1"**

Art.-Nr. 601655

Spare solenoid valve 1" for direct cable connection, approx. 1 m cable, loose ends

**GMV-1/2" EZL**

Art.-Nr. 601657

Add. solenoid valve 1/2" for direct cable connection, with power saving connector, approx. 2 W, for direct connection to 230 VAC, suitable for GEWAS 183A or mains operation

**GMV-1/2" EZH**

Art.-Nr. 601660

Add. solenoid valve 1/2" with add. solenoid valve with 3/4" valve for manual mounting

**GMV-3/4" EZ**

Art.-Nr. 601662

Add. solenoid valve with add. solenoid valve 3/4" valve for direct cable connection

**GMV-1" EZ**

Art.-Nr. 601650

Add. solenoid valve with add. solenoid valve 1" valve for direct cable connection

**GWF-15**

Art.-Nr. 601706

Plug-in water probe, 2 m cable length  
further cable lengths see page 120

**GAZ-1**

Art.-Nr. 602748

Branch adapter (required for each additional water sensor)

**VEKA 2**

Art.-Nr. 601726

Extension cable, 2 m

**VEKA 5**

Art.-Nr. 601727

Extension cable, 5 m

**VEKA 10**

Art.-Nr. 601731

Extension cable, 10 m

## PROTECTION DEVICE FOR UNIVERSAL APPLICATION

AVAILABLE  
AS PLUG-INWITH SWITCHING OUTPUT  
FOR ANY PURPOSE**ALSCHU 480**

Art.-Nr. 602921

Alarm protection device, plug-in for 230 V~ (with grounding contact adapter plug), with or without alarm transmitter and relay switching output (changeover contact)

**ALSCHU 480 P**

Art.-Nr. 602923

as above, but with volt-free switching output and looped socket

**General:**

The ALSCHU 480(P) is a versatile alarm and protection device. Its universal input (3.5 mm jack bush) allows a lot of different external sensors to be connected.

That includes sensors with a switching threshold <100 kOhm like water sensors, float switches, level switches, magnetic contacts, safety shut-off mat etc. In case of an alarm the internal buzzer sounds and a connected device (i.e. pump, machine) is switched on or off via the Schuko adaptor plug (ALSCHU 480). The desired switching function can be set via selector switch I / II. ALSCHU 480 P switches on/off external devices via a potential-free 2-pole switching output. The Schuko socket of ALSCHU 480 P is always current-carrying.

**Specifications:****Voltage supply:** 220 / 240 V 50 / 60 Hz**Power consumption:** approx. 1 VA**Sensor input:** 2.5 mm jack bush**Switching threshold:** input resistance <100 kOhm (e.g. NPN no active, relay, reed contact, etc.)**Switching output****480:** via isolated ground receptacle**480 P:** potential-free normally open / closed contact via 2-pole cable, brought out 0.5 m**Switching function****I:** switching output current-carrying in alarm condition**II:** switching output currentless in alarm condition**Switching power****480:** 250 VAC, 10 A (ohmic load), max. 2400 VA**480 P:** 120 VDC, 2 A (ohmic load), max. 240 W**Controlling device:** LED for operation display, device-on/off, selector switch I / II for switching function**Working conditions:** -20 ... +50 °C; 0 ... 80 % RH**Dimensions:** 112 x 71 x 48 (L x W x H)**Scope of supply:** Device, manual**Accessories and spare parts:****GWF-15**

Art.-Nr. 601706

Plug-in water sensor, 2 m

**GSS-15**

Art.-Nr. 603247

Plug-in level sensor, 2 m



## ACCESSORIES

**GNS-1-2-KS**

Art.-Nr. 602526

plug-in level probe 2-pin

**General:**

PVC body with 2 stainless steel pins, 2 m PVC cable and 2.5 mm jack plug

**Variants:****GNS-1-5-KS**

Art.-Nr. 602529

plug-in level probe 2-pin, 5 m cable

**GNS-1-10-KS**

Art.-Nr. 602530

plug-in level probe 2-pin, 10 m cable

**GWF-15**

Art.-Nr. 601706

Plug-in high-sensitive water probe

**General:**

2 m cable length, with 2.5 mm jack plug; multiple water probes can be connected simultaneously with a GAZ-1 socket-outlet adapter



VEKA 5

**VEKA 2**

Art.-Nr. 601726

Extension cable, 2 m

**VEKA 5**

Art.-Nr. 601727

Extension cable, 5 m

**VEKA 10**

Art.-Nr. 601731

Extension cable, 10 m

**General:**

Connections:

1 x 2.5 mm jack plug, 1 x 2.5 mm jack socket

**GAZ-1**

Art.-Nr. 602748

branch adapter

**General:**

with 2 x 2.5 mm jack socket and 1 x 2.5 mm jack plug; required for each additional water sensor

## INDEX

AAA-AKKU	115	GF 1TK-E1.5	34	GOF 200 HO	31	HD 2303.0	104
AAG...	115	GF 1TK-E3	34	GOF 400 ...	31	HD 31	101-103
ACCREDIA	13-15	GF 1TK-L3	34	GOF 401 Mini	19	HD 31.28	102
ALSCHU 300 ...	117	GF 1TK-T3	34	GOF 501 ...	32	HD-33-...	81
ALSCHU 480	122	GF 2T-E...	23	GOF 900 HO	31	HD-37-...	81
ALSCHU 485	117	GF 3T-E3	23	GOG ...	79	HD 40.1	114
AP-47...	104	GFTB 200 ...	41	GOK 91	47	HD-9609	107
		GFTH 95	42	GOO ...	77	HD21-ABE-17	81
BaleCheck ...	51	GFTH 200 ...	42	GOX 20	70	HD2178.2	30
BAT 40	81	GGA...	77	GOX 100 ...	78	HD32-8-16	28
BAT 40-1	114	GGF 175-BNC	22	GPAD 38	48		
		GGF 200	33	GPB 3300	95	ISO-...	13-15
CaCl	62	GGO ...	77	GPF 100	66		
CP-23	81	GHE 91	47	GPH ...	66	K 50..	112
CP-9509-...	107	GHM SensorSimulator SIM-1	107	GR 1...	66	KCL 3 M	66
CPA/10	96	GIM 530 MS	36	GRF 200	33	KOH 100	68
		GIM 3590	37	GRL 100	62		
DAkks	13-15	GKF 125	32	GRP 100	62	LAN 3200	114
		GKF 250	34	GRS 31 ...	115	LF ...	55
EASYControl net	109	GKK ...	111/112	GRV 100	80	LP-471-...	98-100
EBS 20M / 60M	109	GKL ...	58	GS 150	78	LP-471-SILI-PYRA	100
ecotach	105	GLF 175-BNC	22	GSA ...	115		
ESA 100	81	GLF 401 Mini	19	GSE 91	47	MH-...	114
ESA 369	79	GLP 91	47	GSF 40	47/48	MINICAN-12-A-0	81
		GLS 500	34	GSF 50	47	MINIDIN 4S	115
G 14x0	58	GMF 2...	33	GSG 91	47	MSD ...	89
G 1500	63	GMH 1150	29	GSH 8922	105	MSK 100	80
G 1501	64	GMH 1300	114	GSKA 36x0	68		
G 1610	69	GMH 2710 ...	26	GSOFT 3050	110	Noise Studio NS4	96
G 1700	21	GMH 3000.DLL	110	GSP 91 ...	47		
G 17x0	24	GMH 3111 ...	84	GSS	119	PG 13.5	66
G 7500	72/73	GMH 3151 / 56 ...	84	GST ...	47	PHL ...	62
GAD 1 BNC	66	GMH 3161 / 81...	90/92	GST 3810	50	Prandtl-Staurohr	84
GAF 200	33	GMH 32 ...	27/28	GTD 1100	95	PW 25	45
GAK 9 V	115	GMH 33 ...	39	GTE 130 OK	34		
GAK 1400	62	GMH 34 ...	57	GTF 35	19	RCT	96
GAS 100	80	GMH 35 ...	59	GTF 38	48	ResOx 5695-...	79
GAS 3600	71	GMH 35xx-SET	60	GTF 40 K-...	32	rotaro3	105
GAS 5610	68	GMH 3611 / 51	70	GTF 175 ...	21	RW-015HKL	118
GAZ-1	122	GMH 36x1-SET	71	GTF 300 ...	33	RWI-016 ...	118
GB 9 V	115	GMH 369 ...	76	GTF 400	31		
GB AA	115	GMH 3710 / 50	18	GTF 401 ...	19	SDW 500	66
GBF 1550	34	GMH 37x0/SET ...	20	GTF 601 ...	19	SET 38 ...	48
GBSK 91	47	GMH 37x0/DKD1	20	GTF 900	31	SET-GMH54 ...	56
GBSL 91	47	GMH 38-LW...	49	GTF 1000 AL	31	SET-GMH5650	68
GCAL 3610	68	GMH 3810	49	GTF 1200 ...	31	SoilTemp 1700	25
GCLIP 1000	114	GMH 3831 / 51	46	GTF 2000-BNC	22	ST 512	37
GCO 100	80	GMH 51 ...	83/84	GTH 200 air	20	ST ...	113
GDH 200 ...	93/94	GMH 54 ...	54	GTH 1150	29	STE ...	40
GDUSB 1000	87	GMH 54x0-4xx	56	GTH 1170	29	STS 0...	40
GDUSB FastView	87	GMH 55 ...	61	GTL 130	32	SWD-10	81
GDZ ...	86	GMH 55xx-SET ...	62	GTO 130 OK	34		
GE 1 ...	65/66	GMH 55 ES	62	GTT-15-150	34	TFS 0100 E	40
GEAK- ...	66	GMH 56...	67	GTZ 300	33	TP 47x	30
GEF 38	47	GMH 56x0-L0x	67	GWA 1214	86		
GEG 91	47	GMH 569...	75	GWA 1 ...	66	USB 3100 N	115
GES 20	21	GMI 15	44	GWF-1	120	USB 5100	115
GES 20-P4-DIN...	19	GMK 38	47	GWF-1S	122	USB 5200	115
GES 20-K	32	GMK 100	45	GWF-2	120	USB-Adapter	115
GES 21-K	32	GMK 210	45	GWO 3600	71		
GES 38	48	GMK 3810	50	GWO 5610	68	VD 120	66
GES 130	32	GMR 110	50	GWOK 01	71	VEKA ...	122
GES 175-BNC	22	GMS 300/91	47	GWOK 02	68	VEKA 3105	115
GES 401 ...	19	GMSD ...	88	GWZ-01	58		
GES 500	32	GMV...	121	GZ-...	80	WLAN 3200	114
GES 900	32	GMZ 38	47	GZ-11	78		
GEWAS 18 ...	121	GNG 05 / 5000	115			ZOT 369	78
GEWAS 191 ...	120	GNG 10	115	HayTemp 1700	25		
GEWAS 200	119	GNG 10/3000	115	HD 2020	97		
GEWAS 300	119	GNS-1	119	HD-2010-UC-1	96		
GF 1T-E1.5...	23	GNS-1S	122	HD-2110-CSNM	114		
GF 1T-E3...	23	GNS-3P ...	118	HD 2110-RS	96		
GF 1T-T3...	22/23	GOEL ...	78	HD 2110-USB	96		
GF 1T-T3-B-BS	62	GOF 130 ...	31/32	HD-22-3	114		
GF 1T-L3...	23	GOF 175 ...	22	HD 2302.0	97		



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- **Extensive product range for a wide variety of measured values**
- **Application-oriented special measuring devices**
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- **Price-conscious displays and regulators**
- **Hand-held devices and sensors with high system accuracy**
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