GREISINGER

Member of GHM GROUP

Professional Measurement

Measuring | Controlling | Regulating

Product catalog 2019

www.greisinger.de

Members of GHM GROUP:

GREISINGER
HONSBERG
Martens
IMTRON
DeltaOHM
VAL.CO

GREISINGER. Specialist for handheld devices.

„For more than thirty-fi e years, quality measuring devices from Greisinger have effecti ely 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

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.

GHMGROUP

HONSBERG — 1963

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.

DeltaOHM — 1978

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 — 1980

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 — 1982

VAL.CO, Milan, Italy
Manufacturer of industrial sensors for fill, flow rate and temperature applications; specialist in the Italian and European market

IMTRON — 1984

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 — 1988

Martens Elektronik, Hamburg, Germany
Supplier of customer-specifi industrial electronics and analysis technology; manufacturer of technologically high-quality measurement technology, also for the international market

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.

GHMGROUP

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

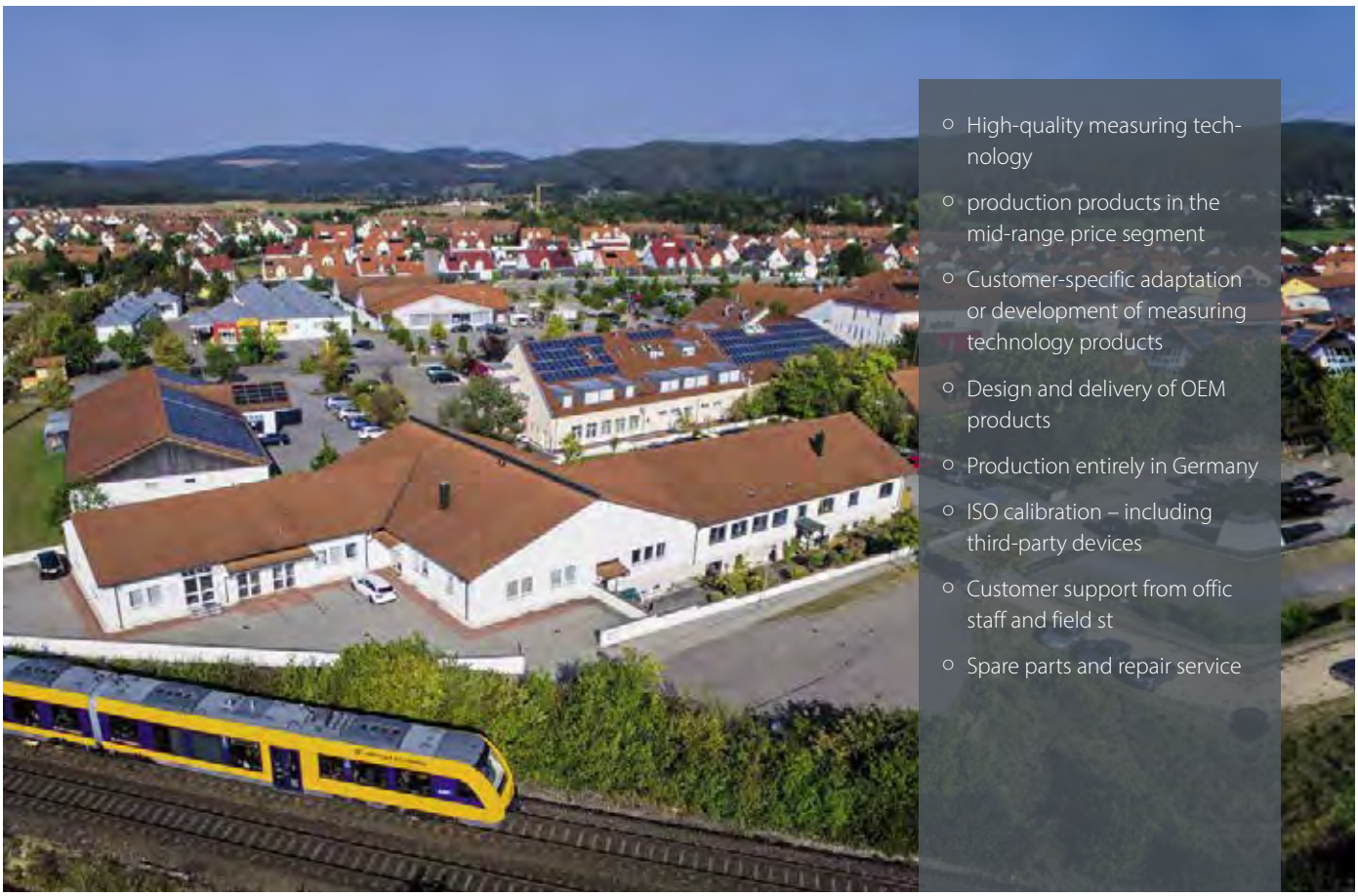
2017 – GHM GROUP umbrella brand, founding of GHM Do Brasil, GHM France and GHM India
Integration of the VAL.CO in the group

16
WORLDWIDE LOCATIONS

> 40 Mio.
MILLION IN SALES PER YEAR

> 300
HIGHLY QUALIFIED AND AMBITIOUS EMPLOYEES

> 2 000
HIGH-QUALITY DEVICE TYPES



- 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 offic staff and field st
- Spare parts and repair service

QUALITY STANDARD AND CERTIFICATION

High-quality technical products at a fair price have made use a permanent fi ture 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-p formance 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 acco ding 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 acco dance with Directive 94/9/EC since 01/05/2003. Several products have already been tested and approved in accordance with this standard.

MADE IN GERMANY

DNV Zertifiziertes QM-System ISO 9001:2008

BVS 13 ATEX ZQS/E234 Zertifiziertes QM-System CE 0158 Ex

OUR INTERNATIONAL AREA SALES MANAGEMENT TEAM

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Language:
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Language:
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Site Manager

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Area Sales Manager Austria

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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 individua lization
- on customer request, factory calibration in our in-house calibration laboratory

PRODUCT OVERVIEW

OEM / CUSTOMER VERSIONS

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

Customer-specific d velopments

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

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 tightnessand 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			•[1)]	•[1)]		•	•

[1)] 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 s e 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 certifi ate
available at surcharge

ACCREDIA Calibration certifi ate
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- unction is activated, device is automatically switched off a ter 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

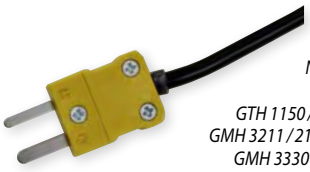
POSSIBLE CONNECTORS

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

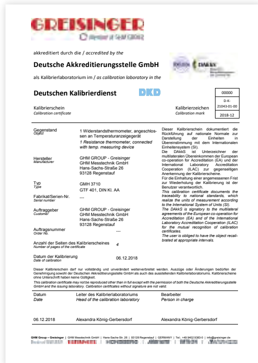
Jack connector 2,5
used in:
discontinued products, e. g. GDH ... AN Serie, GPRT 1400

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

CALIBRATION CERTIFICATES DAKKS

DAkkS calibration certific tes are issued for very high-quality calibrations and for calibration of reference devices or when stipulated by standards and regulations. DAkkS-DKD calibration certific tes are issued with reference devices which must be traceable through a chain to the Laboratories of the German Calibration Service. DAkkS-DKD calibration certific tes can only be issued the calibration laboratories accredited in accordance with the standard DIN EN ISO 17025.
With recurring external certific tion 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.


GREISINGER
Deutsche Akkreditierungsstelle GmbH
Deutschen Kalibrierdienst DKD

Temperature

DAkkS-T
Calibration certific te (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.

DAkkS
Deutsche Akkreditierungsstelle
D-K-21043-01-00

Pressure

DAkkS-P
Art. no. 602731
Calibration certific te over pressure -1 ... 100 bar
(incl. 9 points increasing and decreasing)

DAkkS-PA
Art. no. 602758
Calibration certific te 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 certific te for devices with external sensor
(Testing points: 15 % RH and 70 % RH / at 23 °C)

DAkkS-F
Art. no. 602870
Calibration certific te for devices with fi ed 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

ACCREDIA

At our Delta Ohm location in Padua, Italy, we can issue calibration certific tes 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 y ACCREDIA. On the basis of the worldwide recognition of calibration services by the umbrella organisation ILAC*, the validity of the calibration certific te is guaranteed by the ILAC in Germany and throughout Europe, as well as about 100 other countries. The calibration certific te is issued in German. We offer the listed ACCREDIA calibration certificates for handheld measuring devices marked with the ACCREDIA.

**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^{-2}

ACCREDIA-B3
Art. no. 611510
Luminance
5 measuring points from 10000 ... 30000 cdm^{-2}

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 certific tes
7 measuring points from 50 ... 4000 lux

ISO-WPB2
Art. no. 611516
ISO certific tes Radiometer UV A
10 ... 50 Wm^{-2}

ISO-WPB3
Art. no. 611517
ISO certific tes Luminance
5 measuring points from 10000 ... 30000 cdm^{-2}

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

Air speed

ISO-WPG1
Art. no. 611519
ISO certific tes 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 certific tes
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 certific tes
Devices manufactured by Delta Ohm (see page 96 / 97)

Octave band fil er - third-octave band fil er 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 certific tes (factory calibration certific tes) are issued by GHM Greisinger according to the same measures as DAkkS calibration certific tes, but without the expense for external certific tion, so these certific tes 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 certific tes 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 certific tes are available for all handheld instruments marked with the symbol ISO.
Also possible for measuring transmitters resp. combinations of display instruments and sensors/transmitters.
Calibration certific tes 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 Certific te of calibration with standard values:
0 °C / +70 °C

ISO-WPT2B
Art. no. 602584
ISO Certific te of calibration with standard values:
0 °C / +37 °C

ISO-WPT3
Art. no. 602596
ISO Certific te 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 certific tes: 5 points ascending, 5 points descending
-1 ... +600 bar

ISO-WPD10
Art. no. 602565
ISO certific tes:
10 points ascending, 10 points descending

over 600 bar on request

Humidity

ISO-WPF4
Art. no. 602543
ISO certific tes 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 certific tes 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 certific tes with 3 points:
0 / 20,9 / 100 % O_2
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 certific tes with 3 points:
~147 µS/cm, ~1413 µS/cm, ~12,90 mS/cm

ISO-WPL10
Art. no. 602623
ISO certific tes 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 certific tes with 3 standard-measuring values:
each approx. 2,50 µS/cm; 7,00 µS/cm; 15,00 µS/cm

pH

ISO-WPP3
Art. no. 602767
ISO certific tes with 3 standard-measuring values:
4,00 pH, 6,87 pH, 9,18 pH

ISO-WPP10
Art. no. 602768
ISO certific tes 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

Our express service is focussed on urgent ISO calibrations to eliminate long down times for measuring devices.
The process is fast and uncomplicated with UPS express delivery throughout Germany. Please contact us at **express@greisinger.de**.

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

APPLICATION:	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
Reference- / precision measurement	•	•	•	•	•		•	•	
Quality management	•	•	•	•	•	•	•	•	
Difference measurement									
Surface measurement								•	
Core temperature measurement	•	•		•	•	•	•	•	
High-temperature measurement	•	•						•	
Food, HACCP	•	•	•	•	•	•	•	•	
Water-proof			•	•	•	•	•		
EQUIPMENT:									
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		•				• / -	• / -	- / •	
DEVICE INFORMATION:									
Catalogue page	Page 18	Page 18	Page 26	Page 26	Page 26	Page 21	Page 24	Page 30	Page 20

	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	1	2	2	2	16	1	1	1
•	•	•	•	•	•			•
				•				

DEVICE INFORMATION:

Page 27	**Page 27**	**Page 27**	**Page 27**	**Page 27**	**Page 28**	**Page 29**	**Page 29**	**Page 29**

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 fl xible and wide measuring range

PT100 - HIGH-PRECISION THERMOMETER

AUTOOFF
AUTORANGE
ISO
HOLD
MIN MAX
O/S*CORR

HIGHLIGHTS:

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

ADDITIONAL FUNCTIONS BEI GMH 3750:

ALARM LOGG

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.

Specifi ations:

Measuring range:	-199.99 ... +199.99 °C or -200.0 ... + 850.0 °C -199.99 ... +199.99 °F or -328.0 ... +1562.0 °F
Resolution:	0.01 °C or 0.1 °C 0.01 °F or 0.1 °F
Linearisation:	Curve according to DIN EN 60751. GMH 3750 add. supports an userdefined cu ve.
Accuracy: (±1 digit) (at nominal temperature = 25 °C)	≤0.03 °C / 0.06 °F at resolution 0.01° ≤0.1 °C / 0.2 °F at resolution 0.1°
Temperature drift:	≤0.002 °C / K
Probe connection:	via 4-pin miniature DIN-plug, Pt100, 4-wire, in acc. to DIN EN 60751
Nominal temperature:	25 °C
Working temperature:	-25 ... +50 °C
Relative humidity:	0 ... +95 % RH (non-condensing)
Storage temperature:	-25 ... +70 °C
Display:	two 4½ digit LCDs (12.4 mm or 7 mm high), as well as additional arrows.
Pushbuttons:	6 membrane keys
Output:	3-pin jack connector Ø 3.5 mm, choice between serial interface or analog output
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).
Analog output:	0 ... 1 V, freely adjustable (resolution 13 bit, accuracy 0.05 % at nominal temperature)
Power supply:	9 V-battery, as well as additional d.c. connector for external 10.5 ... 12 V voltage supply
Power consumption:	approx. 1 mA, 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. 155 g
Scope of supply:	Device, battery, calibration protocol, manual

additional at GMH 3750:

Userdefined sensor cu ve:
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 <=>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 -> Software)
Software description:
Comfortable software to edit the user defined sensor cu ve 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

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
1/10 DIN cl. 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 overed 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

-50 °C +400 °C

GTF 401

Art. no. 600377

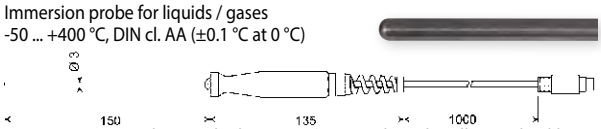
Immersion probe for liquids / gases
-50 ... +400 °C, DIN cl. B

-50 °C +400 °C

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

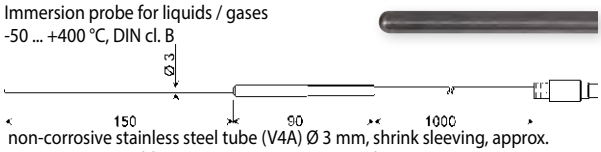
Response time T_{90} water 0.4 m/s approx. 10 s, air 2 m/s approx. 40 s

-50 °C +400 °C

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_{90} water 0,4 m/s approx. 10 s, air 2 m/s approx. 40 s

-50 °C +400 °C

GES 401

Art. no. 600384

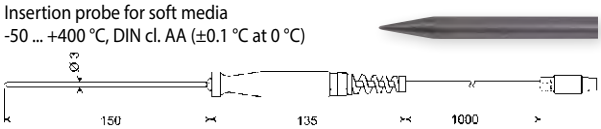
Insertion probe for soft media
-50 ... +400 °C, DIN cl. B

-50 °C +400 °C

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_{90} water 0.4 m/s approx. 10 s, air 2 m/s approx. 40 s

-70 °C +250 °C

GES 20-P4 DIN Kl. A

Art. no. 414061

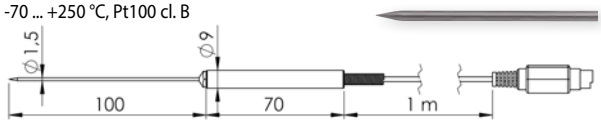
Core temperature- / food probe with compact teflon handl
-70 ... +250 °C, Pt100 cl. A

NEW!

GES 20-P4 DIN cl. B

Art. no. 413543

Core temperature- / food probe with compact teflon handl
-70 ... +250 °C, Pt100 cl. B



V4A tube with narrow insertion tip with 1.5 mm diameter, small Teflon handl , stainless steel anti-kink protection, 1 m Teflon cabl , 4 pin mini-DIN plug connector

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

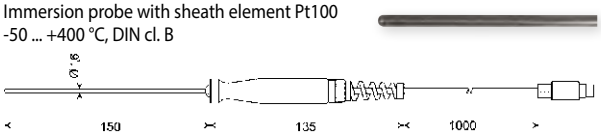
Advantages of sheath element Pt100:
- high temperature resistance
- sheath cable is bendable
- high shock resistance
- high service life

-50 °C +400 °C

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

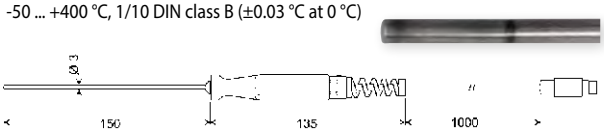
Response time T_{90} water 0.4 m/s <2 s, air 2 m/s approx. 25 s

-50 °C +400 °C

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_{90} water 0.4 m/s <5 s, air 2 m/s approx. 60 s

-200 °C +600 °C

GTF 601

Art. no. 600387

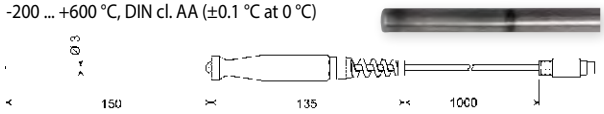
Immersion probe with sheath element Pt100
-200 ... +600 °C, DIN cl. B

-200 °C +600 °C

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

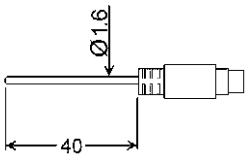
Response time T_{90} water 0.4 m/s <5 s, air 2 m/s approx. 60 s

-25 °C +70 °C

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

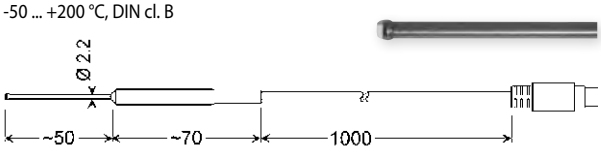
Response time T_{90} air 2 m/s approx. 25 s

-50 °C +200 °C

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_{90} 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 certific te of calibration

Specifi ations:	
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 certific te of calibration

Specifi ations:	
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

Specifi ations:	
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

Messset inkl. DAkkS-Kalibrierschein nach DIN 17025

Specifi ations:	
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 certific te of calibration with 3 calibration points.

ROOM THERMOMETER

AUTOOFF
ISO
MIN MAX

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 ±0.2 °C (at 20 °C). The device has undergone a streamlining process and is optimized to its key features, ensuring a comfortable and effici t 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.

Specifi ations:	
Measuring range:	-25.0 ... +70.0 °C
Resolution:	0.1 °C
Accuracy:	(±1 digit) (at nominal temperature) ±0.5 % of meas. value ±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, Ø 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 place 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 e try-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.

Specifi ations:

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

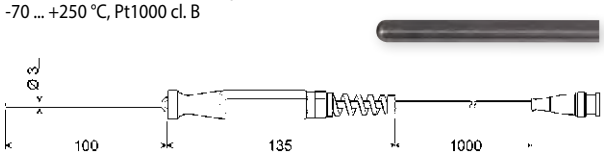
All types of probes also available for Pt100 2- / 3- or 4-wire connection
We manufacture all types of probes according to your special desires - low priced and fast. Please contact us.

-70 °C
+250 °C

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 fl xible silicone cable, BNC connector

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

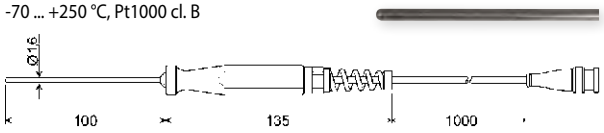
Advantages of sheath element Pt1000:
- high temperature resistance
- sheath cable is bendable
- high shock resistance
- high service life

-70 °C
+250 °C

GTF 175 / 1.6-BNC

Art. no. 611323

Immersion probe with sheath element Pt1000
-70 ... +250 °C, Pt1000 cl. B



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

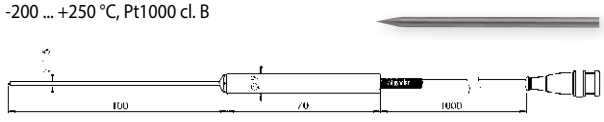
Response time T_{90}: water 0.4 m/s <2 s, air 2 m/s approx. 25 s

-200 °C
+250 °C

GES 20-T-B-BNC

Art. no. 607377

Core temperature- / food probe with compact teflon handl
-200 ... +250 °C, Pt1000 cl. B



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

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

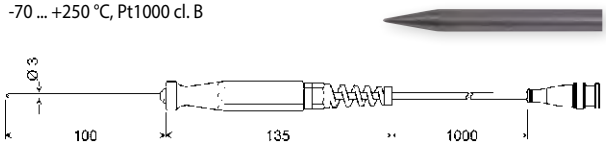
SUITABLE PT1000 - MEASURING PROBES, 2-WIRE

-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 fl xible silicone cable, BNC connector

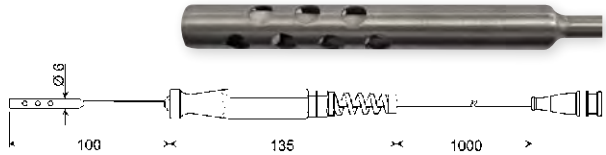
Response time T_{90}: water 0.4 m/s <2 s, air 2 m/s approx. 40 s

-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 fl xible silicone cable, BNC connector

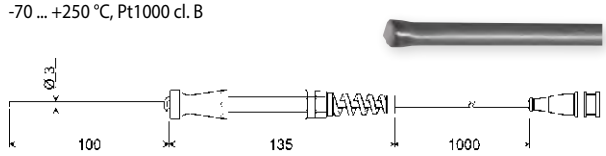
Response time T_{90}: air 2 m / s approx. 15 s

-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 fl xible silicone cable, BNC connector

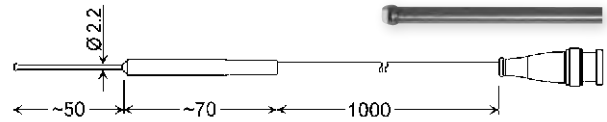
Response time T_{90}: approx. 15 s

-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 fl xible silicone cable, BNC connector

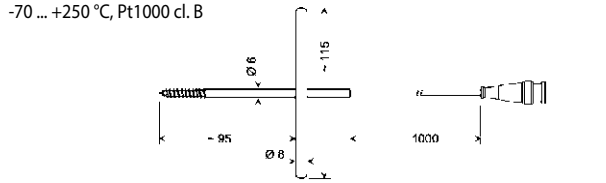
Response time T_{90}: approx. 15 s

-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 fl xible silicone cable, BNC connector

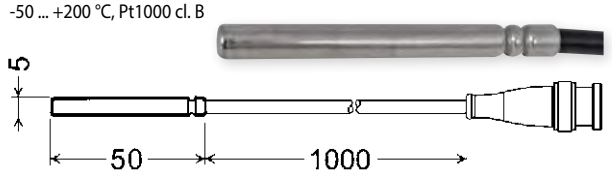
Response time T_{90}: approx. 15 s

-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 fl xible silicone cable, BNC connector, each beginning meter upcharge

Response time T_{90}: 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 cabl
- Waterproof: can be completely immersed
- Temporary temperature resistance of up to 250 °C

-70 °C +250 °C

GF 1T-T3-B-BNC

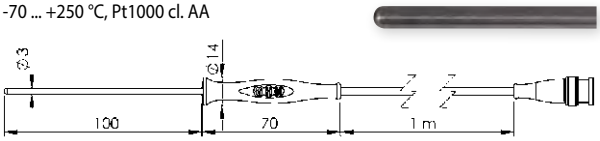
Art. no. 609549

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_{90}: 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

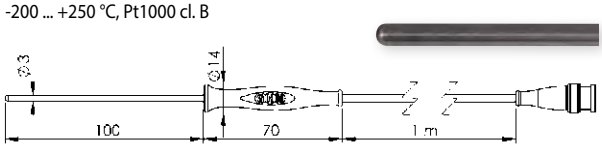
SUITABLE PT1000 - MEASURING PROBES, 2-WIRE

-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 Ø 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

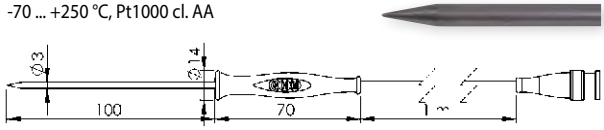
Art. no. 609639

Insertion sensor, Ø 3 mm
-70 ... +250 °C, Pt1000 cl. B

GF 1T-E3-AA-BNC

Art. no. 609640

Insertion sensor, Ø 3 mm
-70 ... +250 °C, Pt1000 cl. AA



Insertion 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_{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

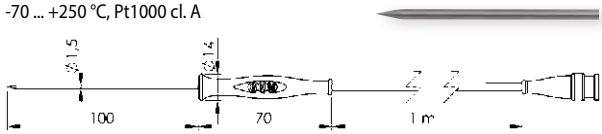
Art. no. 609645

Extra-thin Pt1000 insertion sensor, Ø 1.5 mm
-70 ... +250 °C, Pt1000 cl. B

GF 1T-E1.5-A-BNC

Art. no. 609646

Extra-thin Pt1000 insertion sensor, Ø 1.5 mm
-70 ... +250 °C, Pt1000 cl. A



Insertion probe Ø 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

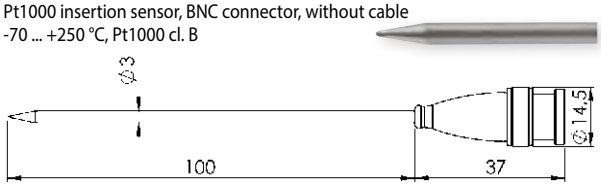
GF 1T-E1.5-A-LE
Art. no. 609644
Extra-thin Pt1000 insertion sensor, Pt1000 Cl. A, with loose ends

-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 Ø 3 mm made of V4A tube, IP67 in connected state, BNC connector with EPDM grommet up to +75 °C

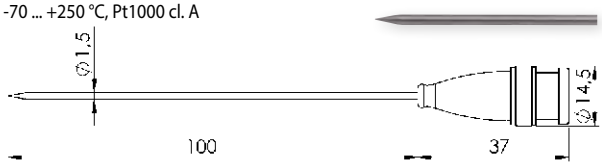
Response time T_{90}: water 0.4 m/s <2 s, air 2 m/s approx. 40 s

-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 Ø 1.5 mm made of V4A tube, IP67 in connected state, BNC connector with EPDM grommet up to +75 °C

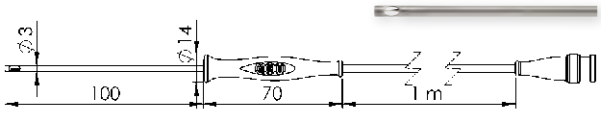
Response time T_{90}: water 0.4 m/s <1 s, air 2 m/s approx. 12 s

-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 Ø 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:

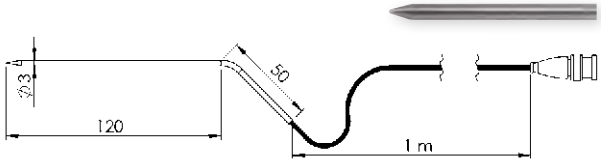
GF 1T-L3-B-LE
Art. no. 611298
Pt1000 air sensor, Pt1000 Class B, with loose ends

-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 Ø 3 mm made of bent V4A tube, 1 m glass fib e 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

ALARM
AUTOOFF
HOLD
ISO
MIN MAX
0/S CORR

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

SUCCESSOR TO THE **GTH 175** PRODUCTS

THEY ARE STILL AVAILABLE ON REQUEST - CONTACT US IMMEDIATELY!

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 place 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 e try-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.

Specifi ations:

Measuring range:	-70.0 ... +250.0 °C (-94.0 ... +482.0 °F)
Accuracy: (at nominal temperature = 25 °C)	-20 ... +100 °C: ±0.1 K ±1 digit -70 ... +250 °C: ±0.2 % of m. v. ±2 digit
Operating conditions:	-20 ... +50 °C; 0 ... 95 % RH (non-condensing)
Display:	3-line unit incl. battery change indicator, with background light, protected by an unbreakable pane, overhead display at the push of a button
Power supply:	2 x AA battery, >5000 h operating time
Sensor	
G 1710:	Immersion sensor Ø 3 mm, Pt1000 permanent 2-wire connection, V4A, 1 m cable
G 1720:	Durable insertion sensor Ø 3 mm, Pt1000 permanent 2-wire connection, V4A, 1 m cable
G 1730:	Extra-thin insertion sensor Ø 1.5 mm, Pt1000 permanent 2-wire connection, V4A, 1 m cable
Response time T_{90}:	Ø 3 mm: water 0.4 m/s <2 s; Ø 1.5 mm: water 0.4 m/s <1 s
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:	130 g (without sensor)
Scope of supply:	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)

HAY THERMOMETER

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 fi efig ters.

Application:

Hay or straw measurements at depth up to 4 m.

Specifi ations:

Device:	G 1700
Probe connection:	BNC, Pt1000, 2-wire
Measuring rod:	Fiberglass probe, approx. 4 m long, approx. 10 mm Ø, 1 measuring point at probe tip
Cutting tip:	screwable, double-edged tip with integrated temperature sensor
Weight:	Measuring rod with cutting tip approx. 600 g
Scope of supply:	Device, fibe glass 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

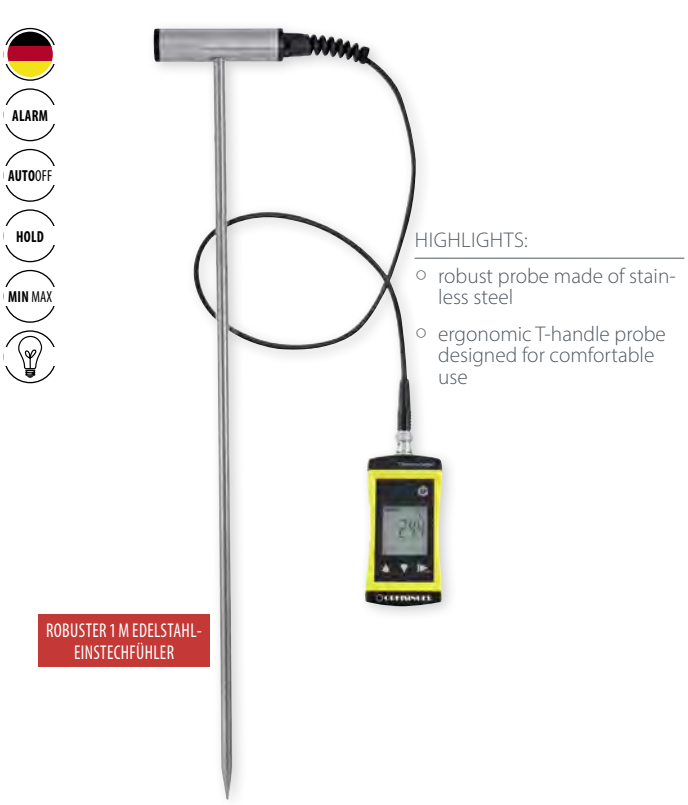
Sondenspitze
Art. no. 606889
With integrated temperature sensor

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



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.

Specifi ations:

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

AUTOHOLD
AUTOOFF
HACCP
ISO
MIN MAX
0/S CORR

GMH 2710-T

GMH 2710-E

GMH 2710-K

GMH 2710-G

GMH 2710-F
GMH 2710-I

HIGHLIGHTS:

- Easy handling
- Battery life time > 6000 hours
- Device and probe are Water-proof and very robust
- 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 inse tion probe, Ø 3 mm

GMH 2710-G
Art. no. 602040
Temperature measuring device incl. mini Teflon p obe, 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 fa ming, aquaculture, etc.
GMH 2710-F/-I:
Optimal for measurements at places difficult o 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.

Specifi ations:

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 cabl , 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 cabl , 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_{90}:	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

AUTOOFF
HOLD
ISO
MIN MAX
0°CORR

VERY QUICK RESPONSE TIMETIME!

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:

TARA

GMH 3251:

TARA ALARM LOGG

SUITABLE PROBES P.R.T. P. 32

GMH 3221 connection

GMH 3231 / 51 connection

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

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

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

PRECISION QUICK-RESPONSE THERMOMETER FOR THERMOCOUPLES

General specifi ations:	
Resolution:	0.1 °C or 1 °C
Working temperature:	-25 ... +50 °C
Display:	two 4½-digit LCDs (12.4 mm and 7 mm high)
Serial interface (except GMH 3201 and GMH 3221):	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).
Data logger (GMH 3251 only):	**manual:** 1.000 data sets (fetch data via buttons or interface) **cyclic:** 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 GSOFT 3050 (see accessories) is available for comfortable read-out of logger data, see page 110.
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)
Nominal temperature:	25 °C ±5 K
Weight:	approx. 155 g
Scope of supply:	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:

- simultanous 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

Precison-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

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

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 suffici t.

Specifi ations:	
Measuring range:	-50 ... +1150 °C
Resolution:	1 °C
Accuracy: (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
Probe connection:	Thermoelectric-voltage-free miniature socket, suitable for all type K (NiCr-Ni) measuring sensors with mini fl t plug
Display:	3½ digit, approx. 13 mm high LCD
Working temperature:	0 ... 45 °C
Storage temperature:	-20 ... +70 °C
Power supply:	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)
Battery life:	approx. 700 operating hours
Dimensions:	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
Weight:	approx. 150 g (GTH 1150), approx. 160 g (GMH 1150)
Scope of supply:	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.

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

Specifi ations:

Display:	LCD, 52 x 42 mm
Operating temperature:	-5 ... +50 °C (Instrument)
Protection rating:	IP 66
Power supply:	4 batteries 1.5 V type AA (Optional mains adapter)
Unit of measurement:	°C or °F
Security of stored data:	Unlimited, independent of battery charge conditions
Measured values storage:	2000 pages each one containing 40 samples, quantity 80000 samples in total
Storage interval:	1, 5, 10, 15, 30 s; 1, 2, 5, 10, 15, 20, 30 min; 1 h
USB interface:	USB 2.0, type B mini USB connection
Housing:	Material: ABS plastic, rubber
Dimensions:	185 x 90 x 40 mm
Weight:	470 g (complete with batteries)
Scope of supply:	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.0
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:** ±1.5 °C at range -40 ... +375 °C
Class 1 for **Type N:** ±1.5 °C at range -40 ... +375 °C
Class 1 for **Type S:** ±1 °C at range 0 ... 1100 °C

basic fee for custom made probe
basic fee for custom made probeGF1TK /GF2TK /GF3TK
We reserve the right to a minimum quantity surcharge for custom-made items

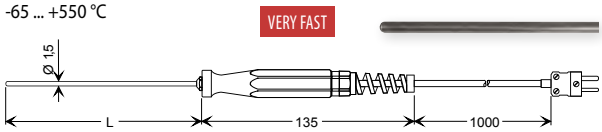
-65 °C / +550 °C

GTF 400

Art. no. 600502

Immersion probe for liquids / gases
-65 ... +550 °C

VERY FAST



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

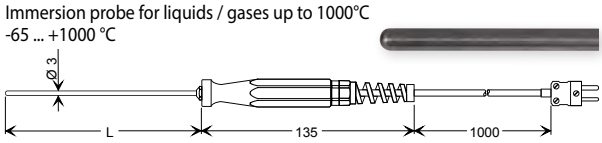
Response time T_{90}: water 0.4 m/s <1 s

-65 °C / +1000 °C

GTF 900

Art. no. 600505

Immersion probe for liquids / gases up to 1000°C
-65 ... +1000 °C



inexpensive, elastic (rigid)
non-corrosive V4A tube Ø 3 mm, L=130 mm, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature fl t plug

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

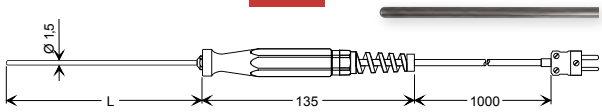
-200 °C / +1150 °C

GTF 1200

Art. no. 600507

Immersion probe with sheatehed thermocouple, for highest temperatures
-200 ... +1150 °C

BENDABLE



Inconel 600 jacket tube Ø 1.5 mm, fl xible, L=150 mm, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature fl t plug

Response time T_{90}: water 0.4 m/s approx. 3 s

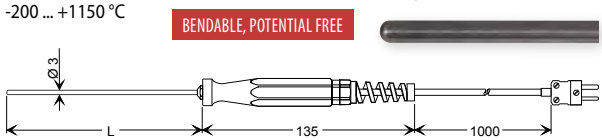
-200 °C / +1150 °C

GTF 1200/300

Art. no. 600510

Immersion probe with sheatehed thermocouple, for highest temperatures
-200 ... +1150 °C

BENDABLE, POTENTIAL FREE



Inconel 600 jacket tube Ø 3 mm, fl xible, L = 300 mm, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature fl t plug

Response time T_{90}: water 0.4 m/s approx. 5 s

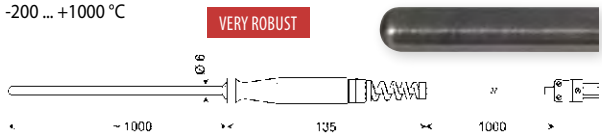
-200 °C / +1000 °C

GTF 1000 AL

Art. no. 600512

Immersion probe, sheathed thermocouple for aluminum smelting etc.
-200 ... +1000 °C

VERY ROBUST



for aluminium melt, non-ferrous metal, etc.
V4A tube Ø 6 x 1.4 mm, L=1000 mm rigid, additional internal mantle thermocouple, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature fl t plug

Response time T_{90}: water 0.4 m/s approx. 30 s

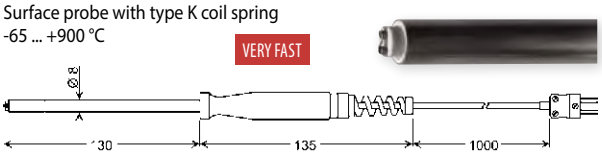
-65 °C / +900 °C

GOF 130

Art. no. 600490

Surface probe with type K coil spring
-65 ... +900 °C

VERY FAST



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

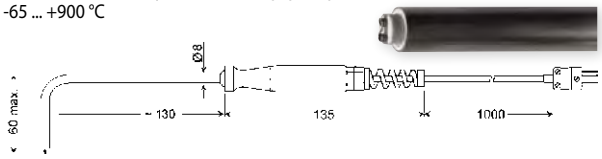
Response time T_{90}: approx. 5 s

-65 °C / +900 °C

GOF 900 HO

Art. no. 600500

Surface probe with type K coil spring, gebogen
-65 ... +900 °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 fl t plug

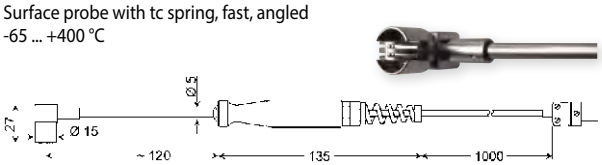
Response time T_{90}: approx. 5 s

-65 °C / +400 °C

GOF 200 HO

Art. no. 600492

Surface probe with tc spring, fast, angled
-65 ... +400 °C



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

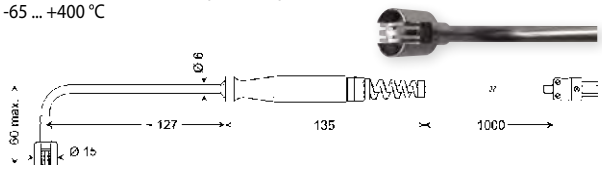
Response time T_{90}: approx. 2 s

-65 °C / +400 °C

GOF 400 HO

Art. no. 600494

Surface probe with tc spring, fast, angled
-65 ... +400 °C



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

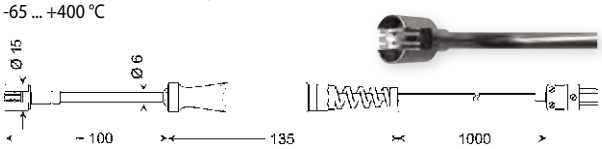
Response time T_{90}: approx. 2 s

-65 °C / +400 °C

GOF 400 VE

Art. no. 600496

Surface probe with tc spring, fast
-65 ... +400 °C



for fastest measurements, fl xible thermocouple tapes, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature fl t plug

Response time T_{90}: approx. 2 s

MH 400VE
Art. no. 607502
Magnet holder, heat resistant up to 100 °C

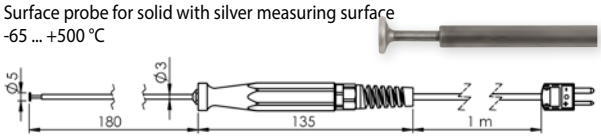
TYPE K - MEASURING PROBE (NICR-NI) WITH DIN-TYPE FLAT-PIN PLUG

-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; fi ed silver plate, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature fl t plug

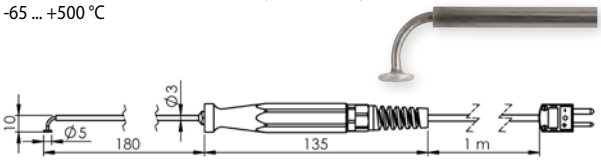
Response time T_{90}: approx. 3 s

-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, fi ed silver plate, plastic handle, anti-buckling glanding, 1 m silicone cable, miniature fl t plug

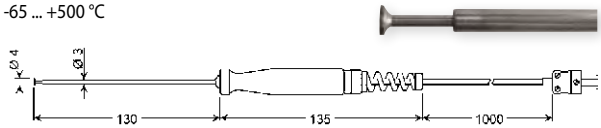
Response time T_{90}: approx. 3 s

-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 fl t plug

Response time T_{90}: approx. 5 s

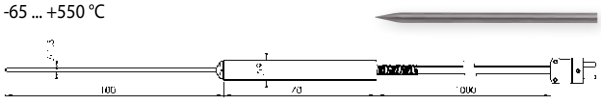
-65 °C +550 °C

GES 20-K

VERY THIN

Art. no. 602591

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



Use for canteen kitchen, backeries, butcher´s shops, etc.
V4A tube with Ø 1.5 mm slim insertion tip, small Teflon handl , stainless steel kink protection, 1 m Teflon cabl , miniature fl t plug

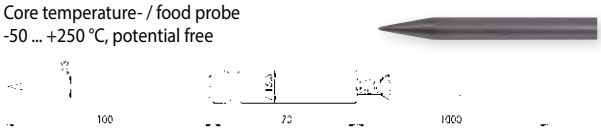
Response time T_{90}: water 0.4 m/s <1 s, air 2 m/s approx. 12 s

-50 °C +250 °C

GES 21-K

Art. no. 600074

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



Use for canteen kitchen, backeries, butcher´s shops, etc.
V4A tube Ø 3 mm with needle-shaped insertion tip, big white teflon handl , stainless steel kink protection, 1 m Teflon cabl , miniature fl t plug

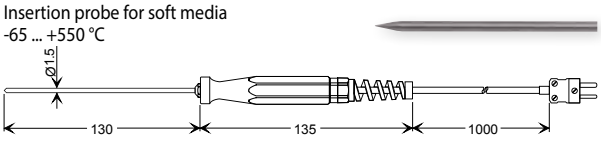
Response time T_{90}: water 0.4 m/s <2 s, air 2 m/s approx. 40 s

-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 fl t plug

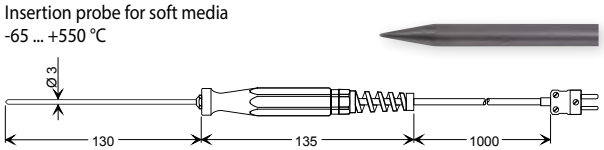
Response time T_{90}: water 0.4 m/s approx. 1 s, air 2 m/s approx. 1.5 s

-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 fl t plug

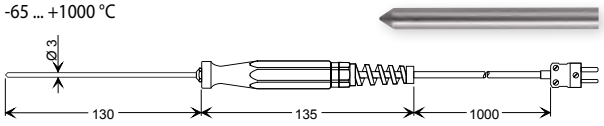
Response time T_{90}: water 0.4 m/s <2 s

-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 fl t plug

Response time T_{90}: water 0.4 m/s approx. 5 s

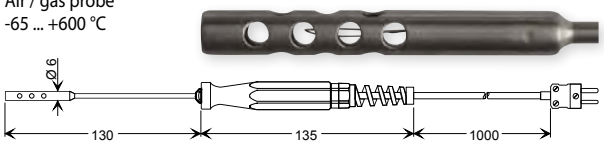
-65 °C +600 °C

GTL 130

VERY FAST

Art. no. 602304

Air / gas probe
-65 ... +600 °C



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

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

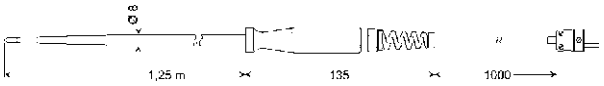
-65 °C +200 °C

GKF 125

Art. no. 600520

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

VERY ROBUST



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 fl t plug

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

-50 °C +250 °C

GTF 40 K-620

NEW!

Art. no. 610829

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

GTF 40 K-1000

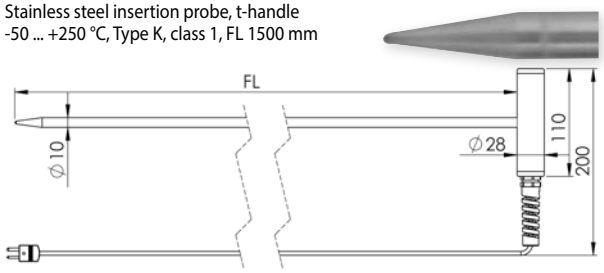
Art. no. 475184

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 fl t plug

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

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

-65 °C / +550 °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 fl t-pin plug

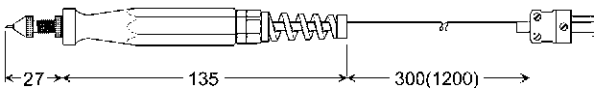
Response time T_{90}: water 0.4 m/s approx. 6 s

-50 °C / +200 °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 fl t plug

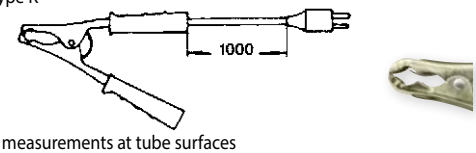
Response time T_{90}: approx. 5 s

-65 °C / +150 °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 Ø, 1 m silicone cable, miniature fl t plug

Response time T_{90}: approx. 3 s

-65 °C / +300 °C

GTF 300

Art. no. 600039

Wire probe for quick-response measurements
Measuring tip twisted/fused

GTF 300-UV

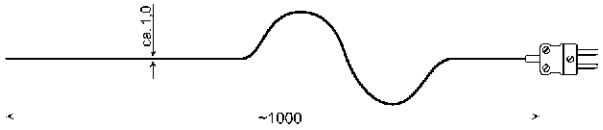
Art. no. 600081

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-insul ted twisted Ø 0.2 mm thermocouple wires, fused measuring tip, very fl xibel, miniature fl t plug

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

-65 °C / +400 °C

GTF 300 GS

Art. no. 602554

Wire probe, glass fib e insulated for quick-response measurements
twisted measuring tip

GTF 300 GS-UV

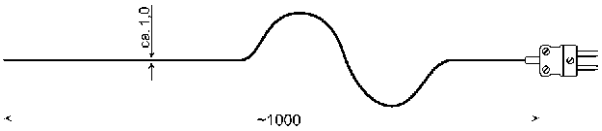
Art. no. 607893

Wire probe, glass fib e insulated for quick-response measurements
Measuring tip non-twisted/fused

GTF 300 GS-SP

Art. no. 606208

Wire probe, glass fib e insulated for quick-response measurements
Measuring tip with weld bead
-65 ... +400 °C



for air, gases, diminutive surfaces (not for liquids)
glass filame t insulated Ø 0.2 mm thermocouple wires, miniature fl t plug

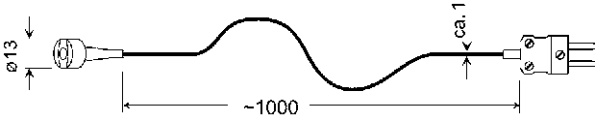
Response time T_{90}: water 0.4 m/s approx. 0.3 s
Additional charge for any length per m

-65 °C / +250 °C

GMF 250

Art. no. 600071

Magnetic surface probe
-65 ... +250 °C



self-adhesive on magnetic materials, spring-loaded CU plate Ø 5 mm, 1 m Teflon-insul ted twisted cable, miniature fl t plug

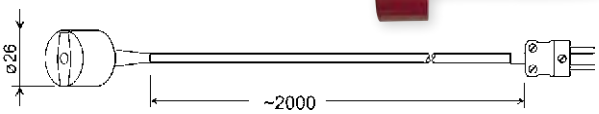
Response time T_{90}: approx. 5 s

-65 °C / +200 °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 Ø 5 mm, resilient 2 m long silicone cable, miniature fl t plug

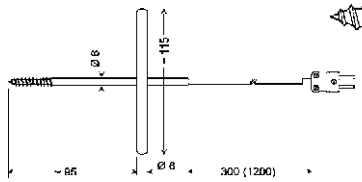
Response time T_{90}: approx. 5 s

-65 °C / +200 °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 Ø with screw prod, spiral cable (approx. 1.2 m drawn out), DIN-type fl t-pin plug

Response time T_{90}: approx. 15 s

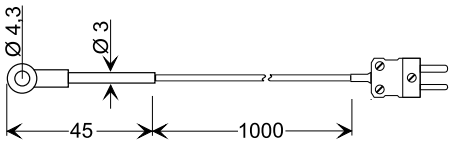
TYPE K - MEASURING PROBE (NICR-NI) WITH DIN-TYPE FLAT-PIN PLUG

-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 cabl , miniature fl t plug

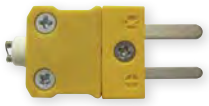
Response time T_{90}: approx. 10 s

-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 fl t plug

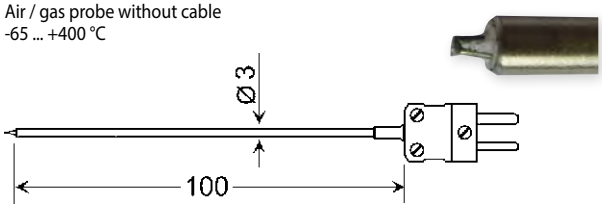
Response time T_{90}: approx. 2 s

-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 fl t, V4A-tube Ø 3 mm, DIN-type fl t-pin plug, rigid connection

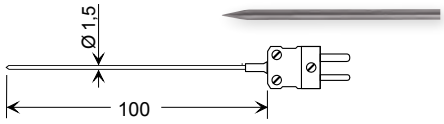
Response time T_{90}: approx. 2 s

-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 fl t plug with a rigid connection

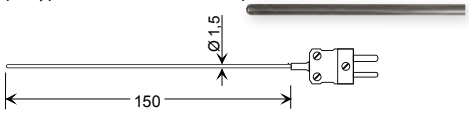
Response time T_{90}: water 0.4 m/s <1 s

-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 fl t plug with a rigid connection

Response time T_{90}: water 0.4 m/s approx. 3 s

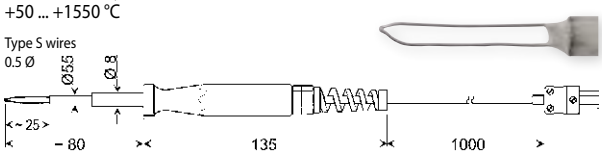
+50 °C / +1550 °C

GBF 1550

FOR HIGHEST TEMPERATURES

Art. no. 603037

Burner probe type S
+50 ... +1550 °C



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

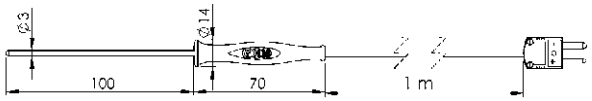
Response time T_{90}: approx. 2 s

-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 fl t connection

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

Variant:

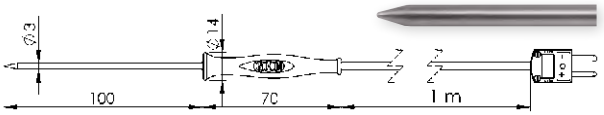
GF 1TK-T3-LE
Art. no. 609696
compact type K temperature probe with silicone handle with loose ends

-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 fl t connection

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

Variant:

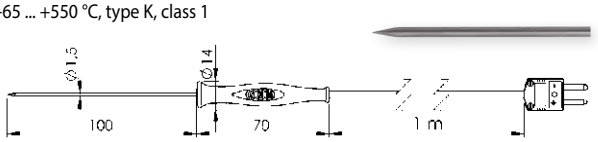
GF 1TK-E3-LE
Art. no. 609698
compact type K temperature probe with silicone handle with loose ends

-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 fl t connection

Response time T_{90}: water 0.4 m/s <1 s, air 2 m/s approx. 15 s

Variant:

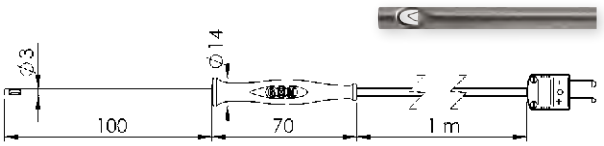
GF 1TK-E1.5-LE
Art. no. 609700
compact type K temperature probe with silicone handle with loose ends

-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 fl t connection

Response time T_{90}: 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

INFRARED

	GIM 530 MS	ST 512
APPLICATION:		
Precision measurement	•	
Fast scanning of surfaces	•	•
Food	•	•
Quality management	•	•
EQUIPMENT:		
Measuring range [°C]	-32 ... +530	-50 ... +1000
Laser	single	dual
Additional probe connection		
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	
Data storage and visualisation / interface		
DEVICE INFORMATION:		
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 the mal bridges etc.
- Motor vehicle diagnosis, electricity, home improvement
- Checking food temperature during keeping warm or storing

Specifi ations:

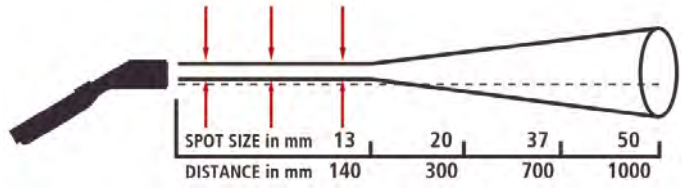
Measuring range:	-32 ... + 530 °C (-20 ... +980 °F)
Resolution:	0.1 °C (0.1 °F)
Temperature display:	°C or °F selectable
System accuracy:	(at ambient temperature = 23 °C ±5 °C)
±1 % or ±1 °C	0 ... 530 °C (highest value shall be valid)
±1 °C ±0.07 °C/°C	0 ... -32 °C
Repeat accuracy:	±0.5 % or ±0.7 °C from 0 °C ... 530 °C (highest value shall be valid) ±0.7 °C ±0.05 °C / °C from 0 °C ... -32 °C
Optical resolution (D:S):	20 : 1
Response time (t_{95}):	0.3 s
Spectral range:	8 ... 14 µm
Emission rate:	0.100 ... 1.000, free selectable
Laser:	<1 mW laser class IIa
Configu ation:	Min/Max/Scan/Hold/Offset/°C/°F
Display illumination:	yes
Alarm function:	optical and acoustic HIGH-/LOW-alarm
Working temperature:	0 ... 50 °C
Storage temperature:	-20 ... +60 °C (without battery)
Power supply:	9 V alkaline battery
Battery life:	approx. 20 hours for use with laser and illumination
Abmessung:	190 x 38 x 45 mm (L x W x D)
Weight:	approx. 150 g
Scope of supply:	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 MEASUREMENT IS NOT SUITABLE FOR LIQUIDS AND SPECULAR OR REFLECTIVE SURFACES

INFRARED THERMOMETER

ALARM
HOLD
MIN MAX

HIGHLIGHTS:
- Dual laser
- Alarm function

ST 512

Art. no. 600004

Infrared thermometer with dual-laser

Application:

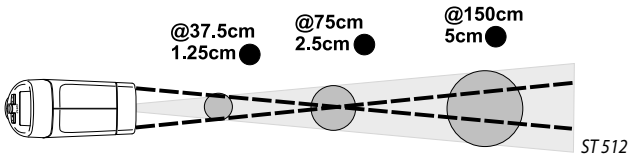
- **Monitoring of circuit boards:** overheated parts
- **Heating / ventilation / air-conditioning:** detecting bad isolation, untight pipes, energy consumption, general service measurements, etc.
- **Electrical systems, machines, power engines:** detecting hot spots at electric connections, temperature 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.)

Specifi ations:

Measuring range:	-50 ... +1000 °C	
Resolution:	0.1 °C	
Accuracy: (at ambient temperature = 23 °C ... 25 °C)	-50 ... -23 °C	±7 °C (typical)
	-23 ... -2 °C	±4 °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)
Reproducibility:	±0.5 % of meas. value or ±1 °C	
Response time (t_{95}):	150 ms	
Emission rate:	0.10 ... 1.00, selectable	
Spectral range:	8 ... 14 µm	
Optical resolution (D / S):	approx. 30:1	
Sight:	dual laser	
Power supply:	9 V battery	
Display:	LCD-display with function indicator symbols and background illumination	
Operating conditions:	0 ... 50 °C, 10 ... 90 % RH	
Storage temperature:	-10 ... +60 °C	
Features:	HOLD, Min- / Max, °F, LOCK, Alarm	
Alarm function:	selectable min / max alarm, with integrated buzzer	
Dimensions:	146 x 104 x 43 mm	
Weight:	163 g	
Scope of supply:	Device, battery, manual	

Accessories and spare parts:

ISO-WPT-Infrarot p.r.t. page 15



INFRARED MEASUREMENT IS NOT SUITABLE FOR LIQUIDS AND SPECULAR OR REFLECTIVE SURFACES

HUMIDITY / FLOW RATE

	GMH 3330 + TFS 0100 E	GMH 3350 + TFS 0100 E	GFTH 95	GFTH 200	GFTB 200
APPLICATION:					
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

ISO
AUTOOFF
HOLD
MIN MAX

HIGHLIGHTS:

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

ADDITIONAL FUNCTIONS GMH 3350:

ALARM LOGG

GMH 3330

Art. no. 600343

Humidity, temperature and fl w rate measuring device, probe not included

GMH 3350

Art. no. 600345

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

General:

The GMH 33xx devices are universal precision hygrometer / Thermometer and fl w 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 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

Specifi ations:

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: (p.r.t. next page)	No calibration required for exchange of humidity/temperature or fl w rate probe.
Probe connection:	6-pin screened Mini-DIN-socket
NiCr-Ni connection:	for miniature fl t-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 GSOFT3050 (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 <=>PC, USB

GSOFT 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. certific te 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 & 3350, exchangeable without any loss in accuracy

General:

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

Specifi ations:	
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 d ta 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 & 3350 with plastic paper fil er 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 e c.

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 & GMH3350, exchangeable without any loss in accuracy

Specifi ations:	
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 fl w:	±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.

Specifi ations:	
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 fl w:	±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

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

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 effici t 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 effici tly 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

Specifi ations:

Measuring ranges	
Temperature:	-25.0 °C ... +70.0 °C
Air humidity:	0.0 ... 100.0 % RH (recommended range: 11 ... 90 % RH)
Air pressure:	10.0 ... 1100.0 mbar
Calculated parameters	
Dew point temperature Td:	-40.0 ... +70.0 °C
Wet bulb temperature Twb:	-27.0 ... +70.0 °C
Mixing ratio x:	0.0 ... 280.0 g/kg
Absolute humidity d:	0.0 ... 200.0 g/m³
Resolution:	0.1 % RH; 0.1 °C or 0.1 °F, 0.1 mbar
Accuracy: (±1 digit) (at nominal temperature = 25 °C)	
Temperature:	±0.5 % of m.v ±0.1°C (Pt1000 DIN cl. AA)
Air humidity:	±2.5 % RH (at range 11 ... 90 %)
Air pressure:	±1.5 mbar (750 ... 1100 mbar)
Messfühler	
Temperature:	Pt1000
Air humidity:	capacitive polymer humidity sensor
Air pressure:	piezo-resistive sensor hybrid
Response time:	T_{90} = 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	
Electronics:	-25 ... +70 °C; 0 ... 80 % RH (non-condensing)
Sensors:	-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)
Interface:	Serial interface, via electrical isolated interface converter USB 3100 N (accessories) directly connectable to PC.
Configu able 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 certific tes humidity, for ISO9000ff (.r.t. page 15)

ISO-WPD5
Art. no. 602514
ISO certific tes pressure, for ISO9000ff (.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.

Specifi ations:

Measuring range	
°C:	-20.0 ... +70.0 °C
% RH:	10 ... 95 % RH (recommanded 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_{90} = 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 certific tes for ISO9000ff (.r.t. page 15)

HUMIDITY / TEMPERATURE / DEW POINT MEASURING DEVICE

HIGHLIGHTS:

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

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.

Specifi ations:

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_{90} = 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

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 certific tes for ISO9000ff (.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

APPLICATION:	GMK 210	GMK 100	GMI 15	GMR 110	GMH 3810	GMH 3831 + suitable electrode	GMH 3851 + suitable electrode	BaleCheck 100	BaleCheck 200
Carpenter, joiners, DIY		•	•	•	•	•			
Boat & Caravan (wood & GFK)	•								
Certified glue la						•	•		
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)						•	•	•	•
EQUIPMENT:									
Method	capacitive (non-destructive)					resistive (resistance)			
Sensor / Probe	integrated			integrated		external		external GSF 40	external GSF 40TF
Characteristics	14	18		4		494		4	494
User curves							4		
General functions	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
Serial interface / analog output						• / 0 ... 1 V	• / 0 ... 1 V		• / 0 ... 1 V
Data logger							•		
DEVICE INFORMATION:									
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INFORMATION

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 coeffici t of water is considerably higher than that of dry lumbers or building materials. Therefore the total dielectric coeffici t 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 [%] =
(mass wet - mass dry) / mass dry * 100
Particularly important for carpenters, joiners, etc.

○ **Moisture content w:**

material moisture related to wet total mass
moisture content w [%] =
(mass wet - mass dry) / 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

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 d wn to a depth of approx. 4 cm. Detection of moisture behind ceramic tiles and/or various wall or floor overings. 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

Specifi ations:	
Display:	3½-digits, 13 mm high LCD
Display range	
Concrete / fl or	0 ... 5 = dry 6 ... 9 = humid, normal humidity level 10 ... = wet
Wood / fib e 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

AUTOOFF
HOLD

NONDESTRUCTIVE MEASUREMENT

Rear side of device

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.

Specifi ations:	
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 deivce

MEASURING DEVICE MOISTURE

AUTOOFF
HOLD

NONDESTRUCTIVE MEASUREMENT

Rear side of device

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 handicraft. 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 einforced plastic)

Specifi ations:	
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 deivce

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

AUTOOFF
AUTOHOLD

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:

LOGG

CONFORM TOEN 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, st aw, hay, concrete, bricks, wash floo , plaster, limestone mortar, cement mortar, paper, carton, textiles, wood chips, professional fi ewood 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.

Specifi ations:

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)
Display:	two 4-digit LCD displays (12.4 mm and 7 mm high), additional indicator arrows
Output:	3-pole jack connector Ø 3.5 mm, either with serial interface or analog output
Serial interface:	connectable to RS232 or USB interface of PCs via electrically isolated interface converter GRS 3100, GRS 3105 or USB 3100 N (accessories).
Analog output:	0 ... 1 V, freely scalable
Average value:	of 3 measurements, e.g. for professional fi ewood moisture measurements
Power supply:	9 V battery, additional socket for external 10.5 ... 12 V direct current power supply (adequate PSU: GNG10/3000).
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:	155 g
Scope of supply:	Device, battery, calibration protocol, manual

additional functions GMH 3851:

User specific cha acteristics: 4, freely programmable
Interpolation points per curve: 20
By means of the gratis software GMHKonfig the i terpolation points can be comfortably edited and stored to the instrument (Required accessories: interface converter)
Sort limitaion 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, legth 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 impa t 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 isol ted 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)

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

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

11

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

12

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

13

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

14

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 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 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

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

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.

Specifi ations:	
Device:	GMH 3831 or GMH 3851, see page 46
Einstechfühler:	GSF 50, GSF 50K, GSF 50TF, GSF 50TFK, see page 47
Scope of supply	
GMH 38-LW1-TF:	GMH 3831, GSF 50 TF, battery, manual
GMH 38-LW1-TFK:	GMH 3831, GSF 50 TFK, battery, manual
GMH 38-LW2-TF:	GMH 3851, GSF 50 TF, battery, manual
GMH 38-LW2-TFK:	GMH 3851, GSF 50 TFK, battery, manual

RESISTIVE MATERIAL-MOISTURE MEASURING DEVICE

AUTOHOLD
AUTOOFF
HOLD

HIGHLIGHTS:

- 494 characteristic curves
- incl. calibration protocol

FOR WOOD AND BUILDING MATERIALS

GMH 3810
Art. no. 600350

Resisitve material moisture measuring device with integrated probes

General:

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

Specifi ations:	
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

AUTOHOLD
AUTOOFF
HOLD

AUTOMATIC TEMPERATURE COMPENSATION

rear side of device

COMFORTABLE CHARACTERISTIC CURVE- AND RATED DISPLAY

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

Resisitve material moisture measuring device with integrated probes

General:

Compact and robust measuring device for fast evaluation of material moisture in fi ewood, timber, flake boa d, 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 fi ewood and timber measurements, however, a lot of additional building materials can be rated.

Specifi ations:

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:	9 V 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), fi
h.03	oak, ash (AM), poplar, douglas fi

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 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

HAY AND STRAW HUMIDITY MEASURING DEVICE

AUTOHOLD
AUTOOFF
HOLD

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

Specifi ations:

Measuring range:	0.0 …. 100 % u (material moisture) 0.0 … 50 % w (water content)
Resolution:	0.1 % (till 19.9 %) and 1 % (from 20 %)
Characteristics:	hay, straw, grain, reference characteristics
Moisture rating:	6-step bar graph (wet … dry)
Temperature compensation:	manual
Display:	2 displays for characteristics and measuring value
Operating conditions:	-25 ... +50 °C (device), 0 ... +100 °C (rod), 0 ... 95 % RH (non-condensing)
Measuring rod:	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
Power supply:	9 V battery
Battery life:	approx. 170 h
Housing:	impact-resistant ABS
Dimensions:	110 x 67 x 30 mm (H x W x D)
Weight:	155 g
Scope of supply:	Device, measuring rod GSF 40, protective bag, battery, calibration protocol, manual

HAY AND STRAW HUMIDITY MEASURING DEVICE INCL. TEMPERATURE MEASUREMENT

AUTOHOLD
AUTOOFF
HOLD

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 fi e prevention (proof of due diligence).

Application:

- fi e prevention
- agriculture
- processing / storing / trading of hay or straw
- stock breeding, horse keeping

Specifi ations:

Measuring range:	0.0 ... 100.0 % u (material moisture) 0.0 ... 50.0 % w (water content) -40.0 ... +200.0 °C (device)
Resolution:	0.1 %, 0.1 %
Characteristics:	hay, straw, grain, reference characteristics, approx. 480 additional material moisture characteristics
Moisture rating:	9-step bar graph (wet ... dry)
Temperature compensation:	automatic or manual
Display:	two 4-digit LCD displays (12.4 mm and 7 mm)
Operating conditions:	-25 ... +50 °C (device), 0 ... +100 °C (rod), 0 ... 95 % RH (non condensing)
Measuring rod:	V4A stainless steel, 600 mm x Ø 10 mm, 1 m connection cable with BNC-/type K- plug, temperature 0 ... 100 °C, 260 g
Features:	interface, analog output (0 ... 1 V), power supply terminal (10.5 ... 12 VDC)
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
Dimensions:	142 x 71 x 26 mm (H x W x D)
Weight:	155 g
Scope of supply:	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
APPLICATION:						
Waters measuring, fish eeping, aquafarming (fresh- / marine waters)	•	•	•	•	•	
Drinking water-, process monito-ring, ground measurements	•	•	•	•	•	
Cleaning processes	•	•	•	•	•	•
Ultrapure water	•	•				•
Food production and -control	•	•	•	•	•	
Quality management	•	•	•	•	•	•
Water-proof	•	•			•	•
Electrodes for replacement	•	•				
EQUIPMENT:						
Measuring range						
Conductivity / Temperature	•	•	•	•	•	•
esp. Resistance	•	•	•	•		•
TDS / Salinity	•	•	•	•	•	
Sensor connection	7-pole bayonet	7-pole bayonet	fi ed	fi ed	fi ed	fi ed
Electrode	2- or 4-pol.	2- or 4-pol.	2-pole graphite	4-pole graphite	2-pole graphite	2-pole graphite
General functions:						
Min/Max, Hold, Auto-Off	•	•	•	•	•	•
Illumination	•	•			•	•
		Calibration memory				
Interface	•	•	•	•		
Alarm / Data logger		•		•		
DEVICE INFORMATION:						
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APPLICATION:	GMH 5530	GMH 5550	GMH 3511	GMH 3531	GMH 3551	G 1500	G 1501	GMH 5630	GMH 5650	GMH 3611	GMH 3651	G 1610	G 7500
Waters measuring, fish eeping, 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	• / rH		•	• / rH		pH	•						• / ppm, hPa
mg / l, % O_2								• / ppm, hPa		• / ppm, hPa		•	
Temperature	•		•	•			•	•		•			
Connections	BNC-socket			BNC-socket		BNC-socket --	BNC-socket 2 banana-jack	7 pin bayonet connection		6-pin Mini-DIN-socket		Electrode permanently connected to device	BNC-socket 2 banana-jack 7 pin bay.
Temperature	2 banana-jack			2 banana-jack									
Temperature compensation	automatic and manual (Pt1000, NTC 10k)		automatic and manual (Pt1000)			manual	automatic	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**

WATER-PROOF HANDHELD DEVICE FOR CONDUCTIVITY MEASUREMENT

ISO
AUTOHOLD
AUTOOFF
MIN MAX

WATER-PROOF - GERÄT UND STECKVERBINDUNGEN

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:

ALARM LOGG

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 fa ming
- drinking water monitoring, process control, soil measurements
- food production and control
- quality management

Additional applications at laboratory:
- medicine, pharmacy, chemistry

Specifi ations:

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)
Power supply:	2 x AAA battery (included), power consumption 6.25 mA
Battery life:	approx. 160 h (without background illumination)
Protection rating:	IP65 / IP67
Housing:	Impact-resistant ABS plastic housing, integrated pop-up clip
Dimensions:	160 x 86 x 37 mm (H x W x D) incl. silicone protection cover
Weight:	approx. 250 g incl. battery and protection cover
Scope of supply:	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 & 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

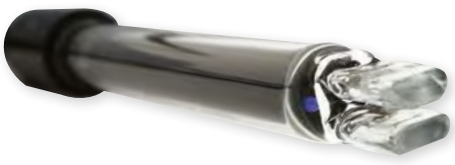
LF 200 RW

Art. no. 602841

Conductivity cell for GMH 5400 / G 7500-Series, stainless steel

Application:
Pure and ultra pure water

Specifi ations:	
Measuring range:	0 ... 200 µS/cm
Temperature range:	-5 ... +100 °C
Cell constant *:	approx. 0.1
Temperature measurement:	NTC 10 k
Shaft:	Stainless steel, Ø 12 mm x 75 mm
Electrode:	2-pole stainless steel
Cable length:	1 m
Scope of supply:	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

Specifi ations:	
Measuring range:	0 ... 1000 µS/cm
Temperature range:	-5 ... +100 °C
Cell constant *:	approx. 1
Temperature measurement:	NTC 10 k
Shaft:	Glass, Ø 12 mm x 120 mm
Electrode:	2-pole glass / platinum
Cable length:	1 m
Scope of supply:	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 Ø12mm

GKL 100
Art. no. 601396
Conductivity control solution (100 ml bottle with 1413 µS/cm according to 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)

GWZ-01
Art. no. 603499
Flow-through chamber for sensors with Ø 12 mm, tube connection Ø 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

Specifi ations:	
Measuring range:	0 ... 200 mS/cm
Temperature range:	0 ... 100 °C
Cell constant *:	approx. 0.55
Temperature measurement:	NTC 10 k
Shaft:	Epoxide, Ø 12 mm x 120 mm
Electrode:	4-pole graphite
Cable length:	2 m
Scope of supply:	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.

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

Specifi ations:	
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
Cable length:	1 m
Scope of supply:	Measuring cell, manual

CONDUCTIVITY MEASUREMENT SET

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

Specifi ations:

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

HANDHELD INSTRUMENTS INCL. ELECTRODE

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

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:

ALARM LOGG

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)

Specifi ations:

Measuring range	
Conductivity:	0.0 ... 200.0 µS / cm 0 ... 2000 µS / cm 0.00 ... 20.00 mS / cm 0.0 ... 200.0 mS / cm 0 ... 400 mS / cm **(GMH 3451 only)** manually selectable or AutoRange
Temperature:	-5.0 ... +100.0 °C
Resistivity:	0.005 ... 100.0 kOhm * cm
Salinity:	0.0 ... 70.0 g / kg water
TDS:	0 ... 1999 mg/l
Accuracy (±1 digit) (at nominal temperature = 25 °C)	
Conductivity:	±0.5 % of m.v. ±0.3 % FS or ±2 µS/cm
Temperature:	±0.2 % of m.v. ±0.3 K
Cell correction:	adjustable 0.800 ... 1.200 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 measuing 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)
Relative humidity:	0 ... +95 % RH (non-condensing)
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).
Pushbuttons:	6 membrane keys for ON/OFF-switch, selection of meas. range, min- and max-value memory, hold-function, etc.
Power supply:	9 V-battery as well as additional PSU connector (internal pin Ø 1.9 mm) for external 10.5 ... 12 V DC supply. (suitable power supply: GNG10/3000)
Battery life:	approx. 150 h
Housing:	Impact-resistant ABS plastic housing, membrane keyboard, transparent panel, integrated pop-up clip
Dimensions:	Device: 142 x 71 x 26 mm (H x W x D) Dimensions (electrode shaft): approx. 120 mm long, Ø approx. 12 mm, 1 m of fi ed connection cable between electrode and device
Weight:	approx. 230 g (incl. battery and measuring cell)
Scope of supply:	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 filt ate 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, Ø 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 mS / 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 µS / 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 µS / cm, acc. to DIN EN 27888)

PRECISE CONDUCTIVITY MEASURING DEVICE

AUTOOFF
HOLD
ISO
MIN MAX

DURABLE AND AFFORDABLE

G 1410 G 1420

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 mou ted, 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 mou ted, 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 place 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/clea- nest water applications.

Application:

Freshwater and salt water aquariums, reverse osmosis and similar fil ers, 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

Specifi ations:	G 1410	G 1420
	Wide-range measuring device, incl. graphite measuring cell	Cleanest water version, incl. stainless steel measuring cell
Measurement:	Conductivity, salinity, TDS	conductivity, specific esistance:
Measuring range:	With automatic measuring range shifting	
Conductivity:	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
Specific esistance:	--	0.0100 ... 0.2000 MOhm*cm 0.010 ... 2.000 MOhm*cm 0.01 ... 20.00 MOhm*cm
TDS:	0 ... 2000 mg/l	--
Salinity (PSU):	0.0 ... 50.0 g/kg	--
Temperature:	-5.0 ... +105.0 °C	-5.0 ... +105.0 °C
Accuracy		
Conductivity:	±0.5 % of m.v. ±0.5 % FS	Typ. ±1 % of m.v. ±0.5 % FS
Temperature:	±0.3 °C	±0.3 °C
Temperature compensation:	off: deactivated nLF: non-linear, according to EN 27888	off: deactivated nLF: non-linear, according to EN 27888 LIN: linear with variable coeffici ts NaCl: For weak NaCl solutions in accordance with EN 60746-3
Reference temperatures:	20 and 25 °C	20 and 25 °C
Sensors / measuring inputs:	permanently connected 2-pole measuring cell with integrated temperature sensor	
Measuring cell:	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)
Display:	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

Specifi ations:	
Measuring ranges	
Temperature:	-5.0 ... +150.0 °C or 23.0 ... +302.0 °F
pH:	0.00 ... 14.00 pH
Redox (ORP):	-1999 ... +2000 mV Based on hydrogen system: -1792 ... +2207 mV_H (DIN 38404)
rH:	0.0 ... 70.0 rH (not GMH 3511)
Accuracy (device) ±1 digit at nominal temperature = 25 °C	
Temperature:	±0.2 °C (at range -5 ... +100 °C)
pH:	±0.01 pH
Redox (ORP):	±0.1 % FS (mV or mV_H)
rH:	±0.1 rH (not GMH 3511)
Sensor connections	
Temperature:	2 x 4 mm banana socket for Pt1000, 2-wire
pH, Redox:	BNC socket
Display:	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_H": 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 GHM 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 ≙ 0 ... 14 pH or -2000 ... +2000 mV, connection via 3-pole jack socket Ø 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 addional 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 <=>PC, USB, electrically isolated

EBS 20M
Art. no. 601158
Measuring data acquisition software for EASYBus & GMH, see page 109

GMH3511 SETS

GMH 3511-SET

COMFORTABLE MEASUREMENT

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.

Specifi ations:

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)

GMH3531 SETS

GMH 3531-SET125

FOR LABORATORY AND FIELD

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 fiel .
Minimum measurement effort with maintenance-free gel electrodes and automatic temperature compensation.

Specifi ations:

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)

GMH3551 SETS

GMH 3551-SET100

WITH DATA LOGGER

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

Specifi ations:

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

ISO
AUTOHOLD
AUTOOFF
HOLD
MIN MAX

WATER-PROOF DEVICE AND PLUG CONNECTIONS

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:

ALARM LOGG

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, fishkeepin , aquafarming
- Drinking water monitoring, process control, soil measuring
- Food production and monitoring
- Laboratory: Medicine, pharmaceutics, chemistry
- Quality management

Specifi ations:

Measuring ranges	
pH:	-2.000 ... 16.000 pH (resolution selectable)
Redox / mV:	-2000.0 ... 2000.0 mV (resolution selectable) for hydrogen system DIN38404: -1792 ... +2207 mV_H)
Temperature:	-5.0 ... +150.0 °C; 23.0 ... 302.0 °F
rH:	0.0 ... 70.0 rH
Accuracy	
pH:	±0.005 pH
Redox / mV:	±0.05 % FS (mV or mV_H)
Temperature:	±0.2 °C (in the range of -5.0 ... 100.0 °C)
rH:	±0.1 rH
Connections	
pH, Redox:	BNC-female connector, compatible to standard BNC-plugs and waterproof BNC-plugs, additional banana-jack (4 mm) for separate reference electrode, input resistance: 10^{12} Ohm
Temperature:	2 banana-jacks (4 mm) for temperature probes (Pt1000 or NTC 10K)
Interface / Supply:	4-pole bayonet connector for serial interface and supply (with accessory USB 5100)
Operating conditions:	-25 ... +50 °C; 0 ... 95 % RH (non-condensing)
Display:	two 4 ½ digit 7-segment displays (15 mm and 12 mm)
pH-Calibration	
Automatically:	1-, 2- or 3- point calibration, GREISINGER standard buffer or buffer to DIN19266 (A, C, D, F, G)
Manual:	1-, 2- or 3- point calibration
Power supply:	2 x AAA-battery, power consumption: <1.0 mA
Battery life:	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

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_H" 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 intervall 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 & 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

Specifi ations:

Measuring ranges	
pH:	-2.000 ... 16.000 pH (resolution selectable)
Redox / mV:	-2000.0 ... 2000.0 mV (resolution selectable) for hydrogen system DIN38404: -1792 ... +2207 mV_H)
Temperature:	-5.0 ... +150.0 °C; 23.0 ... 302.0 °F
rH:	0.0 ... 70.0 rH
Dimensions:	450 x 360 x 140 mm (case)
Weight:	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

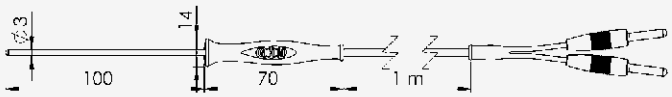
Supplementary set GMH 55 ES

Accessories and spare parts:

GMH 55 ES
Art. no. 603066
pH addional 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_{90}: 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 s orage (filled in the p otective 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

AUTOHOLD
HOLD
ISO
MIN MAX

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 place 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.

Specifi ations:	
Measuring range:	0.00 ... 14.00 pH
Resolution:	0.01 pH
Accuracy (device):	±0.02 pH ±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 connectible 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 **G 1500-SET only:** 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 PHLx 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

AUTOHOLD
HOLD
ISO
MIN MAX
ALARM

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 place 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.

Specifi ations:

Measuring range:	0.00 ... 14.00 pH
Resolution:	0.01 pH
Accuracy (device):	±0.02 pH ±1 digit (at nominal temperature 25 °C)
Temperature:	
Measuring input:	2 x 4 mm banana for Pt 1000, 2-wire
Measuring range:	-5.0 ... +105.0 °C or 23.0 ... 221.0 °F
Accuracy:	±0.2 °C ±1 digit (at nominal temperature 25 °C)

Redox (OPR)

Measuring input:	BNC socket (Redox or pH measurement adjustable via menu)
Measuring range:	-1500 ... 1500 mV or -1293 ... 1707 mV_H
Accuracy:	±0.1 % FS ±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 connectible 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-BS
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-BS
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
Measuring range	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
Conductivity	>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
Temperature measuring	no	no	no	no	no	integr. Pt1000 4 mm banana	no	integr. Pt1000 4 mm banana	no	no	no	no
Water-proof	no	no	no	no	optional	no	no	ja	no	no	no	no
Pressure resistant	no	no	no	6 bar	no	6 bar	no	1 bar	5.5 bar	no	10 bar	6 bar
Cable	1 m [1]	1 m [1]	1 m [1]	2 m [1]	1 m	2 m [2]	1 m	2 m	5 m	1 m [1]	ohne	1 m [1]
Electrolyte	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
Diaphragm	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
Thread	without	without	without	PG 13.5	without	PG 13.5	without	without	1/2" NPT	without	PG 13.5	PG 13.5
Electrode shaft	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
Features	universal electrode	tip Ø 6 mm, small sample volume	for low-ion media	low-maintenance	Low-cost low-maintenance	temperature compen-sated	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-che-mistry, alkali-resistant
Connection:												
BNC *Art. no.*	*600704*	*600693*	*602063*	*600713*	*604701*	*600730*	*600698*	*600731*	*610987*	*600727*	-	*600735*
S7*) *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 [1] [2]
(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

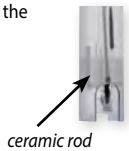
BNC connection


S7 connection at shaft

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.


ceramic rod

Joint / movable joint
The roughened surface between the cut glass of the electrode and a cut glass sleeve permits a electrolyte fl w of several ml/h.
Application:
low-ion or heavily soiled samples


glass sleeve

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.


Pellon strap

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 or 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 fit ed, 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 *)

**) 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

Specifi ations:	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 [1]	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 [1] [2]
(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:

GPH 4,0 / 5 *Art. no. 602614*
pH buffer capsules (5 pieces), pH 4.0

GPH 4,0 / 10 *Art. no. 602615*
pH buffer capsules (10 pieces), pH 4.0

GPH 7,0 / 5 *Art. no. 602616*
pH buffer capsules (5 pieces), pH 7.0

GPH 7,0 / 10 *Art. no. 602617*
pH buffer capsules (10 pieces), pH 7.0

GPH 10,0 / 5 *Art. no. 602618*
pH buffer capsules (5 pieces), pH 10.0

GPH 10,0 / 10 *Art. no. 602619*
pH buffer capsules (10 pieces), pH 10.0

GPH 12,0 / 5 *Art. no. 602620*
pH buffer capsules (5 pieces), pH 12.0

GPH 12,0 / 10 *Art. no. 602621*
pH buffer capsules (10 pieces), pH 12.0

All buffer capsules are traceable to NIST standards and have ±0.02 pH at 25 °C.

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

PHL 4-1000 *Art. no. 415029*
pH buffer solution, ready to use, (pH 4.01 / 25 °C), 1000 ml

PHL 7-1000 *Art. no. 415030*
pH buffer solution, ready to use, (pH 7.00 / 25 °C), 1000 ml

PHL 10-1000 *Art. no. 415031*
pH buffer solution, ready to use, (pH 10.01 / 25 °C), 1000 ml

KCL 3 M *Art. no. 602477* 3 mol KCL electrolyte
for refilling and s orage (fill i to 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 einforced, 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 bottl

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 d y. Electrodes delivered try are long lasting and ready for use within about 1 h after fillin .

Specifi ations:	GMH 5630	GMH 5650
Measuring channels:	O_2, T, air pressure (integrated)	O_2, T, air pressure (integrated) /me-asuring depth *1)
Measuring ranges		
O_2-concentration:	0.00 ... 70.00 mg/l (ppm) (Variable resolution)	
O_2-saturation:	0.0 ... 600.0 % O_2 (Variable resolution)	
O_2-partial pressure:	0 ... 1200 hPa O_2 (0.0 ... 427.5 mmHg)	
Temperature:	0.0 ... 50.0 °C	
Air pressure:	10 ... 1200 hPa abs	300 ... 5000 hPa abs
Measuring depth:	-	0 ... 40.0 m water column *1)
Accuracy		
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:	0.0 ... 50.0 °C	
Air pressure:	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	
Response time:	90 % in 10 s	
Service life:	approx. 3 years, depending on usage and care	

Display:	4 ½ digit, 7-segment, illuminated (white)
Working temperature:	Device: -25 ... +50 °C Sensor: 0 ... 40 °C
Sensor operating pressure:	max. 3 bar corresponds to max. 30 m water depth
Inward fl w:	min. 20 cm / s
Power supply:	2 x AAA-battery, power consumption: 0.9 mA
Battery life:	approx. 1000 h (without lighting)
Protection rating:	IP65 / IP67
Housing:	Impact-resistant ABS, with stand/ hanging bracket
Dimensions:	160 x 86 x 37 mm (H x W x D) including protective silicone case
Weight:	approx. 250 g, including battery and protective case
Scope of supply:	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_2)

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_2 and tempe-rature) with separate alarm thresholds alarm notific tion 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 l wer inward fl w required than with the predecessor model
- Dry storage possible for long-term storage needs
- Compact 12 mm diameter retained!

MEASUREMENT SET FOR DISSOLVED OXYGEN

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 fille , 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

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

Specifi ations:

Measuring channels:	O_2, T, air pressure (integrated) / measuring depth
Measuring range:	
O_2-concentration:	0.00 ... 70.00 mg/l (ppm) (Variable resolution)
O_2-saturation:	0.0 ... 600.0 % O_2 (Variable resolution)
O_2-partial pressure:	0 ... 1200 hPa O_2 (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 pipetts, 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)

HOLD
MIN MAX
O/S CORR

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

SUCCESSOR TO THE **G0X 20**

IT IS STILL AVAILABLE ON REQUEST - CONTACT US IMMEDIATELY!

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 place 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 ater in order to protect the membrane.

Application:

Freshwater and salt water aquariums, aquaculture / fish breeding, monitoring of wells and bodies of water

Specifi ations:

Measuring range / Resolution:	0.0 ... 20.0 mg / l (or ppm) O_2 concentration 0 ... 200 % O_2 saturation
Accuracy	
Oxygen:	±1,5 % of m.v. ±0.2 mg / l or ±1,5 % of m.v. ±2 % O_2 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_{95}:	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

G 1610-1002

Art. no. 474287

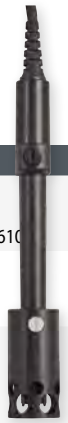
Waterproof handheld for dissolved oxygen incl. sensor Device with fix mou ted sensor 4 m: GWO5610-L02 and case GKK 1002

Accessories and spare parts:

GWOK 02
Art. no. 608012
Spare membrane head for GWO 561

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 3600 mounted on the sensor

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)

OXYGEN MEASURING DEVICES FOR DISSOLVED OXYGEN IN LIQUIDS

AUTOOFF
HOLD
MIN MAX

HIGHLIGHTS:

- Automatic air pressure compensation
- Salinity correction
- Simple calibration in atmospheric air

MEAS. UNITS: O_2-CONCENTRATION O_2-SATURATION AND O_2-PARTIAL PRESSURE (GMH3651 ONLY)

ADDITIONAL FUNCTIONS GMH 3651:

ALARM LOGG

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

Specifi ations:	
Measuring range: (device)	
O_2-concentration:	0.00 ... 70.00 mg / l (ppm) (resolution selectable)
O_2-saturation:	0.0 ... 600.0 % O_2 (resolution selectable)
O_2-partial pressure:	3651: 0 ... 1200 hPa O_2 (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, integrated 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_2 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. comfortable recordings of oxygen profiles in aters.*

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

Specifi ations:	
Measuring range: (device)	
O_2-concentration:	0.00 ... 70.00 mg / l (ppm) (resolution selectable)
O_2-saturation:	0.0 ... 600.0 % O_2 (resolution selectable)
O_2-partial pressure:	3651: 0 ... 1200 hPa O_2 (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)

futher specifi ations 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, GWO 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, GWO5610-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 significa t 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 husband y and aquaculture
- vertical/ urban farming
- conventional agriculture

Specifi ations:	
Input no.1 pH/ Redox	
Connection:	BNC waterproof
Measuring range:	-2.00 ... +16.00 pH (±0.25 % FS @ 25 °C) or -1500 ... +1500 mV Redox voltage (±0.25 % FS @ 25 °C)
Temperature:	-10.0 ... +150.0 °C (Pt1000) ±0.25 % FS connection via 4 mm banana or O_2 / 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_2 / LF sensor)
Conductivity	
Measuring range:	0 µS / cm ... 500 mS / cm (±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_2 (accuracy depending on sensor and calibration with fl w >20 cm/s, add. ±1.5 % FS @ 25 °C, 100 % sat, O_2)

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 fl xibility of the free sensor selection adapted to your emphases is guaranteed.

Temperature compensation:	Automatically via connected sensor
Pressure compensation	Manual, automatic via int. sensor: 500 ... 1100 hPa ±4 hPa
Salinity compensation:	Manual PSU 0 ... 70 g/kg
Additional functions:	Text-base user guidance (DE/EN), Charging via USB jack (3 x AAA batteries integrated, interchangeable)
Display:	LCD (180 x 128 pixel), monochromatic, adjustable backlighting
Interface:	USB 2.0, Micro USB jack
Calibration:	pH 1...5 point calibration (PHL buffer, DIN buffer) LF cell constant O_2: Water-saturated air
Data logger:	Yes (8 GB with FAT file s stem)
Alarm:	Yes, acoustic alerting (horn) Visual (red LCD background)
Power supply:	3 x NiMh AAA (max. 750 mAh)
Current requirement:	On: approx. 75 mA in operation; Off: approx. <0.1 mA
Housing:	Impact-resistant ABS, with stand/hanging bracket
Protection rating:	IP67
Dimensions:	160 x 86 x 37 mm (H x W x D) incl. protection cover
Weight:	300 g incl. battery and protection cover
Scope of supply:	Device with 3 AAA batteries, quick reference guide, operating manual and test report as pdf on mass storage device

Accessories and spare parts:

GWO5610-L04
Art. no. 607764
replacement sensor for dissolved oxygen, GMH 56 & 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 Ø 12 mm

LF452-L02
Art. no. 608773
Conductivity cell for GMH 5400 / G 7500-Series, 4-pole graphite measuring cell, Ø 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 µs/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







APPLICATION:	GMH 5690	GMH 5695	GMH 3692 +Sensor	GMH 3695 +Sensor	ResOx	GOX 100	GOX 100T	GCO 100	HD21-ABE-17
Measurement of atmospheric oxygen	•	•	•	•	•	•	•		
O_2-concentration (oxygen)	•		•	•	•	•	•		
Atmospheric pressure / Pressure connection	•/–	•/•	•/–	•/•	•/•	–/–	–/–	–/–	•/–
Relative humidity									•
Temperature	•	•	•	•	•				•
O_2-partial pressure	•	•	•	•	•				
CO-concentration (carbon monoxide)								•	•
Protective gases	•	•	•	•	•				
Diving *	•		•				•	•	
Exhaust gas monitoring								•	•

EQUIPMENT:

Measuring ranges									
concentration	0 ... 100 % O_2	0 ... 100 % O_2	0 ... 100 % O_2	0 ... 100 % O_2	0 ... 100 % O_2	0 ... 100 %	0 ... 100 %	0 ... 1000 ppm CO	0 ... 500 ppm CO
O_2-partial pressure	0 ... 1100 hPa	0 ... 1100 hPa	0 ... 1100 hPa	0 ... 1100 hPa	0 ... 1100 hPa			0 ... 60 % COHb	0 ... 5000 ppm CO_2
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		•		•	•				•

DEVICE INFORMATION:

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

HIGHLIGHTS

- High display resolution (0.01 % O_2 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:

LOGG

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 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.)*

Specifi ations:	GMH 5690	GMH 5695
Measuring channels:	O_2, T, air pressure (integrated)	O_2, T, air pressure (integrated, with external connection)
Measuring ranges		
O_2 concentration:	0.0 ... 100.0 % O_2 Vol. or 0.00 ... 100.00 % O_2 Vol. (resolution can be selected in menu)	
O_2 partial pressure:	0 ... 1100 hPa O_2 / 0 ... 825 mmHg O_2, 0.0 ... 1100.0 hPa O_2 / 0.0 ... 825.0 mmHg O_2 (resolution can be selected in menu)	
Temperature:	-5.0 ... +50.0 °C	
Air pressure:	10 ... 1200 hPa abs	300 ... 5000 hPa abs *)
Accuracy: (device at nominal temperature = 25 °C)		
O_2 concentration:	±0.1 % ±1 digit	
Temperature:	±0.1 °C ±1 digit	
Air pressure:	±3 hPa or 0.1 % of m.w. (higher applies)	
Compatible sensors:	GGO5 / GOO5 with elements GOEL 370, 381 etc.	GGA5 / GGO5 / GOO5 with elements GOEL 370, 381 etc.
Connections		
Sensor:	7-pin bayonet connection	7-pin bayonet connection Port for pressure connection *)
Output / ext. Power supply:	OUT jack: - 38400 baud interface - 5 V external supply	OUT jack: - 38400 baud interface - Analogue output 0 ... 1 V, adjustable - 5 V external supply
Display:	4 ½ digit, 7-segment, illuminated (white)	
Operating conditions:	-25 ... +50 °C; 0 ... 95 % RH (non-condensing, sensor min. -5 °C)	
Power supply:	2 x AAA battery, power consumption: 0.9 mA	
Battery life:	approx. 1000 h (without lighting)	

Protection rating:	IP65 / IP67
Housing:	Impact-resistant ABS, with stand/hanging bracket
Dimensions:	160 x 86 x 37 mm (H x W x D) including protective silicone case
Weight:	approx. 250 g, including battery and protective case
Scope of supply:	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_2)

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_2 and temperature) with separate alarm thresholds
Alarm notific tion 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

ISO
ALARM
AUTOOFF
HOLD
MIN MAX

WIDE RANGE OF APPLICATION

HIGHLIGHTS:

- Alarm detector with integrated horn
- Automatic compensation of ambient air via integrated barometer

ADDITIONAL FUNCTIONS GMH 3695:

- pressure connection

LOGG

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.)*

Specifi ations:

Measuring ranges	
O_2 concentration:	0.0 ... 100.0 % O_2 (gaseous) 0 ... 1100 hPa O_2
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_2 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 sensores 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_2 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 poi t 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 <=>PC, USB, electrical isolated

GRS 3105
Art. no. 601099
5-point interface converter GMH3xxx <=>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_2 concentrations of up to 35 % O_2, 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_2 concentrations of up to 35 % O_2, 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_2 concentrations of up to 35 % O_2, 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_2 concentrations of up to 35 % O_2, 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_2 concentrations of up to 35 % O_2, 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_2 concentrations of up to 35 % O_2, 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 fl w.

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

Specifi ations:	GGA/GGO/GOO 570/370	GGA/GGO/GOO 581/381
Sensor element:	GOEL 370	GOEL 381
	Oxygen-partial pressure probe, mounted in external sensor housing replaceable (temperature sensor mounted in housing)	
Specific eatures:	Long service life For protective gases with a high O_2 concentration and oxygen content <35 vol. % O_2	for the lowest O_2 concentrations; For protective gases, in general, precise and very small measurements and above 35 vol. % O_2
Measuring range		
Partial oxygen pressure:	0 ... 1100 hPa O_2	0 ... 1100 hPa O_2
Oxygen concentration:	0.0 ... 100.0 % O_2	0.0 ... 100.0 % O_2
Response time: T_{90}	<10 s	<10 s
Accuracy (at 25 °C, 1013 hPa)		<1.5 % O_2
<2 % O_2	±0.2 % O_2	±0.1 % O_2
<25 % O_2	±0.5 % O_2	±0.5 % O_2
>25 % O_2	±0.5 % O_2	no information
Operating conditions:	0 ... 45 °C 0 ... 95 % RH (non-condensing)	0 ... 45 °C 0 ... 95 % RH (non-condensing)
Ambient pressure:	0.6 ... 1.75 bar abs.	
Over-/under-pressure:	max. 0.25 bar (pressure difference sensor membrane to ambient - sensor screwed-in)	
Storage temperature:	-15 ... +60 °C	
Operation life:	on air: >4 years (warranty for sensor element: 12 months)	on air: >2 years (warranty for sensor element: 12 months)
Connection:	**GGA/GGO/GOO 3...:** approx. 1.2 m cable with Mini-DIN-plug. **GGA/GGO/GOO 5...:** approx. 1 m cable with 7-pole bayonet connector	
Dimensions of housing:	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)	
Weight:	approx. 135 g (GGO...) or approx. 145 g (GOO.../GGA...)	
Scope of supply:	GGA... / GGO...: sensor, fl w diverter, T-piece GOO... : sensor, fl w diverter	

ACCESSORIES

GOEL 370

Art. no. 601490

Spares sensor element (acidic electrolyte)

General:

Integrated into GGO 370, GGA 370, GOO 370 (for GMH 3690 / 91 / 92 / 95) or GGO 570, GGA 570, GOO 570 (for GMH 5690 / 95); Universal sensor element with special precautions particularly for diving gas and protective gases from 0.2 ... 35 % O_2, even for applications with elevated CO_2 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, GOO 381 (for GMH 3690 / 91 / 92 / 95) or GGO 581, GGA 581, GOO 581 (for GMH 5690 / 95); Fast sensor element especially for diving gas and protective gases from 0.0 ... 100 % O_2. For application without permanently higher CO_2 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

HIGHLIGHTS:

- Easy to use
- Durable membrane pump
- Quiet
- Low quantity of conveyed gas
- Mobile operation with battery
- Battery charge indicator

GS 150

Art. no. 610005

Gas sampling pump for gas sampling

Application:

E.g. in combination with residual oxygen measuring devices for protective gas applications, etc.

Specifi ations:

Functional principle:	Motorised membrane pump with input/output ports, battery-operated
Max. negative pressure:	approx. -360 mbar
Delivery rate:	open: approx. 280 ml / min, with GDZ 29: approx. 150 ml / min
Connection:	Universal pressure port for 6/4 mm hoses (inside Ø 4 mm)
Range of application:	10 ... 50 °C
Applicable gases:	Non-corrosive, dust-free gases, a condensate trap is recommended for gases with high humidity
Operation:	On / Off slide switch
Environmental conditions:	10 ... 50 °C, 0 ... 95 % RH
Battery / service life:	9 V block battery, approx. 10 h
Battery charge indicator:	2 Leds: full / low
Scope of supply:	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 pa ticles or liquids

COMPACT AIR OXYGEN MEASURING DEVICE

ISO
AUTOOFF

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.)

Specifi ations:

Measuring range:	0.0 ... 100.0 % O_2
Accuracy typ.:	±0.1 % O_2 ±1 digit, calibrated device (range from 15 ... 40 % O_2)
MOD (GOX 100T):	0 ... 100 m / 0 ... 199 ft
Sensor connection:	0.55 m jack-connector cable
Sensor:	Electrochemical oxygen-partial pressure probe, mounted in external sensor housing, M16x1 connection thread.
Warranty:	12 month
Working pressure:	0.5 ... 2.0 bar abs.
Over- /under-pressure:	max. 0.25 bar (pressure difference)
Working temperature:	0 ... 45 °C (sensor), -20 ... +50 °C (device)
Relative humidity:	0 ... 95 % RH
Power supply:	9 V battery
Power consumption:	approx. 120 µA (over 2500 h)
Display:	3½-digit, 13 mm high LCD-display
Housing:	ABS enclosure
Dimensions:	approx. 106 x 67 x 30 mm (H x W x D)
Weight:	approx. 185 g
Scope of supply:	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_2 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

Specifi ations:

Measuring channels:	O_2, T, air pressure
Measurement ranges	
O_2:	0.0 ... 100.0 % O_2 or displayed in hPa O_2 / mmHg O_2
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 fil ers, 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

AUTOOFF
HOLD
MAXALARM
MIN MAX

HIGHLIGHTS:

- 3 display units selectable (ppm, mg/m³ 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 oxic. 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, fi eplace
- Control of the air at maintenance work (tunnel, flue gas t act, ...)
- Detection of CO in the breath of smoker (% CO Hb)
- Cognition of CO poisoning i.e. at burnt offering (fi e fig ters, ...)

Specifi ations:

Measuring principle:	electrochemical CO measuring cell
Measuring range:	0 ... 1000 ppm CO concentration
Display ranges:	0 ... 1000 ppm CO concentration 0 ... 1250 mg/m³ CO concentration 0 ... 60.0 % CO Hb (estimation via exhaled breath gas)
Resolution:	1 ppm, 1 mg/m³ or 0.1 % CO Hb
Sensor element:	integrated in device, measuring inlet at front plate, with inner thread for accessories screw in
Life time:	>5 years at proper usage at air suggested test interval: every 6 months (depending on precision requirements)
Accuracy: (at range 0 ... 500 ppm)	
Linearity:	<±5 % of measured value ±1 digit
Repeatability:	<±5 % of measured value ±1 digit

Interference (extract)

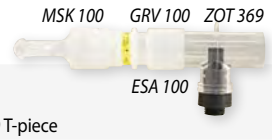
	Concentration (ppm)	Residence time (min.)	Display (ppm)
Sulphur dioxide	50	600	<1
Nitrogen dioxide	50	900	-1
Nitric oxide	50	5	8
Hydrogen	100	5	20
Carbon dioxide	5000	5	0

Display:	approx. 11 mm high, 4½-digit LCD-display
Pushbuttons:	3 membrane keys
Nominal temperature:	25 °C
Operating conditions:	-10 ... +50 °C, 15 ... 90 % RH (non-condensing)
Storage temperature:	-10 ... +50 °C
Interface:	Serial interface, direct connection to RS232 or USB interface of a PC via electrically isolated interface adapter
Power supply:	9 V battery as well as additional d.c. connector for external 10.5 ... 12 V direct voltage supply. (suitable power supply: GNG 10 / 3000)
Battery life:	>1000 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. 155 g
Scope of supply:	Device, battery, calibration protocol, manual

Accessories and spare parts:

ESA 100
Art. no. 603013
Tube adapter, fl wdiverter 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 fl w with test gas)

GZ-02
Art. no. 606710
Gas bottle with 12 l test gas: 30 ppm CO

GZ-03
Art. no. 606711
Gas bottle with 12 l test gas: 300 ppm CO

GZ-04
Art. no. 603570
Gas valve unit MiniFlo for gas bottles with 12 l

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 <=>PC, USB, electrical isolated

INDOOR AIR QUALITY MONITORS

AIR QUALITIY

HIGHLIGHTS:

- Indoor air qualitiy permitting calculation of automatic ventilation rate by CO2 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 CO2
- 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 spa es 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 efficie y.
- Examination of IAQ conditions in factories to optimize microclimate and improve productivity.
- Building Automation checks.

Specifi ations:

Device	
Dimensions:	300 x 90 x 40 mm (H x W x D) (with probe)
Material:	ABS, rubber
Display:	Backlight, Dot Matrix, 160 x 160 dots, visible area 52 x 42 mm
Operating conditions	
Working temperature:	-5 ... +50 °C
Storage temperature:	-25 ... +65 °C
Working relative humidity:	0 ... 85 % RH without condensation
Protection rating:	IP30
Instrument uncertainty:	±1 digit @ 20 °C
Power supply	
Mains adapter (Code SWD-10):	12 V DC/1 A
Batteries:	4 x 1.2 V Ni-MH rechargeable batteries AA type
Autonomy:	8 h of continuous use in measure mode
Serial interface	
Socket:	mini-USB
Type:	USB 1.1 or 2.0 not insulated
Storage capacity:	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_2 Carbon Dioxide	
Sensor:	NDIR Dual Wavelength (two frequences)
Measuring range:	0 ... 5.000 ppm
Sensor working range:	-5 ... +50 °C
Accuracy:	±50 ppm ±3 % of measurement
Resolution:	1 ppm
Temperature dependence:	0.1 % f.s./°C
Response time (T_{90}):	<120 s (air speed = 2 m/s)

CO Carbon Monoxide	
Sensor:	Electrochemical cell
Measuring range:	0 ... 500 ppm
Sensor working range:	-5 ... +50 °C
Accuracy:	±3 ppm ±3 % of measurement
Resolution:	1 ppm
Response time (T_{90}):	<50 s
Service life:	>5 years in normal environment conditions

Atmospheric Pressure (Patm)	
Type of sensor:	Piezo-resistive
Measuring range:	750 ... 1.100 hPa
Accuracy:	±1.5 hPa @ 25 °C
Resolution:	1 hPa
Temperature drift:	±3 hPa with temperature -20 ... +60 °C

Relative Humidity (RH)	
Type of sensor:	Capacitive
Sensor protection:	Stainless steel grid fil er (on request 10 µm sintered fil er P6 in AISI 316 or 20 µm sintered fil er P7 in PTFE)
Measuring range:	0 ... 100 % RH
Sensor working range:	-20 ... +60 °C
Accuracy:	±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
Resolution:	0.1 °C
Temperature dependence:	±2 % on all temperature range
Hysteresis and repeatability:	1 % RH
Response time (T_{90}):	<20 s (air speed = 2 m/s) without fil er

Temperature T	
Sensortyp:	NTC 10 kΩ
Measuring range:	-20 ... +60 °C
Accuracy:	±0.2 °C ±0.15 % of measurement
Resolution:	0.1 °C
Response time (T_{90}):	<30 s (air speed = 2 m/s)

Accessories:

SWD-10
Art. no. 700039
Stabilized power supply at -100 - 240 V AC/12 V 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 CO2 calibration at 0 ppm,
Gas cylinder with 20 l test gas: N2

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 CO2-calibration

HD-33-0
Art. no. 700055
Humidity reference cell incl. adapter, 33 % r.h.

APPLICATION:	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	GDUSB 1000
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		• • •	• •	•	•				
EQUIPMENT:									
Plug-in probe	1 1 2	1 1 2							1
Min/Max, Zero	• • •	• • •	• •	•	•	• •	•	• • •	•
Alarm / Data logger / Analog output	• •	• •	•		•				
DEVICE INFORMATION:									
Catalogue page	Page 83	Page 84 / 85	Page 92	Page 91 - 93	Page 91 - 93	Page 93	Page 94	Page 95	Page 87

WATER-PROOF HANDHELD DEVICE FOR PRESSURE MEASUREMENT WITH EXTERNAL CHANGEABLE PROBES

ISO
AUTOOFF
HOLD
MIN MAX
TARA
0/S CORR

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:

ALARM LOGG

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 e vironments.

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 fi ings
- Automobile trade, hydraulic analysis (peak pressure)

Specifi ations:	GMH 5130
Sensor connections:	1
Suitable probes:	GMSD / MSD sensors, available ranges (resolutions) from -1.999 ... 2.500 mbar (0.001 mbar) to 0 ... 1000 bar (1 bar)
Display range max.:	-19999 ... +19999 digit
Display unit: *	depends on measuring range selection and sensor: mbar, bar, Pa, kPa, MPa, mmHg, inHg, PSI, mH_2O
Measuring frequency:	4 measurements / s or 1000 measurements / s with peak value memory
Average fil er:	adjustable: 1 ... 120 s
Accuracy:	±0.1 % FS ±1 digit
Connections	
Sensor:	1 x 7-pole bayonet connector
Output / external supply:	4-pole bayonet connector for serial interface, supply (with accessories: USB adapter USB 5100)
Display:	4 ½ digit 7-segment, illuminated (white)
Operating conditions:	-25 ... +50 °C, 0 ... 95 % RH (non-condensing)
Storage temperature:	-25 ... +70 °C
Power supply:	2 x AAA-battery, battery life 500 h (without illumination, 4 measurings / s)
Housing:	impact resistant ABS housing with pop-up clip
Protection class:	IP65 / IP67
Dimensions:	160 x 86 x 37 mm (H x W x D) incl. silicone protection cover (red)
Weight:	approx. 250 g incl. battery and protection cover
Scope of supply:	Device, battery, calibration protocol, manual

Specifi ations:	GMH 5150 and GMH 5155
Sensor connections:	1, GMH 5155: 2
Suitable probes:	GMSD / MSD sensors, available ranges (resolutions) from -1.999 ... 2.500 mbar (0.001 mbar) to 0 ... 1000 bar (1 bar)
Display range max.:	-19999 ... +19999 digit
Display unit:	depends on measuring range selection and sensor: mbar, bar, Pa, kPa, MPa, mmHg, inHg, PSI, mH_2O, user
Measuring frequency:	4 measurements / s or 1000 measurements / s with peak value memory
Average fil er:	adjustable: 1 ... 120 s
Accuracy:	±0.1 % FS ±1 digit
Connections	
Sensor:	1 x 7-pole bayonet connector GMH 5155 only: 2 x 7-pole bayonet connector
Output / external supply:	4-pole bayonet connector for serial interface, supply (with accessories: USB adapter USB 5100)
Analog output:	0 ... 1 V, freely adjustable, connection with 4-pole bayonet connector, resolution 12 bit
Display:	4 ½ digit 7-segment, illuminated (white)
Operating conditions:	-25 ... +50 °C, 0 ... 95 % RH (non-condensing)
Storage temperature:	-25 ... +70 °C
Power supply:	2 x AAA-battery, battery life 500 h (without illumination, 4 measurings / s)
Housing:	impact resistant ABS housing with pop-up clip
Protection class:	IP65 / IP67
Dimensions:	160 x 86 x 37 mm (H x W x D) incl. silicone protection cover (red)
Weight:	approx. 250 g incl. battery and protection cover
Scope of supply:	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 displ yed 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 / fl w volume (GMH 5150/55):
Pitot tube measurement (accessories)

peak-detect (Peak value memory):
The min- / max- value memory stored unfil ered 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 p essure unit is possible, if its whole measuring range is displayable within the display of the device and the sensor is supporting these resolution.

ACCESSORIES

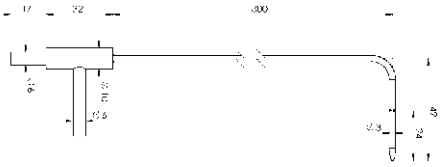
Accessories and spare parts:

GMSD ... - K51
pressure sensors (p.r.t. page 87)Application field: non-ag ressive 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: ai , aggressive gases for over / under press- ure 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 / fl w 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)

HAND-HELD PRESSURE MEASURING DEVICE

DE
ISO
AUTOOFF
HOLD
MIN MAX
O / S CORR
TARA

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

Specifi ations:	
Max. display range:	-19999 ... +19999 digit
Measuring range:	corresponding to used probe
Überlast:	corresponding to used probe
Resolution:	corresponding to used probe
Accuracy: (device)	±0.1 % FS ±1 digit (at nominal temperature = 25 °C)
Pressure units: *	mbar, bar, Pa, kPa, MPa, mmHg, PSI, mH_2O, can be selected
Probe connection:	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.
Display:	2 x 4½ digit LCD
Output:	Interface
serial interface:	direct connection to RS232 or USB interface of a PC via electrically isolated interface converter GRS 3100, GRS 3105 or USB 3100 N.
Power supply:	9 V battery, d.c. connector for external 10.5 ... 12 V direct voltage supply. (suitable power supply: GNG10/3000)
Sensor adjustment:	digital offset and scale input
Measuring cycle:	4 measurements / s
Battery life:	approx. 120 h
Operating conditions:	-25 ... +50 °C, 0 ... 95 % RH, **GMH 3111-EX:** -10 ... +50 °C, 0 ... 95 % RH
Housing:	impact-resistant ABS plastic housing, foil keypad, clear viewing pane; **GMH 3111 only:** integrated pop-up clip for table top or suspended use.
Dimensions:	142 x 71 x 26 mm (H x B x D)
Weight:	approx. 150 g, **GMH3111-EX:** approx. 190 g (incl. leather case)
Scope of supply:	Device, battery, calibration proto- col, manual

Note to Ex-design types:

Technical changes compared to standard instrument (valid for all GMH31xx-EX)

Ex qualifi ation 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 wit- hin 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 p essure 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 measurments / s
- Analog output 0 ... 1 V
- Digital adjustmentable
- 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)

Specifi ations:	
Max. display range:	-19999 ... +19999 digit
Measuring range:	corresponding to used probe
Overload:	corresponding to used probe
Resolution:	corresponding to used probe
Accuracy (device):	±0.1 % FS ±1 digit (at nominal temperature = 25 °C)
Pressure units*:	mbar, bar, Pa, kPa, MPa, mmHg, PSI, mH_2O, can be selected.
Probe connection:	1, **GMH 3156/-EX:** 2 6-pin screended lockable Mini-DIN-socket(s) for GMSD/ MSD-sensors. Automatic probe detection and setting of measuring range upon plugging in of probe.
Display:	2 x 4½ digit LCD
Output:	serial interface or AAG
Serial interface:	direct connection to RS232 or USB interface of a PC via electrically isolated interface converter GRS 3100, GRS 3105 or USB 3100 N.
Analog output:	0 ... 1 V, freely adjustable (resolution 12 bit)
Power supply:	9 V-battery, d.c. connector * for external 10.5 ... 12 V direct voltage supply. (i. e. GNG10/3000)
Sensor adjustment:	digital offset and scale input
Measuring cycle: „slow“	4 measurements / s
„fast“ / „peak-detect“	≥1000 measurements / s
peak-detect:	The min- / max- value memory stored unfil ered pressure peaks ≥1 m

Logger functions	
manually data sets:	99 data sets
cycle data sets:	10000 **GMH 3156/-EX:** 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 p essure 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.


GDZ-01


GDZ-02


GDZ-03


GDZ-04


GDZ-05


GDZ-06


GDZ-08


GDZ-09


GDZ-10


GDZ-11


GDZ-12


GDZ-13


GDZ-14


GDZ-15


GDZ-16


GDZ-17


GDZ-18


GDZ-19


GDZ-20


GDZ-21


GDZ-22


GDZ-23


GDZ-27 GDZ-28


GDZ-29


GDZ-30


GDZ- 31


GDZ-32


GDZ-33


GWA 1214

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 (thic ness 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 fl xible

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

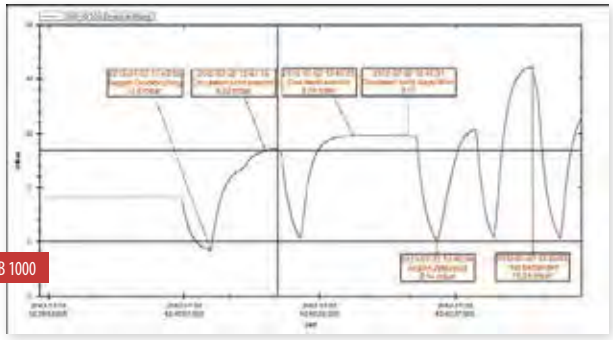
THE SAME SENSORS CAN BE USED AS WITH HANDHELD MEASURING DEVICE GMH 3151

HIGHLIGHTS:

- Complete package incl. software for up-to-date Windows systems
- Live display before and live diagram display

SUITABLE PRESSURE PROBES P.R.T. PAGE 88 / 89

HIGH-SPEED LIVE MEASUREMENT



FOR GDUSB 1000

GDUSB 1000

Art. no. 600271

Complete package for higspeed live data aquisition 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 configu ed 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 recoding rate
- Test setups or on-site recordings with GDUSB 1000

Specifi ations:

Measuring range:	depends on connected sensor
Max. range:	-19999 ... +19999 digit
Pressure units:	mbar, bar, Pa, kPa, MPa, mmHg, PSI, mH_2O, selectable, depending on connected sensor
Measuring rate:	1000 measurements / s (= 1 ms)
Accuracy:	±0.2 % FS (at nominal temperature = 25 °C)
Recording interval:	1 ms (FAST mode) ... 10 s, adjustable via software
Connections	
PC:	standard USB plug (type A)
GMSD / MSD:	6-pole screened mini-DIN socket with locking
Power supply:	supplied by USB interface
Dimensions:	56 x 31 x 24 mm
Cable length (USB):	approx. 20 cm
Weight:	39 g (device only)
Scope of supply:	Device, manual, software- and driver-CD

GDUSB FastView

Software for high-speed live measurement data logging of fast pressure measurements

Functions:

- Serveral 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 pi ture
- 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, GDUSB: 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 ..
Measuring range:	-1.999 ... +2.500 mbar	-19.99 ... +25.00 mbar	-199.9 ... +350.0 mbar	-1000 ... +2000 mbar	-1.00 ... +10.00 bar
Overload:	max. 200 mbar	max. 300 mbar	max. 1 bar	max. 4 bar	max. 10.34 bar
Resolution:	0.001 mbar (0.1 Pa)	0.01 mbar (1 Pa)	0.1 mbar	1 mbar	10 mbar
Accuracy (typ.)					
Hysteresis / linearity:	±0.2 % FS	±0.2 % FS	±0.2 % FS	±0.2 % FS	±0.2 % FS
Temperature influen e (from 0 ... 50 °C):	±1.0 % FS	±0.5 % FS	±0.4 % FS	±0.4 % FS	±0.4 % FS
OPTION higher probe accuracy:			±0.1 % / ±0.2 % FS	±0.1 % / ±0.2 % FS	±0.1 % / ±0.2 % FS
GMSD ... - K31					
Art. no.	*601039*	*601148*	*601154*	*601170*	*601183*
GMSD ... - K51					
Art. no.	*601038*	*601149*	*601157*	*601171*	*601184*

ABSOLUTE PRESSURE SENSORS GMSD...

for absolut pressure measuring (one terminal is without functionality)

	GMSD 1.3 BA ..	GMSD 2 BA ..	GMSD 7 BA ..
Measuring range:	0 ... 1300 mbar abs.	0 ... 2000 mbar abs.	0.00 ... 7.00 bar abs.
Overload:	max. 4 bar abs.	max. 4 bar abs.	max. 10.34 bar abs.
Resolution:	1 mbar	1 mbar	10 mbar
Accuracy (typ.)			
Hysteresis / linearity:	±0.2 % FS	±0.2 % FS	±0.2 % FS
Temperature influen e (from 0 ... 50 °C):	±0.4 % FS	±0.4 % FS	±0.4 % FS
OPTION higher probe accuracy:	±0.1 % FS (hysteresis., linearity); ±0.2 % FS (temperature influen e 0 ... 50 °C)		
GMSD ... - K31			
Art. no.	*601192*	*601196*	*601200*
GMSD ... - K51			
Art. no.	*601193*	*601197*	*601201*

Specifi ations:

Sensor:	piezoresistive pressure sensor
Pressure connection:	2 connection pins for tubes 6 x 1 mm (6 mm inside-Ø and 4 mm outside-Ø)
Electronics:	PC board with amplifier and d ta memory for sensor data (measuring range / calibration etc.) integrated in sensor housing
Working temperature:	0 ... +50 °C
Relative humidity:	0 ... +95 % RH (non-condensing)
Storage temperature:	-25 ... +70 °C
Housing:	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.
Weight:	approx. 75 g (...-K51: approx. 82 g)
Device connection	
GMSD ... - K31: **GMSD ... - Ex:**	1.2 m PVC connection cable, screened with integral 6-pin Mini-DIN-plug, lockable
GMSD ... - K51:	1 m PVC connection cable, screened with 7-pin bayonet plug
Scope of supply:	Device, calibration protocol, manual

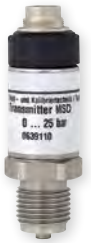
Options:

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 certific tes: 5 points ascending, 5 points descending

STAINLESS STEEL PRESSURE SENSORS G½ INCH



FOR AIR, AGGRESSIVE GASES AND LIQUIDS

FOLLOW-ON TYPE FÜR GMSD-STAINLESS-STEEL-SENSORS

MSD...

exchangeable handheld instruments pressure sensors st.steel G½B
Connection cable MSD-K31 or MSD-K51 has to be ordered separatly (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
MSD 1 BAE *Art. no. 600583*	0 ... 1000 mbar abs.	max. 5 bar abs.	1 mbar
MSD 2.5 BAE *Art. no. 600585*	0 ... 2500 mbar abs.	max. 10 bar abs.	1 mbar
MSD 4 BAE *Art. no. 600587*	0 ... 4000 mbar abs.	max. 17 bar abs.	1 mbar
MSD 6 BAE *Art. no. 600592*	0 ... 6000 mbar abs.	max. 35 bar abs.	1 mbar
MSD 10 BAE *Art. no. 600594*	0 ... 10,00 bar abs.	max. 35 bar abs.	10 mbar
MSD 16 BAE *Art. no. 600596*	0 ... 16.00 bar abs.	max. 80 bar abs.	10 mbar
MSD 25 BAE *Art. no. 600598*	0 ... 25.00 bar abs.	max. 50 bar abs.	10 mbar
Rel. pressure	**Measuring range**	**Overload**	**Resolution**
MSD 100 MRE *Art. no. 600600*	0.0 ... 100.0 mbar rel.	max. 1 bar rel.	0.1 mbar
MSD 250 MRE *Art. no. 600604*	0.0 ... 250.0 mbar rel.	max. 2 bar rel.	0.1 mbar
MSD 400 MRE *Art. no. 600606*	0.0 ... 400.0 mbar rel.	max. 2 bar rel.	0.1 mbar
MSD -1/1.5 BRE *Art. no. 600608*	-1000 ... +1500 mbar rel.	max. 10 bar rel.	1 mbar
MSD -1/3 BRE *Art. no. 600610*	-1000 ... +3000 mbar rel.	max. 17 bar rel.	1 mbar
MSD 1 BRE *Art. no. 600612*	0 ... 1000 mbar rel.	max. 5 bar rel.	1 mbar
MSD 2,5 BRE *Art. no. 600614*	0 ... 2500 mbar rel.	max. 10 bar rel.	1 mbar
MSD 4 BRE *Art. no. 600616*	0 ... 4000 mbar rel.	max. 17 bar rel.	1 mbar
MSD 6 BRE *Art. no. 600618*	0 ... 6000 mbar rel.	max. 35 bar rel.	1 mbar
MSD 10 BRE *Art. no. 600620*	0.00 ... 10.00 bar rel.	max. 35 bar rel.	10 mbar
MSD 25 BRE *Art. no. 600622*	0.00 ... 25.00 bar rel.	max. 50 bar rel.	10 mbar
MSD 40 BRE *Art. no. 600624*	0.00 ... 40.00 bar rel.	max. 80 bar rel.	10 mbar
MSD 60 BRE *Art. no. 600627*	0.00 ... 60.00 bar rel.	max. 120 bar rel.	10 mbar
MSD 100 BRE *Art. no. 600629*	0.0 ... 100.0 bar rel.	max. 200 bar rel.	0.1 bar
MSD 160 BRE *Art. no. 600631*	0.0 ... 160.0 bar rel.	max. 320 bar rel.	0.1 bar
MSD 250 BRE *Art. no. 600639*	0.0 ... 250.0 bar rel.	max. 500 bar rel.	0.1 bar
MSD 400 BRE *Art. no. 600633*	0.0 ... 400.0 bar rel.	max. 800 bar rel.	0.1 bar
MSD 600 BRE *Art. no. 600635*	0.0 ... 600.0 bar rel.	max. 1200 bar rel.	0.1 bar
MSD 1000 BRE *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
MSD 25 MRE *Art. no. 606904*	0.00 ... 25.00 mbar	max. 500 mbar	0.01 mbar
MSD -20/60 MRE *Art. no. 606765*	-20.00 ... +60.00 mbar	max. 500 mbar	0.01 mbar

Specifi ations:

Sensor:	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)
Accuracy: (typ. values)	±0.2 % FS (hysteresis and linearity) ±0.02 % FS / K (TC for zero or slope)
Electronics:	PC board with amplifier and d ta memory for sensor data (meas. range, etc.) integrated in sensor housing, sealed sensor electronic
Reaction time:	1 ms
Medium temperature:	-25 ... +100 °C (compensated range: 0 ... 80 °C); -25 ... +80 °C at MSD 25 MRE and MSD -20/60 MRE
Working temperature:	-20 ... +80 °C
Storage temperature:	-40 ... +80 °C
Pressure connection:	connection thread G1/2B (other on request)
Cable connection:	M16 built-in plug
Housing:	CrNi-steel or elgiloy (parts coming into contact with media) length: 88.5 mm, Ø 27 mm, approx. 220 g
Protection rating:	IP 67 (Sensor)
Scope of supply:	pressure sensor, calibration protocol, manual; **Note: Connection cable has to be ordered separatly.**

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-WPD5
Art. no. 602514
ISO certific tes: 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 GHM 51xx
1 m PVC connection cable, screened with 7-pin bayonet plug cabel 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 onnection cable, screened with integral 6-pin Mini-DIN-plug and M12-socket

HAND-HELD MEASURING DEVICES WITH INTEGRATED SENSOR

AUTOOFF HOLD ISO MIN MAX 0/S*CORR TARA

HIGHLIGHTS:

- Integrated pressure sensor
- Sturdy metal connection pin
- Tare function / zero point offset
- Model with protection available

ADDITIONAL FUNCTIONS GMH 3181-...:

ALARM LOGG

Type specific d ta:	GMH 3161 - ...	GMH 3181 - ...	GMH 3161 - ... -EX	GMH 3181 - ... -EX
Display:	2 x 4½-digit LCD	2 x 4½-digit LCD	2 x 4½-digit LCD	2 x 4½-digit LCD
Sensor:	Piezoresistive differential pressure sensor internally built into the instrument. Suitable for air and non-aggressive gases. *(Note: Not suited for water!)*			
Pressure connection:	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			
Output:	interface	interface or AAG	interface*	interface or AAG*
Serial interface:	x	x	x	x
Analog output:	--	0 ... 1 V, freely adjustable (resolution 12 bit)	--	0 ... 1 V, freely adjustable (resolution 12 bit)
Power supply:	9 V battery, d.c. connector	9 V battery, d.c. connector	9 V battery, d.c. connector*	9 V battery, d.c. connector*
	suitable 9 V-battery, d.c. connector for external 10.5 ... 12 V direct voltage supply. (suitable power supply: GNG10 / 3000)			
Sensor adjustment:	digital offset and scale input	digital offset and scale input	digital offset and scale input	digital offset and scale input
Peak value memory:	--	≥1 ms	--	≥1 ms
Measuring cycle: „slow“	4 measurements / s	4 measurements / s	4 measurements / s	4 measurements / s
„fast“ (with fil er)	--	≥1000 measurements / s	--	≥1000 measurements / s
„peak-detect“ (Spitzenwertspeicher)	--	≥1000 measurements / s The min- / max- value memory stored unfil ered pressure peaks ≥1 ms	--	≥1000 measurements / s The min- / max- value memory stored unfil ered pressure peaks ≥1 ms
Averaging function:	--	x	--	x
Battery life:	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)
Operating conditions:	-25 ... +50 °C, 0 ... +95 % RH (non-condensing)		-10 ... +50 °C, 0 ... 95 % RH (non-condensing)	
Housing:	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			
Weight:	approx. 165 g	approx. 170 g	approx. 205 g (incl. leather case)	approx. 210 g (incl. leather case)
Scope of supply:	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 ala m 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 p essure 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)

Specifi ations:	
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_2O
Accuracy: (typ. values)	
Hysteresis and linearity:	0.3 % FS
Temperature-in-fluen e from 0-50 °C	0.4 % FS
Option higher ac-curacy 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)

Specifi ations:	... - 01	... - 07H
Measuring range:	-100 ... 2500 Pa (-1.00 ... 25.00 mbar)	-1.00 ... +70.00 mbar
Overload:	max. 100 mbar	max. 1000 mbar
Resolution:	1 Pa (0.01 mbar)	0.01 mbar
Additional pressure units:	bar, kPa, PSI, mmHg, mH_2O	bar, Pa, kPa, PSI, mmHg, mH_2O
Accuracy: (typ. values)		
Hysteresis and linearity:	±0.3 % FS	±0.1 % FS
Temperature-in-fluen e from 0-50 °C	±0.4 % FS	±0.4 % FS
Option higher ac-curacy available:	no	already integrated
Pressure connection:	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)

Specifi ations:	... - 07	... - 07B
Measuring range:	-10.0 ... +350.0 mbar	-10.0 ... +420.0 mbar (-7.5 ... 315.0 mmHg)
Overload:	max. 1 bar	max. 1 bar
Resolution:	0.1 mbar	0.1 mbar (0.1 mmHg)
Additional pressure units:	bar, kPa, MPa, PSI, mmHg, mH_2O	bar, kPa, MPa, PSI, mH_2O
Accuracy: (typ. values)		
Hysteresis and linearity:	±0.2 % FS (±0.1 % FS)*3	±0.1 % FS
Temperature-in-fluen e from 0-50 °C	±0.4 % FS	±0.4 % FS
Option higher ac-curacy available:	yes	already integrated
Pressure connection:	2	

For type specific data please efer 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)

Specifi ations:	
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_2O
Accuracy: (typ. values)	
Hysteresis and linearity: ±0.2 % FS; (±0.1 % FS)*3	
Temperature-influen e 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 efer 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

HIGHLIGHTS:
- can be operated completely in a vacuum

FOR ABSOLUTE PRES-SURE MEASUREMENT

0 ... 1300 mbar abs.

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)

Specifi ations:	
Measuring range:	0 ... 1300 mbar abs.
Overload:	max. 4 bar abs.
Resolution:	1 mbar
Pressure units	mbar, bar, kPa, MPa, PSI, mmHg, mH_2O
Accuracy: (typ. values)	
Hysteresis and linearity: ±0.2 % FS; (±0.1 % FS)*3	
Temperature-influen e 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 efer to page 90.

**3 Option higher accuracy*

COMPLETE SOLUTIONS

GMH 3161-07-WPD5
Art. no. 602684
Complete Solution incl. certific te of calibration ISO-WPD5 (5 points ascending / descending) and case GKK 3000.

GMH 3161-12-WPD5
Art. no. 602685
Complete Solution incl. certific te of calibration ISO-WPD5 (5 points ascending / descending) and case GKK 3000.

GMH 3161-13-WPD5
Art. no. 602686
Complete Solution incl. certific te 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 certific tes: 5 points increase, 5 points decrease

ISO-WPD10
Art. no. 602565
ISO Certific te 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 (±199.9 mbar) *1

Functions:

- Differential and relative pressure measurement
- Autorange
- Excellent zero point stabilisation
- Manual slope adjustment
- 4 selectable measuring units: Pa, mbar, mmHg, PSI
- automatic off-fun tion: 1 ... 120 min

Specifi ations:

Measuring range:	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
Resolution:	automatic change 0.1 / 0.01
Overload:	max. 500 mbar
Accuracy:	(at nominal temperature = 25 °C and automatic zero point-adjustment)
Measuring range: up to 200 mbar	±0.2 % f.s. hysteresis and linearity, ±0.4 % f.s. temperature drift from 0 ... 50 °C
Measuring range: up to 20 mbar	±1 % f.s. hysteresis and linearity, ±2 % f.s. temperature drift from 0 ... 50 °C
Sensor:	piezoresistive relative pressure sensor
Pressure connection:	2 pressure port sockets made of nickel-plated brass, for pressure tubings 6 x 1 mm (4 mm inner-diameter)
Operating conditions:	-25 ... +50 °C, 0 ... 95 % RH (non-condensing)
Display:	3½ digit LCD display, approx. 13 mm high
Pushbuttons:	3 membrane keys
Power supply:	9 V battery
Battery life:	approx. 1200 h
Housing:	impact resistant ABS plastic housing, approx. 106 x 67 x 30 mm (H x W x D) +16 mm pressure port sockets
Weight:	approx. 135 g (incl. battery)
Zero point-adjustment:	automatically
Slope-adjustment:	manually
Scope of supply:	Device, battery, calibration protocol, manual

**1 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 (±1999 mbar) *1

Functions:

- Differential and relative pressure measurement
- Autorange
- Excellent zero point stabilisation
- Manual slope adjustment
- 3 selectable measuring units: mbar, mmHg, PSI
- automatic off-fun tion: 1 ... 120 min

Specifi ations:

Measuring range:	0.0 ... 199.9 or 200 ... 1999 mbar (hPa) 0.0 ... 199.9 or 200 ... 1500 mmHg 0.00 ... 19.99 PSI
Resolution:	automatic change 1 / 0.1
Overload:	max. 4000 mbar
Accuracy:	(at nominal temperature = 25 °C and automatic zero point-adjustment)
Measuring range: up to 2000 mbar	±0.2 % f.s. hysteresis and linearity, ±0.4 % f.s. temperature drift from 0 ... 50 °C
Measuring range: up to 200 mbar	±1 % f.s. hysteresis and linearity, ±2 % f.s. temperature drift from
Sensor:	piezoresistive relative pressure sensor
Pressure connection:	2 pressure port sockets made of nickel-plated brass, for pressure tubings 6 x 1 mm (4 mm inner-diameter)
Operating conditions:	-25 ... +50 °C, 0 ... 95 % RH (non-condensing)
Display:	3½ digit LCD display, approx. 13 mm high
Pushbuttons:	3 membrane keys
Power supply:	9 V battery
Battery life:	approx. 1200 h
Housing:	impact resistant ABS plastic housing, approx. 106 x 67 x 30 mm (H x W x D) +16 mm pressure port sockets
Weight:	approx. 135 g (incl. battery)
Zero point-adjustment:	automatically
Slope-adjustment:	manually
Scope of supply:	Device, battery, calibration protocol, manual

**1 measuring range possible by changing the pressure connection ports*
Tubes, clamps, adapters, accessories, etc. p.r.t. page 86

VACUUM- / BAROMETER OR MANOMETER

ISO
AUTOOFF
MIN MAX
0/S´CORR
TARA

FOR ABSOLUTE PRESSURE

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-fun tion: 1 ... 120 min

Specifi ations:

Measuring range:	0 ... 11000 mbar (hPa) abs. 0 ... 8250 mmHg abs. 0.000 ... 11.000 bar abs. 0.00 ...160.00 PSI abs.
Resolution:	1 mbar, 1 mmHg, 0.001 bar, 0.02 PSI
Overload:	max. 13 bar abs.
Accuracy: (at nominal temperature = 25 °C)	±3 mbar or 0.10 % of m.v. (whichever is higher); ±0.3 % f.s. temperature drift from 0 ... 50 °C
Sensor:	piezoresistive absolute pressure sensor
Pressure connection:	Pressure connection ports in nickel-plated brass, for pressure tubings 6 x 1 mm (4 mm inner-diameter)
Operating conditions:	-25 ... +50 °C, 0 ... 95 % RH (non-condensing)
Display:	4½ digit LCD display, approx. 12 mm high
Pushbuttons:	3 membrane keys
Power supply:	9 V battery
Battery life:	approx. 7500 h
Sea level correction:	Barometric values can be converted to sea level (therefore the input of the current altitude is needed).
Housing:	impact resistant ABS plastic housing, approx. 106 x 67 x 30 mm (H x W x D) +16 mm pressure port sockets
Weight:	approx. 135 g (incl. battery)
Zero point-adjustment:	manually
Slope-adjustment:	manually
Scope of supply:	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

AUTOOFF
MIN MAX
0/S´CORR

NEW!

GDH 200-11

Art. no. 474063

Vacuum / Barometer with pressure port

Specifi ations:

Measuring range:	10.0 ... 1200.0 mbar abs. (Resolution: 0.1 mbar) 7.5 ... 900.0 mmHg abs. (Resolution: 0.1 mmHg)
Max. Overload:	4000 mbar abs.
Accuracy: (at nominal temperature)	
@25 °C, 750 mbar:	1.5 min. +1.5 max. mbar
-20 ... +85 °C, 300 ... 1100 mbar:	-2.5 min. +2.5 max. mbar
Long-term stability:	typ. ±1 mbar / year
25 °C, 700 ... 1100 mbar:	-1.5 min. +1.5 max. mbar
0 ... 50 °C, 300 ... 1100 mbar:	-2.0 min. +2.0 max. mbar
-20 ... +85 °C, 300 ... 1100 mbar:	-3.5 min. +3.5 max. mbar
25 °C, 100 ... 300 mbar:	-5 min. +5 max. mbar
25 °C, 10 ... 100 mbar:	-10 min. +10 max. mbar
Pressure connection:	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)
Nominal temperature:	25 °C
Operating conditions:	-25 ... +50 °C, 0 ... 80 % RH (non-condensing)
Storage temperature:	-25 ... +70 °C
Display:	4½ digit LCD display, approx. 13 mm high
Pushbuttons:	3 membrane keys for ON/OFF, min/max value query, offset comparison, etc.
Measuring frequency:	1 measuring / s
Sea level correction:	Barometric values can be converted to sea level (therefore the input of the current altitude is needed).
Zero point-adjustment:	manually
Slope-adjustment:	manually
Power supply:	9 V battery
Battery life:	>5000 h
Housing:	impact resistant ABS plastic housing, front-side IP65
Dimensions:	approx. 106 x 67 x 30 mm (H x W x D) +16 mm pressure port sockets
Weight:	approx. 145 g (incl. battery)
Scope of supply:	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-fun tion: 1 ... 120 min

Specifi ations:

Measuring range:	300.0 ... 1100.0 mbar (hPa) abs. 225.0 ... 825.0 mmHg abs.
Max. Overload:	4000 mbar or 3000 mmHg
Accuracy: (at nominal temperature)	±2.0 mbar (typ. at 0 ... 50 °C)
Sensor:	absolute pressure sensor, integrated in housing
Nominal temperature:	25 °C
Operating temperature:	-25 ... +50 °C, 0 ... 95 % RH (non-condensing)
Display:	4½-digit, 12 mm high LCD-display
Pushbuttons:	3 membrane key for ON/OFF, min-/max-value memory, tara, etc.
Power supply:	9 V battery
Battery life:	approx. 5000 h
Zero point-adjustment:	manually
Slope-adjustment:	manually
Sea level correction:	Barometric values can be converted to sea level (therefore the input of the current altitude is needed).
Housing:	impact resistant ABS housing
Dimensions:	approx. 106 x 67 x 30 mm (H x W x D)
Weight:	approx. 135 g (incl. battery)
Scope of supply:	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.

Specifi ations:

Measuring range	
Temperature:	-10.0 ... +50.0 °C or 14.0 ... +122.0 °F.
Air pressure:	300.0 ... 1100.0 mbar abs. or 225.0 ... 825.0 mmHg abs.
High:	-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
Measuring units:	hPa / mbar, mmHg, °C, °F, m, ft
Max. Overload:	pressure: 4000 mbar or 3000 mmHg
Accuracy: (at nominal temperature = 25 °C)	
Temperature:	±1% FS ±1 digit
Absolute pressure:	±1.5 mbar ±1 digit (750 ... 1100 mbar), with certific te 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.
Power supply:	9 V battery
Battery life:	approx. 6.000 h
System notifi ations:	permanent self-diagnosis and error indication
Housing:	impact resistant ABS housing
Dimensions:	approx. 106 x 67 x 30 mm (H x W x D)
Weight:	approx. 135 g (incl. battery)
Scope of supply:	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 certific tes: 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 certific te, p.r.t. page 15

INTEGRATING SOUND LEVEL METER

ACCREDIA
ISO

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 fi mware 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)
- Identific tion 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 oximity 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.

Specifi ations:

½" Microphone:	UC52 free fiel , pre-polarized, condenser type
Dynamic range:	30 dBA ... 143 dB peak
Linearity range:	80 dB
Acoustic Parameters:	Spl, L_{eq}, L_{eq}l, SEL, $L_{EP,d}$, L_{max}, L_{min}, L_{pk}, Dose, L_n
Frequency weightings:	simultaneous A, C, Z (only C and Z for L_{pk})
Time weightings:	simultaneous FAST, SLOW, IMPULSE
Integration:	from 1 s ... 99 h with erasing function (Back-Erase)
Statistical Analysis:	It displays up to 3 percentile levels, from L_1 to L_{99} Probability distribution and percentile level calculation from L_1 to L_{99} • Parameter: L_{Fp}, L_{eq}, L_{pk} weighted A, C or Z (only C or Z for L_{pk}) • Sampling frequency: 8 samples/s • Classific tion: Classes of 0.5 dB
Display:	Graphic LCD backlit display 128 x 64 • 3 parameters in numeric format
Memory:	• 4 MB internal, memory for more than 500 records
Input / Output:	• 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 ... 12 V 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 preamplifie , UC52/1 free field p epolarized microphone, windscreen, USB connection cable. Noise Studio PC software, carrying case and paper instruction manual. Supplied with DAkkS individual calibration Certific tion, 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

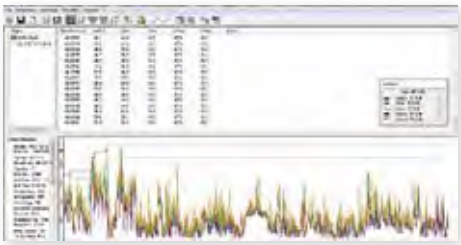
SWD-10
Art. no. 700039
Plug in power supply for devices of the HD-handhelds, 12 V DC 1.0 A

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 (demoversion 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 certifi ate. Customer must be specified when ordering.

ACOUSTIC CALIBRATOR

HD-2020

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

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 displ y.

Specifi ations:

Coupling cavity:	for standard 1/2" microphones (12.7 ±0.03 mm) according to IEC 61094-1 and IEC 61094-4
Frequency:	1.000 Hz
Frequency tolerance:	1 % in the range -10 ... +50 °C and 10 ... 90 % RH
Sound pressure level:	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)
Reference conditions:	20 °C, 50 % RH, 101,3 kPa, 10 mm³ cartridge volume
Reaction speed:	10 s
Total distortion:	<1 %
Ambient condition influen e	
Temperature and humidity influen e:	<0.3 dB in the range -10 ... +50 °C and 10 ... 90 % RH
Static pressure influen e:	<0.1 dB in the range -65 ... 108 kPa
Operating conditions	
Working temperature:	-10 ... +50 °C
Relative humidity:	≤90 % RH
Storage temperature:	-25 ... +70 °C
Microphone equivalent volume:	5 ... 250 mm
Power supply:	9 V alkaline battery IEC type 6LR61. 9 V rechargeable batteries are also allowed.
9 V battery autonomy:	48-hour continuous functioning with good quality alkaline batteries
Display:	3½ LCD, battery symbol
Watch / date-indicator:	internal with 3 V lithium buffer battery
Case material:	ABS
Dimensions:	83 x 43 x 53 mm (H x W x D)
Protection rating:	IP64
Effects of electro-magnetic fields	<0.3 dB
Scope of supply:	HD-2020 calibrator, 1x 9 V alkaline battery, manual. ACCREDIA individual calibration certific tion included.

IMPORTANT INFORMATION:
Device supply with calibration certifi ate. Custome must be specified when ordering.

PHOTO-RADIOMETER

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 outes and work stations. Additional applications for museum and not destructive testing, for tanning / aestethic centers, photovoltaic and aging chamber

Specifi ations:

Instrument	
Dimensions:	140 x 88 x 38 mm (H x W x D)
Material:	ABS
Display:	2 x 4½ digits plus symbols - 52 x 42 mm (visible area)
Operating conditions	
Working temperature:	-5 ... +50 °C
Storage temperature:	-25 ... +65 °C
Working relative humidity:	0 ... 90 % RH without condensation
Protection rating:	IP67
Power	
Batteries:	3 1.5 V type AA batteries
Autonomy:	200 h with 1800 mAh alkaline batteries
Power absorbed with the instrument off:	20 µA
Measuring unit:	lux – fcd – µmol/m²·s – cd/m² – W/m² – µW/cm² – µW/lumen
Connections:	Input module for the probes 8-pole male DIN45326 connector
Scope of supply:	Instrument HD-2302-0, 3 1.5 V alkaline batteries, manual, case. ***The probes must be ordered separately.***

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

Specific tion 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 outes

Specifications:

Measuring range (lux):	0.10 ... 199.99	... 1.999.9	... 19.999	... 199.99·10³
Resolution (lux):	0.01	0.1	1	0.01·10³
Spectral range:	in agreement with standard photopic curve V(λ)			
α (temp. coefficient) f_6 (T):	<0.05 % K			
Calibration uncertainty:	<4 %			
f'_1 (in agreement with photopic response V(λ)):	<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			
Working temperature:	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 / m² ... 2.000·10³ cd / m².

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:

Measuring range (cd / m²):	1.0 ... 1.999.9	... 19.999	... 199.99·10³	... 1999.9·10³
Resolution (cd / m²):	0.1	1	0.01·10³	0.1·10³
Optical angle:	2°			
Spectral range:	in agreement with standard photopic curve V(λ)			
α (temp. coefficient) f_6 (T):	<0.05 % K			
Calibration uncertainty:	<5 %			
f'_1 (in agreement with photopic response V(λ)):	<8 %			
f_3 (linearity):	<1 %			
f_4 (instrument reading error):	<0.5 %			
f_5 (fatigue):	<0.5 %			
Class:	C			
Drift after 1 year:	<1 %			
Working temperature:	0 ... 50 °C			
Reference Standards:	CIE n.69 – UNI 11142			

HIGHLIGHTS:

- Photosysthesis activity, radiation (PAR) measure, langley radiation measurement

PHOTONS FLOW

LP 471-PAR

Art. no. 700066

Quanten-radiometrische Sonde

General:

For measuring the photons flow in the chlorophyll field AR (Photosynthetically active radiation 400 ... 700 nm), µmol $m^{-2}s^{-1}$ measure, cosine correction diffuse .
Measuring range 0.10 µmol $m^{-2}s^{-1}$ ... 10·10³ µmol $m^{-2}s^{-1}$

Application:

Plants, agriculture, greenhouses

Specifications:

Measuring range (µmol·m⁻²s⁻¹):	0.10 ... 199.99	200.0 ... 1.999.9	2.000 ... 10.000
Resolution (µmol·m⁻²s⁻¹):	0.01	0.1	1
Spectral range:	400 ... 700 nm		
Calibration uncertainty:	<5 %		
f_2 (response according to the cosine law)	<6 %		
f_3 (Linearity):	<1 %		
f_4 (instrument reading error):	±1 digit		
f_5 (fatigue):	<0.5 %		
Drift after 1 year:	<1 %		
Working temperature:	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 diffuser or cosine correction.
Measuring range: 1.0·10⁻³ W / m² ... 2.000 W / m².

Application:

Timing Light to ward off errors. For casting and welding control, Polymerization of varnishes, resins, adhesives

Specifications:

Measuring range (W/m²):	1.0·10⁻³ ... 999.9·10⁻³ 1.000 ... 19.999 20.00 ... 199.99 200.0 ... 1.999.9			
Resolution (W/m²):	0.1·10⁻³	0.001	0.01	0.1
Spectral range:	315 ... 400 nm (Peak 360 nm)			
Calibration uncertainty:	<5 %			
f_3 (linearity):	<1 %			
f_4 (instrument reading error):	±1 digit			
f_5 (fatigue):	<0.5 %			
Drift after 1 year:	<2 %			
Working temperature:	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 or cosine correction.
Measuring range: $1.0 \cdot 10^{-3}$ W / m² ... 2.000 W / m².

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 e e problems

Specifi ations:

Measuring range (W/m²):	$1.0 \cdot 10^{-3}$ ... $999.9 \cdot 10^{-3}$ 1.000 ... 19.999 20.00 ... 199.99 200.0 ... 1.999.9
Resolution (W/m²):	$0.1 \cdot 10^{-3}$ 0.001 0.01 0.1
Spectral range:	280 ... 315 nm (Peak 305 nm ... 310 nm)
Calibration uncertainty:	<5 %
f_3 (linearity):	<2 %
f_4 (instrument reading error):	±1 digit
f_5 (fatigue):	<0.5 %
Drift after 1 year:	<2 %
Working temperature:	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 or cosine correction.
Measuring range: $1.0 \cdot 10^{-3}$ W / m² ... 2.000 W / m².

Specifi ations:

Measuring range (W/m²):	$1.0 \cdot 10^{-3}$ ... $999.9 \cdot 10^{-3}$ 1.000 ... 19.999 20.00 ... 199.99 200.0 ... 1.999.9
Resolution (W/m²):	$0.1 \cdot 10^{-3}$ 0.001 0.01 0.1
Spectral range:	220 ... 280 nm (Peak 260 nm)
Calibration uncertainty:	<5 %
f_3 (linearity):	<1 %
f_4 (instrument reading error):	±1 digit
f_5 (fatigue):	<0.5 %
Drift after 1 year:	<2 %
Working temperature:	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 / m²) in spectral band of blue light. The probe consists of a photodiode plus an appropriate fil er and it is provided with diffuser or 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 applic tion is the monitoring of the probe irradiance from blue light used in the treatment of neonatal jaundice.

Specifi ations:

Measuring range (W/m²):	$1.0 \cdot 10^{-3}$ ... $999.9 \cdot 10^{-3}$ 1.000 ... 19.999 20.00 ... 199.99 200.0 ... 1.999.9
Resolution (W/m²):	$0.1 \cdot 10^{-3}$ 0.001 0.01 0.01
Spectral range:	380 ... 550 nm. Action curve for damages of Blue light B(λ)
Calibration uncertainty:	<10 %
f_2 (response according to the cosine law):	<6 %
f_3 (linearity):	<3 %
f_4 (instrument reading error):	±1 digit
f_5 (fatigue):	<0.5 %
Drift after 1 year:	<2 %
Working temperature:	0 ... 50 °C

PHOTOMETRIC AND RADIOMETRIC PROBES

ILLUMINANCE AND UVA IRRADIANCE

HIGHLIGHTS:

- Non destructive material measurement by ISO 3059:2001

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 (µW / cm²) in the UVA spectral range (315 ... 400 nm, with peak at 360 nm). Both the sensors are equipped with diffuser or the correction according to the cosine law.
Illuminance measuring range: 0.10 ... 200·10³ lux
Irradiance measuring range: 1.0 mW / m² ... 2.000 W / m².
This probe provides the ratio between UVA irradiance and illuminance in µW / 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), ...

Specifi ations Illuminance:				
Measuring range (lux):	0.10 ... 199.99	... 1.999.9	... 19.999	... 199.99·10³
Resolution (lux):	0.01	0.1	1	0.01·10³
Spectral range:	in agreement with standard photopic curve V(λ)			
α (temp. coeffici t) f_6 (T):	<0.05 % K			
Calibration uncertainty:	<4 %			
f'$_1$ (in agreement with photopic response V(λ)):	<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			

Specifi ations UVA Irradiance:				
Measuring range (µW / cm²):	0.10 ... 199.99	... 1.999.9	... 19.999	... 199.99·10³
Resolution (µW / cm²):	0.01	0.1	1	0.01·10³
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):	±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 or cosine correction. Spectral range 400 ... 1100 nm.
Measuring range: 1.0·10⁻³ ... 2.000 W / m². The probe is equipped with a SICRAM module and a 5 m cable.

Application:

Efficie y control of photovoltaic panels in home and industrial solar power applications.

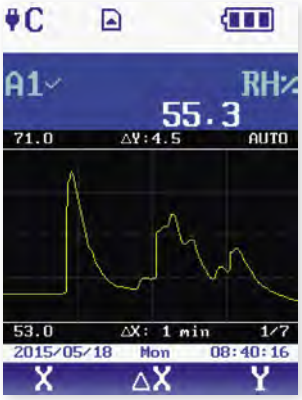
Specifi ations:				
Measuring range (W / m²):	1.0·10⁻³ ... 999.9·10⁻³ 20.00 ... 199.99		1.000 ... 19.999 200.0 ... 1.999.9	
Resolution (W / m²):	0.1·10⁻³	0.001	.01	0.01
Spectral range:	400 ... 1.100 nm			
Calibration uncertainty:	<3 %			
f_2 (response according to the cosine law):	<3 %			
f_3 (linearity):	<1 %			
f_4 (instrument reading error):	±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 Displ y

General:

Universal 3-channel multi-function data logger with graphic displayGeneral:
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.

Hartgummi Schutzhülle (55 SHORE) mit Aufsteller und Magnet für den Einsatz in rauen Umgebungen

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/m²)
• CO2
Numerous variables can be calculated from the aforementioned measurements and stored. This includes, for example, the absolute humidity in g/m3 (from temperature and relative humidity) or with measurement in ventilation ducts of the volume fl w (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 ±20 VDC, input impedance 1 MΩ
IP 472:
SICRAM plug module for signal recording of external measuring transducers, measuring range 0 ... 24 mA, input impedance 25 Ω
VP 472:
SICRAM plug module for connection of pyranometers and albedometers with non-amplified si nal output (adjustable sensitivity from 5 ... 30 µV per W/m²)

Our product data sheet available online at www.ghmgroup.de provides a complete overview

Specifi ations (basic unit HD31):	
Power supply:	Rechargeable internal 3.7 V Lithium battery, capacity 2250 mA/h, JST 3-pole connector. (optional SWD05 power supply)
Battery autonomy:	18 hours of continuous operation with three Pt100 probes (The effective autonomy depends on the number and type of connected sensors)
Logging interval:	1, 5, 10, 15, 30 s; 1, 2, 5, 10, 15, 20, 30 min; 1 h
Storage capacity:	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.
Inputs:	3 SICRAM connections (8-pin, DIN 45326) for connection of measuring sensors with intelligent SICRAM plugs (up to 36 measured variables)
Accuracy:	±0.02 % of the measure (Based on HD31 basic device)
Clock stability:	1 min / month maximum drift
Display:	Color graphic LCD. Visible area 43 x 58 mm
USB Connection:	mini USB connector, USP Port (HID)

3-CHANNEL MULTI-FUNCTION DATA LOGGER

RS232C connection:	1 serial RS232C output with RJ12 connector for connecting to a serial printer
Auto-Off:	Configu able after 2, 5, 10, 15, 20 or 30 min
Operating conditions:	-10 ... +60 °C, 0 ... 85 % RH without condensation (Instrument)
Storage temperature:	-25 ... +65 °C (Instrument)
Protection rating:	IP64
Housing:	ABS plastic, 55 SHORE hard rubber (sides and protective casing)
Dimensions:	165 x 88 x 35 mm (without protective casing)
Weight:	approx. 400 g (including battery and protective casing)
Scope of supply:	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:

CP23
Art. no. 700050
USB connection cable, USB 2.0, Mini USB socket type B

SWD05
Stabilised mains adapter, 100 ... 240 VAC, 5 VDC, output type A USB plug

HD31.28
Protective casing, durable SHORE 55 rubber, stand and magnet

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

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

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)

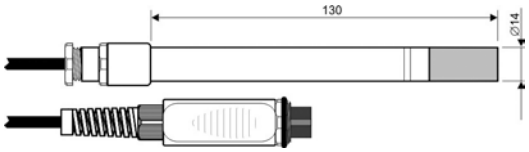
Immersion probe, -196 ... +500 °C, ±0.25 °C (-196 ... +300 °C), Ø 3 mm, sensor length 300 mm, cable length 2 m

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 pilot 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/m²)**
- **UVA, UVB, UVC irradiance (W/m²)**
- **UVeff ir adiance, weighted (W/m²)**
- **Irradiance in the visible and NIR range, 400 ... 1050 nm (W/m²)**
- **"PAR" photosynthetically active radiation (W/m²)**
- **Irradiance of blue light, 380 ... 550 nm (W/m²)**
- **Global solar radiation (W/m²)**

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_2 PROBE

CO_2 probe (NDIR) with SICRAM plug, measuring range 0 ... 5000 ppm CO_2, operating temperature -5 ... +50 °C

Please visit our website **www.ghm-group.de** for complete information about our HD 31 multi-function data logger. You will also find a omplete overview of all compatible probes for the specified pa ameters.

ANEMOMETER (AND THERMOMETER)

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	
Dimensions:	140 x 88 x 38 mm (H x W x D)
Material:	ABS
Display:	2 x 4½ digits plus symbols, Visible area: 52 x 42 mm
Operating conditions	
Working temperature:	-5 ... +50 °C
Storage temperature:	-25 ... +65 °C
Working relative humidity:	0 ... 90 % RH, without condensation
Protection rating:	IP67
Power supply	
Batteries:	3 1.5 V type AA batteries
Battery operation:	200 h with 1800 mAh alkaline batteries
Power absorbed with instrument off:	<20 µA
Measuring unit:	°C – °F – m/s – km/h – ft/min – mph – knot – l/s m^3/min – m^3/h – ft^3/s – ft^3/min
Connections	
Input module for the probes:	8-pole male DIN45326 connector
Measurement of temperature by Instrument	
Pt100 measurement range:	-200 ... +650 °C
Pt1000 measurement range:	-200 ... +650 °C
Resolution:	0.1 °C
Accuracy:	±0.1 °C
Scope of supply:	Instrument HD-2303-0, 3 1.5 V alkaline batteries, manual, case. ***Probes must be ordered separately.***

THERMAL ANEMOMETER PROBES / IMPELLER PROBES

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
Type of measure:	Air speed, calculated flow rate, air temperature	
Type of sensor		
Speed:	NTC thermistor	Omnidirectional NTC thermistor
Temperature:	NTC thermistor	NTC thermistor
Measurement range		
Speed:	0.1 ... 40 m/s	0.1 ... 5 m/s
Temperature:	-25 ... +80 °C	-25 ... +80 °C
Measurement resolution		
Speed:	0.01 m/s – 0.1 km/h – 1 ft/min – 0.1 mph – 0.1 knot	
Temperature:	0.1 °C	
Measurement accuracy		
Speed:	±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)
Temperature:	±0.8 °C (-10 ... +80 °C)	±0.8 °C (-10 ... +80 °C)
Minimum speed:	0.1 m/s	
Air temperature compensation:	0 ... 80 °C	
Sensor working conditions:	Clean air, RH <80 %	
Battery life:	Approx. 20 hours @ 20 m/s with alkaline batteries	Approx. 30 hours @ 5 m/s with alkaline batteries
Unit of Measurement		
Speed:	m/s – km/h – ft/min – mph – knot	
Flow rate:	l/s – m^3/s – m^3/min – m^3/h – ft^3/s – ft^3/min	
Pipeline section for flow rate calculation:	0.0001 ... 1.9999 m^2	
Cable length:	~2 m	
Scope of supply:	Hot-wire telescopic probe	Omnidirectional hot-wire probe

AP 472-S2

Art. no. 700076

Anemometer probes for air speed, Impeller

Specifications:	
Type of measure:	Air speed, calculated flow rate
Diameter:	60 mm
Type of measurement	
Speed:	Vane
Measurement range	
Speed (m/s):	0.5 ... 20
Temperature (°C):	-25 ... +80 (*)
Resolution	
Speed:	0.01 m/s – 0.1 km/h – 1 ft/min – 0.1 mph – 0.1 knot
Accuracy	
Speed:	±(0.4 m/s +1.5 % f.s.)
Minimum speed:	0.5 m/s
Unit of Measurement	
Speed:	m/s – km/h – ft/min – mph – knot
Flow:	l/s – m^3/s – m^3/min – m^3/h – ft^3/s – ft^3/min
Pipeline section for flow rate calculation:	0.0001 ... 1.9999 m^2
Cable length:	~2 m
Scope of supply:	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-fil ers according to the IEC standard. Assignation of the max/min value during one measuring period.

Specifi ations:

Measuring range:	30 ... 130 dB (6 ranges) 30 ... 80, 40 ... 90, 50 ... 100, 60 ... 110, 70 ... 120, 80 ... 130 dB manual or automatic selection of range
Resolution:	0.1 dB
Accuracy:	±1.5 dB
Norms:	ANSI S1.4 and IEC 651 Typ 2
Frequency rate weighted:	31.5 Hz ... 8 kHz
Evaluation weight fil er:	2, selectable
Type A:	evaluation of the spectrum in accordance with the perceptive faculties of the human ear. (Sound insolation establishment, environmental analysis)
Type C:	linear evaluation of spectrum (sonic-analysis of engines or machines)
Weight of time factor:	fast or slow
Microphone:	6 mm Electret condensator
Display:	3½-digit LCD-backlight display, additionally quasi-analog bar graph
Analog output:	AC: 0.707 Vrms, DC: 10 mV DC / dB
Working temperature:	4 ... +50 °C
Relative humidity:	10 ... 90 % RH
Storage temperature:	-20 ... +60 °C
Interface:	RS232, (2400BD8N1)
Power supply:	9 V battery, external 9 V power supply
Operating time:	20 hours (with alkaline)
Housing:	256 x 80 x 38 mm (H x W x D)
Weight:	approx. 240 g (device)
Scope of supply:	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 refle ting 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.

Specifi ations:

Measuring range:	
rpm:	1.00 ... 99.999 min^{-1} (optical measurement) 1 ... 19.999 min^{-1} (mechanical measurement)
Velocity:	Ø 0.1 m: 0.10 ... 1999 m / min Ø 6“: 0.10 ... 1524 m / min (other units possible: m / s, ft / min, in / min ...)
Length:	0 ... 99999 m / ft / in
Accuracy	
rpm:	±0.02 % of m.v. (±1 digit)
Measuring distance:	max. 600 mm
Measuring principle:	optical / mechanical
Memory function:	min- / max- value memory, average and last value
Power-off:	automatically after 30 s
Display:	5-digit LCD display with 10 mm height of digits and flo ting point at range change
Power supply:	2 x AA battery or accumulator
Working temperature:	0 ... 50 °C
Storage temperature:	-20 ... +70 °C
Housing:	plastic ABS
Approval:	CE
Dimensions:	175 x 60 x 28 mm (H x W x D)
Weight:	250 g
Scope of supply:	Rotation speed measuring device incl. refle ting labels, measuring tip, hollow tip, measuring wheels (Ø 0.1 m and Ø 6“), extension shaft, calibration certific te, case, battery, manual

ROTATION SPEED MEASURING DEVICE

VIA LIGHT AND REFLECTING LABEL

ecotach

Art. no. 603673

Speed Indicator via light and refle ting 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.

Specifi ations:

Measuring range:	1 ... 60.000 rpm
Accuracy:	±0.02 % of m.w. (±1 digit)
Measuring distance:	max. 450 mm
Measuring principle:	optical
Power-off:	automatically after 30 s
Display:	5-digit LCD display for measuring value with flo ting point, measuring unit, trigger signal, low-battery warning, notific tion when battery is low
Power supply:	2 x AA battery or accumulator
Working temperature:	0 ... 50 °C
Housing:	plastic ABS
Approval:	CE
Dimensions:	145 x 60 x 28 mm (H x W x D)
Weight:	147 g
Scope of supply:	Rotation speed measuring device incl. refle ting labels, transportation slip case, battery, manual

SIMULATORS

APPLICATION:	GHM SensorSimulator SIM-1	HD-9609
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 ½ digits
DEVICE INFORMATION:		
Catalogue page	Page 107	Page 107

INFORMATION

The GHM sensor simulator is used for fast verific tion of metrological devices such as DMS and temperature measuring amplifier .
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 o 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

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

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 amplifier , 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.

Specifi ations:

Accuracy:	see under Sensors
Connections:	7-pin Binder socket for signal input and output, Mini USB for voltage supply / charge function
Display:	Graphic LCD, monochrome, adjustable background light (180 x 128 pixels)
Operation:	Keypad
Supported languages:	German / English
Dimensions:	86 x 160 x 37 mm(W x H x D)
Weight:	250 g (including battery)
Supply voltage:	5 V DC (micro-USB)
Akku:	Li-Ion battery
Ambient temperature:	0 ... 50 °C
Simulation function	
Voltage source:	Simulation range: ±10 V Accuracy: ±1 %
Signal current:	Simulation range: ±25 mA Accuracy: ±1 %
Strain gauge bridges:	Simulation ranges: 0, 0.5, 1, 2, 4, 5, 10, 25, 50 mV/V Accuracy: ±1 % Feed: 2.5 V, 5 V, 10 V
Thermocouples	
Type K	
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: ±1 %; with internal temperature measurement: ±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: ±1 %; with internal temperature measurement: ±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: ±1 %; with internal temperature measurement: ±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: ±1 %; with internal temperature measurement: ±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:	±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):	±10 V
Accuracy:	±1 %
Measurement function:	
Voltage source:	Measuring range: ±30 V Accuracy: ±0.5 %
Current:	Measuring range: ±30 mA Accuracy: ±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 fiel . 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.

Specifi ations:

pH simulation:	0 ... 14 pH
pH resolution:	0.1 pH
pH accuracy (20 ... 25 °C):	0.002 pH
mV simulation:	±1.999 mV
mV resolution:	1 mV
mV accuracy:	±100 µV
Noise (0 ... 10 Hz):	1 µV peak / peak
Simulation of temperature compensation:	-20 ... +150 °C (-4 ... +302 °F)
Output impedance:	100 kΩ 1 %, 1 GΩ 5 %
Display:	LCD 2 lines, 3 ½ digits. Figure height approx. 12.5 mm.
Symbols:	pH, mV, °C, °F, HI imp., LO imp., 0.1 pH, 1 pH, 1 mV, 10 mV
Working temperature:	-5 ... +50 °C (-23 ... +122 °F)
Power supply:	9 V DC alkaline battery. Low battery indication.
Consumption (instrument only):	5 mA lit up, 20 µA turned off
Autonomy:	about 200 h
Dimensions:	187 x 72 x 38 mm (H x W x D)
Scope of supply:	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

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 & GMH, 20 channel

EBS 60M

Art. no. 601160

Measuring data acquisition software for EASYBus & 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

Specifi ations:	
Program version:	Application with user interface
Data backup:	File (SQLite)
Export formats:	*.csv
Languages:	German English
Access control:	-
Remote access:	-
Alarms:	optical in the interface
Devices:	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)
Several interfaces:	usable at the same time
Recording interval:	from 0.5 s
Live display:	Yes
Reading of data loggers:	No
System requirements:	Microsoft Windows 7 SP1 (32 or 64 Bit) Not executable with Windows RT, Windows 10 im S Modus, ARM or Intel Itanium based Windows systems
Scope of supply:	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-effici t network-compatible data logging and monitoring systems. The visualization can be done by any computer in the network.

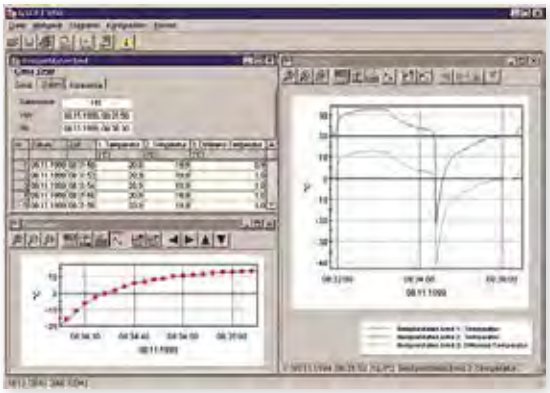
Application:

Long-term monitoring of climate cabinets and cooling cabinets.
When a visualisation of distributed measuring points should take place.

Specifi ations:	
Program version:	Application with user interface
Data backup:	Database (PostgreSQL)
Export formats:	*.doc (Word) *.xls (Excel) *.pdf (Adobe Reader)
Languages:	German English
Access control:	Dedicated user login
Remote access:	In the local network
Alarms:	optical in the interface Relay control via EBB Out
Devices:	EASYBus devices (via EASYBus level converter) GMH 3000 series* (via GRS 3100 or USB 3100N) GMH 5000 series* (via USB 5100)
Several interfaces:	usable at the same time
Recording interval:	from 5 s
Live display:	Yes
Reading of data loggers:	No
System requirements:	Microsoft Windows 7 SP1 (32 or 64 Bit) Not executable with Windows RT, Windows 10 im S Modus, ARM or Intel Itanium based Windows systems
Scope of supply:	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.

Specifi ations:	
Program version:	Application with user interface
Data backup:	File (binary)
Export formats:	*.csv
Languages:	German English French Czech
Access control:	-
Remote access:	-
Alarms:	-
Devices:	GMH 3000 series with data logger (via GRS 3100 or USB 3100N) GMH 5000 series with data logger (via USB 5100)
Recording interval:	Depending on the data logger
Live display:	No
Reading of data loggers:	Yes
System requirements:	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
Scope of supply:	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 <-> 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-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-R3
Art. no. 605931
Nappa leathern device protection bag with 2 round cut-outs for sensor connection
suitable for:
GMH 3511 / 31 / 51

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-N2
Art. no. 601072
Nappa leathern device protection bag with 2 rectangular cut-outs for sensor connection
suitable for:
GMH 3221 / 31 / 51

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

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-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-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-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-G1000
Art. no. 611373
Device protection bag with 1 round cut-out for sensor connection
suitable for:
G 1000-Serie

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)

NEW!

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

NEW!

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 accesso-
ries 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

NEW!

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)

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.

Specifi ations:	
Printing method:	Thermal
Resolution:	203 DPI (8 dot / mm)
Printing speed:	Up to 90 mm / s (depending on battery charge and ambient conditions)
Dimensions:	53 x 165 x 105 mm (H x W x D)
Material:	ABS
Scope of supply:	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

HD 2110-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 GDUSB 1000 via network. 2 USB ports for direct connection of EBW 3, USB 3100 N or GDUSB 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 GDUSB 1000 via local network or via WiFi. With 1 USB port for direct connection of one or more EBW 3, USB 3100N or GDUSB 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 <=> 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 <=> 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 <=> PC for electrically isolated connection of a GMH 3xxx to the RS232-interface.

GRS 3105
Art. no. 601099
5-point interface converter GMH 3xxx <=> 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.

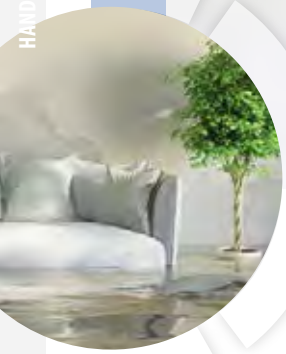
VEKA 3105
Art. no. 601101
Spare connection cable, 2 m, GMH 3xxx <=> GRS 3105

GSA 25S-9B
Art. no. 601105
Connection adapter (25-pin Dsub-adapter <=> 9-pin Dsub-socket)

GSA 9S-25B
Art. no. 601107
Connection adapter (9-pin Dsub-adapter <=> 25-pin Dsub-socket)

USB-Adapter
Art. no. 601109
for connection of a RS232-interface converter to the USB-interface

ALARM / PROTECTION, LEVEL



APPLICATION:	ALSCHU 300 FG ALSCHU 300 SP	ALSCHU 485	ALSCHU 485 OE ALSCHU 485 OE / 3P	GEWAS 181 A GEWAS 183 A GEWAS 181 A - ½"; - ¾"; - 1"	GEWAS 300 FG GEWAS 300 SP
Universal application	•				•
Level controler	•	•	•		
Water leak detector				•	•
Electrodes incl.		•		•	•
Alarm buzzer		•	•	•	
Switching output	•	•	•	•	•/-
Water supply is switched off				•	•
DEVICE INFORMATION:					
Catalogue page	Page 117	Page 117	Page 117	Page 121	Page 119

APPLICATION:	ALSCHU 480 ALSCHU 480 P	GEWAS 200	GEWAS 191 N	GEWAS 191 AN	RWI-016 PPK RWI-016 PVK RW-015 HKL
Universal application	•	•			
Level controler					
Water leak detector	•	•	•	•	
Level Switch			•	•	•
Electrodes incl.			•	•	
Alarm buzzer	•			•	
Switching output	•	•	•	•	•
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 f ame 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, overfl w and low liquid level control, automatic filling and d aining 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:

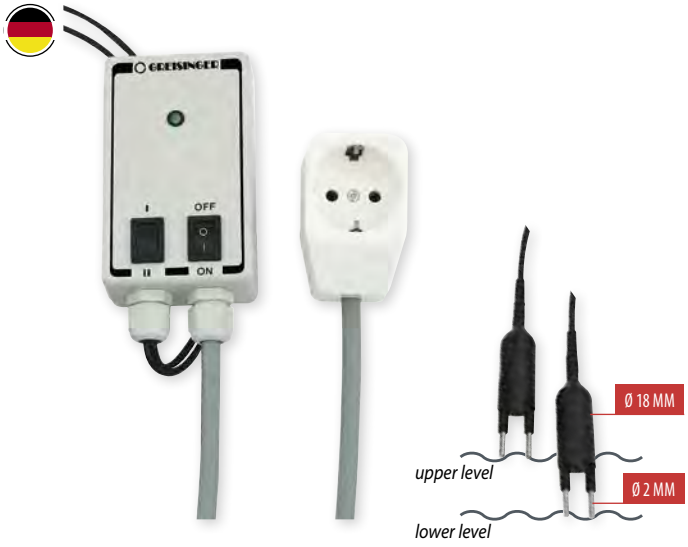
The measuring method for level detection is based on the conductive principle, i.e. the electrical conductivity of the media is monitored. If the switching amplifier de ects a value below the set conductivity the state "media detected" is output, otherwise "no media". Depending on number and design of the connected level sensors the device can be used for level detection (min-/max-detection) or as 2-point controller.

Specifi ations:	
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 emp ying, incl. two 2-pin. electrodes

ALSCHU 485 OE

Art.-Nr. 603807

Electrode control device for filling or emp ying, without electrodes - connection for two 2-pin. electrodes

ALSCHU 485 OE/3P

Art.-Nr. 603808

Electrode control device for filling or emp ying, connection for 3-pin electrodes

Application:

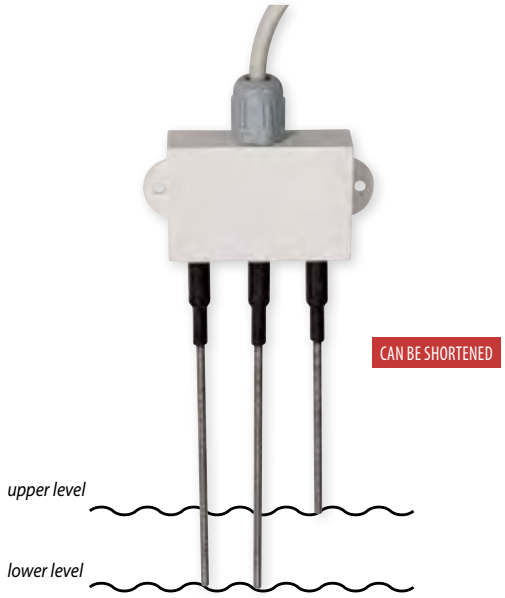
Automatic control of drain pumps and sewage removal plants, overfl w and dry running protection, automatic filling and emp ying of containers, basins, tanks, control of liquid level in storage tanks, aquariums, etc.

Specifi ations:	
Control device:	Flashing LED indicating control state. Selector switch for emptying or fillin . 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-1S 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

3-PIN. PROBE FOR LEVEL CONTROL (CONDUCTIVE)



GNS-3P

Art.-Nr. 603170

3-pin. level probe

General:

- For all industrial applications
- Alarm-, Level- and Doseregulation
- Optional teflon overed staffs
- Combined with control electronics (ALSCHU 300, ALSCHU 485 OE / 3P or MINAL) an accurate liquids level control system

Specifi ations:

Number of electrodes:	3 pieces
Length of electrodes:	150 mm other lengths upon request, probes can be cutted to needed length, in order to be adapted to local conditions.
Electrical connection:	2 m cable connection
Switching distance:	10 mm
Dimensions:	
Electrode diameter:	3 mm
Electronics box:	55 x 35 mm (W x H)
Scope of supply:	Device, manual

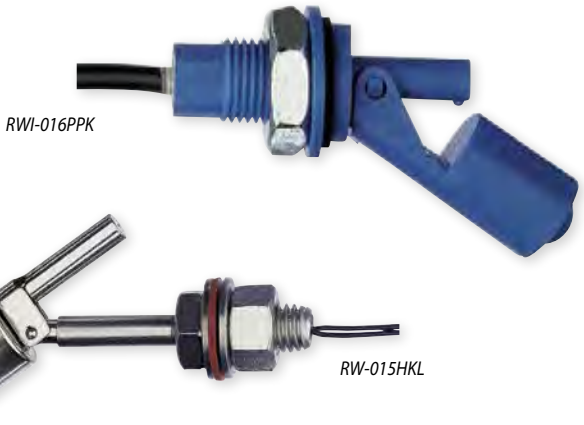
Option:

Teflon overed staffs
only tip is uncovered (for electrodes used in salt water, ...)

Suitable for:

ALSCHU 300 FG, ALSCHU 300 SP, ALSCHU 485 OE / 3P

FLOAT SWITCH



RWI-016PPK

Art.-Nr. 602912

Float switch (polypropylene)

RWI-016PVK

Art.-Nr. 602913

Float switch (PVDF)

RW-015HKL

Art.-Nr. 606211

Float switch (stainless steel)

General:

Mechanical level controller for liquids. A magnet-equipped flo t triggers a pre-fi ed reed switch.

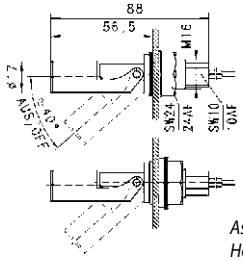
- wall mounting
- reliable and with good repeatabilty
- stainless steel design for high temperatures

Application:

Sensor suitable for: water, oil

Specifi ations:

	RWI-016PPK	RWI-016PVK	RW-015HKL
Measuring principle:	reed switch	reed switch	reed switch
Switch type:	n.c. or n.o depending on installation position		
Switching power:	250 V AC, 0.5 A, 50 VA	250 V AC, 0.5 A, 50 VA	220 V AC, 0.14 A, 30 VA
Density medium:	>0.6 g / cm³	>0.75 g / cm³	>0.70 g / cm³
Working temperature:	max. 90 °C	max. 130 °C	max. 200 °C
Working pressure:	PN = 3 bar	PN = 6 bar	PN = 5 bar
Mounting position:	horizontal	horizontal	horizontal
Protection class:	IP 65	IP 65	IP 65
Electrical connection:	~ 50 cm cable	~ 50 cm cable	~ 60 cm Litze
Materials:			
Body:	PP	PVDF	stainless steel 1.4571
Float:	PP	PVDF	stainless steel 1.4571
Seal:	Viton	Viton	
Weight:	approx. 75 g	approx. 75 g	approx. 120 g



RWI/016...
Assembly internally:
Hole diameter Ø 16.5 mm

Assembly externally:
Hole diameter Ø 23 mm

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 f ame 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 de ects 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, flo ting switches, level probes, magnetic contacts, etc.). In case of an alarm the connected device (e.g. pump, machine) is switched of 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.

Specifi ations:	
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, flo t 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.

Specifi ations:	
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 flo t 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

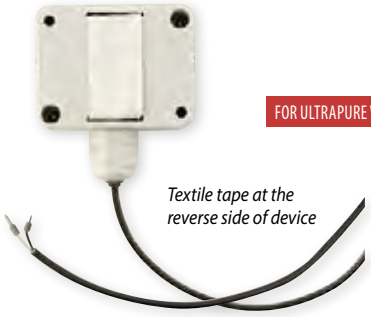
GWF-1
Art.-Nr. 601712
Water sensor without plug, 2 m cable

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

GWF-2
Art.-Nr. 601778
Textile-tape water sensor, 2 m, without plug

Specifi ations:	
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 or supervised device in case of alarm (up to 16 A, 230 V 50 Hz)

General:

If a water film of mo e 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 devi e 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.)

Specifi ations:	
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 fil . 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 einforced polyamide (as customary for washing machines). Safety-low voltage 12 V DC. **Connections:** Screw connection ¾" 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-1/2"

Figure GEWAS 181 A

NO MORE WATER DAMAGE

GEWAS 181 A

Art.-Nr. 601734

Leak-water detector with ½" brass solenoid valve with ¾" connections for hand installation, water sensor, alarm buzzer and switch-off of onnected units 16 A, 230 V~

GEWAS 183 A

Art.-Nr. 602999

Leak water detector without solenoid valve, with water sensor, alarm buzzer and switchoff of connected devices 16 A, 230 V~

GEWAS 181 A - ½"

Art.-Nr. 601736

Leak water detector with ½" brass solenoid valve (fl w quantity: approx. 20 l/min, installation length approx. 55 mm) for installation in the line, water sensor, alarm buzzer and switch-off of onnected devices 16 A, 230 V~.

GEWAS 181 A - ¾"

Art.-Nr. 601738

Leak water detector with ¾" brass solenoid valve (fl w quantity: approx. 91.5 l/min, installation length approx. 80 mm) for installation in the line, water sensor, alarm buzzer and switch-off of onnected devices 16 A, 230 V~

GEWAS 181 A - 1"0

Art.-Nr. 601740

Leak water detector with 1" brass solenoid valve (fl w quantity: approx. 141.5 l/min, installation length approx. 95 mm) for installation in the line, water sensor, alarm buzzer and switch-off of onnected 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 mo e 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 (½" with ¾" glanding - suitable for any ½" tap or ½" tube) or with ½", ¾" 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).

Specifi ations:	
Power supply:	220 / 240 V 50 / 60 Hz (control unit)
Power consumption:	approx. 2.5 Watt (control unit, approx. 6 W incl. solenoid valve)
Control output:	via power socket of safety plug adapter
max. switching current:	max. 16 A (ohmic load)
Water sensor:	Highly sensitive, plug-in water sensor, 2 m of cable, alarm triggered as of ½ mm water fil . 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.
Solenoid valve:	Hence, valve operable in permanent mode; due to energy-saving circuit valve will not run hot even without cooling agent. Valve permanently fi ed to control device (approx. 1 m of connecting cable). Valve body can be removed from coil after loosening of one nut.
Max. working pressure:	10 bar, servo-controlled (pressure difference inlet/outlet >0.5 bar)
Working voltage:	200 V DC or 100 V DC in energy saving mode
Working temperature:	0 ... 50 °C
Dimensions:	control device: 110 x 65 x 45 mm (L x W x H), with suspension hook
Scope of supply:	Device, solenoid valve (not GEWAS 183 A), water sensor, manual

Accessories and spare parts:

GMV-½" L
Art.-Nr. 601645
Spare solenoid valve ½" for direct cable connection, approx. 1 m cable, loose ends

GMV-½" H
Art.-Nr. 601646
Spare solenoid valve ¾" manual mounting, approx. 1 m cable, loose ends

GMV-¾"
Art.-Nr. 601648
Spare solenoid valve ¾" 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-½" 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-½" EZH
Art.-Nr. 601660
Add. solenoid valve ½" with add. solenoid valve with ¾" valve for manual mounting

GMV-¾" EZ
Art.-Nr. 601662
Add. solenoid valve with add. solenoid valve ¾" 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-1S
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-IN

WITH 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, flo t switches, level switches, magnetic contacts, safety shut-off m t 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 chuko adaptor plug (ALSCHU 480). The desired switching function can be set via selector switch I / II. ALSCHU 480 P switches on/off xternal devices via a potential-free 2-pole switching output. The Schuko socket of ALSCHU 480 P is always current-carrying.

Specifi ations:	
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-1S
Art.-Nr. 601706
Plug-in water sensor, 2 m

GSS-1S
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-1S

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

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