Sicherheitshinweise
Ergänzung zur Bedienungsanleitung
für

GMH31xx - ex

Safety Instructions
Supplement to User´s Manuel
for

GMH31xx - ex

Typen/Types: **GMH3110 - ex,**
                     GMH3150 - ex,
                     GMH3160-01 - ex,
                     GMH3160-07 - ex,
                     GMH3160-12 - ex,
                     GMH3160-13 - ex,
                     GMH3180-01 - ex,
                     GMH3180-07 - ex,
                     GMH3180-12 - ex,
                     GMH3180-13 - ex

⟨Ex⟩   CE
                                             0081

GREISINGER electronic GmbH
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Betriebshinweise:

- **Batteriebetrieb:**

  ⚠ *Es dürfen nur 9V Batterien des Typ IEC6F22 in Zink-Kohle-Technologie verwendet werden!*
  Der Batterietausch darf nur außerhalb des explosionsgefährdeten Bereiches erfolgen!

- **Netzgerätebetrieb:**

  Die in der Bedienungsanleitung beschriebene Netzgerätebuchse ist bei den Geräten der
  GMH31XX - ex - Serie nicht vorhanden.

- **Drucksensor:** (für GMH3110 und GMH3150)

  Es dürfen nur Sensoren der GMSD...-ex -Serie verwendet werden!
  Mit anderen Sensoren kann es zur Zerstörung des Meßgerätes und des Sensors kommen.

- **Alarmfunktion:** (nur bei GMH3150-ex und GMH3180-...-ex)

  Die in der Bedienungsanleitung beschriebene Hupe ist bei diesen Geräten nicht vorhanden.
  Die Alarmeinstellung "on" verhält sich somit wie "no.So."

- **Schnittstellenanschluß:**

  ⚠ Als Schnittstellenwandler dürfen nur die Typen GRS3100 und GRS3105 verwendet werden.
  Der Betrieb der seriellen Schnittstelle ist im Ex-Bereich nicht zulässig.

- **Ex-Betrieb:**

  ⚠ *Das Gerät darf im Ex-Bereich nur in der zugehörigen Ledertasche betrieben werden!*

- **Temperaturbereich:**

  ⚠ *Das Gerät darf unter 0°C nicht betrieben werden.*
  Zulässige Umgebungstemperatur: 0°C bis +50°C

Sicherheitshinweise:

Dieses Gerät ist gemäß den Sicherheitsbestimmungen für elektronische Meßgeräte gebaut und geprüft. Die Funktion und Betriebssicherheit des Gerätes kann nur dann gewährleistet werden, wenn die allgemein üblichen Sicherheitsvorkehrungen sowie die Sicherheitshinweise der Bedienungsanleitung beachtet werden.

1. Die einwandfreie Funktion und Betriebssicherheit des Gerätes kann nur unter den klimatischen Verhält-nissen, die im Kapitel "Technische Daten" der Bedienungsanleitung spezifiziert sind, eingehalten werden. Wird das Gerät von einer kalten in eine warme Umgebung transportiert, so kann durch Kondensatbildung eine Störung der Gerätefunktion eintreten. In diesem Fall muß die Angleichung der Gerätetemperatur an die Raumtemperatur vor einer erneuten Inbetriebnahme abgewartet werden.

2. **Beachten Sie die Betriebshinweise sowie die jeweiligen Landesvorschriften bezüglich Ex-Einsatz (z.B. VDE0165)**

3. Konzipieren Sie die Beschaltung besonders sorgfältig beim Anschluß an andere Geräte (z.B. über serielle Schnittstelle). Unter Umständen können interne Verbindungen in Fremdgeräten (z.B. Verbindung GND mit Erde) zu nicht erlaubten Spannungspotentialen führen, die das Gerät selbst oder ein angeschlossenes Gerät in seiner Funktion beeinträchtigen oder sogar zerstören können.

4. Wenn anzunehmen ist, daß das Gerät nicht mehr gefahrlos betrieben werden kann, so ist es außer Betrieb zu setzen und vor einer Wiederinbetriebnahme durch Kennzeichnung zu sichern.
   Die Sicherheit des Benutzers kann durch das Gerät beeinträchtigt sein, wenn es zum Beispiel:
   - sichtbare Schäden aufweist.
   - nicht mehr wie vorgeschrieben arbeitet.
   - längere Zeit unter ungeeigneten Bedingungen gelagert wurde.

   In Zweifelsfällen das Gerät grundsätzlich an den Hersteller zur Reparatur bzw. Wartung einschicken.

5. Es dürfen am Gerät **keine** Veränderungen oder Reparaturen vom Kunden vorgenommen werden.
   Zur Wartung oder Reparatur muß das Gerät zum Hersteller eingesandt werden.

Operating Instructions:

- **Battery operation:**

  ⚠ *Only the usage of zinc-carbon batteries of the type IEC6F22 is allowed!*
  Battery exchange must only be made outside of the hazardous area!

- **Mains operation:**

  The mains adapter socket described in the users manual is not existing in members of the GMH31XX - ex series.

- **Pressure sensor:** (for GMH3110 and GMH3150)

  You must only use sensors of the GMSD...-ex series!
  Usage of other sensors may result in destruction of sensor and device.

- **Alarm function:** (for GMH3150-ex and GMH3180-...-ex)

  The horn sound described in the users manual is not existing in these devices.
  The setting Alarm "on" therefore is identical to setting Alarm "no.So."

- **Serial Interface:**

  Only use convertors of the type GRS3100 and GRS3105!

  ⚠ *The operation of serial interface is not allowed in Ex Protection-Zone.*

- **Ex-Zone operation:**

  ⚠ *The operation in Ex-Zone is only allowed in the accompanying leather case!*

- **Temperature range:**

  ⚠ *The operation is not allowed below 0°C.*
  The permissible ambient temperature range is 0°C to +50°C

Safety Instructions:

This device has been designed and tested in accordance with the safety regulations for electronic devices. However, its trouble-free operation and reliability cannot be guaranteed unless the standard safety measures and special safety advises given in the operating manual will be adhered to when using the device.

1. Trouble-free operation and reliability of the device can only be guaranteed if the device is not subjected to any other climatic conditions than those stated under "Specification" in the operating manual.
   If the device is transported from a cold to a warm environment condensation may cause a failure of the function. In such a case make sure the device temperature has adjusted to the ambient temperature before trying a new start-up.

2. **Consider the operating instructions and the regulations refering the use of electrical equipment for hazardous areas (e.g. VDE0165)**

3. If device is to be connected to other devices (e.g. via serial interface) the circuitry has to be designed most carefully. Internal connection in third party devices (e.g. connection GND and earth) may result in not-permissible voltages impairing or destroying the device or another device connected.

4. If there is a risk whatsoever involved in running it, the device has to be switched off immediately and to be marked accordingly to avoid re-starting.
   Operator safety may be risk if:
   - there is visible damage to the device
   - the device is not working as specified
   - the device has been stored under unsuitable conditions for a longer time.

   In case of doubt, please return device to manufacturer for repair or maintenance.

5. Any changes or repair of the device is not allowed.
   Please return device to manufacturer for repair or maintenance.

Prüf- und Zertifizierungsstelle ZELM Ɛx

(1) **EG-Baumusterprüfbescheinigung**

(2) Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen – Richtlinie 94/9/EG

(3) EG-Baumusterprüfbescheinigungsnummer

ZELM 03 ATEX 0136 X

(4) Gerät: Digital-Druck-Handmessgerät Typ GMH31... – ex und Sensoren Typ GMSD...- ex

(5) Hersteller: GREISINGER electronic GmbH

(6) Anschrift: Hans-Sachs-Straße 26, D-93128 Regenstauf

(7) Die Bauart dieses Gerätes sowie die verschiedenen zulässigen Ausführungen sind in der Anlage zu dieser Baumusterprüfbescheinigung festgelegt.

(8) Die Prüf- und Zertifizierungsstelle ZELM Ex bescheinigt als benannte Stelle Nr. 0820 nach Artikel 9 der Richtlinie des Rates der Europäischen Gemeinschaften vom 23. März 1994 (94/9/EG) die Erfüllung der grundlegenden Sicherheits- und Gesundheitsanforderungen für die Konzeption und den Bau von Geräten und Schutzsystemen zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen gemäß Anhang II der Richtlinie.

Die Ergebnisse der Prüfung sind in dem vertraulichen Prüfbericht Nr. ZELM Ex 0170315178 festgelegt.

(9) Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit

EN 50 014: 1997+A1+A2   EN 50020: 1994

(10) Falls das Zeichen "X" hinter der Bescheinigungsnummer steht, wird auf besondere Bedingungen für die sichere Anwendung des Gerätes in der Anlage zu dieser Bescheinigung hingewiesen.

(11) Diese EG-Baumusterprüfbescheinigung bezieht sich nur auf Konstruktion, Überprüfung und Tests des spezifizierten Gerätes oder Schutzsystems in Übereinstimmung mit Richtlinie 94/9/EG. Weitere Anforderungen der Richtlinie können für das Herstellungsverfahren und die Lieferung dieses Gerätes oder Schutzsystems gelten. Diese sind von vorliegender Bescheinigung nicht abgedeckt.

(12) Die Kennzeichnung des Gerätes muß die folgenden Angaben enthalten:

⟨Ex⟩   II 2 G   EEx ib IIC T4

Zertifizierungsstelle ZELM Ɛx   Braunschweig, 27.04.2003

Adolf Gruber

Seite 1/2

EG-Baumusterprüfbescheinigungen ohne Unterschrift und ohne Stempel haben keine Gültigkeit. Diese EG-Baumusterprüfbescheinigung darf nur unverändert weiterverbreitet werden. Auszüge oder Änderungen bedürfen der Genehmigung der Prüf- und Zertifizierungsstelle ZELM Ex

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CE

EG - Konformitätserklärung

Für die folgend bezeichneten Erzeugnisse

GMH 3110-ex, GMH 3150-ex, GMSD...-ex, GMH 3160-...-ex, GMH 3180-...-ex

wird hiermit bestätigt, daß es den wesentlichen Schutzanforderungen entspricht, die in der Richtlinie des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit (89/336/EWG, 92/31/EWG, 93/68/EWG), der Niederspannungsrichtlinie (73/23/EWG, 93/68/EWG) und der Verwendung in explosionsfähigen Atmosphären (RL 94/9/EG) festgelegt sind.
Für die Beurteilung des Erzeugnisses hinsichtlich elektromagnetischer Verträglichkeit und dem Einsatz in explosionsfähigen Atmosphären wurden folgende Normen herangezogen:

EMV: EN 61326 +A1 +A2

Ex: EN 50 014 : 1997 +A1 +A2
         EN 50 020 : 1994

Diese Erklärung wird verantwortlich für den Hersteller

GREISINGER electronic GmbH
Hans-Sachs-Straße 26
D - 93128 Regenstauf

abgegeben durch

Greisinger, Otmar
Geschäftsführer

Regenstauf   08.04.2003
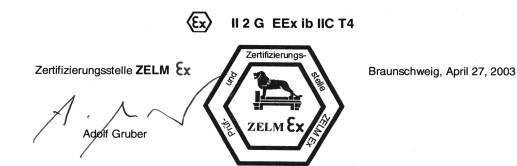Ort   Datum   rechtsgültige Unterschrift

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Prüf- und Zertifizierungsstelle ZELM Ɛx

(1) **EC-TYPE-EXAMINATION CERTIFICATE**

(2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres - Directive 94/9/EC

(3) EC-TYPE-EXAMINATION CERTIFICATE Number:

ZELM 03 ATEX 0136 X

(4) Equipment: Handheld Digital Pressure-Meter type GMH31...- ex and sensors type GMSD...- ex

(5) Manufacturer: GREISINGER electronic GmbH

(6) Address: Hans-Sachs-Straße 26, D-93128 Regenstauf

(7) This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The Prüf- und Zertifizierungsstelle ZELM Ex, notified body No. 0820 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report ZELM Ex 0170315178

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50 014: 1997+A1+A2   EN 50020: 1994

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-type-examination Certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this Certificate.

(12) The marking of the equipment shall include the following:

⟨Ex⟩   II 2 G   EEx ib IIC T4

Zertifizierungsstelle ZELM Ɛx   Braunschweig, April 27, 2003

Adolf Gruber

Sheet 1/2

EC-type-examination Certificates without signature and stamp are not valid. The certificates may only be circulated without alteration. Extracts or alterations are subject to approval by the Prüf- und Zertifizierungsstelle ZELM Ex. This English version is based on the German text. In the case of dispute, the German text shall prevail.

Prüf- und Zertifizierungsstelle ZELM Ex • Siekgraben 56 • D-38124 Braunschweig

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CE

EC – Declaration of Conformity

GREISINGER electronic GmbH, Hans-Sachs-Straße 26, D-93128 Regenstauf

declares in solo responsibility that the products

GMH 3110-ex, GMH 3150-ex, GMSD...-ex, GMH 3160-...-ex, GMH 3180-...-ex

are conform with the prescription of the following European directives

EMC Directives: 89/336/EWG, 92/31/EWG, 93/68/EWG

LV Directives   :   73/23/EWG, 93/68/EWG

Ex Directive   :   94/9/EC

The conformity are verified under observance of following standards or standard documents:

EMC: EN 61326 +A1 +A2

Ex: EN 50 014 : 1997 +A1 +A2
        EN 50 020 : 1994

Regenstauf   2003-04-08
Place   Date   Managing Director

GREISINGER electronic GmbH
Hans-Sachs-Straße 26, D-93128 Regenstauf

GREISINGER electronic GmbH   Hans-Sachs-Straße 26   Tel.: 09402 / 9383-0   http://www.greisinger.de
                                     D-93128 Regenstauf   Fax: 09402 / 9383-33   eMail: info@greisinger.de

User's Manual

Handheld Digital Pressure-Meter

GMH3110

Version 5.1

for GMSD – Pressure Sensors

GREISINGER electronic GmbH

D - 93128 Regenstauf, Hans-Sachs-Straße 26

CONTENTS

1 General

1.1 Safety Requirements

This device has been designed and tested in accordance with the safety regulations for electronic devices. However, its trouble-free operation and reliability cannot be guaranteed unless the standard safety measures and special safety advises given in this manual will be adhered to when using the device.

1. Trouble-free operation and reliability of the device can only be guaranteed if the device is not subjected to any other climatic conditions than those stated under "Specification".
2. Device and sensors have to be handled with care (don't throw, hit, etc.). Protect plugs and sockets from soiling.
3. If the device is transported from a cold to a warm environment condensation may cause in a failure of the function. In such a case make sure the device temperature has adjusted to the ambient temperature before trying a new start-up.
4. If device is to be connected to other devices (e.g. via serial interface) the circuitry has to be designed most carefully. Internal connection in third party devices (e.g. connection GND and earth) may result in not-permissible voltages impairing or destroying the device or another device connected.
    Warning: If device is operated with a defective mains power supply (e.g. short circuit from mains voltage to output voltage) this may result in hazardous voltages at the device (e.g. at sensor socket or interface).
5. If there is a risk whatsoever involved in running it, the device has to be switched off immediately and to be marked accordingly to avoid re-starting.
    Operator safety may be a risk if:
    - there is visible damage to the device
    - the device is not working as specified
    - the device has been stored under unsuitable conditions for a longer period of time.
    In case of doubt, please return device to manufacturer for repair or maintenance.

1.2 Operation And Maintenance Advice

- **Battery Operation**
    If ⚠ and ´bAt´ are shown in the secondary display the battery has been used up and needs to be replaced. The device will, however, operate correctly for a certain amount of time. If ´bAt´ is shown in the upper display the voltage is too low to operate the device; the battery has been completely used up. The battery has to be taken out, when storing device above 50°C.
    Please note: We recommend to take out battery if device is not used for a longer period of time!

- **Mains Operation With Power Supply**
  Warning: When using a power supply please note that operating voltage has to be 10.5 to 12 V DC.
  Do not apply overvoltage!! Cheap 12V-power supplies often have excessive no-load voltage.
  We, therefore, recommend using regulated voltage power supplies. Trouble-free operation is guaranteed
  by our power supply GNG10/3000.
  Prior to connecting the power supply to the mains make sure that the operating voltage stated at the
 power supply is identical to the mains voltage.

- **Connecting/Changing Sensors**
  Do not use insuitable sensors. Connecting other devices/sensors as specificated may cause a damage to
  the instrument and device/sensor! Switch off device before changing the sensor.
  Connect sensor before switching on the device, otherwise the sensor may not be detected correctly.
  When connecting the sensor the connector may not lock correctly. In such case take the plug not at the
  casing but at the buckling protection at the end of the plug. If plug is entered correctly, it will slide in
  smoothly. To disconnect sensor do not pull at the cable but at the plug (to open locking mechanism).

1.3 Connections
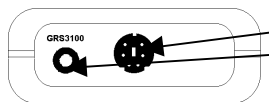
Connection for pressure sensors of the GMSD-family (p.r.t. chapter 9)
Interface: Connection for el. isolated interface adapter (p.r.t. chapter 6)
The mains adapter socket is located at the left side of the device.

1.4 Display

Units: an arrow points to the chosen measuring unit
Tara: appears if tara-function is activated.
SL: appears if sea-level-correction is activated

main display: shows measuring value.
⚠: indicates weak battery or other warnings
secondary display: min-, max- or hold value
Logg: no function
AL: no function

1.5 Basic Operation

When switching on the device and a zero point adjustment was carried out it shows shortly „nuLL Corr".

On-/Off-Switch
Tara: Calling of tara function, zero point adjustment
min/max: Showing the min- resp. max-memory in sec. display
Store/Quit: Calling of hold function
Set/Menu: Calling of configuration

Max Memory:	Pressing ´max´ (key 2) shows the maximum of the measured values. Pressing it again hides it. To clear the max memory press key ´max´ for >2 seconds.
Min Memory:	Pressing ´min´ (key 5) shows the minimum of the measured values. Pressing it again hides it. To clear the min memory press key ´min´ for >2 seconds.
Hold Function:	By pressing ´Store/Quit´ (key 6) the last measuring value will be held in the secondary display. Pressing it again hides it.
Tare Function:	By pressing ´Tara´ (key 3) the display will be set to 0. All measurings from then on will be displayed relatively to the set tare value. When tara function is activated, the arrow "Tara" appears in the display. To deactivate tare function press ´Tara´ for >2 seconds.
	Please Note: Activating/deactivating tara clears the max- & min-memories.
Zero-Point Adjustment:	(for rel. pressure sensors only) If there is no pressure applied to the pressure ports the device will display 0. If there is a permanent deviation (and device is operated under steady conditions), a permanent zero point adjustment can be carried out.
	To carry out the adjustment press key 3 for 5 seconds.
	(Please note: A zero-point adjustment can only be carried out if the difference between the value on display and the value calibrated on site is less than 2%! E.g. for the measuring range of –1.00 ..+25.00mbar, =>zero-point adjustment up to 0.50mbar possible)
	To recall the manufacturer`s calibration press button 3 for approx. 7 seconds.
	Note: If a zero-point adjustment was carried out, this will be signalled by the short displaying of „NuLL Corr" when switching on the device.

2 Configuration

To change device settings, press *Menu* (key 4) for 2 seconds. This will call the configuration menu.
Pressing key *Menu* jumps between the parameters.
The parameters can be changed with ▲ (key 2) or ▼ (key 5).
Quit (key 6) finishes the configuration and returns to standard measuring operation.

2.1 Unit: Choice Of The Display Unit

Choose the desired display unit, the referring unit is displayed by means of a functional arrow in the display. The selection is permanently stored in the sensor, therefore after reconnecting the sensor the unit will instantly reappear. The choice depends on the used sensor.
The unit [m] =H_2O is just supported by devices with [m] printed below the display!

2.2 Sea Level Correction For Absolute Pressure Sensors

The device displays the absolute pressure measured at the sensor. This is not necessarily the same like the values given by weather stations! The weather stations' values are pressure at sea level. Usually the sensor is placed above sea level and therefore, if the value at sea level(zero) is to be measured, the pressure loss resulting from the actual level above zero has to be considered!

- ▪ To correct activate the „Sea-Level-Function":
  Select „on" in the menu „SL" with ▲ (key 2) or ▼ (key 5).

- ▪ Jump to the next parameter „Alti" by pressing *Menu* (key 4).
  Then enter the altitude above sea level of the sensor's location in meters and leave the configuration by pressing *Quit* (key 6)

If the sea level correction is active this will be shown by the functional arrow „SL" in the display, the device now displays the absolute pressure at sea level (zero).

2.3 P.oFF: Auto Power Off Time

The device will be automatically switched off if no key is pressed/no interface communication takes place for the time of the power off time.
The power off time can be set to values between 1 and 120 min. It can be completely deactivated by setting the parameter to ‚P.oFF = oFF".

2.4 Adr: Base Address of Interface

Up to 10 devices of the GMH3xxx- handheld-family can be connected to a serial interface at once (depending on interface converter, e.g. GRS3105: 5 devices). To get access to each device the base addresses of the devices have to be different. For example choose 01 for the first, 11 for the second device and so on.

3 Measuring Of Water Level – Display Unit [m]

(only for devices with ‚m' printed below the display)
When using a suitable waterproof pressure sensor the unit [m] for meters of water can be set in the menu "Unit". 10m of water are roughly 1 bar over pressure. Measurings can be made e.g. like described below :
- With abs. pressure sensor (SL oFF!): Press ‚Tara' when sensor is at ambient air and then bring sensor to the depth to be measured. The display shows now the depth in [m].
- With rel pressure sensor: bring tube connection for lower press. in contact to ambient air by means of a tube (no water contact!) and bring the sensor with its open press. connection for higher pressure to water depth to be measured (display and is compensated for pressure changes in ambient air).

4 Calibration Services

Calibration certificates – DKD-certificates – other certificates:
If device should be certificied for its accuracy, it is the best solution to return it with the referring sensors to the manufacturer.
Only the manufacturer is capable to do efficient recalibration if necessary to get results of highest accuracy!

5 Pressure Connection To The Sensors

The device is designed to be connected to the sensors of the GMSD...-series without a new calibration being necessary. Therefore a great variety of replaceable sensors of e.g. –1.999...2.500 mbar relative up to 0...400.0 bar absolute pressure can be connected to the device (p.r.t. chapter 9)

Relative Pressure Sensors (Types: GMSD...MR. GMSD...BR)

- **For measurements of over- or under pressure:**
  Connect plastic tube with internal dia of 4 mm to pressure port "B". Port "A" will not be used!
  Pressure sensors GMSD 2,5 MR, GMSD 25 MR and GMSD 350 MR allow for measurements of under pressure up to the entire over pressure measuring range by re-plugging the tube to pressure port "A". Please note that all values are displayed as positive values. No minus sign will be shown. (Example for GMSD 25 MR: For tube connection "B" the measuring range covers -19.99 to 25.00 mbar. If you replug to port "A" under pressure measurements down to -25.00 mbar could be carried out with the display showing the value 25.00 (no minus sign).

- **For measurements of pressure differences:**
  Connect both plastic tubes with an internal dia of 4 mm to pressure port "B" and "A"; make sure to apply higher pressure to port "B".

Absolute pressure sensors: (types: GMSD...BA)

Connect plastic tube with an internal dia of 4 mm to pressure port "A". (Port "B" is not used.)

Stainless steel pressure sensors: (types: GMSD...MRE, GMSD...BRE, GMSD...BAE)

For measurements of over-, under- or absolute pressure screw sensor to G1/4" pressure terminal or plug plastic tube to a suitable adapter.

6 The Serial Interface

By means of the serial interface and a suitable electrically isolated interface adapter (GRS3100, GRS3105 or USB3100) the device can be connected to a computer for data transfer. With the GRS3105 up to 5 devices of the GMH3xxx- series can be connected to one interface (see also manual of GRS3100, GRS3105 or USB3100). To avoid transmission errors, there are several security checks implemented e.g. CRC.
The following standard software packages are available:
- **EBS9M**:   9-channel software to display the measuring values
- **EASYCONTROL**:   Universal multi channel software (EASYBUS-, RS485-, or GMH3000- operation possible) for real-time recording and presentation of measuring data of one GMH3xxx device in the ACCESS®-data base format

In case you want to develop your own software we offer a **GMH3000-development package** including:
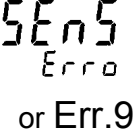- a universally applicable Windows functions library ('GMH3000.DLL') with documentation
- Programming examples Visual Basic 4.0, Testpoint (Keithley Windows measuring software)

Note: ***The measuring and display range values read back from the interface are always in the selected measurement unit (mbar, bar...)!***

Supported functions:

Code	Name/Function	Code	Name/Function
0	Read measurement value	180	Read kind of measuring of sensor
3	Read system state	194	Set display unit
6	Read min memory	199	Read kind of measuring of display
7	Read max memory	200	Read min display range
12	Read ID number	201	Read max display range
32	Read configuration flag BitCorrectToSealevel:32 (only abs. press. Sensors)	202	Read display range - unit
		204	Read display range – decimal point
160	Set configuration flag (see above)	208	Read # of channels
174	Clear min memory	220	Read altitude (only abs. press sensors)
175	Clear max memory	221	Set altitude (only abs. press sensors)
176	Read min measuring range	222	Read power off time (Conf-P.oFF)
177	Read max measuring range	223	Set power off time (Conf-P.oFF)
178	Read measuring range – measuring unit	240	Reset
179	Read measuring range – decimal point	254	Program version

7 Error And System Messages

Display	Meaning	What to do?
`108 -bAt-`	Low battery power, device will only continue operation for a short period of time	Replace battery
`bAt`	Battery empty	Replace battery
	Mains operation without battery: wrong voltage	Check power supply, replace it when necessary
`5En5 Erro` or Err.9	No sensor connected	Switch off device and connect sensor
	Connected sensor or device defective	If second sensor available, check if device is ok. Return defective device/sensor to manufacturer for repair
Err.9	Measured value far out of allowable range	Check: pressure not within sensor range?
No display or confused characters, device does not react on keypress	Battery empty	Replace battery
	Mains operation without battery: wrong voltage or polarity	Check power supply, replace it when necessary
	System error	Disconnect battery and power supplies, wait shortly, then reconnect
	Device defective	Return to manufacturer for repair
Err.1	Measured value above allowable range	Check: pressure not within sensor range? -> measuring value to high
	Sensor defective	Return to manufacturer for repair
Err.2	Measured value below allowable range	Check: pressure not within sensor range? -> measuring value to low
	Sensor defective	Return to manufacturer for repair
Err.4	Value is too low to be displayed, tara is set	Check: display below -2000 (tara?)?
Err.7	System error	Return to manufacturer for repair

8 Specification

Measuring ranges:

Display range: max. -1999...9999 digit, depending on connected sensor

Resolution: depending on connected sensor

Pressure units: mbar, bar, kPa, MPa, mmHg, PSI mH$_2$O (only for devices with ‚m' printed below display), selectable depending on connected sensor

Accuracy: (typ.)   ±0,1%FS (at nominal temperature)
(FASt and P.dET: ±0.5%FS)

Measuring rate: 4 meas./sec

Nominal temperature: 25°C

Sensor: All sensors of the GMSD..-series without recalibration can be connected

Connection: Mini-DIN-Socket with locking mechanism
The sensor will automatically be detected, the measurement range settings are set referring to sensor data

Power-Off-Function: Device will be automatically switched off if no key is pressed/no interface communication takes place for the time of the power-off delay. The power-off delay can be set to values between 1 and 120 min.; it can be completely deactivated.

Display: 2 four digit LCDs (12.4mm high and 7 mm high) for measuring values, and for min/max memories, hold function, etc. as well as additional functional arrows.


Pushbuttons: 6 membrane keys

Interface: Serial interface (3.5mm jack) can be connected to RS232 interface of a PC via electrically isolated interface adapter GRS3100, GRS3105 or USB3100 (see accessories).

Power supply: 9V battery, type: IEC 6F22 (included in scope of supply)
as well as additional d.c. connector (diameter of internal pin 1.9 mm) for external 10.5-12V direct voltage supply. ⊖–Ⓒ–⊕ (suitable power supply: GNG10/3000)

Power consumption: Slow measuring rate: < 1.5 mA

Low battery warning: △-display and ' bAt '

Housing: impact-resistant ABS, membrane keyboard, transparent panel, Front side IP65

Dimensions: 142 x 71 x 26 mm (L x W x D)

Working temperature: -25...+50°C

Allowable rel. humidity: 0...95 % RH (not condensing)

Storage temperature: -25...+70°C

EMC: The device corresponds to the essential protection ratings established in the Regulations of the Council for the Approximation of Legislation for the member countries regarding electromagnetic compatibility (2004/108/EG).

Additional fault: <1%

9 Sensors (03/2005)

Type	Measuring Range	Resolution	Overload	Description
GMSD 2.5 MR	-1.999 ... +2.500 mbar rel.	0.001 mbar	250 mbar rel.	A
GMSD 25 MR	-19.99 ... +25.00 mbar rel.	0.01 mbar	350 mbar rel.	A
GMSD 350 MR	-199.9 ... +350.0 mbar rel.	0.1 mbar	1 bar rel.	A
GMSD 2 BR	-1.000 ... +2.000 bar rel.	1 mbar	4 bar rel.	A
GMSD 10 BR	-1.00 ... +10.00 bar rel.	10 mbar	13.5 bar rel.	A
GMSD 1.3 BA	0 ... 1300 mbar abs.	1 mbar	4 bar abs.	A
GMSD 2 BA	0 ... 2000 mbar abs.	1 mbar	4 bar abs.	A
GMSD 7 BA	0.00 ... 7.00 bar abs.	10 mbar	10 bar abs.	A
GMSD 350 MRE	0.0 ... 350.0 mbar rel.	0.1 mbar	1.3 bar rel.	B
GMSD 3.5 BRE	0 ... 3500 mbar rel.	1 mbar	7 bar abs.	B
GMSD 1 BAE	0 ... 1000 mbar abs.	1 mbar	2 bar abs.	B
GMSD 3.5 BAE	0 ... 3500 mbar abs.	1 mbar	7 bar abs.	B
GMSD 7 BAE	0 ... 7000 mbar abs.	1 mbar	13.5 bar abs.	B
GMSD 35 BAE	0.00 ... 35.00 bar abs.	10 mbar	58 bar abs.	C
GMSD 70 BAE	0.00 ... 70.00 bar abs.	10 mbar	100 bar abs.	C
GMSD 160 BAE	0.0 ... 160.0 bar abs.	0.1 bar	600 bar. abs.	C
GMSD 250 BAE	0.0 ... 250.0 bar abs.	0.1 bar	600 bar. abs.	C
GMSD 400 BAE	0.0 ... 400.0 bar abs.	0.1 bar	600 bar. abs.	C

Description A: Sensor is suitable for air, non corrosive and non ionising gases and liquids
    Pressure connection: 2 nylon pressure ports for connection to 6 x 1 mm tubes
    Housing ABS with mounting eyelet, dimensions 68 x 32.5 x 27.5 mm

Description B: Stainless steel sensor. Suitable for aggressive media, water, etc.
    Pressure connection: Threading G¼", for open ended spanner size: 27 mm
    Housing ABS, dimensions ca. Ø26 (31) x 103 mm

Description C: Stainless steel sensor. Suitable for aggressive media, water, etc.
    Pressure connection: Threading G¼", for open ended spanner size: 27mm
    Steel housing, dimensions ca. Ø26 (31) x 110 mm

10 Accessories

GKK3000	Suitcase (275 x 229 x 83 mm) with punched lining suitable for the GMH3xxx-series.
GKK3100	Suitcase (275 x 229 x 83 mm) with foam lining for universal applications.
GMH1300	Magnet holder
GAK9V	Rechargeable accu 9V
GLG1300	Accu charger for recharging 2 accus at one time
GNG10/3000	power supply 10V/10mA
GRS3100	Interface converter, electrically isolated
GRS3105	5-way interface converter, electrically isolated
GAM3000	Control device for GMH3xxx-devices with alarm function
EBS9M	9-channel software to display the measuring values
GMH3000.DLL	universally applicable windows functions library ('GMH3000.DLL') with documentation for your own software applications