

Operating Manual Vacuum- / Baro- / Manometer

from Version 1.1

## GDH 200-14



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## 1 Intended use

The device measures the absolute pressure of air or non corrosive / non ionizing gases. Either the ambient air pressure can be measured or the measuring pressure is connected with a suitable tube to the connecting nozzle.

Relative measurements can also be realized via the integrated Zero-function.

Field of application

- Barometric measurements (weather)
- Vacuum measurement (down to 1 mbar abs)
- Overpressure measurements pneumatics, tyre pressure etc.

**The pressure connection has to be done adequately! At higher pressures the connection tube has to be locked. Please refer to chapter „Pressure Connection“.**

The safety instruction (see chapter 3) have to be observed.

The device must not be used for purposes and under conditions for that the device had not been designed.

The device must carefully dealt with and has to be used according to the specifications (do not throw, knock, etc.). It has to be protected against dirt.

## 2 General advice

Read through this document attentively and make yourself familiar to the operation of the device before you use it. Keep this document in a ready-to-hand way in order to be able to look up in the case of doubt.

## 3 Safety instructions

This device has been designed and tested in accordance to 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 it.

1. Trouble-free operation and reliability of the device can only be guaranteed if it is not subjected to any other climatic conditions than those stated under "Specification".

Transporting the device from a cold to a warm environment condensation may result 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.

2. Whenever there may be 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 or 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.

3. **Warning:** Do not use this product as safety or emergency stop device, or in any other application where failure of the product could result in personal injury or material damage. Failure to comply with these instructions could result in death or serious injury and material damage.

## 4 Operation notes

- If the symbol "LOBAT" is displayed at the left side of display, the battery is weak, measuring can be continued for a short period. If "bAt" is displayed in the main display the battery is used up and needs to be replaced. Measuring is no more possible.
- The battery has to be removed, when storing device above 50 °C.

**Hint:** *We recommend removing the battery if device is not used for a longer period of time! Risk of leakage!*

## 5 Operation

### 5.1 Display elements



**1: Main display**

Display of current measuring value or of minimal measured value ("Lo" blinking) or maximal value ("Hi" blinking)

**LOBAT**

Indicates low battery

### 5.2 Pushbuttons



**on/off:**

**on/off switch**, press key long to switch device off

**mode:**

**press short:** changes between actual measuring value, the minimal measured value ("Lo" blinking) and maximal measured ("Hi" blinking) value.

**press >2s:** reset Min and Max value

**zero:**

**press >2s:** activates / deactivates the "Zero-function"

## 6 Starting



Switch the device on with button

After the segment test ( ) the device displays some information to its current configuration:

*OFFS*, if offset correction is active

*SCRL*, if scale corrections active

Unit of meas. value: nbAr (=mbar) | bar | PSI | nnHg (=mmHg)

*SEA.L*, if sea-level correction is active

*P.OFF*, if auto power-off is active

Afterwards the device is ready for measuring.

## 7 Pressure Connection

The pressure is connected to the instrument via the front side pressure port. This is optimised for the connection of 6x1 mm (4 mm inner diameter) tubes.

Suitable tubes are:

PVC up to 5 bar rel.

PE up to 10 bar rel.

PUR up to 9 bar rel.

At pressures above 2 bar rel. the tube should be locked e.g. by means of a cable strap or a hose clamp.



## 8 Min-/max- value memory

Display MIN-value (Lo):	Press button mode shortly	Display changes between 'Lo' and min-value
Display MAX-value (Hi):	Press mode shortly again	Display changes between 'Hi' and max-value
Display actual value again:	Press mode shortly again	Actual value is displayed
Delete MIN/MAX:	Press button mode for 2 s	MIN&MAX are deleted. 'CLR' (Clear) is displayed shortly

The Min-/max- display is automatically set to actual value display after 10 s.

The Min-/max- values are deleted if the device is switched on after it had been turned off.

## 9 Zero-function (relative measuring)

With help of the Zero-function relative measurements can be realized: press "zero"-button for 2s. "rLLL" is displayed shortly and the displayed value is set to 0. Press again "zero" for 2s to display the absolute value again.

**Note: Setting and resetting the Zero function will delete your min-/max- value memory.**

Field of application: e.g. tyre pressure measurement, pneumatic measuring up to 10 bar rel.

## 10 General information about pressure measurement

The device measures the absolute pressure. This must not be confused with the pressure at sea level display by weather stations. There the pressure loss due to height above sea level is deducted. The device is also able to perform this sea-level correction on the displayed air pressure. Therefore *SEAL* (Sea Level correction) has to be activated (= "on") and the current height above sea level (*ALT* = Altitude in [m]) has to be entered at the configuration.

### Measurement accuracy at > 5 bar




Highest accuracy is achieved, if the measurement duration during high pressure measurements (> 5 bar) is limited to max 5 min.

At longer durations a reversible offset may appear. This settles within 15min after disconnection from pressure, but keeps in between the specified accuracy (see Specification).


Short measurements can achieve significant higher accuracy than stated in the specification!




## 11 Configuration of the device


Follow this instructions to configure the functions of the device:

- Switch the device off.
- Press **mode** button and keep it pressed. Turn the device on. Release the mode button after the segment test (  ) finished. The first parameter "P.oFF" is displayed.
- If a parameter should be changed press key up or down (   ) the present setting of the parameter will be shown and can be changed via up/down keys.

The parameter setting is confirmed by pressing  .

- Jump to the next parameter with  .




Parameter	value	information
<b>button</b> 	<b>buttons</b>  	
<b>P.oFF</b>	<b>Auto Power-Off</b> (turn-off delay) <i>factory setting: 20 min.</i>	
	1 ... 120	<b>Auto Power-Off</b> (turn-off delay) in minutes. If no key is pressed for the time adjusted in this parameter, the device is automatically switched off to safe battery power. (adjustable range 1 to 120 min)
	oFF	automatic power-off is deactivated (continuous operating)
<b>Unit</b>	<b>Unit and range of display</b> <i>factory setting: nbar=mbar</i>	
	PSI	0 ... 160.00 PSI, resolution 0.02 PSI
	nnHG	0 ... 8250 mmHg, resolution 1mmHg
	nbAr	0 ... 11000 mbar, resolution 1 mbar
	bAr	0 ... 11.000 bar, resolution 0.001 bar
<b>SEA.L</b>	<b>Sea-level correction</b> <i>factory setting: off</i>	
	oFF	Sea-level correction off
	oN	Sea-level correction on
<b>ALti</b>	<b>Altitude input for sea-level correction</b> <i>factory setting: 340</i>	
	-500 ... 9000	-500 ... 9000 m selectable
<b>init</b>	<b>Restore to factory settings</b>	
	no	Settings are kept
	YES	Restoring device to factory settings


Pressing  again stores the settings, the instruments restarts (segment test)


**Please note:** *If there is no key pressed within the menu mode within 2 minutes, the configuration will be cancelled, the entered settings are lost!*




## 12 Adjusting of the instrument


To adjust the instruments according to your needs proceed like follows:

- Switch instrument off.
- Press **zero** button and keep it pressed. Turn the device on. Release the mode button after the segment test (  ) finished. The first parameter “5cL” is displayed.
- If a parameter should be changed press key up or down (   ) the present setting of the parameter will be shown and can be changed via up/down keys.

The parameter setting is confirmed by pressing  .

- Jump to the next parameter with  .

Parameter	value	information
button 	buttons  	
<b>OFF5</b>	<b>Offset of sensors</b>	<i>factory setting: off</i>
	off -5.0 ... +5.0	Selectable -5.0 ... +5.0
<b>SCAL</b>	<b>Scale correction</b>	<i>factory setting: off = 0%</i>
	off -5.00 ... +5.00	Adjustment in %

Pressing  again stores the settings, the instruments restarts (segment test)

**Please note:** *If there is no key pressed within the menu mode within 2 minutes, the adjusting will be cancelled, the entered settings are lost!*

## 13 Notes to the calibration services

Calibration certificates - DKD-certificates - other certificates:

If device should be certificated for its accuracy, it is the best solution to return it with the referring sensors to the manufacturer. (please state desired test values, e.g. 1bar abs)

Only the manufacturer is capable to do efficient recalibration if necessary to get results of highest accuracy!

## 14 Error and system messages

Err. 1	measuring range has been exceeded
Err. 2	measured value has fallen below permitted range
Err. 3	display range has been exceeded (>19999)
Err. 4	measuring value has fallen below displayable range (< -1999)
Err. 7	System fault - the device has detected a system fault (defective or far outside allowable ambient temperature range)
---	Sensor error or value could not be calculated

If the symbol “LOBAT” is displayed at the left side of display, the battery is weak, measuring can be continued for a short time.

If “bAt” is displayed in the display the battery is used up and needs to be replaced. Measuring is no more possible.

## 15 Specification

<b>Measuring range</b>	0 ... 11000 mbar abs., resolution 1 mbar
<b>air pressure:</b>	0 ... 11.000 bar abs., resolution 0.001 bar
	0 ... 8250 mmHg abs., resolution 1 mmHg
	0 ... 160.00 PSI abs., resolution 0.02 PSI
<b>Measuring media:</b>	non corrosive gases
<b>Max. overload:</b>	13 bar abs.
<b>Accuracy: (<math>\pm 1</math> digit)</b>	Hysteresis and linearity (at nominal temperature 25°C) <ul style="list-style-type: none"> <li>- &lt;5bar: <math>\pm 3</math> mbar or <math>\pm 0.10</math> % of meas. value, whichever is higher</li> <li>- &lt;5bar: <math>\pm 0.20</math> % FS (see note in "10 General information about pressure measurement")</li> </ul> +/- 0.30 % FS temperature influence 0 to 50°C
<b>Pressure connection:</b>	connecting nozzle made of nickel-plated brass on top of the device, for tubes 6x1mm (4mm inner Ø), approx. 11mm projecting
<b>Measuring frequency:</b>	1 measurement per second
<b>Offset and scale:</b>	digital offset and scale adjustment for air pressure measurement
<b>Min-/max-value memory:</b>	min- and max- value are stored
<b>Sea level correction:</b>	The displayed value can be referenced to sea level. Therefore the current height above sea level has to be entered.
<b>Zero-function:</b>	relative measurement: the displayed value is set to "zero"
<b>Display:</b>	approx. 13 mm high, 4½-digit LCD display
<b>Pushbuttons:</b>	3 membrane keys for on/off, min-/max-value request, offset adjustment
<b>Working conditions:</b>	-25 to 50 °C; 0 to 80 % RH (non condensing)
<b>Storage temperature:</b>	-25 to 70 °C
<b>Power supply:</b>	9V-battery, type 6F22 (included in scope of delivery)
Current consumption:	ca. 60 µA (Operating time with standard zinc-carbon battery >7500 hours)
Display for weak battery:	automatically if battery consumed "BAT", warning: "LOBAT"
<b>Auto-off function:</b>	If activated: device will be automatically switched off if not operated for longer time (selectable 1..120min)
<b>Housing:</b>	impact resistant ABS housing, front side IP65
<b>Dimensions:</b>	approx. 106 x 67 x 30 mm (H x W x D) , without connecting nozzle
<b>Weight:</b>	approx. 135 g incl. battery
<b>EMC:</b>	The device corresponds to the essential protection ratings established in the Directives of the European Parliament and the council on the approximation of the laws of the member states relating to the electromagnetic compatibility (2004/108/EG). Additional error: <1%

## 16 Disposal notes



Dispense exhausted batteries at destined gathering places.

This device must not be disposed as "residual waste".

To dispose this device, please send it directly to us (adequately stamped).

We will dispose it appropriately and environmentally friendly.