# C300/C310-C340

Version V1 (1/2003)



CE

## Contents

1 READ BEFORE OPERATING FOR THE FIRST TIME 4

2 C300/C310…C340 6

3 THE DISPLAY 8

4 OPERATION 9

5 THE UPPER MENU 11

6 THE LOWER MENU 12

7 SINGLE-POINT CALIBRATION, C300 15

8 CALIBRATION, C310…C340 17

8.1 ZERO POINT CALIBRATION 17

8.2 GRADIENT CALIBRATION 18

9 REPLACING BATTERIES 20

10 MAINTENANCE AND ADJUSTMENT 21

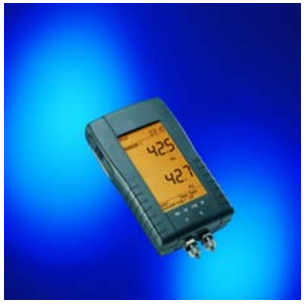
## 1 Read before operating for the first time

- The operating instructions should be read carefully before the device is used and followed in every detail.
- Never take any measurements of electrically live components
- Remain within the measuring ranges of the sensors (overheating can lead to their destruction)
- Observe storage and transport requirements (protect the device from direct sunlight)
- Carry out pressure equalisation only with appropriate reference.
- When moved from one location to another with different climatic conditions, the device needs an acclimatisation period of several minutes.
- Technical data, storage and transport requirements can be found on the data sheet.
- Warranty: Device, 12 months

**Appropriate use:**

- The measuring device must only be operated within the specified technical parameters.
- The measuring device can only be used for non-corrosive gas, such as dry air and dry gases.
- The measuring device must only be used under the conditions and for the purposes for which it was designed.
- Operational safety can no longer be guaranteed in the case of modifications or adaptations.

C300



C310... C340

## 2 C300/C310…C340

The new **C**ompact series of hand-held measuring devices for the measurement of barometric pressure and differential pressure is characterised by:

- a large display with background lighting
- simple operation by means of a thumb wheel
- a robust and attractively shaped housing
- high precision
- low price

| | C300 | C310 | C320 | C330 | C340 |
|---|---|---|---|---|---|
| Range | 750...1100 hPa | +/- 500 Pa | 0...100 mbar | 0…2000 mbar | 0…5000 mbar |
| | Absolute pressure | Differential pressure | Differential pressure | Differential pressure | Differential pressure |

Table: Measuring ranges of the different models

**The differential pressure models C310…C340 are equipped with two pressure ports (P1 and P2):**
**In the case of C310 models, the higher pressure is connected to P1. For all the other models, the higher pressure must be connected to P2.**

**Please also observe the maximum overload on ports P1 and P2. Higher pressures may damage or destroy the sensor.**

## 3 The display


◄ Upper menu with date and time

◄ Sensor 1 display (pressure)

◄ Hold, Min, Max, Avg. display

◄ Lower configuration and equalisation menu

# 4 Operation

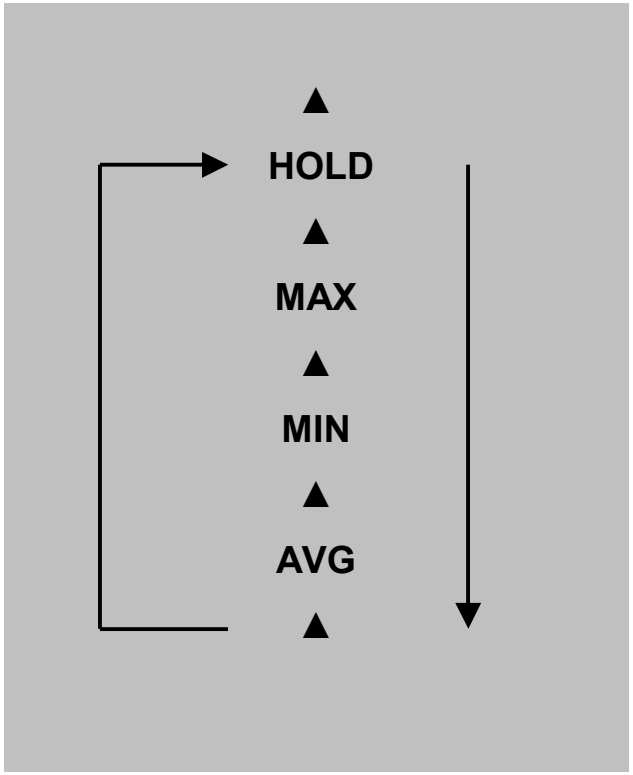
**THUMB-WHEEL**

In contrast to conventional hand-held measuring devices, the C3x0 devices do not have a keypad, but what is known as a ***"THUMB-WHEEL"*** on the left-hand side of the device.
The wheel can be turned up or down through 15° and can also be pressed in the middle position.
Turning the wheel up selects the upper menu. Turning the wheel down selects the lower menu for configuration and equalisation.
The thumb-wheel has to be pressed in the middle position to switch the device on or off and to confirm input values.

The 3 positions of the **THUMB-WHEEL**

| | | |
|---|---|---|
| Symbol in the rest of the text ▶ |  | To switch on: press briefly<br>To switch on with light: press for approx. 2 seconds<br>To switch off: press for approx. 2 seconds (no menu activated) |
| Symbol in the rest of the text ▲ |  | Activating the upper menu with **HOLD MAX MIN AVG**.<br>Select with ▲, confirm with ►, cancel with ▼ or by pressing nothing for 20 seconds. |
| Symbol in the rest of the text ▼ |  | Activating the lower configuration and equalisation menu<br>Select with ▲, confirm with ►, cancel with ▲ or by pressing nothing for 20 seconds. |

## 5 The upper menu




The standard functions:

**HOLD MAX MIN AVG**

can be selected in the uppper menu. Select with ▲, the selected function flashes and is confirmed by means of ►. Once confirmed, the function is shown steady on the display. The menu can be cancelled by ▼ or by pressing nothing for 20 seconds.

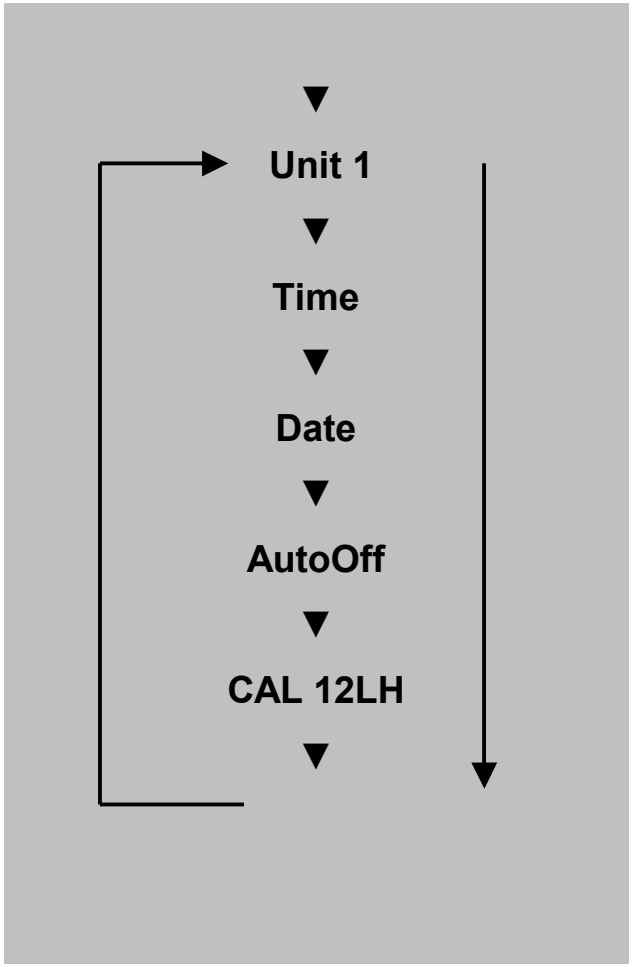
**Hold:** Hold "freezes" the measured value.

**MAX:** MAX displays the maximum value recorded while activated.

**MIN:** MIN displays the minimum value recorded while activated.

**AVG:** AVG displays the arithmetical average value while activated.

The measured values for the functions Hold, MAX, MIN and AVG are displayed in the lower half of the display.




## 6 The lower menu

In the lower configuration and equalisation menu, the functions:

**Unit1 Time Date AutoOff CAL 1LH**

can be selected. Select with ▼, the selected function flashes and is confirmed by means of ►. The menu can be cancelled by ▲ or by pressing nothing for 20 seconds.



Illustration: Housing pressure, C300


Illustration: Housing pressure, C310

**Unit1:** With Unit1 you select the unit of pressure. The unit that can be set depends on the device model. The following table shows which units are possible with which model. You can select with ▲ and ▼, and confirm with ►.

| **Model** | **C300**<br>**750..1100**<br>**hPa** | **C310**<br>**+/- 500**<br>**Pa** | **C320**<br>**0…100**<br>**mbar** | **C330**<br>**0…2000**<br>**mbar** | **C340**<br>**0…5000**<br>**mbar** |
|---|---|---|---|---|---|
| Units | hPa,<br>mbar,<br>In.Hg<br>psi | Pa<br>hPa<br>mbar | hPa<br>mbar<br>in.Hg<br>psi | hPa<br>mbar<br>bar<br>in.Hg<br>psi | hPa<br>mbar<br>bar<br>in.Hg<br>psi |

The units mbar, bar, in.Hg and psi are printed on the housing. The unit selected is indicated by means of arrow symbols.


**Time:** Time is used to set the time. Hours and minutes are one after another. Select by means of ▲ and ▼; and confirm with ►.


**Date:** Date is used to set the date. Day, month end year are entered one after another. Select by means of ▲ and ▼; and confirm with ►.


**AutoOff:** AutoOff is used to set the period in minutes for automatic switching off. If OFF (<1) is set, the device will not switch off automatically. Select by means of ▲ and ▼; and confirm with ►.


## 7 Single-point calibration, C300

**CAL1:** With CAL1 (single-point calibration) you set the offset (error correction + height correction, see table) for the air pressure. The offset is shown in the lower part of the display. Maximum offset is +/- 250.0 mbar / hPa, or 10.00 inHg, or 5.00 psi, and be entered in steps of 0.1 mbar / hPa, or 0.01 bar, or 0.01 inHg, or 0.01 psi. In this context the signs, and the figures before and after the decimal point are set individually, starting with the sign. The offset is active across the whole measuring range.

**The original works settings (elevation head = 0m) can be achieved by setting the offset to 0.0.**

Two-point calibration is not possible with the C300.

Table: Standard atmospheric pressure

| Elevation head/m | Average air pressure/hPa | Height correction/hPa | Change/m hPa |
|---|---|---|---|
| 0 | 1013.25 | 0 | 0.120 |
| 100 | 1001.3 | 12 | 0.118 |
| 200 | 989.5 | 23.8 | 0.118 |
| 300 | 977.7 | 35.6 | 0.116 |
| 400 | 966.1 | 47.2 | 0.115 |
| 500 | 954.6 | 58.7 | 0.114 |
| 600 | 943.2 | 70.1 | 0.113 |
| 700 | 931.9 | 81.4 | 0.111 |
| 800 | 920.8 | 92.5 | 0.111 |
| 900 | 909.7 | 103.6 | 0.109 |
| 1000 | 898.8 | 114.5 | |


# 8 Calibration, C310…C340

## 8.1 Zero point calibration

**CAL1 L:** CAL1 L (zero point calibration) is used to adjust the zero point of the differential sensor. To do this, please remove the connecting hoses from pressure ports P1 and P2.

Select the **CAL1 L** menu with ▼,
and confirm with ►.

Then the value 0.0 is displayed (+/- 1 digit).


## 8.2 Gradient calibration

CAL1 H (gradient calibration) is used to adjust the gradient of the differential sensor.

The adjusted value should be over 50 % of the terminal value of the sensor. The values are entered at the calibration point not as absolute values but as differential values.

The maximum difference at the calibration point is for the

C310: 50Pa (P1=high pressure, P2= low pressure)

C320: 10mbar (P2=high pressure, P1= low pressure)

C330: 2000mbar (P2=high pressure, P1= low pressure)

C340: 500mbar (P2=high pressure, P1= low pressure)

The original works settings can be achieved by setting the offset to 0.

**Important: Gradient calibrations must only be carried out by trained staff with suitable calibration equipment.**

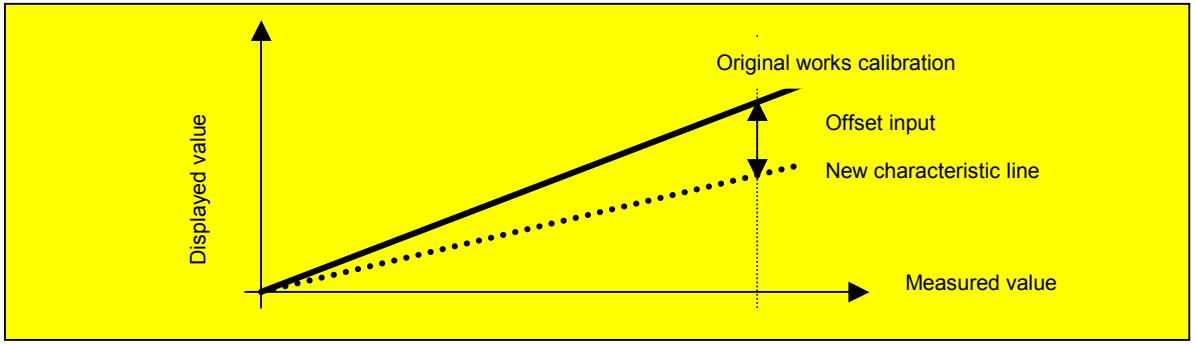
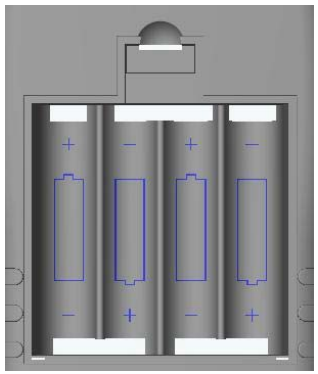



Illustration: Changing the gradient on a differential pressure sensor



Open battery compartment of a C3x0

## 9 Replacing batteries

When the message BAT appears on the display you have a few hours of battery life left. Open the battery cover on the back of the device. Remove the discharged batteries and replace them with new ones.

Please use only IEC LR6 AA batteries.

Do not use rechargeable batteries!

When inserting the batteries please ensure that they are the right way round, and use only high-quality batteries.

## 10 Maintenance and adjustment

When used in the area of climate-control technology, we recommend annual maintenance.

Before it is checked or adjusted the device should be stored at a temperature of approx. 20°C..25°C for 12 hours.

Recalibration should only be carried out by specialist staff or, better still, at accredited laboratories.

Clean the device with a damp cloth as and when necessary. Do not use any cleaning fluids, just plain water to dampen the cloth.