AMPROBE®

CO2-100
CO2 Meter

Users Manual
- Mode d'emploi
- Bedienungshandbuch
- Manual d'Uso
- Manual de uso

AMPROBE®

CO2-100

CO2 Meter

Users Manual

English

July 2009, Rev.1

Limited Warranty and Limitation of Liability
Your Amprobe product will be free from defects in material and workmanship for 1 year from the date of purchase. This warranty does not cover fuses, disposable batteries or damage from accident, neglect, misuse, alteration, contamination, or abnormal conditions of operation or handling. Resellers are not authorized to extend any other warranty on Amprobe's behalf. To obtain service during the warranty period, return the product with proof of purchase to an authorized Amprobe Test Tools Service Center or to an Amprobe dealer or distributor. See Repair Section for details. THIS WARRANTY IS YOUR ONLY REMEDY. ALL OTHER WARRANTIES - WHETHER EXPRESS, IMPLIED OR STAUTORY - INCLUDING IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, ARE HEREBY DISCLAIMED. MANUFACTURER SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, ARISING FROM ANY CAUSE OR THEORY. Since some states or countries do not allow the exclusion or limitation of an implied warranty or of incidental or consequential damages, this limitation of liability may not apply to you.

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All test tools returned for warranty or non-warranty repair or for calibration should be accompanied by the following: your name, company's name, address, telephone number, and proof of purchase. Additionally, please include a brief description of the problem or the service requested and include the test leads with the meter. Non-warranty repair or replacement charges should be remitted in the form of a check, a money order, credit card with expiration date, or a purchase order made payable to Amprobe® Test Tools.

In-Warranty Repairs and Replacement – All Countries
Please read the warranty statement and check your battery before requesting repair. During the warranty period any defective test tool can be returned to your Amprobe® Test Tools distributor for an exchange for the same or like product. Please check the "Where to Buy" section on www.amprobe.com for a list of distributors near you. Additionally, in the United States and Canada In-Warranty repair and replacement units can also be sent to a Amprobe® Test Tools Service Center (see address below).

Non-Warranty Repairs and Replacement – US and Canada
Non-warranty repairs in the United States and Canada should be sent to a Amprobe® Test Tools Service Center. Call Amprobe® Test Tools or inquire at your point of purchase for current repair and replacement rates.

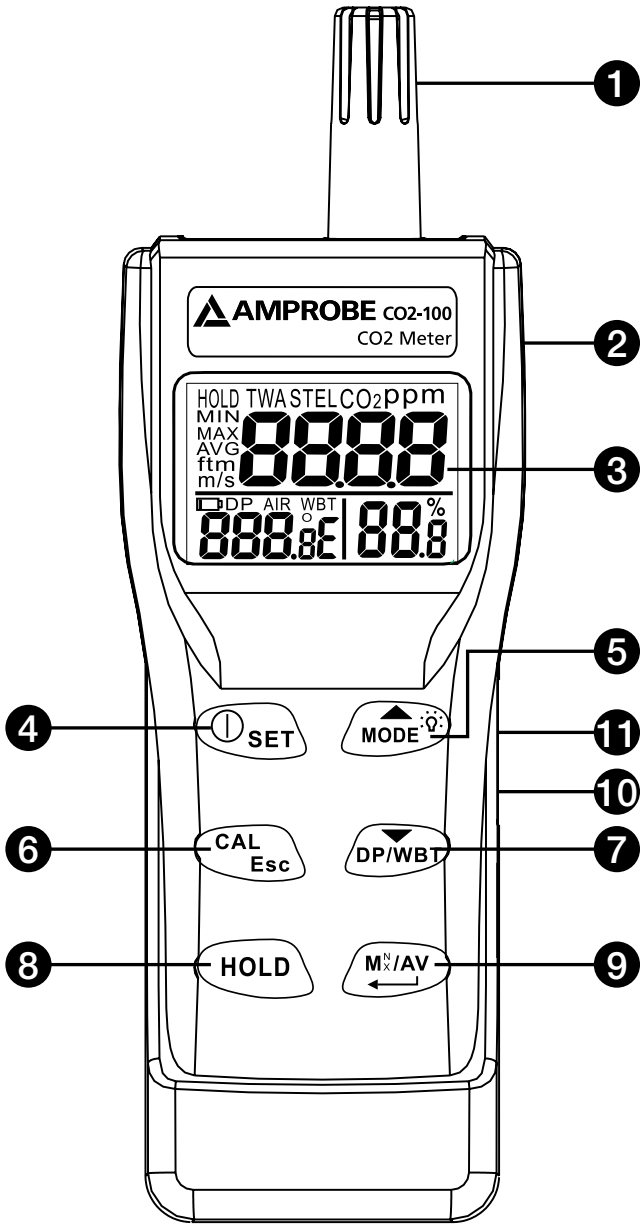
In USA
Amprobe Test Tools
Everett, WA 98203
Tel: 877-AMPROBE (267-7623)

In Canada
Amprobe Test Tools
Mississauga, ON L4Z 1X9
Tel: 905-890-7600

Non-Warranty Repairs and Replacement – Europe
European non-warranty units can be replaced by your Amprobe® Test Tools distributor for a nominalv charge. Please check the "Where to Buy" section on www.amprobe.com for a list of distributors near you.
European Correspondence Address*

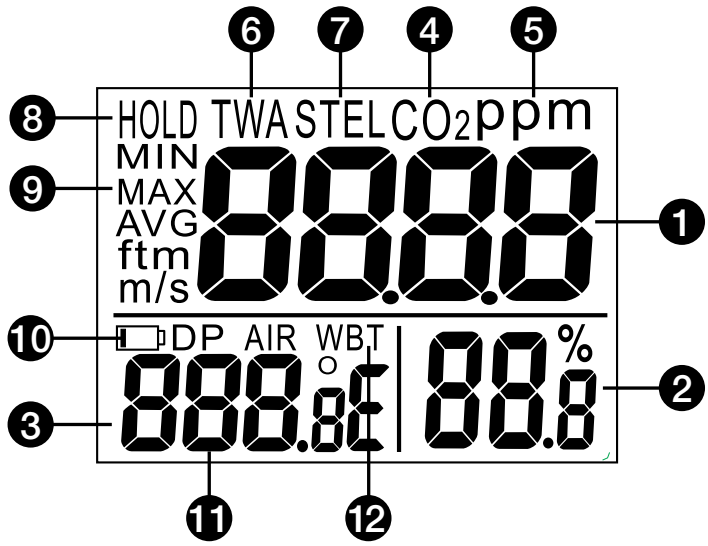
Amprobe® Test Tools Europe
In den Engematten 14
79286 Glottertal, Germany
Tel.: +49 (0) 7684 8009 - 0
*(Correspondence only – no repair or replacement available from this address. European customers please contact your distributor.)

CO2-100 CO2 Meter



1. Humidity Sensor
2. CO2 Sensor (Rear Side)
3. LCD Display
4. POWER/SET Key
5. Backlight/Roll Up Key
6. Calibration/Escape Key
7. Temp. Mode/Roll Down Key
8. Data Hold Key
9. Min/Max/Avg./Enter Key
10. USB Port
11. DC Adaptor Port

LCD Display



1. **Primary Screen Displays CO2 Concentration**
2. **Relative Humidity In %**
3. **Air, Dew Point, Wet Bulb Temperature Display**
4. **Co2 Measurement Mode**
5. **Unit For Co2 Concentration**
6. **Time Weighted Average (8 Hours)**
7. **Short-Term Exposure Limit (15 Minutes Weighted Average)**
8. **To Freeze Readings**
9. **Minimum/Maximun Readings**
10. **Low Battery Indicator**
11. **Dew Point Temperature**
12. **Wet Bulb Temperature**

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SYMBOLS

⚠	Caution! Refer to the explanation in this Manual
✓	Conforms to relevant Australian standards
CE	Complies with European Directives
	Do not dispose of this clamp meter as unsorted municipal waste. Contact a qualified recycler for disposal.

⚠Warning and Precautions

- Avoid condensation on CO2 sensor
- Do not hold the meter close to faces in case exhalation affects CO2 levels.
- Do not calibrate the meter in the air with unknown CO2 concentration. Otherwise, it will be calibrated as 400ppm by default and leads to inaccurate measurements.

UNPACKING AND INSPECTION

Your shipping carton should include:

1 CO2-100 CO2 Meter

4 AA battery

1 User manual

1 Hard carrying case

If any of the items are damaged or missing, return the complete package to the place of purchase for an exchange.

INTRODUCTION

Thank you for purchasing this portable CO2 meter. The meter measures CO2 level, air temp., dew point, wet bulb temp. and humidity and is an ideal instrument for indoor air quality (IAQ) diagnosis.

Poor indoor air quality is considered unhealthy because it causes tiredness, loss of ability to concentrate, and even illness (ex. Sick Building Syndrome). IAQ monitoring and survey, especially on CO2 level and air ventilation become widely applied in public areas such as offices, classrooms, factories, hospitals and hotels. It is also suggested in regulations of industrial hygiene in some countries. (Appendix)

The portable CO2 meter uses NDIR (non-dispersive infrared) technology to ensure the reliability and long term stability. It's useful in verifying HVAC system performance and air ventilation control

Features

- Triple displays of CO2 level, temp. and humidity.
- Stable NDIR sensor for CO2 detection.
- Statistics of weighted averages (TWA & STEL)
- Backlight for working in dark area
- Audile CO2 warning alarm
- Battery and adaptor power supply
- Easy manual calibration on CO2 and humidity
- USB PC connection

OPERATION

1. Press **"POWER/SET"** to turn instrument on and off. At power up, it emits a short beep and performs 30 seconds countdown for meter warm up, then enters normal mode.

2. The meter starts measurement when power on and update readings every second. In the condition of operating environment change (ex. from high to low temp.), it takes 30 sec to respond for CO2 sensor and 30 minutes for RH.

3. Press **"DP/WBT"** to switch temperatures display. The lower left display will cycle from air temperature, dew point temp., and wet bulb temp. (***Fig.1***)

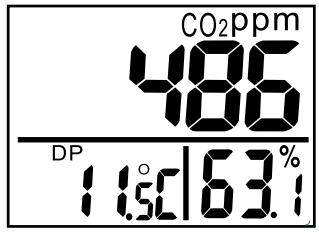

Fig.1

4. Press **"HOLD"** to freeze the readings, **"HOLD"** icon is displayed on the left top of LCD. All current readings are kept unchanged, except STEL and TWA. Press **"HOLD"** again to cancel data hold function.

5. Hold down **"MODE/▲"**for more than 1 second to activate and cancel backlight.

6. Press **"MAX/MIN"** to see the minimum, maximum, and weighted average readings. Each press of it displays MIN, MAX, STEL, TWA in sequence and returns to normal mode. In MIN and MAX modes, it shows the minimum and maximum readings of CO2 on main display, and of AIR/DP/WBT temperatures and humidity on the lower displays.

In STEL and TWA modes, the main display shows the weighted average of CO2 readings for the past 15 minutes (STEL) and 8 hours(TWA), but the lower displays are the current AIR, DP/WB temperatures and humidity readings.

NOTE:

- If the meter is turned on for shorter than 15 minutes, the STEL value will be the weighted average of readings taken since power on. Same for TWA values appear before 8 hours.
- It takes at least 5 minutes to calculate STEL and TWA. The display shows "**----**" during the first 5 minutes from power on (***Fig.2***).

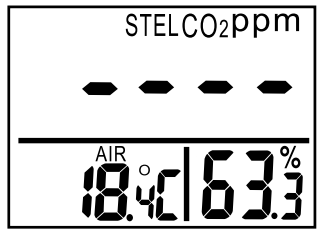

Fig.2

- While all readings are held unchanged, STEL and TWA will keep updating every 5 minutes.

7. The instrument emits beeps (Abt.80dB) when CO2 level goes over the set limit and stops when any key (but "**POWER**" key) was pressed or readings fall below the set value. It beeps again when value goes over the limit. Restart the meter if beeper can't be stopped.

Auto Power Off

The meter turns off automatically after 20 minutes of inactivity. To override the function, hold down "**POWER / SET**" and "**HOLD**" for 2 seconds to turn on the meter until "**n**" appears.

Setup

The advanced setup mode lets you customize your meter.
2 types parameter are available.
P1.0: CO2 alarm threshold setting
P3.0: Temperature unit setting

P1.0 CO2 alarm threshold setting

Hold down "**POWER/SET**" under normal mode for more than 1 sec to enter set up mode. To exit setup, press "**CAL/ESC**" in P1.0 or P3.0.
When entering setup mode, P1.0 and "**AL**" are displayed on the LCD (***Fig.3***). Press "**ENTER**" to go into P1.1 for setting CO2 alarm threshold. The current set value will be blinking on LCD (***Fig.4***). Press "▲"to increase the value or "▼"to decrease. Each press tunes 100 ppm and the alarm range is from 100 to 9900ppm. When the preferred alarm value is set, press "**ENTER**" to save the setting or "**ESC**" without saving and return to P1.0.

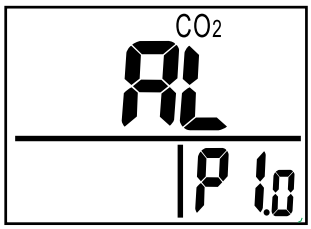

Fig.3

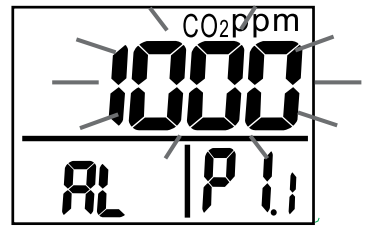

Fig.4

P3.0: Temperature unit setting

Press "▲"or "▼"in P1.0 to access P3.0 for setting up temperature scale. Press "**ENTER**" and it goes into P3.1 with blinking °C or °F current set on the lower left display. To switch °C or °F, press "▲"or "▼. Then press "**ENTER**" to save the setting or "**ESC**" without saving and return to P3.0.

Calibration Mode

CO2 calibration

1. Place the meter in an outdoor area with well ventilated air. Turn on the meter and hold down "**CAL**" and "▼" simultaneously to enter CO2 calibration mode. 400ppm and "**CAL**" are blinking on the LCD while performing calibration (***Fig.5***).

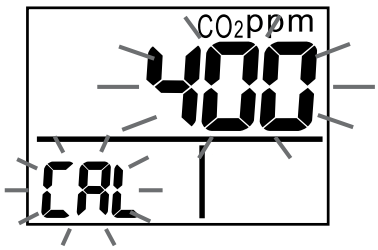

Fig.5

2. Wait about 5 minutes until it stops blinking and the calibration completes automatically and back to normal mode.
3. To abort the calibration, turn off the meter at any time.

Humidity calibration

1. Plug the sensor probe into 33% salt bottle. Hold down "**CAL**" and "▼" under normal mode to enter 33% calibration. "**CAL**" and calibrating value (32.7% if at 25°C) are blinking on the LCD with current temperature at the left. Meter is now calibrating, and will finish in about 60 minutes when "**CAL**" and humidity value stop blinking.
2. After 33% calibration, plug the sensor probe into 75% salt bottle, then press "**ENTER**" to enter 75% calibration. "**CAL**" and calibrating value (75.2% if at 25°C) are blinking on the LCD with current temperature at the left. Meter is now calibrating. Wait about 60 minutes until blinking stops, then calibration is completed and it returns to normal mode.

3. Users can also calibrate either point. To calibrate 33% only, press "**ESC**" and exit when 33% calibration is completed. To calibrate 75% only, press "▲" or "▼"within 5 minutes while initializing 33% calibration. To abort calibration, just turn off the meter.

USB Interface Capabilities

The USB cable and software (optional kit) are required to transfer data to a PC. Install the USB driver in the software first before connection.

SPECIFICATION

CO2	
Range	0~9999ppm (5001~9999 out of accuracy scale range)
Resolution	1 ppm
Accuracy	±30ppm±5%rdg (0~5000) (Not specified for out of scale)
Pressure	+1.6% reading per kPa deviation from normal
Dependence	Pressure, 100kPa
Temperature	
Range	-10.0~60.0°C (14~140°F)
Resolution	0.1°C /0.1°F
Accuracy	±0.6°C / ±0.9°F
Humidity	
Range	0.0~95%
Resolution	0.1%
Accuracy	±3%(10~90% at 25°C) ; ±5%(others)
Operating environment	0~50°C, 0~95%RH (avoid condensation)
Storage environment	-20~60°C, 0~99%RH (avoid condensation)
Power supply	4pcs AA batteries

CE - **EMC:** Conforms to EN61326-1. This product complies with requirements of the following European Community Directives: 89/ 336/ EEC (Electromagnetic Compatibility) and 73/ 23/ EEC (Low Voltage) as amended by 93/ 68/ EEC (CE Marking). However, electrical noise or intense electromagnetic fields in the vicinity of the equipment may disturb the measurement circuit. Measuring instruments will also respond to unwanted signals that may be present within the measurement circuit. Users should exercise care and take appropriate precautions to avoid misleading results when making measurements in the presence of electronic interference.

MAINTENANCE AND REPAIR

If there appears to be a malfunction during the operation of the meter, the following steps should be performed in order to isolate the cause of the problem.

1. Check the battery. Replace the battery immediately when the "🔋" symbol appears on the LCD.
2. Review the operating instructions for possible mistakes in operating procedure.

Except for the replacement of the battery, repair of the meter should be performed only by a Factory Authorized Service Center or by other qualified instrument service personnel. The front panel and case can be cleaned with a mild solution of detergent and water. Apply sparingly with a soft cloth and allow to dry completely before using. Do not use aromatic hydrocarbons or chlorinated solvents for cleaning.

BATTERY REPLACEMENT

1. The meter is powered by either 4 AA batteries or a DC adaptor (9V/1A output).
2. When battery voltage gets low, "🔋" and "Lob" will appear on the LCD (Fig.6). And beeper sounds. The CO2 sensor can't work under low voltage, so it beeps to indicate failed CO2 measurement and the readings won't be displayed. Please replace with fresh batteries or connect with an adaptor.

TROUBLE SHOOTING

Can't power on

- Make sure you press power key more than 0.3 second.
- Check the battery conditions and replace if necessary.
- Check whether the adaptor is well plugged.
- Move batteries away for one minute and then re-install.

Display disappear

- Check whether the low battery icon is appeared before the display is off. If yes, replace with new batteries.

Fixed readings

- Check whether data hold function was activated. (HOLD icon at the left top)

Slow response

- Check whether the air flow channels on the rear were blocked

Error code

E01: CO2 sensor damaged.

E02: The value is under range.

E03: The value is over range.

E04: The original data error results in this error (DP, WB)

E07: Too low voltage to measure CO2. Replace batteries or use an adaptor.

E11: Retry humidity calibration.

E17: Retry CO2 calibration.

E31: Temperature sensor damaged.

E34: Humidity sensor damaged.

APPENDIX - CO2 LEVELS AND GUIDELINES

NIOSH recommendations

250-350 ppm: normal outdoor ambient concentrations
600 ppm: minimal air quality complaints
600-1000 ppm: less clearly interpreted
1000 ppm: indicates inadequate ventilation; complaints such as headaches, fatigue, and eye/throat irritation will be more widespread. 1000 ppm should be used as an upper limit for indoor levels.

ASHRAE Standard 62-1989: 1000ppm

CO2 concentration in occupied building should not exceed 1000ppm.

Building bulletin 101 (BB101): 1500ppm

UK standards for schools say that CO2 at averaged over the whole day(i.e. 9am to 3.30pm) should not exceed 1500ppm.

OSHA: 5000ppm

Time weighted average over five 8-hour work days should not exceed 5000ppm.

Germany, Japan, Australia, UK...: 5000ppm

8 hours weighted average in occupational exposure limit is 5000ppm.

Visit www.Amprobe.com for

- Catalog
- Application notes
- Product specifications
- User manuals

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