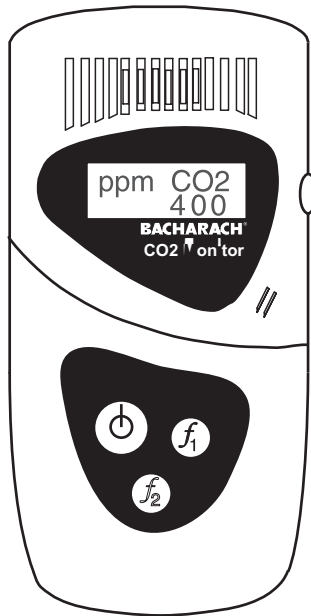




CO₂ Monitor 2800

Instruction 19-9220 Operation & Maintenance

Rev. 6 – June 2004



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SPECIFICATIONS

Range:	0 - 50,000 ppm* or 0 - 5%
Resolution:	0.01% or 100 ppm
Accuracy:	±5000 ppm CO ₂
Temperature:	0 - 40° C
Relative Humidity:	10 - 95% non-condensing
Response Time:	<10 seconds to 90% of reading
Size:	140 (L) x 65 (W) x 20 (D) mm (5.5 x 2.6 x 0.8 in.)
Weight:	200 grams (0.44 lbs.)
Case:	ABS Plastic IP55 (NEMA 3R)
Available Models:	Standard Instrument19-3319 Instrument with 110 VAC Charger19-7101 Instrument with 230 VAC Charger19-7102

* Note that ppm is the standard as supplied. With the optional

1.0 INTRODUCTION

1.1 General

The Bacharach CO₂ Monitor Model 2800 is easy to use, but **it is essential that these Operating Instructions** are read prior to use.

The CO₂ Monitor is designed to warn the user of increasing Carbon Dioxide levels in the range of 0 to 50,000 ppm. The unit is based on the Infra-red absorption principle and has two preset alarm levels - normally 5,000 ppm and 10,000 ppm. When either of these levels is reached, a combination of audible and visual alarm signals will be activated until the CO₂ level returns below the lowest preset level. It is a compact, easy-to-use unit and can be hand-held or attached to a belt.

1.2 Main Features

- *Audible and visual warnings if CO₂ exceeds preset levels.*
- *Easy to operate with user-friendly screen display.*
- *Easy calibration in clean air.*
- *Functional test mode.*
- *Fault condition warning.*

The unit is normally supplied complete with a battery charger and operating instructions.

1.3 Battery

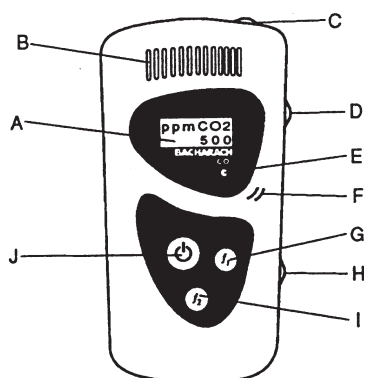
The battery should provide 8 to 10 hours of continuous use when fully charged. When the BATTERY LOW indicator is activated, the unit must be recharged as soon as possible using the battery charger (supplied) which connects to the socket on the side of the unit.

1.4 Units of Measurement

Models are available with readout of CO₂ concentration in either parts per million (ppm) or % (unit must be reconfigured using the optional BACH-COM Software). Please note that 1 % = 10,000 ppm and 0.01 % = 100 ppm.

1.5 Important Note

Always ensure that the sensor grille located on the front of the unit is unobstructed and open to the atmosphere. A quick instrument check can be performed by breathing directly into the sensor grille. This will cause the indicated CO₂ level to increase and may cause the instrument to alarm.



- A - Digital Display
- B - Gas diffusion grille
- C - Alarm light
- D - IrDA communication link
- E - Alarm light
- F - Audible alarm location
- G - Test button (f₁)
- H - Battery charging and ear phone socket
- I - Air calibration button (f₂)
- J - On/Off Button

1.6 Cleaning

Keep the unit clean by wiping with a soft cloth dampened with a mild detergent solution.

1.7 Sunlight

The unit should not be left out in direct sunlight, or in other areas where excessive heat exists, for long periods since component damage due to overheating may result.

1.8 Servicing

There are no user-serviceable parts inside the CO₂ Monitor. Unauthorized disassembly of the unit will invalidate the warranty.

2.0 OPERATION

2.1 Reading Mode

When the instrument is switched on, there will be a 20 second (approximately) warm up time before the CO₂ level present in the atmosphere surrounding the user is displayed. The ON/OFF button should be pressed quickly when switching the unit on and held down for approximately 2 seconds when switching the unit off.



When the unit has been turned on, a “confidence beep” will sound for 0.25 seconds every 30 seconds. This should NOT be interpreted as an alarm condition. The unit has two preset alarm levels which are normally set to indicate the presence of Carbon Dioxide in concentrations above 5,000 ppm or 10,000 ppm (factory preset levels). The levels can be factory set at customer specified levels, or can be reset using the BACH-COM Software (See Section 4.1).

When the CO₂ level rises above the low alarm level:

- The display will show the concentration and flash once per second.
- The Alarm LEDs will flash once per second.
- The beeper will sound intermittently once per second.

When the CO₂ level rises above the high alarm level:

- The display will show the concentration and flash once per second.
- The Alarm LEDs will be lit continuously.
- The beeper will sound continuously.

3.0 MAINTENANCE

3.1 Battery Low

When the battery voltage falls below a predetermined level, the screens will alternate between the following:

Low Batt 300	and	FPM CO2 300
-----------------	-----	----------------

In addition, the alarm will emit three rapid tones every 30 seconds. The unit must be given a full charge as soon as possible. Charging time is between 1 and 1.5 hours. Once the unit is fully recharged, it will emit a constant beeping tone for 30 seconds and display:

CHARGING >>>>	then	CHARGED
------------------	------	---------

3.2 Air Calibration

The unit can be calibrated, approximately, in clean outside air (assumed to be 340 ppm CO₂) by pressing and holding down the f_2 button for a minimum of 3 seconds. It is essential to ensure that the unit is in clean air before attempting an air calibration. If this condition is not ensured, incorrect readings will be obtained. Be careful that your breath does not affect this air calibration procedure. A 340 ppm calibration gas cylinder can be used (See Section 4.1 for a list of Calibration accessories).

Hold the f_2 button down and the following sequence of displays will appear.

A i r C a l
A i r C a l Ø K

The gas display screen will reappear after the f_2 button has been released. If the calibration was unsuccessful, or if the f_2 button was released prematurely, then the display will show the following:

A i r C a l Failed

If this happens, retry the Air Calibration procedure, ensuring that the unit is only exposed to clean outside air. If the procedure is still unsuccessful then the unit must be returned to a Bacharach Service Center (see Section 4.2) for evaluation. This procedure will provide a good low end CO₂ calibration.

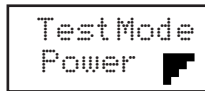
3.3 Calibration Using Higher Gas Concentration

The unit should be checked periodically with a higher concentration of CO₂ gas, depending on usage (every 3-6 months). Check the unit with a gas typically in the 1.5 to 3.0% CO₂ range using the optional Calibration Accessories (Section 4.1). Accuracy should be ±10% of reading.

If during the calibration check, the instrument reading is outside of the tolerance of the check gas used, the instrument can be returned to a Bacharach Service Center (see Section 4.2) for recalibration.

3.4 Test Mode

To activate the TEST MODE, switch the unit on, and then press and hold down the f_1 button. Both LEDs will illuminate and the alarm will sound. The following screen will be displayed:



Provided that both alarm LEDs illuminate, the alarm sounds and the display is as shown, the unit is ready for operation. If any of these functions are NOT operating correctly, the unit must be returned immediately to Bacharach for service.

In the lower part of the Test Mode screen is a bar graph showing the approximate amount of battery power available. As the power in the unit reduces, the bar graph decreases in size.



Full



Empty

3.5 Fault Condition Warning

The unit can warn the user of an internal fault, i.e. a source failure or blockage in the Infrared path. When a fault occurs, both LEDs will illuminate and the alarm will sound continuously. The following screen will display until the unit is switched off.



FAULT

If the fault condition warning is activated at any time, then the unit must be returned to Bacharach for service.

3.6 Data Logging

When the CO₂ Monitor is switched on, it will automatically begin storing time, date and CO₂ levels at 30 second intervals. Optional BACH-COM Software allows this interval to be changed (Section 4.1).

Readings are stored with their real time to the nearest second. There is storage capacity for more than 1,500 sets of readings. Once the storage capacity has been exceeded, the latest readings will overwrite the oldest stored data - i.e. first in, first out.

NOTE: *Optional BACH-COM Software is available to produce tables and plots of real time CO₂ exposure (See Section 4.1 for part numbers).*

3.7 Software Version/Serial Number

While holding the f_1 button down, turn the unit 'on' in order to retrieve the instrument software version and issue date. Releasing the f_1 button will display the instrument serial number for five seconds.

3.8 Factory Authorized Reset Mode

This function should only be activated when advised by a Bacharach service representative as it may alter calibration.

While holding down f_2 button, turn unit "on". The display will show...



FACTORY
SETTINGS

Keep f_2 button depressed for 5 more seconds until the display shows...



FACTORY
RESET OK

4.0 PARTS & SERVICE

4.1 Parts and Accessories

Accessories

IrDA Interface Kit & BACH-COM Software	19-3301
12 VDC Charger w/Cigarette Lighter Adapter	19-3302
Earphone	19-3303
Protective Boot	19-3304
Stand.....	19-3307
Carrying Case	19-3311

Replacement Parts

Battery Pack.....	19-3306
110 VAC USA Plug Charger.....	19-3312
230 VAC European Plug Charger	19-3313

Calibration Accessories

Calibration Kit	19-8027
Calibration Cup.....	19-3305
Calibration Gas:	
340 ppm CO ₂	24-1125
2500 ppm CO ₂	24-1130

4.2 Bacharach Service Centers

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