

Airwatch PM 1500 Personal CO₂ Monitor

Operating Manual

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Airwatch PM 1500 Personal CO₂ Monitor

1. Introduction

1.1 Operating Instructions

The Airwatch PM 1500 CO₂ Personal Monitor is a simple to operate monitor, but it is essential that these operating instructions are read prior to use.

1.2 General

The Airwatch PM 1500 CO₂ Personal Monitor is designed to warn users of increasing carbon dioxide levels in the range of 0 to 5.0%. The unit is based on the infrared principle and has two pre-set alarm levels, normally 0.5% and 1%. When either of these levels is reached, a combination of audible and visual alarm signals will be activated until CO₂ levels return below the lowest pre-set level. Airwatch PM 1500 is a compact, easy to use unit and can be handheld or attached to a belt.

Main features:

- Audible and visual warnings if CO₂ levels exceed pre-set levels
- Easy to operate with user friendly screen display
- Calibration facility in clean ambient air
- Functional test mode
- Fault condition warning

The unit is normally supplied complete with the following accessories:

- Battery charger and lead
- Operating instructions
- Calibration certificate
- Instrument case

1.3 Battery

The unit continuously monitors the state of the battery which will provide typically eight hours 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 into the socket on the side of the unit. As with all rechargeable batteries there are guidelines that should be observed:

- The battery should not be charged at temperatures below 12°C and charging at room temperature is recommended. Charging at lower temperatures may cause a false indication of when the battery is charged and could damage the battery.
- The battery has a long shelf life, but it is recommended that the unit is recharged once a month if left unused. Units that have not been charged for several months should be given two charge/discharge cycles before use.

1.4 Units of Measurement

The Airwatch PM 1500 displays CO₂ in either % or ppm (parts per million).

1.5 Important

Always ensure that the gas diffusion port situated on the front of the unit is unobstructed and open to the atmosphere. Breathing directly into this gas diffusion port will cause the CO₂ level to increase and could thus cause the unit to alarm.

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2. Diagram



A	Digital display	F	Audible alarm location
B	Gas diffusion port	G	Test key (f ₁)
C	Alarm light	H	Battery charging and ear phone socket
D	IrDA communication link	I	Air calibration key (f ₂)
E	Alarm light	J	On/Off key

3. Maintenance

3.1 Cleaning

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

3.2 Sunlight

The unit should not be left out in direct sunlight for long periods since component damage may result due to overheating.

3.3 Servicing

There are no user-serviceable parts inside the Airwatch PM 1500. Unauthorised entry into the unit will invalidate the warranty.

The unit needs to be returned on a 12-month service contract. Please contact your supplier to register your unit for warranty and to organise the annual service contract required on the instrument.

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4. Operation

4.1 Reading Mode

When the unit is switched on, there will be a twenty second warm-up time before the CO₂ level present in the atmosphere surrounding the user is displayed. The On/Off key should be depressed momentarily when switching on the unit and held down for two seconds when switching off the unit.

When the unit has been turned on, a 'confidence chirp' will sound for 0.25 seconds every 30 seconds. This should not be interpreted as an alarm condition. The unit has two pre-set alarm levels which are normally set to indicate the presence of carbon dioxide in concentrations above 0.5% or 1%.

Airwatch 0.03% CO ₂

When the CO₂ level raises above 0.5%:

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

When the CO₂ level rises above 1%:

- The display will show the concentration and flash at once per second
- The alarm LEDs will be lit continuously
- The beeper will sound intermittently at once per second

4.2 Battery Low

When the battery voltage falls below a pre-determined level, the screen will alternate between:

Low Batt 0.03% CO ₂	and	Airwatch 0.03% CO ₂
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In addition, the alarm will emit three rapid tones every thirty seconds. The unit must be given a full charge as soon as possible. Charge time is between 1 and 1.5 hours.

4.3 Air Calibration

The unit can be calibrated in clean outside air (assumed to be 340 ppm CO₂) by pressing and holding down the f₂ button for a minimum of three 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 the user's breath does not affect this air calibration procedure.

Hold the f₂ button down and the following sequence of displays will appear:

AirCal	AirCal OK!
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The 'Gas Display' screen will re-appear after the f₂ button has been released. If the calibration is successful a value of 0.03% or 0.04% will be displayed. If the calibration is unsuccessful, or if the f₂ button is released prematurely, then the display will show:

AirCal Failed!

If this happens re-try 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 an authorised service centre.

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4.4 User Re-calibration

In addition to the 'Air Calibration' procedure, it is also possible to achieve a more precise calibration by connecting the unit to a PC running PM-COM software (optional). The computer will 'talk' to the unit, via an IrDA interface, whilst a known calibration gas is passed over the gas diffusion port.

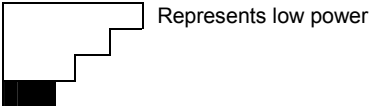
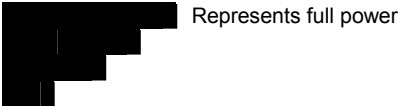
PM-COM software, calibration hood and calibration gas are available from your local distributor.

4.5 Test Mode

To activate the test, switch on the unit and then press and hold down the f₁ button. Both LEDs will illuminate and the alarm will sound every three seconds. The following screen will be displayed:



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, i.e.



4.6 Fault Condition Warning

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



If the fault condition warning is activated at any time, then the unit must be returned to your local distributor for servicing.

4.7 Data Logging

When the Airwatch PM 1500 is switched on, it will automatically commence storage of data at thirty second intervals.

Readings are stored with their 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.

Note	Optional PM-COM software is available to alter data logging intervals and to produce tables and graphs of real time CO ₂ exposure. Please contact your local distributor for details.
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4.8 Software Version/Serial Number

With the unit 'Off' and whilst holding down the f₁ button, turn the unit 'On' in order to display the instrument's software version and issue date. Releasing the f₁ button will display the instrument's serial number for five seconds.

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4.9 Factory Settings

Note	This function should only be activated when advised by your local distributor.
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With the unit 'Off' and whilst holding down the f₂ button, turn the unit 'On'. The display will show:

FACTORY SETTINGS

Keep the f₂ button depressed for five more seconds until the display shows:

RESET OK

Release the f₂ button and follow instructions from your service representative.

Note	An air calibration must now be performed before the unit is used.
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5. Accessories and Spare Parts

Accessories and spare parts are available from your local distributor.

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6. Technical Specification

ELECTRONICS	
Power supply	900mAHr Nickel Metal Hydride rechargeable battery
Communications	RS232 via IrDA conversion unit
Reading storage	1,400 readings approx. (time, date, reading)
Signal output	Ascii data string
Battery life (full charge)	8 Hours typical
Battery charge method	<ul style="list-style-type: none">• Separate mains regulated constant voltage charger (400mA)• Car charger
Battery life	500 charge cycles minimum

ENVIRONMENT	
Operating temperature	0°C to +40°C
Relative humidity	0-100% Non-condensing
Case sealing	IP55

RANGES	
Carbon Dioxide	0 - 5%
Visible/Audible alarms	Any value 0.01% to 5.0% vol
Pre-set alarm setting	0.25% and 0.5% vol
Unit of display	% vol (resolution 0.01%) or ppm (resolution 100 ppm)

PERFORMANCE	
Full scale typical accuracy	<±10%
Response time	<ul style="list-style-type: none">• Standard alarm settings respond in <10 seconds when exposed instantaneously to 0.25% and 0.5% vol CO₂• Response in <5 seconds when exposed instantaneously to 100% CO₂
Audible output	<ul style="list-style-type: none">• 90db at 0.5m• 80db at 1.0m

PHYSICAL	
Weight	0.2KG
Size (excluding fittings)	140mm x 65mm x 20mm (5.5" x 2.6" x 0.8")
Case material	ABS
Keys	3 Key tactile membrane panel
Display	8 x 2 Dot matrix super twist LCD

7. WEEE Compliance

The wheelie bin symbol displayed on equipment supplied by Geotechnical Instruments signifies that the apparatus must not be disposed of through the normal municipal waste stream but through a registered recycling scheme.

The Waste Electrical and Electronic Equipment directive (WEEE) makes producers responsible from July 1st 2007 in meeting their obligations, with the fundamental aim of reducing the environmental impact of electrical and electronic equipment at the end of its life.

Geotechnical is now registered with the Environmental Agency as a producer and has joined a recycling scheme provider who will manage and report on our electrical waste on the company's behalf.

Our Producer Registration Number is WEE/GB0052TQ

When your instrument is at the end of its life, please contact the Geotechnical Instruments sales team who will advise you on the next step in order to help us meet our WEEE obligations.

