User Manual and Installation Guide

SAN-10

Personal 5% CO2 Safety Monitor

CO2Meter
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Revision 00.00

Contents

Introduction to the SAN-10

Congratulations on your purchase of the SAN-10 Personal CO2 Monitor and Data Logger. It is designed to alert employees who work in enclosed areas where carbon dioxide buildup may cause personal harm. If CO2 buildup occurs, it will show the level on screen, flash, alarm and vibrate. In addition, the SAN-10 includes built-in data logging and a man-down alarm that uses an accelerometer to set off the alarm if a sudden shock to the unit (like the wearer falling down) occurs.

The SAN-10 uses a non-dispersive infrared CO2 sensor to provide long term stability. It is shipped fully tested and calibrated and, with proper use, will provide years of reliable service.

Features

- Audible, visual strobe and vibrating alarms
- Large LCD display
- Rugged design with protective rubber enclosure
- Heavy duty metal clip
- Front facing sensor
- Rechargeable Battery 4.2v, 1500mAh
- Micro USB cable and Wall USB charger
- Rechargeable Li-Ion battery – 20+ hours per charge
- Man down alarm
- Calibration methods: Ambient Air (300-600ppm) OR Nitrogen (0-200ppm)
- Automatic atmospheric pressure compensation for CO2 concentrations
- No over-exposure or negative memory effects
- Stable NDIR sensor for CO2 detection
- CO2 Data log
- Data can be exported via USB

Monitor

1. Visual alarm/strobe
2. Front facing sensor
3. Charging indicator
4. LCD display
5. Power button
6. Menu button
7. USB-C port and charging inlet (bottom side)
8. Heavy duty metal clip
9. Factory reset button

LCD Display

1. Low alarm indicator
2. High alarm indicator
3. Battery indicator
4. CO2 concentration
5. CO2 concentration units (ppm or %)
6. Calibration icon
7. Man down alarm
8. Data logging indicator

Operation

Power Button

1. When the Monitor is turned off, press the power button to turn on the unit.

2. When the Monitor is turned on, press the power button for 3 seconds to turn off the unit.

When the unit is first turned on, it performs a 5 second countdown, then enters normal display with current CO2 readings displayed. The monitor starts taking measurements when powered on and updates readings every 2 seconds.

Menu Status

By pressing the menu button for 5 seconds, the unit enters into "Menu status". There are six menu items by pressing the menu button shortly to loop switching between AIR, N2, Hx.x, Lx.x, A ON/OFF, SC, Px, Log and E (exit).

The menu times are further described in the table below:

Menu Items	Functional Description
AIR (“AIR”)	**Ambient Air Calibration**. User presses the power button to implement **Ambient Air Calibration** (300~600ppm).
N2 (“n2”)	**Nitrogen Calibration**. Press the power button to start nitrogen calibration (0~200ppm).
H0.5/H0.5T/ H1.0/H1.5/H2. 0/H2.5/H3.0/ H3.5/H4.0	**High Alarm Threshold** setup. **User presses the power button to switch the high alarm threshold: H0.5 (5000ppm), H0.5T (5000 ppm TWA), H1.0 (1000ppm), H1.5 (15000ppm), H2.0 (20000ppm), H2.5 (25000ppm), H3.0 (30000 ppm), H3.5 (35000 ppm) and H4.0 (4000ppm).**
L0.5/L0.5T/L1.0 /L1.5/L3.0	**Low Alarm Threshold** setup. Press the power button to switch the low alarm threshold: L0.5 (5000 ppm), L0.5T (5000 ppm TWA), L1.0 (10000 ppm), L1.5 (15000 ppm), and L3.0 (30000 ppm).
A ON A OFF	**Man down alarm** set on/off. Press the power button to switch “A ON” to turn on the man down alarm or “AOFF” to turn off the man down alarm)
SC (“SC”)	**Real time clock** setup Press the power button to enter the real time clock setup: a. Press the °F/°C button to switch between Year (Y), Month (0), Day (d), Hour (h), Minute (i) , Second (S) and . (E) to exit. b. Press the power button to increase the value until the correct time is set. This value is a cyclic change. Press the power button again to save and exit the menu status.

Px	**Data logging period** setup Press the power button to switch the data logging period between: P30 (30 seconds), P60 (60 seconds), P120 (120 seconds or 2 minutes), P300 (300 seconds or 5 minutes), P600 (600 seconds or 10 minutes) or P900 (900 seconds or 15 minutes).
Log ("L09")	**Data logging memory** operation Press the power button to switch the data logging memory operation between: • EP (Export data logging by USB) • RES (Reset the memory) • E (Exit without operation).
E	**Exit**. Press the power button to exit the menu status.

Alarm Threshold

The SAN-10 is equipped with audible, visual and vibration alarms to alert users when the ambient oxygen concentration exceeds either of the two factory preset alarm levels:

- Danger High Alarm: LED will flash and audible alarm will sound 3x / sec.
- Warning Low Alarm: LED will flash and audible alarm will sound 2x / sec.

There are high and low alarm thresholds in the SAN-10. Both high and low alarms have five thresholds: 5000ppm, 5000ppm TWA, 1.0%, 1.5%, 2.0%, 2.5%, 3.0%, 3.5% and 4.0%. Obviously, the high alarm threshold should not be less than the low threshold.

They can be the same alarm level.

Automatic Atmospheric Pressure Compensation.

The CO2 measurement is affected by atmospheric pressure or altitude changing. When users are at high altitude, compensation is made internally to ensure maximum monitor accuracy.

This device has automatic atmospheric pressure compensation for CO2 concentrations by means of a digital atmospheric pressure sensor integrated in the unit.

Man Down Alarm

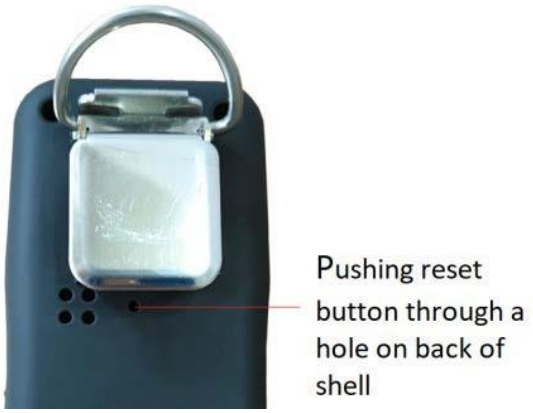
Falling by breathing dangerous gases can cause serious injury and even fatality to workers. If the Man down alarm function in SAN-10 is set on, SAN-10 can detect falls and send a man down alert which will activate the audible and visual alarms and alert other people in the area.

The man-down detection uses a three-axis accelerometer to automatically monitor the user's movements in order to identify a sudden fall or impact and a lack of movement for a period of 6 seconds.

Once alerted, you can turn off the man-down alarm by pressing either of the two buttons.

Reset Button

Users can reset the unit by pushing a reset button through a hole on back of shell.



Access Data Log

The SAN-10 has an internal storage system that acts like an SD card. Simply connect the SAN-10 to a PC using the included USB-C charging cable. The device will connect to a COM port of the PC. You will be able to access all saved data this way. Manage the data files (Save/Copy/Delete/Export) in this manner. When you are finished managing the data, **eject** the device from the pc and then disconnect the cable to resume use of the personal safety monitor. Failure to eject the device prior to disconnecting the cable could result in damage to the device .

Calibration

Step 1. Power the unit on by pressing and holding the power button for 3 seconds

Step 2. Press and hold the ºF/ºC button for 5-10 seconds to open the first menu

Step 3. Use the ºF/ºC button to scroll through the first menu which will read:

a) AIR (Ambient Air Calibration Option)
b) N2 (Zero Nitrogen Calibration Option)
c) L 0.5 (Low alarm threshold)
d) H 3.0 (High alarm threshold)
e) A ON (Alarm option. Turns the alarm on and off)
f) E (To exit the menu and return to home screen)

SAN-10

Step 4. Perform AIR or N2 calibration

"AIR" Ambient air calibration	"N2" Nitrogen calibration
• Follow above instructions to access the menu • The "AIR" option is the first to appear • Bring the unit OUTSIDE or use 400ppm CO2 • Press the power button to start the calibration • If the screen reads "FAIL" repeat until the calibration passes *IF THE MONITOR DOES NOT READ IN THE **300-600 PPM RANGE** BEFORE PERFORMING THE CALIBRATION, IT WILL NOT CALIBRATE IN THE FIRST MENU.	• Follow above instructions to access the menu • Go to "N2" option • Expose the device to nitrogen gas • Press the power button to start the calibration • If the screen reads "FAIL" repeat until the calibration passes *IF THE MONITOR DOES NOT READ IN THE **0-200 PPM RANGE** IT WILL NOT CALIBRATE IN THE FIRST MENU.

Step 5. (USE ONLY IF THE DEVICE IS NOT IN RANGE AND FAILED TO CALIBRATE IN THE FIRST MENU) To open the second menu press and hold the ºF/ºC button while already in the first menu.

Step 6. This menu will allow you to calibrate without range limitations. The second menu will read: o -AIR (Ambient Air Calibration Option without limits) o -N2 (Zero Nitrogen Calibration Option without limits) o -E (To exit the menu and return to home screen)

Step 7. When calibration is complete make sure the unit is reading within the span values. Test with fresh air which should read about 400-450 ppm CO2.

Maintenance

The SAN-10 is a low maintenance safety monitor that requires little maintenance. It is recommended to calibrate the internal NDIR CO2 Sensor annually. This calibration can be completed in the field, or the monitor can be returned to CO2Meter to perform the calibration. A calibration certificate will be provided with every calibration service. Be sure to ask a CO2Meter technician for more information.

Warranty

CO2Meter warrants the products to be substantially free of defects in workmanship and materials when used for their intended purposes for a period of either one (1) year or ninety (90) days from the date of shipment of the applicable products as specified for each product on the individual product pages located at www.co2meter.com (the "Manufacturer's Limited Warranty"). No employee or representative of CO2Meter may alter the terms of the Manufacturer's Limited Warranty verbally or in writing.

To take advantage of the Manufacturer's Limited Warranty, the product must be returned to us at your expense. If after examination, we determine that the product is defective, CO2Meter at its election will repair or replace the defective product. The foregoing is the customer's exclusive remedy in the event of a valid warranty claim.

Notwithstanding anything contained herein, the Manufacturer's Limited Warranty shall not apply to: (i) any product that has been customized, altered, or repaired by any person not authorized to do so by CO2Meter; or (ii) any product that has been subject to misuse, neglect, or accidental damage. This warranty does not apply to calibration of any product.

In the event of an alleged warranty claim, you agree to contact us to request a return authorization prior to returning any products to us. We will only honor valid warranty claims of which we have been given notice prior to the expiration of the applicable limited warranty period. You agree to comply with all commercially reasonable rules and policies governing warranty claims which we may institute from time to time. Such rules and policies may be located at www.co2meter.com/pages/faq#warranty.

If you return a product to us, and we determine in our reasonable discretion that it falls within an exception to the Manufacturer's Limited Warranty as described herein, we will have no obligation to you other than to return the product(s) at your sole cost and expense.

It is our customer(s) responsibility to share your application with the CO2Meter sales team so they can help identify any potential issues your application may cause with our devices. Important information to share will be: expected CO2 concentration, temperature, humidity, and any other particles or gases in your application. Applications with interfering gases can damage our sensors and devices. Those applications with high humidity can damage the electronics and the CO2 sensors beyond repair.

Product Returns

If any Product fails under normal use, you may return it to us, by first submitting a customer case support ticket (submission here). Policies and procedures for returns and refunds related to the same are located at www.co2meter.com/pages/faq.

All returns for refund after thirty (30) days from shipment of the applicable product will incur a 25% re-stocking fee. No product will be accepted for return or refund after 45 days from shipment.

Non-refundable clause, if a product is refunded, and your purchase included a calibration certificate charge, due to the calibration being a service, not an actual product item your refund will not include the certification charge in your refund.

Support

If the User Manual/ Installation guide above does not contain the needed operation, installation or trouble shooting information, please contact CO2Meter at:
Support@CO2Meter.com

Contact Us

We are here to help! For information or technical support, please contact us using the information below. For further guidelines on CO2Meter Terms & Conditions, click here.

- support@co2meter.com
- (386) 256-4910 (Technical Support)
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