Air Quality CO_2 Meter
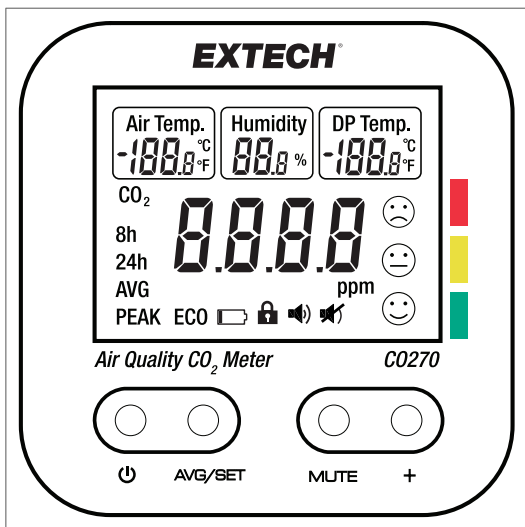**CO270**

Introduction

Thank you for selecting the Extech CO270 Air Quality Meter. The CO270 monitors CO_2 levels using an NDIR sensor (non-dispersive infrared), with additional sensors for temperature and humidity. Dew point temperature is calculated from temperature and humidity readings. CO_2 concentration is displayed digitally and with three display emoji and associated color-coded labels.

The unit is battery powered and includes peak and average features, password and anti-theft and protection, and a CO_2 alarm. The alarm offers a high volume beeper. The monitor can be field-calibrated.
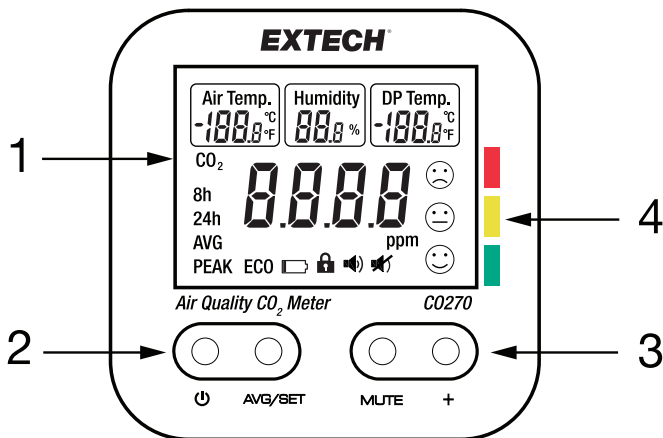
The package includes one monitor, three (3) AAA batteries, a wall-mount kit, and documentation.

Quick Start

1. Install the three (3) AAA batteries in the rear compartment.
2. For setup purposes, stand the monitor on a desktop, using the rear tilt-stand.
3. On a sunny day, away from CO_2 sources, leave the monitor next to an open window for 20 minutes.
4. After 20 minutes, check that the CO_2 reading is between 350 and 450 ppm. If not, calibrate the monitor.
5. Install the meter in the desired location using the tilt-stand or the wall-mount kit.
6. Do not block the air vents, air must be able to circulate freely through the monitor.
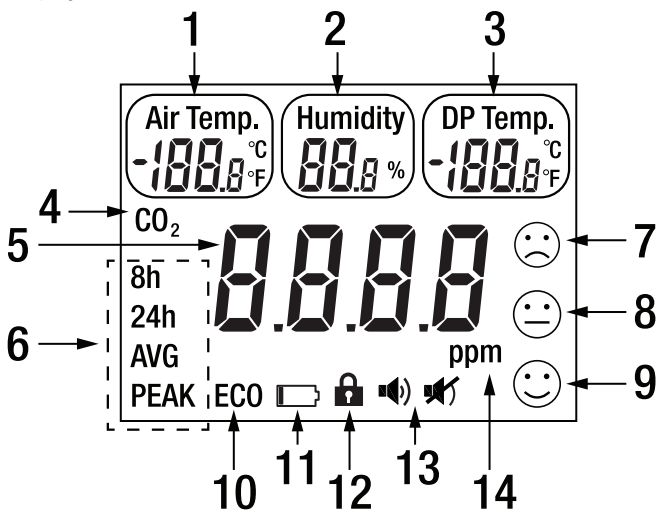
Description

Front Panel

1. Display (detailed below).
2. Power and Average/Set button (detailed below).
3. Mute and Plus (+) button.
4. Color-coded CO_2 concentration labels, next to their associated emoji. Green for normal, yellow for moderate, and red for high concentration.
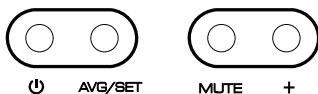
Display

1. Air temperature measurement.
2. Relative humidity measurement.
3. Dew point temperature calculation.
4. Carbon dioxide symbol.
5. CO_2 measurement.
6. Icons for 8– and 24–hour average reading and 24–hour peak reading modes.
7. High level of CO_2 emoji (beeper will sound).
8. Moderate level of CO_2 emoji.
9. Normal level of CO_2 emoji.
10. ECO mode. Conserves battery energy (display updates every 60 seconds instead of every 10 seconds).
11. Low battery icon.
12. Password lock is enabled.
13. Beeper enabled (L) and disabled (R) icons.
14. Parts per million. Unit of measure for CO_2.

Keypad

The monitor has four control buttons, power, average/set, mute, and plus (+), as shown. The table below describes how the buttons are used.

| ⏻ | AVG/SET | MUTE | + |

SET and **MUTE**	Press the SET and MUTE buttons together to unlock the meter (if locked).
⏻	Power button. Press to power the meter. Long press to switch OFF.
AVG	Average reading. Press to view the average reading over the previous 8–hour or 24–hour period. Also shows the 24–hour peak.
SET	Setup mode button. Long press to access the setup mode. While in setup mode, use this button to scroll and to confirm a setting.
MUTE	Mute button. Press to mute the audible beeper when it triggers.
+	Addition button. Press to adjust a parameter in the setup mode.
SET and **+**	Press the SET and + buttons together to access the 400 ppm CO_2 calibration mode.

Operation

POWER

The monitor is powered by three (3) AAA batteries, housed in the rear compartment. Press the power button to switch the monitor ON, the 10–second warm-up timer will run.

NORMAL OPERATION

When the monitor is powered it will indicate CO_2 concentration, temperature, and humidity.

Before first use, and before mounting, place the monitor next to an open window, on a sunny day, away from CO_2 sources, for twenty (20) minutes. After 20 minutes, check that the CO_2 reading is between 350 and 450 ppm. If not, calibrate the monitor.

Place the monitor on a desktop using the rear tilt-stand or mount on a wall using the supplied mounting kit.

Do not block the air vents, air must be able to circulate freely through the monitor.

ANTI-THEFT MOUNTING

When mounting in a public space, use the supplied stainless steel mounting kit to wall-mount the monitor.

PASSWORD LOCK

The password lock protects the monitor from tampering. This feature is OFF by default.

When the unit is locked, you'll be prompted to enter the four-digit password when you attempt to access the monitor. The password is factory set to 5555. When prompted, unlock the monitor as explained below.

1. Long press the SET and MUTE buttons together. Four digits will appear, with the left digit flashing.
2. Use the + button to adjust the flashing digit.
3. Press SET to confirm the digit, and then adjust the remaining three digits similarly.
4. When the correct four-digit password is entered, the lock icon will switch off.

To set the password protection ON, and to change the four-digit password, refer to the Setup Mode section.

AVERAGE AND PEAK MODES

The monitor averages readings over the previous 8–hour and 24–hour period. It also records the peak reading over the previous 24–hour period. Use the AVG button to view these readings. Refer to the display description section, above, to interpret the display.

AUDIBLE BEEPER

The beeper is disabled by default. Enable the beeper in the setup mode. The beeper sounds when the CO_2 alarm is triggered. Set the alarm threshold per the instructions in the setup mode.

Setup Mode

SETUP MODE OVERVIEW

Long press the SET button to access the setup mode. Use the SET button to scroll through the parameters, listed below, and use the + button to make changes.

- P 1.1 (AL 1): Alarm threshold 1 (the change from smile ☺ to neutral ☺ emoji)
- P 1.2 (AL 2): Alarm threshold 2 (the change from neutral ☺ to frown ☹ emoji)
- P 2.0 (UNt): Temperature units (C/F)
- P 3.0 (BU): Beeper (ON/OFF)
- P 4.0 (Loc): Password lock (ON/OFF)
- P 5.0 (ABc): Automatic Baseline Calibration (ON/OFF)
- P 6.0 (ECo): Energy saving mode (ON/OFF)

ALARM THRESHOLDS (AL1 and AL2)

1. Long press SET to access the setup mode. AL1 is the first parameter (P1.1). This is the alarm threshold that switches the smile ☺ emoji to the neutral ☺ emoji.
2. Use the + button to adjust the threshold. The adjustment range is 600 to 3000 ppm in 100 ppm increments. See the table below for default emoji ranges.
3. Press the SET button to access the AL2 parameter (P1.2). This is the alarm threshold that changes the neutral ☺ emoji to the frown ☹ emoji.
4. If the beeper is enabled in the setup mode, it beeps when the frown emoji is shown.
5. If the two alarm thresholds are set to the same value, the neutral emoji will be excluded.

Table 1 Default ranges for the display emoji

☺	< 800 ppm
☺	800 to 1000 ppm
☹	> 1000 ppm

TEMPERATURE UNITS (UNt)

1. Use the + button to set ℃ or ℉ units.
2. Press SET to step to the next parameter.

BEEPER ON/OFF (BU)

1. Use the + button to enable the beeper (the beeper is disabled by default).
2. Press SET to step to the next parameter.

PASSWORD LOCK ON/OFF (Loc)

1. Use the + button to enable the lock (the lock is disabled by default).
2. When you set the lock ON, the next screen will prompt you to set the password. The first password digit (on the left) will flash. Use the + button to change the flashing digit, and then press the SET button to move to the next digit. Change the remaining digits in the same way.
3. Press SET to step to the next parameter.

AUTO BASELINE CALIBRATION ON/OFF (ABc)

An ABC calibration uses the lowest CO_2 value measured over the previous 7.5 days as a reference. The ABC calibration can be used if a full manual calibration is not convenient or possible. Do not activate the ABC calibration in confined, heavily populated, public places, such as a hospital.

1. Use the + button to enable the ABC calibration (ABC is disabled by default).
2. Press SET to step to the next parameter.

ECONOMY MODE ON/OFF (ECo)

In normal mode, the monitor updates the display every ten (10) seconds. To conserve battery energy, activate the ECO (ecological) mode. The monitor will then update every sixty (60) seconds.

1. Use the + button to enable ECO (ECO is disabled by default).
2. Press SET to exit the setup mode.

CO$_2$ Calibration

Calibration Overview

The monitor is factory calibrated at a CO$_2$ concentration of 400 ppm. To maintain high accuracy, calibrate the unit periodically.

Calibration Procedure

1. Set the monitor in an environment of 400 ppm for at least twenty (20) minutes.
2. Long press the SET and + buttons until **CAL** is displayed.
3. Press the + button to select **YES** and then press SET to start the calibration (Select **NO** to abort).
4. The monitor will countdown 300 seconds while calibration is active.
5. After 300 seconds, If the calibration is successful, the display will show **PASS**. If **FAIL** is displayed, retry the calibration. If issues persist, contact Customer Support.
6. Press SET to return to normal operation.

Calibration Considerations

- Do not calibrate the meter in an environment with an unknown CO$_2$ concentration.
- Perform calibration in a well-ventilated area outdoors with fresh air and sunny skies where the CO$_2$ concentration is approximately 400 ppm.
- Do not calibrate on a rainy day or in very high humidity.
- Do not calibrate in crowded areas or near air ducts or fireplaces.

Maintenance

Battery Replacement

The monitor is powered by three (3) AAA batteries, housed in the rear compartment. When the low battery icon appears, replaced the batteries.

1. Unlatch the battery compartment.
2. Remove the old batteries and discard responsibly and in accordance with applicable laws and regulations.
3. Install the new batteries, observing correct polarity. Always use new batteries of the same type.
4. Secure the battery compartment before use.

Do not dispose of used batteries or rechargeable batteries in household waste.

Cleaning and Storage

Wipe the monitor with a damp cloth and mild detergent as necessary. Do not use solvents or abrasives to clean this device.

When storing, remove the batteries and store separately.

Specifications

Measurement Specifications

CO_2
Range: 0 to 9999 ppm; Resolution: 1 ppm
Accuracy: ± (50 ppm + 3% of reading) from 400 to 5000 ppm   10 % of reading from 5001 to 9999 ppm   < 400 ppm (not specified)
Air temperature
Range: 32 to 122°F (0 to 50℃); Resolution: 0.1°
Accuracy: ± 1.0°F (0.6℃)
Relative Humidity
Range: 5 to 95% RH; Resolution: 0.1 %
± 7% RH @ 77°F (25℃)
Dew point temperature
Range: -90.8 to 122.0°F (-68.2 to 50.0℃); Resolution: 0.1°
Accuracy: Dew point is calculated from temperature and humidity readings

General Specifications

Display	LCD type (2.4 x 1.7 in. [60 x 44 mm])
Warm-up time	10 seconds
Response time	CO_2: < 5 minutes (90% step change)
	Temperature: < 2 minutes (90% step change)
	Humidity: < 20 minutes (90% step change)
Beeper level	70 dB (approximately) at 4 in. (10 cm) distance
Housing material	ABS
Mounting height	4.6 to 5.9 in. (1.4 to 1.8 m)
IP rating	IP30
Power supply	Three (3) x AAA batteries
Battery life	1 year in ECO mode; 6 months in normal mode
Power consumption	40 μA (ECO mode); 70 μA (normal mode)
Operating temperature	32 to 122°F (0 to 50°C)
Storage temperature	–4 to 122°F (–20 to 50°C)
Operating and storage humidity	< 95% non-condensing
Dimensions	3.4 x 3.4 x 1.0 in. (86 x 86 x 25 mm)
Weight	4.1 oz. (115 g)
Included items	Monitor, three (3) AAA batteries, wall mount kit, documentation

Troubleshooting

Error Code Displays

CODE	DESCRIPTION
E34	CO_2 sensor is damaged. Contact Customer Support.
E03	Over-range CO_2 measurement. Place the meter in a 400 ppm environment for 5 minutes.
E02	Under-range CO_2 measurement. Calibrate the meter.
E04	Data error. Similar to an over- or under-range condition. Place the monitor in a room temperature environment for 30 minutes.
FAIL	Calibration failed. If issues persists, contact Customer Support.
E36	Power to the sensor is low. Replace the batteries.

Customer Support

Customer Support Local Telephone List:

https://support.flir.com/contact

Returns (RMA):

https://customer.flir.com/Home

Warranty

Teledyne FLIR warrants this Extech brand instrument to be free of defects in parts and workmanship for two years from date of shipment. To view the full warranty text, please visit the support site, link below.

https://www.flir.com/support-center/warranty/

EXTECH®

USER MANUAL

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