

FLUKE®

CO-210

Carbon Monoxide Probe

Instruction Sheet

Introduction

The CO-210 Carbon Monoxide Probe (hereafter referred to as “the Probe”) detects the presence of carbon monoxide (CO) and measures concentrations between 1-1000 parts/million (PPM).

The Probe can be used in one of two ways:

- As a stand-alone unit that indicates the presence of CO by a flashing, light-emitting diode (LED) and a beeper.
- As an accessory to a digital multimeter (DMM) that reads out 1 PPM as 1 mV dc. (The Probe is compatible with most DMMs that have an input impedance of $\geq 1 \text{ M}\Omega$.)

Contacting Fluke

To contact Fluke, call one of the following telephone numbers:

USA: 1-888-99-FLUKE (1-888-993-5853)

Canada: 1-800-36-FLUKE (1-800-363-5853)

Europe: +31 402-678-200

Japan: +81-3-3434-0181

Singapore: +65-738-5655

Anywhere in the world: +1-425-446-5500

Or, visit Fluke's Web site at: www.fluke.com.

PN 689429 (English)

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⚠ Safety Information - Read First

⇒ **Do not use the Probe as a personal safety monitor.**

⇒ **Learn and recognize the effects of CO poisoning.**

0-1 PPM	Normal background levels.
9 PPM	ASHRAE Standard 62-1989 for living areas.
50 PPM	OSHA enclosed space 8-hour average level.*
100 PPM	OSHA exposure limit.*
200 PPM	Mild headache, fatigue, nausea and dizziness.
800 PPM	Dizziness, nausea and convulsions. Death within 2 to 3 hours.
<small>* U.S. Department of Labor Occupational Safety & Health Administration (OSHA) Regulation 1917.24: The CO content in any enclosed space shall be maintained at not more than 50 PPM (0.005%). Remove employees from enclosed space if the CO concentration exceeds 100 PPM (0.01%).</small>	

Turning the Probe On

Install the battery. To turn the Probe on, press the green button.

The probe beeps twice, then performs a 10-second self-test, during which the Probe emits a series of 2 beeps followed by a pause.

If the Probe passes the self-test, the Probe begins monitoring, which is indicated by a beep every two seconds.

Self-Test

The Probe tests the sensor and the battery each time it is turned on and continuously monitors the battery.

If the battery needs to be replaced or the sensor fails, the Probe emits a series of five beeps, followed by a long pause, and another series of five beeps. The Probe then turns itself off.

If after replacing the battery, the alarm condition persists, the sensor may have failed. Contact an authorized Fluke service center for information on how to replace the sensor.

Establishing a Baseline

Before testing for CO, establish a baseline against which the Probe compares other environments.

Do this by turning on the Probe. If the Probe detects between 0-3 PPM of CO, the beeper sounds, the LED flashes once a second, and the Probe establishes a new baseline.

If the Probe detects more than 3 PPM, it does not establish a new baseline, but starts taking CO measurements.

Automatic Power-Off

The Probe automatically turns itself off after 20 minutes.

Muting the Beeper

To mute the beeper, press the ON/OFF switch for more than 2 seconds when turning the instrument on.

To re-enable the beeper, turn the Probe off and then turn it back on.

Using the Probe as a Stand-Alone Unit

When the Probe is used as a stand-alone indicator, the LED and beeper indicate the presence of CO.

The faster the LED flashes and the beeper sounds, the higher the concentration of CO.

Above 200 PPM the LED stays on, the beeper sounds continuously, and the frequency of the tone increases with the concentration of CO.

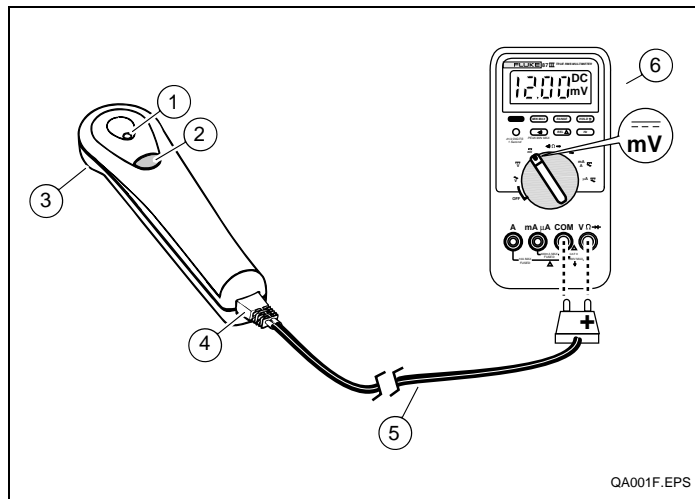
Using the Probe as a DMM Accessory

1. Plug the RJ45 connector into the Probe and plug the Probe cable into the voltage and common jacks on the DMM.
2. Put the DMM in the mV dc (or V dc) function, and turn the DMM on.

To avoid false readings, replace the battery in the DMM as soon as the low battery indicator appears.

3. The DMM displays 1 mV dc for each 1 PPM of CO.

Above 1000 PPM, the Probe outputs 5000 mV to indicate an over-range condition.

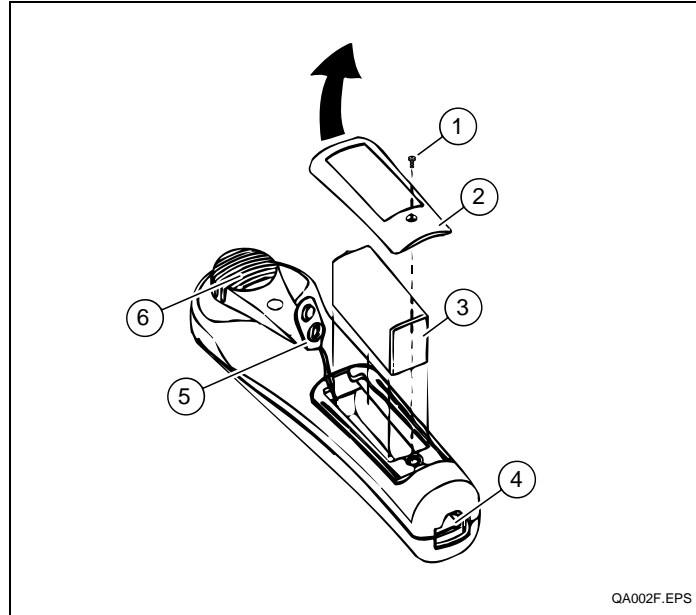


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①	Light-Emitting Diode (LED)
②	ON/OFF Button
③	Sensor (Fluke PN 689497)
④	RJ45 Connector
⑤	Cable with RJ45 Connector and Plug (Fluke PN 689307)
⑥	DMM Connections and Settings

Fluke CO-210 Carbon Monoxide Probe

Installing and Replacing the Battery



①	Screw
②	Battery Door
③	Battery, 9 V NEDA or IEC 6LR61, or equivalent
④	RJ45 Jack
⑤	Battery Connector
⑥	Sensor

Common Sources of CO

Common sources of potentially dangerous levels of CO are:

- Poorly maintained furnaces, gas heaters, or fireplaces.
- Dirty or plugged chimneys, or flue exhausts.
- Poorly maintained gas, oil, or kerosene appliances.
- Internal combustion engines (e.g., automobiles, lawnmowers, blowers).

CO and Appliance Malfunctions

The following table identifies typical problems that can produce high levels of CO.

Appliance	Fuel	Typical Problems
Gas furnaces Room heaters	Oil, natural gas, or LPG (liquefied petroleum gas)	<ol style="list-style-type: none"> 1. Cracked heat exchanger. 2. Not enough air to burn fuel properly. 3. Defective/blocked flue. 4. Maladjusted burner. 5. Building not properly pressurized.
Central heating furnaces	Coal or kerosene	<ol style="list-style-type: none"> 1. Cracked heat exchanger. 2. Not enough air to burn fuel properly. 3. Defective grate.
Room heaters Central heaters	Kerosene	<ol style="list-style-type: none"> 1. Improper adjustment. 2. Wrong fuel (not K-1). 3. Wrong wick or wick height. 4. Not enough air to burn fuel. 5. System not properly vented.
Water heaters	Natural gas or LPG	<ol style="list-style-type: none"> 1. Not enough air to burn fuel properly. 2. Defective/blocked flue. 3. Maladjusted burner. 4. Building not properly pressurized.
Ranges Ovens	Natural gas or LPG	<ol style="list-style-type: none"> 1. Not enough air to burn fuel. 2. Maladjusted burner. 3. Misuse as a room heater. 4. System not properly vented.
Stoves Fireplaces	Gas, wood, coal	<ol style="list-style-type: none"> 1. Not enough air to burn fuel properly. 2. Defective/blocked flue. 3. Green or treated wood. 4. Cracked heat exchanger. 5. Cracked firebox.

Specifications

Temperature Operating: Storage:	0 °C to +50 °C -30 °C to +50 °C
Humidity (non-condensing) < 3 weeks > 3 weeks	0-99 % RH 0-90 % RH
Measurement range	0 to 1000 PPM
Measurement resolution	1 PPM for 0 - 200 PPM; 5 PPM for 200 - 1000 PPM
Accuracy	3 % or ± 2 PPM (whichever is greater)
Sensor type	Stabilized electrochemical Gas-specific (CO)
Typical sensor life	3 years
Temperature Coefficient	Add 0.4 % per °C > 25 °C Add 0.6 % per °C < 20 °C
Output	1 mV dc = 1 PPM carbon monoxide
Self Test	< 20 seconds
Battery	9 V, NEDA 1604A or IEC 6LR61, or equivalent.
Typical battery life	500 hours
Certification	CE

Calibration or Service

The Probe should be calibrated once a year by an authorized Fluke service center.

During normal use, the Probe does not require adjustment.

Any required adjustments are made at calibration. To replace the sensor, contact an authorized Fluke service center.

LIMITED WARRANTY & LIMITATION OF LIABILITY

This Fluke product will be free from defects in material and workmanship for one year from the date of purchase. This warranty does not cover fuses, disposable batteries or damage from accident, neglect, misuse or abnormal conditions of operation or handling. Resellers are not authorized to extend any other warranty on Fluke's behalf. To obtain service during the warranty period, send your defective tester to the nearest Fluke Authorized Service Center with a description of the problem.

THIS WARRANTY IS YOUR ONLY REMEDY. NO OTHER WARRANTIES, SUCH AS FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSED OR IMPLIED. FLUKE IS NOT 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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