MACURCO GAS DETECTORS
CM-2B
INSTALLATION & OPERATING INSTRUCTIONS

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GENERAL INFORMATION

The CM-2B is a Carbon Monoxide (CO) meter and 4 to 20 ma transducer. It is an all electronic system that uses a microcomputer to measure the CO and control the digital display and analog output. The unit also has the ability to be calibrated in the field. The unit is intended for use with building automation computers or controllers, which control exhaust fans to maintain a safe environment within OSHA or building code specifications. The CM-2B sources power to the computer or controller, which needs to have a resistor at its input. The CM-2B has an isolated output circuit. This allows use of one power supply to power many detectors. See the front of the data sheet for the chart of CO versus ma, to program the computer.

LOCATION

The unit on average can cover about 5000 sq. ft. The coverage depends on air movement in the room or facility. Extra detectors may be needed near any areas where people work or the air is stagnant. Normally, the unit mounts 5 feet above the floor, in a central area where air movement is generally good. See the CM-2B data sheet for more information on location.

INSTALLATION

Open the cover of the knock-out box, and orient the unit with the cover down. Remove the two small screws at the BOTTOM of the internal face plate panel. The inner panel will now hinge up for access to mount the box and make the wiring connections. Note the vent plugs in four of the conduit access holes. These vent plugs must be left in place for air to circulate through the CM-2B. Connect the conduit or other wiring in one of the smaller (1/2) knock-out holes in the bottom of the box. Connect the power, 24 VAC or VDC to the C & D terminals (no polarity). Connect the output signal wires to the A & B terminals ("A" is positive and "B" is negative). See the CM-2B data sheet for more technical information on wiring. Replace the two screws in the cover and close the box, when wiring is finished. See the back of the data sheet for wiring diagrams

OPERATION

When power is first applied to the CM-2B, it will go through a 2 1/2 minute start-up cycle. The digital ppm meter will step through a 0 to 150 reading at a rate of one count per second. The output will move through a range of 4.0 to 16.0 ma, as the meter counts from 0 to 150. At the count of 150, the CM-2B finishes the test cycle, then displays the ambient reading of CO and sets the output accordingly.

THIS AND FUTURE READINGS WILL HOLD FOR 2 1/2 MINUTES. NO MATTER WHAT YOU DO, THIS READING WILL NOT CHANGE DURING EACH 2 1/2 MINUTE CYCLE.

The CM-2B continuously supervises itself. If the unit detects a problem internally it will indicate it through the display and output. See ERRORS below.

TESTING

To test the unit it is suggested to use the Red Test switch located inside the gray case on the face plate. Press the switch once. The unit should reset, the display should begin to count up from 0 and the ma output should correlate to the display. There are other ways to test the unit. If the unit is in a parking garage, run a car near the CM-2B. Open the cover and observe the digital meter, which updates every 2 1/2 minutes. Initially, the digital display should have a reading near zero, then increase after about 5 minutes. If it isn't convenient to start a car, a lit cigarette can be used. Hold the cigarette a few inches under the CM-2B, so the smoke drifts up and into the unit. After about 5minutes, there should be a higher reading. The optional CM2B-FCK (Field Calibration Kit), which contains a cylinder of carbon monoxide, could also be used to test the CM-2B. Instructions on how to use the Kit are included with it.

ERRORS

The CM-2B indicates internal troubles in two ways: through the digital display and the ma output. If there is an error, the display will read an error code E-1 thru E-7 and the ma output will drop below 1 ma. The controller or computer should be programmed to read error conditions. The first time an error occurs, induce the CM-2B to reset, by interrupting the power or pushing the Red Test switch once. It will restart by stepping through the warm-up cycle. If a second E (error) occurs within 15 minutes, check that power to the unit is within the normal range (22 to 26 volts AC or DC). If another error occurs, consult the factory. A Brown-out (lower than normal line voltage) can sometimes cause the unit to display erratically and become inoperable. Simply reset the unit by turning off the power or pushing the Red Test switch once.

SENSOR POISONS

The gas sensing tip in the detector is designed with extreme sensitivity to the environment. As a result, the sensing function of the tip may be deteriorated if it is exposed to a direct spray from aerosols such as paints, silicone vapors, etc., or to a high density of corrosive gases (such as hydrogen sulfide, sulfur dioxide) for an extended period of time.

SERVICING OF UNIT

The CM-2B does not require regular maintenance. The unit uses a self purging semi-conductor sensor that has a 7-10 year life expectancy. All maintenance and repair of products manufactured by Macurco, Inc. are to be performed at the Macurco manufacturing facility. Macurco does not sanction any third-party repair facilities.

LIMITED WARRANTY

The CM-2B gas detectors are warranted to be free from defective material and workmanship for a period of one (1) year from the date of installation. If any component becomes defective during the warranty period, it will be replaced or repaired free of charge, if the unit is returned in accordance with the instructions below. This warranty does not apply to units that have been altered or had repair attempted, or that have been subjected to abuse, accidental or otherwise. The above warranty is in lieu of all other express warranties, obligations or liabilities. THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE ARE LIMITED TO A PERIOD OF ONE (1) YEAR FROM THE PURCHASE DATE. Macurco shall not be liable for any incidental or consequential damages for breach of this or any other warranty express or implied arising out of or related to the use of said gas detector. Manufacturer or its agents liability shall be limited to replacement or repair as set forth above. Buyer's sole and exclusive remedies are return of the goods and repayment of the price, or repair and replacement of non-conforming goods or parts. (The Uniform Commercial Code applicable in the State of Colorado shall govern.)

RETURN INSTRUCTIONS

Call (303) 781-4062 for a Return Authorization number. Then carefully pack the gas detector with a written description of the nature of the return. Send the unit to the following address:

Macurco Inc.
3946 South Mariposa Street
Englewood, Colorado 80110
WWW.MACURCO.COM

TESTING THE CM-2B AFTER INSTALLATION

SUGGESTED FUNCTIONAL TEST

GENERAL:

Normally this will be the only test required for the CM-2B and is the recommended way to test the unit or units after installation. All CM-2B units are factory calibrated and 100 % tested for proper operation. The unit also has the ability to test itself automatically and does so every 2 1/2 minute cycle. If the unit detects an improper voltage or inoperable component including the CO sensor it will default into Error mode. In Error mode, the digital display will read E01 to E08.

This test may require 2 people to run the test. One person at the CM-2B and one person at the control panel or other monitoring system. You will need to verify that the CM-2B digital display is illuminated, and reads 000 to 250 (normal). To verify the display, it will be necessary to open the gray mounting case. If the reading is not normal, do not proceed with the tests. If the unit fails to indicate a normal reading, See "CM-2B Installation & Operating Instructions" for information on correcting the problem.

NOTE: It is assumed that the CM-2B front gray lid is open.

TESTING:

1. Observe the gold face plate of the CM-2B.
2. Note the RED switch mounted on the face plate.
3. Press the RED switch once.
4. The CM-2B will step through a 2 1/2 minute test cycle:
    a. The digital display will start at 000 and then count up to 150, at a rate of one count per second.
    b. The 4 to 20 ma output will progressively increase from 4.0 to 16.0 ma
    c. Any devices connected to the output will now be tested over the 4.0 to 16 ma range.
5. At the end of the test cycle, the digital display and unit output will indicate the ambient CO level.
6. When testing is completed close the gray cover of the unit.

CARBON MONOXIDE GAS TEST (Optional)

GENERAL:

The CM2B-FCK is needed to complete a CO gas test. The kit includes a cylinder of 50 ppm of carbon monoxide (CO) in air. A cylinder of 200 ppm of CO in air will also be needed. These are available through your local representative or from Macurco Inc.

NOTE: 1) All units to be tested must be powered continuously for a minimum of **72 hours**.
2) For optimum test results concerning accuracy it is suggested that the unit be tested in clean air and be in a low ambient air flow.

TESTING:

1. Open the front gray cover of the CM-2B.
2. Remove the two philips screws located at he bottom of the gold face plate. The face plate should now hinge up to expose the CM-2B printed circuit board.
3. Open the CM2B-FCK. Connect the 50 ppm gas cylinder to the regulator.
4. Check the pressure gauge on the regulator. If you have 25 psi or less you will need to replace the gas canister.
5. Place the white cap from the regulator over the round gray device labeled FIGARO TGS 203 (CO sensor).
6. Wait 5 minutes with the gas applied continuously. The CM-2B takes samples every 2 1/2 minutes.
7. After the five minutes the digital display should read 050 ±10%, plus the accuracy of the gas (normally ±2%).
8. Once the reading has been taken remove the gas from the sensor.

Note: If the display did not read within the given parameters, there are three possibilities:
a) the gas cylinder is empty, check the pressure gauge. Replace the gas cylinder if 25 psi or less.
b) the unit needs to be re-calibrated (go through recalibration and re-test)
c) the detector is in need of servicing (return unit to factory for servicing).

9. Wait 7 1/2 minutes for the CM-2B to stabilize, with no gas applied to the sensor. You might test another unit at 50 ppm while waiting. If you do not test another unit with the 50 ppm gas disconnect the canister from the regulator.
10. After the 7 1/2 minutes, if the 50 ppm canister has not been disconnected from the regulator do so now and connect the 200 ppm cylinder of carbon monoxide to the regulator.
11. Check the pressure gauge. If there is 25 psi or less the cylinder should be replaced.
12. Place the white cap from the regulator over the gray device labeled FIGARO TGS 203 (CO sensor). Continue to apply the gas for 5 minutes.
13. The digital display will update every 2 1/2 minutes.
14. After 5 minutes the unit should have updated the digital display twice and should read 200 ±20%, plus the accuracy of the gas (normally ± 2%). See 3 possibilities in "Note" above if the reading is not with specifications.
15. Hinge down the gold face plate, replace the screws, and close the gray box on the CM-2B.
16. If there are more units to test repeat the above steps from step one.
17. When testing is complete disassemble the regulator and cylinder.

Note: The specification for repeatability (±10%) is after calibration at 50 ppm. The gas accuracy (normally ± 2%) needs to be considered also.