

MACURCO GAS DETECTORS

CM-3 INSTALLATION AND OPERATING INSTRUCTIONS

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GENERAL INFORMATION

The CM-3 is a microcomputer-controlled electronic sensor and controller for Carbon Monoxide (CO). The CM-3 includes a CO sensor (electrochemical), a digital display, a 4-to-20 mA current loop output, and a dry contact fan relay. The unit is intended for use with building automation computers or controllers that control exhaust fans to maintain a safe environment within OSHA or building code specifications. The CM-3 may be used as standalone unit. The CM-3 current loop output sources power to the computer or controller, which must have a resistor at its input. The current loop output is isolated, allowing the use of one power supply to power many detectors. See the front of the data sheet for a chart to convert output current in milliamps to CO concentration in parts-per-million for controller programming.

LOCATION

The CM-3 can monitor about 5000-sq. ft. (465 sq. meters), depending 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 CM-3 should be mounted about 5 feet (1.5 meters) above the floor. See the CM-3 data sheet for further details on mounting locations.

INSTALLATION

The CM-3 is housed in an electrical box that has mounting holes on the back. Conduit can be connected to the bottom three knockout holes. **Do NOT** remove the four black vents in the case since they are necessary for adequate airflow into the unit. To gain access to the internal circuitry, open the outer door and remove the two small screws toward the bottom of the inside cover. The inside cover will then swing up for internal access.

Once the inside cover is open, you should notice a seven-screw terminal block at the bottom of the circuit board. The first two screws, at the far left, are for power and are marked "POWER 12-24 V ac/dc". There is no polarity. The three middle terminals are for the Fan SPDT relay. They are marked from left to right N.O. (normally-open), COM (common), and N.C. (normally-closed). The dry contact Fan relay can handle up to 5 amps. The two terminals at the far right are for the 4-to-20 mA current loop, and are marked "+" and "-". Refer to the CM-3 data sheet for detailed wiring diagrams and other technical information.

OPERATION

When power is first applied to the detector, it will go through a warm-up period of 30 seconds. The digital display will count down from 30 to 0 during the warm-up period. The Fan relay will actuate, and the current loop will maintain the trouble signal of 2 mA during the warm-up period. The CM-3 is now operational. Set the Fan PPM level as needed for the job requirements.

The fan relay turn-on delay is fixed at 15 seconds. When the turn-on delay has been started by a CO level exceeding the FAN PPM threshold level, the digital display will alternate between "dLY" and the CO level reading in parts-per-million. When the turn-on delay has expired, the digital display will alternate between "ALr" and the CO level reading, and the Fan relay will actuate. The fan relay has a minimum on-time of 60 seconds to prevent short cycling devices controlled by the relay.

TESTING

Testing the unit can be performed by pressing the "TEST/RESET" switch located to the left of and below the digital display on the printed circuit board. This will initiate the test cycle. The display will count down from 30 to 0, the current loop output will be greater than 20 mA and the Fan relay will actuate. The test cycle will last approximately 30 seconds.

RESET

The reset feature is activated by pressing the switch labeled "TEST/RESET." Pressing the switch will initiate the warm-up cycle as mentioned above in "OPERATION," and will test the unit (see "TESTING.")

STABILIZATION TIME

The CM-3 will be operational within the 30-second warm-up period after the detector is first powered, and should be powered continuously.

ALARMS DUE TO OTHER GASES

Although the CM-3 is specifically calibrated with CO, the electro-chemical sensor will detect a variety of gases such as Hydrogen, Ethylene, Hydrogen Sulfide, Sulfur Dioxide, Chlorine, and Hydrogen Chloride. These gases may cause a reading and alarm initiation/relay closures.

REPLACING THE SENSOR AND RECALIBRATING THE CM-3

Macurco provides a replacement sensor and a Field Calibration Kit for the CM-3. We recommend that the detector be recalibrated at least once every six months, and the sensor be replaced every two years. The Field Calibration Kit can be used to calibrate several units. The number of units that can be calibrated is determined by the gas quantity in the gas cylinder. This will vary due to calibration kit usage and gas flow rate. However, the gas mixture has a useful life of no more than one year.

SERVICING OF UNIT

The CM-3 uses a self-purging electro-chemical sensor that has a two to five-year life expectancy. This sensor acts somewhat like a battery in that its output will be reduced with time. The manufacturer of the sensor (Sixth Sense) indicates the sensor can be expected to have a reduced output of up to 2% per month, but not to normally exceed 5% per year.

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. Any attempted repair of a Macurco product will void the products limited warranty. For further information or technical advice, call Macurco Tech Support at (303) 781-4062.

LIMITED WARRANTY

The CM-3 gas detectors are warranted to be free from defective material and workmanship for a period of one (1) year from the date of manufacture. 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