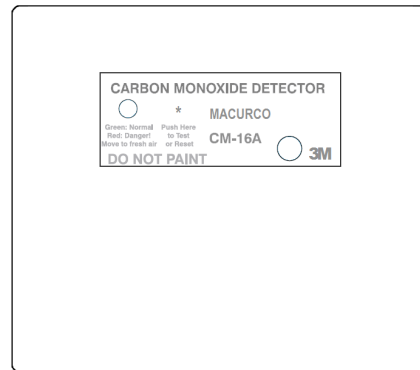




Macurco™ Carbon Monoxide Detector CM-16A

User Instructions for 3M™ Macurco™ Carbon Monoxide Detector (CO) CM-16A



FOR MORE INFORMATION

In United States, contact:

Website: www.3M.com/OccSafety

Technical Assistance: 1-800-243-4630

For other 3M products:

1-800-3M-HELPS or

1-651-737-6501

3M Occupational Health and Environmental Safety Division

3M Center, Building 0235-02-W-70

St. Paul, MN 55144-1000

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Important: These *User Instructions* are to be provided to the homeowner/end user upon product installation. Each person installing or using this equipment must read and understand the information in these *User Instructions* before use. Installation of this equipment by untrained or unqualified persons, or use that is not in accordance with these *User Instructions* may adversely affect product performance and **result in sickness or death**. For proper use see *User Instructions* or call 3M in U.S.A., 1-800-243-4630. In Canada, call Technical Service at 1-800-267-4414.

Important: Keep these *User Instructions* for reference

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GENERAL SAFETY INFORMATION

Intended Use

The CM-16A is a low voltage (12-24V AC or DC) detector of Carbon Monoxide (CO). The CM-16A is designed for connection to Fire Alarm/Burglary Control Panels or as a stand alone unit. This carbon monoxide detector is designed to detect CO gas from ANY source of combustion. It is NOT designed to detect smoke, fire or any other gas. It is intended for use in ordinary indoor locations of family living units and office work spaces. This product is not UL listed.

List of Warnings and Cautions within these *User Instructions*

WARNING

Each person using this equipment must read and understand the information in these *User Instructions* before use. Use of this equipment by untrained or unqualified persons, or use that is not in accordance with these *User Instructions*, may adversely affect product performance and **result in sickness or death**. For proper use see *User Instructions*, or call 3M in U.S.A., 1-800-243-4630. In Canada, call Technical Service at 1-800-267-4414.

Use only for monitoring the gas which the sensor and detector are designed to monitor. Failure to do so may result in exposures to gases not detectable and **cause sickness or death**. For proper use see *User Instructions*, or call 3M in U.S.A., 1-800-243-4630. In Canada, call Technical Service at 1-800-267-4414.

Do not cover or obstruct visual alarm LED. Doing so may adversely affect product performance and **result in sickness or death**.

Do not disassemble unit or attempt to repair or modify any component of this detector. This detector contains no user serviceable parts, and substitution of components may adversely affect product performance and **result in sickness or death**.

This detector helps monitor for the presence and concentration level of carbon monoxide gas. Misuse may produce an inaccurate reading, which means that higher levels of the gas being monitored may be present and could result in overexposure and **cause sickness or death**. For proper use, see supervisor, *User Instructions*, or call 3M in U.S.A., 1-800-243-4630. In Canada, call Technical Service at 1-800-267-4414.

When the unit is turned on it performs a self-test, which activates the visual alarms. If the self-test fails, or the alarm does not activate, do not use. Failure to do so may adversely affect product performance and **result in sickness or death**. Immediately exit the environment if it causes an alarm condition on the detector. **Failure to do so may result in sickness or death**.

CM-16A may not function effectively below 40°F (4.4°C) or above 100°F (37.8°C). Using the detector outside of this temperature range may adversely affect product performance and **result in sickness or death**.

This product is intended for use in ordinary indoor locations of family living units and office workspaces. The CM-16A is not designed to measure compliance with Occupational Safety and Health Administration (OSHA) commercial or industrial standards.

To help avoid false alarms, the CM-16A is not intended for low level detection (below 30 ppm) of carbon monoxide per UL 2034.

Individuals with certain medical problems may consider using warning devices that provide audible and visual signals for carbon monoxide concentrations below 30 ppm.

The following symptoms are related to CARBON MONOXIDE POISONING and should be discussed with ALL members of the household:

Mild exposure: Slight headache, nausea, vomiting, fatigue (often described as “Flu-like” symptoms).

Medium Exposure: Severe throbbing headache, drowsiness, confusion, fast heart rate.

Extreme Exposure: Unconsciousness, convulsions, cardio respiratory failure, and death.

Many cases of reported CARBON MONOXIDE POISONING indicate that while victims are aware they are not well, they become so disoriented they are unable to save themselves by either exiting the building or calling for assistance. Young children and household pets may be the first affected.

Transient CO situations can occur:

1. Excessive spillage or reverse venting of fuel burning appliances caused by outdoor ambient conditions, such as:
 - a) Wind direction and/or velocity, including high gusts of wind. Heavy air in the vent pipes (cold/humid air with extended periods between cycles).
 - b) Negative pressure differential resulting from the use of exhaust fans.
 - c) Simultaneous operation of several fuel-burning appliances competing for limited internal air.
 - d) Vent pipe connections vibrating loose from clothes dryers, furnaces, or water heaters.
 - e) Obstruction or unconventional vent pipe designs, which can amplify the above situations.
2. Extended operation of un-vented fuel burning devices (range, oven, fireplace, etc.).
3. Temperature inversions, which can trap, exhaust gases near the ground.
4. Car idling in an open or closed attached garage, or near a home.

CAUTION: This detector will only indicate the presence of carbon monoxide gas at the sensor. Carbon monoxide gas may be present in other areas. Accommodation spaces should be well ventilated when household cleaning supplies or similar contaminants are used.

CAUTION

- Avoid the use of harsh cleaning materials, abrasives and other organic solvents. Such materials may permanently scratch the surface, damage the sensor, labels, or instrument housing.
- If you have any doubts about the applicability of the equipment to your job situation, consult an industrial hygienist or call 3M at 1-800-243-4630. In Canada, call Technical Service at 1-800-267-4414.

USER INSTRUCTIONS AND LIMITATIONS

WARNING

Each person using this equipment must read and understand the information in these *User Instructions* before use. Use of this equipment by untrained or unqualified persons, or use that is not in accordance with these *User Instructions*, may adversely affect product performance and **result in sickness or death**. For proper use, see supervisor, *User Instructions*, or call 3M in U.S.A., 1-800-243-4630. In Canada, call Technical Service at 1-800-267-4414.

Use For

The CM-16A is a low voltage (12-24V AC or DC) detector of Carbon Monoxide (CO). The CM-16A is designed for connection to Fire Alarm/Burglary Control Panels or as a stand alone unit. This carbon monoxide detector is designed to detect CO gas from ANY source of combustion. It is NOT designed to detect smoke, fire or any other gas.

⚠ WARNING

Use only for monitoring the gas which the sensor and detector are designed to monitor. Failure to do so may result in exposures to gases not detectable and **cause sickness or death**. For proper use, see supervisor, *User Instructions*, or call 3M in U.S.A., 1-800-243-4630. In Canada, call Technical Service at 1-800-267-4414.

Do Not Use For

The CM-16A is NOT intended for use in industrial applications such as refineries, chemical plants, etc. The CM-16A is NOT intended for use in parking garages as the controller of exhaust systems. Do NOT use the CM-16A for monitoring for gases other than Carbon Monoxide (CO). The CM-16A is NOT designed to detect smoke, fire or any other gas. Do NOT mount the unit in the garage. Do NOT mount the CM-16A where the normal ambient temperature is below 40°F (4.4°C) or exceeds 100°F (37.8°C), or within 5 feet (1.5 meters) of a cooking or heating appliance. The Alarm Control Panel must be dedicated to CO detection or have alarm devices that provide a distinctive alarm for carbon monoxide detection. Do not connect the CM-16A to Fire Alarm Circuits.

⚠ WARNING

CM-16A may not function effectively below 40°F (4.4°C) or above 100°F (37.8°C). Using the detector outside of this temperature range may adversely affect product performance and **result in sickness or death**.

General Description

The CM-16A is for use with Fire Alarm/Burglary Control Panels that have 12 to 24V AC or DC power and alarm initiating circuits. The CM-16A is intended for installation in buildings in non-hazardous locations such as residences, retail stores, office buildings, and institutional buildings.

Features

- Surface mounts to a wall using the supplied enclosure rear housing.
- Flush mounts in a 4 x 4 or 2-gang, handy electrical box.
- Low profile, attractive unit in a white plastic case.
- Inexpensive, easy to install. Microcomputer control allows mostly automatic operation.
- Test & Reset switch conducts internal tests and actuates alarm relay.
- Visual display: GREEN - Normal operation.
- FLASHING AMBER - Trouble Contact your installer or 3M Macurco Tech Support
- RED - Danger! Move to fresh air (hazardous condition is present).
- Long Life solid state sensor
- N.O. and N.C. SPDT Alarm Relay and N.C. SPST Trouble relay to connect to Alarm Control Panels

SPECIFICATIONS

- SPDT Alarm Relay SPDT Alarm Relay
- SPST Trouble Relay SPST Trouble Relay
- Visual Status Indicator
- Loud Buzzer
- Voltage 12-24 VDC or VAC Input (50-60 Hz)
- Current (standby) 67 mA @ 12V, 47 mA @ 24V
- Current (alarm) 115 mA @ 12V, 81 mA @ 24V
- Size 4-1/2" x 5" x 1-5/8"
- Alarm Relay 1 Amp, 125V, 30VA
- Trouble Relay 0.5 Amp, 200V, 10VA
- Buzzer Rating 85 dBA at 10 Feet
- Shipping Weight (each) One pound
- Color: White
- Operating Temperature Range 32°F to 120°F
- Alarm Setting: 70 ppm of CO after 60 to 240 minutes, 150 ppm of CO after 10 to 50 minutes, and 400 ppm of CO after 4 to 15 minutes, in accordance with the provisions of UL Standard 2034.
- This product is not UL listed.

INSTALLATION AND OPERATION INSTRUCTIONS

The following instructions are intended to serve as a guideline for the use of the 3M™ Macurco™ Carbon Monoxide Detector CM-16A. It is not to be considered all-inclusive, nor is it intended to replace the policy and procedures for each facility.

⚠ WARNING

This detector helps monitor for the presence and concentration level of carbon monoxide gases. Misuse may produce an inaccurate reading, which means that higher levels of the gas being monitored may be present and could result in overexposure and **cause sickness or death**. For proper use, see supervisor, *User Instructions*, or call 3M in U.S.A., 1-800-243-4630. In Canada, call Technical Service at 1-800-267-4414.

LOCATION

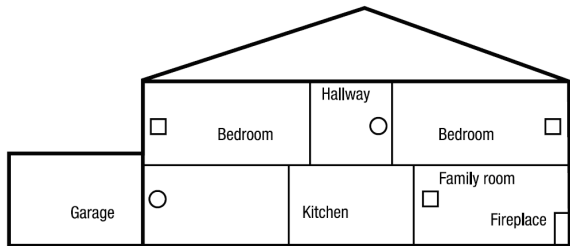
There are two usual sources of CO in homes -- defective heat sources (furnaces or wood burning stoves) and automobiles running in adjoining garages. The CM-16A can detect CO from these sources, as well as any other sources of CO.

For best operation, mount a CM-16A in the hallway near each bedroom area. In addition, another CM-16A may be mounted just inside the door from the adjoining garage. Consider placing another detector in a bedroom that is adjacent to a furnace room.

⚠ WARNING

This product is intended for use in ordinary indoor locations of family living units and office workspaces. The CM-16A is not designed to measure compliance with Occupational Safety and Health Administration (OSHA) commercial or industrial standards.

Do NOT mount the unit in the garage. Do NOT mount the CM-16A where the normal ambient temperature is below 40°F (4.4°C) or exceeds 100°F (37.8°C), or within 5 feet (1.5 meters) of a cooking or heating appliance.



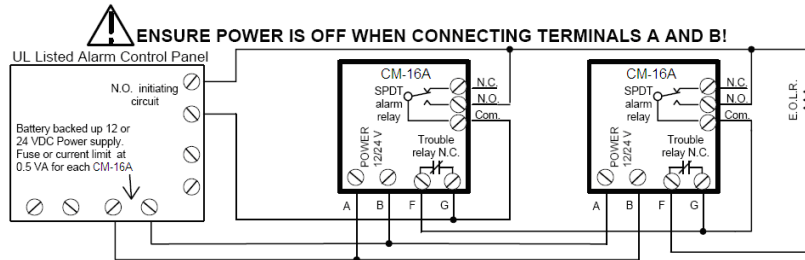
LOCATION NOTES

- Normal CM-16A location
- Alternate CM-16A location
- Do NOT mount the CM-16A within 5 feet (1.5 m) of any cooking appliance

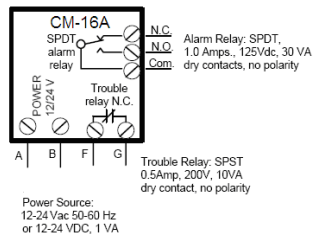
INSTALLATION

- In the configuration as normally shipped, the CM-16A has a three-part case. This allows the unit to mount flush to a wall over a single gang electrical box (not included). If the back cover is removed, (remove the two screws inside), the CM-16A's mount on a two gang, old work box or a 4 X 4 electrical box, provided by the installer.
- The detector may be installed on either a ceiling or a wall. If installed on a peaked, gabled, or sloped ceiling, it should be located about 3 feet from the highest point. The unit can be placed vertically or horizontally on a wall, so the information on the front of the CM-16A can be read in a normal manner. Do NOT mount the CM-16A in a corner. Use the same spacing as for smoke detectors-- 30 foot (9 meters) centers, 900 sq. feet (83 sq. meters) per detector.
- The CM-16A's have terminal strips to connect to the cables from the control panel or other device. When connecting the unit, follow good wiring practices, and ensure the power is turned off. Access to the terminal strip will be easier if the back cover is off.
- Ensure that the CM-16A is connected to a continuous source of power (not controlled by a wall switch). The CM-16A power consumption figures represent worst-case conditions under AC power; DC performance may vary.
- See wiring diagram for information on connections of the CM-16A. 3M™ Macurco™ recommends a minimum of 22 AWG wire for runs up to 200 ft., and 18 AWG wire for longer runs.

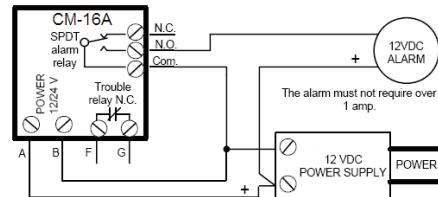
TYPICAL CONNECTION OF TWO CM-16A's TO AN ALARM CONTROL PANEL



- The alarm relay of the CM-16A is a dry contact and rated at 1 Amp, 125V at 30 VA. It is not suitable for fan control use. When connecting the units to remote buzzers or other devices, make sure that the load does not exceed the relay's rating. External buzzers must be capable of generating a sound output greater than 85 dBA at 10 ft.



CM-16A CONTROLLING A REMOTE ALARM



⚠ WARNING

When the unit is turned on it performs a self-test, which activates the visual alarm. If the self-test fails, or the alarm does not activate, do not use. Failure to do so may adversely affect product performance and **result in sickness or death.**

When the detector is first powered, the status light will alternate between RED and GREEN as the unit performs a 2-1/2 minute warm-up cycle and self-test procedure. The buzzer on the CM-16A will cycle twice, emitting its characteristic 4-chirp tone. At the end of this 2-1/2 minute cycle, the status light will turn GREEN to indicate normal operation and safe air. The alarm relay is not energized during the 2-1/2 minute warm-up cycle.

Operation

The CM-16A continuously monitors the air. If the CM-16A measures levels of CO greater than the danger level, the RED light will turn on, the Alarm Relay will switch to actuate the alarm circuits in the control panel, and the buzzer on CM-16A units will sound. The computer in the CM-16A is programmed to alarm if the danger levels of carbon monoxide are exceeded, which are time and concentration related. When the detector is first powered, the status light will alternate between RED and GREEN as the unit performs a 2-1/2 minute warm-up cycle and self-test procedure. At the end of this 2-1/2 minute cycle, the status light will turn GREEN to indicate normal operation and safe air. The alarm relay is not energized during the 2-1/2 minute warm-up cycle.

⚠ WARNING

Individuals with certain medical problems may consider using warning devices that provide audible and visual signals for carbon monoxide concentrations below 30 ppm.

ALARMS

The alarm points are: 70 ppm of CO after 60 to 240 minutes, 150 ppm of CO after 10 to 50 minutes, and 400 ppm of CO after 4 to 15 minutes, in accordance with the provisions of UL Standard 2034. This product is not UL listed. The CM-16A will automatically come out of alarm once the air clears. The time to stop alarming will depend on the CO exposure time and the CO level.

⚠ WARNING

Immediately exit the environment if it causes an alarm condition on the detector. **Failure to do so may result in sickness or death.**

⚠ WARNING

The following symptoms are related to CARBON MONOXIDE POISONING and should be discussed with ALL members of the household:

- Mild exposure: Slight headache, nausea, vomiting, fatigue (often described as "Flu-like" symptoms).
- Medium Exposure: Severe throbbing headache, drowsiness, confusion, fast heart rate.
- Extreme Exposure: Unconsciousness, convulsions, cardio respiratory failure, and death.

Many cases of reported CARBON MONOXIDE POISONING indicate that while victims are aware they are not well, they become so disoriented they are unable to save themselves by either exiting the building or calling for assistance. Young children and household pets may be the first affected.

Transient CO situations can occur:

1. Excessive spillage or reverse venting of fuel burning appliances caused by outdoor ambient conditions, such as:
 - a) Wind direction and/or velocity, including high gusts of wind. Heavy air in the vent pipes (cold/humid air with extended periods between cycles).
 - b) Negative pressure differential resulting from the use of exhaust fans.
 - c) Simultaneous operation of several fuel-burning appliances competing for limited internal air.
 - d) Vent pipe connections vibrating loose from clothes dryers, furnaces, or water heaters.
 - e) Obstruction or unconventional vent pipe designs, which can amplify the above situations.
2. Extended operation of un-vented fuel burning devices (range, oven, fireplace, etc.).
3. Temperature inversions, which can trap, exhaust gases near the ground.
4. Car idling in an open or closed attached garage, or near a home.

RESET/SILENCE SWITCH

The switch on the front of the CM-16A labeled "TEST/RESET," performs three functions.

1. A short press of switch, less than 5 seconds, will place the unit into self test mode with no alarm relay activation. The status light will turn red for 5 seconds and then it will alternate slowly between green and amber while the self-test executes. The controlling software simulates a 3000 ppm CO environment and causes the unit to alarm after approximately one minute has elapsed. When this happens, the status light turns red for five seconds. The unit will then return to normal operation.
2. A long press of switch, 5 or more seconds long, will place the unit into self-test mode with alarm relay activation. Pressing and holding the switch will cause the status light to turn red for 5 seconds and then switch to solid amber. The alarm relay will then be activated and the switch can be released. After about 5 seconds, the alarm relay will turn off and the status light will alternate slowly between green and amber while the self test executes. The controlling software simulates a 3000 ppm CO environment and causes the unit to alarm after approximately one minute has elapsed. When this happens, the status light turns red for five seconds. The unit will then return to normal operation.
3. If the CM-16A is in an alarm condition due to the detection of carbon monoxide, one push of the switch will cause the alarm relay to open for five minutes. After the five-minute period, if CO is still present, the status light will again switch to RED, the alarm relay will close. If after the five-minute period, the detected CO level has dropped below 70 ppm, the CM-16A unit will reset.

⚠ WARNING

Do not cover or obstruct visual alarm LED. Doing so may adversely affect product performance and **result in sickness or death.**

TROUBLE INDICATOR

Internal failure of the CM-16A will cause an open circuit in the normally closed (NC) Trouble Relay to provide for actuation of the control panel circuits. The status LED will flash AMBER. See ERRORS section. The CM-16A microprocessor continuously monitors various detector parameters. Failure of the CM-16A's internal power supply or a lack of power to the detector will result in the status light remaining OFF (not illuminated). In this case, the most common cause of detector trouble would be a break in the wiring between the control panel and the CM-16A.

ERRORS

The CM-16A continuously monitors various internal operating parameters. If a problem is found, the unit will switch to Trouble mode. See TROUBLE INDICATOR section. To reset the unit for normal operation, press the TEST/RESET switch, or remove power to the unit, wait a few seconds, then re-apply unit power. If this problem persists, your detector requires repair; contact the alarm panel installer or 3M™ Macurco™ Tech Support for advice. If repair is required, return the unit to manufacturer to comply with warranty.

MAINTENANCE

⚠ WARNING

Do not disassemble unit or attempt to repair or modify any component of this detector. This detector contains no user serviceable parts, and substitution of components may adversely affect product performance and **result in sickness or death.**

The CM-16A has a long life solid state sensor. The CM-16A will go into a Trouble Fault when the sensor has expired. All maintenance and repair of products manufactured by 3M™ Macurco™ are to be performed at the 3M Macurco Service Center. 3M™ Macurco™ does not sanction any third-party repair facilities.

TESTING

The CM-16A should be tested monthly by pushing the TEST/RESET switch; see TEST/RESET switch. Normally this will be the only test required for the CM-16A and is the recommended way to test the unit or units after installation. All CM-16A units are factory calibrated and 100% tested for proper operation. The unit also has the ability to automatically self test and does so every 2 1/2 minute cycle. If the unit detects an improper voltage or inoperable component it will default into Trouble mode. See TROUBLE INDICATOR section. Check that the CM-16A status indicator light is illuminated (GREEN) continuously. If not, do not proceed with the tests. Though there is no field calibration procedure for this unit, there is an optional field test procedure.

CLEANING

The CM-16A should be cleaned using the soft brush attachment of your vacuum cleaner. The CM-16A should be tested after cleaning to ensure the unit is operating normally.

SENSOR POISONS

The gas sensor in the detector is designed with extreme sensitivity to the environment. As a result, the CO sensor may be damaged 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 or sulfur dioxide for an extended period of time. The sensor may react to chemicals such as ammoniated cleaning agents, volatile solvents and hydrogen gas. In sufficient concentration, these chemicals may cause a false alarm.

CAUTION: This detector will only indicate the presence of carbon monoxide gas at the sensor. Carbon monoxide gas may be present in other areas. Accommodation spaces should be well ventilated when household cleaning supplies or similar contaminants are used.

3M FIXED GAS DETECTION PRODUCTS LIMITED WARRANTY

3M™ Macurco™ warrants the CM-16A gas detector will be free from defective materials and workmanship for a period of two (2) years from date of manufacture (indicated on the inside cover of the CM-16A), provided it is maintained and used in accordance with 3M™ Macurco™ instructions and/or recommendations. 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 FIVE (5) YEARS FROM THE PURCHASE DATE. 3M™ 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 agent's 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.