



## Macurco™ GD-2B Combustible Gas Detector User Instructions



**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 Macurco Technical Service.

## GENERAL SAFETY INFORMATION

### INTENDED USE

The GD-2B is a low voltage (9-32VDC, 12-24VAC) electronic detector of combustible, heating type gases. The GD-2B is designed for connection to Fire Alarm/Burglary Control Panels. Alarm control panels that work on 12 or 24 VDC can provide battery backup to the GD-2B detectors. This combustible gas detector has been designed for methane (natural gas) and propane (LP) gas. It is NOT designed to detect smoke, fire or carbon monoxide.

### LIST OF WARNINGS AND CAUTIONS



#### 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**.
- 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 or *User Instructions*, or call Macurco Technical Service.
- GD-2B may not function effectively below 32 °F or above 120°F. Using the detector outside of this temperature range may adversely affect product performance and **result in sickness or death**.
- This detector helps monitor for the presence and concentration level of certain specified airborne 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 or *User Instructions*, or call Macurco Technical Service.
- The GD-2B is not designed to measure compliance with Occupational Safety and Health Administration (OSHA) commercial or industrial standards. When the unit is turned on it performs a self-test, which activates the audible and/or visual alarms. If the self-test fails, or all the alarms do 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 there is an alarm condition on the detector. **Failure to do so may result in sickness or death**.

- This detector will only indicate the presence of combustible gas at the sensor. Combustible gas may be present in other areas. Accommodation spaces should be well ventilated when household cleaning supplies or similar contaminants are used.
- 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**.

#### CAUTION

- Avoid the use of harsh cleaning materials, abrasives and other organic solvents. Such materials may permanently scratch the surfaces; 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 Macurco Technical Service.

#### USE INSTRUCTIONS AND LIMITATIONS



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**.

#### USE FOR

The GD-2B is an electronic detector of combustible, heating type gases (natural gas and propane), designed for connection to alarm control panels. It can operate on 12 to 24 VDC power from standby or interruptible panel power, or be powered separately. The GD-2B is intended for installation in buildings in non-hazardous locations such as residences, retail stores, office buildings, and institutional buildings.



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 or *User Instructions*, or call Macurco Technical Service.

## DO NOT USE FOR

The GD-2B is NOT intended for use in industrial applications such as refineries, chemical plants, etc. The GD-2B does NOT detect carbon monoxide. Do NOT mount the GD-2B in a corner. The GD-2B is designed for connection to Fire Alarm/Burglary Control Panels. Do not connect the GD-2B to Fire Alarm Circuits, or Burglar Alarm or other signals. The Alarm Control Panel must be dedicated to gas detection or have alarm devices that provide a distinctive alarm for gas detection. Do NOT mount the GD-2B in kitchens or bathrooms - alcohol's, ammonia, cleaning solvents, paint thinner, gasoline vapors, and aerosol propellants (aerosol cans such as hair spray usually contain a combustible gas) may cause nuisance alarms.



## WARNING

GD-2B may not function effectively below 32 °F or above 120°F. Using the detector outside of this temperature range may adversely affect product performance and **result in sickness or death.**

## GENERAL DESCRIPTION

The GD-2B is a low voltage (9-32VDC, 12-24VAC) electronic detector of combustible, heating type gases, that has been calibrated for methane (natural gas) and propane (LP) gas. The GD-2B is designed for connection to Fire Alarm/Burglary Control Panels. The GD-2B has a SPST Alarm relay, for connection to control panels or other devices. The GD-2B does NOT detect carbon monoxide. The GD-2B has an optional internal audible sounder.

## FEATURES

- DESIGNED TO MEET UL STANDARD 2075 FOR THE STANDARD FOR SAFETY FOR GAS AND VAPOR DETECTOR AND SENSORS
- SENSITIVITY TESTED BASED ON UL 1484 STANDARD FOR RESIDENTIAL GAS DETECTORS
- DETECTS HEATING GASES: PROPANE (LP), NATURAL GAS (METHANE)
- SPST ALARM AND TROUBLE RELAYS
- CAN BE SELF-RESTORING OR LATCHING
- ELECTRONIC SENSORS: NO MAINTENANCE OR RECALIBRATION
- TEMPERATURE COMPENSATED
- SIMPLE INSTALLATION AND OPERATION
- SUPERVISED SENSOR

## SPECIFICATIONS

- Size: 3-1/8 X 5-1/8 X 1-3/4 inch (7.94 x 13.02 x 4.4 cm)
- SHIPPING WEIGHT: 0.54 pound
- VOLTAGE: 9-32VDC, 12-24VAC
- Current (non-alarm): 40 mA @ 12 VDC, 20 mA @ 24 VDC, 34 mA @ 12 VAC, 17 mA @ 24 VAC
- Current (in alarm): 56 mA @ 12 VDC, 28 mA @ 24 VDC, 46 mA @ 12 VAC, 23 mA @ 24 VAC
- COLOR: White
- SENSOR MAINTENANCE: Not required
- ALARM RELAY RATING: SPST, 100mA, 40VDC
- TROUBLE RELAY: SPST, 100mA, 40VDC
- OPERATING TEMPERATURE RANGE: 32° to 120° F
- ALARM SET POINT: Per UL 1484 (25% LEL)

## INSTALLATION AND OPERATING INSTRUCTIONS

The following instructions are intended to serve as a guideline for the use of the Macurco GD-2B Combustible Gas Detector. 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 certain specified airborne 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 or *User Instructions*, or call Macurco Technical Service.

### LOCATION

A GD-2B is usually located in each room (except kitchens or bathrooms) where there are gas appliances or through which gas pipes pass. Do NOT mount the GD-2B in a corner. Do NOT mount the GD-2B in kitchens or bathrooms - alcohol's, ammonia, cleaning solvents, paint thinner, gasoline vapors, and aerosol propellants (aerosol cans such as hair spray usually contain a combustible gas) may cause alarms. Do NOT mount the GD-2B where the normal ambient

This product is intended for use in ordinary indoor locations of family living units and office workspaces.



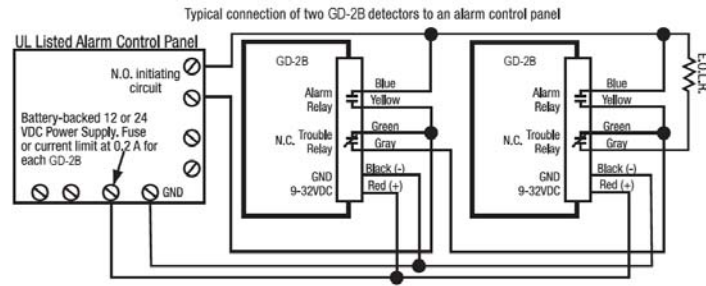
## WARNING

The GD-2B is not designed to measure compliance with Occupational Safety and Health Administration (OSHA) commercial or industrial standards.

### INSTALLATION

1. If the gas used is natural gas (methane) mount the GD-2B on a wall about one foot down from the ceiling. If the gas used is propane (LP), mount the GD-2B on a wall or column one foot above the floor. Use the same spacing as for smoke detectors- 30-foot centers, 900 square feet per detector.
2. As shipped, the GD-2B faceplate is mounted on the enclosure's rear-housing component. This enclosure configuration allows the unit to be surface mounted flush on a wall. Wiring is routed through an access area on the base of the rear housing.
3. A thin mid-plate enclosure component is also supplied with the GD-2B. Using the supplied screws, this mid-plate component is used to mount the GD-2B on a 2 x 4 inch (5.08cm x 10.16 cm) switch box - single-gang or "handy", provided by the installer. The GD-2B's faceplate component (with the detector attached) is then mounted on the mid-plate component.
4. Electrical connections to the GD-2B are made via the supplied six-conductor pigtail cable. The pigtail cable is first connected to the control panel wiring by means of wire-nuts (refer to the diagrams for proper pigtail wiring). The pigtail cable's connector then snaps into the mating connector on the back of the GD-2B detector, allowing easy installation and replacement of the GD-2B. For proper detector operation, ensure that the GD-2B is connected to a continuous source of power (not controlled by a wall switch). The GD-2B current draw figures represent worst-case conditions and will not vary as the applied DC voltage varies.
5. The alarm control panel zone inputs must be terminated with end of line resistors (E.O.L.R.), which are provided with the panel.
6. In the configuration, as shipped from the factory, the GD-2B is used with normally open initiating circuits. A jumper on the circuit board can be removed to use the GD-2B with normally closed initiating circuits. When using the GD-2B with normally closed initiating circuits, remove the blue jumper labeled "ALARM RELAY" on the top side the printed circuit board under the buzzer.

7. See wiring diagram for information below on connections of the GD-2B. Macurco™ recommends a minimum of 22 AWG wire for runs up to 200 ft. (6096 m), and 18 AWG wire for longer runs.
8. See wiring diagram and information below for connections of the GD-2B.



9. The alarm control panel zone inputs must be terminated with end of line resistors (E.O.L.R.), which are provided with the panel. The GD-2B has an **optional** internal audible sounder and should be connected to a Fire Alarm/Burglary Control Panel with an audible device that provides at least 85 DB sound output. See BUZZER option in the OPERATION section.

**WARNING**

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

**OPERATION**

1. Once the GD-2B is operational (ARMED) the green light will be on continuously. If gas is detected the red LED (ALARM) turns on and the SPST alarm relay activates to indicate the alarm condition.
2. In the configuration, as shipped from the factory, the GD-2B is self-restoring. When the air clears of gas, the red light turns off and the relay switches to its normal state. A jumper on the circuit board can be removed to allow the unit to latch in upon alarm.

Once latched in, power will need to be interrupted to un-latch the alarm condition. The GD-2B can be modified, either before or after installation, to have a latching output. Locate the blue jumper labeled "LATCH IN" on the printed circuit board on the left hand side under the buzzer. Remove this jumper and the unit will stay in alarm (once gas has exceeded the pre-set threshold) until the power is interrupted.

3. In the configuration, as shipped from the factory, the GD-2B has an internal audible sounder. A jumper on the circuit board can be removed to disable the internal audible sounder. If the jumper on the circuit board is removed the GD-2B should be connected to a Fire Alarm/Burglary Control Panel with an audible device that provides at least 85 DB sound output. The GD-2B can be modified, either before or after installation, to disable the internal audible sounder. Locate the blue jumper labeled "BUZZER" on the printed circuit board on the left hand side under the buzzer. Remove this jumper to disable the internal audible sounder.
4. In the configuration, as shipped from the factory, the GD-2B is used with normally open initiating circuits. A jumper on the circuit board can be removed to use the GD-2B with normally closed initiating circuits. When using the GD-2B with normally closed initiating circuits, remove the blue jumper labeled "ALARM RELAY" on the top side the printed circuit board under the buzzer.

#### ALARMS



#### WARNING

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

The final alarm is determined by the configuration of the control panel, with the GD-2B only switching its relay to actuate the panel. Do not connect the GD-2B to Fire Alarm Circuits, or Burglar Alarm or other signals. The illumination of the red (ALARM) light on the GD-2B indicates the alarm condition. When an alarm occurs immediately evacuate the premises and seek assistance.



#### WARNING

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



In addition to the methane (natural gas) and propane (LP) gas that it is designed to detect, the GD-2B can also be affected by a broad range of combustible gases. Some of these that may cause an alarm are: alcohol, ammonia, cleaning solvents, paint thinner, gasoline vapors, and aerosol propellants. Aerosol cans such as hair spray usually contain a combustible gas. Always make sure that there is adequate ventilation when you use these products. Proper location, not in kitchens or bathrooms, will minimize alarms due to normal use of household products.

#### RESET/SILENCE SWITCH

The switch on the front of the GD-2B labeled "TEST/RESET," performs four functions.

1. A short press of the button (less than 5 seconds) will place the unit into self-test mode with no alarm relay activation. The buzzer will sound for two complete alarm cycles, the LED will turn red for 5 seconds and then it will alternate between green and amber every second while the self-test executes. About a minute after entering in self-test mode software will simulate an alarm condition. When this happens, the LED turns red and the buzzer will sound two complete alarm cycles. The unit will then return to normal operation.
2. Pressing and holding the button will cause the buzzer to sound for two complete alarm cycles and LED turns red for 5 seconds and then to solid amber for 30 seconds. The alarm relay is activated during the 30 seconds while LED is solid amber. Button can be released once the solid amber is displayed. 30 seconds after entering self-test mode the alarm relay will turn off and the LED will alternate between green and amber every second while the self-test executes. About a minute after entering self-test mode software will simulate an alarm condition. When this happens, the LED turns red and the buzzer will sound two complete alarm cycles. The unit will then return to normal operation.
3. If the GD-2B is in an alarm condition due to the detection of combustible gas, one push of the switch will cause the alarm buzzer to mute for five minutes. After the five-minute period, if gas is still present, the status light will again switch to RED, the alarm relay will close and the buzzer will sound. If after the five-minute period, the detected gas level has dropped below 25% LEL the GD-2B unit will reset unless it is latched in. See LATCH IN option of OPERATION section.
4. If the GD-2B is at the end of its seven year life the TEST/RESET switch can be used to temporarily silence the buzzer function. See section "End-of-life Indicator"

## TROUBLE INDICATOR

Internal failure of the GD-2B 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 and the GD-2B buzzer will emit a short "chirp" (if the BUZZER is enabled) every 50 seconds. See ERRORS section. The GD-2B microprocessor continuously monitors various detector parameters. Failure of the GD-2B'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 GD-2B.

## END-OF-LIFE INDICATOR

Seven years after the GD-2B is installed the end-of-life signal will be activated indicating that the GD-2B has reached the end of its service life and needs to be replaced. The end-of-life signal will cause an open circuit in the normally closed (NC) Trouble Relay to provide actuation of the signal circuits. The status LED will flash alternate AMBER and OFF every 2 seconds and the GD-2B buzzer will emit a short "chirp" every 50 seconds (if the BUZZER is enabled). The end-of-life buzzer can be silenced for 48 hours by pressing the "TEST/RESET" button. The silencing of the buzzer also resets the Trouble Relay to the Normally Closed (NC) position. The silence function will continue to be available for 29 days after the GD-2B initiates an end-of-life signal. After this 29 day period the GD-2B can no longer be silenced and must be replaced.

## ERRORS

The GD-2B 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 Macurco Tech Support for advice. If repair is required, return the unit to manufacturer to comply with warranty.



## WARNING

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

## MAINTENANCE

The GD-2B does not require regular maintenance. The unit uses a self-purging semi-conductor sensor that has a long life expectancy. All service and repair of the GD-2B are to be performed by Macurco. Macurco does not sanction any third-party repair facilities.



## WARNING

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

## TESTING

The GD-2B should be tested monthly by pushing the TEST/RESET switch; see TEST/RESET switch section. Normally this will be the only test required for the GD-2B and is the recommended way to test the unit or units after installation. All GD-2B 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 GD-2B 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 gas test procedure.

## GAS TEST

Once the unit is fully operational (the green light is on steady), test the unit by directing gas from an unlighted butane cigarette lighter into the detector through one of the vent holes. It will be necessary to hold the lighter valve open for several seconds. The red light (ALARM) will turn on, the alarm relay switches, and any devices connected should activate. The detector should be tested regularly by using gas from an unlit cigarette lighter, as detailed above.

## CLEANING

The GD-2B should be cleaned using the soft brush attachment of your vacuum cleaner. The GD-2B should be tested after cleaning to ensure the unit is operating normally.

## 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 deteriorate 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.

## LIMITED WARRANTY

The Macurco GD-2B Combustible Gas Detector is warranted to be free from defective material and workmanship for a period of two (2) years from the date of manufacture (stamped on the unit). 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 TWO (2) YEARS 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 equipment. 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.

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