

# ZG106 CO<sub>2</sub> and Temperature Monitor Operating Instructions

ZG106 is a portable, accurate handheld CO<sub>2</sub> monitor. In addition to measuring the CO<sub>2</sub> concentration, this device can also measure the ambient temperature. It uses Dual Beam NDIR technology to improve the long term stability.

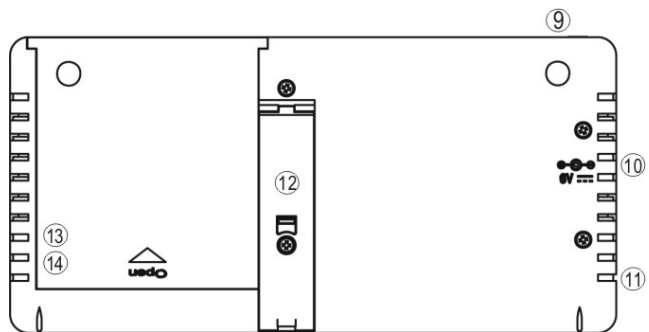
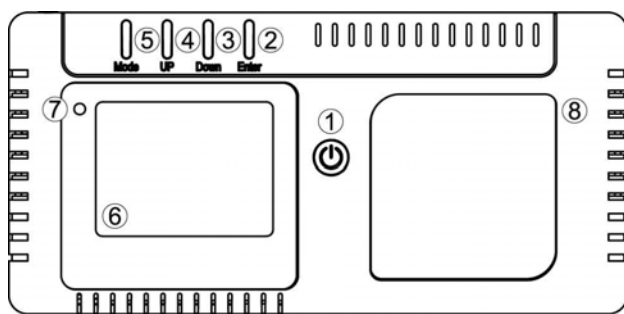
## Features:

- ☑ **The built-in Data logger** can store 48 sets of CO<sub>2</sub> and temperature in the past 24 hours; one log per 30 minutes.
- ☑ **Max/Min mode** can record the maximum and minimum concentration of CO<sub>2</sub> since the device has been last turned on.
- ☑ **The Alarm mode** will sound at 1000 PPM, the ASHRAE limit. The Alarm Level can be modified, and the Alarm sound can be turned off.
- ☑ **The RCFS Mode** can recover the original factory settings after the CO<sub>2</sub> device has been recalibrated, altered, or damaged.



(Display Features and Modes)

1. Power Button
2. Enter Button
3. Down Button
4. Up Button
5. Mode Button
6. LCD Display
7. LED Light
8. Function Label
9. Gas Entry Hole
10. Power inlet
11. RJ45 socket
12. Housing Stand
13. Battery Cover
14. AA Batteries\*4



## MODE FUNCTIONS

There are several Modes which we can adjust the setting parameters. These modes are Alti Mode, Alarm Mode, Outside Mode, Ucal Mode, Datalogger Mode, MaxMin Mode and rcFS Mode in sequence.

ALTI	Compensate the pressure changes with appropriate altitude of location when measure.	
ALARM	Alarm while CO <sub>2</sub> concentration exceed one threshold, which can be modified. The Alarm sound can be turn on/off while the "speaker Icon" flashes.	
OUTSIDE	Modify the outside CO <sub>2</sub> concentration, for defining the ventilation rate.	
CALI	Calibrate the sensor while the reading deviates from the actual CO <sub>2</sub> concentration.	
DATALOGGER	Show the past CO <sub>2</sub> and Temperature records in the past 24 hours.	
MaxMin	Show the Max and Min CO <sub>2</sub> reading before being cleared or powered off after PowerOn.	
rcFS	Recover the factory setting, if the device cannot show accurate reading.	

## OPERATION INSTRUCTIONS

### PowerOn

Press Power button (1) to turn on the device after placing 4 AA batteries into the battery holder or AC adapter plug into the DC socket. Once power on, CO<sub>2</sub> reading will show after 15 seconds of warm up.

## ■ WarmUp

It lasts approximately 1min before WARMUP disappears; all the functions will not response during warm up.

## ■ UserMode

After warm up, the device will stabilize and display the normal CO<sub>2</sub> Reading (Upper Display) - remain visible at all times.

## ■ Temp and Ventilation Rates (Lower Display)

The Up/Down button (④/③) allows you to scroll through the Temperature and Ventilation Modes. When pressing the Up button, the lower display will go through the following sequence: Temp°C -> Temp°F -> Vent Rate lps -> Vent Rate cfm/p

\*Note: lps refers to Liter Per Second Per Person; cfm/p refers to Cubic Feet Per Minute Per Person

## ■ Operation of Mode Adjustment

### 1. ALTI Mode:

- 1.1. Press the Mode Button (⑤), ALTI flashes
- 1.2. Press Mode (⑤) to alter between m (meters) and ft (feet).
- 1.3. Press Up/Down (④/③) to adjust the altitude (Step=100m/500ft)
- 1.4. Press the Enter Button (②), save or leave the ALTI Mode, return to UserMode

### 2. ALARM Mode

- 2.1. Adjust the alarm level
  - 2.1.1 Press the Mode button (⑤), until ALARM flashes
  - 2.1.2. Press Enter Button (②), "CO<sub>2</sub>" icon flashes
  - 2.1.3 Press Up/Down(④/③) to adjust the alarm level ( $\geq 1,000$  ppm, interval is  $\pm 100$ ppm;  $< 1,000$ ppm, interval is  $\pm 50$  ppm)
  - 2.1.4. Press the Enter (②), save the setting and return to UserMode.
- 2.2. Turn ON/OFF the ALARM
  - 2.2.1. Press the Mode button (⑤), until "Speaker Icon" flashes.
  - 2.2.2. Press Enter Button (②)
  - 2.2.3. Press Up/Down (④/③) to turn on/off the ALARM,
  - 2.2.4. Press the Enter (②), save the setting and return to UserMode.

### 3. OUTSIDE Mode

#### \*\* Note: Ventilation Rate

Ventilate rate represents how much air is introduced into the indoor space from the outside. Low values indicate low ventilation rates and potentially poor air quality. High levels indicate excessive ventilation and potential excessive energy usage. **To obtain an accurate measurement, reading should be taken 2-3 hours after occupancy has stabilized in a space or at a peak in daily CO<sub>2</sub> concentrations.** In indoor air quality control, CO<sub>2</sub> value is an indicator of ventilation rate. **400ppm (Parts Per Million) is the default CO<sub>2</sub> concentration outside** (according to ASHRAE: American Society of Heating, Refrigeration and Air conditioning Engineers)

- 3.1. Press the Mode button (⑤), until OUTSIDE flashes
- 3.2. Press Enter (②), show OUTSIDE, CO<sub>2</sub> and PPM flash  
Press Up/Down (④/③) to adjust the reading
- 3.3. Press the Enter (②), save the setting and return to UserMode  
After modification, the VENT Rate will change

### 4. CALI Mode

The CO<sub>2</sub> monitor has been calibrated in the factory. Sensor drift usually occurs in linearity. Please follow below steps.

- 4.1. If battery icon shows low power, please replace new batteries or use AC adapter
- 4.2. Press the Mode button (⑤), until CALI flashes
- 4.3. Press Enter (②), CALI shows on display
- 4.4. Adjust the lower display to ambient CO<sub>2</sub> value by Up/Down (④/③) Button.
- 4.5. Press Mode button (⑤) more than 10 sec., CALIBRATING flashes.  
Calibration will be done after about 3 min and LCD will appear "PASS". If LCD appears "FAIL", please calibrate once again.
- 4.6. Press Enter (②), return to UserMode

### 5. DATA LOGGER Mode

The device has a built-in data logger, which can provide users the past CO<sub>2</sub> and temperature readings within the past 24 hours.

- 5.1. Press the Mode button (⑤), until DATALOGGER flashes
- 5.2. Press Enter (②), CO<sub>2</sub> and Temperature show up  
Press Up/Down (④/③) to page up/down the reading.
- 5.3. Press the Enter (②), return to UserMode

## 6. MaxMin Mode

The device has a built-in MaxMin mode, which can provide users the Maximum and Minimum CO<sub>2</sub> readings since the device has last been turned on.

- 6.1. Press the Mode button (Ⓢ), until MAX MIN flashes
- 6.2. Press Enter button (Ⓜ), MAX and MIN CO<sub>2</sub> reading alternatively shows.
- 6.3. "CLR" will flash if press Up/Down (Ⓞ/Ⓝ)  
Press Enter (Ⓜ), to CLEAR the MAX and MIN record .
- 6.4. Press Mode or enter (Ⓢ), return to UserMode

## 7. rcFSMode:

If user set or calibrated the sensor wrongly, you can recover the factory setting

- 7.1. Press the Mode button (Ⓢ), until rcFS flashes on the lower display
- 7.2. Press Enter (Ⓜ), "no" shows on the upper display
- 7.3. Press Up/Down (Ⓞ/Ⓝ), "no" change to "yes"  
Press Enter (Ⓜ), Factory Setting will reload, return to UserMode;
- 7.4. Press Mode (Ⓢ), leave rcFS Mode, return to UserMode

## SPECIFICATIONS (Preliminary Version)

**Method** - Dual Beam (NDIR Non-Dispersive-Infrared)

**Display** - LCD

Independent CO<sub>2</sub> and Temperature readings.

Calculates and Displays Ventilation Rates

**Sample Method** -Diffusion or flow through (50 ~200 ml/min)

### ■ Performance - CO<sub>2</sub>

Measurement Range	0-3,000 ppm display
Display Resolution	1ppm at 0-1,000ppm; 5ppm at 1,001-2,000ppm; 10ppm at 2,001-3,000ppm
Accuracy	±50 ppm or ±5% of reading
Repeatability	±20 ppm
Temperature Dependence	Typ. ±0.1% of reading per °C or ±2 ppm per °C, whichever is greater, referenced to 25°C
Pressure Dependence	0.13% of reading per mm Hg (Corrected via user input for altitude)
Response Time	About 2min for 63% of step change
Warm-Up Time	<60 seconds at 22°C

### ■ Performance - Temperature

Temperature Range	Display 32 to 122°F (0 to 50°C)
Display Resolution	0.1°F (0.1°C)
Display Options	°F / °C, or Off. Set with Up / Down button
Accuracy	±2°F (±1°C) When the fan blows to the device directly, the accuracy of temperature is + / -1.5 degC .
Response Time	20-30 minutes (case must equilibrate with environment)

### ■ Outputs

OC: Normally Low, 100mA max. @ 24 VDC. Adjustable setpoint, factory setting is 1000ppm, hysteresis is 50ppm

### ■ Power Supply

Two power supply types

Battery type: Alkaline, AA\* 4 (80 hours)

External: 6 VDC from external AC/DC adapter which is included in package (Use specified AC adapter only)

**Power Requirement**

160 mA Peak, 15 mA average from 6V

### ■ General Operating Conditions

**Operating Temperature:** 32-122°F (0-50°C) 0-95% RH, non-condensing

**Storage Temperature:** -4 to 140°F (-20 to 60°C)

■ **Dimensions :** 24.3×81.1×165 mm (0.96×3.19×6.50 inch)

**Weight (including batteries) :** 273.6 grams(9.65 oz)

## ■ LCD ERROR MESSAGES

The device incorporates visual diagnostic messages as follows:

「Err 3」 Error 3, it is displayed when the temperature being measured is outside of the measurement range.

「Err 5」  
「Err 6」 Error 5-6, it is necessary to reset the device. To reset it, turn the instrument off, remove the battery and wait for a minimum of one minute, reinsert the battery and turn on. If the error message remains please contact the Service Department for further assistance.

**ZyAura**  
*Monitor the invisible*

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