CO_2 Controller Operating Instructions

Model: ZGh213

1. Product Instruction

Thank you for selecting the ZGh213 wall mount CO_2 controller. By using the CO_2 controller as an indicator, you can easily measure the current CO_2 concentration together with the temperature. The wall mount CO_2 controller can be used in greenhouses, hydroponics rooms, and other places where not only plant health is important, but also the safety and comfort of the botanist who is caring for the plants are held in high regard as well.

ZGh213 CO_2 controller is cost-effective and has many features:
1. Dual Beam NDIR (Non-Dispersive Infrared) technology is used to measure CO_2 concentration up to 3,000ppm (0-10,000ppm, optional) (parts per million) and temperature.
2. Built-in Photo Sensor.
3. Relay output can automatically control a CO_2 generator or bottled CO_2 to produce CO_2 in confined spaces.

2. Package Content Check & Main Unit View

The ZGh213 contains the following items:
1. CO_2 Controller
2. Wall panel holder (1)
3. Screws (2)
4. User Manual
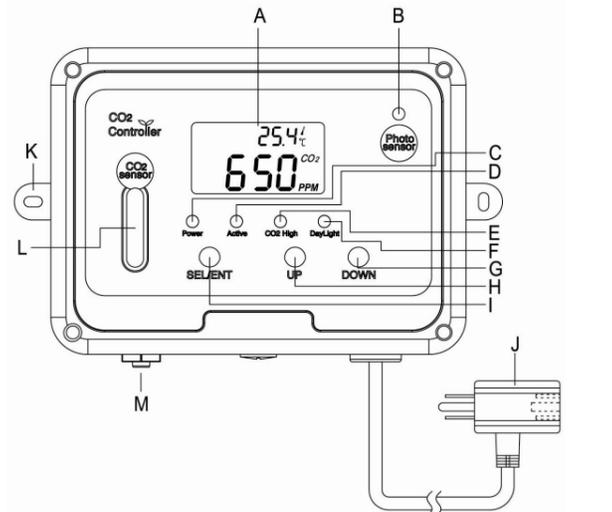
A. LCD display
B. Photo Sensor(control DayLight LED)
C. Red LED (Power indication)
D. Green LED(Active when CO_2 (concentration is < SetPoint1)
E. Red LED(CO_2 High: CO_2 (concentration > SetPoint2)
F. Yellow LED (DayLight)
G. Down Button
H. Up Button
I. Sel/Ent Button
J. Piggy back style plug
K. Panel Holder
L. CO_2 sensor
M. Air Fitting(for professional calibration)

3. Connection Diagram
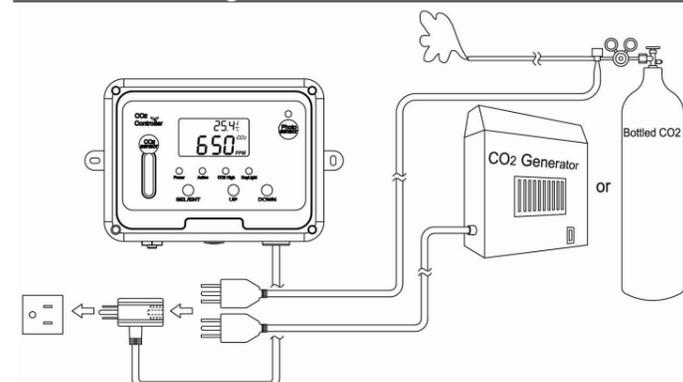
Note: The CO_2 controller cannot control fan itself. User can connect CO_2 generator or bottled CO_2 to the piggyback plug.

4. LCD Display Symbol

Symbol	Meaning	Description
650 $^{CO2}_{PPM}$	CO_2 Concentration ppm (Parts Per Million)	ambient CO_2 concentration
25.4℃	Temperature	display the current temperature
ReFactSet	Recover Factory Setting	to recover factory default settings and cancel any customized settings
CALIBRATING	Calibration	To calibrate the CO_2 sensor when the accuracy deviates from the actual CO_2 concentration.
SetPoint12	Setting CO_2 value	Setting 1,2 CO_2 value

5. Function Instruction

The Photo sensor is used to detect the presence or absence of light.
The Red LED will be constantly lit when the power is supplied.
The Yellow LED: when lit, the photo sensor is active; but the controller will not operate during periods of darkness, piggyback plug has no output, CO_2 generator or bottled CO_2 won't produce CO_2.
Warning: If the CO_2 concentration reaches the second setting level, the Red LED will light on the controller. Take careful action before entering the room where it is placed, such as ventilating the space.

6. Safety Note

Warning: Your safety is very important to us. To ensure correct and safe use of the product, please read these warnings and the entire User Manual before using the product. Otherwise, the protection provided by the equipment may be impaired. These warnings provide important safety information and should be observed at all times.
1. Please handle the device carefully; do not subject the product to impact or shock. Otherwise, this may cause the precision of the device to decrease.
2. Do not place the unit or the adaptor near a heat source. Heat can cause distortion of the unit, which may result in an explosion or fire.
3. Do not touch the exposed electronic circuitry of the device under any circumstances, as there is the danger of electric shocks.
4. Please use only the included power adaptor. Improper power adaptor or power sources can cause serious damage to the product, or result in injury or death to the user.

7. Caring For the Product

To get the most out of this product, please observe the follow guidelines.
1. Repair - Do not attempt to repair the product or modify the circuitry by yourself. Please contact your local dealer or a qualified repairman if the product needs servicing, including the replacement or calibration of the sensor.
2. Cleaning - Disconnect the power before cleaning. Use a damp cloth. Do not use liquid cleaning agents such as benzene, thinner or aerosols, as these will damage the device.

8. Installation Instructions

Please carefully take out the controller, Relay Socket, 1 panel holder, user manual, screws, from the package.
Step-by-Step Installation:
1. Choose a suitable location to install the controller. Fix the panel holder on the wall with the four screws (included).
2. Put it on the panel holder and make sure that they are connected tightly.
3. The ZGh213 CO_2 controller has one relay output: The relay cable is pre-wired to it. The relay can control a CO_2 generator or bottled CO_2 to produce CO_2 in monitored space when necessary and the relay will be triggered when the CO_2 concentration below SetPoint1 and when there is extraneous light.
Note: If the light intensity is less than the preset value **(this value cannot be set by the user),** the CO_2 controller will not be active, even if the CO_2 level is less than SetPoint1. Only if the light intensity is higher than the preset level will the CO_2 controller become active.

4. After finishing the installation, please connect the piggy back type plug into the electrical supply outlet.

9. Customizing Settings

In order to meet the personal requirements, it is advisable to set up the customizing CO_2 setting when necessary.
After press the SEL/ENT buttons for 3 seconds, you can scroll through the SetPoint1, SetPoint2, Calibration, and RcFactSetting by Up/Down button.

Setting point 1:
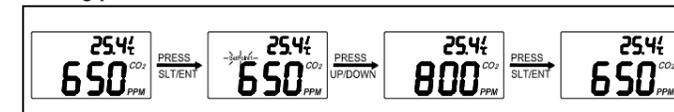
1. Press Sel/Ent key for more than 3 second, the "SetPoint1" icon appears.
2. Press Sel/Ent key to enter Setpoint1 mode.
3. Press Up/Down key to adjust the SetPoin1 data.
4. Press Sel/Ent key to save this parameter setting, SAVE appears on the LCD.
Note: The default SetPoint 1 is 1,000ppm.

Setting point 2:

1. Press Sel/Ent key for more than 3 second, scroll to this Mode by Up/Down button, the "SetPoint2" icon appears.
2. Press Sel/Ent key to enter Setpoint2 mode.
3. Press Up/Down key to adjust the SetPoint2 data.
4. Press Sel/Ent key to save this parameter setting, SAVE appears on the LCD.

Note: The default SetPoint2 is 1,450ppm. The second setting level should be higher than the first setting level when setting level parameter.

Using the Calibration function:

1. Press Sel/Ent key for more than 3 second, scroll to this Mode by Up/Down button, the "Cali" icon flash.
2. Press Sel/Ent key again to enter "Cali" mode.
3. Press Up/Down key to Select the calibration value.
4. Press Sel/Ent key more than 10 second to calibrating the device. After about 3min, "Pass" will appear on the LCD. If Fail appears on the LCD, please do calibration again.

Notes: Between growing cycles or at least once a year, you should manually recalibrate the unit. We recommend you use normal outdoor fresh air (400ppm) for calibration. By taking it outdoors, plugging it in, or you can pump the standard CO_2 gas (0~2000ppm) through the Air Fitting in field. Waiting about 5min, before you do above calibration.

Using the ReFactSet function:

1. Press Sel/Ent key for more than 3 second, scroll to this Mode by Up/Down button, the "ReFactSet" icon flashes.
2. Press Sel/Ent key again to enter "ReFactSet" mode.
3. Press Up/Down key to Select "Yes".
4. Press Sel/Ent key to save the setting after selection.

Note: If the user sets the data or calibrates the sensor incorrectly, use the ReFactSet to return the default factory setting like SetPoint1, SetPoint2.

10. Specification

CO_2 Specification	
Measurement Range	0-10,000ppm
Display Resolution	1ppm at 0~1,000ppm; 10ppm above 1000ppm
Accuracy	0~2000ppm: ±70ppm or ±5% of reading, whichever is greater >2000ppm:±7% of reading
Repeatability	±20ppm @400ppm
Pressure Dependence	0.13% of reading per mm Hg
Response Time	<60 seconds for 90% response to step change
SetPoint1 (First Setting Level)	Default value= 1,000ppm
SetPoint2 (Second Setting Level)	Default value= 1,450ppm
Warm-Up Time	<60 seconds at 22°C
Splash Proof Grade	IP54

Operating Conditions:	
Operating Temperature	0°C to 50°C (32°F to 122°F)
Humidity Range	0 ~ 95% RH non-condensing

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

■Power Supply & Relay Output:

Power Supply		AC adapter 110/220 VAC
AC Input	Voltage	100 ~ 240 VAC
	Frequency	50 / 60 Hz
	Power Requirement	3 W maximum
Relay Socket		One Relay output, Peak Current< 5A@ 250 VAC, SPST. Normally Open.

11. Dimension

170.0mm [6.69inch]
126.0mm [4.96inch]
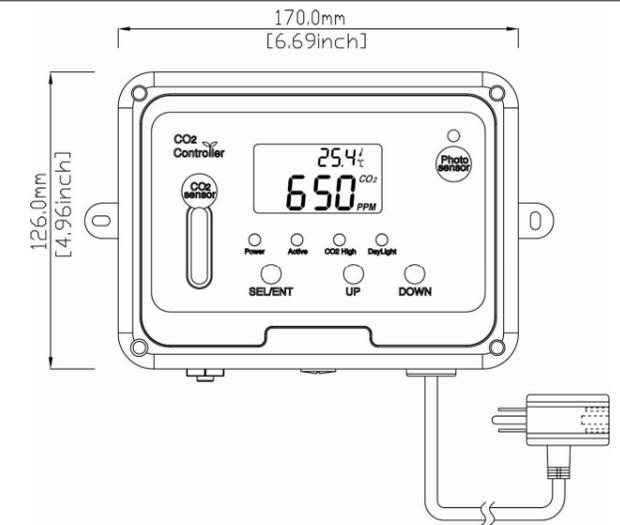
12. Fault Codes& Troubleshooting Guide

No	LCD Fault Icon	Description (of the fault)	Suggested Actions
1	Er3	The ambient temperature has exceeded the temperature range 0°C to 50°C (32°F to 122°F)	This error will disappear when the temperature returns to the range between 0°C and 50°C (32°F to 122°F).
2	Er4	Inaccurate measurement or the sensor has exceeded its expected life	Please unplug the AC adapter and reconnect it. If the "Er4" always appears, please contact the local dealer.
3	Er5 Er6	EEPROM System Problem	Please unplug the AC adapter and reconnect it. If the "Er5, Er6" still appears, please contact the local dealer.
4	Er8	The accuracy of CO_2 sensor may deviate from the actual concentration.	①Please unplug the AC adapter and reconnect. If the "Er8" still appears, please contact with the local dealer. ②Please calibrate the unit. After calibration if the "Er8" still appears, please contact the local dealer.