User Manual

Grow CO2 Enrichment Controller



ENGLISH

Grow CO2 Enrichment Controller for grow room and greenhouse.

WARNING!

Please read these instructions carefully prior to start-up and use. These instructions should be saved for future reference and passed on to any subsequent owner. Failure to follow any of these instructions could result in bodily harm or death, and could void product warranties. LogiCO2 International AB, its affiliates and third party providers assume no responsibility for claims arising from improper or careless use or handling of its products. Retain this instruction.

LEGAL NOTICE

All persons responsible for the operation and maintenance of this equipment must read and understand the safety and operating information contained in this guide. Installation and service of this equipment should be performed only by professionals. The function of the equipment will be impaired if it is not properly installed. Disconnection from supply source: When installing the Grow CO2 Enrichment Controller to the power net, please ensure that the fuse that the system runs on is clearly marked. This makes it easy to disconnect the power to the system, if needed. It is very important to be aware that the Grow CO2 Enrichment Controller does not function if disconnected from power mains.

Testing set, BEFORE INSTALLATION

The different sets are delivered pre-connected in the package. Always test the set before installation to verify proper function!

1. Open the box and carefully take the components out of the package.
2. Find the power supply in the package and attach the correct mains-adaptor for your country's outlet, then connect the power supply to the electrical outlet. The set should now activate.
3. Check that all LEDs on the Grow CO2 Enrichment Controller illuminate and that the built-in buzzers beep. This is part of the selfdiagnostics program.
4. Now your product is tested and you can start the installation.

Technical specifications

Power supply:	24V DC
Mains power supply:	Transient overvoltages up to the levels of overvoltage category II. NOTE: These levels of transient overvoltage are typical for equipment supplied from the building wiring.
Power consumption:	130 mA
Power consumption with Enrichment Valve (10 Watt):	Max 550 mA
Measurement range:	0-5000 ppm CO2-concentration
Altitude:	Calibrated for altitude up to 5000 m.
Pollution degree:	2
Serial communication:	Modbus protocol over RS485
Automatic calibration:	At regular intervals
Operating temperature:	Calibrated for operating between 32 – 115F (Sensor functions from -5F) Calibrated for operating between 0 to 45˚C (Sensor works from -20°C) but values valid only for 0-45°C).
Operating humidity:	0-95% RH non condensed
Storage temperature:	-40 to + 70˚C

LED indications

Red:	Alarm - CO2 concentration over 5000 ppm
Green:	Adding CO2 gas
Green:	Power on
Installation:	For indoor use
Dimensions (LxWxD):	90x161x38 mm 3.5"x6.3"x1.5"
Ingress protection:	IP 56

Function

The LogiCO2 Grow CO2 Enrichment Controller is a device that measures the concentration of CO2 in the ambient environment of the room being controlled and opens/closes our enrichment valve to achieve a perfectly enriched CO2 environment in the grow room.

Mount the Grow CO2 Enrichment Controller at the same height as the foliage of the plants, where the photosynthesis is taking place. If plant lighting is used in the greenhouse, make sure that the plant light hits the Grow CO2 Enrichment Controller. An internal light sensor in the Grow CO2 Enrichment Controller makes it possible to activate the CO2-control only when the plant lighting is on. It is possible to disable this function via DIP-switch.

The system control the CO2 level with a "plug and play" Enrichment Valve. If the CO2 gas for the grow room is produced by burning gas, use the RCB external relay box to start and stop the burner, instead of the Enrichment Valve. Both the Enrichment Valve and the RCB have RJ45 connectors for direct connection to the Grow CO2 Enrichment Controller.

Just like the LogiCO2 Safety CO2 Sensor, the Grow CO2 Enrichment Controller can be adjusted for the correct altitude.

Adaptive CO2-control

The Grow CO2 Enrichment Controller is default set to use a fixed dosing time of 30 or 60 seconds every 5 minutes. The Grow CO2 Enrichment Controller also has an Adaptive CO2-control algorithm that automatically adjust the dosing time of CO2 between 10 to 120 seconds. This dosage of CO2 is done in intervals of 5 minutes. The initial dosage time is 30 seconds. It is possible to enable the Adaptive CO2-control via DIP-switch on the printed circuit board.

The Grow CO2 Enrichment Controller has an adjustable CO2 setpoint via a push button on the outside of the cover. The setpoint for the target CO2 concentration is adjustable from 700 to 2000 ppm in steps of 50 ppm. The default setpoint is 1200 ppm. Setpoint "OFF" stops the CO2 regulation.

The hysteresis can be set to 40 or 100 ppm and default setting is 40 ppm.

The display is alternately reading:

- The current CO2 concentration
- The CO2 target setpoint value
- The current altitude setting (height over the ocean)

It can also show "Low" if the current concentration is 200 ppm below the setpoint, indicating for example that the CO2 container is empty. The green "Power on" LED starts blinking to indicate this function. If connected to a LogiCO2 Safety System Central Unit, the Central Unit will also show "/Low", after the concentration value, on the display.

Optional Remote Connection box for fans

Use a RCB external relay box (0471) and connect it to the Grow CO2 Enrichment Controller, to activate greenhouse fans. The fans will be on when the Grow CO2 Enrichment Controller actively is controlling the CO2 concentration. If the light sensor in the Grow CO2 Enrichment Controller is enabled, the fans will be on if it is light and off when it is dark in the greenhouse. When it is dark, the Grow CO2 Enrichment Controller will also stop the CO2 enrichment.

Connected with CO2 Safety System

The Grow CO2 Enrichment Controller can be used in conjunction with the Mk9 CO2 Safety System to make the perfect combination of safety and efficiency.

When the Grow CO2 Enrichment Controller is connected to the Mk9 Central Unit the current CO2 concentration can also be read on the Central Unit's display.

LED indications on the Grow CO2 Enrichment Controller



Red: Alarm - CO2 concentration over 5000ppm.

Green: Adding CO2 gas

Green: Power on

If the display is showing "AbC0" at startup, the automatic CO2 calibration is disabled.

The LogiCO2 Safety System Central Unit display shows the ID number of the CO2 Sensor, its current CO2 concentration followed by:

/Low: Concentration 200 ppm below the setpoint

/On: CO2-control activated

/Off: Only when light sensor is activated and it is dark

Explanations of symbols

Direct current

Double insulation

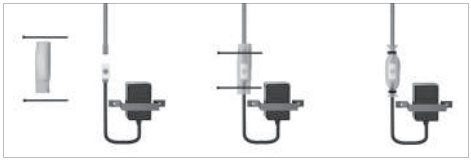
Accessories

Item code	Descirption
0475	Enrichment valve with filter
0471	RCB box, fan control

Installation

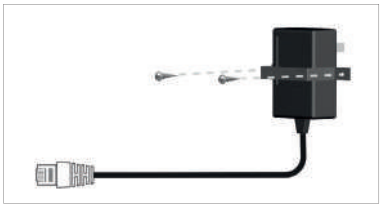
Mount the Grow CO2 Enrichment Controller at the same height as the foliage of the plants, where the photosynthesis is taking place. If plant lighting is used in the greenhouse, make sure the plant light hits the Grow CO2 Enrichment Controller. Avoid direct water spraying on the Grow CO2 Enrichment Controller.

The different units are connected to each other by cables. The blue marked cable is used for the Enrichment Valve and/or for the RCB external relay box, for activation of fans. The RCB external relay box can also be used to start and stop burner for production of CO2 gas.
The red marked cable are for communication and power. Please observe, all cables have splitters at the end to facilitate extended cable lenghts. When installing, the cables may need to be disconnected for purposes of cable routing. When reconnecting, please make sure that you connect to the original splitters and connectors. If possible, route the cables through cable conduits between the units, for a neat and safe installation.
Protective collar seals and cable ties are included. They must be used as below to protect the RJ45 1-1 connector or RJ45 1-2 splitter from moisture and dust.

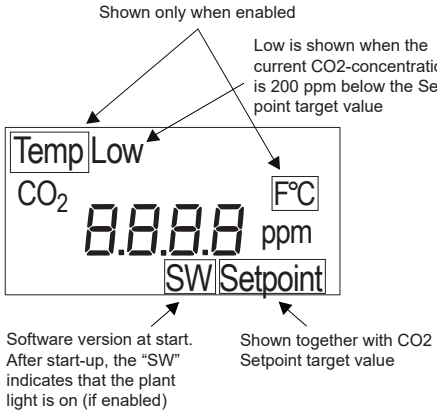


Connecting to the power supply

A separate power supply (100-240 VAC) supplies power to the system. Please observe that you have to connect the appropriate plug adaptor to the power supply depending on which country you are in.
Connect the power supply to the electrical outlet.
Mount the included plug-lock so that the power supply can not be disconnected without the use of tools.
It is also possible to order a hardwired power supply option when and were it is needed.

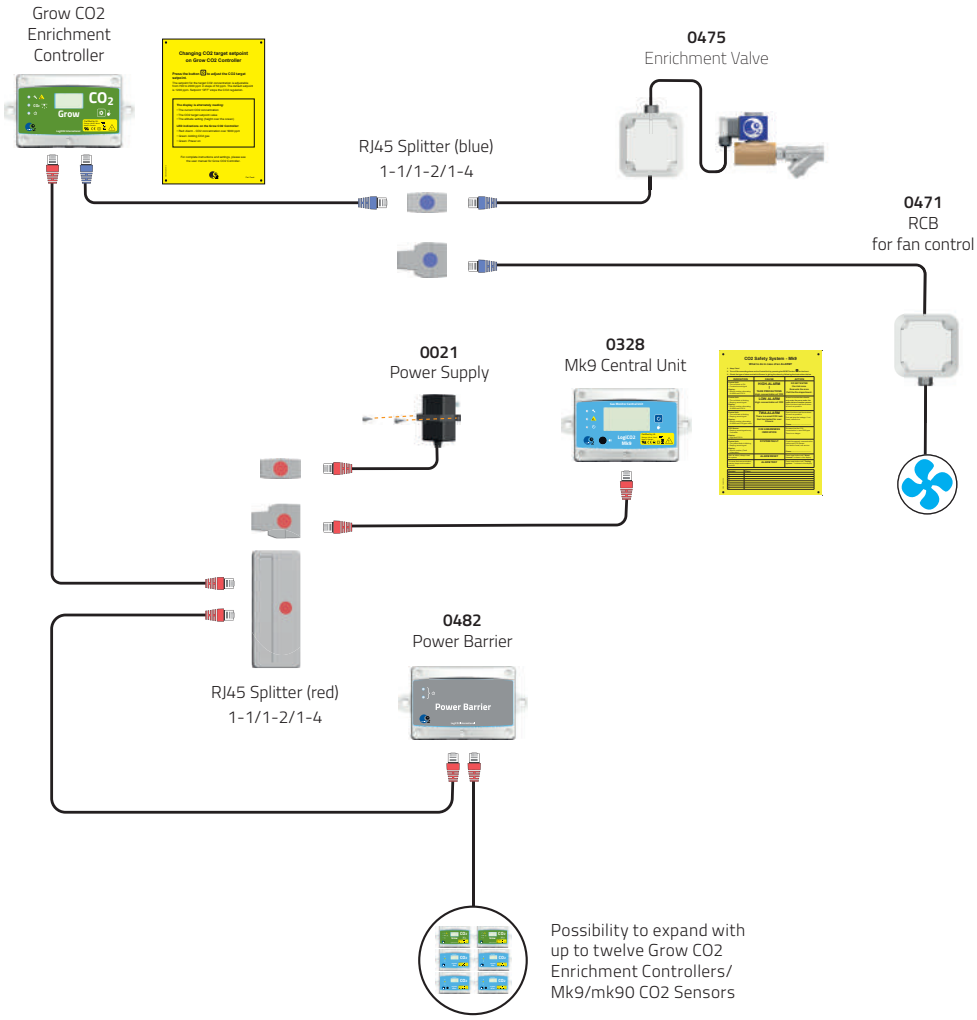


Display signs

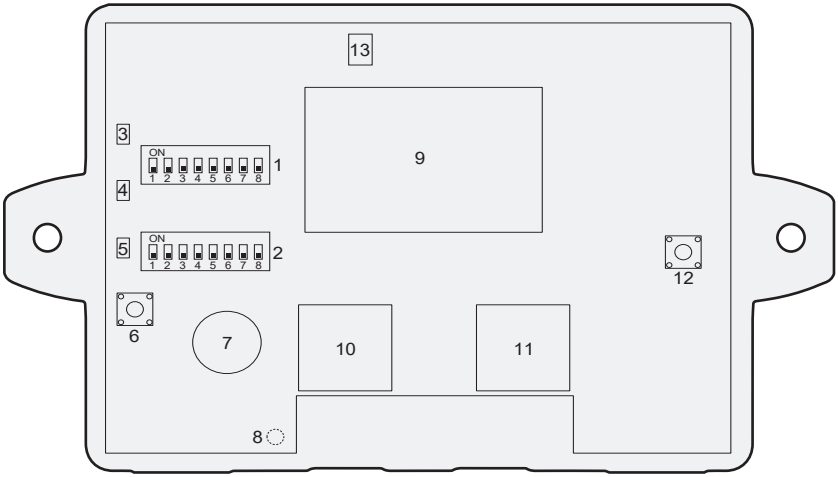


Connection diagram

This connection diagram shows an example of how the different systems can be installed.



Grow CO2 Enrichment Controller, Internal layout



Grow CO2 Enrichment Controller	Function/Indication
1. DIP-switch 1	Setting of Grow CO2 Enrichment Controller functions
2. DIP-switch 2	Service mode, ABC calibration and ID settings
3. LED red	Alarm - CO2 concentration over 5000ppm
4. LED green	Adding CO2 gas
5. LED green	Power ON
6. Service button	Service functions and altitude setting
7. Buzzer	Beeping: Alarm - CO2 concentration over 5000 ppm
8. Temperature sensor	Temperature can be shown on display
9. Display	CO2 measurement, Setpoint, altitude and other information
10. RJ45 input connector	Power and communication (red connector)
11. RJ45 output connector	Output to valve and fan activation
12. Push button	Toggel push button for choice of target CO2 setpoint
13. Light sensor	Internal light sensor for activation of CO2 control

Altitude adjustment height index table:

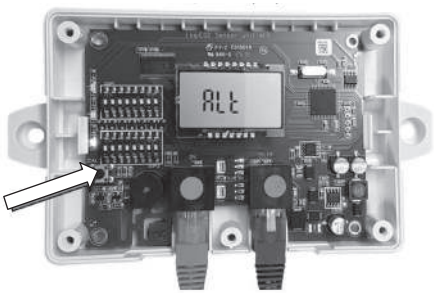
Height index	Meter	Feet
H-00	0	0
H-01	200	656
H-02	400	1312
H-03	600	1969
H-04	800	2625
H-05	1000	3281
H-06	1200	3937
H-07	1400	4593
H-08	1600	5249
H-09	1800	5906
H-10	2000	6562
H-11	2200	7218
H-12	2400	7874

Height index	Meter	Feet
H-13	2600	8530
H-14	2800	9186
H-15	3000	9843
H-16	3200	10499
H-17	3400	11155
H-18	3600	11811
H-19	3800	12467
H-20	4000	13123
H-21	4200	13780
H-22	4400	14436
H-23	4600	15092
H-24	4800	15748
H-25	5000	16404

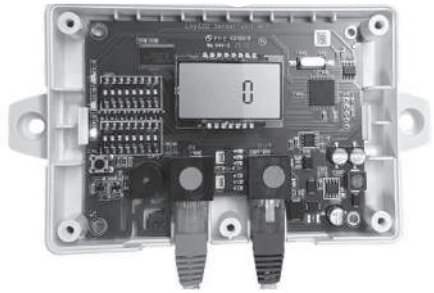
CO2 Sensor, Altitude adjustment

To change the altitude adjustment on the Grow CO2 Enrichment Controller please follow the simple instructions below.

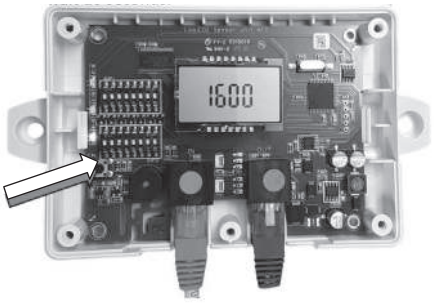
1. Press the push button, the display shows Alt.



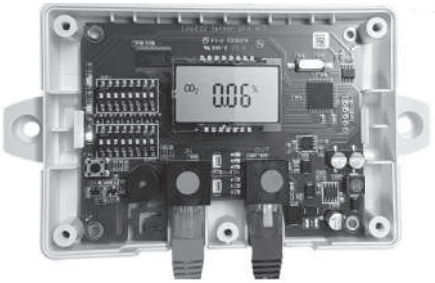
2. Current altitude setting is then shown.



3. Press the button to adjust the altitude setting, in steps of 200 m (for feet, see the converter table). **Observe!** Adjust the altitude to the closest higher value for the location. To confirm setting, wait 10 seconds.



4. The display returns to normal view after 10 seconds. Finished.



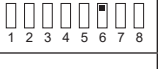
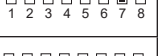
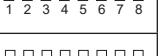
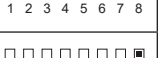
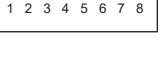
Altitude adjustment converter table

Meter	Feet
0	0
200	656
400	1312
600	1968
800	2625
1000	3281
1200	3937
1400	4593
1600	5249
1800	5905
2000	6562
2200	7218
2400	7874

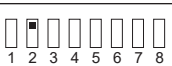
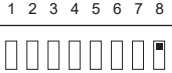
Meter	Feet
2600	8530
2800	9186
3000	9842
3200	10499
3400	11155
3600	11811
3800	12467
4000	13123
4200	13779
4400	14436
4600	15092
4800	15748
5000	16404

DIP-switch settings

DIP-switch 1: Dip 1-8, Functionality settings

Functionality settings	Dip1	Dip2	Dip3	Dip4	Dip5	Dip6	Dip7	Dip8	DIP-switch 1
Light sensor enabled	OFF								
Light sensor disabled	ON								
Adaptive CO2-control disabled		OFF							
Adaptive CO2-control enabled		ON							
Dosage time 30 sec (Dip2 must be OFF)			OFF						
Dosage time 60 sec (Dip2 must be OFF)			ON						
Dip4 Not used									
Temperature alarm disabled					OFF				
Temperature alarm enabled					ON				
Celsius						OFF			
Fahrenheit						ON			
CO2 control hysteresis 40 ppm							OFF		
CO2 control hysteresis 100 ppm							ON		
"LOW-indication" disabled								OFF	
"LOW-indication" enabled								ON	

DIP-switch 2: Dip 1, 2 and 8, Functionality settings

Functionality settings	Dip1	Dip2	Dip8	DIP-switch 2
Service mode off	OFF			
Service mode on	ON			
Automatic calibration disabled		OFF		
Automatic calibration enabled		ON		
RS485 termination off			OFF	
RS485 termination on			ON	

DIP-switch 2: Dip 3-7, Communication ID-number

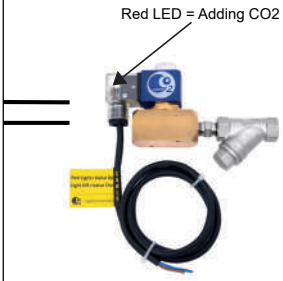
ID- address	Dip3	Dip4	Dip5	Dip6	Dip7	DIP-switch 2
ID1	OFF	OFF	OFF	OFF	OFF	
ID2	ON	OFF	OFF	OFF	OFF	
ID3	OFF	ON	OFF	OFF	OFF	
ID4	ON	ON	OFF	OFF	OFF	
ID5	OFF	OFF	ON	OFF	OFF	
ID6	ON	OFF	ON	OFF	OFF	
ID7	OFF	ON	ON	OFF	OFF	
ID8	ON	ON	ON	OFF	OFF	
ID9	OFF	OFF	OFF	ON	OFF	
ID10	ON	OFF	OFF	ON	OFF	
ID11	OFF	ON	OFF	ON	OFF	
ID12	ON	ON	OFF	ON	OFF	

Plug-In Power Supply, Specifications

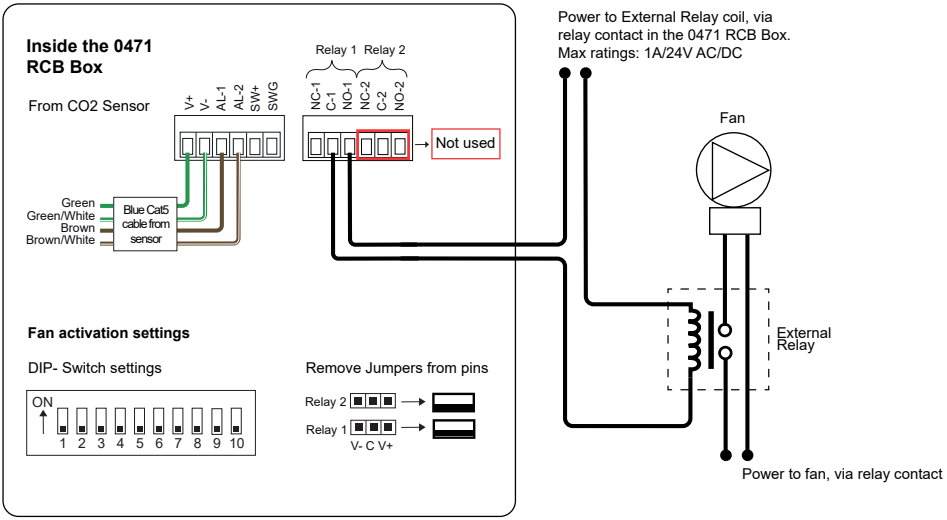
Type:	Model FJ-SW2401000N
Input voltage:	100-240V AC, 50/60 Hz, max 0.5 A.
Output:	24V DC, max 1.0 A
Ambient temperature:	0-40°C (+32°F to +102°F)
Dimensions (LxWxD):	82.4 x 44.5 x 36.2 mm / 3.2" x 1.8" x 1.4" + input plug

Connection: Enrichment valve 0475

The Enrichment Valve is pre-connected to the connection box and no extra wiring is needed.



Connection diagram: Start fan via external relay with RCB Box 0471



Service and maintenance

1. Service and maintenance should be performed only by authorized professional service agents who are familiar with the Grow CO2 Enrichment Controller and all pertinent safety and service procedures. Contact your representative for the name of the authorized service agent(s) in your area.
2. Since this also is a safety product we recommend that a function check should be performed on the Grow CO2 Enrichment Controller, by a qualified professional service agent at least once every year.
3. The Grow CO2 Enrichment Controller has no user serviceable parts. All service work should be performed by an authorized professional agent.
4. **NOTE!** Any attempt to service the equipment by unauthorized persons or to perform unauthorized modifications will void the warranty.
5. The housing must NEVER be opened by unauthorized personnel.
6. Cleaning is done by use of water on a moistened cloth.

Important

All persons responsible for the use and maintenance of this equipment must read and understand the safety and operating information contained in this guide. Installation and service of this equipment should be performed only by professionals. The function of the equipment will be impaired if it is not properly installed.

Important information regarding third party products

The functionality of LogiCO2's products are only warranted if connected to LogiCO2's systems and products. LogiCO2 is not liable for the functionality of any systems if LogiCO2 components or parts are connected to third party products. LogiCO2 permits its products to be connected to external relays controlling ventilation and valves as well as fire alarm panels and building management systems.

Subject to typographical errors and change without prior notice.

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