

# CO2-400 CO<sub>2</sub> CONTROLLER

## INTRODUCTION

The CO2-400 provides monitored CO<sub>2</sub> control. Automated CO<sub>2</sub> dispensing avoids wasted CO<sub>2</sub> and gives finer control over grow room CO<sub>2</sub> concentration compared to a timer. The user simply sets a desired concentration level in PPM (parts per million) and the CO2-400 does the rest. It is designed to be used with any model of the Gas Pro CO<sub>2</sub> Generator. The CO2-400 consists of a Sensor Unit with a 10 foot cable that plugs directly into the Gas Pro. A 15 foot extension cable is available. A display and three buttons allow easy set up. No separate power supply is required because it draws power from the Gas Pro. It operates on 24 VAC - safer than other controllers that have 120 VAC at the controller.

## INSTALLATION

- 1) Set up the Gas Pro as indicated in its instructions. Complete the "Initial Startup" section. Unplug the power supply. Leave the gas supply connected. Refer to Gas Pro instructions for location of its CO2-400 switch and connector.
- 2) Move the Gas Pro's CO2-400 Switch to DOWN, towards the connector.
- 3) Plug the CO2-400's cable into the the Gas Pro's CO2-400 connector.
- 4) Mount the CO2-400 in a place that is most likely to measure an average of the changing CO<sub>2</sub> environment. Position it for good air circulation. Avoid dead air spaces where there is poor air circulation. Place it some distance away from the Gas Pro to allow the CO<sub>2</sub> to mix with the air before measurement. Some experimentation may be required for best control.
- 5) Plug the Gas Pro's power supply into an outlet that is always powered. If you wish to prevent CO<sub>2</sub> dispensing when your lamp is off, plug the power supply into your lamp timer or another timer on the same schedule. Do the following steps while the power supply has power from the outlet or timer.
- 6) After a few seconds of power, you should hear the pilot valve open and the spark start. Next the spark lights the pilot, the spark stops, the main valve opens, and the pilot then lights the main burners.
- 7) After power is provided, the CO2-400 display goes through a power on sequence and then shows CO<sub>2</sub> level, increasing to room level. Wait 5 minutes for system warm up. The CO2-400 will then display the actual room CO<sub>2</sub> level.
- 8) When you press the SET button on the front panel of the CO2-400, the display switches from showing actual room CO<sub>2</sub> PPM to showing the set point level (also in PPM). When the room CO<sub>2</sub> level falls below the set point, the CO2-400 turns on the Gas Pro. The dispensed CO<sub>2</sub> will eventually increase the room CO<sub>2</sub> level above the set point and the CO2-400 will then turn off the Gas Pro. The CO2-400's front panel LED indicator changes from steady to blinking when the actual room CO<sub>2</sub> level is above the set point.
- 5) To adjust the set point on the CO2-400, keep holding the SET button down while repeatedly pressing either the "+" button or the "-" button until you get the reading you want. A typical desired

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value for a set point is 1500 PPM \*. Now release the SET button and the display once again shows the actual room CO<sub>2</sub> level.

6) That's it. Your CO2-400 will now maintain the CO<sub>2</sub> concentration you have selected in your indoor growing environment.

\* The CO2-400 has 40 PPM of hysteresis (offset) built into it. For example, if you adjust the set point to 1500 PPM, it would actually turn off CO<sub>2</sub> at 1540 PPM and turn on CO<sub>2</sub> at 1460 PPM. This is to try to smooth fluctuations in CO<sub>2</sub> levels. CO<sub>2</sub> typically rises and falls in a cyclical manner as it is dispensed and then utilized by the plants or otherwise escapes the grow room. Some grow rooms are more difficult than others in this regard. In more difficult environments, the CO2-400 needs to be located by experimentation to minimize overshoot and undershoot. The set point usually needs to be adjusted such that it "averages" the overshoot and undershoot around the desired CO<sub>2</sub> level. The Gas Pro is not designed for continuous operation and it must be able to raise the CO<sub>2</sub> level in the growing area high enough for the CO2-400 to turn it off in a reasonable amount of time. Also, it is not designed for a high rate of on / off cycling. See "Typical CO<sub>2</sub> Dispensing Cycle" in the Gas Pro instructions.

## SPECIFICATIONS

Operating principle	Non-dispersive infrared (NDIR)
Gas sampling method	Diffusion
Range	0-2000 PPM CO <sub>2</sub> (1000 PPM = 0.1%)
Maximum drift (per year)	±75 PPM
Accuracy	±5% of reading or ±75 PPM, whichever is greater
Repeatability	±20 PPM
Response time	Less than 1 minute
Set point hysteresis (offset)	Approximately 40 PPM
Operating temperature range	0 to 50 °C
Operating humidity range	0 - 95% rH (non condensing)
Warm up time	5 minutes
Display	4 digit LCD showing actual or set point PPM CO <sub>2</sub>
Indicator	1 LED: on steady below set point, blinks when above
User controls	3 buttons: SET, +, -
Power	24 VAC 60 Hz from / to Gas Pro via cable
Cable length (to Gas Pro)	10 feet
Dimensions	5.2" x 3.2" x 1.4"
Weight	1/2 pound
Storage temperature	-30 to +60 °C
Recommended calibration interval	5 years
Operating life expectancy	10 years typical
Warranty	1 year parts and labor