



PLUG'N'GROW™ CO₂ Controller Calibration Kit

Technical support: www.igrowing.com or Toll-Free 888-577-6274

Put an end to CO₂ waste with an accurate control! Get the benefits from CO₂ enrichment to show on your plants with high enough CO₂ concentration! The gardener can finally completely trust the reading shown on the PPM CO₂ controller. This kit can be used to calibrate CO₂ controllers and external sensors of any make and any model. Get a perfect calibration every time in 30 minutes or less!

Nova Biomatique, Inc., manufacturer of the PLUG'N'GROW™ controllers and accessories for climate in indoor gardening worked out wise choices for the gardener in building this kit. A CO₂ sensor is not accurate at the beginning and at the end of its measuring range, namely about "0" and around 5000 PPM (parts per million). Sensor manufacturers recommend calibrating CO₂ sensors around the zero value and most indoor gardeners wish to enrich garden concentration to about 1500 PPM. Nova Biomatique, Inc. developed its unique calibration method at 1000 PPM. This choice ensures the most accurate calibration. The PLUG'N'GROW™ products offering CO₂ control are now factory calibrated with this method.

This calibration kit works with all CO₂ controller models showing the actual concentration in PPM. It works with controllers with the CO₂ sensor located inside the vented enclosure and with external sensors on cables. With careful handling, the easy PLUG'N'GROW™ calibration method will give a perfectly calibrated controller. The gardener will get accurate readings and as good a CO₂ control as the equipment allows.

This kit contains all the required parts in a useful toolbox:

1. Calibration gas bottle at 1000 PPM CO₂ (20 calibrations)*
2. Gas flow regulator
3. Rechargeable air pump with charger
4. Flexible clear tubing
5. 2 Pinch clamps to cut air flow in the clear tube
6. 20 Clear calibration bags*
7. 4 Reusable Tie Wraps

25 Labels to affix to calibrated controllers*

1 Shop-window "Authorized CO₂ Calibration Service"

* Renewable items: calibration gas bottle, bags, and labels

Sorry, law prohibits this type of gas bottle refilling.



Why is CO₂ controller or sensor calibration needed?

A CO₂ NDIR (non dispersive infrared) sensor such as the ones used in most gardening controllers is a delicate measuring instrument. It might easily lose its calibration from some shock received during transport or while handling or at installation. Avoid knocking the CO₂ controller or sensor and the panel where it is installed. The CO₂ NDIR is known to "drift" with time around its "zero" value. Also, this type of sensor contains a light source and reflective surfaces that are easily affected by climate factors. For instance, in a dusty environment, the sensor rapidly loses its accuracy. Other climate variables like high humidity, CO₂ and sulphur vapours when combined damage the reflective surfaces inside the sensor further promoting the "drift" and difference between the reading shown and the actual CO₂ concentration. Finally, the room temperature where the CO₂ sensor is used also affects the measurement accuracy. That's why the CO₂ sensor should be calibrated near real operating conditions.

PLUG'N'GROW™ recommends that all CO₂ controllers be calibrated upon purchase and upon beginning every new growth season. These precautions will ensure an accurate control of CO₂ enrichment with a high enough concentration to reap the benefits and as little CO₂ wasted as possible. Every "used" CO₂ controller purchased should be calibrated before installation in the garden. If there is any doubt about the CO₂ readings validity, after a shock or after a long time the equipment has not been in use, it's better to calibrate it.

Why not calibrate the CO₂ sensor with outside air?

This is simply the "better than nothing" method. It is based on the assumption that the average CO₂ concentration in outside air is in between 350 to 400 PPM. This assumption is false most of the time. In urban areas where vehicles reject about 20% of fuels in CO₂, with all the combustion heating and industrial systems also rejecting CO₂, the actual concentration is somewhere between 400 and many thousands PPM depending upon the time of the day. Also, during the cold season, the temperature of outside air might differ widely from the temperature of the indoor garden and the sensor calibration is affected.

Can the CO₂ controller be calibrated by referring to a calibrated controller?

Actual CO₂ NDIR sensors used in gardening controllers have an accuracy of ± 75 PPM around the real value of concentration. In scientific measurement error calculations, it is said that errors from measuring equipments add up. If the reference controller is somewhat off the real concentration value, with the intrinsic uncertainty of the controller you want to calibrate, you might land a calibration fairly off the real CO₂ concentration value. Also, just breathing around a controller in the calibration process might distort the final result. Human breath has a concentration between 6000 and 8000 PPM and certainly affects calibrating unprotected equipment.

For best results, Nova Biomatique, Inc., recommends that only PLUG'N'GROW™ calibration gas and bags be used. Make sure each use is marked on the gas bottle label! After 15 calibration procedures, you should purchase a refill kit including gas and bags.

To order

CK-1 CO₂ « Master » Calibration kit

RGBK-1 CO₂ « Recharge » Calibration kit : 1 000 PPM CO₂ calibration gas, 20 bags, labels, pinch clamps, reusable Tie wraps and flex. tubing