PGC20 Growth Chambers

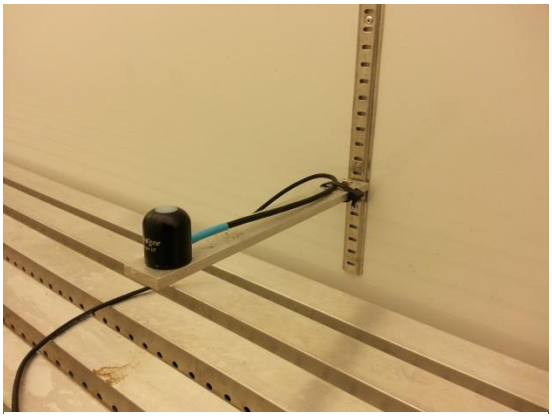
Specifications

All PGC20s are equipped with Conviron CMP5000 series controllers. Data logging is available for all environmental conditions (temperature, relative humidity, light levels, and carbon dioxide) and can be accessed on the internet using the following link: http://131.104.193.187:9001/?Folder=PGC20 .

Growth Area 1.9 m^2 (20 ft^2)
Growth Height 157 cm (62")
Growth Capacity 3115L (110 ft^3)
Temperature range with lights: OFF 4 – 40 ^oC
Temperature range with lights: ON 10 – 40 ^oC
Combination of T5 fluorescent and incandescent lamps. Fluorescent lamps use dimming ballasts and a quantum light sensor for precise control of light levels in the chamber. Light range 0-1125 umol/m^2/s @ 15cm from canopy and 25 ^oC. Maximum light level can vary with distance of plant canopy from the lamps, the age of the lamps, and the temperature in the chamber.
Relative Humidity - additive humidity and dehumidification are both available, but temperature dependent. Consult with the Phytotron Coordinator.
Additive carbon dioxide up to 3000 ppm. Below ambient concentrations (< 350 ppm) are possible, but require special set up. Consult with the Phytotron Coordinator.
18 PGC20s are available in the Phytotron. Two of the 18 use T8 fluorescent and incandescent lamps and have the ability to reach 4 ^oC with the lights ON, but do not have carbon dioxide control.

Additional tips:

- Air flows in the chamber up through the floor, cooling first the plants, the air around and above the plants and finally the lights. To ensure even temperatures in the chamber, try not to block the entire floor with trays – open trays without holes (daisy baskets) will allow for the best airflow. Using this method, plants can still be bottom watered by dipping daisy baskets into trays filled with water.
- Watering can be performed in the chamber – there is a drain under the floor and all chambers are connected to floor drains.



PGC20 Light Sensor

- **The light sensor in the PGC20 chambers controls the light output by making the lights brighter or dimmer as is necessary.** For example, if the PGC20 growth chamber is programmed for 150 umol/m^2/s, the light sensor will direct the chamber to make the lights brighter until the light sensor reads 150 umol/m^2/s. If the sensor becomes shaded for any reason (by leaves, pots, dirt, etc…) the light reading will not match the programmed level. The chamber will then attempt to increase the light output until the sensor reading matches the programmed light level. This situation could lead to your plants receiving up to 1000 umol/m^2/s rather than the programmed light level (in this example, 150 umol/m^2/s). **To ensure accurate light levels in the chamber, it is extremely important that you do not shade the light sensor!!!**

- **The light sensor should be kept just above the plant canopy, in a level, horizontal position.** There is a track along the back wall that will allow the sensor to be moved higher as the plants grow**. This will ensure consistent light levels at the plant canopy.**

PGC20 aspirator

- The white box inside the growth chamber (also known as the aspirator) contains the chamber temperature sensor and relative humidity sensor along with a circulating fan. Take care not to get the box wet as moisture will damage the fan and the relative humidity sensor.
- The aspirator should also be kept at the level of the plant canopy to ensure accurate environmental measurements and good environmental control.
- If you are concerned about particular environmental conditions, specific alarms can be programmed to alert either the researcher or the Phytotron Coordinator about potential problems. For example, if it was desired to keep carbon dioxide levels above 2000ppm, an alarm can be set to alert researchers or staff if CO_2 levels fell below that threshold (e-mail alerts can be programmed for any researcher from any chamber).

- To minimize the effects of any environmental gradients inside the chamber on plant growth, we recommended that plant position in the growth chamber be randomized so that particular treatments are not spatially aggregated. A useful random number generator for randomizing plant positions in the chamber can be found at www.random.org
- For additional information about reporting environmental conditions for your growth chamber experiment see the following document: http://www.controlledenvironments.org/Guidelines/Minimum-Guidelines-Brochure-version-A4.pdf