

PGV36 Growth Chambers

Specifications

All PGV36s 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=PGV36>.

Growth Area 3.3 m² (36 ft²)

Growth Height 204 cm (80.25")

Growth Capacity 6700L (240 ft³)

Temperature range with lights: OFF 4 – 45 °C

Temperature range with lights: ON 10 – 40 °C

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 $\mu\text{mol}/\text{m}^2/\text{s}$ @ 15cm from canopy and 25 °C. 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.

4 PGV36s are available in the Phytotron.

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.
- The hole in the middle of the floor is NOT a drain – this is where air is returned to the chamber's environmental sensors for sampling and ultimately decisions the chamber makes about heating/cooling, humidification etc. Do NOT block this hole. All chambers have additional tubes that fit in this hole, allowing you to adjust the position of air sampling. Ideally, you should sample at the height of your plant canopy.



PGV36 Light Sensor

- Watering can be performed in the chamber – there is a drain under the floor and all chambers are connected to floor drains. Take care not to get water down the hole in the middle of the floor described in the previous point – this will interfere with air sampling and environmental control

- **The light sensor in the PGV36 chambers controls the light output by making the lights brighter or dimmer as is necessary.** For example, if the PGV36 growth chamber is programmed for 150 $\mu\text{mol}/\text{m}^2/\text{s}$, the light sensor will direct the chamber to make the lights brighter until the light sensor reads 150 $\mu\text{mol}/\text{m}^2/\text{s}$. 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 $\mu\text{mol}/\text{m}^2/\text{s}$ rather than the programmed light level (in this example, 150 $\mu\text{mol}/\text{m}^2/\text{s}$). **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.**
- 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>