PGW36
WALK-IN
PLANT GROWTH
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Product Overview/Applications
The PGW36 equips the researcher with a walk-in environment which is accessible from four large doors two on the front of the chamber and two on the back. This model is often employed, and is ideally suited, for research involving taller classified plants. Its extended growth height ensures that most plants can be grown to full maturity within a moderate to high light regime. Also uniquely designed for the PGW36 is the ability to operate below freezing, while incorporating full daylight cycles. This low temp operation can be performed without the need for defrost operation (which can necessitate an undesirable “lights-off” event).

Lighting
The standard lighting package for the PGW36 generates mid-level light intensity, using both fluorescent and incandescent lamps, which results in a broad based lighting spectrum ideally suited for plant growth. Lamp groups can be programmed separately allowing for multiple lighting levels while Conviron’s manually adjustable Lightright™ canopy enables the researcher to easily raise and lower the lamps to the proper height above the research material. Higher light intensities area available on this model.

Airflow
Airflow for the PGW36 is distributed uniformly upward using Conviron’s innovative Unifloor® air distribution plenum. The unit includes fresh air intake and exhaust ports which are adjustable to allow up to 55 ft³/min (1.55m³/min.) of air exchange.

Refrigeration
Cooling for the PGW36 is provided by a self-contained water-cooled condensing unit with hot gas bypass for continuous compressor operation. An electronic modulating valve provides tight temperature control while ensuring quiet operation. Pressure transducers are included for monitoring the status of the refrigeration system. Alternative refrigeration methods are available depending on site-specific and/or user-defined requirements. Consult the factory for heat rejection information and other refrigeration options.

Experiment Protection
User programmable “set and forget” alarms track the chamber’s operation versus user-defined set points. This allows for exceptionally accurate monitoring without the need for adjustment every time the set point is redefined. Backup “high/low” alarms provide a further level of protection while visual and audible notification is provided when any alarm is activated. Contacts for connection to a building management system are also included.

Key Product Attributes
- Large and accessible growth space for higher light mature plants
- Conviron’s Lightright™ canopy height adjustment system for enhanced flexibility of light intensity
- Efficient growth area-to-footprint ratio
- Product certifications/markings; CSAus (NRTL), CE

Performance Data

<table>
<thead>
<tr>
<th>Temperature Range (°C)</th>
<th>Interior Capacity</th>
<th>Growth Area</th>
<th>Growth Height</th>
<th>Exterior Dimensions (WxDxH)</th>
<th>Light Intensities (6in. from lamp)</th>
<th>Electrical Service</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 – 45 lights on</td>
<td>240ft³ (7000L)</td>
<td>36ft² (3.3m²)</td>
<td>80.25&quot; (2040mm)</td>
<td>134” x 60” x 99.75”</td>
<td>860 µmoles/m²/s</td>
<td>120/208-3Ø-60Hz</td>
<td>3655lb.</td>
</tr>
<tr>
<td>4 – 45 lights off</td>
<td>(6700L)</td>
<td>(3.3m²)</td>
<td>(2040mm)</td>
<td>3410 x 1525 x 2535 (mm)</td>
<td>@ 25°C</td>
<td>220/380-3Ø-50Hz</td>
<td>(1658kg)</td>
</tr>
</tbody>
</table>
**CONVIRON MODEL**
**PGW36**
**PLANT GROWTH CHAMBER**

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.0</strong></td>
<td>Control System: Conviron CMP6050</td>
</tr>
<tr>
<td><strong>2.0</strong></td>
<td>Construction: (Note: All dimensions are nominal.)</td>
</tr>
<tr>
<td>2.1 Exterior Dimensions:</td>
<td>134&quot;W x 60&quot;D x 99.25&quot;H (3410mmW x 1525mmD x 2535mmH).</td>
</tr>
<tr>
<td>2.2 Interior Dimensions:</td>
<td>98&quot;W x 54&quot;D x 93&quot;H (2490mmW x 1370mmD x 2350mmH).</td>
</tr>
<tr>
<td>2.3 Floor:</td>
<td>Perforated aluminum channel floor for uniform upward air flow - Unifloor®.</td>
</tr>
<tr>
<td>2.4 Subfloor:</td>
<td>Molded resin fiberglass construction with floor drain.</td>
</tr>
<tr>
<td>2.5 Growth Area:</td>
<td>36ft² (3.3m²).</td>
</tr>
<tr>
<td>2.6 Growth Capacity:</td>
<td>240ft³ (6700 liters).</td>
</tr>
<tr>
<td>2.7 Growth Height:</td>
<td>80.25&quot; (2040mm) from Unifloor® to Lightright™ in the UP position.</td>
</tr>
<tr>
<td>2.8 Exterior Finish:</td>
<td>Blue-green enamel baked on patterned aluminum.</td>
</tr>
<tr>
<td>2.9 Interior Finish:</td>
<td>Reflective white enamel baked on smooth aluminum.</td>
</tr>
<tr>
<td>2.10 Conditioning Compartment:</td>
<td>Stainless steel drain pan for corrosion protection.</td>
</tr>
<tr>
<td>2.11 Cabinet Construction:</td>
<td>CFC-free insulation.</td>
</tr>
<tr>
<td>2.12 Doors:</td>
<td>Four reach-in doors with light tight gaskets and keyed magnetic locks, each clear opening 29.75&quot; x 76&quot; (755mm x 1930mm).</td>
</tr>
<tr>
<td>2.13 Control Panel:</td>
<td>Left hand (right hand model optional).</td>
</tr>
<tr>
<td>2.14 Instrument Ports:</td>
<td>Two ports, 1&quot; (25mm) with light tight caps.</td>
</tr>
<tr>
<td>2.15 Convenience Receptacle:</td>
<td>Two (2) electrical receptacle located in lamp canopy.</td>
</tr>
<tr>
<td><strong>3.0</strong></td>
<td>Lighting:</td>
</tr>
<tr>
<td>3.1 Intensity1:</td>
<td>Approximately 860 micromoles/m²/s (Higher light intensities are optional)</td>
</tr>
<tr>
<td>3.2 Programming and Control:</td>
<td>Independent, 4 level programming of each light type.</td>
</tr>
<tr>
<td>3.3 Lamps:</td>
<td>Balanced spectrum for plant growth using fluorescent (T8 – 60Hz, T5 – 50Hz) and halogen incandescent lamps.</td>
</tr>
<tr>
<td>3.4 Lamp Fixture:</td>
<td>Counterbalanced for adjustable light intensities - Lightright™</td>
</tr>
<tr>
<td>3.5 Lamp Heat:</td>
<td>Removed by refrigeration system.</td>
</tr>
<tr>
<td>3.6 Ballasts:</td>
<td>High efficiency electronic and easily accessible.</td>
</tr>
<tr>
<td>3.7 Light Meter:</td>
<td>Quantum light meter for display and recording of light output.</td>
</tr>
<tr>
<td><strong>4.0</strong></td>
<td>Temperature Control: (Maximum design ambient temperature is +35°C)</td>
</tr>
<tr>
<td>4.1 Range:</td>
<td>+4°C to +45°C lights OFF, +10°C to +45°C lights ON.</td>
</tr>
<tr>
<td>4.2 Control2:</td>
<td>±0.5°C, at control point.</td>
</tr>
<tr>
<td>4.3 Temperature Safety Limits:</td>
<td>A programmable min and max temperature limit alarm or a limit tracking alarm that automatically follows the programmed set point</td>
</tr>
<tr>
<td></td>
<td>An independent factory-set high and low temperature limit is also provided for increased assurance.</td>
</tr>
</tbody>
</table>

An audible alarm is standard for both limits. Activation of temperature safety limit set points turns off power to the chamber.

1 Average light measurement at 6" (150mm) from lamp barrier on a 6-inch grid, chamber temperature of 25°C. Light intensities are nominal values measured at the rated chamber supply voltage. (Measured by a LI190 Quantum Sensor).

2 Measured by Precision Thermistors, measured without test materials or optional accessories.
4.4 Telensair®: This vertically adjustable sensing device located in the growth area directs a continuous sample of chamber air over the remote sensors for accurate controlling and recording, unaffected by lamp radiation.

5.0 Refrigeration:

5.1 Condensing Unit: Cabinet is supplied with a water-cooled hermetically sealed condensing unit with hot gas bypass system for continuous compressor operation, extended compressor life and close temperature control. Condensing unit is located in the machine compartment, and includes a 3-way water modulating valve and hand operated shut off bypass valve. Maximum pressure drop across the condenser and water valve not to exceed 10psi (0.7 bar).

5.2 Valve: Electronic modulating valve that smoothly regulates the heating and cooling functions of the chamber.

5.3 Heat Exchanger Coil(s): Copper-tubed construction.

5.4 Refrigerant: Refrigeration system is charged with CFC-free refrigerant.

5.5 Monitoring: a) Refrigeration system operation is monitored by the control system, including visual and audible alarm.

5.6 Pressure transducers allow for real-time diagnostics for preventative maintenance & repair.

6.0 Air Flow:

6.1 Vertical: Uniformly upward through the entire growth area.

6.2 Fresh Air: Filtered inlet and adjustable exhaust 55ft³/min (1.55m³/min).

7.0 Humidity Control: (Optional)

7.1 Range: No control on basic unit. Refer to Humidity under Optional Accessories

8.0 Carbon Dioxide Additive Control: (Optional)

8.1 Range: No control on basic unit. (Refer to Carbon Dioxide Additive Control under Optional Accessories)

9.0 Utility Requirements\(^3\): (Rating increases with some options.)

9.1 Electrical Service: (Alternative services available, consult factory)

60Hz: 120/208-3Ø-60Hz-4 wire plus ground

50Hz: 220/380-3Ø-50Hz-4 wire plus ground

9.2 Drain: Floor drain must be provided outside footprint of cabinet.

10.0 Installation: (Optional)

10.1 Not included, to be performed by others. Installation is available upon request, please consult factory.

10.2 Should installation or technical support be required through Convirons’ Technical Service group, additional charges may apply.

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\(^3\) This unit will tolerate ±10% voltage fluctuation from the rated voltage on the serial plate. A voltage stabilizer must be used if the fluctuation is greater than ±10%. Failure to do so can result in serious damage to the compressor and electronic components and will void warranty. Disconnect switch must be sized by a local qualified electrician.
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**PGW36**

**PLANT GROWTH CHAMBER**

### OPTIONAL ACCESSORIES

#### PROGRAMMING

See Control System documentation.

<table>
<thead>
<tr>
<th>UPS</th>
<th>Uninterrupted Power Supply</th>
<th>Surge protection and uninterrupted power supply, on controller only, for continuous operation of the controller during power interruptions, duration of the UPS is approx. 15 minutes. (Consult factory for increased duration, if required.)</th>
</tr>
</thead>
</table>

#### TEMPERATURE

<table>
<thead>
<tr>
<th>LT</th>
<th>Low Temperature Operation</th>
<th>(No fresh air below 4°C.) A defrost cycle will occur resulting in a temperature increase for temperatures set below 10°C lights ON, or 4°C lights OFF. Temperature deviations and defrost time are dependant on chamber operating temperature. During the defrost cycle, the lights will be turned off. Specified light intensity will be reduced when chamber is operating at low temperatures. With temperature ranges below 0°C; cabinet shall include drain pan, drain line and door heaters. Temperature ranges below 4°C with additive humidity option; cabinet shall include purge function. (Consult factory with requirements.)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>LTC</th>
<th>Continuous Low Temperature</th>
<th>A system designed to continuously maintain temperature below freezing with no significant deviation in the temperature during defrost. (Consult factory for temperature range.)</th>
</tr>
</thead>
</table>

#### LIGHTING

<table>
<thead>
<tr>
<th>M10T5</th>
<th>High Light</th>
<th>Fluorescent/incandescent light intensities giving approximately 1270 micromoles/m²/s using T5 fluorescent and halogen incandescent lamps plus end lamps. Independent, 8 level programming of fluorescent, halogen incandescent lamps plus end lamps. (Temperature range becomes +4°C no lights, +8°C half lights and +10°C all lights; reduces growth height by 3&quot; [75mm].) Note: Amp draw changes, please consult factory.</th>
</tr>
</thead>
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<thead>
<tr>
<th>HID4</th>
<th>High Intensity Discharge Lighting</th>
<th>High intensity discharge lighting using metal halide and high pressure sodium lamps with a light intensity of 1200 micromoles/m²/s at a distance of 1 meter from the barrier. System utilizes our Lightright™ counterbalanced lamp canopy with lamps separated from growth area by a barrier with openings to allow chamber air to cool the lamps. Upon start-up, lamps experience a 5 to 10 minute warm up period before full light intensity is achieved. Note: HID canopy reduces growth height by 9.5&quot; (240mm). Amp draw changes, please consult factory. Please contact the factory for other lighting possibilities.</th>
</tr>
</thead>
</table>

#### HUMIDITY (Based on +21°C and 50% RH ambient condition)

<table>
<thead>
<tr>
<th>DHS</th>
<th>Dry Humidity Sensor</th>
<th>Dry Electronic Sensor that directly measures and displays relative humidity in %RH by means of constant display on the CMP6050. (Not required if ordering additive humidity control option.)</th>
</tr>
</thead>
</table>
SNH spray nozzle humidification

- **Range:** Up to 85% RH lights ON/OFF, limited by a +25°C maximum dewpoint. Additive humidity through use of spray nozzles. Range given in an empty chamber. Chamber may achieve higher levels with plant loading.
- **Programming:** See Control System documentation.
- **Control:** ±3% RH. System uses a dry humidity sensor to directly measure humidity in %RH (no wet sock). Spray nozzles require a 60 psi (4.2 bar) pressure and must be supplied with clean water to the following specification; pH = 7.0 ± 0.5, filtration <2 microns (0.00008 in) and resistivity between 0.5 and 1.0 Meg Ohms. Maximum water usage to maintain specified levels is 6 liters/hr. If the above water pressure is not available the CPSNH option is required to supply necessary pressure.
- **Note:** When ordered with units requiring temperatures below 4°C, humidity system is provided with a low pressure air clean out system. Low pressure air must be supplied to cabinet (35 psi). (When combined with M10 option, maximum humidity level with lights ON is 75% RH.)

CPSNH compact pump spray nozzle humidification

- **Compact pump and reservoir for spray nozzles.** Order this option with SNH if the minimum 60 psi (4.2 bar) water pressure is not available. Supplies pressurized water for up to 12 nozzles.

RES reservoir

- **Pressure reservoir at downstream chambers.** Must be ordered for all downstream chambers fed from CPSNH.

BDH bypass dehumidification

- **A precisely controlled volume of chamber air bypasses the heat exchanger by means of a proportionally controlled air damper.** Using excess capacity in the refrigeration system, moisture is removed from the remaining air by cooling and reheating.
- **Note:**
  1. Amp draw increases, please consult factory.
  2. Available with GLY option (please contact factory with requirements).
  3. Must be ordered with additive humidity control option.

CD dehumidification by chemical dryer

- **Chamber air is passed over a desiccant such as titanium silica gel to remove moisture.** The dry air is re-introduced into the chamber at very low humidities. Chemical dryers offer the greatest degree of dehumidification. (Please contact factory with requirements.)

**Carbon Dioxide Additive Control**

CO₂ carbon dioxide additive control

- **Package includes gas analyzer, CO₂ regulator (North America only), control valve, and injection system.** CO₂ tank not included.

**Construction**

GH96 growth height extension

- **Extended growth height by an additional 16” (405mm).** Exterior height becomes 118.5” (3010mm).

GH144 growth height extension

- **Extended growth height by an additional 64” (1625mm).** Exterior height becomes 164” (4170mm).

RHC right-hand control panel

- **Right-hand control compartment gives you the convenience and flexibility to arrange your chambers in a compact orderly fashion, back to back and end to end, or to facilitate its location in any appropriate space.**

DD deduct doors

- **If access from both sides of the growth area is not required, up to 3 doors may be deducted, reducing your cost.**

OW observation window

- **11” x 15” (280mm x 380mm) dual pane with light tight cover.** (Please specify quantity and door)
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CBS  Bench Shelving  Free-standing, adjustable corrosion resistant wire benching covering entire growth area.

GA  Additional Cabinet Sealing  Construction for gas injection experiments. Consists of silicone sealed joints laboratory type inlet and exhaust valve, oil-filled manometer, adjustable hinges and well-fitting gaskets plus a valved condensate drain. (Does not provide a “gas tight” environment.)

TXD  Damper  Tight-Fitting Exhaust Damper.

MAN  Manual  Additional Operator's Manual. (One supplied with basic unit.)

REFRIGERATION

RAC  Remote Outdoor Air-Cooled Condenser  Remote outdoor air-cooled condenser complete with all weather housing, low ambient operation controls and low noise level operation. Remote location (up to 50’ [15m] combined horizontal and vertical distance) of condenser only, compressor, receiver and other refrigeration components remain in cabinet machine compartment. Order “RACH” for climates with ambient temperatures from +35°C to +45°C for extended periods. Electrical: 60Hz - 208-230-1Ø-60Hz-3wire plus ground, 50Hz - 220-1Ø-50Hz-2wire plus ground. Consult factory for amperages.

Note:
1. Inter-connecting refrigeration and electrical lines are not included and must be provided by others.
2. RAC and RACH require a separate electrical service.
3. For remote location distances over 50’ (15m) please consult factory.

GLY  Glycol  Glycol heating/cooling designed to work with a central chiller refrigeration system. Includes proportional valve control.

FMC  Floor Mounted Compressor  Floor mounted compressor located away from the growth chamber if a remote installation is desired.

OACU  Outdoor Air-Cooled Condensing Unit  Outdoor air-cooled condensing unit containing condenser, compressor, receiver, suction accumulator, control and pressure regulating valves and electrical disconnect. The OACU comes complete with weatherized hood and crankcase heater for low ambient conditions. Inter-connecting refrigeration and electrical lines are not included and must be provided by others. OACU requires a separate electrical service. Electrical: 60Hz - 208-3Ø-60Hz-3wire plus ground, 50Hz - 400-3Ø-50Hz-3wire plus ground. Consult factory for either amperages or other voltages available.

ESSENTIAL SPARE PARTS

ESP  Essential Spare Parts  Consult factory.

SLS  Spare Lighting Set  Consult factory.

SLSM10  Spare Lighting Set for M10T5  Includes 5 x ballasts, 4 x pairs of fluorescent sockets, 4 x incandescent sockets, 90 x fluorescent lamps (192 fluorescent lamps – export only) and 45 x incandescent lamps.
NOTES:
1. STANDARD REFRIGERATION SYSTEM IS WATER COOLED (1/2"Ø (13mmØ) CONNECTION).
2. DEPTH DIMENSION IS CHAMBER SIZE ONLY. DIMENSION DOES NOT INCLUDE DOOR LATCH OR PIPING ON BACK WALL.
3. LENGTH AND WIDTH DIMENSIONS ±1/4 (6mm). HEIGHT DIMENSION ±1" (25mm). DO NOT SCALE DRAWING.