



Product Overview/Applications

The MPGR14 provides a 14 ft² growth area and a 58 inch growth height making this chamber suitable for a range of applications including plant science, bioengineering, and soil and food sciences. Shipped fully assembled, the MPGR14 fits through standard doorways. The chamber comes standard with a closed loop lighting system that uses 5-foot lamps mounted into fixed canopies. Please consult Meditech with your particular application and area of research and we will provide you with an overview of the available options.

Lighting

The standard light intensity for the MPGR14 is 865 micromoles/ m²/s using both fluorescent and incandescent lamps. The result is a broad based lighting spectrum. Also standard is a closed loop lighting system (programmed in micromoles) which allows for precise and repeatable control of light output while also automatically adjusting for lumen maintenance. Lamp heat is controlled and managed by the refrigeration system.

Airflow

Airflow for the MPGR14 is distributed uniformly upward using Meditech's innovative Uni-floor air distribution plenum. This airflow configuration promotes uniformity as well as proper gas exchange at the plant's leaf surface. The unit includes fresh air intake and exhaust ports which are adjustable to allow up to 20 ft³/ min (0.57m³/min.) of air exchange.

Refrigeration

Cooling for the MPGR14 is provided by a side mounted 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 options for cooling.

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

- Closed-loop lighting system with dimming control
- 58 inch growth height and 865 umoles/m²/s light intensity
- Shipped fully assembled – fits through standard doorways
- Product certifications/markings; (NRTL), CE



Performance Data

Temperature Range (°C)	Interior Capacity	Growth Area	Growth Height	Exterior Dimensions (WxDxH)	Light Intensities (6in. from lamp)	Electrical Service	Weight
10 – 45 lights on	70 ft ³	14.4 ft ²	58.25"	95" x 35" x 83.5"	865 μmoles/m ² /s	120-1Ø-60Hz	1445 lb.
4 – 45 lights off	1970 L	1.34 m ²	1480 mm	2415 x 890 x 2120 (mm)	@ 25°C	220-1Ø-50Hz	655 kg

1.0 Control System: 7" Meditech touch screen controller

2.0 Control Construction: (Note: All dimensions are nominal.)

- 2.1 Exterior Dimensions: 95"W x 35"D x 83.5"H (2415mmW x 890mmD x 2120mmH) (Removable ballast cover to pass through doorways)
- 2.2 Interior Dimensions: 65"W x 31.75"D x 65.25"H (1650mmW x 805mmD x 1480mmH)
- 2.3 Floor: Perforated aluminum channel floor for uniform upward air flow- Uni-floor
- 2.4 Growth Area: 14.4ft² (1.34m²)
- 2.5 Growth Capacity: 69.5ft³ (1968 liters)
- 2.6 Growth Height: 58.25" (1480mm) from Uni-floor to lamp bank
- 2.7 Cabinet Construction: Bonded paneling using CFC-free insulation
- 2.8 Exterior Finish: Blue-green enamel baked on patterned aluminum
- 2.9 Interior Finish: Reflective white enamel baked on smooth aluminum
- 2.10 Drain Pan: 22 gauge stainless steel drain pan under the entire growth area, sloped the full length toward the machine compartment. A drain fitting is installed and connected to an external drain tube.
- 2.11 Condensing Unit Access: Easy access to compressor and refrigeration components through an exterior panel on the end of the chamber.
- 2.12 Doors: Two reach-in doors with keyed magnetic locks, each clear opening 25.75"W x 54"H (655mmW x 1375mmH).
- 2.13 Observation Window: Dual pane with light tight cover 11" x 15" (280mm x 380mm)
- 2.14 Shelf: Corrosion resistant wire adjustable on 0.5" (12mm) centers.
- 2.15 Control Panel: Left hand. (Right hand model optional).
- 2.16 Instrument Ports: Two ports, 1" (25mm) with light tight caps.
- 2.17 Packaging: Factory assembled, tested and fully crated.

3.0 Lighting:

- 3.1 Intensity¹: 865 micromoles/m²/s (Higher light intensities are optional)
- 3.2 Programming and Control: Fluorescent lamps incorporate dimming ballasts and a quantum light sensor to allow closed loop light control. Automatic adjustment of light intensity within the programmed range of 20% to maximum intensity. Incandescent lamps are controlled in 3 levels.
- 3.3 Lamps: Balanced spectrum for plant growth using T8 fluorescent and tungsten incandescent lamps.
- 3.4 Lamp Heat: Removed by refrigeration system.
- 3.5 Ballasts: High efficiency electronic and easily accessible.
- 3.6 Ballast Cooling: Circulating fan motor (mechanical convection).

4.0 Temperature Control: (Maximum design ambient temperature is +35°C)

- 4.1 Range: +4°C to +45°C lights OFF, +10°C to +45°C lights ON.
- 4.2 Control 2: ±0.5°C, at control point.
- 4.3 Temperature Safety Limits:

Primary: A programmable min and max temperature limit alarm or a limit tracking alarm that automatically follows the programmed set point.

Secondary: An independent factory-set high and low temperature limit is also provided for increased assurance.

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

- 4.4 Air Sensor : 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.

¹ Average Light measurement at 6" (150mm) from lamp barrier on 6-inch grid, chamber and ambient 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.



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: Electromagnetic 3-way proportional valve that smoothly modulates 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:
- Refrigeration system operation is monitored by the control system, including visual and audible alarm.
 - Pressure transducers allow for real-time diagnostics for preventative maintenance & repair.

6.0 Air Flow:

- 6.1 Vertical: Optimized air flow, provided by centrifugal impellers, is directed to growth area uniformly upward via Uni-floor system.
- 6.2 Fresh Air: Individual adjustment of positively sealed inlet and outlet from open 20ft³/min (0.57m³/min) to closed.

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 Requirements³: (Rating increases with some options.)

- 9.1 Electrical Service: 60Hz: 50Hz: (Alternative services available, consult factory)
120/208-3Ø-60Hz-4 wire plus ground
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 thorough Convirons' Technical Service group, additional charges may apply.

OPTIONAL ACCESSORIES

PROGRAMMING	Can be modified according to customers requirements	
UPS	Uninterrupted Power Supply	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.)
TEMPERATURE	Low Temperature Operation	(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.)

LIGHTING

Consult Factory

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

DHS	Dry Humidity Sensor	Dry Electronic Sensor that directly measures and displays relative humidity in %RH by means of constant display (Not required if ordering additive humidity control option.)
SNH	Spray Nozzle Humidification	Range: Up to 90% RH lights OFF and 85% RH lights ON, limited by a +25°C maximum dew point. Additive humidity through use of spray nozzles. Range given in an empty chamber. Chamber may achieve higher levels with plant loading. 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 2 liters/hr. If the above water pressure is not available the CPSNH option is required to supply necessary pressure.

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. Must be ordered with additive humidity control option.
Carbon Dioxide Additive Control		
CO2	Carbon Dioxide	Package includes gas analyzer, control valve, and injection system. Additive Control CO2 tank not included.
CONSTRUCTION		
GHE 72	Growth Height Extension	Extended growth height by an additional 12" (305mm) (removable to pass through doorways). Exterior height becomes 98.5" (2500mm).
SMC	Split Machine Compartment	Split machine compartment for convenience and flexibility for installation with reduced or limited access. Cabinet component dimensions become; 1) Growth Section - 73.5"W x 35"D x 83.5"H 2) Control Section - 21.5"W x 35"D x 83.5"H
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.
S	Shelves	Additional corrosion resistant wire shelves may be added. (One supplied with basic unit.)
C	Castors	Heavy duty swivel casters.
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.)
MAN	Manual	Additional Operator's Manual. (One supplied with basic unit.)

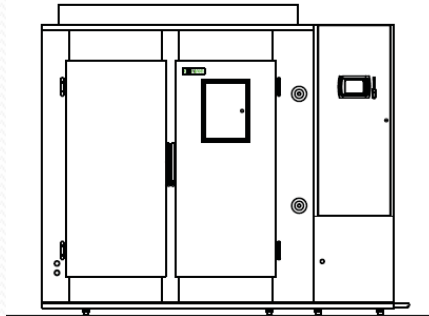
REFRIGERATION

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-3 wire plus ground, 50Hz - 220-1Ø-50Hz-2 wire plus ground. Consult factory for either amperages or other voltages available. Notes: 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. 4. Must be ordered with an electronic 3-way proportional valve [PV].
GLY	Glycol	Glycol heating/cooling designed to work with a central chiller refrigeration system. Includes 3-way proportional valve control.
PV	Proportional Valve	Electromagnetic 3-way proportional valve that smoothly modulates the heating and cooling functions of the chamber. The only moving part of this valve is a floating component within the pressure system, which is totally sealed.
ACSC	Air-Cooled Self-Contained Condenser	An air-cooled, self-contained condenser. (Requires a small chamber extension of 8" (200mm) when combined with BDH option).
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, crankcase heater for low ambient conditions and electromagnetic 3 way proportional valve for smooth modulating heating and cooling of the chamber functions. 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.

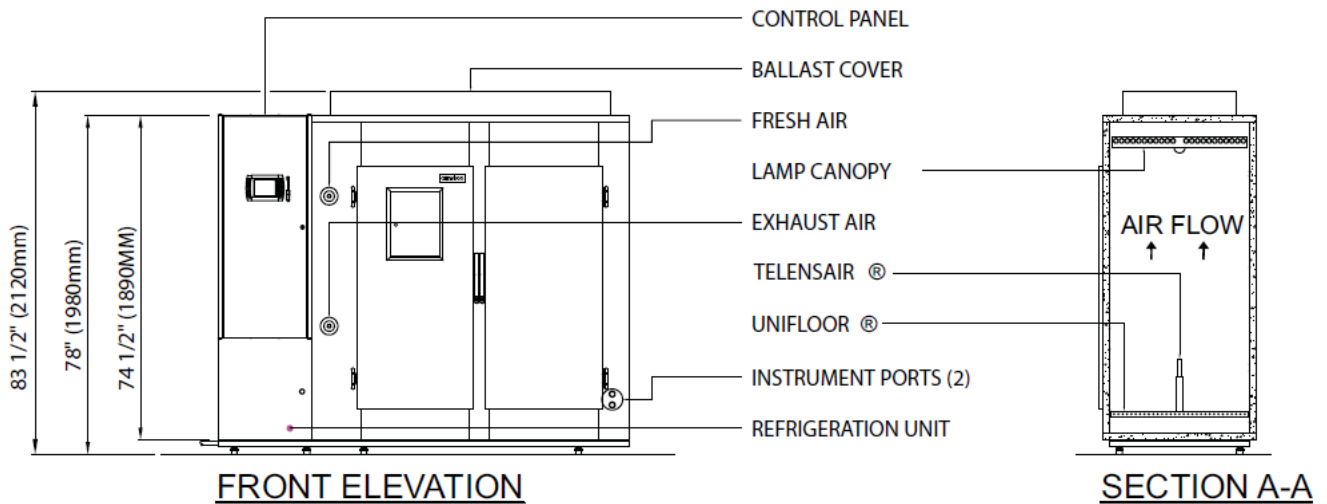
Plant Growth Chamber MPGR14

NOTES:

1. STANDARD REFRIGERATION SYSTEM IS WATER COOLED (1/2"Ø (13mmØ) CONNECTION).
2. REQUIRE A MINIMUM OF 2" (51mm) FROM REAR OF CHAMBER TO BACK WALL.
3. CASTER OPTION ADDS 2" (51mm) TO OVERALL HEIGHT OF CHAMBER.
4. DEPTH DIMENSION IS CHAMBER SIZE ONLY. DIMENSION DOES NOT INCLUDE DOOR LATCH OR PIPING ON BACK WALL.
5. LENGTH AND WIDTH DIMENSIONS ±1/4 (6mm). HEIGHT DIMENSION ±1" (25mm). DO NOT SCALE DRAWING.

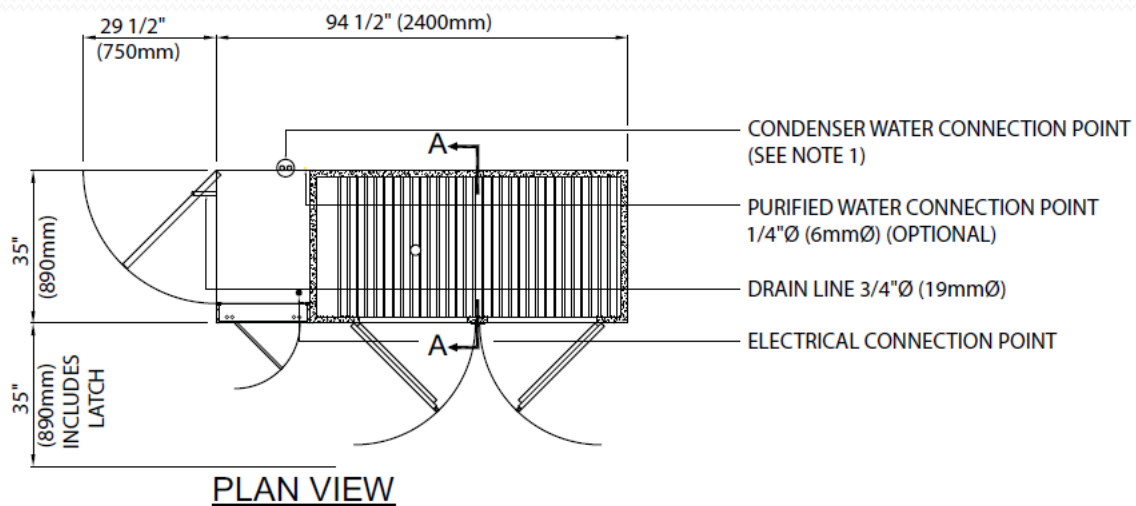


**RIGHT HAND
CONTROL PANEL**



FRONT ELEVATION

SECTION A-A



PLAN VIEW

