GEN1000

Multi-Application Reach-in Chamber

PROPOSAL

CONVIRON®

GEN1000 OVERVIEW

With its unique ability to adapt to different research applications, the GEN1000 offers an economical and flexible solution for plant science. The base chamber can be fitted with one of four specially configured kits each with airflow, lighting and shelving designed to suit specific plants and applications with any of the following configurations available:

Short Plant Kit
Horizontal airflow over multiple shelves optimizes growth area for shorter plants, like Arabidopsis. Ideal for research in propagation, genetics, physiology, and other moderate light experiments.

GEN 1000	SHORT PLANT

Key Features

Growth height:	**20** inches, 510 mm
Growth area:	**11.3** ft² (1.05 m²)
Light intensity:	**550** µmols/m²/sec
Lighting:	**LED** Light emitting diode
Airflow:	Horizontal
Max loading:	**≈48** Pots, 6" (150 mm) diameter

SIDE VIEW

550 µmols/m²/sec

20" (510 mm)

Tall Plant Kit
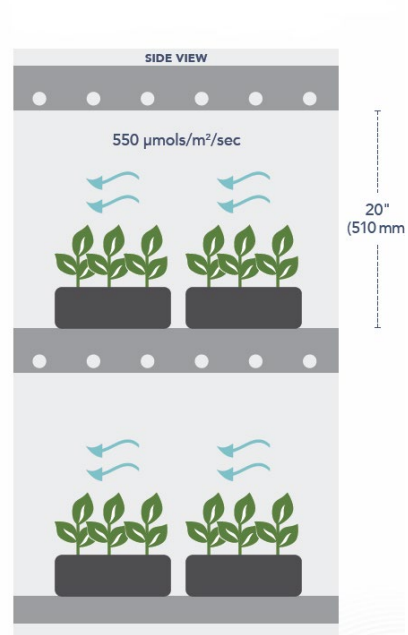Upward airflow, maximum growth height and light intensity for taller plants such as Wheat, Rice & Barley.

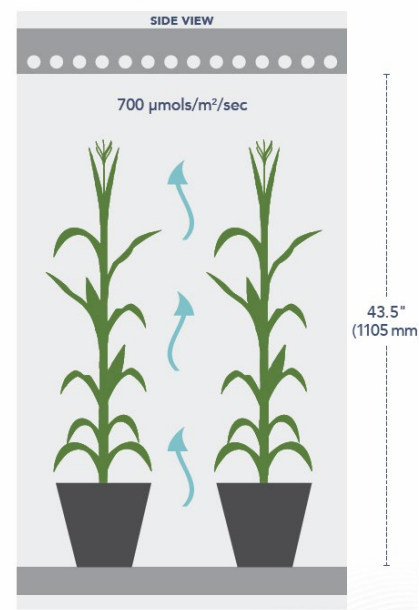| GEN 1000	TALL PLANT

Key Features

Growth height:	**43.5** inches, 1105 mm
Growth area:	**6.31** ft² (0.58 m²)
Light intensity:	**700** µmols/m²/sec
Lighting:	**LED** Light emitting diode
Airflow:	Vertical
Max loading:	**≈25** Pots, 6" (150 mm) diameter

SIDE VIEW

700 µmols/m²/sec

43.5" (1105 mm)

Incubator Kit

Low light and multiple tiers for nurturing young seedlings into shorter plants. The Incubator kit can be easily adapted for entomology research by selecting the optional phenolic coated refrigeration coil, which protects it from insect damage.
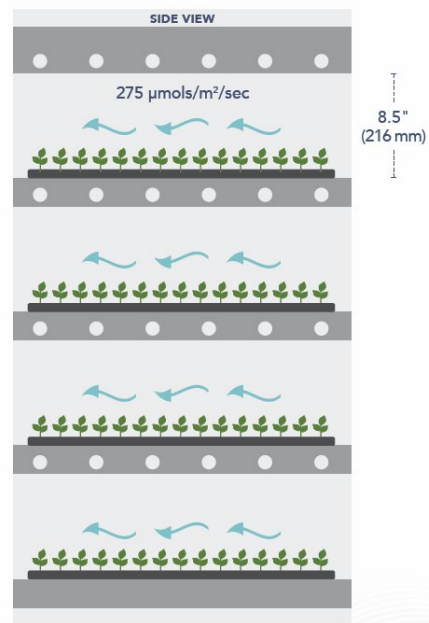

GEN 1000

INCUBATION KIT

Key Features

Growth height:	**8.5** inches, 216 mm	
Growth area:	**22.6** ft² (2.1 m²)	
Light intensity:	**275** μmols/m²/sec	
Lighting:	**LED** Light emitting diode	
Airflow:	Horizontal	
Max loading:	**≈384** Seed cells ≈2" x 2" (5x5cm)	

SIDE VIEW

275 μmols/m²/sec

8.5" (216 mm)

Tissue Culture Kit

Low light and multiple tiers to maximize space and provide upward airflow that minimizes condensation in petri dishes and jars used in propagation and genetics experiments.
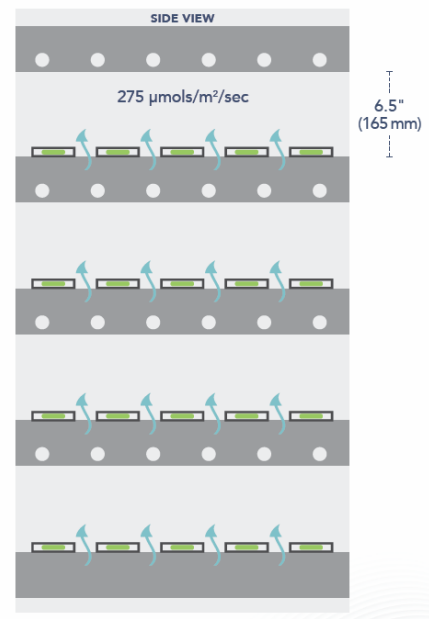

GEN 1000

TISSUE CULTURE

Key Features

Growth height:	**6.5** inches, 165 mm	
Growth area:	**22.6** ft² (2.1 m²)	
Light intensity:	**275** μmols/m²/sec	
Lighting:	**LED** Light emitting diode	
Airflow:	Vertical	
Max loading:	**≈200** Petri dishes, 100 mm diameter	

SIDE VIEW

275 μmols/m²/sec

6.5" (165 mm)

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FEATURES

1. Interface
7'' full-color, high resolution touch screen with USB logging.

2. Exterior Finish
Wet-painted galvanized steel.

3. Interior Finish
Reflective white, wet-painted galvanized steel for corrosion resistance, durability, ease of cleaning, and maximum light uniformity.

4. Shelves
In the SH, TA and IN Kits the shelves can be height adjusted or removed by adjusting the height of the clips on the pilaster strip. In the TC configuration the 4 shelves are not removable (due to the unique air shelf design). Each shelf can support 40lb (18kg). (60 lbs for TA configuration).

5. Drainage
A 1" (25mm) drain is provided underneath the chamber, located near the back. The drain may be extended to a nearby floor drain as required. If there is no floor drain nearby, the optional condensate drip pan (DP option) may be used to collect the condensate or the optional condensate pump and drip pan (PUMP Option) may be used.

6. Mobility
The unit is supplied with front-locking casters and levelers to stabilize the chamber in its final location and compensate for variations in the finished floor.

7. Observation Window (OW Option)
Measuring 9½" x 34" (240mm x 860mm) unheated dual pane with light tight cover.

8. Aspirator
Houses temperature and humidity sensors shielded to avoid effects of solar radiation.

Instrument Port
One instrument port, 2'' (50mm) with light tight cap.

Fresh Air Damper
The fresh air inlet allows the operator to manually adjust the rate at which fresh air is introduced into the chamber. Adjustable from fully closed (no fresh air) to fully open to allow up to 20ft3/min (0.57m3/min) of air exchange.

Audible and Visual Alarms
User programmable "set and forget" alarms track the chamber's operation versus user-defined points. Backup "high/low" alarms provide a further level of protection while visual and audible notification is provided when any alarm is activated.

Fan Speed Controls
Adjustable fan speed control through CMP6060 enhances airflow control.

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CONNECTIONS

1. Electrical
The unit will tolerate +/- 10% voltage fluctuation from the rated voltage on the serial plate. Use a voltage stabilizer if the fluctuation is greater +/- 10%.

2. Uninterruptable power supply (UPS Option)
The optional UPS provides surge protection and emergency power to the controller only in the case of a facility power interruption.

3. Central Alarm Contact
The "Central alarm contact" consist of a normally closed dry contact energized by a control system alarm output that is connected to a Building Management System (BMS) or an optional auto dialer (ADIAL). When an alarm condition occurs, that contact opens, interrupting the circuit from the BMS (or the system) to indicate the alarm. The CAC is only triggered by shut-down alarms.

### RO Water Connection (not shown)
1/4" Quick connect for connection to RO water supply Type IV purified water to ASTM D1193 – 06(2018)
Maximum 1 liter/hour
Pressure 5-115 psi

4. Condensate Pump (PUMP Option)
Collects chamber condensate and pumps the condensate from the condensate drip pan to the floor drain when direct plumbing is not available or desirable.

5. Ethernet Port
Connect an RJ45 terminated cable to the optional Central Management System.
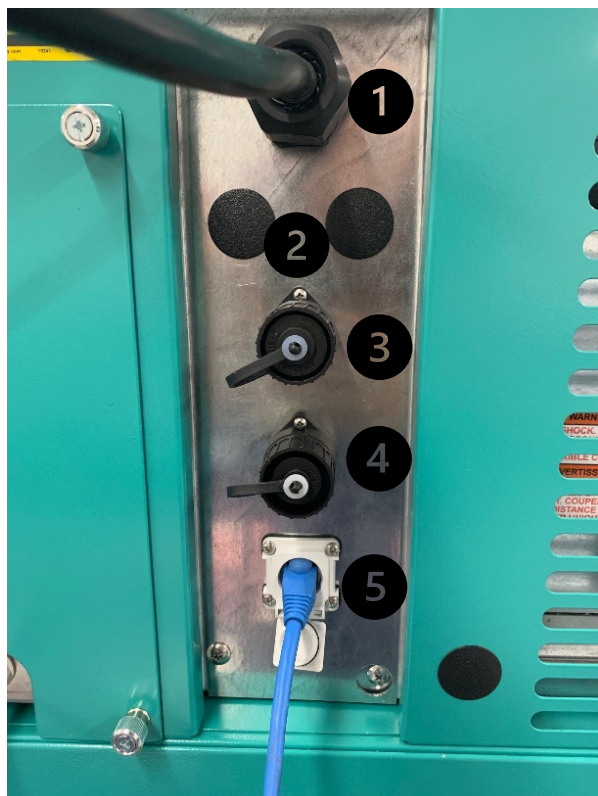
CONSTRUCTION

Exterior Dimensions
41"W x 32½"D x 77"H
(1040mmW x 825mmD x 1955mmH)

Interior Dimensions
37½"W x 24¼"D x 52½"H
(955mmW x 620mmD x 1330mmH

Capacity	Weight (crated)
27.6ft^3	800 lbs
(781 liters)	320kg

REFRIGERATION

Standard (ACSC)
The self-contained air-cooled refrigeration system is optimized to ensure uniform conditions regardless of the kit installed.

Optional: Water-cooled Condensing Unit (WC Option)
Used when a facility has a Chilled Water system, or when an air- cooled condenser system will add unwanted heat into the room.

Optional: Phenolic-Coated Refrigeration Coil (CPC Option)
Coated coil for entomology applications.

TEMPERATURE

Standard
Maximum design ambient temperature is +35°C
Temperature Range: +4°C to +40°C lights OFF and +10°C to +45°C lights ON

Optional: Low Temperature Operation (LT Option)
Low temperature operation of 2°C with the lights ON (No fresh air below 8°C.) A defrost cycle will occur resulting in a temperature increase for temperatures set below 10°C with the lights ON, 4°C with the lights OFF. Temperature spikes and defrost time are dependent on the chamber operating temperature. During this cycle, the lights will be turned off. When using fluorescent lighting, specified light intensity will diminish when the chamber is operating at low temperatures.

CARBON DIOXIDE

Standard
No control on basic unit

Optional: Additive Carbon Dioxide Control (CO2)
Additive CO2 Package includes CO2 sensor, control valve, and injection system. CO2 tank not included. Option allows for range from ambient up to 2,900ppm.

Optional: CO2 Monitoring Package (CO2-M)
Carbon Dioxide Monitoring (CO2-M) indicates the CO2 level without controls or limits.

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HUMIDITY

Standard
Range: No control on basic unit.

Optional: Additive Humidification (USH Option)
Range is resultant to 90% RH lights OFF, 75% RH lights ON, limited by a +25°C dew point, control: ±6% RH. Range given in an empty chamber; chamber may achieve higher levels with plant loading.

Optional: Dehumidification (BDH Option)
Enables user to set humidity levels inside the chamber to a specific %RH below resultant conditions. Resultant conditions are ambient humidity of the indoor space plus any humidity loading from soil, plant transpiration, watering etc. Note: Utilities increase to 30-amp service 60Hz (16-amp 50Hz). Heat rejection to ambient shall not exceed 8,000 btu/h (2350 watts).

LIGHTING

Standard
The standard lighting systems for the GEN1000 incorporate broad spectrum 12W T5 LED fixtures configured to suit the intensity required for each application and kit. As standard, lighting can be dimmed by the user through the controller.

Light measurement at 6" (150mm), chamber temperature of 25°C. Light intensities are nominal values measured at the rated chamber supply voltage and (dimmable lighting) with a maximum light output (verified by a LI-190R factory reference Quantum Sensor).

Optional: Fluorescent Lighting
Balanced spectrum for plant growth using T5 fluorescent canopy. With fluorescent lamps, light intensity values may be lower than specified if measured at temperature set points below 25°C

	Lighting Intensity (umol/m²/sec)	
	LED	**Fluorescent**
SH kit	550	450
TA Kit	700	1000
IN Kit	275	300
TC Kit	275	300

Open Loop Lighting Control (Standard)
All lamps on and controlled to percentage level of total power wattage. No light sensor included.

Optional: Closed Loop Dimming (LMMCL Option)
Programmed Intensity is reportable and repeatable. Light intensity programmed and controlled to specific micromoles/m²/s intensity. Includes light sensor.

Optional: Additional Light Tier for SH Kit (XTIER Option)
Additional tier with lamp canopy and additional wire shelf. Growth area becomes 16.9ft² (1.5m²). Growth height becomes 12" (305mm) on 1st tier, 13" (330mm) on 2nd and 3rd tier. Temperature becomes 15°C ON. Maximum humidity becomes 70% RH lights ON. Note: Not available with Low Temperature (LT) option. (Available in Short Plant Kit only).

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CONTROLS & MONITORING

Standard

The GEN1000 chamber comes equipped with Conviron's most advanced yet simple-to-use controller – the CMP6060. Configured to your chamber specifications from the factory the CMP6060 offers a wide array of set-up, control, and alarm features. The scalability of the CMP6060 will help future proof your research as it can accommodate additional input/output ports should your research require additional sensors at any point. Features include:

- 7" full-color, high resolution touch screen
- Easy navigation where users can view data, graphs, and settings directly on the screen
- Ability to design complex experiments with up to 16 programs
- Ability to organize schedules to create single-day, multi-day, and seasonal experiments
- Visual, color-coded, and audible alarms
- Ramped or stepped multi set-point functionality

Other Controls Options:

- PCo Web Card for connection to Ethernet (WEBCARD Option)
- An automatic telephone dialing system (autodialer) to notify user of chamber alarm (ADIAL Option)
- Connect seamlessly to an Argus controls system with CMPLink (CMP-LINK Option)

Creating Programs

Create, edit, name and store up to 16 programs (24-hour cycles) up to 18 each with 48 lines of control processes including Temperature, Humidity, Lighting, and other optional parameters such as Carbon dioxide.
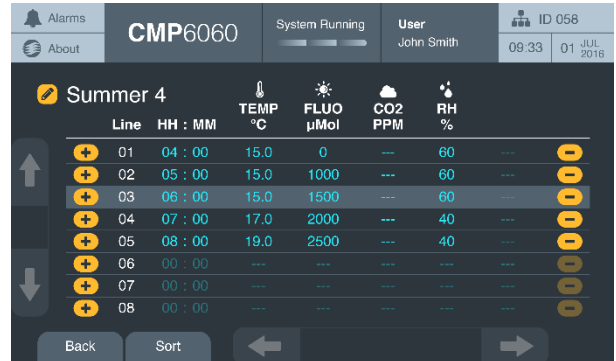

Trend Graphs

Trend graphs viewed directly on screen for both set point and actuals.
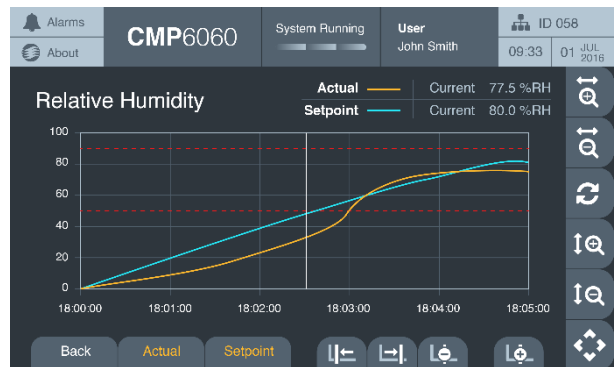
Optional: Central Management System (CM Option)

With Conviron's Central Management™, researchers and facility managers can operate a single chamber or manage an entire fleet of plant growth environments from a central workstation and remote devices connected through LAN or Internet.

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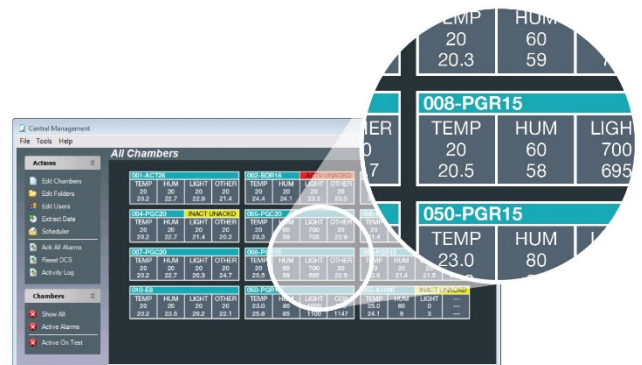
OPTIONS

Kit Variations
Short Plant Kit (LED)	SH
Tall Plant Kit (LED)	TA
Incubator Kit (LED)	IN
Tissue Culture Kit (LED)	TC
Short Plant Kit (Fluorescent)	SH-FL
Tall Plant Kit (Fluorescent)	TA-FL
Incubator Kit (Fluorescent)	IN-FL
Tissue Culture Kit (Fluorescent)	TC-FL

Control System
Enable control via Argus System	ARGUS
Automatic Telephone Dialing System	ADIAL
Controller UPS & Surge Protection	UPS
Web Card for connection to Ethernet	WEBCARD
CMv8 Central Management System	CM

Construction
Observation Window	OW
Additional Wire Shelf	S
Condensate Drip Pan	DP
Condensate Pump and Drip Pan	PUMP

Lighting
Extra Tier with Lamp Canopy (SH Kit)	XTIER
Dimming & Light Sensor	LMMCL

Temperature
Low temperature Operation	LT

Refrigeration
Water Cooled Condensing Unit	WC
Phenolic Coated Refrigeration Coil	CPC

Humidity Control
Ultrasonic Humidification	USH
Bypass Dehumidification	BDH

Carbon Dioxide
CO_2 Additive Control	CO2
CO_2 Monitoring Only	CO2-M

Service and Maintenance
Essential Spare Parts Kit	ESP
Spare Lighting Set-Fluorescent	SLS-FL
Spare Lighting Set-LED	SLS-LED
Preventative Maintenance	PM
Extended Warranty	XWTY

WARRANTY

The hallmark of Conviron products is their precision, reliability, and application specific design. Based on this, Conviron has established a global reputation of leadership with product solutions that are proven, reliable, and robust. This allows us to back our equipment with industry leading warranties.

Standard:
Conviron' s proposal provides a full two-year warranty on its systems and labor. Systems include all parts and all materials required to repair any faults and/or defects of design, material, and workmanship.

Please refer to www.conviron.com/warranty for full warranty details

Optional:
Extended warranties are available on request.

PREVENTATIVE MAINTENANCE

Preventative Maintenance & Service Program GroGuardian™:
Conviron offers comprehensive preventative maintenance and service programs for its equipment.   Program frequency and structure are customized based on your requirements and desired level of service. To learn more about GroGuardian™, please contact us at info@conviron.com