

MT52 Plant Growth Chamber



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Product Overview/Applications

Meditech's MT52 plant growth chamber is a compact yet highly configurable unit that is suitable for a wide variety of research and teaching programs. As a Floor Model design, it is easily accessed at standard bench heights and can be ordered with a bench kit complete with casters. The chamber accommodates a 29" (740mm) growth height with 7 ft² (0.6m²) of growth area. This facilitates growing a wide range of plants, including growth to maturity. Please consult Meditech regarding specific requirements.

Lighting

The standard lighting system on the MT52 provides a broad based light spectrum for plant growth using a combination of fluorescent and incandescent lamps. The lamps are housed within a barriered canopy which reduces heat transfer to the growth area. Excess heat in the canopy is ventilated to ambient. Standard light intensity is 400 micromoles/m²/s which is measured by a quantum light meter and transmitted to the controller for user readout. Standard lighting control provides two light levels per lamp type.

Airflow

Airflow for the MT52 is distributed uniformly upward using Meditech's innovative Uni-floor air distribution plenum. The unit includes fresh air intake and exhaust which are adjustable to allow up to 10 ft³/min (0.28m³/min.) of air exchange.

Refrigeration

Cooling on the MT52 model is provided by a self-contained air 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.

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 on requests.

Key Product Attributes

- Designed for Floor Model installation
- Small footprint, yet can accommodate full-size plants
- Standard lighting provides a broad based light spectrum at medium 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
-2°C to +40°C Lights Off	17ft ³	7ft ²	29"	54" x 27.25" x 53	400 µmoles/m ² /s	120-1Ø-60Hz	580lb.
+5°C to +45°C Lights On	480L	0.65m ²	740mm	1375 x 695 x 1350 (mm)	@ 25°C	220-1Ø-50Hz	263kg

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1.0 Control System: Meditech 7 inch Touch Screen Controller

2.0 Construction: (Note: All dimensions are nominal)

- 2.1 Exterior Dimensions: 54"W x 27.25"D x 53.25"H (1375mmW x 695mmD x 1350mmH).
- 2.2 Interior Dimensions: 41"W x 24.25"D x 33"H (1040mmW x 615mmD x 840mmH).
- 2.3 Floor: Perforated aluminum channel floor for uniform upward air flow – Uni-floor.
- 2.4 Growth Area: 7ft² (0.65m²).
- 2.5 Growth Capacity: 17ft³ (480 liters).
- 2.6 Growth Height: 29" (740mm) from Uni-floor to the barrier.
- 2.7 Exterior Finish: Blue-green enamel baked on patterned aluminum.
- 2.8 Interior Finish: Reflective white enamel baked on smooth aluminum.
- 2.9 Cabinet Construction: Bonded panelling using CFC-free insulation.
- 2.10 Door: One reach-in door with keyed magnetic lock, clear opening 19.75"W x 24.75"H (500mmW x 630mmH).
- 2.11 Observation Window: Dual pane with light tight cover 11" x 15" (280mm x 380mm).
- 2.12 Shelf: Stainless Steel resistant wire adjustable on 0.5" (12mm) centers.
- 2.13 Instrument Ports: Two ports, 1" (25mm) with light tight caps.
- 2.14 Packaging: Factory assembled, tested and fully crated.

3.0 Lighting:

- 3.1 Intensity¹: 400 micromoles/m²/s (higher light intensities are optional)
- 3.2 Programming and Control: Independent, 2 level programming of each light type.
- 3.3 Lamps: Balanced spectrum for plant growth using T8 fluorescent and tungsten incandescent lamps.
- 3.4 Lamp Fixture: Separated from the growth area by a transparent barrier. Barrier is hinged for easy lamp access from inside the growth area.
- 3.5 Lamp Heat: The air within the lamp canopy is force-ventillated to ambient.
- 3.6 Ballasts: High efficiency electronic and easily accessible.
- 3.7 Light Meter: Quantum light meter for display and recording of light output.

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.

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.



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- 5.1 Condensing Unit: Cabinet is supplied with an air-cooled condensing unit with hot gas bypass system for continuous compressor operation, extended compressor life and close temperature control. Condensing unit is located in machine compartment.
- 5.2 Heat Exchanger Coil(s): Copper-tubed construction.
- 5.3 Valve: Electronic modulating valve that smoothly regulates the heating and cooling functions of the chamber.
- 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.
b) Pressure transducers allow for real-time diagnostics for preventative maintenance & repair.

6.0 Air Flow:

- 6.1 Vertical: Uniformly upward through Uni-floor less than 50ft/min (15.2m/min).
- 6.2 Fresh Air: Filtered inlet and adjustable exhaust 10ft³/min (0.28m³/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 Additive Control and Optional Accessories)

9.0 Utility Requirements3:

- (Rating increases with some options.)
- 9.1 Electrical Service: (Alternative services available, consult factory)
60Hz: 120-1Ø-60Hz-2 wire plus ground
50Hz: 220-1Ø-50Hz-2 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.

Cabinet Construction

- 1.The cabinet of MEDITECH refrigerators is insulated with high density CFC free Poly Urethane Foam 120 mm thick insulation.
- 2.Interior chamber is finished resistant stainless Steel (304, 0.8 mm thick).
- 3.The exterior is Sky Blue/white Pure Polyester powder coated (1.0 mm thick) Mild Steel and the door has a magnetic gasket with a keyed lock.
- 4.Stainless steel trays are provided for storage inside.
5. The refrigerators are provided with handle and lock for safety and security.

Refrigeration

1. Heavy-duty, air-cooled refrigeration system
2. Forced air circulation maintains chamber uniformity of +/-1°C and provides quick recovery after door openings
- 3.Non-CFC, commercially available refrigerant
- 4.Automatic condensate evaporator is standard
- 5.Internal evaporator fan(s) shut off during door openings
- 6.Defrost cycle required to maintain constant temperature



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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	Adjustable	
LIGHTING		
HL	High Light	Intensity of 550 micromoles/m ² /s using fluorescent and tungsten incandescent lamps. Note: Amperage increases, 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 dewpoint. 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.
Carbon Dioxide Additive Control		
CO2	Carbon Dioxide	Package includes gas analyzer, control valve, and injection system. Additive Control CO2 tank not included.

