



Features:

- 1.8m² (19ft²) of tissue culture area total on four tiers
- 210mm (8¼") of height on each of the four tiers
- 95µmol m⁻² s⁻¹ PPFD of lighting
- Ideal for tissue culture
- Four tiers of shelving maximizes tissue culture area
- Upward through-the-shelf airflow reduces condensation
- Small footprint maximizes floor space in the facility



Quality product.
Excellent service.
Innovative designs.

 **BioChambers**
PROVIDING GROWTH TO RESEARCH.

TISSUE CULTURE SERIES

TCC-18

INTRODUCTION

BioChambers' tissue culture chamber model TCC-18 was specifically designed with an open channel floor on each shelf delivering upward airflow to minimize or eliminate condensation in the tissue culture dishes. The chamber features four fixed height light tiers of shelving maximizing the tissue culture area. BioChambers' tissue culture chambers provide tight uniform control of temperature, lighting using LED lamps, and adjustable airflow.

1.0 CONTROLLER

- 1.1 **Controller Version:** BioChambers NEXUS.
- 1.2 **Interface:** Fanless panel PC with a 305mm (12") color touch screen.
- 1.3 **Ethernet Connection:** Secure remote access using a unique site specific webkey allowing the chambers/rooms to be connected to a facility supplied local area network (LAN)/internet.
- 1.4 **Security:** Multiple levels of password security for researchers, administrators, service technicians, and BioChambers' factory technicians.
- 1.5 **NEXUS Viewer:** Instantly view the status of all your experiments. Single or multiple chambers/rooms can be remotely monitored and operated from a central location via the LAN/internet. NEXUS Viewer can be installed on up to three existing computer stations.
- 1.6 **Schedule:** Multi-line schedule can be created for temperature, lighting (day length), light intensity, and fan speed using the touch screen interface or remotely using the facility provided LAN/internet. Available options: humidity, carbon dioxide, auxiliary circuits primarily for automatic watering, etc... can also be scheduled.
- 1.7 **Multi-Day:** Multi-day changing environmental conditions can be scheduled.
- 1.8 **Ramping:** Temperature and light intensity changes gradually (ramping) from setpoint to setpoint. Available options: humidity and carbon dioxide can also be ramped.
- 1.9 **Astronomical Clock:** Researchers can produce photoperiod schedules for locations worldwide by simply entering the latitude and longitude.
- 1.10 **Graphing:** Controlled parameters such as temperature, light intensity, and the following available options: humidity and carbon dioxide can be graphed to show setpoint versus actual conditions.
- 1.11 **Research Data:** Controller equipped with a memory card to store multiple schedules and logged data such as temperature, alarms, etc... Log rate and duration can be set by the user.
- 1.12 **Data Export:** Data can be exported to the researcher's/administrator's computer for further analysis.
- 1.13 **Start-up:** Provisions for chamber/room start-up delay in facilities with multiple chambers/rooms helping to reduce the initial inrush current after a power outage.
- 1.14 **Alarms:** Notification via e-mails, building alarm contacts connected to a facility supplied building security system, and on chamber/room audible alarm with red indicator light.
- 1.15 **Service Data:** Refrigeration system pressures and temperatures along with other service parameters are logged. Log rate and duration can be set independently of the research log.
- 1.16 **Service Screen:** Displays compressor discharge and suction pressures and temperatures, facility water supply and return temperatures, automatic temperature setting safety limits status, lamp hours, sensor calibration hours, temperature control valve position, and more.
- 1.17 **Service:** On-screen override switches with a 10 minute schedule bypass are provided for the service technician to place the chamber/room into full cooling or heating and all lights on or off. This enables faster and easier service work as the technician does not need to learn how to program a schedule.



TISSUE CULTURE SERIES

TCC-18**2.0 CONSTRUCTION**

- 2.1 Exterior Dimensions:** 735mmW x 915mmD x 2045mmH (29"W x 36"D x 80½"H). Add 150mm (6") to the depth for the display and electrical raceways.
- 2.2 Assembly:** Chamber shipped assembled as one unit for easy installation in the facility.
- 2.3 Interior Dimensions:** 660mmW x 665mmD (26"W x 26¼"D).
- 2.4 Growth Area:** 1.77m² (19.0ft²) total on four tiers.
- 2.5 Growth Height:** 210mm (8¼") each of the four tiers.
- 2.6 Growth Capacity:** 0.4m³ (13ft³) total on four tiers.
- 2.7 Interior:** Pre-painted white smooth aluminum.
- 2.8 Exterior:** 22ga. Stainless Steel Type 304 #4 Brushed.
- 2.9 Lamp Canopies:** Four fixed height, non-barriered lamp canopies.
- 2.10 Drain Pan/Floor:** Constructed of anodized aluminum on each shelf and floor drain pan constructed of stainless steel for superior corrosion resistance.
- 2.11 Insulation:** 38mm (1½") CFC free, high-density expanded polystyrene.
- 2.12 Electronics:** Filtered air blown into the control panel, providing cooling to the electronics and positive pressure in the control panel keeping dust out, extending the life of the electronics.
- 2.13 Service:** Easy access to electronics and mechanical components located on the roof of the chamber.
- 2.14 Instrument Port:** One 50mm (2") with light tight covers.
- 2.15 Reach-In Door:** One 655mmW x 1265mmH (25¾"W x 49¾"H) with light tight magnetic gaskets and self closing cam-lift hinges.
- 2.16 Observation Window:** Available as an option.
- 2.17 Control Panel:** Display mounted on the center of the chamber when facing the door.
- 2.18 Aisle/Vestibule:** Not applicable.

**3.0 AIR TEMPERATURE**

- 3.1 Ambient:** Designed for a maximum ambient of 35°C outside the chamber.
- 3.2 Range:** 4°C to 40°C all lights off, 10°C to 40°C all lights on (extended temperature options are available).
- 3.3 Control:** PID control, +/-0.5°C at the aspirated sensor.
- 3.4 Temperature Limits:** Automatically set when the user selects a schedule. One high/low and one lamp safety temperature limit sensor independent of the main temperature sensor.
- 3.5 Sensor Box:** Moveable, aspirated, and sensors are shielded from the radiative heat produced by the lights.
- 3.6 Temperature Sensor:** High precision fast responding thermistor sensor.

4.0 LIGHTING

- 4.1 Type:** T5 LED (other lighting options are available).
- 4.2 Intensity:** 95µmol m⁻² s⁻¹ PPFD (Photosynthetic Photon Flux Density measured in the PAR (Photosynthetically Active Radiation) range of 400-700nm) on each tier of shelving. Light intensity is measured at 150mm (6") from the lamp canopy at 25°C and averaged on a 150mm (6") grid.
- 4.3 Light Source:** 610mm (24") T5 LED lamps.
- 4.4 Programming:** Via NEXUS controller.
- 4.5 Light Intensity Control:** 2 levels of lighting on top two shelves and 2 levels of lighting on bottom two shelves, total of 4 lighting levels.
- 4.6 Lamp Heat:** Cooling system sized to remove all heat generated by the lights.
- 4.7 Light Sensor:** One quantum sensor measures PPFD and data is logged by the controller.

5.0 COOLING SYSTEM

- 5.1 **Type:** Direct expansion cooling system with a self-contained air-cooled condenser (other options are available).
- 5.2 **Temperature Valve:** No maintenance electronic proportional hot gas bypass system for close temperature control and continuous compressor operation.
- 5.3 **Compressor:** Scroll compressor.
- 5.4 **Coolant:** HFO based R-449a or R-448a.
- 5.5 **Cooling Coil:** Copper tube and aluminum fin construction.
- 5.6 **Analysis:** Compressor discharge pressure, suction pressure, and temperatures are logged for ease of service.
- 5.7 **Safety:** One suction pressure switch and one discharge pressure switch is provided for the refrigeration system to prevent short cycling and compressor burn out.
- 5.8 **Barriered Lamplift:** Not applicable.
- 5.9 **Defrost Cycle:** Not applicable.

6.0 AIR DISTRIBUTION

- 6.1 **Air Flow:** Vertical uniformly upward through an anodized aluminum open channel floor to minimize or eliminate condensation in the tissue culture dishes.
- 6.2 **Fan Type:** Energy efficient electronically commutated (EC) motor with built in fan speed control and tach output.
- 6.3 **Fan Speed:** Can be programmed from 50% to 100% in the controller, enabling researchers to vary the airflow through the plants (85% or higher recommended, temperature gradients increase at lower fan speeds).
- 6.4 **Fresh Air:** Filtered fresh air with a manually adjustable vent: 0.4m³/min (15ft³/min).

7.0 RESEARCH SAVER

- 7.1 **Surge Protector:** Over voltage protection of the controller and control circuit from electrical surges.
- 7.2 **Capacitor Back-up:** Provides time for soft shutdown of the controller.
- 7.3 **Power Phase Detector:** Loss of power phase alarm protects the compressor and other components.
- 7.4 **Air Flow:** Tach output of each fan displayed in the controller with automatic low rpm alarm to detect fan failure.
- 7.5 **Factory Diagnostics:** Through a facility supplied LAN/internet connection a BioChambers' factory technician can remotely access the chamber/room to analyze the mechanical, electrical, and control systems.
- 7.6 **Testing:** 100% assembled, tested, and run-in at the factory before being disassembled for shipment to the site reducing on-site assembly time and disruptions.
- 7.7 **Quality Standard:** ISO 9001:2015 certified company.

8.0 WARRANTY

- 8.1 **Duration:** Two years parts and labor.
- 8.2 **Diagnostics:** Additional years three to five remote diagnostics service.

9.0 ELECTRICAL

- 9.1 **Service:** 120/208V-240V/1-phase/60Hz, 3-wire + ground (NEMA L14-20R) (50Hz option: 240V/1-phase/50Hz/2-wire + ground). Electrical service to be provided by others (contact BioChambers for utility requirements).
- 9.2 **Electrical Safety:** Chamber/Room is CSA inspected (CE where applicable).

10.0 INSTALLATION & CUSTOMER TRAINING

- 10.1 **Manuals:** Controller manual, operation & maintenance manual, and electrical schematics provided.
- 10.2 **Training:** Please consult with BioChambers for training options.
- 10.3 **Installation:** Please consult with BioChambers for installation options.

TCC-18

Available Options

BioChambers Rooms and Chambers are available with a variety of options and accessories. If your research has specific requirements, BioChambers can outfit your equipment to meet your needs. These are just a few of the standard options we have available. Ask for more information.



T5 FLUORESCENT LIGHTING



PPFD DATA LOGGING



LOW TEMPERATURE DEFROST



EXTENDED TEMPERATURE RANGE



EXTENDED WARRANTY



CONTAINMENT HEPA FILTRATION



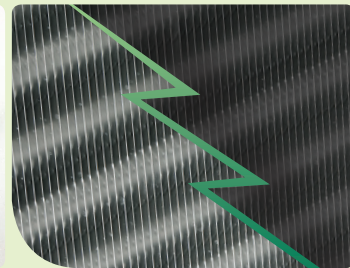
CONTAINMENT +/- PRESSURE



PROGRAMMABLE RECEPTACLE



WATER COOLED CONDENSER



EVAPORATOR COATING



ADDITIVE CO₂



CO₂ SCRUBBER



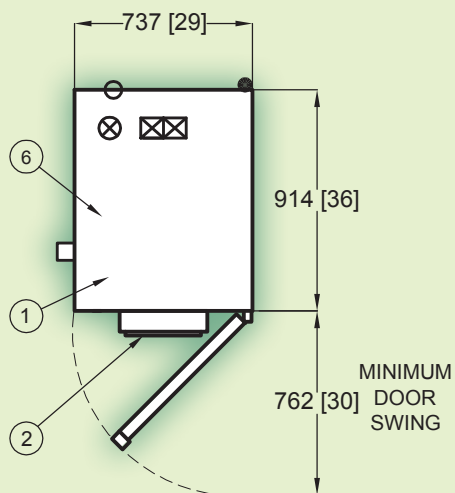
ADDITIVE HUMIDITY SPRAY NOZZLES



RELATIVE HUMIDITY DATA LOGGING

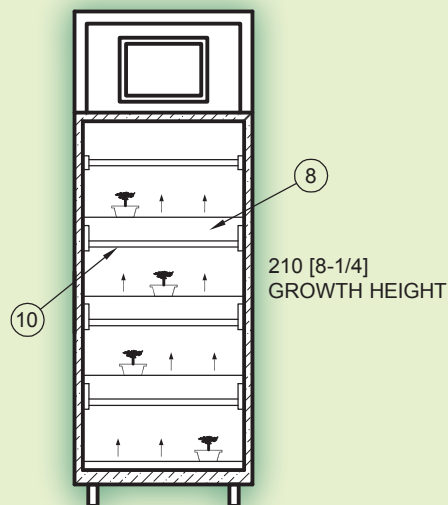
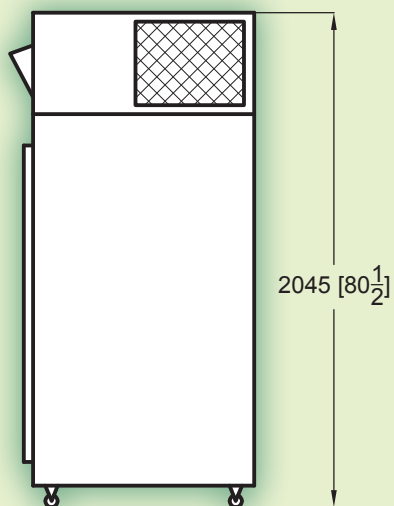
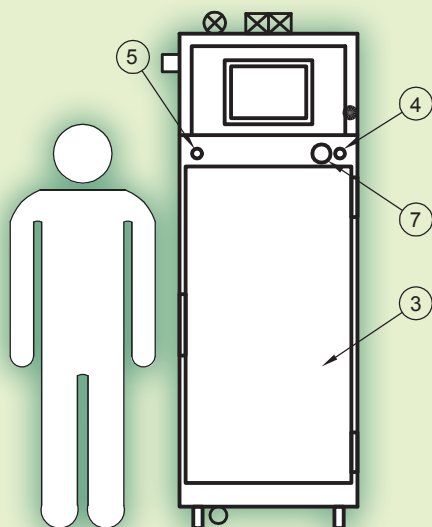
TISSUE CULTURE SERIES

TCC-18

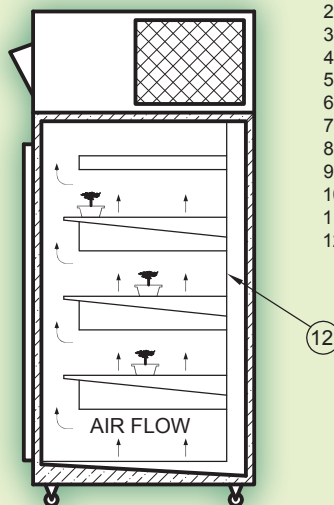


Metric (mm) [Imperial (")]

- - Ethernet connection
- ⊗ - Purified water connection (if humidity option selected)
- - Electrical connection
- - Ø 7/8" O.D. Drain location
- ⊠ - Cooling water or refrigeration line connections for condenser



SECTIONED FRONT VIEW



SECTIONED SIDE VIEW

1. Control Panel
2. Touch Screen Interface
3. Door Opening 655 [25-3/4] x 1265 [49-3/4]
4. Fresh Air
5. Exhaust Air
6. Cooling System
7. Instrument Port
8. Lighting Drivers
9. N/A
10. Fixed Height Lamp Canopy
11. N/A
12. Air Plenum



TISSUE CULTURE SERIES
TCC-18



Biochambers TCC-18 Specifications version 2024-02A.
Our policy of continuous product improvement will occasionally result in changes to product specifications without notice.
©BIOCHAMBERS INCORPORATED 2024. ALL RIGHTS RESERVED PRINTED IN CANADA

biochambers.com