Features:

- 6.8m² (73ft²) of tissue culture area total on four tiers
- 355mm (14") of height on each of the four tiers
- 400μmol 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
- Entirely front serviced - can be placed back-to-back and side-to-side
Quality product. 
Excellent service. 
Innovative designs.
INTRODUCTION

BioChambers’ tissue culture chamber model TCC-74, first in the industry, was specifically designed for facilities with high ceilings, allowing a design which maximizes the available floor space. The chamber features four fixed height light tiers of shelving maximizing the tissue culture area and an open channel floor on each shelf delivering upward airflow to minimize or eliminate condensation in the tissue culture dishes. 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 VNET.

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 VNET 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. VNET Viewer can be installed on up to three existing computer stations.

1.6 Schedule: Multi-line schedule can be created for temperature, lighting, 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, light intensity, etc... can also be scheduled.

1.7 Multi-Day: Multi-day changing environmental conditions can be scheduled.

1.8 Ramping: Temperature changes gradually (ramping) from setpoint to setpoint. Available options: humidity, carbon dioxide, and dimmable lighting 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 and the following available options: humidity, carbon dioxide, and light intensity can be graphed to show setpoint versus actual conditions.

1.11 Research Data: Controller equipped with a compact flash 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: Two manual toggle 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 use the control system.
**2.0 CONSTRUCTION**

2.1 Exterior Dimensions: 2540mmW x 890mmD x 2820mmH (100"W x 35"D x 111"H) assembled. Add 230mm (9") to the height to assemble the chamber (custom heights are available).

2.2 Assembly: Chamber splits at a height of 2005mm (79") for easy installation in the facility.

2.3 Interior Dimensions: 2465mmW x 730mmD (97"W x 28¾"D).

2.4 Growth Area: 6.79m² (73.1ft²) total on four tiers.

2.5 Growth Height: 355mm (14") each of the four tiers.

2.6 Growth Capacity: 2.4m³ (85ft³) total on four tiers.

2.7 Interior: Pre-painted white smooth aluminum.

2.8 Exterior: Powder coated painted green aluminum.

2.9 Lamp Canopies: Four fixed height, non-barriered lamp canopies.

2.10 Drain Pan/Floor: Constructed of 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 from the front to electronics and mechanical components located on the roof of the chamber.

2.14 Instrument Ports: Two 50mm (2") with light tight covers.

2.15 Reach-In Doors: Two 840mmW x 1700mmH (33"W x 67"H) with light tight magnetic gaskets and self closing cam-lift hinges.

2.16 Observation Window: One 380mm x 280mm (15" x 11") dual pane glass window with light tight cover.

2.17 Control Panel: Display mounted on the center of the chamber when facing the doors.

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: Dimmable T5 LED with energy efficient ballasts (other lighting options available).

4.2 Intensity: 400µmol 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: 1220mm (48") 24W T5 LED lamps.

4.4 Programming: Via VNET controller.

4.5 Light Intensity Control: Users program a percentage setpoint within the dimmable range of 30% to 100% via the controller.

4.6 Lamp Heat: Refrigeration system sized to remove all heat generated by the lights.

4.7 Lighting Relays: 100% solid state for increased reliability.
5.0 COOLING SYSTEM

5.1 Type: Direct expansion cooling system with a water-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. Facility water supply and return temperatures are also logged.

5.7 Safety: One suction pressure switch and one discharge pressure switch with a manual reset is provided for the refrigeration system to prevent short cycling and compressor burn out.

5.8 Bariered Lamplight: 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: 1.7m³/min (60ft³/min).

7.0 RESEARCH SAVER

7.1 Surge Protector: Over voltage protection of the controller and control circuit from electrical surges.

7.2 Uninterruptible Power Supply (UPS): Protects the controller and control circuit from brown outs, surge conditions, and momentary loss of power.

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.


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/3-phase/60Hz/4 Wire + ground (50Hz option: 240/415V/3-phase/50Hz/4 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.
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.
**Tissue Culture Series**

**TCC-74 Chamber - Diagram**

- Ethernet connection
- Purified water connection (if humidity option selected)
- Electrical connection
- Ø1-1/8" Drain location
- Cooling water or refrigeration line connections for condenser
- Electrical line connections for air-cooled condenser (if option selected)

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**BIOCHAMBERS CAN MANUFACTURE THIS PRODUCT AT CUSTOM HEIGHTS TO ACCOMMODATE CEILING OBSTRUCTIONS.**

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1. Control Panel
2. Touch Screen Interface
3. Door Opening 840 [33] x 1700 [67]
4. Fresh Air
5. Exhaust Air
6. Cooling System
7. Instrument Ports
8. Lighting Drivers
9. Viewing Window
10. Fixed Height Lamp Canopy
11. N/A
12. Air Plenum