

ESCO

WORLD CLASS. WORLDWIDE.



CelCulture® CO₂ Incubators

CelCulture®

CO₂ Incubators
Cradle for Beautiful Cells



Designed in the USA



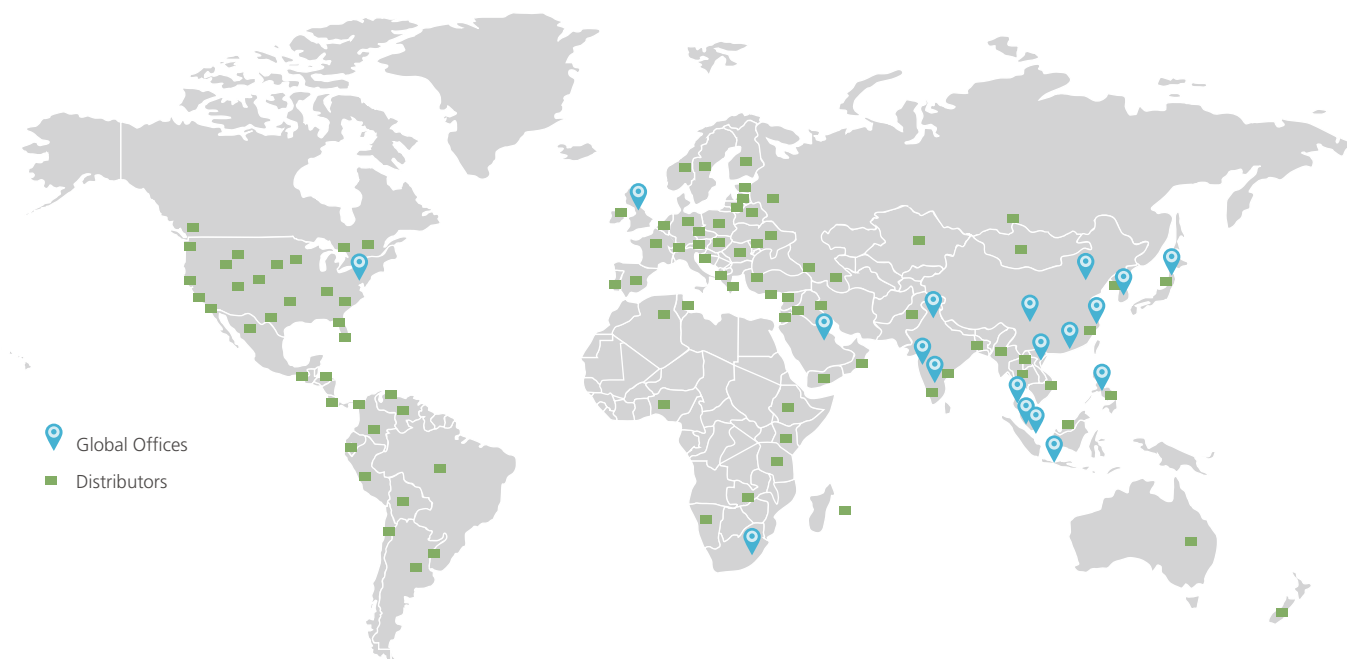
WELCOME TO ESCO

Esco's Vision is to provide enabling technologies for scientific discoveries to make human lives healthier and safer.

- A leader in the development of controlled environment, laboratory and pharmaceutical equipment solutions.
- A world leader in biological safety cabinets.
- Esco has established offices in 13 countries such as Bahrain, China, India, Japan, Korea, Malaysia, Philippines, Singapore, UK, US, Vietnam, South Africa and Indonesia and is continually expanding.
- North American facilities in Pennsylvania; sales, service, logistics for US & Canada.
- Group total of more than 600 employees.
- Distributors in more than 100 countries.
- Products independently tested to international standards.
- Large R&D investments, world leading technologies.
- State-of-the-art production; vertically integrated manufacturing floor space.
- Worldwide service played out over a geographic expanse so broad that the sun never sets on what we do.



GLOBAL NETWORK



PRODUCTS AND APPLICATION

Esco Life Science Tools

Laboratory Equipment

Biosafety and Laminar Flow

Class II Type A2 Biological Safety Cabinets

Class II Type B2 Biological Safety Cabinets

Class III Biological Safety Cabinets

Horizontal Laminar Flow Clean Benches

Vertical Laminar Flow Clean Benches

Laboratory Animal Research Workstations

PCR Cabinets

Fume Hoods

Laboratory Fume Hoods

Ductless Fume Hoods

Fume Scrubbers

Exhaust Blowers

Fume Hood Airflow Monitors

PCR

PCR Thermal Cyclers

Not Available in North America

Incubators and Ovens

Forced Convection Laboratory Ovens

Forced Convection Laboratory Incubators

Refrigerated Incubators

CO₂ Incubators

Remote Monitoring, Data Logging, and Programming Software

Cold Storage

Ultra-low Temperature Freezers

Medical Equipment

Assisted Reproductive Technology

ART Workstations

CO₂ Incubators with Suppressed O₂

Multi-room Incubators

Pharmaceutical Equipment

Containment / Compounding Pharmacy

Downflow Booths

Powder Weighing Balance Enclosures

Pharmacy Isolators

Cytotoxic Safety Cabinets

Soft Capsule

Air Showers

Straddle Units

Garment Storage Cabinets

Pass Boxes

Transfer Hatches



CelCulture® CO₂ Incubators

INTRODUCTION

CO₂ incubators are widely used in scientific research to grow and maintain cell cultures. Typical fields of application include tissue engineering, *in vitro* fertilization, neuroscience, cancer research and other mammalian cell research.

Sleek, reliable and intuitive, Esco CelCulture CO₂ incubators provide all-rounded sample protection that brings your scientific dreams one step closer to reality.

KEY FEATURES

CelCulture® CO₂ INCUBATORS

Cradle for Beautiful Cells



CelCulture® CO₂ Incubators
are available in 3 sizes, 50L, 170L, 240L.

ULPA FILTER

- 99.999% efficient, superior to conventional HEPA filters
- Filters air continuously
- Chamber returns to ISO Class 5 cleanliness in 13 minutes upon door closing to prevent contamination



SHELVING

- Perforated shelving to improve uniformity
- Anti-tip
- Stainless steel
- Built-in grip
- Dismantles without tools for easy cleaning

DIRECT HEAT & AIR JACKET

- Fast and uniform heating
- Rapid temperature recovery without overshoot
- Air jacket improves chamber stability



DUCT WORK

- Directs air flow for rapid recovery and excellent uniformity
- Easily removed for cleaning



WATER PAN

- Precisely heated by base heater to provide high humidity
- Gentle airflow over water surface accelerates humidity recovery



ROUNDED CORNERS

- Seamless design
- Facilitates cleaning

O₂ SENSOR

for suppressed O₂ model

- Long life
- Stable output signal
- No influence from CO₂

DOOR SWITCH

Automatically turns off the blower and gas supply when the door is opened

TOP COVER

Provides quick access to electrical panel components

CO₂ SENSOR

- Choice of TC or IR
- Single-beam, dual-wavelength IR sensor is drift-free
- Auto-zeroing

SMARTSENSE™ MICROPROCESSOR INTERFACE

Intuitive, fully equipped control and monitoring system

BLOWER

Gentle airflow in chamber improves recovery and uniformity

OUTER DOOR

- Reversible
- Heated to prevent condensation

SAMPLE PORT

Allows direct measurement of chamber atmosphere such as temperature and CO₂ concentration

GLASS DOOR

For observing sample cells inside the chamber during operation

DOOR LATCH

To lock / unlock the glass door

LEVELING FEET

Easily adjustable

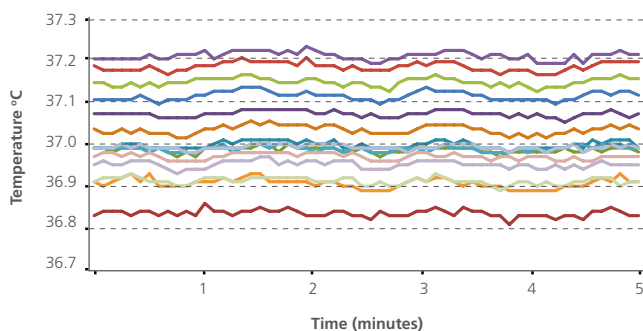
QUALITY ESCO CONSTRUCTION

- Electrogalvanized steel with white oven-baked epoxy-polyester antimicrobial powder-coated finish.
- External surfaces are powder coated with Esco **ISOCIDE™** to eliminate 99.9% of surface bacteria within 24 hours of exposure.
- Ensures a healthier, safer and cleaner lab environment.

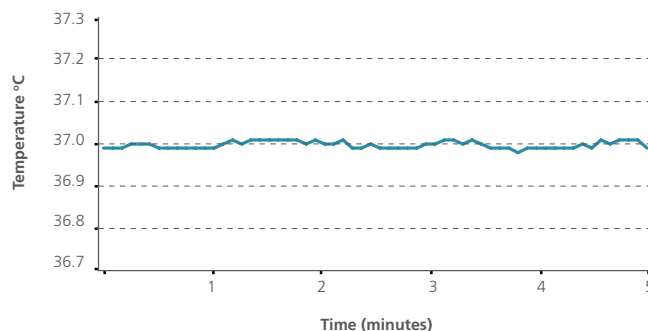
Note: For 50 L Model, no top plenum, bottom plenum, blower & ULPA Filter.

VIVOCELL™ PRECISE PARAMETER CONTROL

BEST UNIFORMITY AND CONTROL AMONG COMPETITION

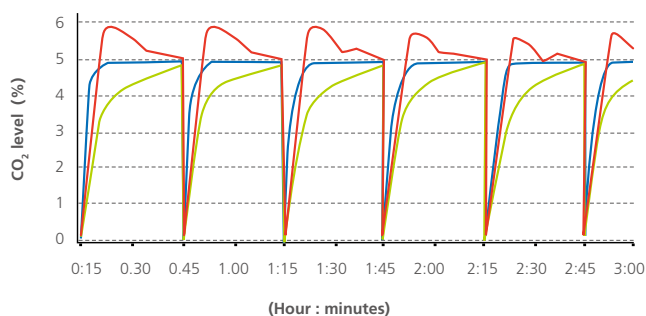


Different lines represent different sensor positions inside the chamber. Esco CelCulture has uniformity variance of less than ± 0.2 °C which means all the samples are evenly heated. *



Minimal fluctuation (± 0.1 °C) ensures temperature stability.*

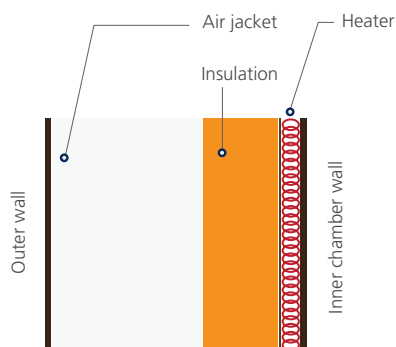
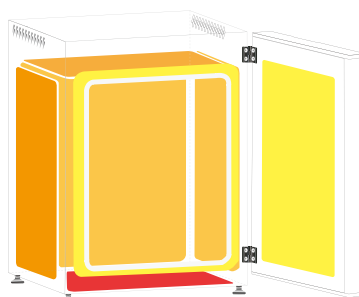
FAST CO₂, TEMPERATURE AND HUMIDITY RECOVERY WITHOUT OVERTHOOT



Precisely tuned sensor and software result in fast recovery of CO₂ without overshoot. This ensures uniform CO₂ levels even with frequent incubator door openings. *Similarly, temperature and humidity recoveries are twice as fast as conventional incubators.

- Company A's model: overshoot.
- Company B's model: slow recovery.
- Esco CelCulture: fast recovery, no overshoot.

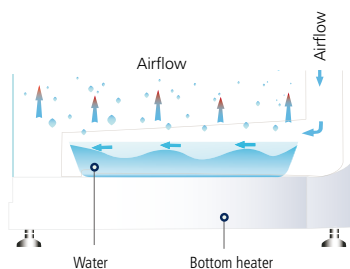
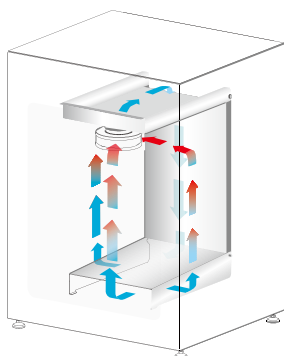
DIRECT HEAT AND AIR JACKET



- Direct heating enables rapid temperature recovery while air jacket provides isolation against ambient temperature fluctuations.
- Precise heating in the chamber is achieved by using 8 heaters (3 zones). The 3 zones are intelligently controlled by the microprocessor for best temperature uniformity and minimal fluctuation.

- The main heater provides precise temperature control.
- The bottom heater warms the water pan and controls humidity.
- The outer door heater prevents condensation on glass door and facilitates temperature recovery.

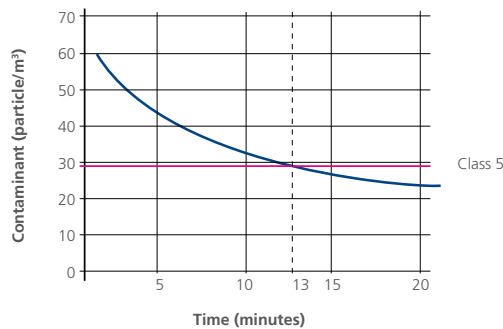
VENTIFLOW™ FORCED CONVECTION



- No disturbance to cell culture.
- Blower automatically stops when door is opened to minimize mixing of chamber and room air.
- Accelerates recovery of chamber air to ISO Class 5 Cleanliness after door closing to prevent contamination.
- Improves CO₂, humidity and temperature uniformity.
- Filtered air circulates across water pan to accelerate humidifying process.

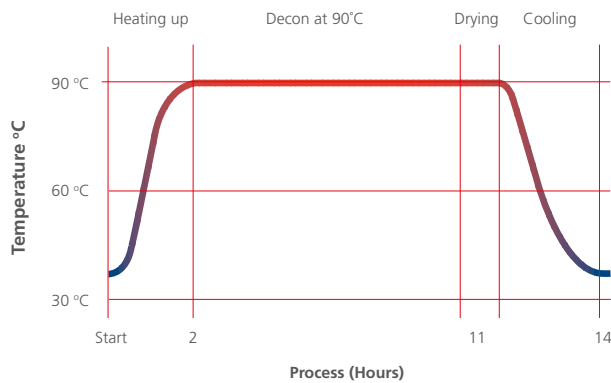
CELSAFE™ ROBUST CONTAMINATION CONTROL

STERISAFE™ ULPA FILTRATION SYSTEM



- Chamber air is continuously filtered by ULPA filters to keep the chamber at ISO Class 5 cleanliness, this ensures all contaminants from the room air and chamber air are filtered and only clean air is recirculated.
- ULPA filters operate at 99.999% efficiency, superior to conventional HEPA filters which are 99.99% efficient.
- Chamber achieves ISO Class 5 Cleanliness condition after a mere 13 minutes following a door closing.*

VALIDATED SWIFTCON™ OVERNIGHT DECONTAMINATION CYCLE

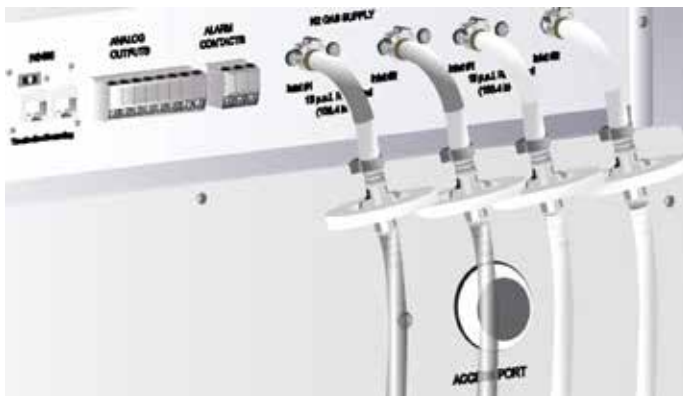


Microorganisms	Before Decon	After Decon
Bacillus atrophaeus	1.59 x 10 ⁶	0
Aspergillus brasiliensis	1.52 x 10 ⁴	0
Pseudomonas aeruginosa	2.38 x 10 ⁶	0
Staphylococcus epidermis	2.33 x 10 ⁶	0
Escherichia coli	1.57 x 10 ⁶	0
Staphylococcus aureus	5.72 x 10 ⁶	0
Enterobacter faecalis	2.15 x 10 ⁶	0

- The Esco CelCulture CO₂ incubator 90°C decontamination cycle has been evaluated by the Health Protection Agency (HPA) in UK and shown to be an effective method of deactivation of the normally resistant fungi, bacterial spore and vegetative cell.
- Use of 90°C moist heat kills most microorganisms.**
- SwiftCon™ completes within 15 hours.

- Chamber is cool and dry at the end of the cycle. No further wipe down is needed.
- Independently proven to be as effective as high temperature decontamination.
- Lower temperature causes less damage to electronic components, therefore prolongs the life span of the incubator.
- For CelMate models, Swiftcon completes within 20 hours.

GAS INJECTION LINES ARE FILTERED



- All gas injection lines are filtered via 0.2 micron in-line filters to remove impurities and contaminants before being injected into the chamber.
- In-line filters are field replaceable external to the incubator.

* Units were factory tested under controlled environmental conditions per Esco method. Esco does not guarantee identical results in the field under differing conditions. Original report available upon request. Model used in the test is CCL-170B-8.

** During decontamination cycle, temperature may increase from 90°C to 94°C.

ORDERING INFORMATION

TC SENSOR MODEL WITH STAINLESS STEEL CHAMBER

MODELS	DESCRIPTION
CCL-050A-8	CelCulture® Incubator, 50L, TC Sensor, CO ₂ Control, Moist Heat Decon, 230VAC, 50/60HZ
CCL-050A-9	CelCulture® Incubator, 50L, TC Sensor, CO ₂ Control, Moist Heat Decon, 115VAC, 50/60HZ
CCL-170A-8	CelCulture® Incubator, 170L, TC Sensor, CO ₂ Control, ULPA, Moist Heat Decon, 230VAC, 50/60HZ
CCL-170A-8-NF	CelCulture® Incubator, 170L, TC Sensor, CO ₂ Control, Moist Heat Decon, 230VAC, 50/60HZ, (No ULPA Filter)
CCL-170A-9	CelCulture® Incubator, 170L, TC Sensor, CO ₂ Control, ULPA, Moist Heat Decon, 115VAC, 50/60HZ
CCL-170A-9-NF	CelCulture® Incubator, 170L, TC Sensor, CO ₂ Control, Moist Heat Decon, 115VAC, 50/60HZ, (No ULPA Filter)
CCL-240A-8	CelCulture® Incubator, 240L, TC Sensor, CO ₂ Control, ULPA, Moist Heat Decon, 230VAC, 50/60HZ
CCL-240A-8-NF	CelCulture® Incubator, 240L, TC Sensor, CO ₂ Control, Moist Heat Decon, 230VAC, 50/60HZ, (No ULPA Filter)
CCL-240A-9	CelCulture® Incubator, 240L, TC Sensor, CO ₂ Control, ULPA, Moist Heat Decon, 115VAC, 50/60HZ
CCL-240A-9-NF	CelCulture® Incubator, 240L, TC Sensor, CO ₂ Control, Moist Heat Decon, 115VAC, 50/60HZ, (No ULPA Filter)

IR SENSOR MODEL WITH STAINLESS STEEL CHAMBER

MODELS	DESCRIPTION
CCL-050B-8	CelCulture® Incubator, 50L, IR Sensor, CO ₂ Control, Moist Heat Decon, 230VAC, 50/60HZ
CCL-050B-9	CelCulture® Incubator, 50L, IR Sensor, CO ₂ Control, Moist Heat Decon, 115VAC, 50/60HZ
CCL-170B-8	CelCulture® Incubator, 170L, IR Sensor, CO ₂ Control, ULPA, Moist Heat Decon, 230VAC, 50/60HZ
CCL-170B-8-NF	CelCulture® Incubator, 170L, IR Sensor, CO ₂ Control, Moist Heat Decon, 230VAC, 50/60HZ, (No ULPA Filter)
CCL-170B-9	CelCulture® Incubator, 170L, IR Sensor, CO ₂ Control, ULPA, Moist Heat Decon, 115VAC, 50/60HZ
CCL-170B-9-NF	CelCulture® Incubator, 170L, IR Sensor, CO ₂ Control, Moist Heat Decon, 115VAC, 50/60HZ, (No ULPA Filter)
CCL-240B-8	CelCulture® Incubator, 240L, IR Sensor, CO ₂ Control, ULPA, Moist Heat Decon, 230VAC, 50/60HZ
CCL-240B-8-NF	CelCulture® Incubator, 240L, IR Sensor, CO ₂ Control, Moist Heat Decon, 230VAC, 50/60HZ, (No ULPA Filter)
CCL-240B-9	CelCulture® Incubator, 240L, IR Sensor, CO ₂ Control, ULPA, Moist Heat Decon, 115VAC, 50/60HZ
CCL-240B-9-NF	CelCulture® Incubator, 240L, IR Sensor, CO ₂ Control, Moist Heat Decon, 115VAC, 50/60HZ, (No ULPA Filter)

SURPRESSED O₂ MODEL WITH STAINLESS STEEL CHAMBER

MODELS	DESCRIPTION
CCL-050T-8	CelCulture® Incubator, 50L, IR Sensor, CO ₂ Control, O ₂ Control, Moist Heat Decon, 230VAC 50/60HZ
CCL-050T-9	CelCulture® Incubator, 50L, IR Sensor, CO ₂ Control, O ₂ Control, Moist Heat Decon, 115VAC 50/60HZ
CCL-170T-8	CelCulture® Incubator, 170L, IR Sensor, CO ₂ Control, O ₂ Control, ULPA, Moist Heat Decon, 230VAC 50/60HZ
CCL-170T-8-NF	CelCulture® Incubator, 170L, IR Sensor, CO ₂ Control, O ₂ Control, Moist Heat Decon, 230VAC 50/60HZ, (No ULPA Filter)
CCL-170T-9	CelCulture® Incubator, 170L, IR Sensor, CO ₂ Control, O ₂ Control, ULPA, Moist Heat Decon, 115VAC 50/60HZ
CCL-170T-9-NF	CelCulture® Incubator, 170L, IR Sensor, CO ₂ Control, O ₂ Control, Moist Heat Decon, 115VAC 50/60HZ, (No ULPA Filter)
CCL-240T-8	CelCulture® Incubator, 240L, IR Sensor, CO ₂ Control, O ₂ Control, ULPA, Moist Heat Decon, 230VAC 50/60HZ
CCL-240T-8-NF	CelCulture® Incubator, 240L, IR Sensor, CO ₂ Control, O ₂ Control, Moist Heat Decon, 230VAC 50/60HZ, (No ULPA Filter)
CCL-240T-9	CelCulture® Incubator, 240L, IR Sensor, CO ₂ Control, O ₂ Control, ULPA, Moist Heat Decon, 115VAC 50/60HZ
CCL-240T-9-NF	CelCulture® Incubator, 240L, IR Sensor, CO ₂ Control, O ₂ Control, Moist Heat Decon, 115VAC 50/60HZ, (No ULPA Filter)



CelMate®

CO₂ Incubators

INTRODUCTION

Esco now offers the new CelMate, 170-liter and 240-liter, entry-level cell culture CO₂ incubator with superb contamination control.

This is for customers looking for a CO₂ incubator that can provide the best protection for their cell cultures but with a limited budget.



CONTAMINATION CONTROL SYSTEMS:

ULPA Filtration System , Validated Swiftcon Overnight Decontamination Cycle (20 hours), Filtered Gas Injection Lines , and Exterior is coated with Isocide.

OPTIONS AND ACCESSORIES:

All options and accessories for CelCulture CO₂ incubators are also appropriate to use on CelMate CO₂ incubator.

CelMate® CO₂ Incubators are available in 170L and 240L.

CelMate is using TC CO₂ sensor and no decontamination pump.

ORDERING INFORMATION

MODELS	DESCRIPTION
CLM-170-A-8	CelMate® Incubator, 170L, TC Sensor, CO ₂ Control, ULPA, Moist Heat Decon, 230VAC, 50/60HZ (Without Decon Pump)
CLM-170-A-9	CelMate® Incubator, 170L, TC Sensor, CO ₂ Control, ULPA, Moist Heat Decon, 115VAC, 50/60HZ (Without Decon Pump)
CLM-240-A-8	CelMate® Incubator, 240L, TC Sensor, CO ₂ Control, ULPA, Moist Heat Decon, 230VAC, 50/60HZ (Without Decon Pump)
CLM-240-A-9	CelMate® Incubator, 240L, TC Sensor, CO ₂ Control, ULPA, Moist Heat Decon, 115VAC, 50/60HZ (Without Decon Pump)



CelCulture®

CO₂ Incubators with Copper Interior Chamber

Copper has been known for millennia to have anti-microbial properties. 100% pure solid copper interiors offer additional protection for your precious samples.

ACCESSORIES

COA-2026-F Extra Shelf (50L, Solid Copper)

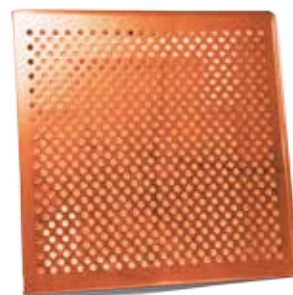
Each CelCulture CO₂ Incubator comes standard with 3 shelves for 50L and it can accommodate up to a maximum of 4 shelves for 50L. Extra shelves are available.

COA-2027-F Extra Shelf (170L, Solid Copper)

Each CelCulture CO₂ Incubator comes standard with 4 shelves for 170L and it can accommodate up to a maximum of 7 shelves for 170L. Extra shelves are available.

COA-2028-F Extra Shelf (240L, Solid Copper)

Each CelCulture CO₂ Incubator comes standard with 4 shelves for 240L and it can accommodate up to a maximum of 7 shelves for 240L. Extra shelves are available.



Other options and accessories for CelCulture CO₂ incubators except for the shelves are also appropriate to use on CelCulture CO₂ incubator with Copper Interior Option.

ORDERING INFORMATION

IR SENSOR MODEL WITH 100% COPPER CHAMBER

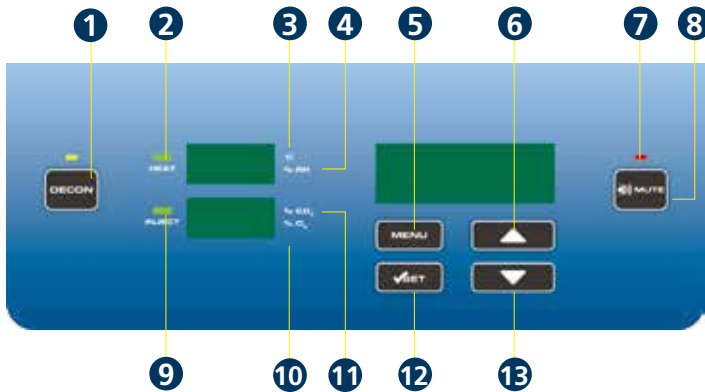
MODELS	DESCRIPTION
CCL-050B-8-Cu	CelCulture® Incubator, 50L, IR Sensor, CO ₂ Control, Moist Heat Decon, 230VAC, 50/60HZ
CCL-050B-9-Cu	CelCulture® Incubator, 50L, IR Sensor, CO ₂ Control, Moist Heat Decon, 115VAC, 50/60HZ
CCL-170B-8-Cu	CelCulture® Incubator, 170L, IR Sensor, CO ₂ Control, ULPA, Moist Heat Decon, 230VAC, 50/60HZ
CCL-170B-9-Cu	CelCulture® Incubator, 170L, IR Sensor, CO ₂ Control, ULPA, Moist Heat Decon, 115VAC, 50/60HZ
CCL-240B-8-Cu	CelCulture® Incubator, 240L, IR Sensor, CO ₂ Control, ULPA, Moist Heat Decon, 230VAC, 50/60HZ
CCL-240B-9-Cu	CelCulture® Incubator, 240L, IR Sensor, CO ₂ Control, ULPA, Moist Heat Decon, 115VAC, 50/60HZ

SUPRESSED O₂ MODEL WITH 100% COPPER CHAMBER

MODELS	DESCRIPTION
CCL-050T-8-Cu	CelCulture® Incubator, 50L, IR Sensor, CO ₂ Control, O ₂ Control, Moist Heat Decon, 230VAC 50/60HZ
CCL-050T-9-Cu	CelCulture® Incubator, 50L, IR Sensor, CO ₂ Control, O ₂ Control, Moist Heat Decon, 115VAC 50/60HZ
CCL-170T-8-Cu	CelCulture® Incubator, 170L, IR Sensor, CO ₂ Control, O ₂ Control ULPA, Moist Heat Decon, 230VAC 50/60HZ
CCL-170T-9-Cu	CelCulture® Incubator, 170L, IR Sensor, CO ₂ Control, O ₂ Control ULPA, Moist Heat Decon, 115VAC 50/60HZ
CCL-240T-8-Cu	CelCulture® Incubator, 240L, IR Sensor, CO ₂ Control, O ₂ Control ULPA, Moist Heat Decon, 230VAC 50/60HZ
CCL-240T-9-Cu	CelCulture® Incubator, 240L, IR Sensor, CO ₂ Control, O ₂ Control ULPA, Moist Heat Decon, 115VAC 50/60HZ

CONTROLLER TYPE

USER - FRIENDLY SOFTWARE INTERFACE



1. Start / stop decontamination cycle
2. **HEAT LED**
Lights when heat is applied to chamber
3. °C is lit when displaying the temperature
4. %RH is lit when displaying the humidity level
5. Enter menu / go back to previous menu
6. Scroll up / increase value
7. **ALARMS LED**
Will blink when errors and warnings occur
8. Mute alarms
9. **INJECT LED**
Lights when gas is injected
10. %O₂ is lit when displaying the O₂ concentration
11. %CO₂ is lit when displaying the CO₂ concentration
12. Confirm value / enter a menu
13. Scroll down / decrease value

Comprehensive, user-configurable alarms:

Temperature
CO₂
Humidity (if installed)
O₂ (if installed)

CelAlert™ alarm system reminds user to replace parts.

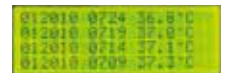
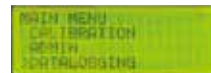


CO₂ tank depletion reminder in addition to CO₂ tank low alarm. Automatic calculation of how much CO₂ gas is left in the tank provides fail proof reminder that alerts user one week before the gas is depleted. This gives user some buffer time to place order for new tanks.



ULPA reminder will alert user to replace ULPA filter.

Intelligent data and event logger records all incubator parameters for on screen recall. A16Mb built-in flash memory guarantees long term storage of data.



Diagnostic interface and online quick help provide comprehensive solutions to frequently encountered problems.

Voyager®

Remote Monitoring, Datalogging, Programming Software

Esco Voyager® is a PC-based software package developed for the remote monitoring, datalogging, and programming / device configuration of Esco thermostatic products

It is a centralized monitoring and control system for your laboratory which provides EXTRA PROTECTION FOR YOUR SAMPLES.

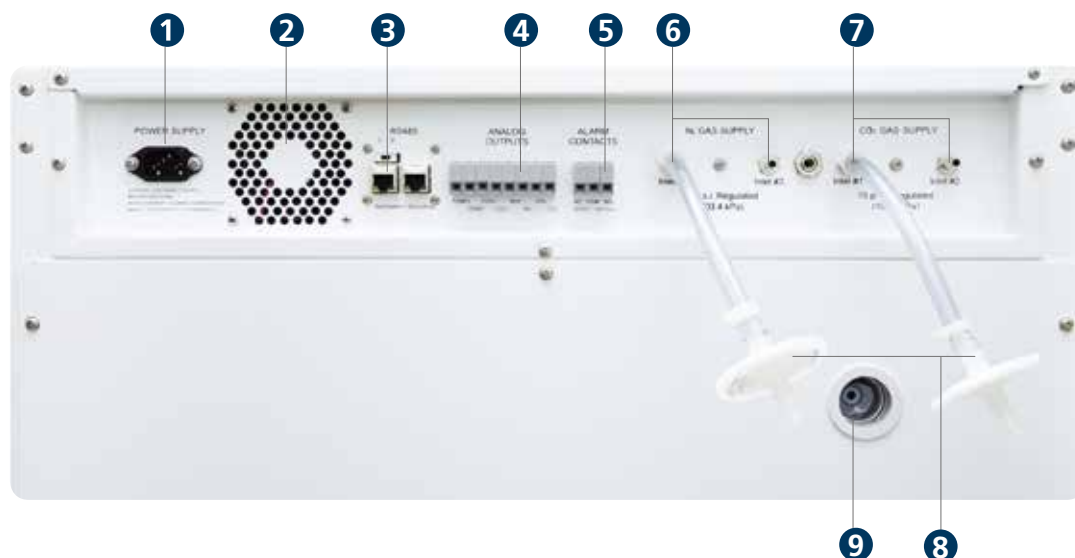
Voyager® interfaces with individual Esco equipment over RS485 using the EscoBUS communications protocol. Multiple equipment maybe interfaced to a single PC.

Compatible Equipment

- Lexicon® – Ultra-low Temperature Freezer
- CelCulture® – CO₂ Incubator (CCL)
- CelMate® - CO₂ Incubator (CLM)
- Isotherm® – Forced Convection Oven (OFA)
- Isotherm® – Forced Convection Incubator (IFA)
- Isotherm® – Refrigerated Incubator (IFC)



REAR PANEL



1 Power Supply Inlet

The power supply inlet connects the incubator unit to the power source.



2 Cooling Fan

The cooling fan prevents the electrical panel from overheating.



3 RS485 Communication Port

The RS485 provides serial communication port for PC. It can be daisy chained from product to product and connected to a PC.



4 Analog Port (Optional)

The analog port allows the incubator to output analog signals representing temperature, CO₂/O₂* concentration and relative humidity, depending on the options available in the incubator. This allows the Incubator to be connected to an in-house data acquisition or alarm system.



5 Alarm Contact

A set of relay contacts located on the rear of the unit is provided to monitor temperature, humidity or CO₂ alarms. The alarm contacts can be connected to a remote alarm system.



6 N₂ Gas Supply Inlet (for Suppressed O₂ model)

The N₂ gas supply inlet is only applicable for models with N₂* Control function. Inlet pressure requirement is 15 psi.



7 CO₂ Gas Supply Inlet

The CO₂ gas supply inlet connects the CO₂ gas supply with the Incubator unit. Inlet pressure requirement is 15 psi.



8 Gas Inline Filter

Inline filters are provided to remove any contaminants from the gas supply.



9 Access Port

Allows cables, hoses or additional sensors to be routed into the work space. A rubber stopper with controlled leak is installed as standard configuration and is part of standard accessories.

* O₂ and N₂ functions are applicable only to models with Suppressed O₂.

CelCulture CO₂ INCUBATOR SENSORS



IR SENSOR

An IR sensor is a versatile instrument for measuring CO₂ level inside the incubator. The CARBOCAP® sensor is silicon based and its operation is based on the NDIR Single-Beam Dual-Wavelength principle. IR based sensors are not affected by water vapor, dust or most chemicals. The single-beam dual-wavelength technology (one reference and one measurement) ensures a drift-free sensor that does not require calibration by the user.

Operating principle

The light source is positioned to shine at the IR detector so that the light travels a fixed distance to the detector, where the intensity of the light is measured. A Fabry-Perot Interferometer (FPI) is positioned just in front of the IR detector. The FPI is a tunable filter which allows only certain wavelengths of light to pass through to the detector.

Carbon dioxide absorbs certain wavelengths of light and not others, so the FPI is designed to pass light at a CO₂ absorption wavelength (4.26 µm) and a nearby, non-absorbing wavelength.

When the sensor is operating, the FPI is regularly tuned back and forth between the two wavelengths. At the CO₂ absorption wavelength, the intensity of detected light is reduced in proportion to the concentration of CO₂ in the optical path. The light intensity measured at the non-absorbing wavelength serves as a baseline for comparison.

Operating Conditions:

%CO₂ detection range: 0 to 20% CO₂ Concentration

%RH operating range: Not affected by Humidity

Temperature range: -20°C to +60°C



TC CO₂ SENSOR

Esco TC CO₂ sensor's operating principle relies on a resistor as a heater and two thermocouples as a sensing element for the CO₂ gas. Accurate sensing is made possible by the porous cap on the eye of the sensor probe.

One of the thermocouples functions as a reference signal, while the other functions as the sensing signal. An amplifier will feed the data variance between the two thermocouples to an electronic control system.

Operating Conditions:

%CO₂ detection range: 0 to 20% CO₂ Concentration

%RH operating range: 40% to 98% Relative Humidity

Temperature range: +25°C to +100°C



O₂ SENSOR

Figaro's O₂ sensor is a unique galvanic cell type oxygen sensor. Its most notable features are long life expectancy, excellent chemical durability, and it is not influenced by CO₂. The O₂ sensor is ideal to meet the ever-increasing demand for oxygen monitoring in various fields such as combustion gas monitoring, the biochemical field, medical applications, domestic combustion appliances, etc.

Operating Conditions:

%O₂ detection range: 1 to 20.7% O₂ Concentration

%RH operating range: 10% to 90% Relative Humidity

Temperature range: 5°C to +40°C

TESTING & CERTIFICATION



For IVF applications, Esco CelCulture CO₂ incubators are certified EMBRYO-SAFE.

Rigorously tested with the Mouse Embryo Assay (MEA), the CelCulture remarkably has 100% embryo survival. The Mouse Embryo Assay (MEA) is the de facto standard test done to demonstrate that a procedure or an article of equipment is safe to use for manipulating human embryos (e.g., *in vitro* fertilization or IVF).



The Esco CelCulture CO₂ incubators is listed by Underwriters Laboratory (UL)*, to meet the requirements of both the U.S. and Canada standards for electrical/mechanical integrity.

*applicable for 170L



HPA Validated Decontamination Cycle

The Esco CelCulture CO₂ Incubator 90°C decontamination cycle has been evaluated and shown to be an effective method for deactivation of the normally resistant fungi and bacterial spores *Aspergillus brasiliensis* and *Bacillus atrophaeus*, and the vegetative cells *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Enterobacter faecalis* and *Escherichia Coli*.

OPTIONS AND ACCESSORIES



COA-1001 / COA-1001-F Humidity Display

This option allows the Incubator to monitor the relative humidity inside the chamber. The probe for the sensor works in freezing conditions (-70°C) and also in temperatures up to +180°C. The sensor is easy to install and has excellent accuracy. The airflow in the chamber does not affect the measurement. The sensor is maintenance free. It does not need to be removed during 90°C moist heat decontamination cycle.



COA-1002 / COA-1002-F CO₂ Backup

This option allows two tanks of CO₂ to be connected to the incubator. It will automatically switch from the primary tank to the secondary tank when low gas pressure is detected on the primary tank.



COA-1005 / COA-1005-F Analog Output

A set of relay contacts are provided at the rear of the incubator that allows the incubator to output analog signals representing the temperature, CO₂ / O₂ content and relative humidity, depending on the options available in your incubator. This allows the chamber to be connected to an in-house data acquisition or alarm system. This option can also be field-installed.

The analog signal outputs can be set to operate in either voltage DC (0-5 Vdc) or current (4-20 mA) mode. The factory default setting is voltage. Switch on the board to toggle between the modes.



COA-1006 / COA-1006-F Sealed Inner Door Kit (170L)

CelCulture CO₂ Incubators can be equipped with 4 glass doors, which allows access to defined sections of the incubator without disturbing the inner atmosphere. This minimizes recovery times and contamination risks. The Sealed Inner Door is available as a factory installed option or field installed retrofit kit.



COA-1007 / COA-1007-F N₂ Back-up

This option allows two tanks of N₂ to be connected to the incubator. It will automatically switch from the primary tank to the secondary tank when low gas pressure is detected on the primary tank.



COA-2018-F (50L) / COA-2001-F (170L) / COA-2019-F (240L) Roller Base

Roller base is available with casters for mobility of your incubators and to provide protection against floor contamination.



COA-2020-F (50L) / COA-2002-F (170L) / COA-2021-F (240L) Floor Stand 200 mm (8.0") With Adjustable Feet

Floor stands are available with adjustable feet, with a nominal range of 180 mm to 250 mm (7.1" to 9.8") for comfortable access to the incubator and to avoid floor contamination.



COA-2022-F (50L) / COA-2003-F (170L) / COA-2023-F (240L) Floor Stand 700 mm (27.6") With Casters

This support stand raises the incubator to a height of 700 mm (27.6") above the floor for comfortable access. It comes with casters for mobility of your incubators.



COA-2005-F 2-Stage Gas Regulator for CO₂/N₂

CO₂ and N₂ gas input regulators reduce pressure from the tank to the incubator. It has dual pressure gauges, barbed line connection and shut-off valve. It prevents over-pressurization of the gas supply into the incubator which could cause the tubing to burst.

- CGA 320 connector (U.S. Standard)
- BP-BS341-#8-NT4 connector (British Standard)

Note: Compatible with European DIN477, French NFE29-650 and Australia AS2473

- G5/8-RH connector (China Standard)



COA-2024-F (50L) / COA-2007-F (170L) / COA-2025-F (240L) Extra Shelf (Stainless Steel) for Standard Stainless Steel Chamber

Each CelCulture CO₂ Incubator comes standard with 3 shelves for 50L / 4 shelves for 170L & 240L and it can accommodate up to a maximum of 4 shelves for 50L / 7 shelves for 170L & 240L.



COA-2008-F Stacking Kit

Stacking kit is a provision to stack one incubator on top of another incubator. Four stacking brackets are included as standard inside the Accessories Kit Box with each incubator.



COA-2010-F Electronic CO₂ Analyzer, For CO₂ / Temp Measurement

COA-2016-F Electronic CO₂ + O₂ Analyzer, For CO₂ / O₂ / Temp Measurement

COA-2017-F Electronic CO₂ + O₂ + RH Analyzer, For CO₂ / O₂ / RH / Temp Measurement

The Electronic Analyzer allows the measurement of CO₂ concentration, O₂ concentration, Relative Humidity and temperature (temperature probe already included).



COA-2012-F 6" Chart Recorder, Temp, 115/230VAC 50/60HZ

The chart recorder provides an easy-to-read graph of data vs time. It is a reliable, accurate, and stable instrument for on-the-spot written documentation of incubator chamber temperature. This model offers 6" chart of temperature data.



COA-2013-F 8" Chart Recorder, Temp/Temp, 115/230VAC 50/60HZ

The chart recorder provides an easy-to-read graph of data vs time. It is a reliable, accurate, and stable instrument for on-the-spot written documentation of incubator chamber temperature. This model offers 8" chart of temperature data and comes with 2 remote probes for dual temperature monitoring.



COA-2014-F 6" Chart Recorder, Temp/RH, 115/230VAC 50/60HZ

The chart recorder provides an easy-to-read graph of data vs time. It is a reliable, accurate, and stable instrument for on-the-spot written documentation of incubator chamber temperature. This model offers 6" chart of temperature and humidity data.



COA-2015-F Inner Door Shelving Kit (4 Sets With Total 12 Mini Shelves For One Incubator) (170L)

These mini shelves are to be used with the Sealed Inner Door Kit installed. There are 4 sets with a total of 12 mini shelves on each incubator.



5250001 Voyager Software Kit

Esco Voyager is a PC-based software package developed for the remote monitoring, datalogging and programming / device configuration of Esco controlled environment laboratory equipment. Compatible equipment includes Laboratory Ovens and Incubators, Low Temperature Incubators, CO₂ Incubators and Ultra-low Temperature Freezer.

ORDERING INFORMATION

ACCESSORIES	DESCRIPTION
COA-1001	Humidity Display, Factory Installed
COA-1001-F	Humidity Display, Field Install Kit
COA-1002	CO ₂ Backup (Tank Switcher), Factory Installed
COA-1002-F	CO ₂ Backup (Tank Switcher), Field Installed
COA-1004	Reversed Door Swing, Factory Installed
COA-1005	Analog Outputs, Factory Installed
COA-1005-F	Analog Outputs, Field Installed
COA-1006	Sealed Inner Door Kit for 170L (4 Glass Doors With Latches), Factory Installed
COA-1006-F	Sealed Inner Door Kit for 170L (4 Glass Doors With Latches), Field Installed
COA-1007	N ₂ Back-up (Tank Switcher), Factory Installed
COA-1007-F	N ₂ Back-up (Tank Switcher), Field Installed
COA-2018-F	Roller Base (50L)
COA-2001-F	Roller Base (170L)
COA-2019-F	Roller Base (240L)
COA-2020-F	Floor Stand 200 mm (8.0") With Adjustable Feet (50L)
COA-2002-F	Floor Stand 200 mm (8.0") With Adjustable Feet (170L)
COA-2021-F	Floor Stand 200 mm (8.0") With Adjustable Feet (240L)
COA-2022-F	Floor Stand 700 mm (27.6") With Casters (50L)
COA-2003-F	Floor Stand 700 mm (27.6") With Casters (170L)
COA-2023-F	Floor Stand 700 mm (27.6") With Casters (240L)
COA-2005-F	2-Stage Gas Regulator for CO ₂ /N ₂ Choose One of The Connectors Below: 1080588 - CGA 320 Connector (US Standard) 1080589 - BP-BS34-#8-NT4 Connector (British Standard) 1080590 - G5/8-RH Connector (China Standard)
COA-2024-F	Extra Shelf (50 L, Stainless Steel)
COA-2007-F	Extra Shelf (170 L, Stainless Steel)
COA-2025-F	Extra Shelf (240 L, Stainless Steel)
COA-2008-F	Stacking Kit (One Set Included With Every Unit Purchased)
COA-2010-F	Electronic CO ₂ Analyzer, For CO ₂ / Temp Measurement (With Temp. Probe)
COA-2016-F	Electronic CO ₂ + O ₂ Analyzer, For CO ₂ / O ₂ / Temp Measurement
COA-2017-F	Electronic CO ₂ + O ₂ + RH Analyzer, For CO ₂ / O ₂ / RH / Temp Measurement
COA-2011-F	IQ / OQ Documentation
COA-2012-F	6" Chart Recorder, Temp, 115/230VAC 50/60HZ
COA-2013-F	8" Chart Recorder, Temp/Temp, 115/230VAC 50/60HZ
COA-2014-F	6" Chart Recorder, Temp/RH, 115/230VAC 50/60HZ
COA-2015-F	Inner Door Shelving Kit for 170L (4 Sets With Total 12 Mini Shelves For One Incubator)
5250001	Voyager Software Kit

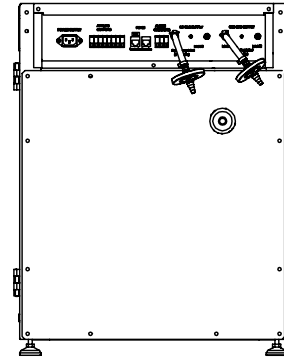
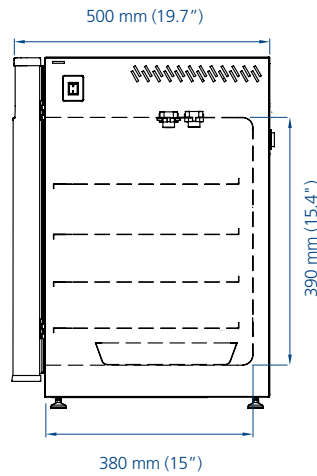
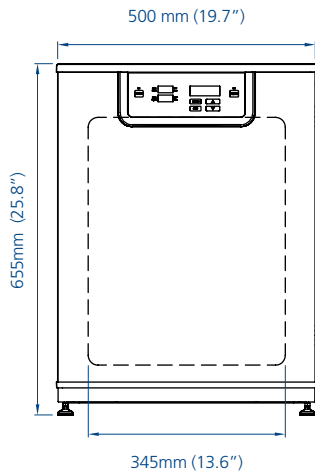
TECHNICAL SPECIFICATIONS

Front view

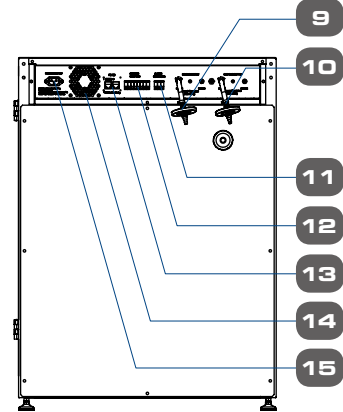
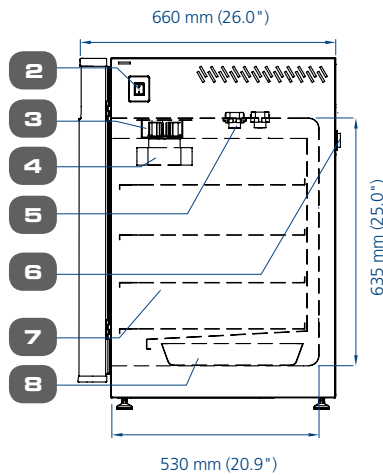
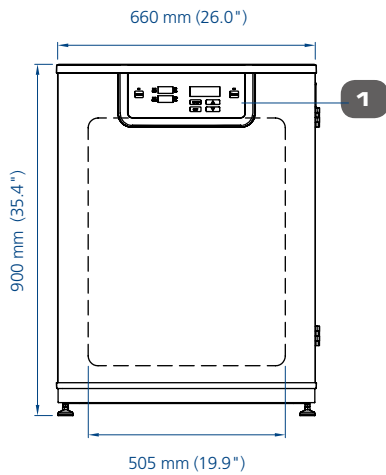
Side view

Rear view

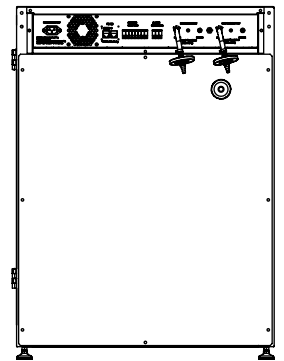
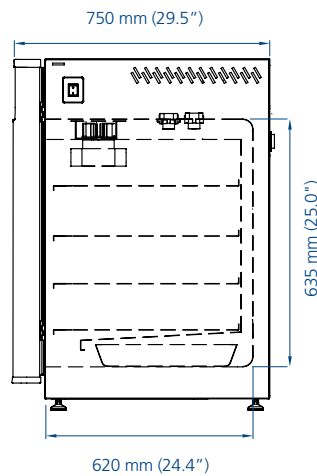
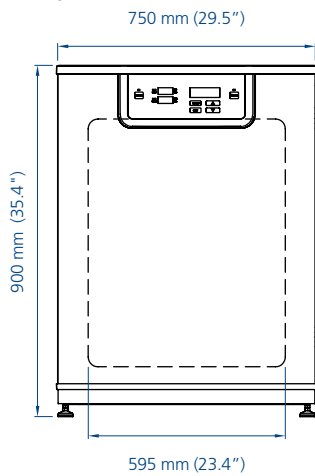
MODEL 50L



MODEL 170L



MODEL 240L



1. Control panel*
2. On / off switch
3. Blower fan
4. ULPA filter
5. Sensors

6. Access port
7. Adjustable shelves
8. Humidity pan
9. N₂ gas supply
10. CO₂ gas supply

11. Alarm contact
12. Analog output
13. RS485
14. Cooling fan
15. Power supply inlet

*Control panel position differs for CelMate CO₂ incubator models.

GENERAL SPECIFICATIONS

CEL CULTURE CO₂ INCUBATORS

GENERAL SPECIFICATIONS	CCL-050 _ _		CCL-170 _ _ CLM-170 _ _		CCL-240 _ _ CLM-240 _ _	
CEL CULTURE CO ₂ INCUBATORS						
TEMPERATURE						
Temp. Control Method	Direct heat & air jacket using Microprocessor PID					
Temp. Range, °C	Amb. +3 to 60					
Temp. Uniformity, °C	<± 0.2*		<± 0.2*		<± 0.3*	
Temp. Accuracy, °C	<± 0.1					
Recovery Time** (after 1 min. door opening, 98% from initial value)	4 mins		6 mins		6 mins	
Ambient Temp. Range	18 to 34°C (64 to 93 °F)					
CO ₂						
CO ₂ Control System	Microprocessor PID					
CO ₂ Range, % CO ₂	0-20					
CO ₂ Accuracy, % CO ₂	± 0.1					
CO ₂ Sensor	Infrared (IR) Sensor*** / TC Sensor					
CO ₂ Recovery Time*** (after 1 min. door opening, 98% from initial value)	Standard Unit: 8 minutes Suppressed O ₂ model: 8 minutes		Standard Unit: 4 minutes Suppressed O ₂ model: 5 minutes		Standard Unit: 5 minutes Suppressed O ₂ model: 5 minutes	
O ₂ SPECS (FOR SUPPRESSED O ₂ MODEL)						
O ₂ Control System	Microprocessor PID					
O ₂ Range, % O ₂	1-20.7%					
O ₂ Accuracy, % O ₂	± 0.1					
O ₂ Sensor	Galvanic Cell Type					
O ₂ Recovery Time (after 1 minute door opening)	At 1.0% O ₂ by volume: 10 minutes		At 1.0% O ₂ by volume: 20 minutes		At 1.0% O ₂ by volume: 24 minutes	
	At 5.0% O ₂ by volume: 6 minutes		At 5.0% O ₂ by volume: 10 minutes		At 5.0% O ₂ by volume: 12 minutes	
HUMIDITY						
Humidification Method	Humidity pan					
Humidity Range, % RH	Up to 97%					
PHYSICAL CONSTRUCTION						
Interior Volume	50 L (1.8 cu.ft.)		170 L (5.7 cu.ft.)		240 L (8.5 cu.ft.)	
External Dimensions (W x D x H)	500 x 500 x 655 mm (19.7" x 19.7" x 25.8")		660 x 660 x 900 mm (26.0" x 26.0" x35.4")		750 x 665 x 900 mm (29.5" x 26.2" x 35.4")	
Internal Dimensions (W x D x H)	345 x 375 x 390 mm (13.6" x 14.8" x 15.4")		505 x 530 x 635 mm (19.9" x 20.9" x 25.0")		595 x 620 x 635 mm (23.4" x 24.4" x 25.0")	
Shipping Weight	70 kg (154.3 lbs)		120 kg (264.6 lbs)		155 kg (341.7 lbs)	
Shipping Dimensions (W x D x H)	660 x 660 x 890 mm (26.0" x 26.0" x 35.0")		850 x 720 x 1150 mm (33.5" x 28.3" x 45.3")		860 x 830 x 1110 mm (33.9" x 32.7" x 43.7")	
Number of Shelves	3		4		4	
Maximum No. of Shelves	4		7		7	
Shelves Area (W x D)	310 x 310 mm (12.2" x 12.2")		470 x 470 mm (18.5" x 18.5")		550 x 550 mm (21.7" x 21.7")	
Max. Load per Shelf	4 kg/shelf (8.8 lbs/shelf)		11 kg/shelf (24.3 lbs/shelf)		15 kg/shelf (33.1 lbs/shelf)	
Available Electrical Configuration	220 - 240 VAC, 50 / 60 Hz, 1Φ, 3.4 A					
	110 - 130 VAC, 50 / 60 Hz, 1Φ, 7.0 A					
Maximum Power Consumption	372 watts		800 watts		1100 watts	
Power Consumption 37°C	37 watts		80 watts		110 watts	
Interior Material	Stainless steel, type 304					
CONTAMINATION CONTROL						
Contamination Control Methods	1) Main body is electrogalvanized steel with ISOCIDE antimicrobial coating; 2) Moist 90°C OVERNIGHT decon. cycle (HPA validated); 3) 0.2 micron in-line filter for gas inputs; 4) ULPA filter****					

* Data recorded under optimum factory setting conditions

** For temperature not exceeding 37°C

*** For CO₂ not exceeding 5.2%. Recovery time with TC sensor is longer.

****Not available for 50L



ART Equipment
Biological Safety Cabinets
CO₂ Incubators
Compounding Pharmacy Equipment
Containment / Pharma Products
Ductless Fume Hoods
Freeze Dryer
Lab Animal Research Products
Laboratory Fume Hoods
Laboratory Ovens and Incubators
Laminar Flow Clean Benches
PCR Cabinets
PCR Thermal Cyclers
Powder Weighing Balance Enclosures
Ultra-low Freezers

The Esco Group of Companies is a global life sciences tools provider with sales in over 100 countries. The group is active in lab equipment, pharma equipment and medical devices. Manufacturing facilities are located in Asia and Europe. R&D is conducted worldwide spanning the US, Europe and Asia. Sales, service and marketing subsidiaries are located in 12 major markets including the US, UK, Singapore, Japan, China and India. Regional distribution centers are located in the US, UK, and Singapore.

Life Science • Chemical Research • Assisted Reproductive Technology (ART) • Pharmaceutical Equipment • General Equipment

ESCO

WORLD CLASS. WORLDWIDE.

Esco Technologies, Inc. • 2940 Turnpike Drive, Units 15-16 • Hatboro, PA 19040, USA
Toll-Free USA and Canada 877-479-3726 • Tel 215-441-9661 • Fax 215-441-9660
us.escoglobal.com • usa@escoglobal.com

Esco Micro Pte. Ltd. • 21 Changi South Street 1 • Singapore 486 777
Tel +65 6542 0833 • Fax +65 6542 6920 • mail@escoglobal.com
www.escoglobal.com

Esco Global Offices | Manama, Bahrain | Beijing, China | Chengdu, China | Guangzhou, China | Shanghai, China | Bangalore, India
Delhi, India | Mumbai, India | Banten, Indonesia | Osaka, Japan | Kuala Lumpur, Malaysia | Melaka, Malaysia | Manila, Philippines
Singapore | Seoul, South Korea | Salisbury, UK || Philadelphia, PA, USA | Hanoi, Vietnam