

ESCO

WORLD CLASS. WORLDWIDE.



CelSafe® CO₂ Incubator

CelSafe®

CO₂ Incubators

The Safest Way To Grow Your Beautiful Cells



Products and Applications

Life Sciences Laboratory Equipment

Sample Preparation

- Class I Biological Safety Cabinets
- 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
- Freeze Dryers

Sample Cultivation

- CO₂ Incubators with Cooling System
- CO₂ Incubators with Stainless Steel Exterior
- CO₂ Incubators (Water-jacketed)
- Laboratory Shakers

Sample Analysis

- PCR Thermal Cyclers
- Conventional Thermal Cyclers
- Real-time PCR Systems
- PCR Sample Handling
- Microplate Shakers
- PCR Cabinets

Sample Storage & Sample Protection Solutions

- Ultra-low Temperature Freezers
- Lab Refrigerators and Freezers
- Sample Database Management Software
- Intelligent Remote Monitoring Application Protocol
- Remote Monitoring, Datalogging, Programming Software
- Wireless Monitoring System

Chemical Research

- Ductless Fume Hoods
- Laboratory Fume Hoods
- Fume Hood Airflow Monitors
- Exhaust Blowers
- Powder Weighing Balance Enclosures

General Equipment

- Laboratory Thermostatic Products
- Laboratory Oven
- Laboratory Incubator
- Refrigerated Incubator
- Constant Climate Chamber

Medical / IVF Equipment

- Time-Lapse Embryo Incubators
- Benchtop Multi-room Embryo Incubators

- CO₂ Incubators
- IVF Workstation

- Anti-Vibration Table
- CO₂ / O₂ Temperature Validation Unit

Pharmaceutical Equipment

Airflow Containment

- Downflow Booths
- Ceiling Laminar Airflow Units
- Laminar Flow Horizontal Trolley
- Laminar Flow Vertical Trolley
- Laminar Flow Straddle Units
- Garment Storage Cabinet

Isolation Containment

- Aseptic Containment Isolator (ACTI)
- Weighing and Dispensing Containment Isolator (WDCI)
- General Processing Platform Isolator (GPPI)

Cross Contamination Facility Integrated Barrier

- Cleanroom Air Showers
- Air Shower Pass Box
- Cleanroom Transfer Hatch
- Pass Boxes
- Soft Wall Cleanroom
- Dynamic Passboxes and Dynamic Floor Label Hatches



CelSafe®: NEW GENERATION CO₂ INCUBATOR

Esco's CelSafe® CO₂ incubator with touch screen user interface and latest advanced technology represents safety of your precious samples, efficiency on your lab work and enhanced user experience.

With CelSafe®, you will never look for another CO₂ / O₂ incubator



KEY COMPONENTS OF CelSafe® CO₂ INCUBATOR



MAGNETIC DOOR LOCK

- Manual and automatic lock functions.



STERILIZATION COOLING FAN

- Helps to emit the hot air during sterilization cycle.



DIRECT HEAT AND AIR JACKETED DESIGN

- Fast uniform heating
- Rapid temperature recovery without overshoot
- Air jacket improves chamber stability
- Double insulation system



INNER DOOR LATCH

- Locks the glass door.
- Automatically turns off the pump, gas supply, and heating functions when inner door is opened.



SHELVING

- Perforated shelving to improve uniformity
- Anti-tip
- Stainless steel
- Built-in grip



WATER RESERVOIR (Active Humidification Mode)

- User can precisely set %RH required for specialized application.



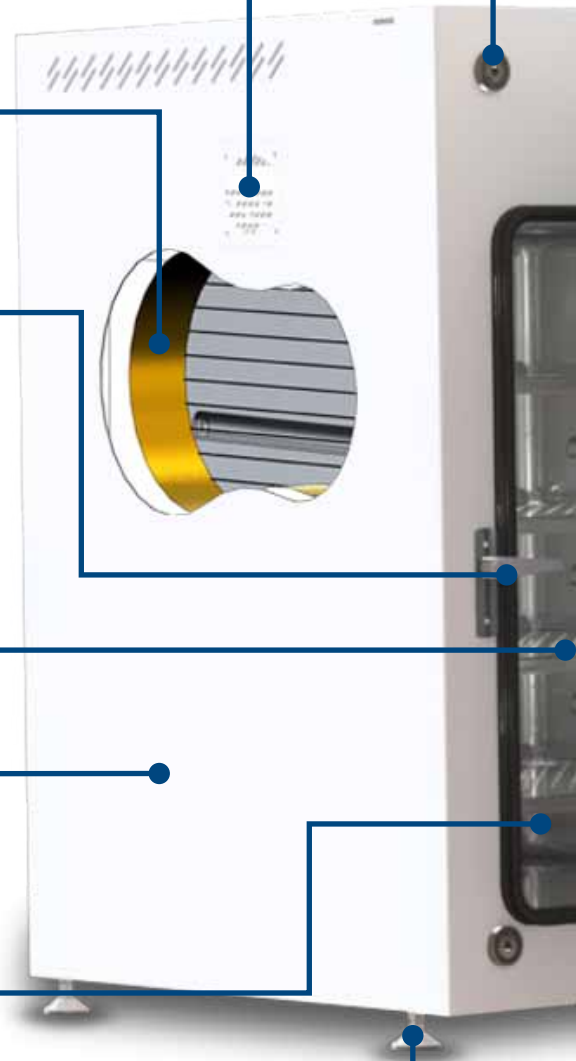
WATER PAN (Standard Model)

- Precisely heated by base heater to provide humidity.



LEVELING FEET

- Easily adjustable





DOOR HINGE

- Better door alignment and contact.

**CelTouch:
TOUCHSCREEN INTERFACE**

- Big, clear and easy-to-read parameter display.
- Easy to follow onscreen icon menus

USB INTERFACE

- For exporting of data log parameters
- Entering set up parameters
- Easy software updates

INNER DOOR

- Reversible (factory-installed)
- Easy viewing of samples

SAMPLE PORT

- Allows direct measurement of chamber atmosphere such as temperature, CO₂, O₂ and humidity.

OUTER DOOR

- Reversible (factory-installed)
- Heated to prevent condensation
- Back cover is made of stainless steel

RIBBED TYPE CHAMBER DESIGN

- Seamless design
- Facilitates faster cleaning
- More chamber space

QUALITY ESCO CONSTRUCTION

- External surfaces are powder coated with Esco ISOCIDE™ to eliminate 99.9% of surface bacteria within 24 hours of exposure.
- Inner chamber and main door back cover is made of stainless steel for cleaner look and easy maintenance.



HIGH HEAT STERILIZATION CYCLE

With a simple touch on the screen, CelSafe® sterilization cycle assures deactivation of microbes, spores, fungi, vegetative cells and other harmful microorganisms that can affect the growth of your precious samples.



- Fully automatic 200°C sterilization cycle with a simple touch on the screen.
- Effectiveness of high heat sterilization cycle is validated thru in-house laboratory test.
- All components and accessories are designed to meet 200°C temperature requirement.
- Complies with different international guideline requirements for dry heat sterilization such as U.S. and E.U. Pharmacopeias.
- Everything is STANDARD. Avoid running cost on other external accessories and consumables just to perform decontamination / sterilization cycle.
- The entire sterilization cycle period is 8 hours.



LATEST INFRARED CO₂ SENSOR TECHNOLOGY

The new carbon dioxide IR Sensor probe withstands high temperature sterilization.

- CARBOCAP® technology for heat durability and long term stability.
- CO₂ probe remains inside the incubator chamber during sterilization cycle. This saves time and reduces the risk of cross contamination.
- Water vapor, dust, other chemicals, change in temperature, humidity, other gases and pressure do not affect the performance of the IR sensor.
- Internal pressure sensor improves accuracy and stability.
- With full temperature and pressure compensation.
- Sensor head is heated to prevent condensation.



OPTIMIZED CLEAN CHAMBER DESIGN

Less components mean more space for your samples.

- New ribbed design chamber allows installation of shelves without screws or pilasters.
- Minimize risk of contamination.
- Easy maintenance.
- Quick and easy to clean.
- More chamber space.

MODELS	CelCulture®	CelSafe® (Natural Humidification)	CelSafe® (Active Humidification)
90 mm Petri Dish	675 pcs	825 pcs	975 pcs
Treated Flask 25 cm ² Surface Area	632 pcs	796 pcs	843 pcs
Treated Flask 175 cm ² Surface Area	190 pcs	250 pcs	264 pcs
Cell Culture Plate (96 wells)	466 pcs	576 pcs	612 pcs
Cell Culture Plate (24 wells)	366 pcs	405 pcs	450 pcs
Cell Culture Plate (48 wells)	366 pcs	405 pcs	450 pcs



COMPLETE SECURITY SYSTEM

Protection for Samples, User and Environment

- Multiple over-temperature protection system guarantees maximum sample, user and environment protection.
- All electrical components are UL-recognized.
- Electrical circuit protection is in accordance with UL requirements.
- PIN code prevents unauthorized access on screen menu and functions.
- Magnetic Door Lock System
 - Manually locks during normal operation to protect samples.
 - Automatically locks during high heat sterilization cycle to protect users.
- Inlet Door Latch function turns off pump, gas supply, and heating functions when the door is opened.



Door Lock Option



PIN Code Security Display

CELTOUCH SCREEN CONTROL SYSTEM

High-tech, Simple and Functional CelTouch screen interface

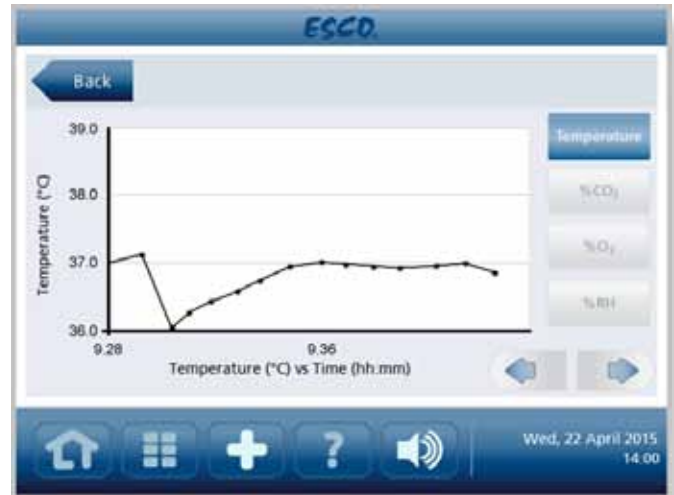
- Big, clear, and easy-to-read parameter display
- Easy to follow on-screen icon menus
- Actual Data Graph, Data Logging functions, Event Logs and Alarm Functions are easily seen on the screen
- Easy download of data log files using USB Write menu
- Can be performed with gloved fingers
- Multiple language selections: English, German, Spanish, French, Italian



Home Screen



Icon Menu



Graph Display

Date and time	T°C	%CO2	%O2	%RH
21 Apr 2015 -15:3	37.0	5.0	5.0	85.0
21 Apr 2015 -15:0	37.0	5.0	5.0	85.0
21 Apr 2015 -14:58	37.0	5.0	5.0	85.0
21 Apr 2015 -14:55	37.0	5.0	5.0	85.0
21 Apr 2015 -14:52	37.0	5.0	5.0	85.0
21 Apr 2015 -14:49	37.0	5.0	5.0	85.0
21 Apr 2015 -14:46	37.0	5.0	5.0	85.0
21 Apr 2015 -14:43	37.0	5.0	5.0	85.0
21 Apr 2015 -14:40	37.0	5.0	5.0	85.0
21 Apr 2015 -14:37	37.0	5.0	5.0	85.0
21 Apr 2015 -14:34	37.0	5.0	5.0	85.0
21 Apr 2015 -14:31	37.0	5.0	5.0	85.0

Data Log Display



Language Option Display

COMPLETE DATA COLLECTION AND GRAPH FUNCTION

High-tech, Simple and Functional CelTouch screen interface

USB PORT



USB Port



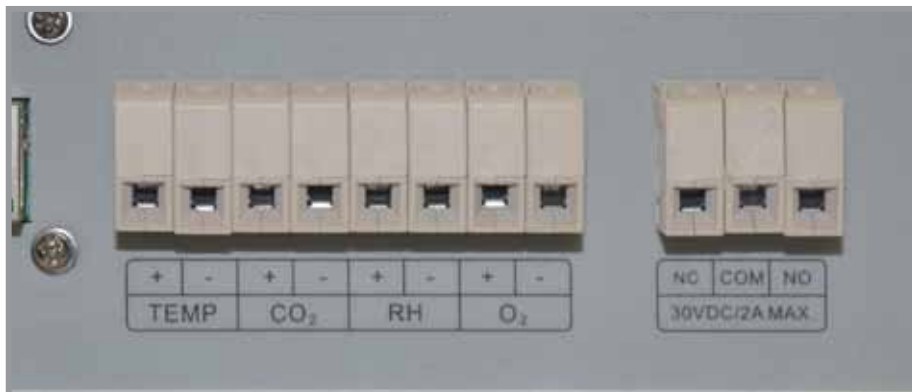
USB Write Screen

ANALOG OUTPUT

- Stand-by 0-5 VDC 4-20 mA analog output which allows the chamber to be connected to an in-house data acquisition or alarm system.

ALARM CONTACTS

- 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.



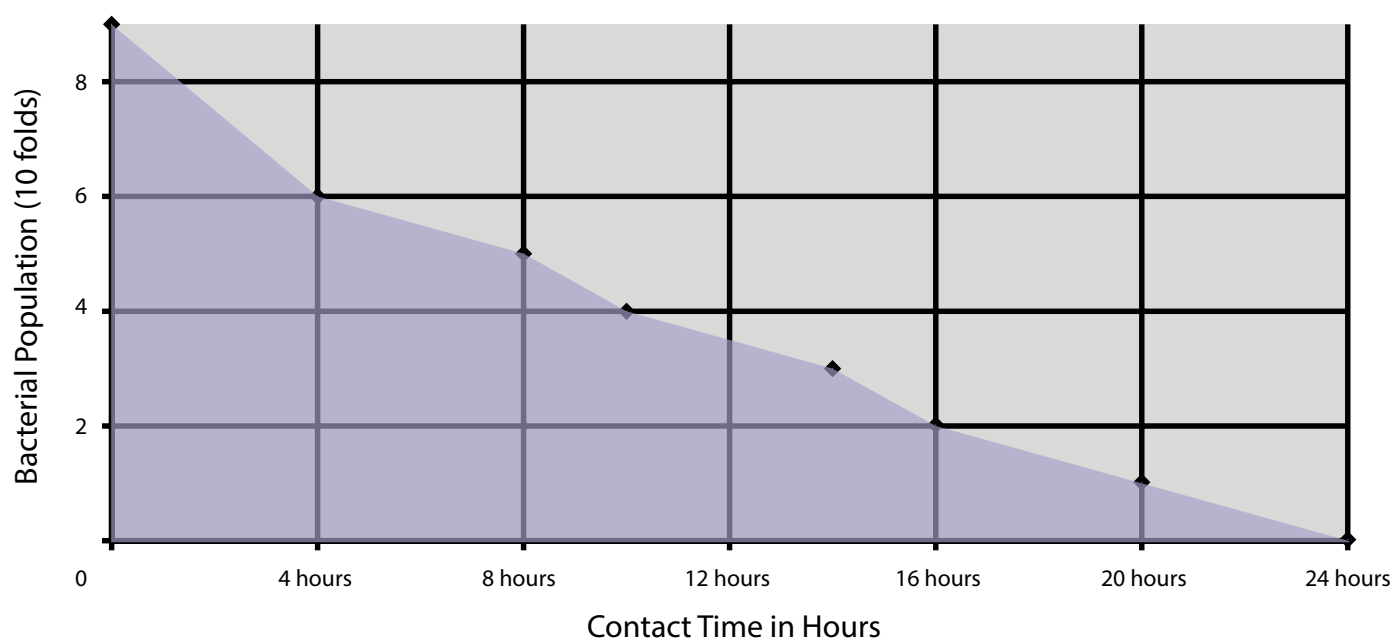
Analog Output and Alarm Contacts

ANTI-MICROBIAL POWDER COATING

Protection for Samples, User and Environment

- Electro-galvanized 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 healthier, safer and cleaner lab environment.

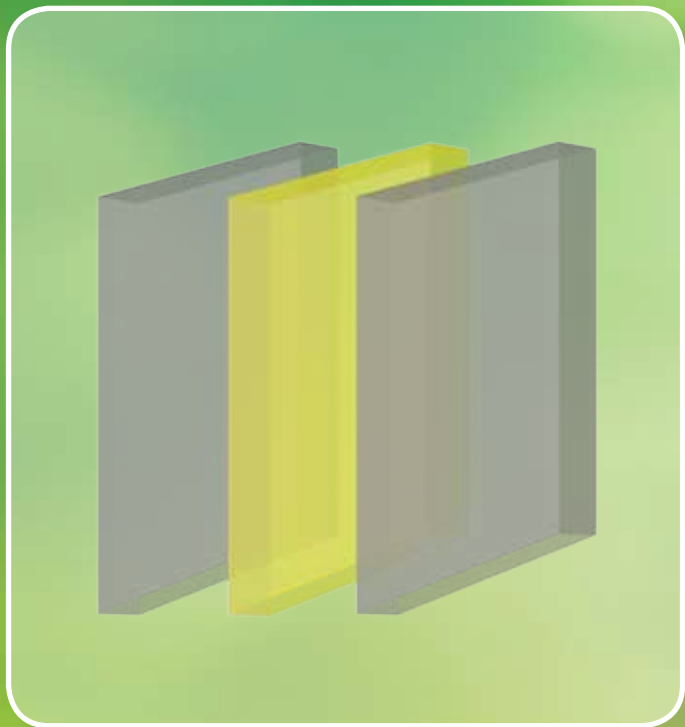
ISOCIDE™ ANTI-MICROBIAL COATING



All exterior painted surfaces are powder-coated with Esco Isocide™, an antimicrobial inhibitor to minimize contamination. Isocide™ is integrated into the coating substrate and cannot be washed out or diminished by repeated cleaning. Performance results are available upon request.

GREEN PRODUCT

DOUBLE INSULATION SYSTEM = LESS HEAT EMISSION



Regular CO₂ Incubator with Single Insulation
Heat Emission Value: Approximately 42 W/sec
Energy Consumption: 150 kWh



CelSafe® CO₂ Incubator with Double Insulation
Heat Emission Value: Approximately 39 W/sec
Energy Consumption: 142 kWh

One with nature.

Esco builds eco-friendly products.



ACTIVE HUMIDIFICATION SYSTEM

Flexibility on your CelSafe® CO₂ Incubator

- In order to provide optimal environmental conditions for cell growth that requires specific relative humidity, the CelSafe® CO₂ incubator with optional active humidity control allows user to actively control humidity from up to 95%. Natural humidification method is from 85% to 90%.
- Water reservoir is located at the back of the chamber. No more water pan.
- Heats up and maintains water reservoir based on RH control.
- Water inlet valve is triggered by water level sensor.



Water Reservoir

SUPPRESSED O₂ MODEL

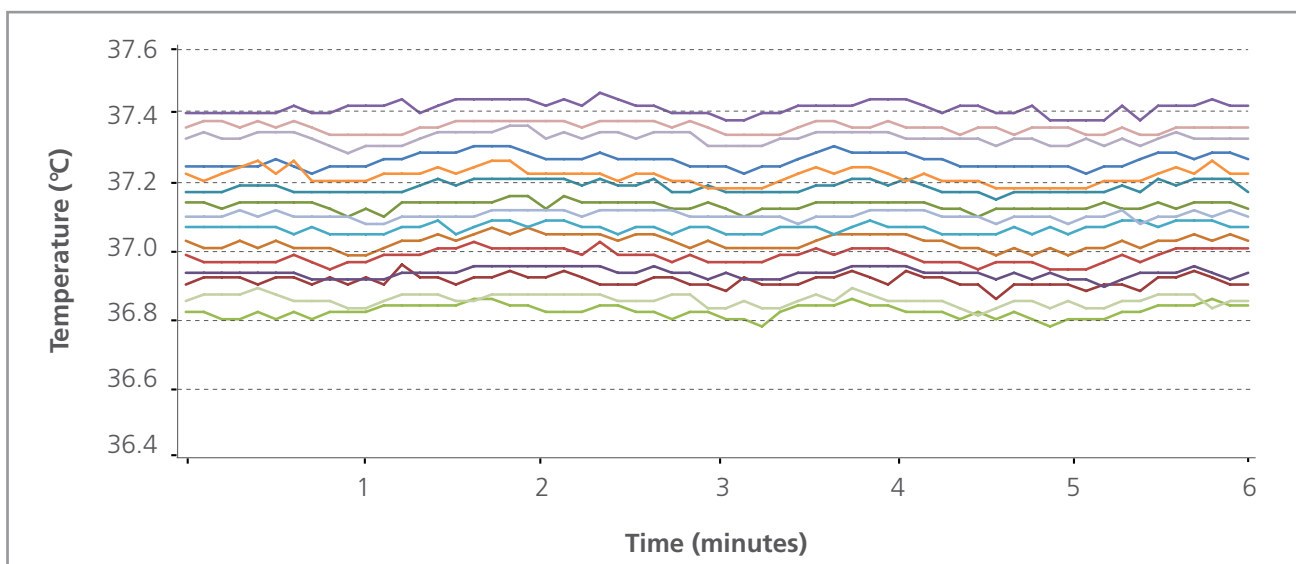
O₂ REQUIREMENT FOR SPECIALIZED APPLICATIONS

- Esco CelSafe® CO₂ incubators with suppressed O₂ provide accurate environmental control inside the incubator chamber. Oxygen levels are controlled through precise introduction of nitrogen into the incubator culturing system.
- Esco Celsafe® CO₂ incubator with suppressed O₂ has an optional nitrogen gas switching system in order to install two nitrogen gas tanks. Making sure you will not run out of N₂ gas.
- New Zirconium type O₂ Sensor provides faster response time and more reliable than Galvanic type O₂ Sensor.

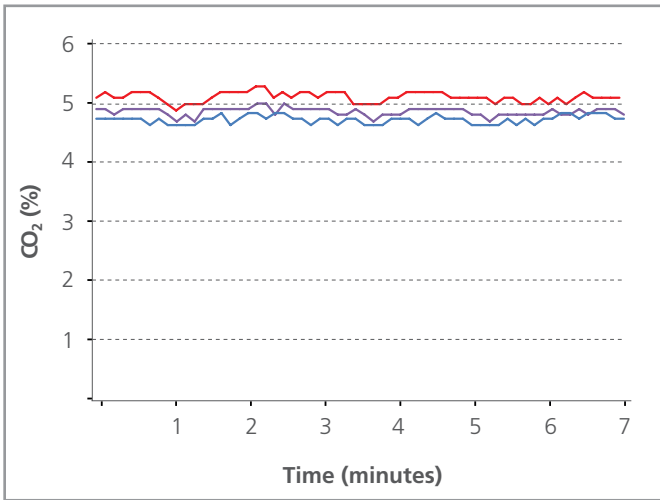
SUPERIOR PERFORMANCE

PRECISE PARAMETER CONTROL

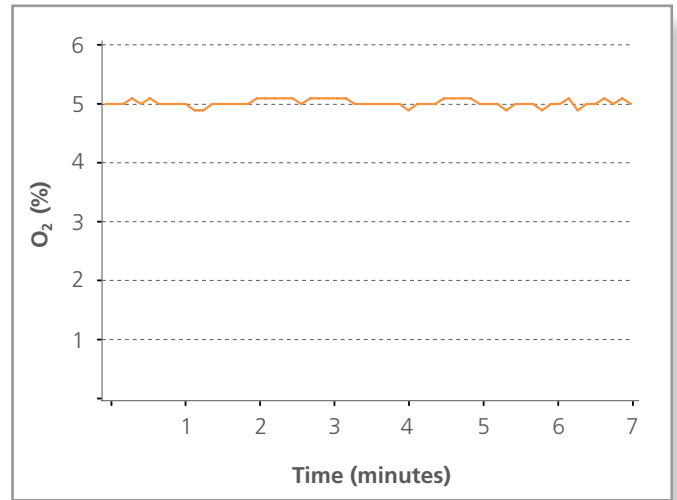
- Uniformity test measures the difference between the coldest spot and warmest spot in the chamber when the CO₂ incubator is operating at set temperature.
- Esco Celsafe® CO₂ incubator has excellent uniformity under normal operating condition.



Temperature Uniformity Graph at 37°C



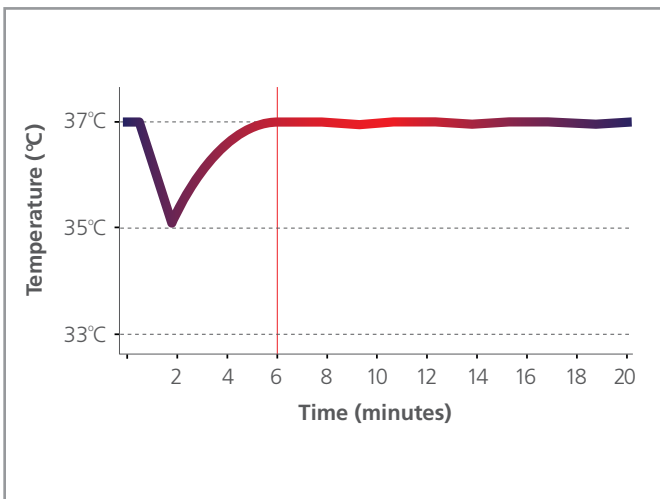
CO₂ Uniformity / Stability at 5% CO₂ concentration Graph



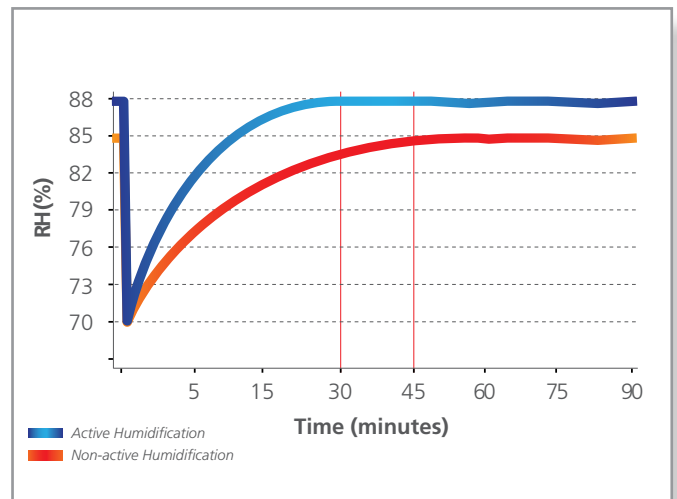
O₂ Fluctuation at 5% O₂ concentration Graph (for Suppressed O₂ model)

FAST TEMPERATURE, O₂, CO₂ HUMIDITY RECOVERY TIME AFTER DOOR OPENING

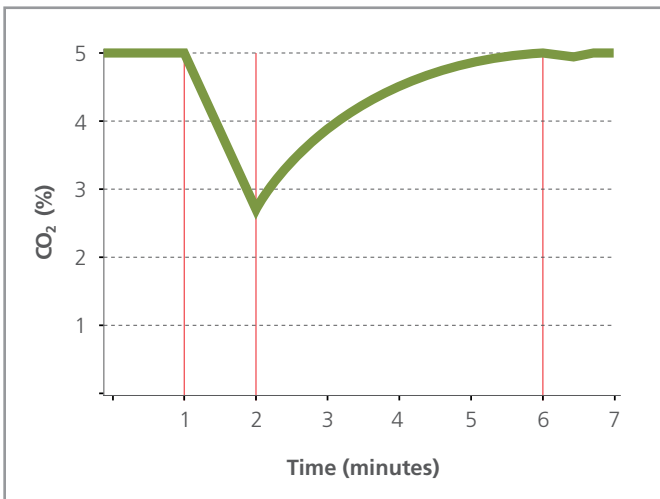
- Esco CelSafe® recovers temperature, %CO₂, %O₂ and %RH in minutes following a 30-second door opening. Fast recovery of %CO₂, %O₂ and %RH ensures integrity of the growth of the samples.



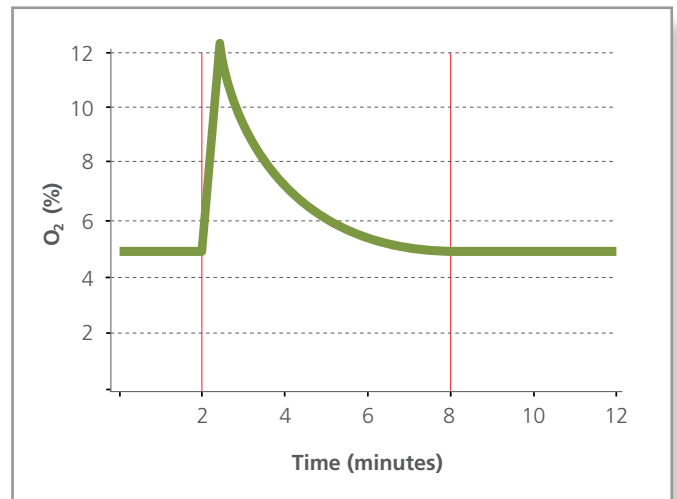
Temperature Recovery Graph



Humidity Recovery Graph



CO₂ Recovery graph

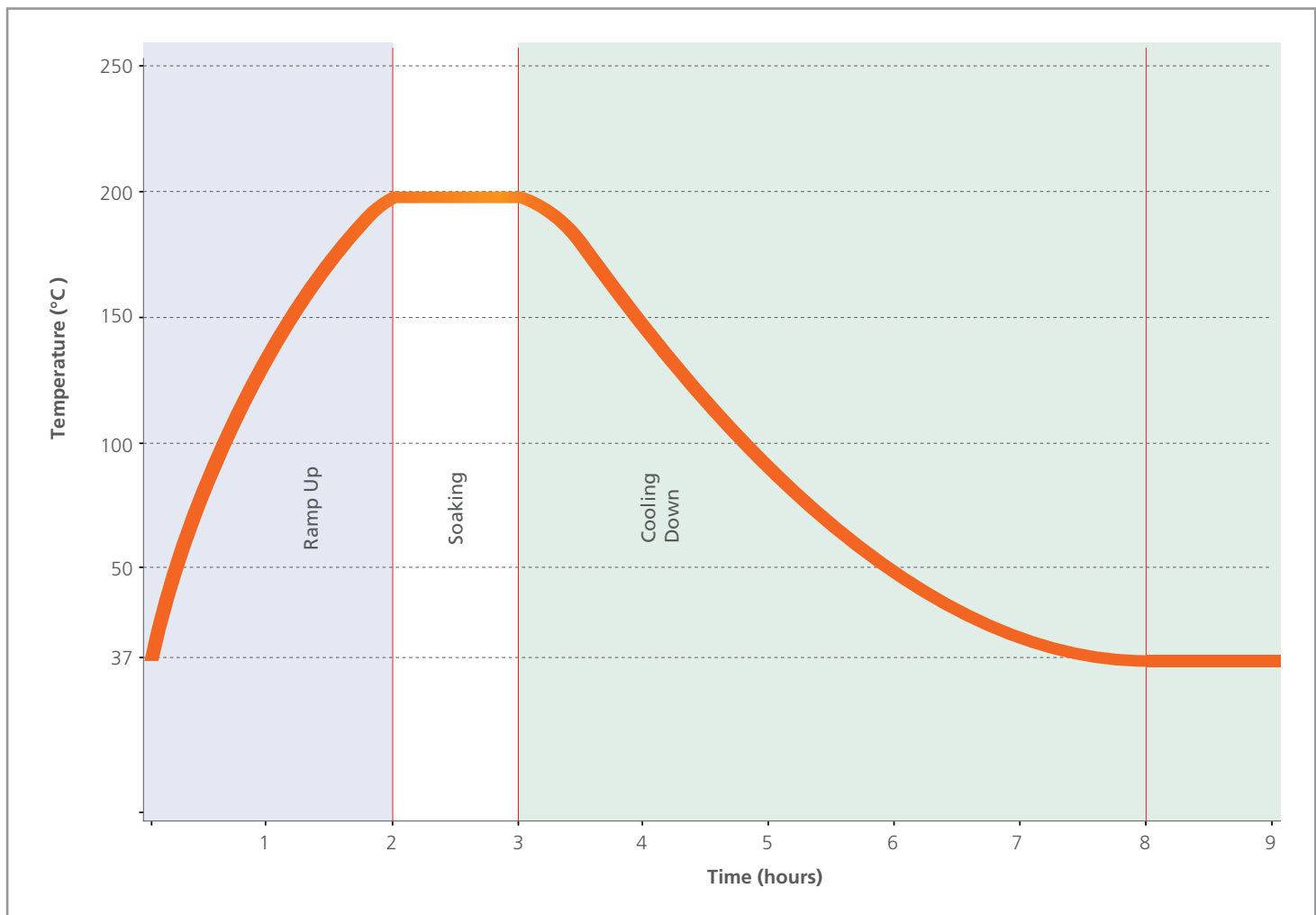


O₂ Recovery graph (for Suppressed O₂)

EFFECTIVENESS OF STERILIZATION CYCLE

- The Esco CelSafe® CO₂ Incubator 200°C Sterilization Cycle has been evaluated thru in-house laboratory test and shown to be an effective method in deactivating fungi, bacterial spore, and vegetative cells. This testing is also effective in deactivating *Geobacillus stearothermophilus* which is a heat-resistant microorganism.
- 200°C High Heat Sterilization process completes within 8 hours.

MICROORGANISM	Before Decon	After Decon
<i>Bacillus atrophaeus</i>	Log 6	0
<i>Aspergillus brasiliensis</i>	Log 4	0
<i>Pseudomonas aeruginosa</i>	Log 6	0
<i>Staphylococcus epidermidis</i>	Log 6	0
<i>Escherichia coli</i>	Log 6	0
<i>Staphylococcus aureus</i>	Log 6	0
<i>Enterobacter faecalis</i>	Log 6	0
<i>Geobacillus stearothermophilus</i>	Log 6	0



Sterilization Graph

STILL WANT MORE PROTECTION?

ESCO GOT YOU COVERED USING ESCO VOYAGER® SOFTWARE SYSTEM OR ESCO PROTECT® SYSTEM

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.

Voyager® interfaces with individual Esco equipment over RS485 using the EscoBUS communications protocol. Up to 16 devices of equipment may be interfaced to a single PC.

Compatible Equipment

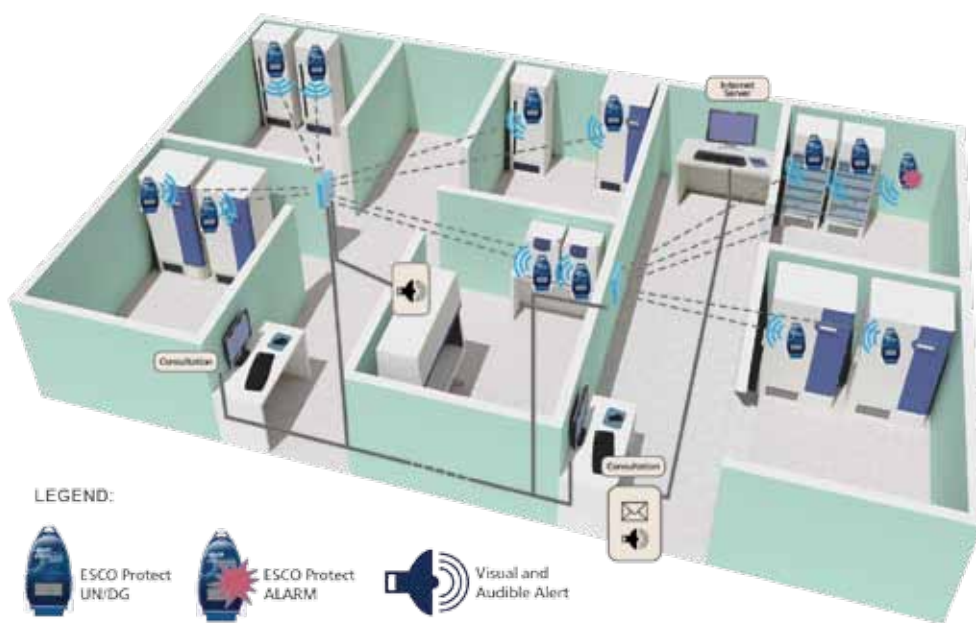
- Lexicon® II - Ultra-low Temperature Freezer
- CelCulture® - CO₂ Incubator (CCL)
- CelMate® - CO₂ Incubator (CLM)
- Isotherm® - Forced Convection Oven (OFA)
- Isotherm® - Forced Convection Incubator (IFA)
- Isotherm® - Low Temperature Incubator (IFC)
- OrbiCult™ - Laboratory Shakers









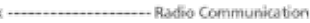
PROtect®

A completely independent and redundant sample monitoring system, which is a critical component in providing protection for important sample.

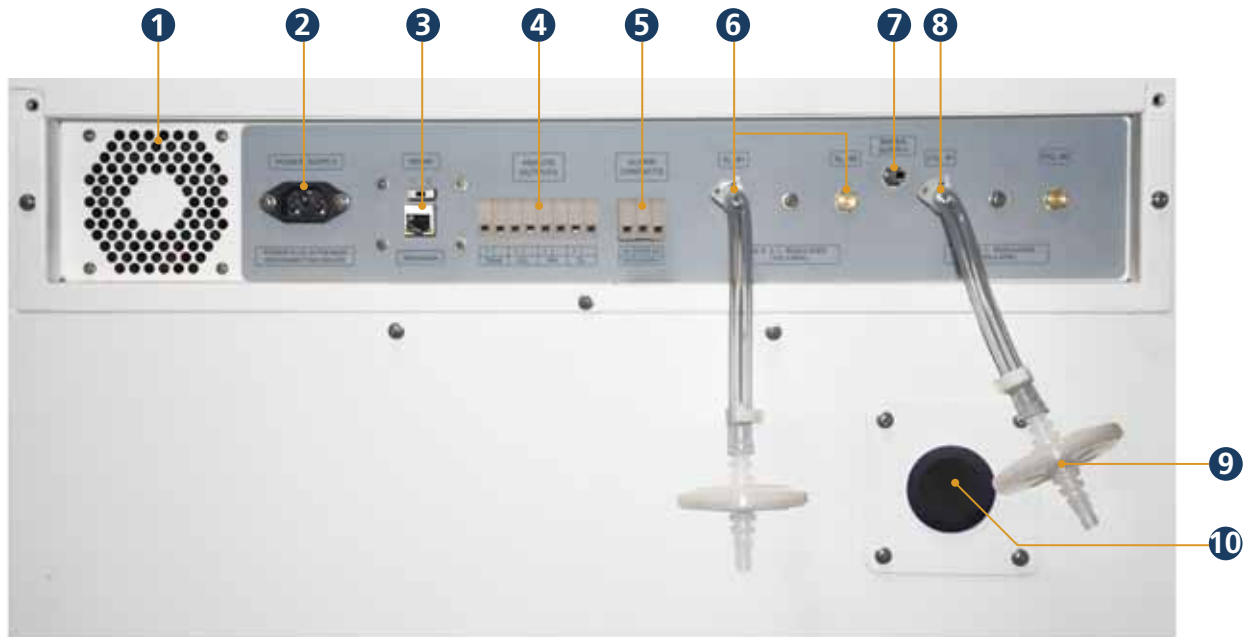
CFR-21 Compliant Software



LEGEND:

-  ESCO Protect UN/DG
-  ESCO Protect ALARM
-  Visual and Audible Alert
-  ESCO Protect EMD-1
-  Email Alert
-  Ethernet network
-  Radio Communication (200-300 meters)

REAR PANEL



1 Cooling Fan

The cooling fan prevents the electrical panel from overheating.



2 Power Supply Inlet

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



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

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 Water Inlet

(For models with Active Humidification System)
To fill up water in the reservoir tank used in the active humidification.



8 CO₂ Gas Supply Inlet

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



9 Gas Inline Filter

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



10 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.

ORDERING INFORMATION

IR SENSOR MODEL WITH STAINLESS STEEL CHAMBER

MODELS	DESCRIPTION
CLS-170-B-8 (2170187)	CelSafe® Incubator, 170 L, IR Sensor, CO ₂ Control, High Heat Sterilization, 230 VAC, 50/60 Hz
CLS-170-B-9 (2170188)	CelSafe® Incubator, 170 L, IR Sensor, CO ₂ Control, High Heat Sterilization, 115 VAC, 50/60 Hz

IR SENSOR MODEL WITH STAINLESS STEEL CHAMBER AND ACTIVE HUMIDIFICATION

MODELS	DESCRIPTION
CLS-170-B-8-RH (2170192)	CelSafe® Incubator, 170 L, IR Sensor, CO ₂ Control, High Heat Sterilization, Active Humidification, 230 VAC, 50/60 Hz
CLS-170-B-9-RH (2170194)	CelSafe® Incubator, 170 L, IR Sensor, CO ₂ Control, High Heat Sterilization, Active Humidification, 115 VAC, 50/60 Hz

SUPPRESSED O₂ MODEL WITH STAINLESS STEEL CHAMBER

MODELS	DESCRIPTION
CLS-170-T-8 (2170130)	CelSafe® Incubator, 170 L, IR Sensor, CO ₂ Control, O ₂ Control, High Heat Sterilization, 230 VAC, 50/60 Hz
CLS-170-T-9 (2170151)	CelSafe® Incubator, 170 L, IR Sensor, CO ₂ Control, O ₂ Control, High Heat Sterilization, 115 VAC, 50/60 Hz

SUPPRESSED O₂ MODEL WITH STAINLESS STEEL CHAMBER AND ACTIVE HUMIDIFICATION

MODELS	DESCRIPTION
CCL-170T-8-RH (2170193)	CelSafe® Incubator, 170 L, IR Sensor, CO ₂ Control, O ₂ Control, High Heat Sterilization, Active Humidification, 230 VAC, 50/60 Hz
CCL-170T-9-RH (2170195)	CelSafe® Incubator, 170 L, IR Sensor, CO ₂ Control, O ₂ Control, High Heat Sterilization, Active Humidification, 115 VAC, 50/60 Hz

OPTIONS AND ACCESSORIES



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-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-2033-F Sealed Inner Door Kit

CelSafe® CO₂ Incubators can be equipped with 4 glass doors, which allow 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-2034-F Roller Base 170 L

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



COA-2036-F Floor Stand 170 L

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-2035-F Floor Stand 170 L

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-2037-F Extra Shelf

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



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-2015-F Inner Door Shelving Kit (4 Sets with total 12 mini shelves for one incubator)

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.



PROtect® - Redundant Wireless Sample Monitoring System

A completely redundant, sample monitoring system to provide the utmost protection of precious samples.



Voyager® Software Kit

Esco Voyager® is a PC-based software package developed for the remote monitoring, data logging and programming / device configuration of Esco controlled environment laboratory equipment. Compatible equipment includes laboratory ovens and incubators, low temperature incubators, CO₂ incubators, ultra-low temperature freezers, and laboratory shakers.

ACCESSORIES FOR CO₂ INCUBATOR, MODEL CLS-170_ _

Item Code	Options and Accessories	Description	Unit of Measurement
5170472	COA-1002	Option, CO ₂ Backup (Tank Switcher), Factory-installed	UT
5170473	COA-1002-F	Option, CO ₂ Backup (Tank Switcher), Field-installed	UT
5170696	COA-2033-F	Option, Sealed Inner Door Kit for 170 L (4 Glass Doors With Latches), Field Installed	UT
5170701	COA-2038	Option, Sealed Inner Door Kit for 170 L (4 Glass Doors With Latches), Factory Installed	UT
5170490	COA-1007	Option, N ₂ Backup (Tank Switcher), Factory Installed	UT
5170491	COA-1007-F	Option, N ₂ Backup (Tank Switcher), Field Installed	UT
5170697	COA-2034-F	Accessory, Roller Base	PC
5170698	COA-2035-F	Accessory, Floor Stand 200 mm (8") Adjustable Feet	PC
5170699	COA-2036-F	Accessory, Floor Stand 700 mm (27.6")	PC
5170481	COA-2005-F	Accessory, 2-Stage Gas Regulator For CO ₂ / N ₂	PC
1080588	CGA 320	CGA 320 Connector (US Standard)	PC
1080589	BP-BS341#08-NT4	BP-BS34-#8-NT4 Connector (British Standard)	PC
1080590	G5/8-RH	G5/8-RH Connector (China Standard)	PC
5170700	COA-2037-F	Accessory, Extra Stainless Steel Shelf	PC
5170329	COA-2010-F	Accessory, Electronic CO ₂ Analyzer (Worldwide), for CO ₂ / Temp Measurement (with Temperature Probe)	UT
5170397	COA-2016-F	Accessory, Electronic CO ₂ Analyzer (Worldwide), for CO ₂ / O ₂ / Temp Measurement (with Temperature Probe)	UT
5170398	COA-2017-F	Accessory, Electronic CO ₂ Analyzer (Worldwide), for CO ₂ / O ₂ / RH / Temp Measurement (with Temperature Probe)	UT
2170020	COA-2011-F	Accessory, IQ/OQ Documentation	UT
5170487	COA-2015-F	Accessory, Inner Door Shelving Kit	UT
5250001	Voyager®	Voyager® Software Kit	SET

GENERAL SPECIFICATIONS		CLS-170_-_-
CelSafe® CO ₂ INCUBATORS		
TEMPERATURE		
Ambient Temperature Range	18°C to 34°C (64°F to 93 °F)	
Temperature Control Method	Direct Heat and Air-Jacketed using PID microprocessor	
Temperature Range, °C	ambient +3 to 60	
Temperature Uniformity, °C	± 0.3*	
Temperature Accuracy, °C	± 0.1	
Recovery Time** (after 30 seconds door opening), minutes	6	
Start up time (25°C ambient 37.0°C), minutes	40	
CO₂		
CO ₂ Control System	Microprocessor PID	
CO ₂ Range, % CO ₂	0-20	
CO ₂ Accuracy, % CO ₂	0.1	
CO ₂ Fluctuation, % CO ₂	± 0.2	
CO ₂ Sensor	Infrared (IR) Sensor* (with Temperature and Pressure Compensation)	
CO ₂ Recovery Time*** (after 30 seconds door opening), minutes	Standard Unit: 4	
O₂ SPECS (FOR SUPPRESSED O₂ MODEL)		
O ₂ Control System	Microprocessor PID	
O ₂ Range, % O ₂	1-20.7%	
O ₂ Accuracy, % O ₂	0.1	
O ₂ Fluctuation, % O ₂	± 0.2	
O ₂ Sensor	Zirconium (Solid)	
O ₂ Recovery Time**** (after 30 seconds door opening), minutes	At 5.0% O ₂ volume: 8	
HUMIDITY		
Humidification Method	Natural Humidification	
	Active Humidification (Optional)	
Humidity Range*****	Natural Humidification: 85% - 90% Active Humidification (Optional): 90% - 95%	
PHYSICAL CONSTRUCTION		
Interior Volume	170 L (6.0 cu. Ft.)	
External Dimensions (W x D x H)	660 x 725 x 980 mm (26.0" x 28.5" x 38.6")	
Internal Dimensions (W x D x H)	505 x 530 x 635 mm (19.9" x 20.9" x 25.0")	
Net Weight	99 Kg (218 lbs)	
Shipping Weight	118 Kg (260 lbs)	
Shipping Dimensions (W x D x H)	850 x 770 x 1135 mm (33.5" x 30.3" x 44.7")	
Number of Shelves	4	
Maximum No. of Shelves	7	
Shelves Area (W x D)	502 mm x 475 mm (19.8" x 18.7")	
Max. Load per Shelf	11 Kg/shelf (24.3 lbs/shelf)	
Available Electrical Configuration	230 VAC, 50/60 Hz (8)	
	115 VAC, 50/60 Hz (9)	
Interior Material	Stainless Steel, Type 304	
Nominal Power at 37°C, Watts	70	
Maximum Power at 200°C, Watts	1050	
CONTAMINATION CONTROL		
Contamination Control Methods	1) High Heat Sterilization Cycle ; 2) Main body is electrogalvanized steel with ISOCIDE™ antimicrobial coating; 3) 0.2 micron in-line filter for gas input; 4) 1 micron in-line filter for air circulation	

* Data recorded under optimum factory setting conditions

** For temperature not exceeding 37°C

*** For CO₂ not exceeding 5.2%

**** For O₂ not exceeding 5.2%

***** Esco does not guarantee condensation free chamber at higher humidity level.

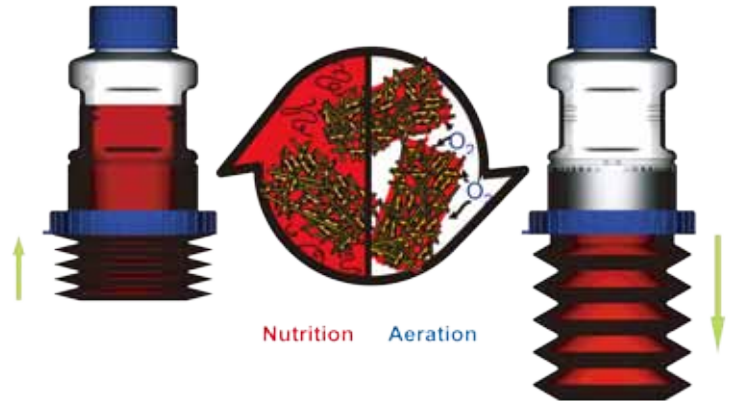
Advanced Cell Culture with Esco CO₂ Incubator and CelCradle™

CELCRADLE™ : CRADLE FOR HIGH DENSITY CELLS

CelCradle™ is a cost-effective, single-use benchtop bioreactor system capable of supporting high density culture of adherent cells. It is designed based on the concept of bellow-induced intermittent flow of media and air through porous matrices, where cells reside. This provides a low shear stress, high aeration, and foam-free culture environment.

During operation, the CelCradle™ bottle is partially filled with media and inoculated with cells. The media is raised and lowered alternately to submerge and expose the matrices, creating a dynamic interface between air and media on cell surface to maximize nutrient uptake and oxygen transfer.

CelCradle™ system is part of the tide motion bioreactor system, which features linear scalability up to 5000L!



BioNOC™ II: Heart of the Tide Motion System

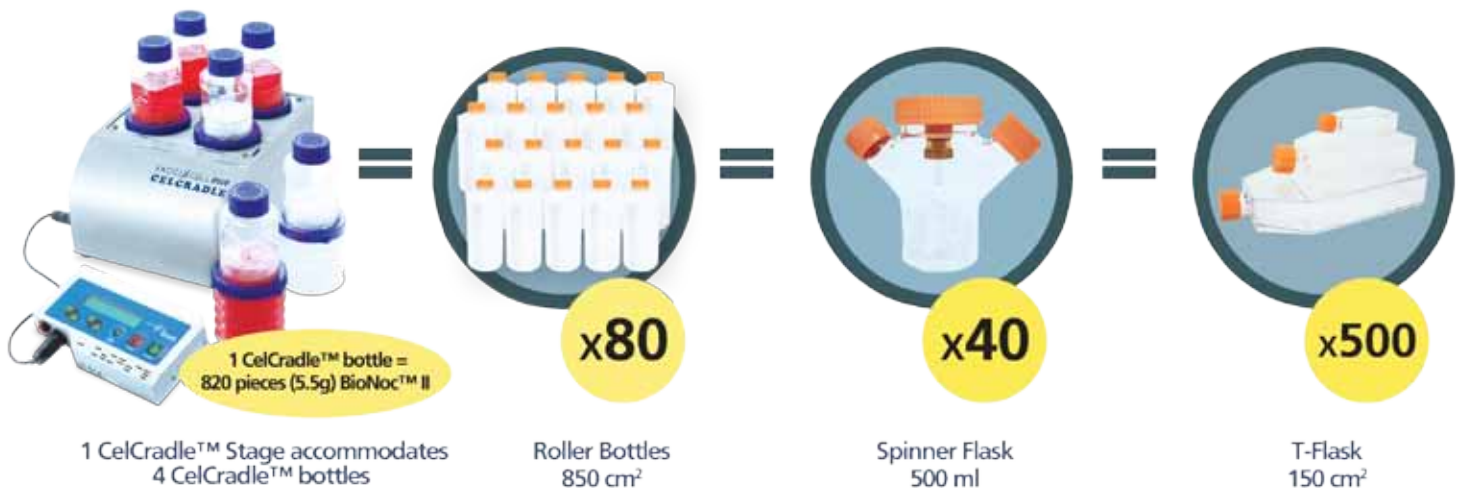
BioNOC™ II are carriers that allow attachment of cells for adherent cell culture. Each CelCradle™ bottle consists of 5.5g of BioNOC(TM) II carriers, providing 13,200 cm² of surface area for attachment and growth of cells.. Apart from its high surface area, BioNOC™ II carriers feature enhanced biocompatibility, long hydrophilicity, high porosity, low lint content, and excellent mechanical strength. The characteristics of BioNOC™ II, combined with the tide motion principle, allow the CelCradle™ system to support the high density culture of adherent cells.

Features:

- Stainless Steel 304 L BA CelCradle™ Stage capable of operating 4 CelCradle™ bottles simultaneously and compatible with a CO₂ incubator
- Pre-sterilized and ready-to-use disposable CelCradle™ bottles
- Provides a low shear stress and foam-free culture environment that has no O₂ limitation
- A single CelCradle™ bottle has the same productivity of up to 20 850 cm² roller bottles
- Compact design allows the CelCradle™ to be placed inside a 6 ft³ CO₂ incubator
- Easy parameter optimization
- Capable of performing batch, fed-batch or perfusion culture mode
- Compatible with most media formulations including serum-free media
- Contains BioNOC™ II carriers with specially treated surface to allow growth of most anchorage-dependent cells. BioNOC™ II also allows easy harvest of whole cells, cell components or secreted proteins
- Easy-scale up by using additional bottles or by using TideCell® bioreactor system

Applications:

- Human and Animal Vaccines
- Autologous and Allogeneic Cell Therapy
- Culture of anchorage-dependent/ adherent cells
- Overcome limitations of micro carrier-stirred tank bioreactor technology
- Conversion from Roller Bottles to closed system, single-use cell culture
- Mammalian and insect cell research
- Monoclonal antibody production
- Protein production



Useful for batch and semi-batch operation where process components are easily traceable.

Simple to operate - virtually no learning curve

Controller - adjusts nutrient and gas exchange of the bottle

Magnetized controller enables convenient positioning on the outside surface of the incubator



Bottle cap is integrated with 0.22µm ventilation filter

Cells remain entrapped in the BioNOC™ II matrix bed, simplifying media replacement and product harvesting

Sampling Port enables aseptic removal of BioNOC™ II carriers for cell counting

Retaining ring locks bottles in place in the CelCradle® Stage

Collapsible bellows

Extremely compact system fits in most standard CO₂ incubators.

Easy to read LED display



Useful for continuous operation where process components are easily traceable

Tubing set with peristaltic pump head enable recirculation and continuous feeding of nutrient

CelFeeder enables 4 pumps operation with individual programming setting

Autoclavable pump head supports consistent, calibration-free feeding rate

UP: 1.5 ml/s
T_H: 04 M 04 S

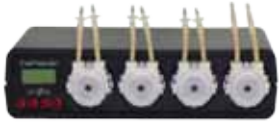
DISPOSABLE CELCRADLE™ BOTTLES

A complete product line of CelCradle™ meets your specific needs. Different CelCradle™ bottles cover 90% of applications in cell culture.

- Batch, semi-batch or continuous culture
- BioNOC™ II carriers or preferred microcarriers
- Cell harvest with or without trypsin
- Disposable Bottle

Bottle	Item Code	Secreted Protein, viruses (adherent cells)	Cell Harvest (for non-secreted proteins, viruses or cells)	Carrier Harvest (for protein extraction or reuse of carriers)
CelCradle™ 500	1400001	Best Application	Applicable, but not optimal	Applicable, but not optimal
CelCradle™ 500A	1400003	Applicable, but not optimal	Best Application	Best Application
CelCradle™ 500P	1400002	Best Application	Applicable, but not optimal	Applicable, but not optimal
CelCradle™ 500AP	1400004	Applicable, but not optimal	Best Application	Best Application

OPTIONS AND ACCESSORIES



CelFeeder

The CelFeeder pump module is an auxiliary peristaltic pump used for the recirculation and perfusion processes for CelCradle™ 500 high density continuous cell culture system.



Tubing Complete Set

The Tubing Complete Set includes pre-assembled tubes, reusable pump head and head plate with a sampling port to support the continuous culture in CelCradle™-500P system.



Disposable Tubing Accessory

The Disposable Tubing Accessory provides simple options to replace the tubes in the Tubing Complete Set, thus avoiding wear out of the tubes during operation. It is recommended to replace the tubes after 3x of use.



GlucCell® Glucose Monitoring System

The GlucCell® Glucose Monitoring System enables simple and accurate glucose measurements using disposable test strips.



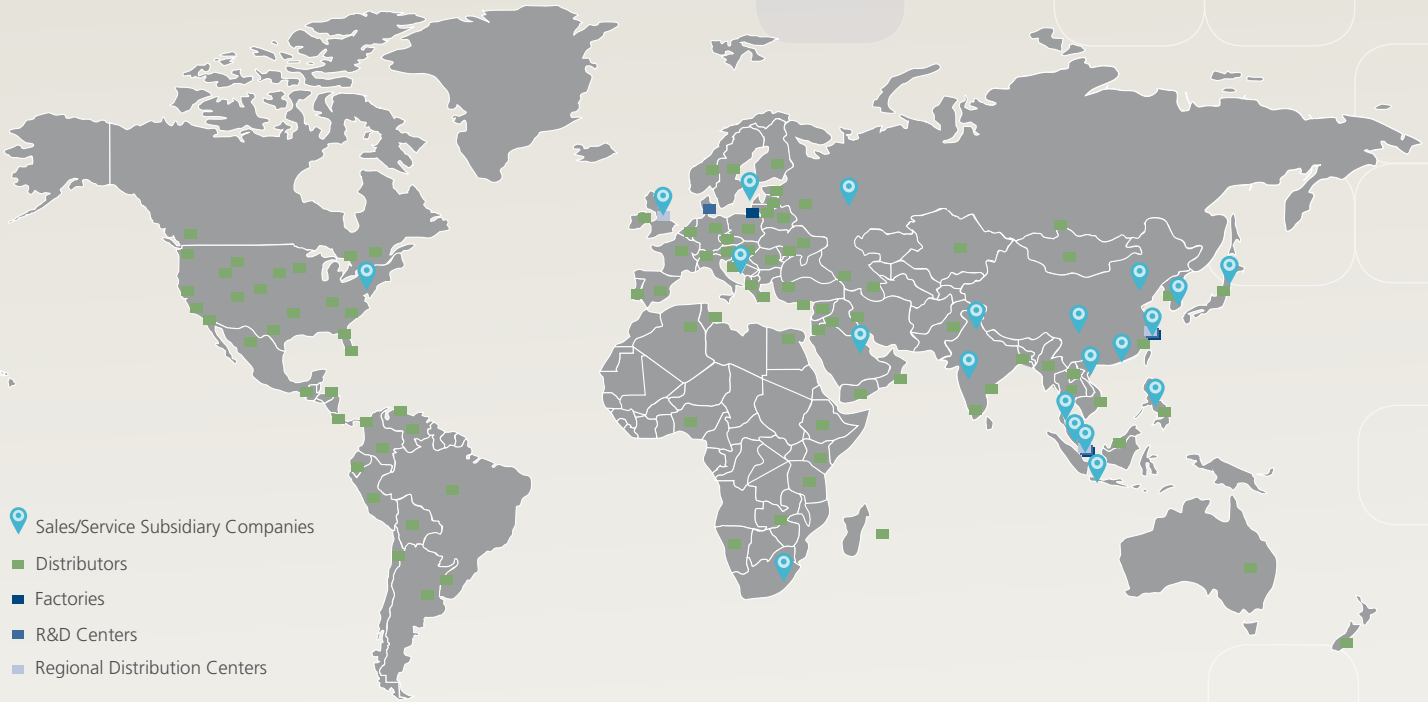
Crystal Violet Dye Nucleus Count Kit






The Crystal Violet Dye Nucleus Count Kit contains crystal violet dye, citric acid and detergent used to disrupt the cells and release cell nuclei for cell count. The CVD kit is an efficient reagent for cell count in a porous matrix.

ORDERING INFORMATION

Product Name	Item Code	Package
CelCradle™ System Complete	2230006	1 x CelCradle™ Stage 1 x GlucCell® Glucose Monitoring System
CelCradle™ Continuous System Complete	2230007	1 x CelCradle™ Stage 1 x GlucCell® Glucose Monitoring System 1 x CelFeeder Pump 2 x Tubing Complete Set
CelCradle™ Stage	2230005	1 x Main Console 1 x Control Box 1 x 100-240 V power adapter 1 x Signal Cable 1 x Manual CD 2 x Forceps 1 x Crystal Violet Dye Nucleus Count Kit
CelFeeder Pump	1400067	1 x CelFeeder Pump
Tubing Complete Set	1400011	1 x Disposable Tubing Accessory 1 x Pump Head
Disposable Tubing Accessory	1400013	5 x Disposable Tubing Accessory
Disposable Tubing Set & Pump Head	1400012	1 x Tubing Set 1 x Pump Head
GlucCell® Glucose Monitoring System	1400009	1 x GlucCell® Glucose meter 2 x Glucose Test Strip Bottles (2 x 25 pcs)
GlucCell® Glucose Test Strip	1400010	2 x Glucose Test Strip Bottles (2 x 25 pcs)
Crystal Violet Dye Nucleus Count Kit	1400014	1 x CVD Bottle (100ml/bt)
Filtered Cap	1400015	Cap for CelCradle™ Bottle
Non-Vented Cap	1400016	Cap for CelCradle™ AP/P Bottle
Forceps	1400017	Used for sampling of BioNOC™ II carriers

ESCO GLOBAL NETWORK



-  Sales/Service Subsidiary Companies
-  Distributors
-  Factories
-  R&D Centers
-  Regional Distribution Centers



- ART Equipment
- Biological Safety Cabinets
- CO₂ Incubators
- Cold Storage
- Compounding Pharmacy Equipment
- Containment / Pharma Products
- Ductless Fume Hoods
- Lab Animal Research Products
- Laboratory Fume Hoods
- Laboratory Incubators
- Laboratory Ovens
- Laminar Flow Cabinets
- Laboratory Freeze Dryers
- PCR Cabinets
- PCR Thermal Cyclers
- Powder Weighing Balance Enclosures

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

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