

# ESCO

WORLD CLASS. WORLDWIDE.



CelSafe® CO<sub>2</sub> Incubator

# CelSafe®

## CO<sub>2</sub> 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

- CO<sub>2</sub> Incubators with Cooling System
- CO<sub>2</sub> Incubators with Stainless Steel Exterior
- CO<sub>2</sub> 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

- CO<sub>2</sub> Incubators
- IVF Workstation

- Anti-Vibration Table
- CO<sub>2</sub> / O<sub>2</sub> 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

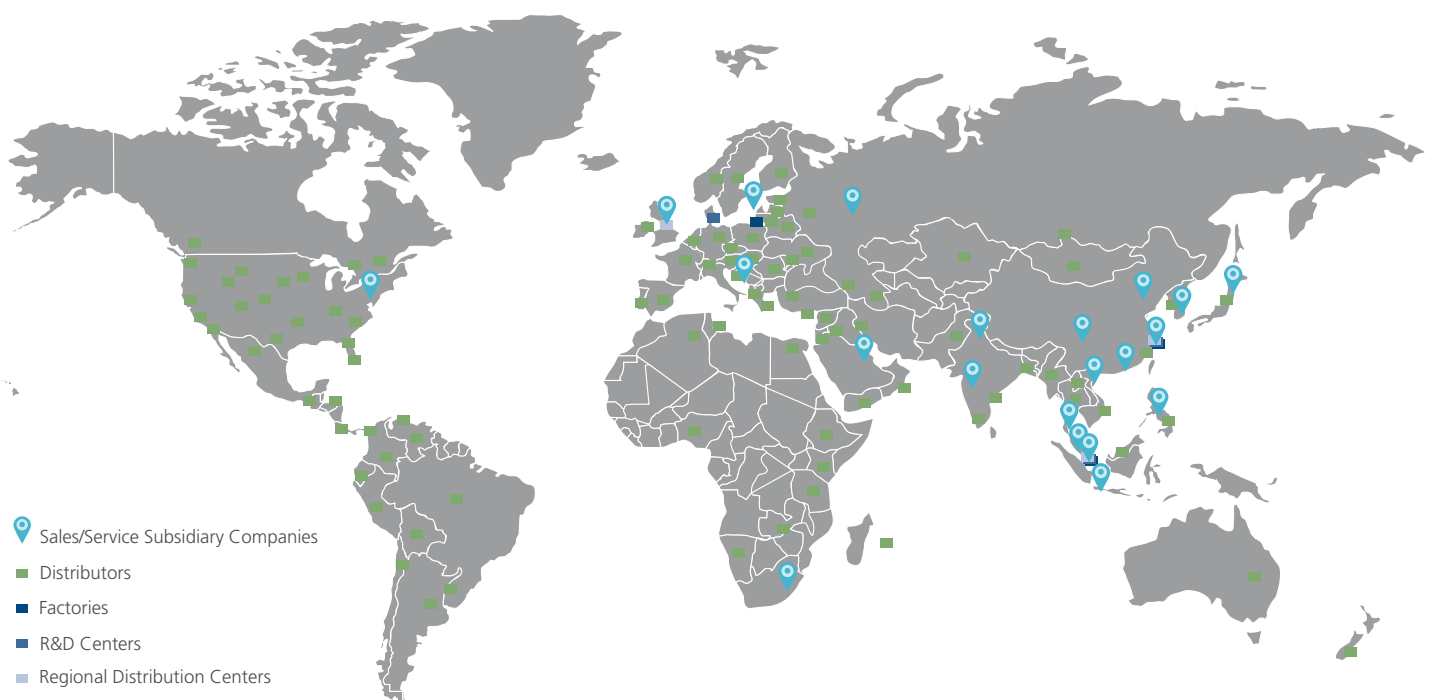
#### Isolation Containment

- 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

## Global Network



# CelSafe®: NEW GENERATION CO<sub>2</sub> INCUBATOR

Esco's CelSafe® CO<sub>2</sub> 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 CO<sub>2</sub> / O<sub>2</sub> incubator



# KEY COMPONENTS OF CelSafe® CO<sub>2</sub> 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.



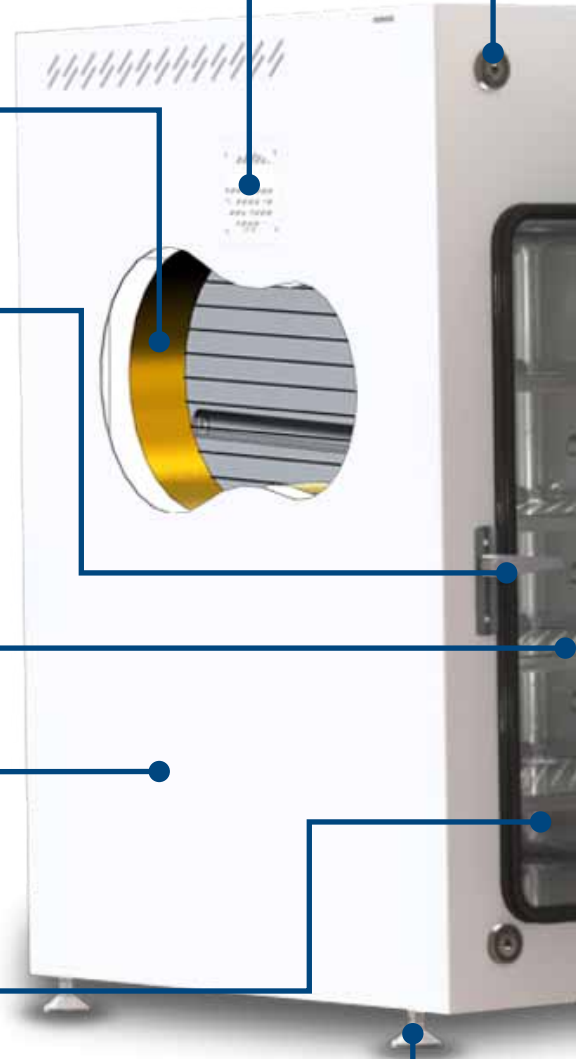
## WATER PAN (Standard Model)

- 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, CO<sub>2</sub>, O<sub>2</sub> 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 CO<sub>2</sub> SENSOR TECHNOLOGY

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

- CARBOCAP® technology for heat durability and long term stability.
- CO<sub>2</sub> 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 <sup>2</sup> Surface Area	632 pcs	796 pcs	843 pcs
Treated Flask 175 cm <sup>2</sup> 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

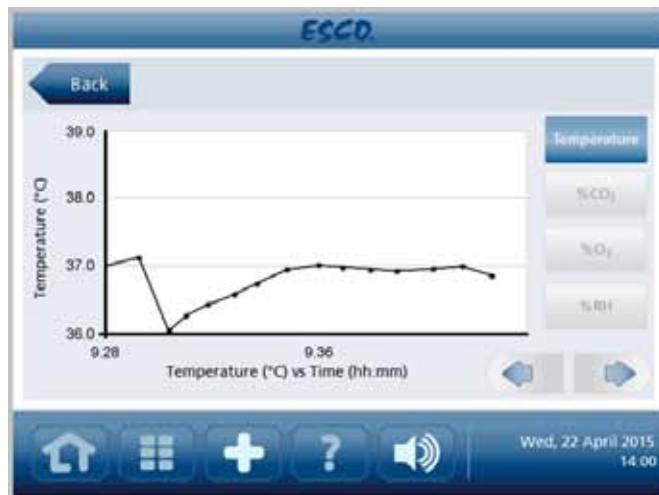


Home Screen





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



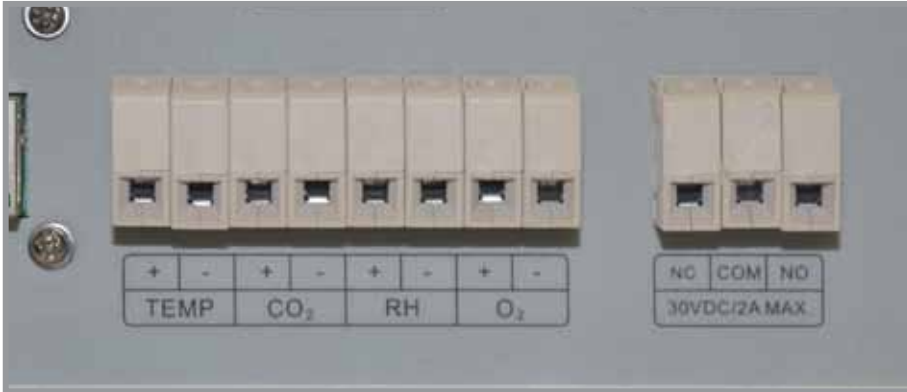
USB Write Screen

## 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 CO<sub>2</sub> alarms. The alarm contacts can be connected to a remote alarm system.



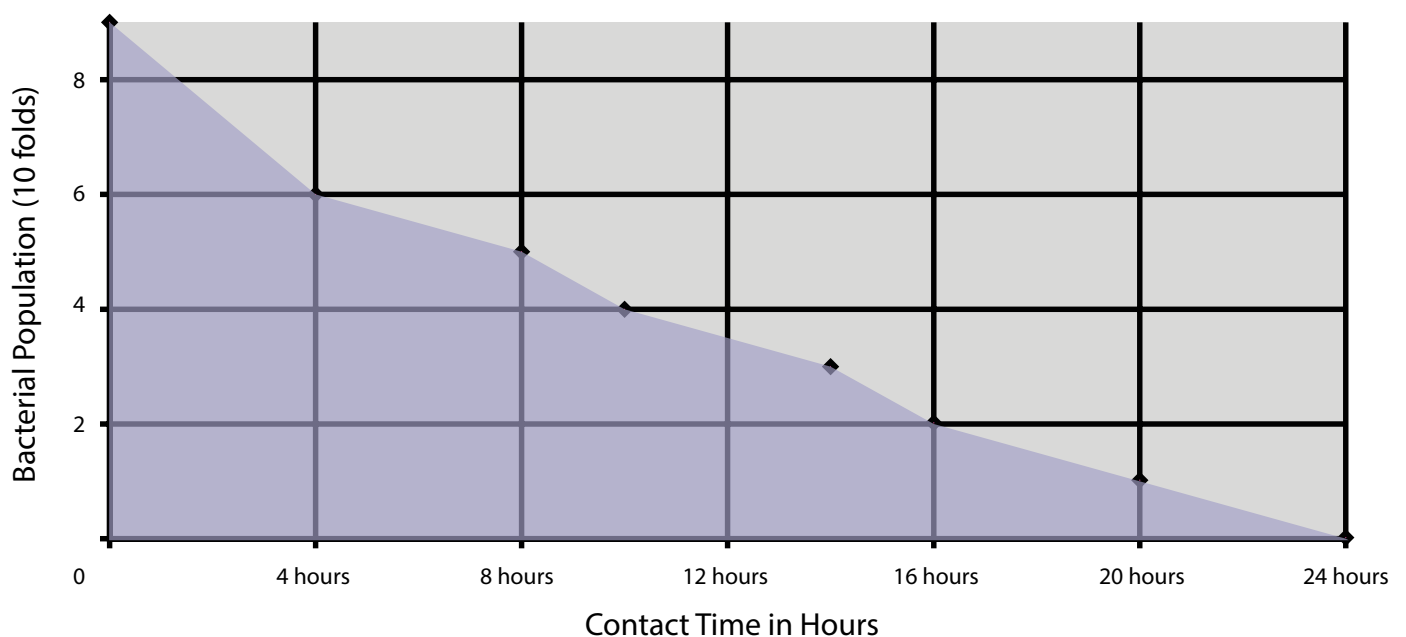
Analog Output and Alarm Contacts

# 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.

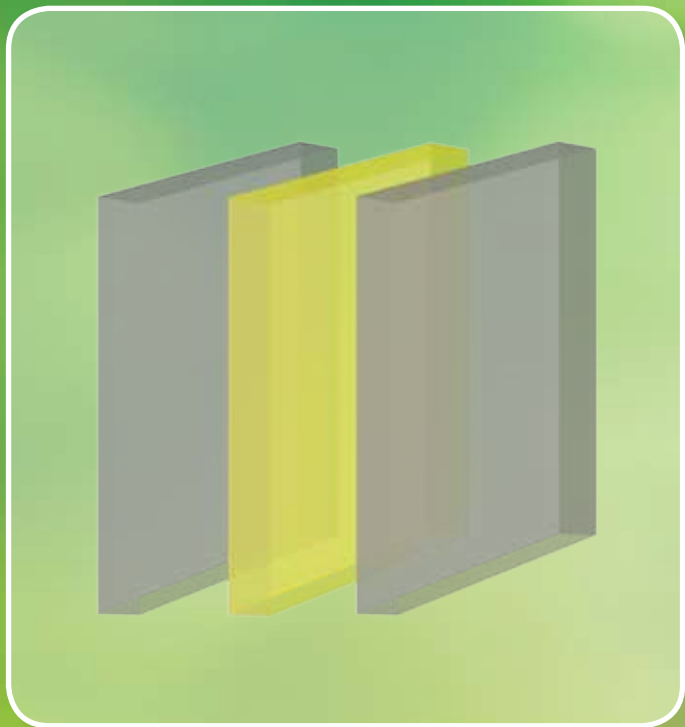
## ISOCIDE® ANTI-MICROBIAL COATING



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 CO<sub>2</sub> Incubator with Single Insulation  
Heat Emission Value: Aproximately 42 W/sec  
Energy Consumption: 150 kWh



CelSafe® CO<sub>2</sub> Incubator with Double Insulation  
Heat Emission Value: Aproximately 39 W/sec  
Energy Consumption: 142 kWh

# One with nature.

Esco builds eco-friendly products.



# ACTIVE HUMIDIFICATION SYSTEM

## Flexibility on your CelSafe® CO<sub>2</sub> Incubator

- In order to provide optimal environmental conditions for cell growth that requires specific relative humidity, the CelSafe® CO<sub>2</sub> 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 O<sub>2</sub> MODEL

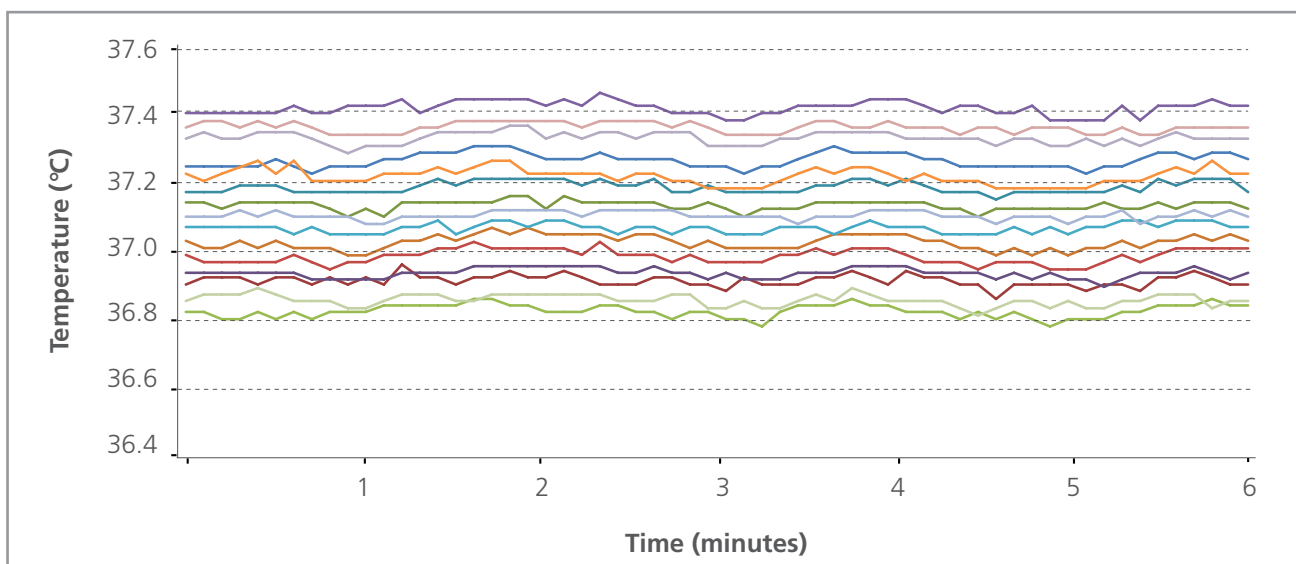
## O<sub>2</sub> REQUIREMENT FOR SPECIALIZED APPLICATIONS

- Esco CelSafe® CO<sub>2</sub> incubators with suppressed O<sub>2</sub> provide accurate environmental control inside the incubator chamber. Oxygen levels are controlled through precise introduction of nitrogen into the incubator culturing system.
- Esco Celsafe® CO<sub>2</sub> incubator with suppressed O<sub>2</sub> has an optional nitrogen gas switching system in order to install two nitrogen gas tanks. Making sure you will not run out of N<sub>2</sub> gas.
- New Zirconium type O<sub>2</sub> Sensor provides faster response time and more reliable than Galvanic type O<sub>2</sub> Sensor.

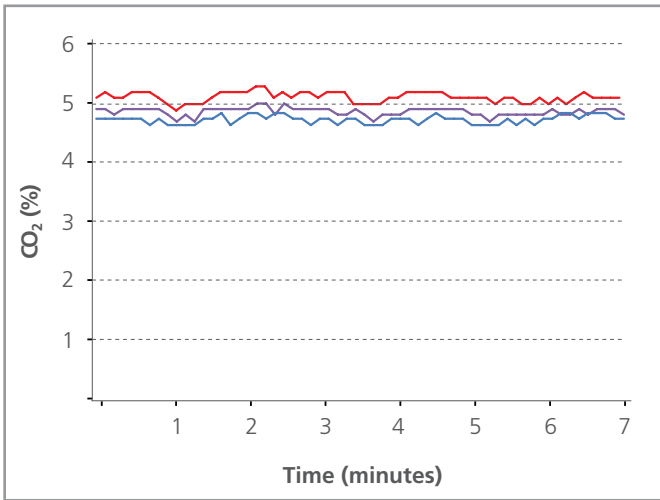
# SUPERIOR PERFORMANCE

## PRECISE PARAMETER CONTROL

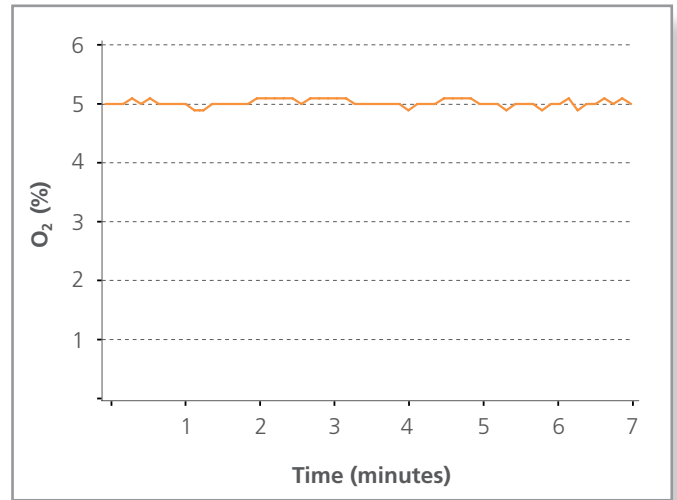
- Uniformity test measures the difference between the coldest spot and warmest spot in the chamber when the CO<sub>2</sub> incubator is operating at set temperature.
- Esco Celsafe® CO<sub>2</sub> incubator has excellent uniformity under normal operating condition.



Temperature Uniformity Graph at 37°C



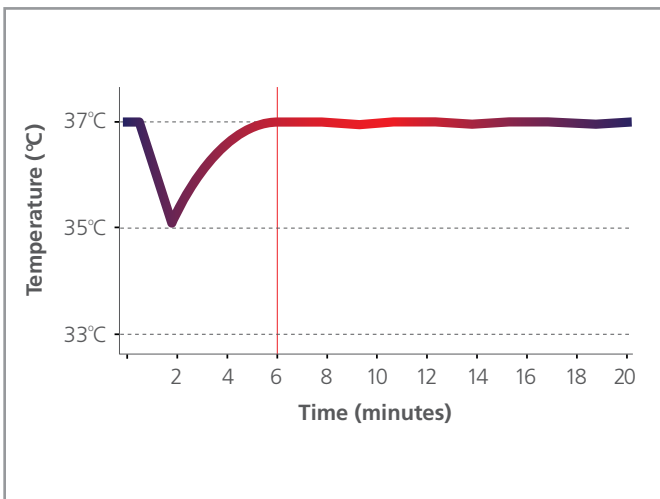
CO<sub>2</sub> Uniformity / Stability at 5% CO<sub>2</sub> concentration Graph



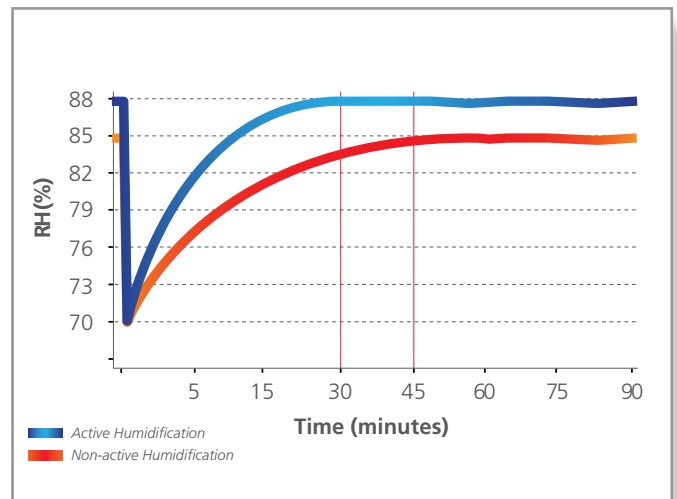
O<sub>2</sub> Fluctuation at 5% O<sub>2</sub> concentration Graph (for Suppressed O<sub>2</sub> model)

### FAST TEMPERATURE, O<sub>2</sub>, CO<sub>2</sub> HUMIDITY RECOVERY TIME AFTER DOOR OPENING

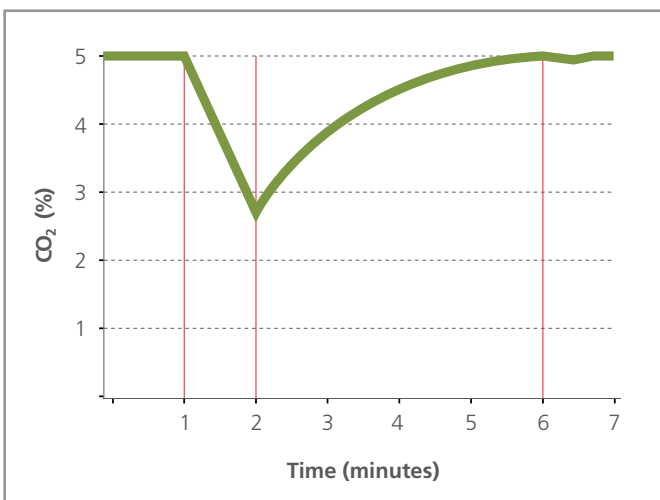
- Esco CelSafe® recovers temperature, %CO<sub>2</sub>, %O<sub>2</sub> and %RH in minutes following a 30-second door opening. Fast recovery of %CO<sub>2</sub>, %O<sub>2</sub> and %RH ensures integrity of the growth of the samples.



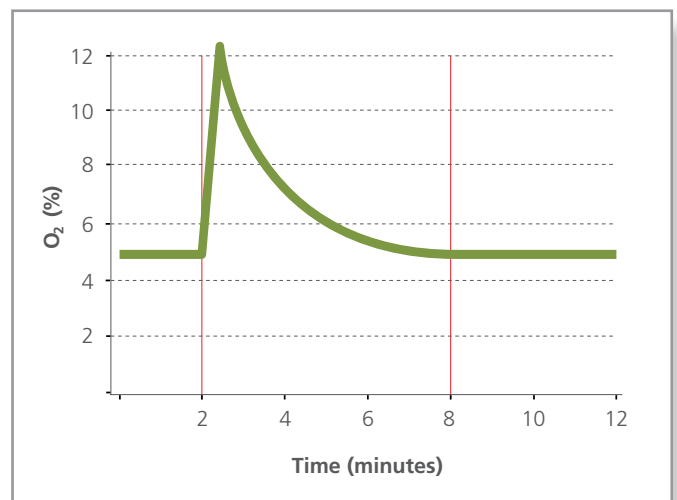
Temperature Recovery Graph



Humidity Recovery Graph



CO<sub>2</sub> Recovery graph

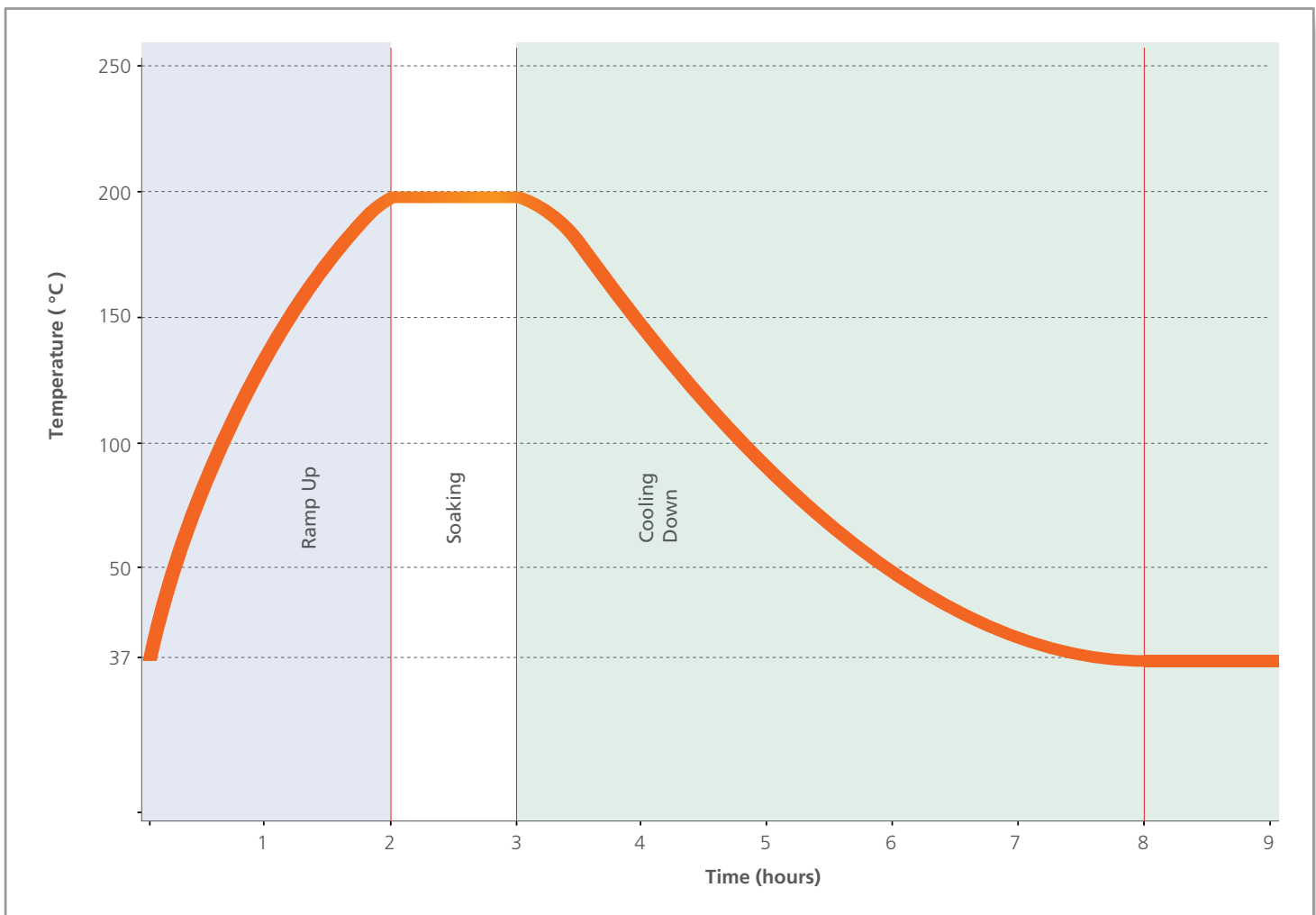


O<sub>2</sub> Recovery graph (for Suppressed O<sub>2</sub>)

# EFFECTIVENESS OF STERILIZATION CYCLE

- The Esco CelSafe® CO<sub>2</sub> 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

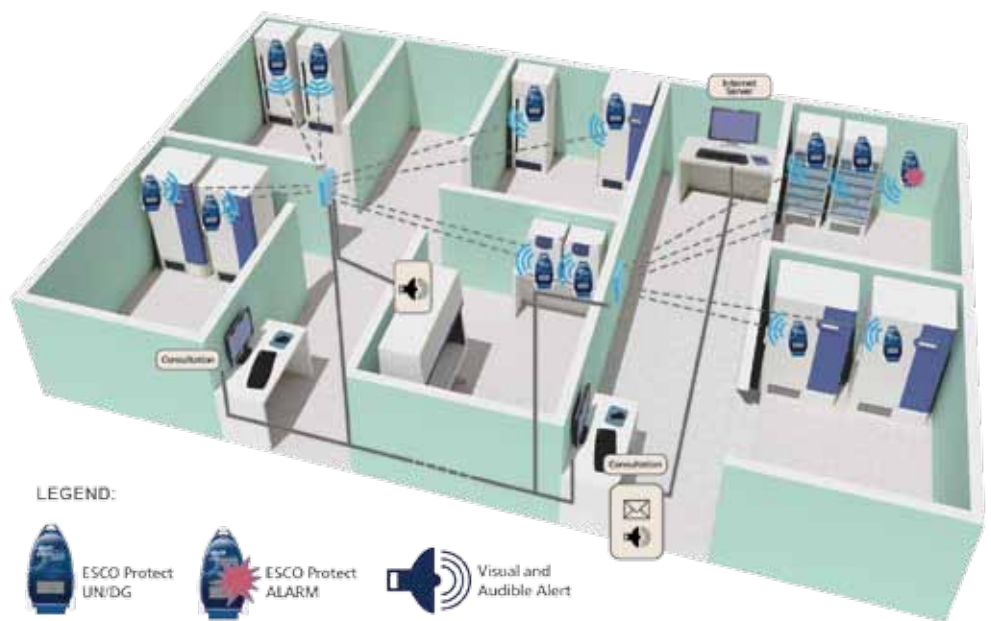
- Lexicon® II - Ultra-low Temperature Freezer
- CelCulture® - CO<sub>2</sub> Incubator (CCL)
- CelMate® - CO<sub>2</sub> Incubator (CLM)
- Isotherm® - Forced Convection Oven (OFA)
- Isotherm® - Forced Convection Incubator (IFA)
- Isotherm® - Low Temperature Incubator (IFC)
- OrbiCult™ - Laboratory Shakers



### PROtect®

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

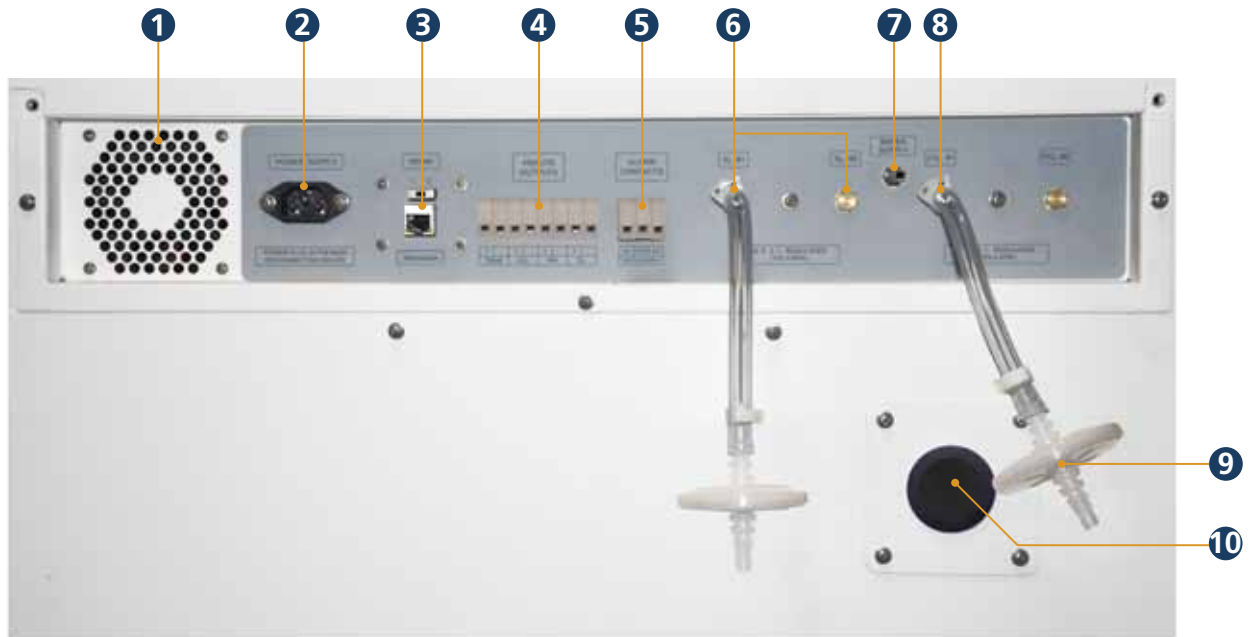
CFR-21 Compliant Software



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, CO<sub>2</sub>/O<sub>2</sub> 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 CO<sub>2</sub> alarms. The alarm contacts can be connected to a remote alarm system.



## 6 N<sub>2</sub> Gas Supply Inlet (for Suppressed O<sub>2</sub> model)

The N<sub>2</sub> gas supply inlet is only applicable for models with N<sub>2</sub> 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 CO<sub>2</sub> Gas Supply Inlet

The CO<sub>2</sub> gas supply inlet connects the CO<sub>2</sub> 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 <sub>2</sub> Control, High Heat Sterilization, 230 VAC, 50/60 Hz
CLS-170-B-9 (2170188)	CelSafe® Incubator, 170 L, IR Sensor, CO <sub>2</sub> 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 <sub>2</sub> Control, High Heat Sterilization, Active Humidification, 230 VAC, 50/60 Hz
CLS-170-B-9-RH (2170194)	CelSafe® Incubator, 170 L, IR Sensor, CO <sub>2</sub> Control, High Heat Sterilization, Active Humidification, 115 VAC, 50/60 Hz

## SUPPRESSED O<sub>2</sub> MODEL WITH STAINLESS STEEL CHAMBER

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

## SUPPRESSED O<sub>2</sub> MODEL WITH STAINLESS STEEL CHAMBER AND ACTIVE HUMIDIFICATION

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

# OPTIONS AND ACCESSORIES



## COA-1002 / COA-1002-F CO<sub>2</sub> Backup

This option allows two tanks of CO<sub>2</sub> 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 N<sub>2</sub> Back-up

This option allows two tanks of N<sub>2</sub> 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® CO<sub>2</sub> 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-2005-F 2-Stage Gas Regulator for CO<sub>2</sub>/N<sub>2</sub>

CO<sub>2</sub> and N<sub>2</sub> 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-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-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-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-2037-F Extra Shelf

Each CelSafe® CO<sub>2</sub> 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 CO<sub>2</sub> Analyzer, for CO<sub>2</sub> / Temp Measurement

## COA-2016-F Electronic CO<sub>2</sub> + O<sub>2</sub> Analyzer, for CO<sub>2</sub> / O<sub>2</sub> / Temp Measurement

## COA-2017-F Electronic CO<sub>2</sub> + O<sub>2</sub> + RH Analyzer, for CO<sub>2</sub> / O<sub>2</sub> / RH / Temp Measurement

The Electronic Analyzer allows the measurement of CO<sub>2</sub> concentration, O<sub>2</sub> 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, CO<sub>2</sub> incubators, ultra-low temperature freezers, and laboratory shakers.

### ACCESSORIES FOR CO<sub>2</sub> INCUBATOR, MODEL CLS-170\_ \_

Item Code	Options and Accessories	Description	Unit of Measurement
5170472	COA-1002	Option, CO <sub>2</sub> Backup (Tank Switcher), Factory-installed	UT
5170473	COA-1002-F	Option, CO <sub>2</sub> 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 <sub>2</sub> Backup (Tank Switcher), Factory Installed	UT
5170491	COA-1007-F	Option, N <sub>2</sub> 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 <sub>2</sub> / N <sub>2</sub>	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 <sub>2</sub> Analyzer (Worldwide), for CO <sub>2</sub> / Temp Measurement (with Temperature Probe)	UT
5170397	COA-2016-F	Accessory, Electronic CO <sub>2</sub> Analyzer (Worldwide), for CO <sub>2</sub> / O <sub>2</sub> / Temp Measurement (with Temperature Probe)	UT
5170398	COA-2017-F	Accessory, Electronic CO <sub>2</sub> Analyzer (Worldwide), for CO <sub>2</sub> / O <sub>2</sub> / 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

<b>GENERAL SPECIFICATIONS</b>		<b>CLS-170_-_-</b>
<b>CelSafe® CO<sub>2</sub> INCUBATORS</b>		
<b>TEMPERATURE</b>		
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	
<b>CO<sub>2</sub></b>		
CO <sub>2</sub> Control System	Microprocessor PID	
CO <sub>2</sub> Range, % CO <sub>2</sub>	0-20	
CO <sub>2</sub> Accuracy, % CO <sub>2</sub>	0.1	
CO <sub>2</sub> Fluctuation, % CO <sub>2</sub>	± 0.2	
CO <sub>2</sub> Sensor	Infrared (IR) Sensor* (with Temperature and Pressure Compensation)	
CO <sub>2</sub> Recovery Time*** (after 30 seconds door opening), minutes	Standard Unit: 4	
<b>O<sub>2</sub> SPECS (FOR SUPPRESSED O<sub>2</sub> MODEL )</b>		
O <sub>2</sub> Control System	Microprocessor PID	
O <sub>2</sub> Range, % O <sub>2</sub>	1-20.7%	
O <sub>2</sub> Accuracy, % O <sub>2</sub>	0.1	
O <sub>2</sub> Fluctuation, % O <sub>2</sub>	± 0.2	
O <sub>2</sub> Sensor	Zirconium (Solid)	
O <sub>2</sub> Recovery Time**** (after 30 seconds door opening), minutes	At 5.0% O <sub>2</sub> volume: 8	
<b>HUMIDITY</b>		
Humidification Method	Natural Humidification Active Humidification (Optional)	
Humidity Range*****	Natural Humidification: 85% - 90% Active Humidification (Optional): 90% - 95%	
<b>PHYSICAL CONSTRUCTION</b>		
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	
<b>CONTAMINATION CONTROL</b>		
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 CO<sub>2</sub> not exceeding 5.2%

\*\*\*\* For O<sub>2</sub> not exceeding 5.2%

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

# Advanced Cell Culture with Esco CO<sub>2</sub> 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, 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™ is a single-use packed bed bioreactor that has linear scalability from bench-scale to production scale with automated cell harvesting.



### CelCradle™ Features:

- Stainless Steel 304L BA CelCradle™ Stage capable of operating 4 CelCradle™ bottles simultaneously and compatible with a CO<sub>2</sub> incubator.
- Pre-sterilized, ready-to-use, disposable
- Low shear stress, foam-free, no O<sub>2</sub> limitation
- Large surface area: one CelCradle™ bottle has a specific surface area of 15,000 cm<sup>2</sup>, comparable to 18-20 roller bottles.
- Compact design: fits in 6 ft<sup>3</sup> CO<sub>2</sub> incubator
- Capacity to produce hundreds of milligrams to several grams of secreted proteins or monoclonal antibodies per month in four bottles
- Few parameters for easy optimization
- Choice of batch, fed-batch, or perfusion culture modes
- Compatible with most serum-free media
- Specially treated carrier surface to grow most anchorage-dependent cells and allow easy harvest of whole cells, cell components or secreted proteins
- Easy scale-up by multiplying bottles or using TideCell® bioreactor system

### Applications:

- Mammalian and insect cell culture
- Monoclonal antibody production
- Drug discovery
- Gene and cell therapy
- Protein and virus production
- Proteome research
- Pharmacokinetics study

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

Simple to operate - virtually no leaning curve

Controller - adjusts nutrient and gas exchange of the bottle

Magnetized controller enables convenient positioning by attaching on the outside surface of the incubator.



0.22 um ventilation filter is provided in the cap

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

Sampling Port enables aseptic removal of BionNOC™ II carries for cell counting

Retaining ring locks bottles into place in the CelCradle® Stage console Collapsible bellows

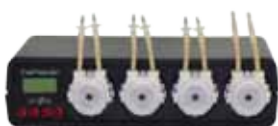
## DISPOSABLE CELCRADLE™ BOTTLES

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 to achieve 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 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.



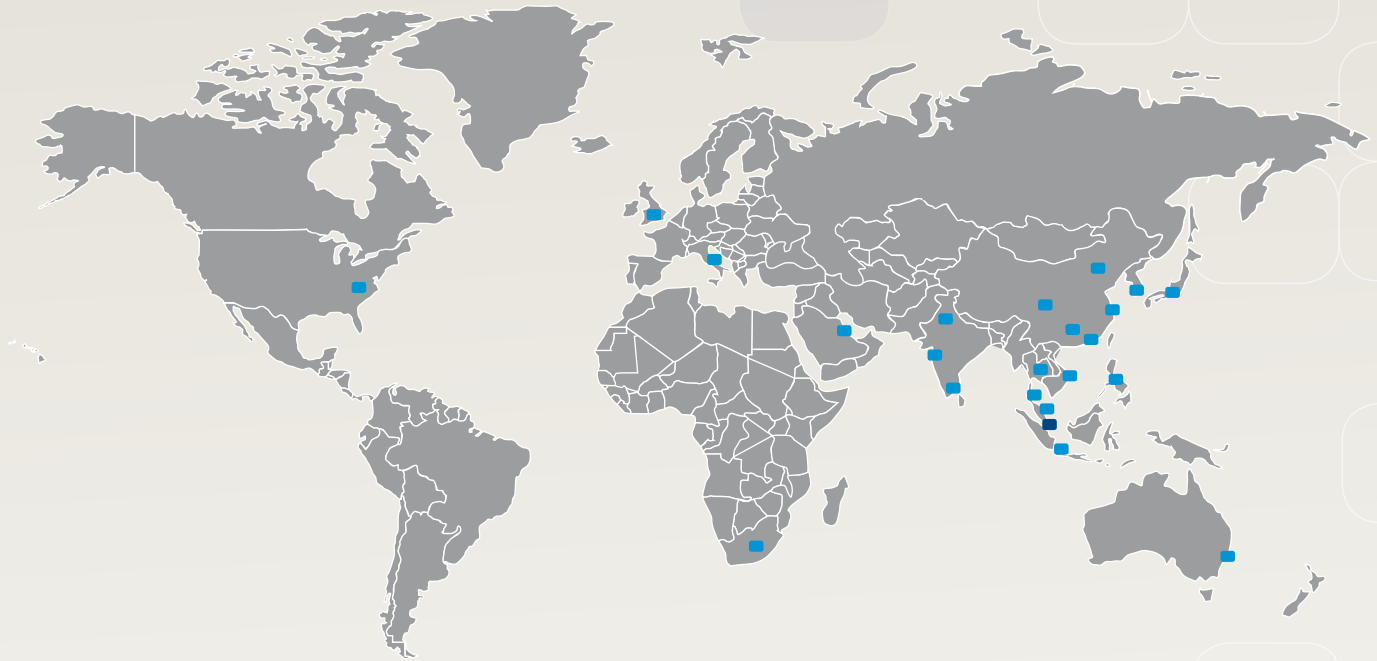
### Crystal Violet Dye Nucleus Count Kit

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/bt
GlucCell® Glucose Test Strip	1400010	2 x Glucose Test Strip bts (2 x 25pcs)
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 carriers

# ESCO GLOBAL NETWORK



- ART Equipment
- Biological Safety Cabinets
- CO<sub>2</sub> 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

# ESCO.

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