

**ESCO**  
**VACCI<sup>X</sup>CELL**  
ADHERENT BIOPROCESSING SPECIALIST



Designed in  
Singapore

# CelCradle<sup>®</sup>

## Cradle for High Cell Density



**ESCO**<sup>®</sup>  
Healthcare



## The Cradle for Your Cells

CelCradle® is a cost-effective, single-use, benchtop bioreactor system capable of supporting high density culture of anchorage-dependent or adherent cells. It is a ready-to-use, packed-bed bioreactor system that has linear scalability from laboratory scale to production scale, complete with automated cell harvesting system.

The CelCradle® operates through the Tide Motion principle wherein cells, attached to BioNOC II® carriers, are alternately exposed to aeration and nutrition via the decompression and compression of the bellows holding the culture medium. The gentle vertical oscillation of the culture medium creates a dynamic interface between air and culture medium on the surface of the cells, providing the cells with an environment that is of extremely low shear stress, high aeration and nutrition levels, zero foaming, and no O<sub>2</sub> limitation. This efficient nutrient and oxygen transfer allow the CelCradle® system to produce high cell density and yield.

### Applications

The CelCradle® can be used in many different applications, as exhibited by journal articles (see literature report on page 5). These include the following applications:

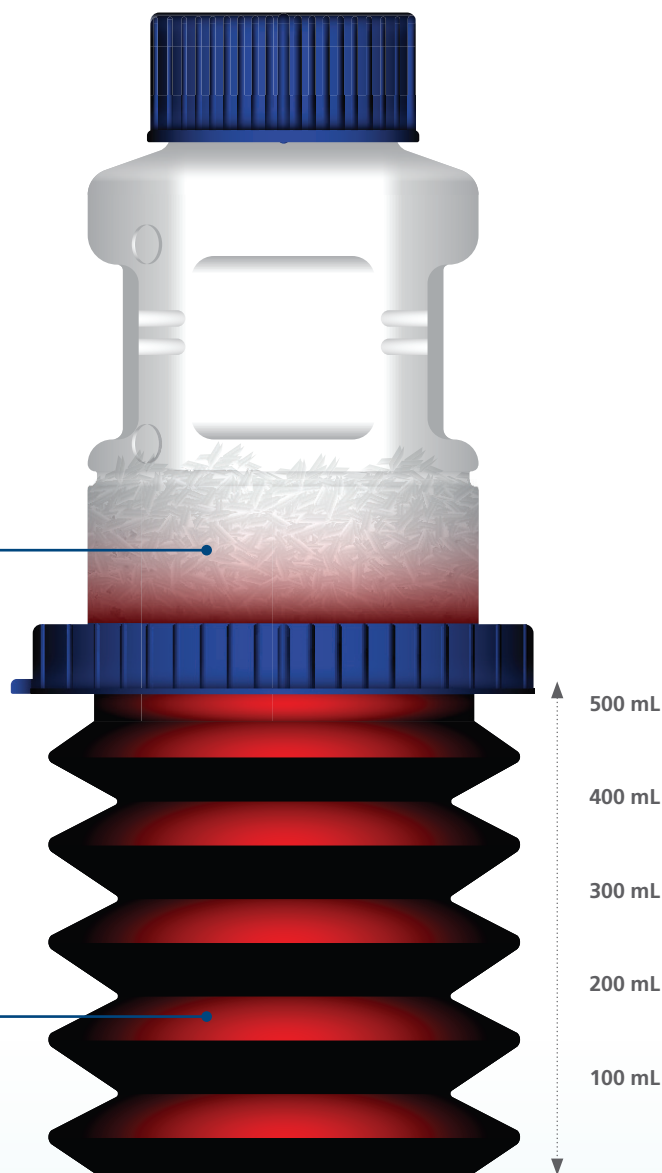
- Culture of anchorage-dependent or adherent cells
- Conversion from roller bottles to single-use, closed system
- Overcome limitations of microcarrier-stirred tank bioreactor technology
- Autologous and allogeneic cell therapy
- Human and animal vaccines

#### 5.5 grams of BioNOC II® (standard)

- Serves as the packed bed where cells adhere to and stabilize within the culture vessel
  - Enhanced biocompatibility
  - Long-lasting hydrophilicity (negatively charged surface for coating)
  - High porosity
  - BioMESH®: Extremely low lint
  - BioNOC II®: Reduced lint compared with other macroporous carriers.
  - Excellent mechanical strength

#### Media reservoir

- 500 mL culture medium containing compartment



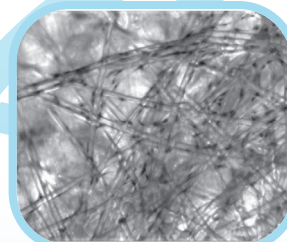
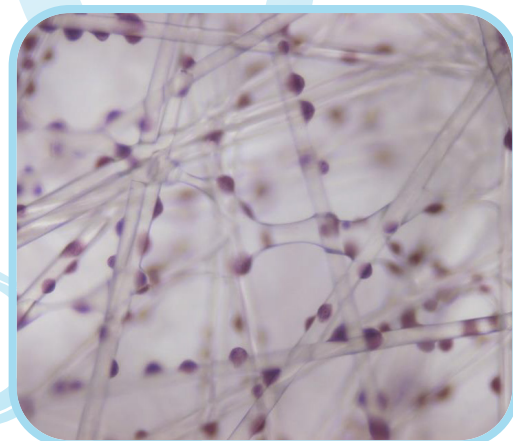
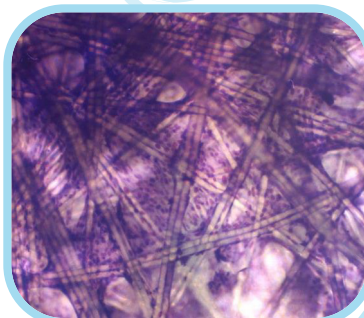
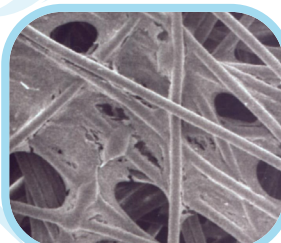
Dimension: 480 x 300 x 140 mm  
Weight: 156~175 g with different models

## Key Features

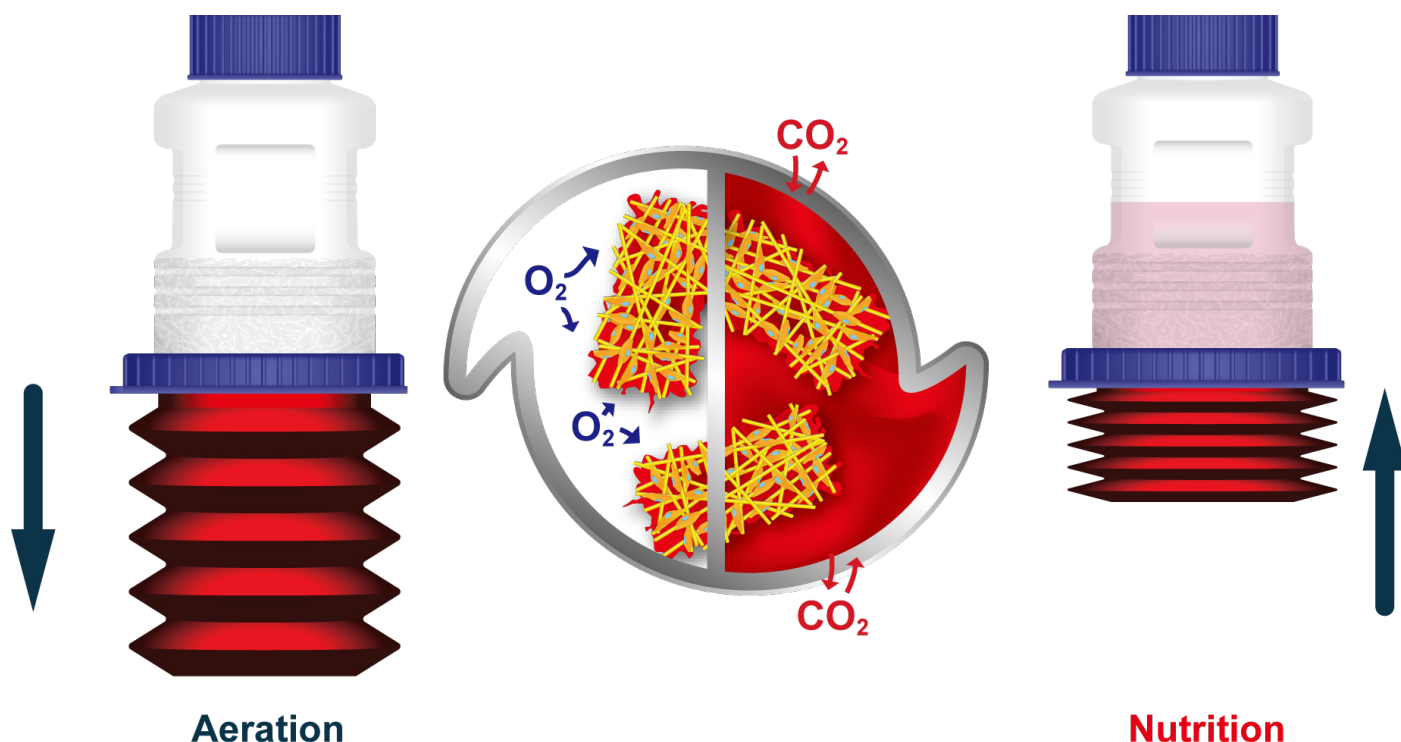
- Single-use, pre-sterilized, and ready-to-use bottles
- Compact and small footprint (standard system fits inside a 170 L or 6 ft<sup>3</sup> CO<sub>2</sub> incubator)
- Compatible with most serum-free culture medium
- Harvest whole cells or cell components
- Linear scale-up by direct multiplication of bottles or the use of TideXcell®
- Reduced labor, costs, and space requirements
- Large surface area for cell attachment and growth
- Available in batch, fed-batch, and recirculation modes

## Established Cell Lines

- |          |                                                            |
|----------|------------------------------------------------------------|
| ☑ VERO   | ☑ MRC 5                                                    |
| ☑ MDCK   | ☑ WI 38                                                    |
| ☑ SF-9   | ☑ Marc 145                                                 |
| ☑ SF-21  | ☑ Chick embryonic fibroblast (CEF)                         |
| ☑ rCHO   | ☑ Hybridoma                                                |
| ☑ HEK293 | ☑ Human bone marrow-derived mesenchymal stem cells (hMSCs) |
| ☑ C2C12  |                                                            |
| ☑ Hela   |                                                            |
| ☑ MDBK   |                                                            |



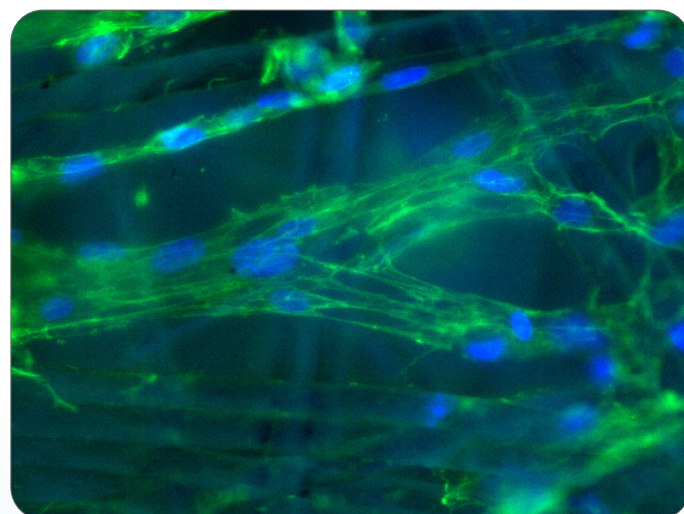
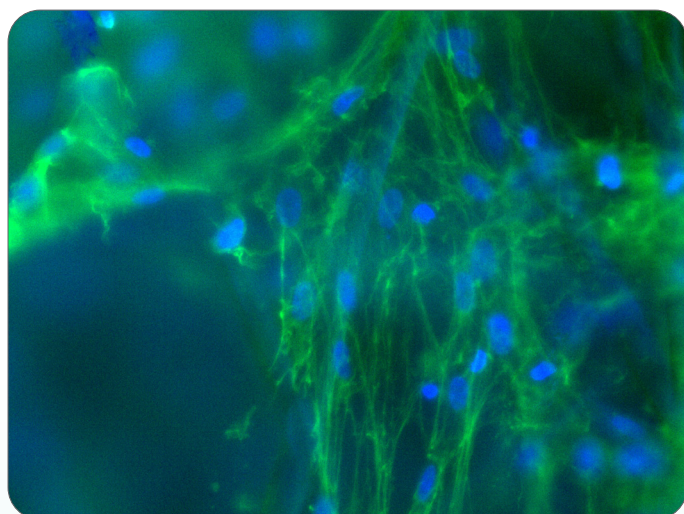
## The Tide Motion Principle



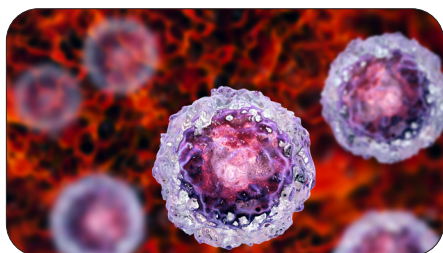
### Anchorage-dependent Cell Culture

- One CelCradle® bottle pre-packed with 5.5 grams of BioNOC II® provides up to 15,000 cm<sup>2</sup>/bottle of surface area for cell attachment and growth. The carriers are proven to have enhanced biocompatibility, long-lasting hydrophilicity, extremely low lint waste, and excellent mechanical strength.

*Note: surface area may vary depending on the cell line to be cultured.*



FDA and Hoescht 33342-stained cells attached to the BioNOC II® carriers



## Autologous and Allogeneic Cell Therapy

Cell Therapy involves the use of live whole cells and cultivating them to a certain density prior to administration for treating diseases. A commonly used cell type in cell therapy is mesenchymal stem cells, which are anchorage-dependent. Currently, cultivation of cells for cell therapy is done using T-flasks; however this method is quite laborious, time and space consuming. T-flasks have limited surface area for growth and thus, require handling of several hundred T-flasks and multiple passaging. The CelCradle® system's large surface area and compact design help solve these problems, with a single CelCradle® bottle equalling the productivity of several hundred T-flasks.

## Human and Animal Vaccine

Cell culture-based vaccine production is the current trend in vaccine production as it offers several advantages over traditional vaccine production technologies including simpler mass production, rapid manufacturing, independent of SPF animal, controllable quality, and hypoallergenic products.

The CelCradle® is an ideal system for laboratory-scale, cell-culture based vaccine production as it is capable of supporting high cell density culture, production of high viral titer, and linear scalability to production level. The Tide Motion bioreactor system has been used for the research and development, and production of vaccines for several indications including:

- Influenza
- JEV
- COVID-19
- Hog Cholera
- Hepatitis A
- EV71
- Rabies
- IBDV



Apart from these, the CelCradle® has also been used for other applications including recombinant protein production, pharmacokinetic studies, and cellular component production. Details of these applications can be found from literature support.

## Literature Support

The following are some of the available literature support online for the various applications of the CelCradle® system.

- [1] Asaoka, Y., Tanaka, T., Tsumoto, K., Tomita, M., & Ide, T. (n.d.). Efficient expression of recombinant soluble human FcγRI in mammalian cells and its characterization. *Protein Expression and Purification*, 155-161.
- [2] Brown, A., Singer, D., Mcsharry, J., Barnard, R., Hazuda, D., & Drusano, G. (n.d.). In Vitro Dose Ranging Studies for Serine Protease Inhibitor, MK-4519, Against a Hepatitis C Virus (HCV) Replicon using the BelloCell System. *Antiviral Research*.
- [3] Chen, Y., Wu, J., Wang, K., Chiang, Y., Lai, C., Chung, Y., & Hu, Y. (n.d.). Baculovirus-mediated production of HDV-like particles in BHK cells using a novel oscillating bioreactor. *Journal of Biotechnology*, 135-147.
- [4] Drugmand, J., J.-F., J., Agathos, S., & Schneider, Y. (n.d.). Growth of Mammalian and Lepidopteran Cells on BioNOC II® Disks, a Novel Macroporous Microcarrier. *Cell Technology for Cell Products*, 781-784.
- [5] Hammonds, J., Chen, X., Zhang, X., Lee, F., & Spearman, P. (n.d.). Advances in methods for the production, purification, and characterization of HIV-1 Gag-Env pseudovirion vaccines. *Vaccine*, 8036-8048.
- [6] Ho, L., Greene, C., Schmidt, A., & Huang, L. (n.d.). Cultivation of HEK 293 cell line and production of a member of the superfamily of G-protein coupled receptors for drug discovery applications using a highly efficient novel bioreactor. *Cytotechnology*, 117-123.
- [7] Hu, Y., Lu, J., & Chung, Y. (n.d.). High-density cultivation of insect cells and production of recombinant baculovirus using a novel oscillating bioreactor. *Cytotechnology*, 145-153.
- [8] Huang, K., Lo, W., Chung, Y., Lai, Y., Chen, C., Chou, S., & Hu, Y. (n.d.). Combination of Baculovirus-Mediated Gene Delivery and Packed-Bed Reactor for Scalable Production of Adeno-Associated Virus. *Human Gene Therapy*, 1161-1170.
- [9] Lu, J., Chung, Y., Chan, Z., & Hu, Y. (n.d.). A Novel Oscillating Bioreactor BelloCell: Implications for Insect Cell Culture and Recombinant Protein Production. *Biotechnology Letters Biotechnol Lett*, 1059-1065.
- [10] Mcsharry, J., Singer, D., Kulawy, R., Brown, A., & Drusano, G. (n.d.). Use of the BelloCell System to Determine the Optimal Dose of Ribavirin to Inhibit the Expression of an HCV Replicon in 2209-23 Cells. *Antiviral Research*.
- [11] Toriniwa, H., & Komiya, T. (n.d.). Japanese encephalitis virus production in Vero cells with serum-free medium using a novel oscillating bioreactor. *Biologicals*, 221-226.

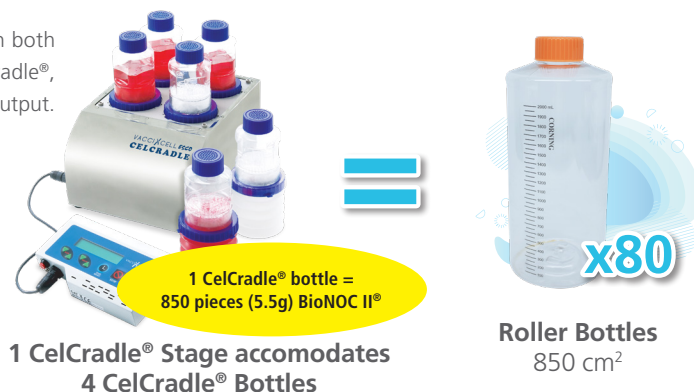
## Conversion From Roller Bottle to Single-use, Closed System Cell Culture

The roller bottle system plays a major role in cell culture-based vaccine production as it is easy to operate, has a simple scale-up method, observable cell growth and cytopathic effect (CPE), and limited contamination. However, the system has many limitations including intensive labor, large space requirement, high running costs, and low efficiency of culture medium utilization.

In principle, the roller bottle system is very similar to CelCradle® system. In both systems, cells are alternately exposed to aeration and nutrition. The CelCradle®, however, can overcome the limitations of the roller system while improving output.

The advantages of the CelCradle® system over the roller bottle include:

- One CelCradle® system is equivalent to eighty (80) roller bottles
- Reduced labor and space requirements
- More controllable
- Reduced contamination risks
- Cell harvest in a closed system
- More efficient use of culture medium
- Higher cell density and viral titer



## CelCradle® System Complete

CelCradle® System is simple to operate and virtually no learning curve. CelCradle® 500A bottle is placed in the CelCradle® unit stage for batch and semi-batch operation where process components are easily traceable.

### Filtered Cap

0.22 µm ventilation filter provided in the cap



### CelCradle® Stage

Stainless Steel 304 L Carcass that can hold up to 4 CelCradle® bottles.

### Controller

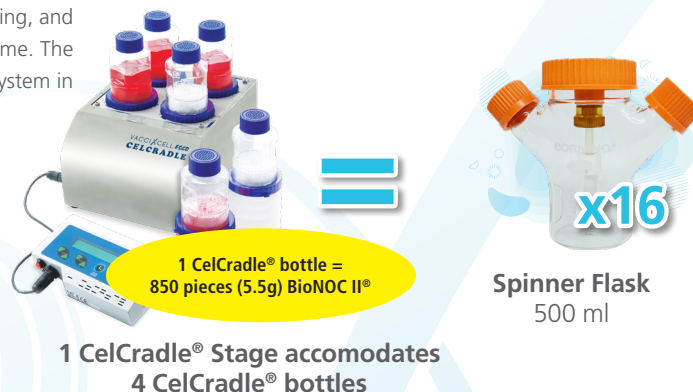
Magnetized back for convenient positioning on the side or on the front of a CO<sub>2</sub> Incubator.

Place inside a 170 L or 6 ft<sup>3</sup> CO<sub>2</sub> incubator

## Overcome limitations of microcarrier-stirred tank bioreactor technology

Another technology used for the culture of adherent cells is the use of microcarriers, specially-treated micro-beads where cells attach to and grow on. The microcarriers are suspended in culture medium in stirred tank bioreactors where the medium is continuously agitated and parameters are automatically monitored and controlled. The microcarrier technology, however, has several disadvantages including reduced cell attachment efficiency, shear stress, foaming, and lack of linear scalability, all of which the CelCradle® system are able to overcome. The CelCradle® system also has improved features compared to the microcarrier system in terms of the following:

- Viral titer and cell density
- Cell harvest efficiency
- Culture medium usage efficiency



### BioNOC II® (packed bed)

Cells remain entrapped in the carriers simplifying media replacement and product harvesting.

### Compressible Bellows

Compresses for nutrition and decompresses for aeration.

## CelCradle® Continuous System Complete

Same CelCradle® unit stage but utilizes CelCradle® 500AP bottle for recirculation/continuous processes.

Each CelCradle® System accomodates up to four single-use bottles, making this an ideal screening device to test varying medium formulations or cell lines.

No steam or water lines, autoclave or utilities required, just a power outlet and CO<sub>2</sub> incubator

Fits in a 240 L or 8.5 ft<sup>3</sup> CO<sub>2</sub> incubator

### CelCradle® Stage

Stainless Steel 304 L Carcass that can hold up to 4 CelCradle® bottles.

Place inside a  
240 L or 8.5 ft<sup>3</sup>  
CO<sub>2</sub> incubator

|                                                 |                                                                                                                                      |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Dimension                                       | 264 (W) x 359 (L) x 170 (H) mm<br>(10.4 x 14 x 6.7 inches)                                                                           |
| Weight                                          | 7.0 kg (15.4 lbs)                                                                                                                    |
| Power                                           | 100~230 VOLTS AC, 50/60 Hz (Input);<br>12 VOLTZ DC (Output)                                                                          |
| Up-Down Rate                                    | 0.25 to 2.0 mm/sec.<br>Step of 1.0 sec or 1.0 min.                                                                                   |
| Delay Time                                      | 0 to 99 min 59 sec<br>Step of 1.0 sec or 1.0 min.                                                                                    |
| Driver Motor                                    | DC stepping-motor                                                                                                                    |
| Environment                                     | 20~42 °C, 0~90% relative humidity<br>(in a CO <sub>2</sub> incubator)                                                                |
| Mechanical Protection                           | Hi-Low Optical Sensor                                                                                                                |
| Transmission                                    | Gear set (ratio 1:1.2) and belt                                                                                                      |
| Materials                                       | Aluminum alloy, chromic steel                                                                                                        |
| Recommended CO <sub>2</sub> incubator dimension | CCL-170 L model: 505 x 535 x 633 mm<br>(19.9" x 21.1" x 24.9") and<br>CCL-240 L model: 595 x 640 x 633 mm<br>(23.4" x 25.2" x 24.9") |



### CellFeeder™

Enables four-pump operation with individual programming setting.

### Media Reservoir

Fresh culture medium bottle in either 1 L or 2 L volume.

*Note: Media reservoir bottles are NOT sold with the package. Please buy locally.*

### Tubing Complete Set (Connection Set)

Connects the media reservoir bottle to the CelCradle® bottle.

### Disposable Tubing Set and Pump Head

Replacement tubings and pump head for tubing complete set (connection set).

### Culture Medium Sampling Port

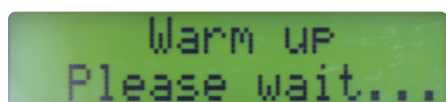
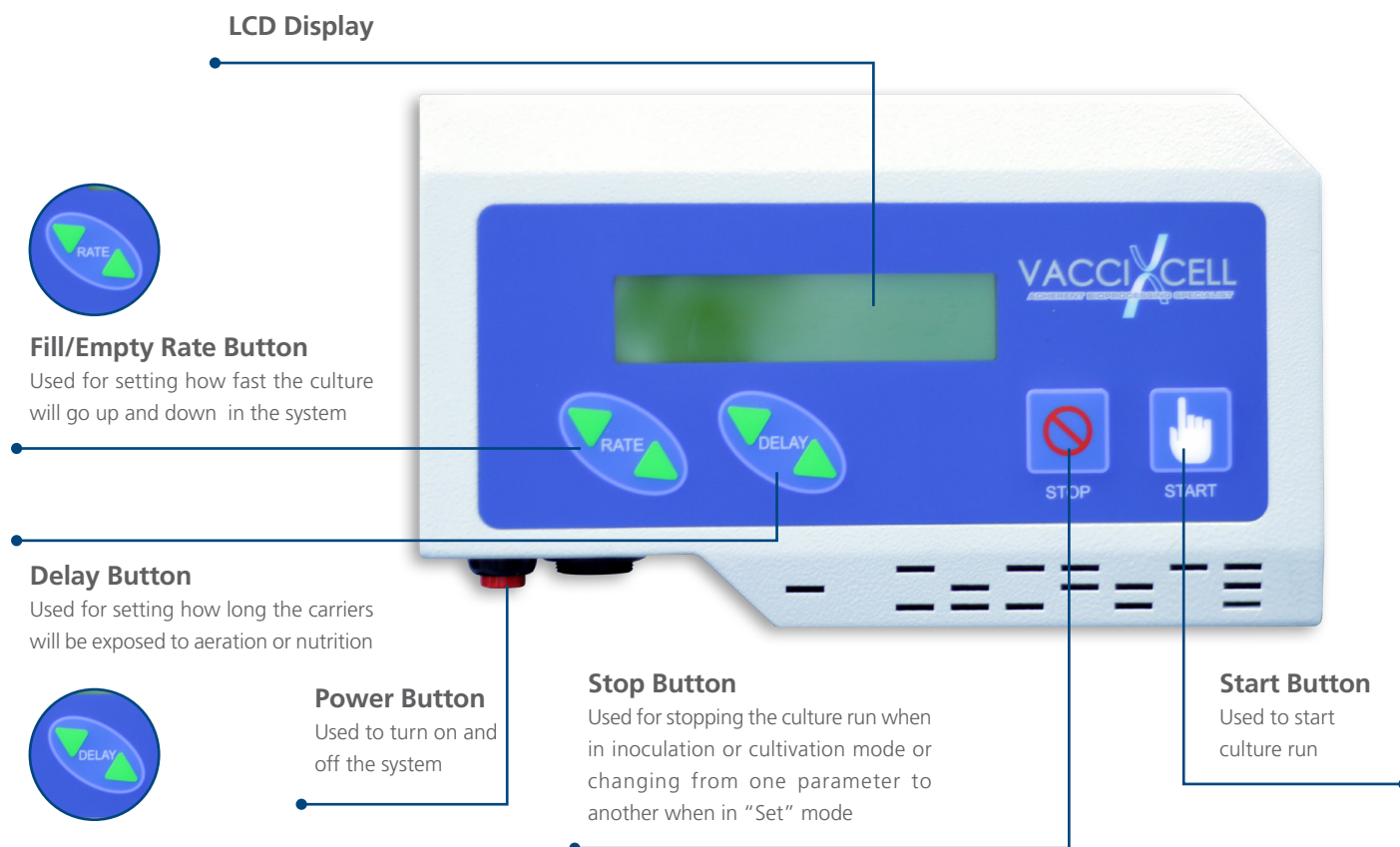
Needleless closed sampling for cell culture growth monitoring.

### Pump Head

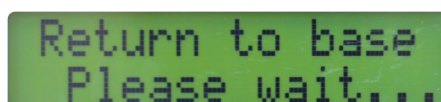
Calibration-free single-use pump head for up to three times to support consistent feeding rate.



## The Main Controller



Message displayed on screen once controller is turned on



Message that will be displayed when stage is rendered on top before opening



Display message after system has warmed up

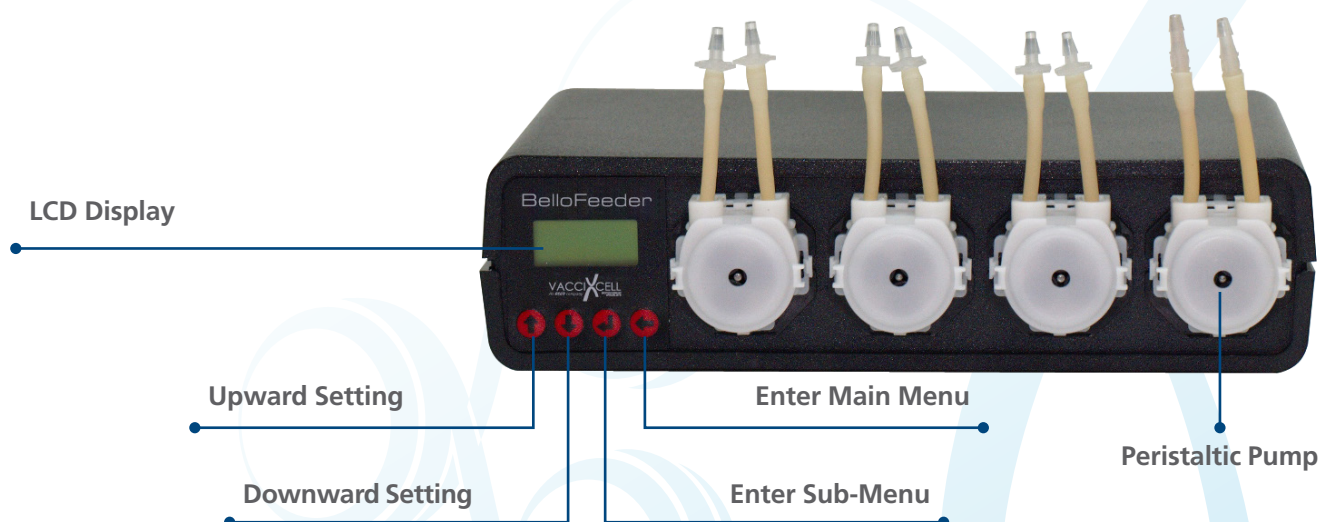


|             |                                                                           |
|-------------|---------------------------------------------------------------------------|
| Dimension   | 226 (W) x 40 (D) x 137 (L) mm<br>(5.4 x 8.9 x 1.6 inches)                 |
| Weight      | 1.16 kg (2.6 lbs)                                                         |
| Power       | 100~230 volts AC 50/60 Hz (Input) ;<br>12 volts DC (Output)               |
| Environment | Room temperature (outside CO <sub>2</sub> incubator)                      |
| Materials   | Magnetic back plate, to hold the controller to the side of the incubator. |

## The CelFeeder™

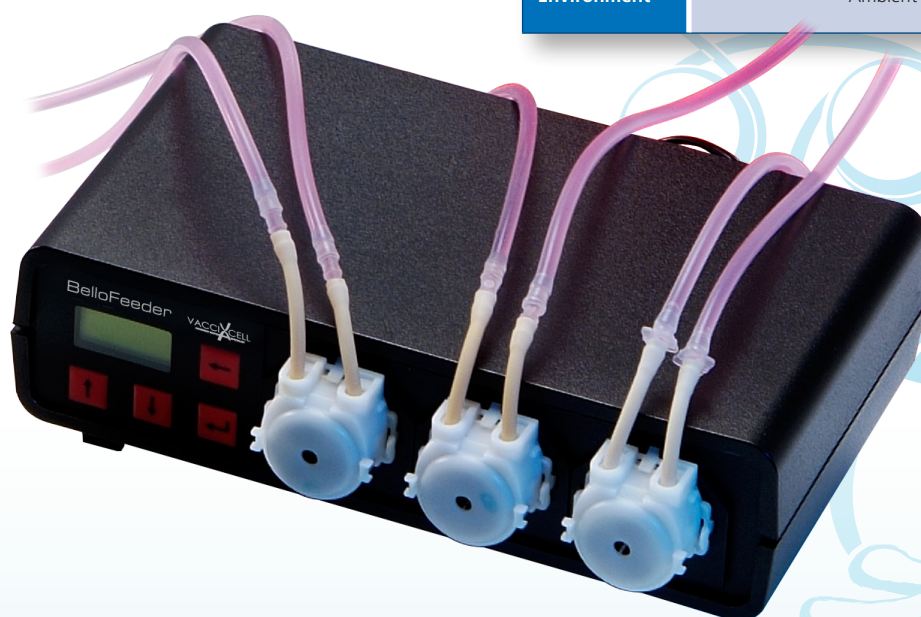
CelFeeder™ is a microprocessor-controlled pumping unit of the CelCradle® Continuous Complete or other cell culture systems.

The CelFeeder™ is designed to simplify user's operation such that daily feeding volume and frequency of the feeding are the only two parameters required. It simplifies setup work by avoiding calibration and calculation as usually needed in conventional peristaltic pumps.



- Controls four (4) peristaltic pumps individually
- Controls four (4) recirculation process of CelCradle® 500AP bottles at a time
- Daily feeding rate ranges from 1 – 1999 mL/day
- Feeding frequency of 1-24 times
- Pump calibration made possible to improve accuracy

|                    |                                                         |
|--------------------|---------------------------------------------------------|
| <b>Dimension</b>   | 230 (W) x 131 (D) x 61 (H) mm, (5.2 x 9.1 x 2.4 inches) |
| <b>Weight</b>      | 0.645 kg (1.42 lb)                                      |
| <b>Power</b>       | 85~240 Volts AC, 50/60 Hz (Input); ~180 mA              |
| <b>Environment</b> | Ambient to 45°C, ~95% Relative Humidity                 |



## Single-Use and Ready-to-Use CelCradle® Bottles

CelCradle® bottles are sterilized through gamma irradiation and come pre-packed with 5.5 grams of carriers as standard. Different models of bottles cover a specific application in cell culture.

**CelCradle® 500A**



Suitable for cell harvest, transient transfection, slow adhering cells; batch/semi-batch culture

**CelCradle® 500AP**



Suitable for cell harvest, transient transfection, slow adhering cells; continuous culture

| Application/<br>Bottle | Item Code | Secreted Protein,<br>Viruses | Cell Harvest (for non-secreted<br>proteins, viruses or cells) | Carrier Harvest (for protein<br>extraction or reuse of<br>carriers) |
|------------------------|-----------|------------------------------|---------------------------------------------------------------|---------------------------------------------------------------------|
| CelCradle® 500A        | 1400003   | Applicable                   | Best application                                              | Best application                                                    |
| CelCradle® 500AP       | 1400004   | Applicable                   | Best application                                              | Best application                                                    |

## Cell Monitoring



**GlucCell™**

A portable, easy-to-use, calibration-free glucose monitoring system for cell culture. Get results in just 15 seconds. Sample with just 1.5  $\mu$ L culture medium with measurement range from 30-500 mg/dL.



**Crystal Violet Dye**

A simple tool for the quantification of cells based on the number of nuclei dyed. The CVD kit contains reagents that disrupt the cells, thereby releasing the nuclei, which are subsequently dyed.

*Note: CVD is not recommended for counting stem cells or VERO cells. Use fluorescence dyes to achieve better cell observation.*

## Carrier Sampling

### 500A/500AP Bottles

Adherent cells attached to the macroporous carriers can be monitored through carrier sampling. The bottle is opened inside a biosafety cabinet and using a sterile forceps, carriers can be taken out for cell count, cell staining and monitoring.



## Inoculation Phase pH Control

### OPTION 1

If using a pre-mixed media with fixed amount of sodium bicarbonate ( $\text{NaHCO}_3$ ), readjusting before culture may be difficult. Alternatively, users can opt to:

#### For Upright Seeding

Seed at 5% or higher  $\text{CO}_2$  concentration



#### For Inverted Seeding

Adjust pH with hydrochloric acid (HCl) to pH 6.8 as a starting point



### OPTION 2

Use 500AP bottle and connect one tubing with air filter and the other leaving tightly closed.

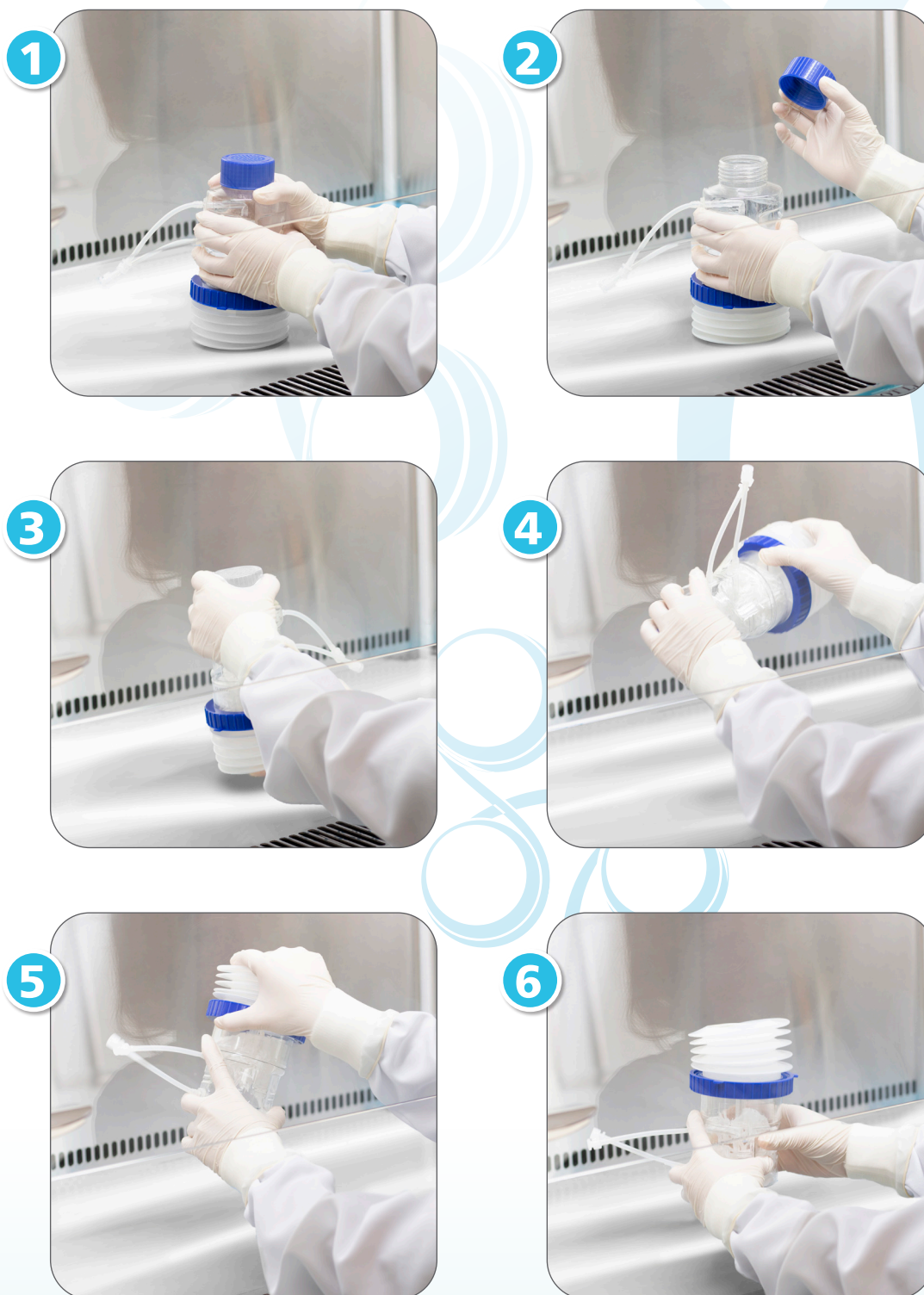


attached to a 0.22  $\mu\text{m}$  syringe filter

close cap

## OPTION 3

Compress the bellows before closing the bottles with a non-vented cap (white cap). This method lessens excessive air in the CelCradle® bottle which may affect the pH value of the culture medium. This can be attributed to the decrease of CO<sub>2</sub> concentration in the liquid rendering it basic.



## Ordering Information

| Item Code | Product Name                          | Dimension          | Weight   | Package                                                                                                                                                     |
|-----------|---------------------------------------|--------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2230006   | CelCradle® System Complete            | 590 x 380 x 420 mm | 14 kg    | 1 x CelCradle® Stage<br>1 x GlucCell™ Glucose Monitoring System                                                                                             |
| 2230007   | CelCradle® Continuous System Complete | 590 x 380 x 420 mm | 15 kg    | 1 x CelCradle® Stage<br>1 x CelFeeder™ Pump<br>2 x Tubing Complete Set                                                                                      |
| 2230005   | CelCradle® Stage                      | 360 x 265 x 170 mm | 7 kg     | 1x Main Console<br>1x Control Box<br>1x 100-240 V Power Adapter<br>1x Signal Cable<br>1x Manual CD<br>2x Forceps<br>1x Crystal Violet Dye Nucleus Count Kit |
| 1400067   | CelFeeder™ Pump                       | 290 x 210 x 80 mm  | 0.645 kg | 1 x CelFeeder™ Pump                                                                                                                                         |
| 1400011   | Tubing Complete Set                   | 370 x 150 x 75 mm  | 0.5 kg   | 1x Disposable Tubing Accessory<br>1x Pump Head                                                                                                              |
| 1400012   | Disposable Tubing Set & Pump Head     | 370 x 150 x 75 mm  | 0.5 kg   | 1x Tubing Set<br>1x Pump Head                                                                                                                               |
| 1400013   | Disposable Tubing Accessory           | 370 x 150 x 75 mm  | 0.5 kg   | 5x Disposable Tubing Accessory                                                                                                                              |
| 1400009   | GlucCell™ Glucose Monitoring System   | 96 x 60 x 18.5 mm  | 0.5 kg   | 1 x GlucCell™ Glucose meter<br>2 bottles of Glucose Test Strip<br>(1bt = 25 test strips)                                                                    |
| 1400010   | GlucCell™ Glucose Test Strip          | 80 x 70 x 35 mm    | 0.05 kg  | 2 x Glucose Test Strip bts (2 x 25 pcs)                                                                                                                     |
| 1400014   | Crystal Violet Dye Nucleus Count Kit  | 50 x 50 x 105 mm   | 0.5 kg   | 1 x CVD Bottle (100 ml/bt)                                                                                                                                  |
| 1400015   | Filtered Cap                          | 370 x 150 x 75 mm  | 0.5 kg   | Cap for CelCradle® bottle                                                                                                                                   |
| 1400016   | Non-Vented Cap                        | 370 x 150 x 75 mm  | 0.5 kg   | Cap for CelCradle® bottle                                                                                                                                   |
| 1400017   | Forceps                               | 250 x 15 x 10 mm   | 0.1 kg   | Used for sampling of BioNOC II® carriers                                                                                                                    |
| 1400021   | CelCradle® 500A/500AP Strainer        | 370 x 150 x 75 mm  | 0.5 kg   | Single-use Strainer (Pack of 10)                                                                                                                            |

## CelCradle® and Esco CO<sub>2</sub> Incubator

### The Perfect Combination for High Density Adherent Culture

The CelCradle® system can be incorporated into an existing CO<sub>2</sub> incubator or can be purchased with an Esco CO<sub>2</sub> incubator. Esco offers a wide range of CO<sub>2</sub> incubators that suit clients' different requirements, provide superior performance and cell protection.

# CelCulture® CO<sub>2</sub> Incubator

Sleek, reliable, and intuitive, Esco CelCulture® CO<sub>2</sub> incubators provide all-rounded sample protection that brings your scientific dreams one step closer to reality.

## Features:

- HPA-validated 90°C overnight moist heat decontamination cycle
- Rounded corners and seamless design for easy cleaning
- Constructed using electrogalvanized with ISOCIDE™ powder-coating to eliminate 99.9% of surface bacteria within 24 hours of exposure
- With optional copper interiors for added antimicrobial protection
- Available in 50 L, 170 L, and 240 L sizes
- ULPA Filter
  - 99.999% efficient, superior to conventional HEPA filters
  - Filters air continuously
  - Chamber returns to ISO Class 5 cleanliness in 11 minutes upon door closing to prevent contamination
- Direct Heat & Air Jacket
  - Fast and uniform heating
  - Rapid temperature recovery without overshoot
  - Air jacket improves chamber stability
- O<sub>2</sub> Sensor (for suppressed O<sub>2</sub> Model)
  - Long life
  - Stable output signal
  - No influence from CO<sub>2</sub>
- CO<sub>2</sub> Sensor
  - CelCradle® and CO<sub>2</sub> Incubator Combination
  - Single-beam, dual-wavelength IR sensor is drift-free



- Auto-zeroing
- SmartSense™ Microcontroller Interface
  - Intuitive, fully equipped control and monitoring system

## CelCulture® CO<sub>2</sub> Incubators IR Sensor Model with Stainless Steel Chamber

| 230 VAC, 50/60 Hz |               | 115 VAC, 50/60 Hz |               | Description                                                                                            |
|-------------------|---------------|-------------------|---------------|--------------------------------------------------------------------------------------------------------|
| Item Code         | Model         | Item Code         | Model         |                                                                                                        |
| 2170034           | CCL-050B-8    | 2170054           | CCL-050B-9    | CelCulture® Incubator, 50 L, IR sensor, CO <sub>2</sub> Control, Moist Heat Decon (Without Decon Pump) |
| 2170002           | CCL-170B-8    | 2170004           | CCL-170B-9    | CelCulture® Incubator, 170 L, IR sensor, CO <sub>2</sub> Control, ULPA, Moist Heat Decon               |
| 2170068           | CCL-170B-8-NF | 2170075           | CCL-170B-9-NF | CelCulture® Incubator, 170 L, IR sensor, CO <sub>2</sub> Control, Moist Heat Decon (No ULPA Filter)    |
| 2170058           | CCL-240B-8    | 2170060           | CCL-240B-9    | CelCulture® Incubator, 240 L, IR sensor, CO <sub>2</sub> Control, ULPA, Moist Heat Decon               |
| 2170069           | CCL-240B-8-NF | 2170079           | CCL-240B-9-NF | CelCulture® Incubator, 240 L, IR sensor, CO <sub>2</sub> Control, Moist Heat Decon (No ULPA Filter)    |

## CelCulture® CO<sub>2</sub> Incubators Suppressed O<sub>2</sub> Models with Stainless Steel Chamber

| 230 VAC, 50/60 Hz |               | 115 VAC, 50/60 Hz |               | Description                                                                                                          |
|-------------------|---------------|-------------------|---------------|----------------------------------------------------------------------------------------------------------------------|
| Item Code         | Model         | Item Code         | Model         |                                                                                                                      |
| 2170055           | CCL-050T-8    | 2170056           | CCL-050T-9    | CelCulture® Incubator, 50 L, IR sensor, CO <sub>2</sub> Control, Moist Heat Decon (Without Decon Pump)               |
| 2170047           | CCL-170T-8    | 2170048           | CCL-170T-9    | CelCulture® Incubator, 170 L, IR sensor, CO <sub>2</sub> & O <sub>2</sub> Control, ULPA, Moist Heat Decon            |
| 2170070           | CCL-170T-8-NF | 2170076           | CCL-170T-9-NF | CelCulture® Incubator, 170 L, IR sensor, CO <sub>2</sub> & O <sub>2</sub> Control, Moist Heat Decon (No ULPA Filter) |
| 2170061           | CCL-240T-8    | 2170062           | CCL-240T-9    | CelCulture® Incubator, 240 L, IR sensor, CO <sub>2</sub> & O <sub>2</sub> Control, ULPA, Moist Heat Decon            |
| 2170071           | CCL-240T-8-NF | 2170080           | CCL-240T-9-NF | CelCulture® Incubator, 240 L, IR sensor, CO <sub>2</sub> & O <sub>2</sub> Control, Moist Heat Decon (No ULPA Filter) |

## CelCulture® CO<sub>2</sub> Incubator with Stainless Steel Exterior Cabinet

The Esco CelCulture® CO<sub>2</sub> incubator is also available with stainless steel exterior with the same superior features.

### Features:

- Corrosion Resistant Surface
- Meets Pharmaceutical and Clinical Laboratory Requirements
- HPA-validated 90°C overnight moist heat decontamination cycle
- ISO Class 5 cleanliness via ULPA Filter System
- Available in 50 L, 170 L and 240 L sizes



## Ordering Information

| IR SENSOR MODEL WITH STAINLESS STEEL EXTERIOR CABINET |           |                                                                                                                                      |
|-------------------------------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------|
| Models                                                | Item Code | Description                                                                                                                          |
| CCL-050B-8-SS                                         | 2170128   | CelCulture® Incubator 50 L, IR Sensor, CO <sub>2</sub> Control, Moist Heat Decon, SS Cabinet, 230 VAC, 50/60 Hz (Without Decon Pump) |
| CCL-170B-8-SS                                         | 2170065   | CelCulture® Incubator 170 L, IR Sensor, CO <sub>2</sub> Control, ULPA, Moist Heat Decon, SS Cabinet, 230 VAC, 50/60 Hz               |
| CCL-240B-8-SS                                         | 2170137   | CelCulture® Incubator 240 L, IR Sensor, CO <sub>2</sub> Control, ULPA, Moist Heat Decon, SS Cabinet, 230 VAC, 50/60 Hz               |
| CCL-050B-9-SS                                         | 2170176   | CelCulture® Incubator 50 L, IR sensor, CO <sub>2</sub> Control, Moist Heat Decon, SS Cabinet, 115 VAC, 50/60 Hz (Without Decon Pump) |
| CCL-170B-9-SS                                         | 2170177   | CelCulture® Incubator 170 L, IR Sensor, CO <sub>2</sub> Control, ULPA, Moist Heat Decon, SS Cabinet, 115 VAC, 50/60 Hz               |
| CCL-240B-9-SS                                         | 2170140   | CelCulture® Incubator 240 L, IR Sensor, CO <sub>2</sub> Control, ULPA, Moist Heat Decon, SS Cabinet, 115 VAC, 50/60 Hz               |

| SUPPRESSED O <sub>2</sub> MODEL WITH STAINLESS STEEL EXTERIOR CABINET |           |                                                                                                                                                       |
|-----------------------------------------------------------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Models                                                                | Item Code | Description                                                                                                                                           |
| CCL-050T-8-SS                                                         | 2170171   | CelCulture® Incubator 50 L, IR Sensor, CO <sub>2</sub> & O <sub>2</sub> Control, Moist Heat Decon, SS Cabinet, 230 VAC, 50/60 Hz (Without Decon Pump) |
| CCL-170T-8-SS                                                         | 2170129   | CelCulture® Incubator 170 L, IR Sensor, CO <sub>2</sub> & O <sub>2</sub> Control, ULPA, Moist Heat Decon, SS Cabinet, 230 VAC, 50/60 Hz               |
| CCL-240T-8-SS                                                         | 2170138   | CelCulture® Incubator 240 L, IR Sensor, CO <sub>2</sub> & O <sub>2</sub> Control, ULPA, Moist Heat Decon, SS Cabinet, 230 VAC, 50/60 Hz               |
| CCL-050T-9-SS                                                         | 2170178   | CelCulture® Incubator 50 L, IR Sensor, CO <sub>2</sub> & O <sub>2</sub> Control, Moist Heat Decon, SS Cabinet, 115 VAC, 50/60 Hz (Without Decon Pump) |
| CCL-170T-9-SS                                                         | 2170179   | CelCulture® Incubator 170 L, IR Sensor, CO <sub>2</sub> & O <sub>2</sub> Control, ULPA, Moist Heat Decon, SS Cabinet, 115 VAC, 50/60 Hz               |
| CCL-240T-9-SS                                                         | 2170141   | CelCulture® Incubator 240 L, IR Sensor, CO <sub>2</sub> & O <sub>2</sub> Control, ULPA, Moist Heat Decon, SS Cabinet, 115 VAC, 50/60 Hz               |

## CelCulture® CO<sub>2</sub> Incubator with Cooling System

Esco CelCulture® CO<sub>2</sub> Incubator with Integrated Cooling System provides solution for highly specialized application. The integrated cooling system allows studies of samples that requires temperature at/or below ambient temperature.

### Features:

- Wider temperature range of 8°C below ambient to 60°C above ambient
- Highly efficient, environment friendly Peltier Cooling System
- Constructed using electrogalvanized with ISOCIDE™ powder-coating to eliminate 99.9% of surface bacteria within 24 hours of exposure
- Complete contamination control methods
  - 90°C Validated Moist Heat Decontamination Cycle
  - ULPA Filter
  - 0.2 µm inlet filter
- Available in 170 L and 240 L sizes



### GUIDE TO MODELS, CelCulture® CO<sub>2</sub> Incubators with Cooling System

#### IR Sensor Model With Stainless Steel Chamber

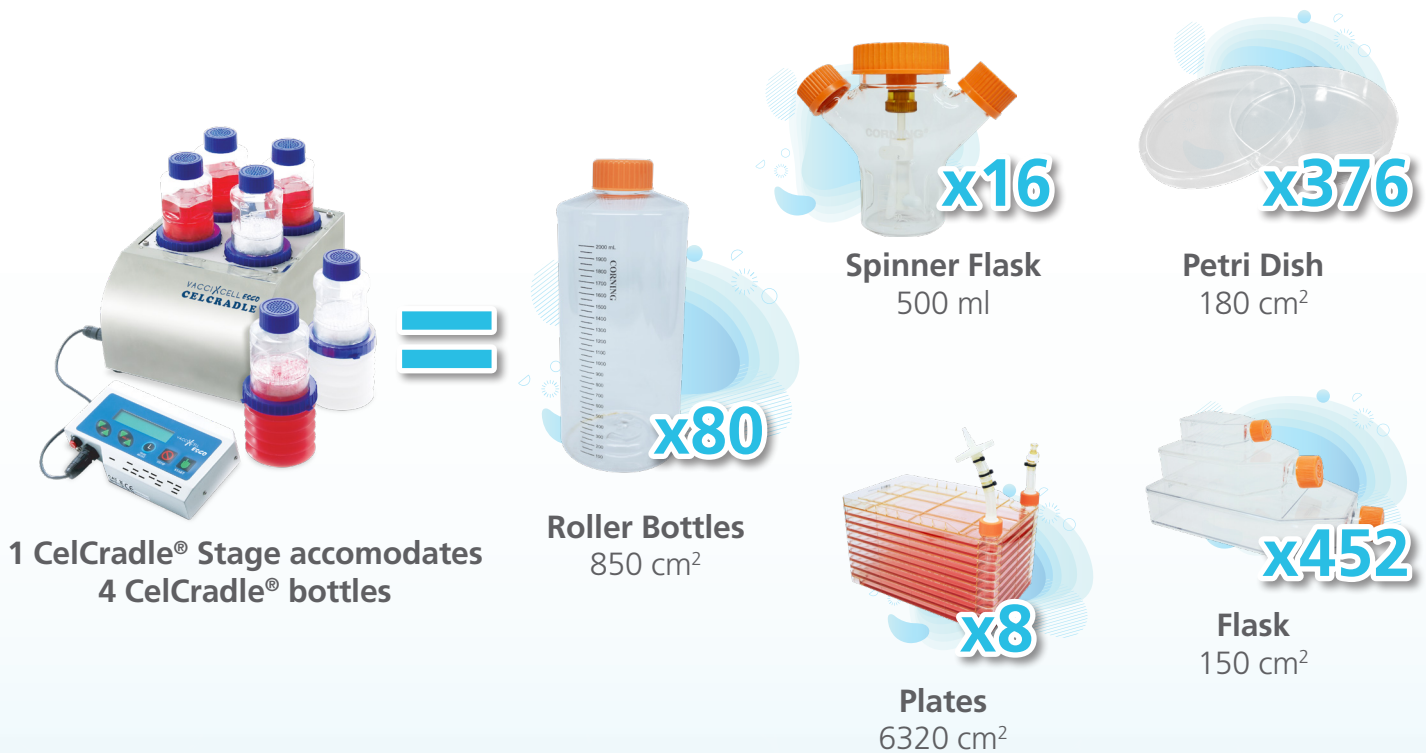
| 230 VAC, 50/60 Hz |              | 115 VAC, 50/60 Hz |              | Description                                                                                        |
|-------------------|--------------|-------------------|--------------|----------------------------------------------------------------------------------------------------|
| Item Code         | Model        | Item Code         | Model        |                                                                                                    |
| 2170101           | CCL-170B-8-P | 2170115           | CCL-170B-9-P | CelCulture® Incubator, 170 L, IR sensor, CO <sub>2</sub> control, Moist Heat Decon, Peltier System |
| 2170116           | CCL-240B-8-P | 2170266           | CCL-240B-9-P | CelCulture® Incubator 240 L, IR Sensor, CO <sub>2</sub> Control, Moist Heat Decon, Peltier System  |

#### Suppressed O<sub>2</sub> Models with Stainless Steel Chamber

| 230 VAC, 50/60 Hz |              | 115 VAC, 50/60 Hz |              | Description                                                                                                                |
|-------------------|--------------|-------------------|--------------|----------------------------------------------------------------------------------------------------------------------------|
| Item Code         | Model        | Item Code         | Model        |                                                                                                                            |
| 2170112           | CCL-170T-8-P | 2170153           | CCL-170T-9-P | CelCulture® Incubator, 170 L, IR sensor, CO <sub>2</sub> control, O <sub>2</sub> control, Moist Heat Decon, Peltier System |
| 2170267           | CCL-240T-8-P | 2170268           | CCL-240T-9-P | CelCulture® Incubator 240 L, IR Sensor, CO <sub>2</sub> & O <sub>2</sub> Control, Moist Heat Decon, Peltier System         |

# Highest Yield. Affordable Cost. Linearly Scalable.

A single CelCradle® bottle replaces hundreds of petri dishes, tissue culture flasks, and dozens of spinner flasks, roller bottles, and more.



**ESCO**  
**VACCI**XCELL  
ADHERENT BIOPROCESSING SPECIALIST

For queries and comments, please contact Esco VacciXcell Technical Support team.

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#### CDMO Services:

##### Esco Aster Fermentation (Plasmids)

21 Changi South Street 1  
Singapore 486777  
Tel +65 6542 0833

##### Esco AsterTide PD-Phase 2 CTM (Cells/Viruses/EVs)

#02-04 Blk 67 Ayer Rajah Crescent  
Singapore 139950  
Tel +65 6251 9361

##### Esco AsterMavors Cellular Agriculture and Alternative Proteins (Food)

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