BioSpherix

CELL RESEARCH PRODUCTS



CYTOCENTRIC APPROACH

Cells Need Full Time Protection . . . Not Part Time

Cells outside the body no longer have an immune system to protect them from microbes. Conventional equipment provides only part-time protection. ***Cytocentric-by-design*** equipment provides full time protection. ***Cytocentric upgrade*** options for conventional equipment can increase protection, even up to full time.

Cells Need Full Time Optimization . . . Not Part Time

Cells outside the body no longer have the body to keep them viable. Temperature, pH, osmolarity, O_2, CO_2, etc. must be controlled at optimal levels outside the body or cells die. Conventional equipment only provides part time optimization, only inside incubators when they are closed. ***Cytocentric-by-design*** equipment provides full time optimization. ***Cytocentric upgrade*** options for conventional equipment can increase optimization, even up to full time.

Cells Need Physiologic Simulation . . . Not Air

Conventional equipment leaves huge gaps in physiologic simulation. Oxygen is the best example. In conventional equipment oxygen is taken for granted, and typically mishandled. However oxygen concentration is now known to be an absolutely fundamental cell parameter, and plays a critical newly discovered role in gene expression. Cells inside the body never see oxygen levels as high as air oxygen. Physiologic levels are much lower, and they do not fluctuate in the body. Peri-cellular dissolved oxygen is the important parameter but poor equilibration between gas and liquid in culture makes oxygen control extremely challenging. Conventional equipment does not account for peri-cellular oxygen in any way, and allows it to fluctuate unknowingly. ***Cytocentric-by-design*** equipment fully accounts for not only oxygen, but also CO, NO, and other important physiologic conditions. ***Cytocentric upgrade*** options for conventional equipment provide enhanced physiologic simulation.

Cells Need Dynamics

Cell cultures are essentially dynamic in nature, not static. They grow over time. Their metabolic rate can change over time. Conventional incubators only provide static conditions. ***Cytocentric-by-design*** equipment provides dynamic conditions to keep up with cell needs as they change over time. ***Cytocentric upgrade*** options can give your cells dynamics in conventional equipment.

Cells Need Protocol

Different cell culture protocols require different conditions. Conventional equipment forces all protocols into monolithic incubator chambers with one size fits all and one set of conditions, regardless of protocol differences. ***Cytocentric-by-design*** equipment provides unlimited culture protocols. ***Cytocentric*** upgrade options for your existing conventional equipment can too.

Cells Need To Fit

Cytocentric equipment can be configured in any number of ways to fit any application, any budget and any space. It can fit in existing equipment, or existing equipment can fit inside. It can then be upgraded as needed, reconfigured as needed, redeployed as needed, moved as needed. There is never a dead-end.

Cells Need Accountability

Critical conditions that cells experience in conventional equipment are often never known. No one knows how long the cells were outside the incubator, experiencing suboptimal conditions in the hood. No one knows how many times or how long the incubator door was kept open on any particular day, exposing cells to suboptimal conditions. ***Cytocentric*** equipment can record everything and alarm any condition.

Cells Need To Protect Their Caretakers

Cells that harbor and release dangerous viruses, vectors, prions, etc. can infect humans. Open hoods and open incubators offer minimal protection, but ***Cytocentric*** equipment can isolate and contain the cells and dangerous organisms inside, and protect you and your team from contagion better than conventional equipment.

Thank you for your interest in the new ***cytocentric*** approach to cell incubation and processing.

CYTOCENTRIC CELL INCUBATION & PROCESSING SYSTEMS

What is Cytocentric? It is a new and better way to grow and manipulate cells *in vitro*. It goes beyond the needs of people, to meet the needs of cells. You might say Cytocentric is a philosophy, and in some ways it is. It certainly includes an unusually hefty reverence for cells. But in reality, our new approach to cell culture and processing is based on a lot of hard science, much of which is brand new and currently unfolding in hundreds of labs around the world.

In another way, our new approach is simply a more disciplined and strict approach based on old knowledge about cells. Somehow, this knowledge has faded after decades of putting up with equipment designed for people instead of cells! This catalog briefly describes our Cytocentric offering.

Most exciting is a completely new category of cell equipment. The ***Xvivo System***™ is the first and only cell incubation and processing system designed from the ground up for cells. Cytocentric-by-design, it by-passes all the handicaps inherent in conventional equipment designed for people. It offers unprecedented new abilities.

The other category is a variety of Cytocentric upgrade equipment for conventional incubators, hoods, glove boxes, etc. You'll discover a full suite of Cytocentric upgrade accessories and Cytocentric retrofits for *your existing equipment* to meet specific cell needs.

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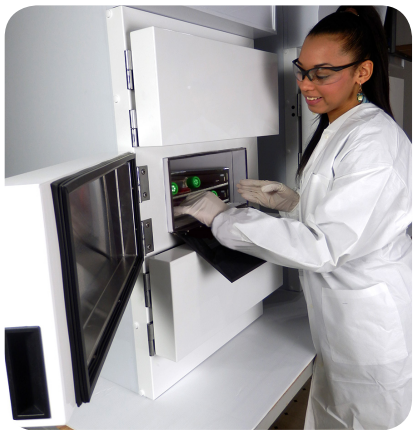


XVIVO INCUBATION SYSTEM ***model X3***

FIRST CELL INCUBATION SYSTEM ACTUALLY DESIGNED FOR CELLS INSTEAD OF PEOPLE …*CYTOCENTRIC BY DESIGN*

Cells need more than conventional incubators provide. This cutting edge incubation technology is the first that can satisfy those needs. More than a typical incubator, it is a comprehensive system of modular interconnecting incubation chambers, sub-chambers, and co-chambers with advanced controls. Modules can be fitted together like building blocks, and configured for virtually any application, large or small. If needs change, you can easily modify and upgrade your incubator by adding or removing modules or controls. Your incubator will never again constrain your research. Your investment will never become obsolete. Now do experiments not possible in conventional equipment. Your cells will benefit...

... If Your Cells Need Their Own Protocol



Unlike conventional incubators with one chamber and one protocol, the X3 has the option of multiple independent chambers per incubator. Each can have different conditions simultaneously. That means different culture protocols can run in one incubator at the same time. The ***Xvivo Incubation System*** can culture up to 15 different protocols in one integrated system! Don't be fooled by conventional incubators with multiple doors on the same chamber. It is still one protocol.

... If Your Cells Need Full Time Protection and Optimization

Unlike conventional incubators that open only into the room, exposing cells inside to suboptimal conditions and contamination risk, ***Xvivo*** incubators can open into the room or be configured to open only into aseptic gloved processing chambers with the same CO_2, O_2, and temperature as the incubator. Optimum conditions are never disturbed, even during handling. People and contaminants in room air are kept safely outside.

- Contamination problems are significantly reduced.
- Experimental variability is significantly reduced.
- Cell proliferation may significantly improve.
- Differentiation and phenotypic integrity may significantly improve.



Xvivo is the first incubator that can expand into a processing chamber. Just remove the outer door of the free standing version, and replace with a gloved processing chamber. Now incubator opens only into an aseptic atmosphere, the same atmosphere as inside the incubator!



Xvivo incubators can be configured with one large, two medium, or three small incubation chambers. Each chamber can have different conditions to optimize different protocols.



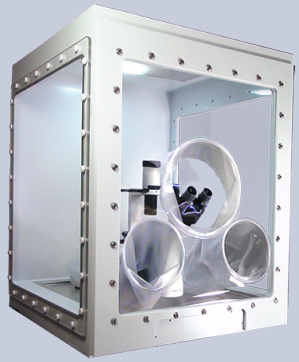
Same incubator can perform multiple functions, or accommodate different culture vessels with different purposes. For example, one chamber can optimize conditions for a single large multilayer Corning Hyperstack vessel with high O_2 and low CO_2 for expansions, while simultaneously optimizing conditions for a dozen flasks with low O_2 and high CO_2 to simulate a pathophysiologic hypoxia experiment in another chamber. Opening one chamber does not disturb the other.



One dual chamber incubator (outer door removed) bolted to end of a processing chamber before glove front of processing chamber is mounted. Incubators can bolt to back or end of processing chambers.



Two single chamber incubators bolted to the rear of a processing chamber. Technicians are sealed outside and can't contaminate the inside, where the cells are.



Any 3rd party cell equipment can be integrated inside, including microscopes (shown above), centrifuges, cell sorters, refrigerators, etc.



Even conventional CO_2 incubators can be integrated inside ***X3*** processing chambers, effectively converting people-centric CO_2 incubator (Thermo model 3351 shown above) into a cytocentric system with full time optimization of O_2/CO_2 during all incubation and handling and full time protection in an aseptic environment.



X3 processing chambers with temperature, O_2, and CO_2 control can serve as the incubator for certain applications that do not require high RH control.



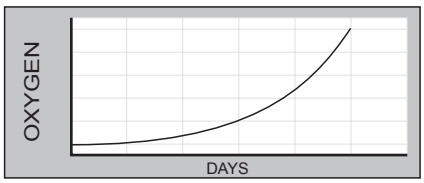
Many ***X3*** processing chambers can be used to configure large systems. Fit the entire lab inside!

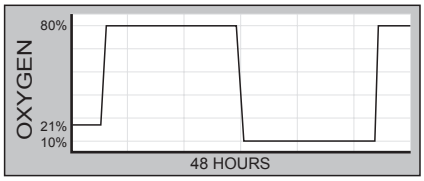


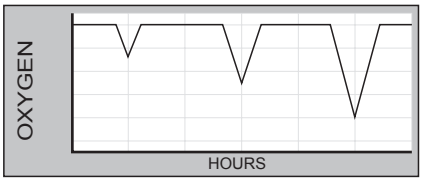
Regardless of how many independent incubation chambers are integrated into the same processing chamber, all with different conditions, that processing chamber can replicate the unique conditions of that incubator before it is opened. Optimum conditions are never interrupted, regardless of how numerous and varied they might be.

Cells Need Dynamics

Unlike conventional incubators with just static conditions, ***Xvivo*** incubators also offer new *dynamic* control of cell parameters. After all, cells are dynamic. They grow over time. Their metabolic rate changes over time. There is only one way to keep up with these changes. Plus dynamics give you unprecedented capability to create and model many pathophysiologic conditions, such as ischemia, reperfusion, acidosis, etc.







Cells Need Accountability

Every cell parameter is not only controlled but can be data-logged and visualized over time on comprehensive trend plots. Always know what happened over night, or over the weekend. One interface can operate over a dozen incubators and processing chambers.



Cells Need Physiologic Simulation

Compared to conventional CO_2 incubators with oxygen fixed at 20%, the ***Xvivo System*** has full range oxygen control (0.1 - 99.9%) in every incubation chamber, and in every processing chamber. Simulating physiologic O_2 and simulating pathophysiologic hypoxia or hyperoxia is easy. And the newly recognized critical requirement for preventing oxygen fluctuations during handling is built in. No other system can compare when it comes to oxygen.

Cells Need to Protect Their Caretakers

Cells incubated and handled in a closed system reduce the risk of transmitting infectious disease to the technicians who work with cells. Absolute isolation is not offered in the ***Xvivo Incubation System model X3*** and no biological safety rating is claimed, but clearly the risk to humans is reduced over conventional open incubators and hoods.

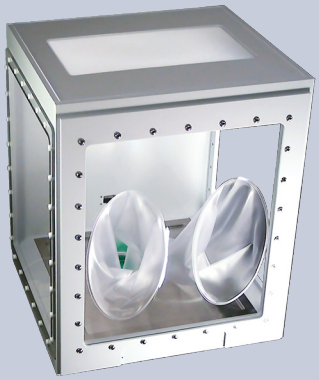


Cells Need to Fit

Xvivo System is extremely modular and can be configured to fit most budgets, fit most available lab spaces, fit any research needs.



A couple ***X3*** processing chambers can immediately and economically convert the core of any existing cell culture lab to *cytocentric.*



For economy most ***X3*** processing chambers have translucent light panels to let in ambient light, or permit you to shine in specialty lights.



Cells can be safely moved in and out of ***Xvivo System*** inside transport chambers and subchambers without exposure to room contaminants or disturbances to O_2 and CO_2.



For extreme economy and flexibility, ***X3*** processing chambers and buffer chambers can be controlled with modular independent controls such as ProOx and ProCO_2.



Entire cell culture and processing lab can fit on suitable bench/table tops.

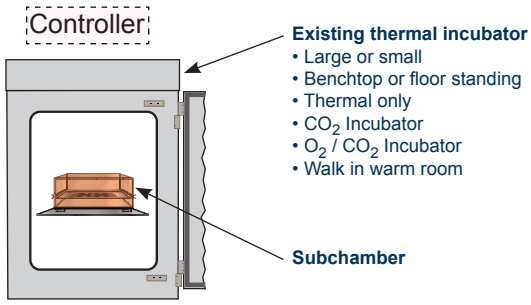
Upgrading Conventional Incubators With Cytocentric Features

Cells outside the body have needs that cannot be met by conventional incubators and hoods. Rethinking the relationship between incubator and hood led to the ***Xvivo System*** which essentially combines the two into one seamless system. Better for cells in every way, Cytocentric by design is likely to be the equipment of choice when the cells are valuable or the research is important.

However, it is also possible for any lab to meet any particular need of cells by simply upgrading conventional incubators. Our practical and powerful new line of Cytocentric upgrade accessories and retrofits for incubators, based upon the subchamber/superchamber concept, can make your existing incubators capable and efficient at meeting any or all the needs of cells. Here's how:

SUBCHAMBER CULTURE SYSTEMS

A subchamber is one chamber inside the other. Subchambers go inside your incubator. Subchambers are a way to add Cytocentric improvements to the ***cell incubation*** step. Subchambers and a variety of controllers bring many new enhancements to an incubator.



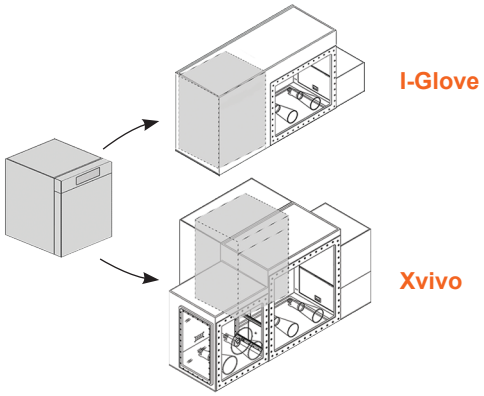
Subchambers can provide multiple protocols in the same incubator. They make it easy to simulate physiologic or pathophysiologic extremes. They prevent disturbances to cells when the host incubator door is opened. They are space efficient. They are gas efficient. They make it easy to transport cells in and out of the incubator without disturbing optimal and aseptic conditions.

Our incubator subchambers, called ***C-Chambers***, are simple translucent plastic boxes with a hinged semi-sealed door. They sit on a shelf inside your incubator. Cells are cultured inside. With the proper controller you can meet many needs of cells, far beyond what incubators can normally do on their own.

SUPERCHAMBER CULTURE AND HANDLING SYSTEMS

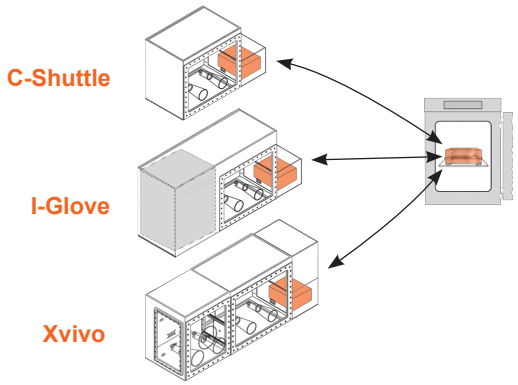
A superchamber is a chamber that encloses another chamber. Superchambers can surround your incubator, and can enclose other chambers as well. Superchambers are a way to add Cytocentric improvements to the ***cell manipulation and handling*** steps. They bring many enhancements to an incubator.

Inserted into an ***I-Glove*** or ***Xvivo System***, your incubator becomes immersed in and opens only into an aseptic environment that is also O_2/CO_2 optimized for cells. Cells can be handled under the same conditions as inside the incubator. Incubator gas consumption and incubator contaminations are eliminated. Think of superchambers as the Cytocentric alternative to conventional hoods.



SUBCHAMBERS + ***SUPER***CHAMBERS WORK TOGETHER

Cells Cytocentrically incubated in remote subchamber culture systems can be transported to and from superchambers for Cytocentric handling and manipulation. Avoid suboptimal exposures in conventional hoods.





I-Glove

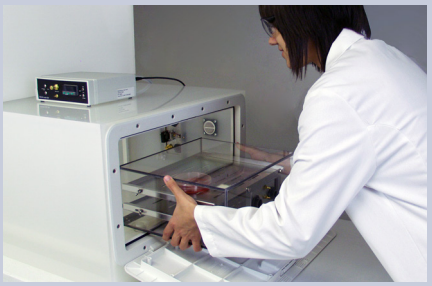
Incubator Glove Box

The I-Glove is a cytocentric accessory for substantially upgrading conventional incubators with full time O_2/CO_2 optimization, full time protection, physiologic simulation, and accountability. Your incubator is installed inside, immersed in an aseptic O_2/CO_2 optimized atmosphere. When cells are removed from the incubator and handled inside the I-Glove, there is no change in O_2 or CO_2. There is also no danger of contamination from the technician or room air. Any O_2 level can be controlled, from as low as 0.1% to as high as 30%, which covers the physiologic range, and the pathophysiologic cell hypoxia range.

- Culture and handle your cells at the same O_2/CO_2
- Reduce contamination risk
- Transform any incubator into an O_2/CO_2 incubator with O_2/CO_2 handling
- Low gas consumption
- Docks and O_2/CO_2 conditions subchambers and transport chambers



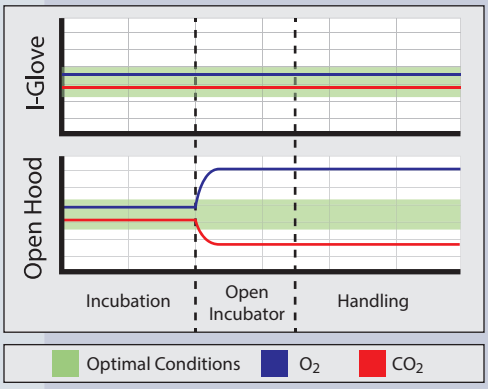
Existing incubator installed and operated inside I-Glove where conditions are aseptic and O_2/CO_2 are the same inside and outside the incubator.



Cells can safely be moved into and out of I-Glove inside subchambers and transport chambers without disturbance to O_2 and CO_2, or exposure to microbes in lab.



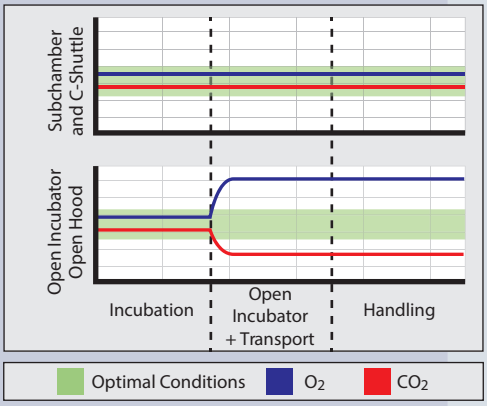
Soft comfortable glove front makes sealed barrier between inside and outside. Less contamination risk than standard open BSL hood.



With incubator inside, when incubator door opens, there's no disturbance in O_2/CO_2. No gas is used to restore controlled levels. Results in huge savings.

Options

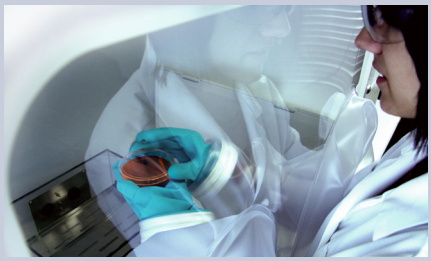
- Right or Left Entry Configurations
- Double-sided Glovefront for 2 Users
- O_2/CO_2 Control in Buffer Chamber
- O_2/CO_2 Control in Glove Chamber
- Continuous Recirculating HEPA Atmosphere Conditioner



Cells are never exposed to suboptimal conditions.



Chambers and vessels are moved in and out through the airlock. It is large enough to receive a wide range of subchambers and specialized culture vessels.



Creates an optimal matched environment between incubation and manipulation.



Protects cells from human exposure as well as humans from cell exposure.

Options

- Right or Left Entry Configurations
- Double-sided Glovefront for 2 Users
- O_2/CO_2 Control in Buffer Chamber
- O_2/CO_2 Control in Glove Chamber
- Continuous Recirculating HEPA Atmosphere Conditioner

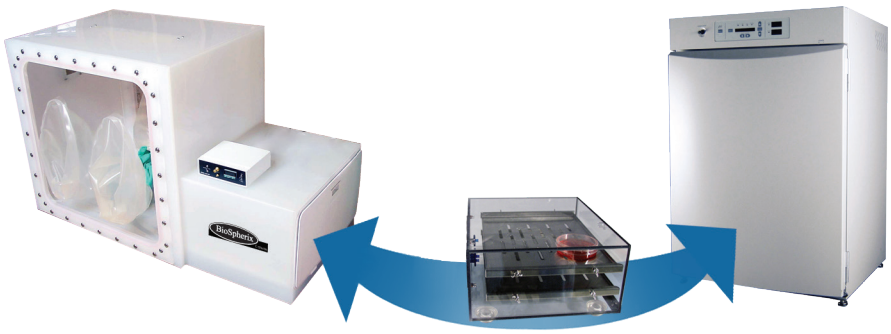


C-Shuttle

Glove Box

The C-Shuttle Glove Box is the most basic and economical option for handling cells under controlled O_2 and/or CO_2. Cells can be “shuttled” back and forth to this glove box from remote incubators inside closed subchambers without disturbing O_2 and/or CO_2. Once inside a C-Shuttle Glove Box with identical O_2 and/or CO_2 concentrations, the subchamber is opened and cells removed and handled with no disturbance in O_2 and/or CO_2. Cells are then put back inside the subchamber and shuttled back to the host incubator for incubation, for full time optimization.

- Uninterrupted oxygen/carbon dioxide culturing
- Extended oxygen range hypoxia/hyperoxia
- Safety barrier from dangerous cells
- Reduced risk of contamination
- Consistent results
- Low gas consumption
- Better cell growth
- Better cell health



Transport Cells in a semi-sealed C-Chamber from the incubator to the C-Shuttle and back without ever interrupting conditions.

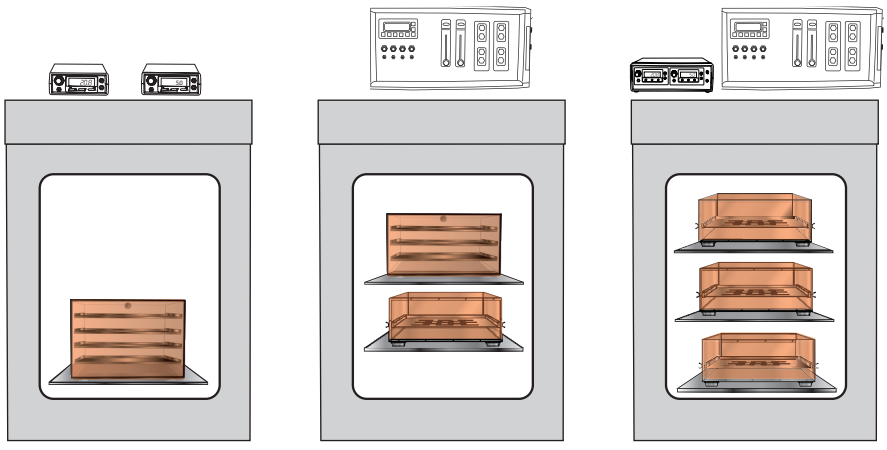


C-Chamber

Incubator Subchamber

BioSpherix C-Chambers are designed to fit right inside your existing incubator. C-Chambers provide practical, controlled and isolated atmospheres for cell cultures. C-Chambers may also be used for protected, uninterrupted transport for cells.

- Extends the range of user protocols within the user's incubator
- Full time protection
- Optimized for gas efficiency
- Saves gas in comparison to an incubator
- Magnetic door control - no latches
- Prevents cross-contamination
- Quick recovery after access to cells
- No complicated "flushing" procedures
- Four standard sizes

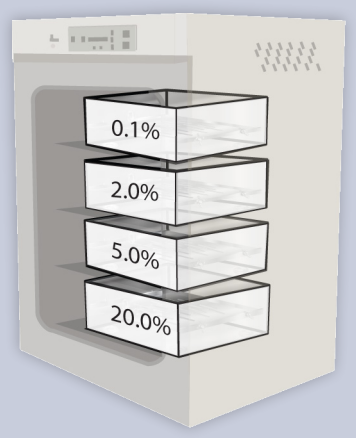


Two Protocols | Three Protocols | Four Protocols

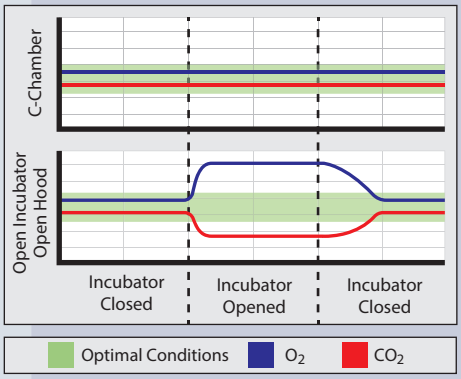
Subchambers can be functionalized by any variety of controllers according to protocol size and needs.



Recovery time is short and gas usage is minimized.



Subchambers allow specific, multiple protocols in the same incubator. Most popular is assessing optimal O_2 concentration of the same cells.



Cells inside a subchamber are not disrupted by the opening of the host incubator.

Options

- One Shelf
- Two Shelf
- Three Shelf
- Four Shelf



The adapter plate that comes standard with the GT41 is upgraded by the GT81CN pods. There is no need to buy another plate, just install the pods and the functionality expands.



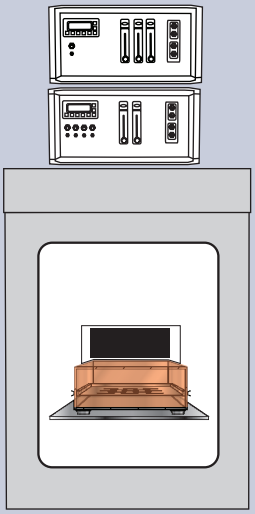
OxyCycler GT4181CN

CO and NO Subchamber Culture System

CO and NO are both important gasotransmitters with a wide variety of functions. The OxyCycler GT4181CN makes it possible to study them simultaneously without the complications of chemical donors. Control O_2, CO_2, CO, and NO independently while limiting humidity and unwanted NO_2 side product and monitoring temperature. There is no other tool available that covers as wide a range of physiologic conditions *in vitro*.

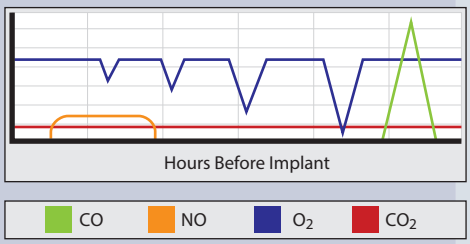
- First dual CO/NO Gasotransmitter Cell Culture System
- Dynamic or static CO and NO exposures
- Controls CO and NO precisely and independently
- Multipod design maximizes ease of maintenance
- PC interface with data logging
- Internal and remote monitors with alarms
- Programmable setpoints

Typical Configuration



From outside the host incubator, the GT4181CN and GT41 control conditions inside the chamber. Optional I-Hood (not shown) can be added for additional layer of safety.

Performance



Above is an example of the dynamic, independent control of multiple gases simultaneously that the OxyCycler GT4181CN is capable of.



Typical configuration of this dual-controller system has one module stacked atop the other. This saves valuable lab space.



OxyCycler GT4181C

CO Subchamber Culture System

CO is known to be a gasotransmitter involved in cell signaling. The OxyCycler GT4181C makes the complex process of controlling CO in vitro easier and reproducible. Automated control lets you set up your experiment, then let it run while you work elsewhere. PC interface graphs all exposures and logs what conditions your cells were exposed to.

- Dynamic or static CO exposures
- Controls CO precisely
- Unprecedented CO induced phenotypes
- Multipod design maximizes ease of maintenance
- PC interface with data logging
- Internal and remote monitors with alarms
- Programmable setpoints

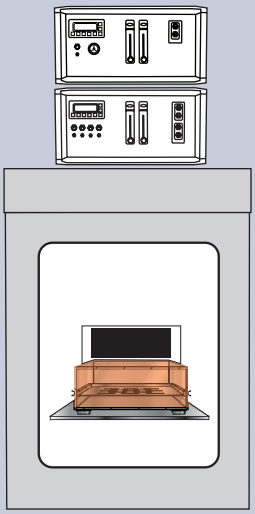


The adapter plate separates cells from sensors in pods with antimicrobial barriers.



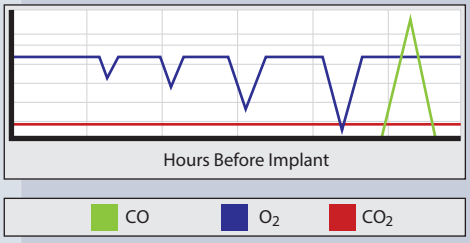
Multipod design dramatically reduces downtime for routine maintenance.

Typical Configuration



From outside the host incubator, the GT4181C and GT41 control conditions inside the chamber. Optional I-Hood (not shown) can be added for additional layer of safety.

Performance

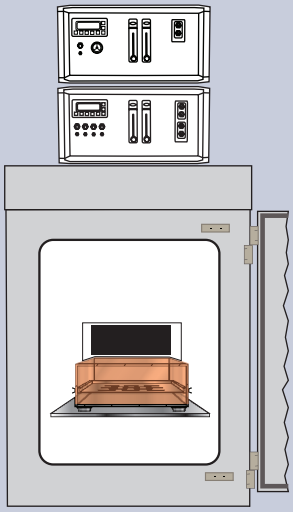


Above is an example of the dynamic, independent control of multiple gases simultaneously that the OxyCycler GT4181C is capable of.



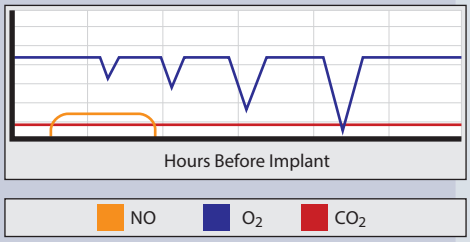
The sensor assembly is universal across the GT41, GT4181CN, GT4181C and GT4181N. The individual pods are hotswappable. You can decide to work with CO down the road, even if you don't need it now.

Typical Configuration



From outside the host incubator, the GT4181N and GT41 control conditions inside the chamber. Optional I-Hood (not shown) can be added for additional layer of safety.

Performance



Above is an example of the dynamic, independent control of multiple gases simultaneously that the OxyCycler GT4181N is capable of.



OxyCycler GT4181N

NO Subchamber Culture System

The OxyCycler GT4181N makes working with the gasotransmitter NO much easier than traditional, crude attempts at control. Eliminate the use of NO donors and work with NO directly, precisely, and reliably. Create reproducible exposures and review data logs to eliminate all guesswork with NO experiments.

- Dynamic or static NO exposures
- Controls NO precisely
- Unprecedented NO phenotypes
- Multipod design is gas efficient
- PC interface (data logging)
- Keeps unwanted NO_2 side product controlled
- Internal and remote monitors with alarms
- Programmable setpoints



Your lab is protected from dangerous build up of NO or NO_2 outside of its intended chamber. In the event that these gases are detected by the remote monitor pod (above) an alarm will sound.



OxyCycler GT41

Gasotransmitter Ready O_2/CO_2 Subchamber Culture System

The OxyCycler GT41 base controller creates any change in oxygen and/or carbon dioxide concentration. Independently monitor temperature and provide Relative Humidity (RH) limit control. Data logging can be used for validation as research progresses. Dynamically and efficiently send intermittent spikes of multiple gases to cells.

- Simultaneous O_2, CO_2, RH (limit control), temperature (monitoring)
- Easily add CO and/or NO controller.
- Multiple gas combinations
- Easy, safe and dynamic control via PC interface with data logging
- Internal and external monitors and alarms
- Programmable setpoints

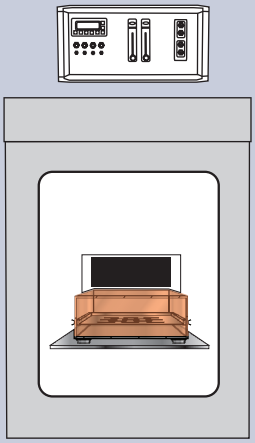


The OxyCycler GT41 consists of external controller(s) connected to a sub chamber with an attached pod system (multipod) placed inside a third party incubator. The pods control all pertinent parameters through microbial barrier filters while keeping aseptic conditions in the culture subchamber.



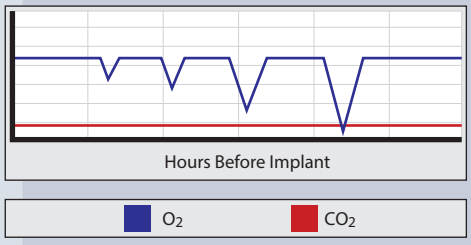
The GT41 comes standard with an adapter plate for sensor pods. This plate attaches to a C-Chamber and has two covered upgrade ports; you can upgrade the system with CO, NO, or both CO and NO at any time.

Typical Configuration

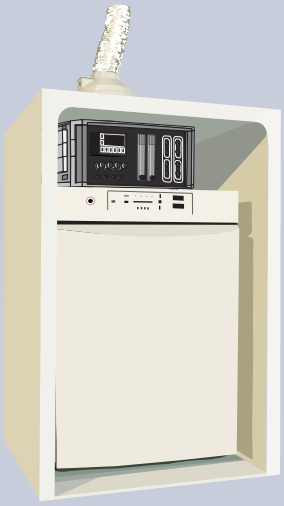


The base controller and gases used by every GT series combination are shown. A secondary controller can be implemented for additional control of exotic gases CO and NO.

Performance



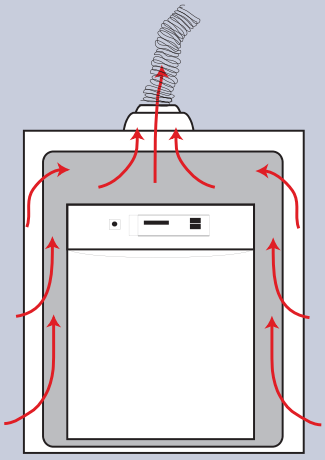
Above is an example of the dynamic, independent control of multiple gases simultaneously that the OxyCycler GT41 is capable of.



A standard I-Hood provides enough room for the GT4181 component within the hood.



Though it is not required to put the GT41 component inside I-Hood, custom sizes can be provided to allow both controllers inside.



The ventilation fan pulls room air into the I-Hood, effectively sweeping any dangerous airborne particles or vapors away from the people using the incubator.



I-Hood

Dedicated Ventilation for Incubator

The I-Hood pulls air from the room to an exhaust duct in order to sweep dangerous airborne particles and vapors away from users accessing the incubator. The duct can lead to a fume hood or other points of exit from the room.

- Fits standard size incubator
- Protects users from hazardous gases
- Custom versions are available



I-Hoods are normally designed for a single incubator with enough headspace to fit a GT series controller, but larger custom I-Hoods are available.

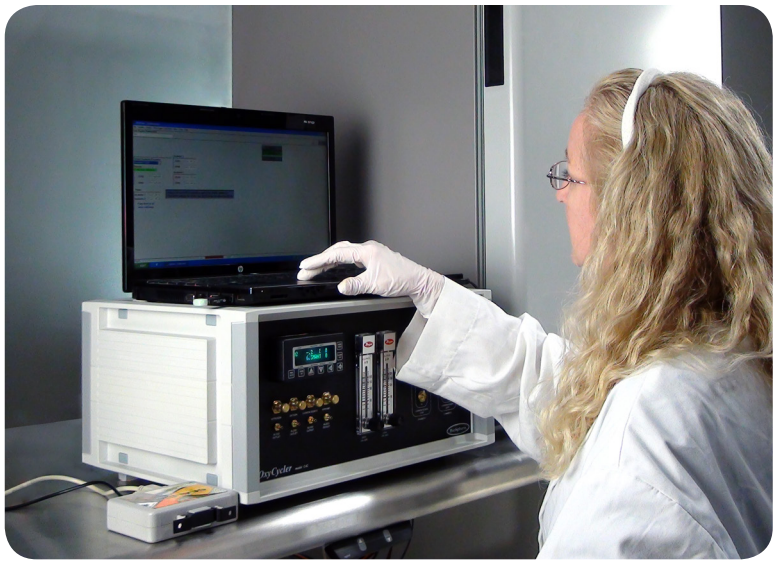


OxyCycler C42

Dynamic O_2/CO_2 Subchamber Controller

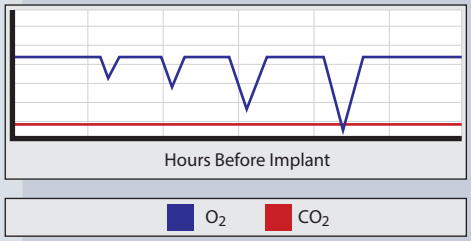
The OxyCycler C42 is a unique dual channel/dual gas controller for incubators and C-Chambers. Controlling O_2 and CO_2 on independently programmable channels offers optimum control. No other instrument offers better simulation of dynamic conditions.

- Dynamic O_2 exposures
- Physiological/Pathophysiological O_2 control
- O_2 Profile 0.1-99.9%
- CO_2 Profile 0.1-20.0%
- Independently control and profile up to two chambers simultaneously.
- Computer system for easy interface, real time trend charting, data logging, and remote operation



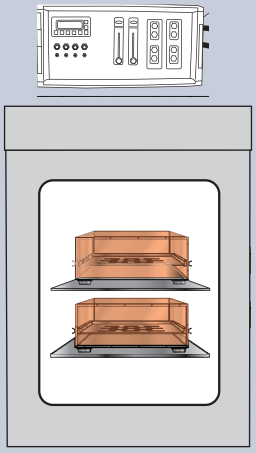
Multiple setpoints for any length of time, over any rate of change between setpoints with any number of cycles and setpoints.

Dynamic, Programmable



Above is an example of the dynamic, independent control of multiple gases simultaneously that the OxyCycler C42 is capable of.

Typical Configuration



Control up to two chambers, each can be programmed independently to provide a control chamber and an experimental chamber. If the control culture is in another incubator, then both chambers can be used as experimental points.



The OxyCycler C42 interfaces with a C-Chamber subchamber via a unipod. The unipod attaches to the standard cut-out on the chamber. Anti-microbial barrier filters separate cells from sensors significantly reducing risk of contamination.



A ProOx C21 subchamber culture system is the most practical alternative to O_2/CO_2 incubators because of its versatility and efficiency. The ProOx C21 interfaces with a C-Chamber subchamber via a unipod which attaches to a standard cut-out on the chamber. Anti-microbial barrier filters separate cells from sensors significantly reducing risk of contamination.



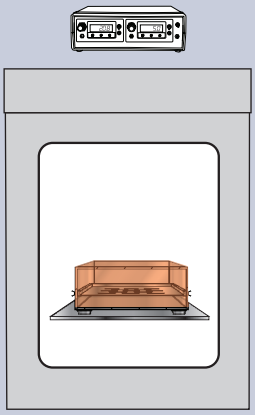
ProOx C21

O_2/CO_2 Subchamber Controller

The ProOx C21 controls both O_2 and CO_2 simultaneously. It is the most flexible choice for hypoxia/hyperoxia research using existing laboratory incubators, BioSpherix C-Chambers, or any semi-sealed vessel. The remote gas control pod has a unique design that is resistant to initial and inadvertent cross contamination maintaining a contamination free environment.

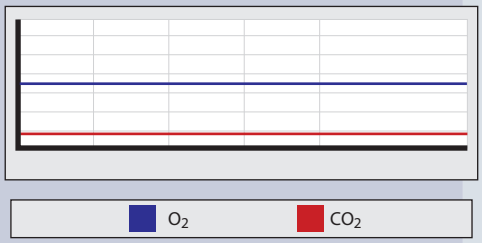
- Full Range Oxygen Control
- Independent CO_2 Control
- Automatic Operation
- Forced Gas Homogenization
- Unique design maintains contamination resistant environment
- Fits and controls existing incubator and cell culture chambers

Typical Configuration



From outside the host chamber, the ProOx C21 works by remotely sensing oxygen and carbon dioxide inside the chamber and infusing gas to control both.

Performance



The ProOx C21 independently controls both CO_2 and O_2. No pre-mixed gas! Set oxygen anywhere between 0.1 - 99.0% and carbon dioxide anywhere between 0.1 - 20.0%.



Set desired O_2 and CO_2 levels via front panel interface. Once calibrated and set, operation is automatic.



ProOx P360

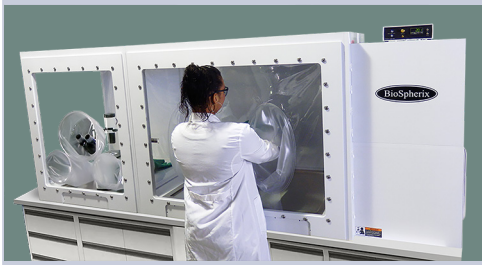
High Infusion Rate O_2 Controller

The ProOx P360 quickly brings chambers to O_2 setpoint. This controller works in any semi-sealable container, including third party incubators. Its high infusion rate means absolute minimal recovery times in smaller chambers, and the ability to accurately control large chambers such as the I-Glove. The ProOx P360 holds O_2 stable against consumptive or generative processes.

- Full range oxygen control
- Static and adjustable setpoints
- Gas efficient
- Versatile and compact
- Control 0.1-99.9% oxygen
- Fits any semi-sealable enclosure
- Disturbances are immediately detected and corrected
- Easy to install, operate and relocate



The ProOx P360 is capable of controlling large chambers accurately.

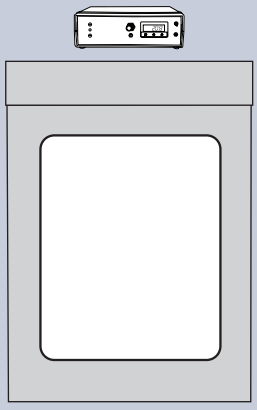


The ProOx P360 is a versatile controller with the capacity to accurately control large chambers such as the BioSpherix I-Glove, C-Shuttle, or X3 System.



The ProOx P360 is easily operated through its front panel interface. Digital output displays current oxygen levels when not in use for programming.

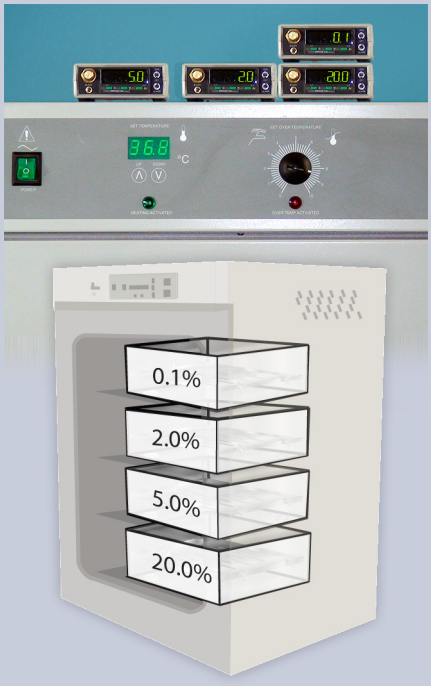
Typical Configuration



From outside the chamber, the ProOx P360 detects and controls oxygen levels.

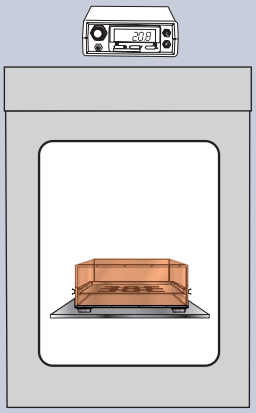


Compact design requires minimal lab space.



Multiple ProOx P110s can control independent subchambers within the same incubator. They are an economic alternative to O_2 incubators

Typical Configuration



From outside the host chamber, the ProOx P110 works by remotely sensing oxygen inside the chamber and infusing gas to control to setpoint. The ProOx P110 is versatile. Can control subchamber, incubator, refrigerator, etc.



ProOx P110

Compact O_2 Controller

The ProOx P110 is a versatile and compact oxygen controller for O_2 sensitive work. Though designed to work with all BioSpherix chambers, the ProOx P110 works in incubators, glove boxes, refrigerators, plant growth chambers and many other semi-sealable chambers without disturbing your cells. With the feedback control system oxygen is quickly taken to the setpoint and held there indefinitely. Any disturbances are instantly detected and immediately corrected.

- Full range oxygen control
- Static and adjustable setpoints
- Gas efficient
- Versatile and compact
- Control 0.1-99.9% oxygen
- Fits any semi-sealable enclosure
- Disturbances are immediately detected and corrected
- Easy to install, operate and relocate



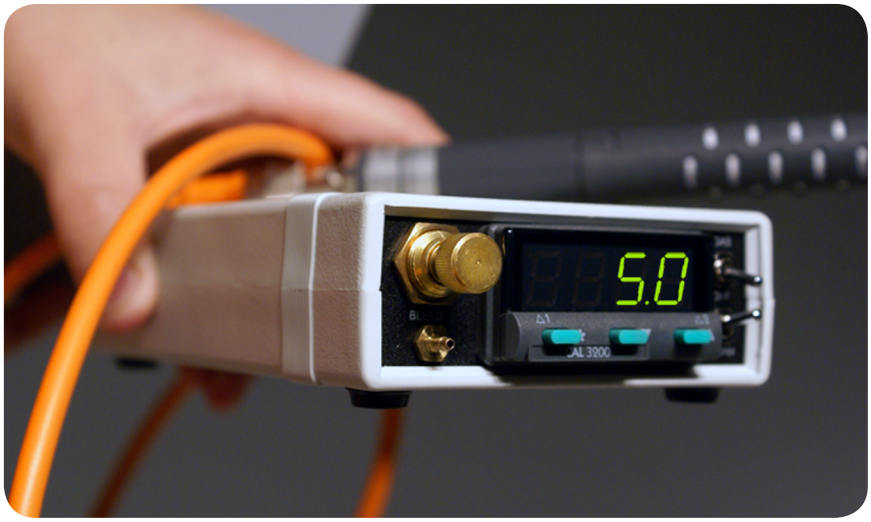


ProCO$_2$ P120

Compact CO$_2$ Controller

The ProCO$_2$ P120 is a versatile and compact carbon dioxide controller for CO$_2$ sensitive work. Though designed to work with all BioSpherix chambers, the ProCO$_2$ P120 works in incubators, glove boxes, refrigerators, plant growth chambers and many other semi-sealable chambers. Carbon dioxide is quickly taken to the desired setpoint and held there indefinitely. Disturbances are instantly detected and immediately corrected.

- Automatic operation
- Gas efficient
- Quick recovery to setpoint
- Versatile and compact
- Control setpoint: 0.1-20.0% CO$_2$ for most physiologic or pathologic concentrations
- Fits any semi-sealable enclosure
- Disturbances are immediately detected and corrected
- Easy to install, operate and relocate

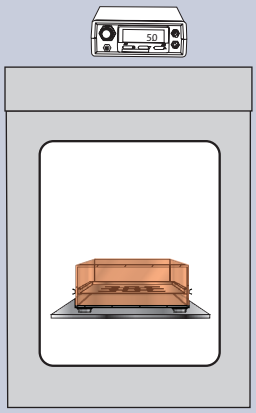


The compact design controls remotely, assuring that cells are never unnecessarily disturbed.



Compact design requires minimal lab space.

Typical Configuration



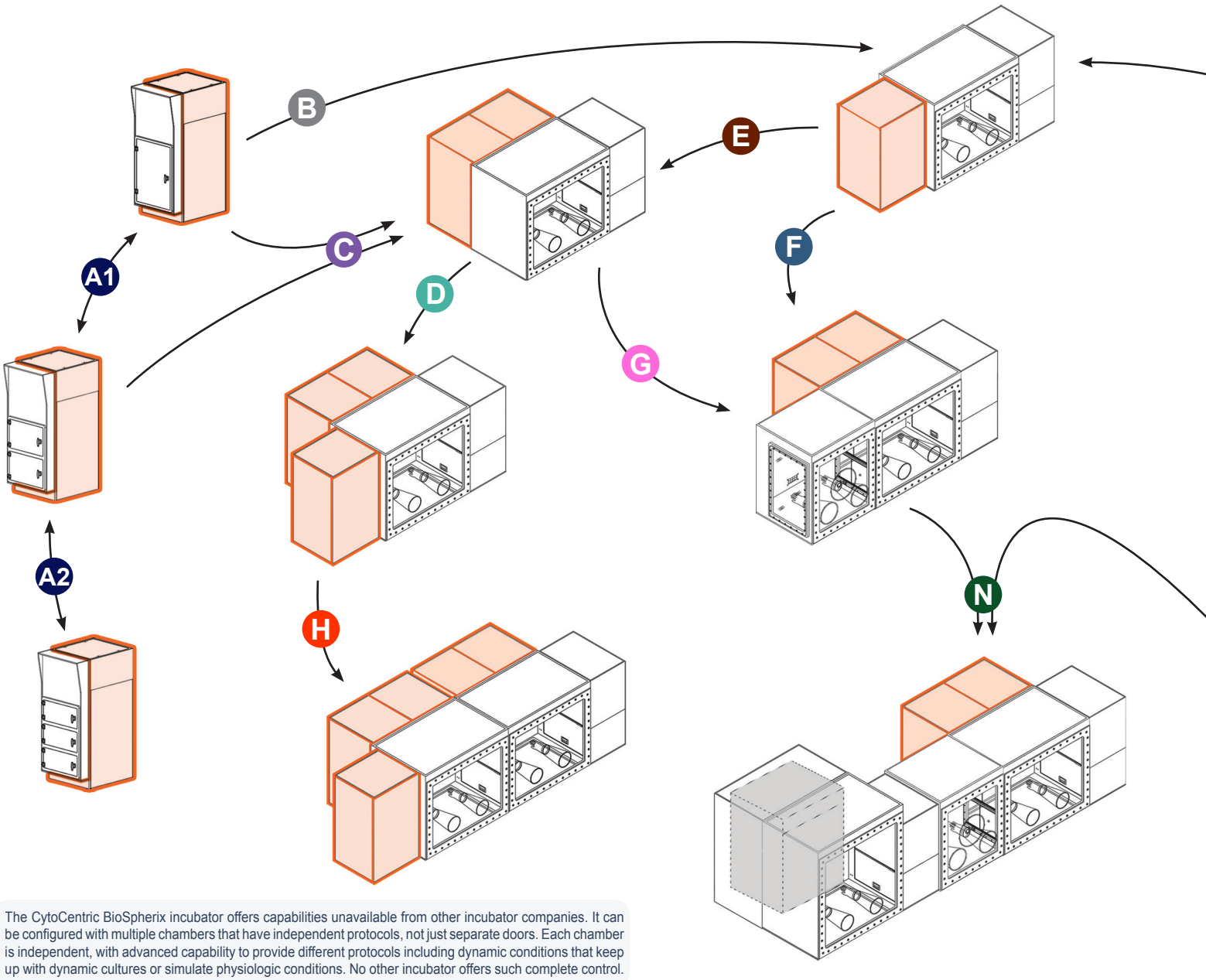
From outside the host chamber, the ProCO$_2$ P120 works by remotely sensing carbon dioxide inside the chamber and infusing gas to control to setpoint.

Versatile



The ProCO$_2$ P120 can control an entire incubator to add custom levels of CO$_2$, control a subchamber within an incubator to add an additional protocol, or control any chamber you manipulate cells in.

Cells Need To Fit Your Research ...



The CytoCentric BioSpherix incubator offers capabilities unavailable from other incubator companies. It can be configured with multiple chambers that have independent protocols, not just separate doors. Each chamber is independent, with advanced capability to provide different protocols including dynamic conditions that keep up with dynamic cultures or simulate physiologic conditions. No other incubator offers such complete control.

A1 The modular design of the X3 incubator allows you to change the number of independent chambers to adapt to the needs of current research. Chamber volume and number of protocols are flexible - one large chamber can become two medium chambers, and vice versa. You can also swap between 1 and 3 chambers.

A2 If more protocols are needed, a 2-chamber incubator can evolve into a 3-chamber incubator. If more volume is needed, swap from 3 chambers to 2 larger chambers.

B Any Cytocentric incubator can be seamlessly integrated with a Cytocentric processing chamber for a combined incubation and processing system.

C Two Cytocentric incubators that open into the room can be integrated with a processing chamber that gives all of the features of an integrated incubation and processing system.

D Cytocentric expansion capability is shown here, where a dual-incubator combination becomes a triple combination allowing for larger cell volume and/or more protocols.

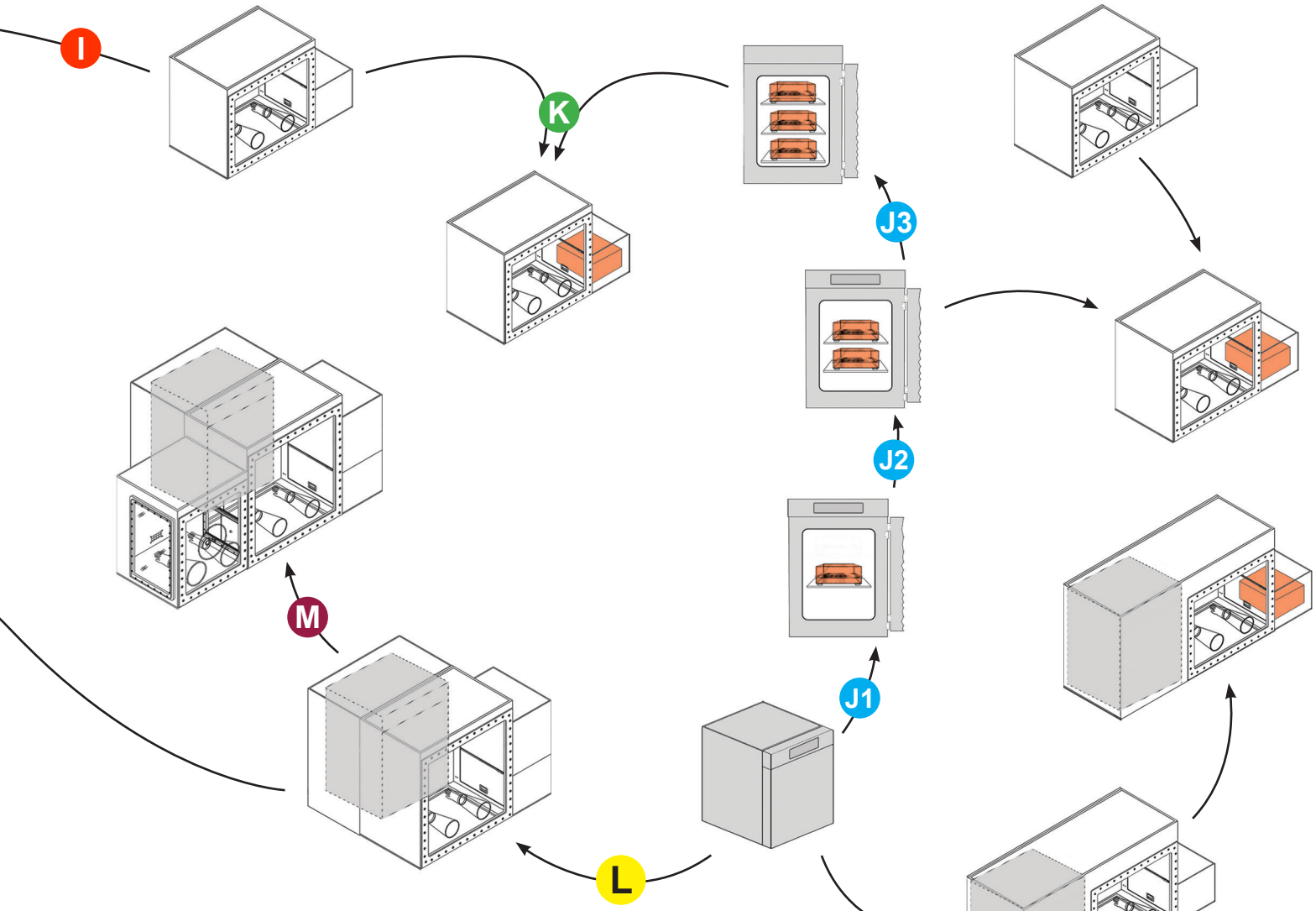
E Any integrated Cytocentric incubation and processing system can be expanded/upgraded by adding more incubation chambers.

F Expansions and upgrades can be made simply by altering system configuration to accommodate additional modules. In this example, incubation and microscope modules are added, increasing capacity while further enclosing a process.

G Processing expansions and upgrades can be added to any existing systems. For example: microscope chambers, cell sorters, automation equipment, or almost any other additional equipment.

H The X3 system has virtually unlimited incubation capacity and protocol expansion. Simply connect any number of additional processing chambers to accommodate 2-3 more incubation modules apiece, based on system configuration - end chambers can accommodate three incubators. (3-9 more independent incubation chambers.)

Your Budget ... Your Lab ... Now They Can!



The vast majority of cell research labs already have a third party incubator. Your current incubator does not have to be obsolete; BioSpherix offers many solutions to adapt a standard CO_2 incubator to more advanced protocols.

I A standalone controlled processing chamber can work with a third party incubator but retain the ability to upgrade to an integrated cytocentric incubation and processing station (with the addition of a cytocentric X3 incubator) when budget allows.

J1 You may add an additional protocol to a standard incubator with a subchamber culture system. This chamber is isolated from the rest of the incubator and can have a variety of protocols depending on the controller.

J2 Another subchamber is integrated into a standard incubator, providing three total independent protocols.

J3 A third subchamber provides the ability to run a fourth protocol in an existing incubator.

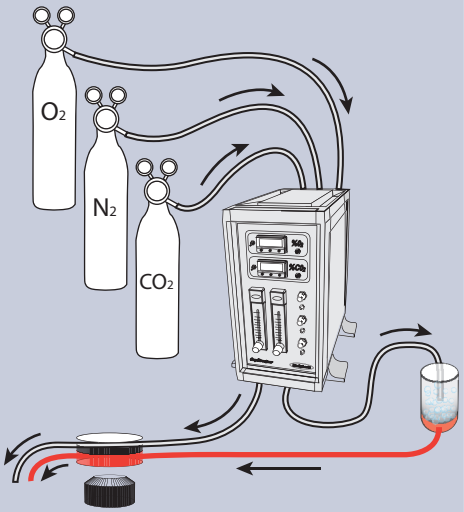
K Subchamber systems are used with freestanding people-centric incubators by simply using the sub-chamber as a shuttle transport. This protects culture from room air hazards and ties the X3 system in with any BioSpherix Subchamber.

L Traditional people-centric incubators have a limitation for meeting cell needs because they open into the room. This exposes cultures to sub-optimal conditions and contaminants. The X3 fulfills cell needs by integrating any existing incubator into a controlled, aseptic processing chamber. Now, when doors open optimal conditions are uninterrupted and cells are protected against room contaminants.

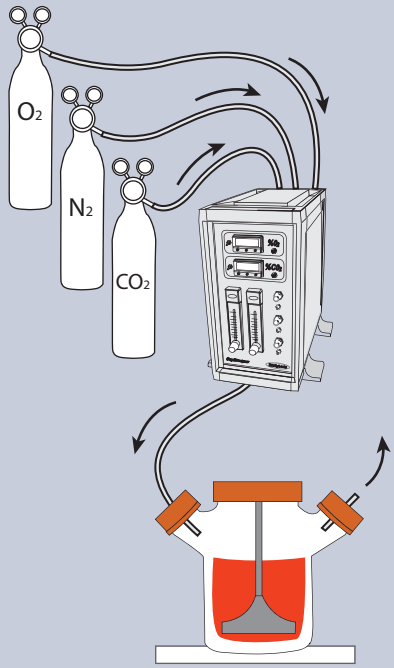
M As a research lab's needs change over time, any X3 system can expand to accommodate additional equipment into its optimized, aseptic environment. A microscope is shown here, but the possibilities are virtually unlimited.

N Both CytoCentric and adapted "People-Centric" X3 systems are compatible with each other and can be combined for virtually unlimited capabilities.

Typical Configuration



OxyStreamer eliminates the need for pre-mixed gas. Controller is used primarily to pre-condition perfusion media and headspace above the culture simultaneously.



OxyStreamer works as an open loop headspace controller for spinner flask applications. The system can also be used for sparging. There are many different spinner flask designs, but the installation remains similar.



OxyStreamer

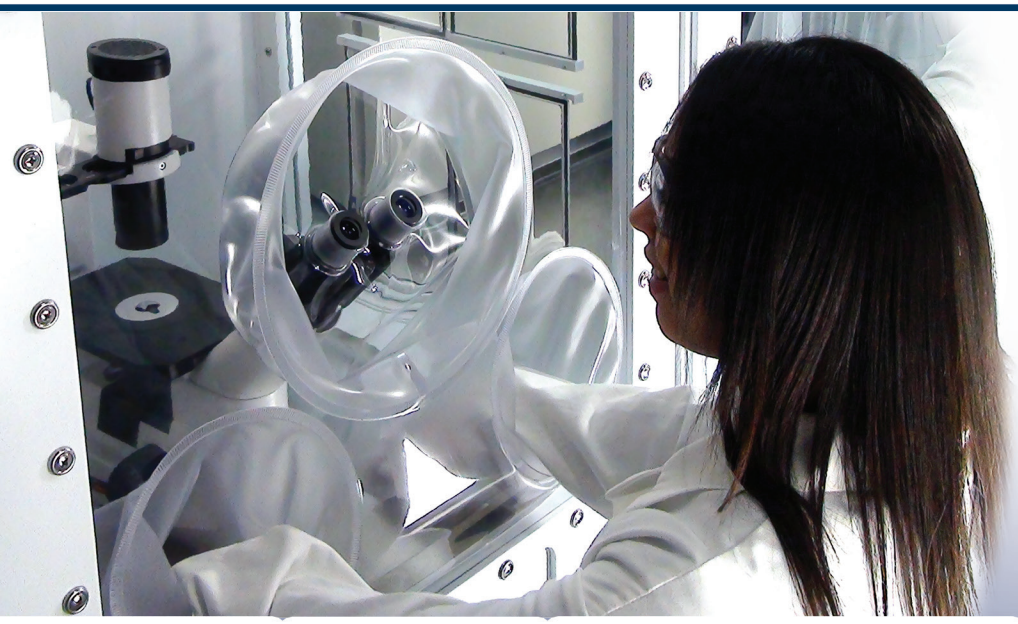
Oxygen and Carbon Dioxide for Live Cell Microscopy

The OxyStreamer pre-mixes O_2 and CO_2 manually, then conditions both the atmosphere and media within a stage mount. It independently monitors and controls in real time. Keep cells under optimal conditions even while viewing them. Optional PC software provides trend plotting, data logging, and remote operation.

- Full range, real-time control of O_2 and CO_2
- Dual streams for simultaneous control of gas phase and liquid phase in live cell microscopy
- Eliminates inflexibility of premixed gas
- Eliminates the high cost of premixed gas
- Eliminates inaccuracies due to gas stratification in premixed gas tanks
- Vertical footprint saves bench space

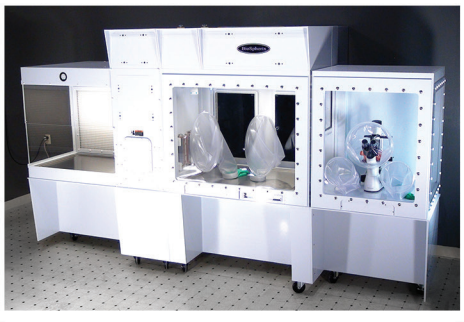


Works with 3rd party live cell microscopy stage chambers, such as the DH-35iL Culture Dish Incubator shown above.









GMP Xvivo System *Model X2*

Cytocentric concepts are closely aligned with quality management for cell production and the ***Xvivo System model X2*** has been warmly embraced by the cell therapy community as an attractive alternative to cleanrooms. Regulatory agencies around the world agree. Good manufacturing practices are easier to achieve. Risk is reduced in many ways. Speed of implementation is much faster and much easier. Huge savings (in the millions of dollars) result for most customers.

Contact us for more information.

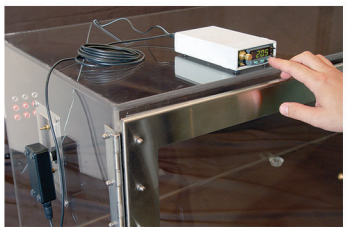
Animal Modeling

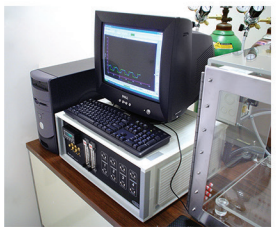
Animal models are used widely to simulate disease and pathology of humans. Many important animal models can be created by BioSpherix animal equipment, including

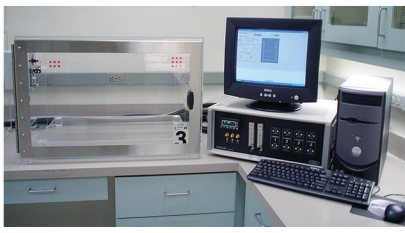
Ocular Angiogenesis
Pulmonary and Systemic Hypertension
Apnea, Sleep Apnea and Apnea of Prematurity
SIDS (Sudden Infant Death Syndrome)
Atherosclerosis
Ischemia (Cardiac Infarction, Stroke, etc.)
Chronic Obstructive Pulmonary Disease
Pulmonary Fibrosis
ADHD
Polycythemia
Developmental Disabilities / Eclampsia
Recreational and Occupational Hypoxia
Recreational and Therapeutic Hyperoxia
Acute Mountain Sickness
New NO, CO and Hypoxia Therapies

Contact us for more information.











BioSpherix

cytocentric
cell incubation and processing
systems

Toll Free 800.441.3414
www.biospherix.com
25 Union Street, Parish, NY 13131
Ph: 315.387.3414 Fax: 315.387.3415 E-mail: sales@biospherix.com