

# OxyCycler

AT Series ...O<sub>2</sub>, CO<sub>2</sub>, CO, NO, O<sub>3</sub>

*multi-chamber  
multi-variable  
multi-setpoint  
bioactive gas  
control systems  
for IN VIVO  
studies*



**O**xygen and its gaseous oxide cousins are

the most bio-active gases in the biosphere. Medical research is illuminating more and more roles these gases play in living things. Both physiologic and pathologic functions are being discovered that will eventually enable doctors to treat and even cure human disease ...if they can manipulate and experiment with these gases.

The trouble is some of these gases are toxic too. Until now it was difficult to use them.

The OxyCycler AT series systems are advanced automated tools that allow biomedical scientists to create virtually any exposures to any of these bio-active gases, in any combination in all in vivo models...with relative safety.

Controllers can be configured as needed, and integrated with any variety of chambers to complete the system of your choice. Any leaks or off-gas is exhausted to a fume hood.



Each chamber can hold one or more animal cages. This keeps all the food and litter in the cage, and chambers stay clean. Animal caretakers can easily remove cages for routine maintenance of animals with virtually no exposure to controlled gases. Each chamber sits inside its own dedicated fume shroud.

This shows a complete 4 chamber system: the OxyCycler controller, the PC, 4 chambers each inside its own fume shroud. Notice the black flexible umbilicals which extend from the controller to each of the chambers. These carry the gases and electronic signals



between the controller and chambers. The chamber's fume shrouds can be stacked or distributed around the lab within the reach of an umbilical. The toxic gas (CO, NO, NO<sub>2</sub>, O<sub>3</sub>, etc.) that's controlled inside the chambers will leak out their ventilation holes into the shroud and be whisked away to the room's fume hood and never build up in the room. These systems can only be installed in rooms with built in fume hoods and negative pressure.

## MULTI-CHAMBER

You can simultaneously but independently control in any number of chambers. You can control the same thing in all chambers at the same time. You can control the same thing in all chambers at different times. You can control different things in different chambers at the same time...or at different times.

Minimum number to consider is 2. Experimentalists need one chamber as a control.

## MULTI-VARIABLE

You can control any single gas or any combination of the gases.

O<sub>2</sub> is a widely used single gas system for hypoxia and hyperoxia. You can get just O<sub>2</sub> controlled systems.

CO<sub>2</sub> and O<sub>2</sub> are the primary respiratory I/O gases. You can get combo O<sub>2</sub>/CO<sub>2</sub> systems.

CO and NO are new signaling gases. You can get O<sub>2</sub>/CO systems, O<sub>2</sub>/NO systems, O<sub>2</sub>/CO<sub>2</sub>/CO systems, O<sub>2</sub>/CO<sub>2</sub>/NO systems. Match the needs of your research program.

## MULTI-SETPOINT

You can program the gas concentration to change at any time. Just set a series of setpoints each associated with a time. Intermittent hypoxia is a common one.

You can program multiple variables at the same time. For example, make O<sub>2</sub> go down while CO<sub>2</sub> goes up.

You can run different programs in different chambers.

Dynamic control allows you the unique ability to better simulate natural conditions and manipulate new artificial ones.



This shows the OxyCycler controller and the PC which serves as the user friendly interface. The PC also displays real time trend plots of the gas concentrations in each of the chambers, and datalogs this information 24/7. It also visually notifies of any alarm conditions, and records all alarms - the time and date of the alarm condition, and the type of alarm. An external switch is activated by any alarm, and this switch can activate any external device like lights, buzzers, automatic phone dialers, etc. (see switch below). All alarms have to be acknowledged before they can be cleared from the alarm log. Passwords can be set up to limit access to only certain users. Three different security levels allow password access to only those screens that are necessary.



Chambers sit inside fume shroud and chamber door opens a full 110 degrees for full frontal access. Chamber door is opened with a single quarter turn latch.



Each fume shroud has it's own dedicated exhaust fan that routes all chamber exhaust through a flexible 4 inch duct to the requisite fume hood.



External devices can be activated by this global alarm switch on the back panel. It switches 3-32 VDC up to 3 A. Automatic phone dialer can notify you of alarm condition no matter where you are (home, office, cell, pager, etc.)



Each system has sensors that monitor and log gases in the room outside the fume shroud. This allows an alarm to signal if any dangerous gases are released into the lab, allowing you to take corrective action before levels build to harmful levels. Datalog provides a record of exposure to users.



Pods at the end of each umbilical attach to the chamber and provide the interface between the OxyCycler and the chamber. This is where the sensors and the gas infusion nozzles are located. The sensors monitor the gas concentration in the chamber, and the controller infuses the appropriate gas when necessary. A small fan is used to (1) instantly homogenize the gas throughout the chamber, (2) aid ventilation of fresh air into the chamber to handle off-gases, (3) and efficiently recirculate the chamber gas under the riser platform on which the cages sit.

ABOUT US: Since 1982 we've made a wide variety of tools, that is advanced atmosphere systems (instruments and chambers), for biomedical researchers. Both *in vitro* and *in vivo* systems. All involve bioactive gases: O<sub>2</sub>, CO<sub>2</sub>, NO, CO, O<sub>3</sub>. Automation. Precision. If one of our many standard systems don't fit, system can be customized to *exactly* fit your needs. We make atmospheres. We make them work for you!



6678 Route 17  
Redfield, New York 13437  
315-387-3414  
FAX 315-387-3415  
TOLL FREE US/CAN 800-441-3414  
www.biospherix.com