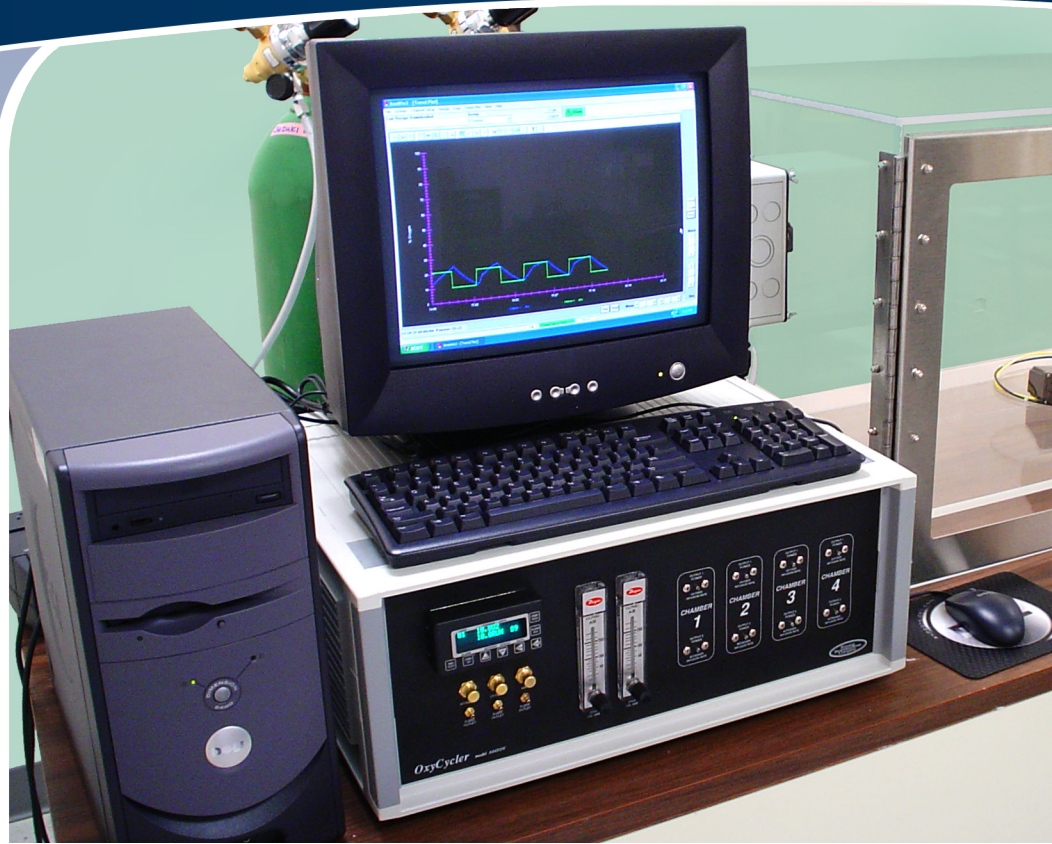


- Static or Dynamic CO₂ control
- Reproducible Hypercapnia Exposures
- Controls four chambers independently
- Monitoring and quality control
- Data logging
- Convenient PC user interface



Dynamic 0.1-20% CO₂ In Four Chambers

POWERFUL TOOL

The OxyCycler A44C is a powerful research tool for scientists who do CO₂ sensitive work. It makes complex CO₂ profile control easy.

FULL RANGE DYNAMIC PROFILES

Control carbon dioxide profiles with multiple setpoints anywhere from 0.1-20%.

Hold any setpoint for any length of time. Rate of change between any two setpoints is fully adjustable. Cycle any profile any fixed number of times, or continuously.

WORKS IN ANY CHAMBER

The OxyCycler A44C works exceptionally well with BioSpherix A-Chambers. However, it can work with practically any semi-sealable enclosure. Large or small. Square or round. Flexible or rigid. Manufactured or custom made. Most chambers can be fitted in minutes.

MULTI-CHAMBER IS PRODUCTIVE

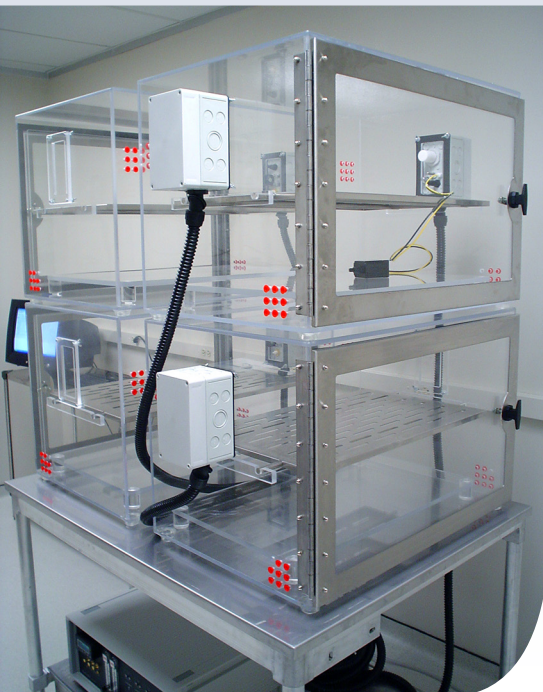
Controls up to four chambers at once. Operate all chambers simultaneously, or each independent of the others. Control different profiles, or same profile in every chamber. Start all at the same time, or each at different times.

CONTROL IS EFFICIENT

Nitrogen or compressed dry air is infused to lower CO₂. Carbon Dioxide is infused to raise it. Feedback from the carbon dioxide sensor inside chamber tells the OxyCycler A44C exactly when and exactly how much gas to infuse. No gas is ever wasted! Any disturbances are immediately detected and corrected.

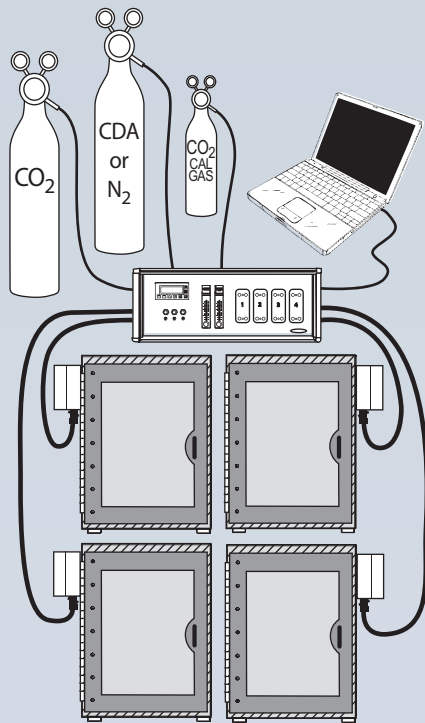
OPERATION IS SIMPLE

Once installed and configured, it's easy. Check calibration once in a while and don't run out of gas. Otherwise it's all automatic! Can work continuously year round, or on occasion as needed.



Controls four chambers simultaneously but independently. An actuator pod attaches to each chamber.

Installation Schematic



Installation

1. Set OxyCycler A44C on or near host chambers and plug it in.
2. Mount each actuator pod to its host chamber.
3. Hook up gas supply.

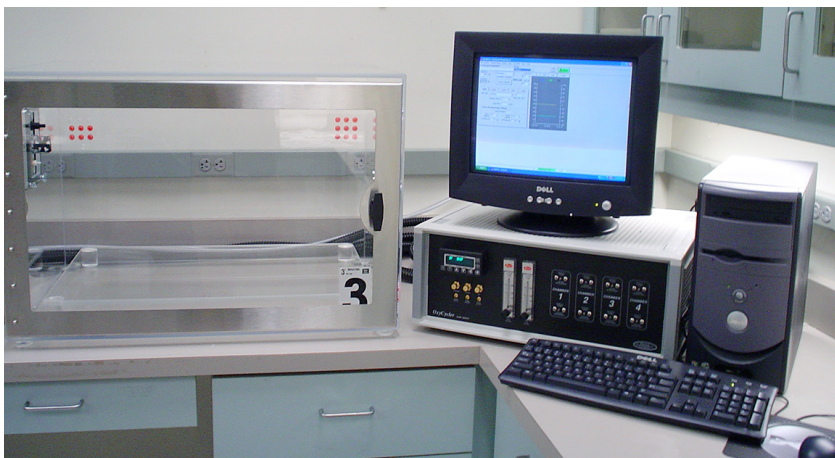
How It Works



From outside four chambers, the OxyCycler A44C works by remotely sensing carbon dioxide inside each chamber, infusing compressed dry air or nitrogen to reduce carbon dioxide, and infusing carbon dioxide to raise it. A continuous supply of both up and down gases are required. Compressed dry air vs nitrogen will depend upon your setup and protocol.

The OxyCycler A44C connects to the chambers via four flexible umbilicals. At the tip of each umbilical is an actuator pod which contains a carbon dioxide sensor, a gas nozzle, and mounting hardware. Pods mount to chamber over special pre-cut holes so CO₂ sensors can monitor chamber carbon dioxide and gas can be infused.

Operation



Use PC software for easy interface, real-time trend charting, data logging, and remote operation. Dynamic CO₂ exposures are programmed with a series of setpoints that can change, be stored and re-run with the click of a mouse.

Gas

USE ANY GAS SUPPLY

Conveniently utilizes gas from any source. Compressed gas is best in low consumption applications. Generator is best in high consumption applications. Liquid is best in between.

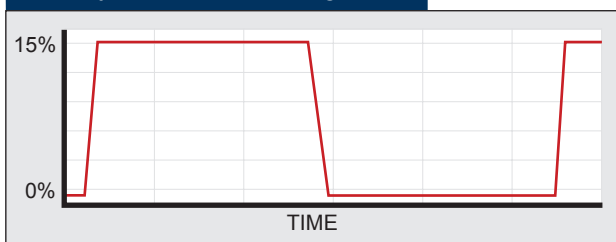
SAVES GAS

Maximum efficiency reduces chamber gas consumption.

SAVES MONEY

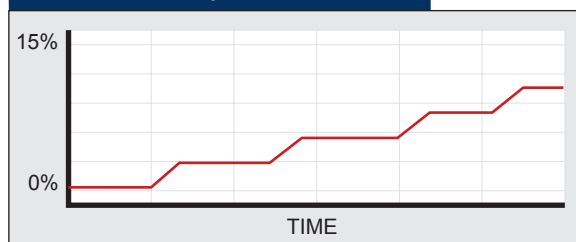
Gas costs are reduced to absolute minimum.

Hyper/Normo Swings



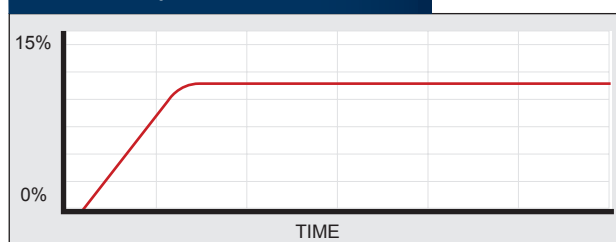
High CO₂ levels for a set period, then normal levels for a set period. Set the pattern to repeat as many times as needed. Any fluctuation can be created. Rapid swings, lengthy swings, increasing or decreasing durations; whatever CO₂ model you need for your research, the OxyCycler A44C can handle it.

Graded Hypercapnia



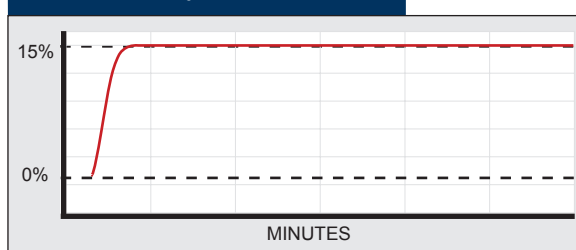
Raise CO₂ levels gradually, or lower them gradually. The rise can be spread over days. Any rate of change can be set and repeated, faster or slower, and held for any length of time.

Hypercapnia



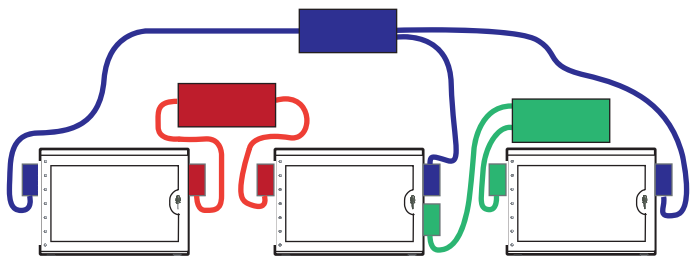
Hypercapnia is a relative term that means excess concentration of CO₂. The OxyCycler A44C can create hypercapnia by infusing the CO₂ into the chamber until it reaches the setpoint and holding it.

Acute Hypercapnia



Sharp increase in CO₂ levels can aid in psychological or neural models.

Works With Other Controllers



The OxyCycler series was designed to be very flexible to meet researcher's needs. This flexibility allows you to add additional gas controls down the line if you discover you need them. It also allows you to buy exactly what you need now, with confidence that you can add more later for new experiments.

OxyCyclers can work together on the same chamber. Software configuration makes two controllers work together seamlessly as one. Each controls their respective gases simultaneously; even dynamic setpoints while holding other gases static.

PROFILING IS FLUX

Carbon Dioxide flux can affect physiology. It can only be studied if it can be recreated. Profiles are reproducible flux patterns. Profiles have multiple setpoints which change at precise times, with any rate of change from one setpoint to the next.

NORMOBARIC FLUX

Carbon Dioxide profiles in a semi-sealed chamber are normobaric. Nitrogen and gas infusions displace chamber gas and equilibrates with ambient barometric pressure outside the chamber. Normobaric avoids hassles of pressure equipment. Chamber control avoids hassle of ventilation equipment.

MULTIPLE PROFILING

Four chambers means one control profile and up to three experimental profiles. Comparing profiles makes optimizing models easy and straightforward. It also makes dose-response studies possible.

Up to 17 different profiles can be stored. Each can be run or re-run in any of the four chambers at any time. Any given profile can be run in all the chambers simultaneously, or staggered at different times. Or every chamber can have a different profile running.

MODEL ANY CARBON DIOXIDE FLUX

Pattern any carbon dioxide flux. Each profile can have 1- 20 set points. Straight line rate between any two sequential set points can be 0 - 999 minutes with resolution to seconds. Profiles can be cycled 1-99 times, or cycled continuously.

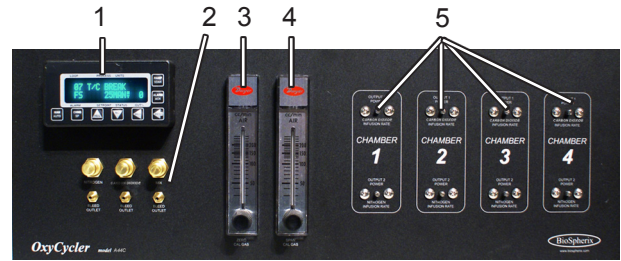
Specs

ELECTRICAL POWER: 12 VDC @ 6.66A
CONTROL RANGE: 0.1-20% Carbon Dioxide
ACCURACY: ±1%
RESOLUTION: 0.1%
GAS SOURCE: Compressed gas tanks, liquid carboys (from headspace), or generators.
GAS SUPPLY: Pressurized CO ₂ , N ₂ .
GAS SUPPLY LINE: 1/4 inch I.D. hose pressure rated at 40 PSIG.
GAS SUPPLY LINE PRESSURE: 0-40 PSIG
GAS INFUSION RATE: 1-150 S.C.F.H. each control gas each chamber.
GAS SUPPLY HOSE FITTINGS: 1/4 inch hose barb.
UMBILICAL LENGTH: 12 feet (custom lengths available).
ACTUATOR POD SIZE: 7"H, 4.375"W x 4.5"D inches.
ALARM OUTPUT: Visible flashing indicator. PC adds audible and more visible indicators.
ALARM MODES: Process high, process low, deviation high, deviation low, deviation band.
WEIGHT: 31 lbs. (Controller Only)
DIMENSIONS: 9"H x 22.2"W x 18.5"D

Sensor Operational Parameters

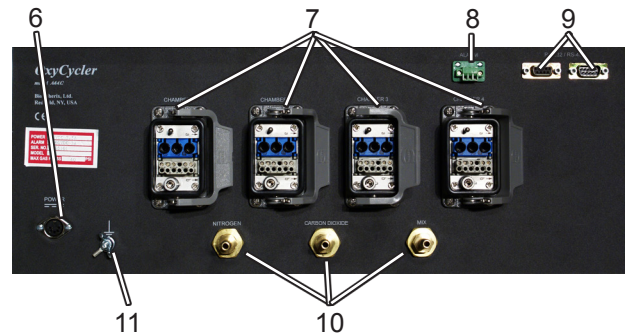
HOST CHAMBER TEMPERATURE: 0-40°C (depending on sensor).
HOST CHAMBER CO₂: 0-20% (depending on sensor).
HOST CHAMBER HUMIDITY: 1-95% R.H. (depending on sensor).

Front Panel



- 1. Controller:** Bright blue digits on black background. Continuously displays current control gas level, control status, and alarm status in all chambers. Displays menu items and settings during programming.
- 2. Bleed Valves and Barbs:** Bleeds gases out of gas supply lines. Calibration cup for sensor attaches here.
- 3. ZERO Cal Gas Flowmeter:** Used for calibration.
- 4. SPAN Cal Gas Flowmeter:** Used for calibration.
- 5. Needle Valves:** Sets infusion rate of control gases in each chamber to accommodate different dynamics. Can manually override controller to shut off gas.

Back Panel



- 6. Power Receptacle:** 12VDC power supply connects here.
- 7. Actuator Pod Umbilical:** Flexible umbilicals connect remote actuator pods to back panel. Semi-swivel connectors at both ends allow 360° orientation. Some models are hard welded; function is the same.
- 8. Alarm Receptacle:** Connect an appropriate alarm to this jack.
- 9. RS 485 Connections:** One cable attaches to a computer and the other cable attaches to another unit, to allow communication with the computer (if applicable).
- 10. Supply Gas Hose Barb:** Barbs for 1/4 inch I.D. hose from gas sources. Handles pressure up to 40 PSIG.
- 11. Ground Stud:** For grounding the unit to protect from electric damage.



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