Embrient Inc
Formerly known as billups-rothenberg inc

9030 Carroll Way, Suite 1
San Diego, CA 92121

Tel: 1 (858) 535-0545
Toll-Free: 1 (877) 755-3309
Email: info@embrient.com

embrient.com

Gas Mixing System

GMS-5003

Instructions for Use

DESCRIPTION

The GMS-5003 is a state-of-the-art flow-through oxygen (O_2) sensor that delivers rapid and precise oxygen readings from 0% to 25%. It becomes the ultimate tool for achieving precise mixtures of custom O_2 concentrations when used with our Dual Flow Meter (DFM-3002). It is particularly beneficial for creating hypoxic culture conditions or when specialized pre-mixed gases are costly or unavailable.

What sets the GMS-5003 apart is its advanced (self-calibrating) oxygen sensor, which measures the oxygen partial pressure (pO_2). Furthermore, integrated internal pressure, temperature, and humidity sensors work in concert to provide a comprehensive dataset, converting pO_2 readings into accurate oxygen percentages.

Unlike traditional electrochemical or galvanic sensors, the GMS-5003 boasts integrated solid-state sensors that eliminate the need for replacements or recalibrations. These sensors are factory-calibrated to account for ambient temperature, pressure, and humidity variations, ensuring precise performance across a broad environmental spectrum. The system is user-friendly, stable, durable, devoid of hazardous materials, and exhibits negligible cross-sensitivity to other gases such as CO_2 and N_2.

BENEFITS

- Easy to use
- Long battery life & rechargable
- Accurate (O_2 range 0 - 25%)
- Reliable
- Small and compact
- Low-cost
- Maintenance-free
- Factory calibrated
- Measures barometric pressure

SPECIFICATIONS

Oxygen Sensor

- Technology: Solid-state fluorescence quenching, diffusion sampling
- Range: 0 - 25%
- pO2 Accuracy: <2% FS/0.1 mbar
- Resolution: 0.1%
- Operating conditions: -30°C to 60°C, 500-1200 mbar

Humidity Sensor

- Range: 0% RH to 100% RH
- Accuracy tolerance: ±2% RH
- Resolution: 0.01% RH
- Hysteresis: ±0.8% RH (@25°C)
- Long-term drift (typical) : <0.25% RH/year

Temperature Sensor

- Range: -40°C to 125°C
- Accuracy tolerance: ±0.2°C (0°C to 90°C)
- Resolution: 0.01°C
- Long-term drift (max): <0.03°C/year

Barometric Pressure Sensor

- Range: 500-1200 mbar
- Accuracy tolerance: 5 mbar
- Resolution: 1 mbar

The GMS-5003 is calibrated using NIST gas mixture references. Oxygen calibration is performed in 5% CO_2.

DISPLAY FEATURES

Power level indicator is located on upper left corner.

Bottom left corner indicates warmup status and countdown.

Oxygen reading displayed in the center of the screen.

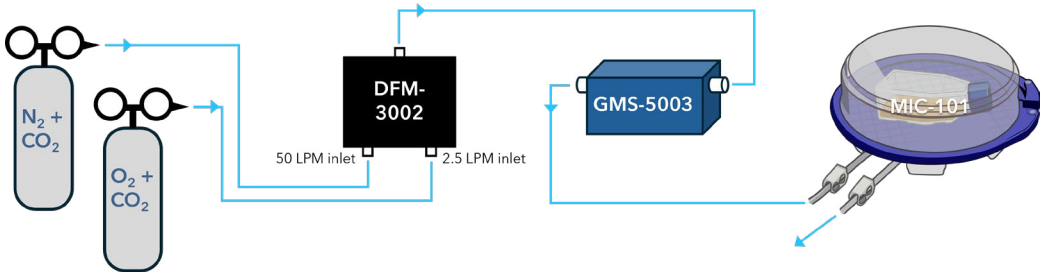
Bottom right corner shows barometric pressure in mBars.

OPERATION

1. To turn on the GMS-5003, press and hold the black power button, located on the front side of the enclosure, for approximately 2 seconds. If the battery is low, recharge the unit by connecting the provided USB power cable.
2. Allow the GMS-5003 sensors 2-3 minutes to stabilize. The display's bottom left corner counts down warmup time.
3. Connect the gas lines from the two tanks to the Dual Flow Meter (DFM-3002). The line from the 95% N_2 & 5% CO_2 tank connects to the bottom tubing connector of the 50 LPM flow meter inlet. The line from the 95% O_2 & 5% CO_2 is attached to the bottom tubing connector of the 2.5 LPM flow meter inlet.
4. After the bottom tubing is attached to your gas tanks, attach the upper tubing of the DFM-3002 with the red pressure release valve to the connector marked "IN" of the GMS-5003. The connector on the left side of enclosure marked "OUT" will be attached to the MIC-101.
5. Leave both white tubing clamps on the MIC-101 in the OPEN position prior to mixing gases and flushing the MIC-101. Failure to OPEN both white clamps will cause EXCESSIVE PRESSURE in the MIC-101. The MIC-101 is not designed to be a pressure or vacuum chamber. **Please read instructions for the MIC-101 prior to use.**
6. To mix gases, first predetermine the approximate flow rates of the 50 LPM and 2.5 LPM flow meters to obtain the percentage of oxygen needed for your experiments. *Example: To obtain 5% O_2, 5% CO_2 and 90% N_2 set the 50 LPM meter at 47.5 LPM and the 2.5 LPM meter set at 2.5 LPM.*
7. Open both tanks and adjust flow meters to the predetermined flow rate settings. Reading the GMS-5003, adjust the flow meters to obtain the desired accurate percentage of oxygen.
8. Flush 100 liters of gas through the MIC-101 with the desired percentage of oxygen.
9. Shut off the gas tanks and seal the MIC-101 by closing the white tubing clamps.

As we cannot anticipate nor control conditions of product application, we do not warrant suitability or favorable results. The GMS-5003 and accessories are for research purposes only and not for human use.

SETUP DIAGRAM



RELATED PRODUCTS & ACCESSORIES

Modular Incubator Chamber
MIC-101, Qty: 1

Air Filters
HFS-2021, Qty: 6/pkg

Dual Flow Meter
DFM-3002, Qty: 1

Tubing
TUB-516, Qty: 3 meters

SHOP

embrient.com

Embrient, Inc. 9030 Carroll Way, Suite 1 - San Diego, CA 92121 - Tel: 1 (858) 535-0545 - Email: info@embrient.com