



# Chamber Environment Control

*Control temperature and CO<sub>2</sub> in a microscope chamber environment*



The front panel of this ECU-HOC displays the monitored parameters: CO<sub>2</sub> level, air flow, chamber temperature.

This system offers precision control of temperature and carbon dioxide, as well as remote control and data logging via a USB connection. The system is flexible and easy to configure for a variety of experimental conditions. A satellite **AirTherm** provides heat to the system, and it is controlled by the **Environmental Control Unit (ECU)**.

## Control System Configurations

<b>ECU-H5</b>	Controller with heat only
<b>ECU-HC</b>	Controller with CO <sub>2</sub> and heat
<b>ECU-HOC</b>	Controller with CO <sub>2</sub> and O <sub>2</sub>

The **ECU** houses all the electronics for:

- Regulating the CO<sub>2</sub> flow
- Regulating the chamber temperature via our **AirTherm** Satellite
- Monitoring the air flow, CO<sub>2</sub> level and temperature

The system comes in three configurations:

- **ECU-H5**—Pre-mixed CO<sub>2</sub> gas of the desired concentration is pumped into the system, and this **ECU** regulates the airflow at the desired level. It also controls the heating and monitors the environment chamber.
- **ECU-HC**—This control unit mixes the air and CO<sub>2</sub> gas to the desired concentration. An internal CO<sub>2</sub> sensor (inside the **ECU** controller) monitors the concentration of the gas. The **ECU-HC** regulates the airflow at the desired level, controls the heating of the system and monitors the environment chamber.
- **ECU-HOC**—This unit performs like the **ECU-HC**. In addition to controlling the temperature and CO<sub>2</sub>, this unit also controls the O<sub>2</sub> level. However, it offers no auxiliary heating options. Nitrogen is used to displace oxygen from the background air, which generally has about 20.7% oxygen. The O<sub>2</sub> level of the background gas can be regulated down to as low as 1%.

## Features

- USB-based remote control and data logging
- Electronic flow meter
- Programmable alarm for out of tolerance condition
- Compact and lightweight
- Adjustable setpoints for parameters, including:
  - Temperature PID controls for the environmental chamber with  $\pm 0.1^\circ\text{C}$  precision
  - CO<sub>2</sub> digital PID control with  $\pm 0.1\%$  precision
  - Airflow digital PID control from 0–900 SCCM



**WORLD  
PRECISION  
INSTRUMENTS**  
*Instrumenting scientific ideas*

# Chamber Environment Control

*Control temperature and CO<sub>2</sub> in a microscope chamber environment*

## SPECIFICATIONS

Power	110/240V, 50/60Hz
Operating Temperature (ambient)	10 – 45°C (50 – 113°F)
Operating Humidity (ambient)	15 – 70% RH, non-condensing
Warm up Time	20 minutes
Computer Interface	USB via external USB/RS232 converter
Sensor	Non-dispersive infrared (NDIR), dual beam, 20s response time

### **CO<sub>2</sub> Sensor (ECU-HC only)**

Sensor Range	0 – 20% CO <sub>2</sub>
Control Range	0 – 20%
Control Precision	0.1% CO <sub>2</sub>
Control Accuracy	0.1 – 3% of reading
Drift	<2.5% reading/year

### **O<sub>2</sub> Sensor (ECU-HOC only)**

Sensor Type	Zirconium Dioxide, diffusion, 4s response time
Sensor Range	0–25%
Control Range	0–25%*
Control Precision	0.1% O <sub>2</sub>
Control Accuracy	±0.5% (2% of the full scale)

\*The upper limit of the ECU-HOC oxygen control range is constrained by the oxygen content in the background gas. For example, if the background air has 20.7% oxygen, the ECU-HOC can only control up to 20.7% oxygen.



**ECU Controller  
Connection**

*The Satellite AirTherm can be controlled by the ECU to regulate temperature in an incubation chamber.*

## **WORLD PRECISION INSTRUMENTS**

**USA:** International Trade Center, 175 Sarasota Center Boulevard, Sarasota FL 34240-9258 USA  
**Tel:** (941) 371-1003 • **Fax:** (941) 377-5428 • **E-mail:** wpi@wpiinc.com • **Internet:** www.wpiinc.com

**UK:** 1 Hunting Gate, Hitchin, Hertfordshire SG4 0TJ England • Tel: 44 (0)1462 424700 • E-mail: wpiuk@wpi-europe.com

**Germany:** Saarstraße 23, D-61169 Friedberg (Hesson) • Tel: +49 (0)6031 1602171 • Fax: +49 (0)6031 1602180 • E-mail: wpide@wpi-europe.com

**China & Hong Kong:** Rm 25e, No8 Dongfang Rd., Pudong District, Shanghai 200120 PRC • Tel: +86 688 85517 • E-mail: ChinaSales@china.wpiinc.com

**Brazil:** Conselheiro Nabias, 756 sala2611, Santos-São Paulo 11045-002 Brazil • E-mail: info@brazil.wpiinc.com