



# Stagetop Environmental Control

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



**STEV**

(Above) All the connection ports for the STEV are located on the same side of the unit.

(Below) The ECU is positioned on an inverted microscope. The ECU system consist of the stagetop environment base unit and the electronic controller.



For short term or long term studies of living cell cultures under a microscope or for time lapse video research, a microscope stagetop incubator is essential.

Perfect for Live Cell Imaging, **STEV** (the stagetop environmental control system) is a heated, humidified, compact environmental case that houses your culture wells and fits on a microscope stage. The **STEV** can be used with 35mm well plates by simply replacing the seal on the bottom of the stagetop environment case.

This system offers precision control of temperature, CO<sub>2</sub> and O<sub>2</sub>. The system is flexible and easy to configure for a variety of experimental conditions.

The system includes the **Environmental Control Unit (ECU)** electronics which use four programmable loops to control the temperatures of the case and the lid, CO<sub>2</sub> and O<sub>2</sub> within the environmental case, and airflow within the incubator.

The system comes in four configurations:

## Control System Configurations

<b>ECU-H5</b>	Controller with heat, premix gas
<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>
<b>ECU-HCP</b>	Controller with CO <sub>2</sub> and heat, external probe

- **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 stagetop environment chamber.
- **ECU-HC**—Mixes the air and CO<sub>2</sub> gas to the desired concentration (0–10% CO<sub>2</sub>). 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 stagetop environment chamber.
- **ECU-HCP**—Performs like the **ECU-HC**, except this unit comes with a remote CO<sub>2</sub> sensor that is positioned inside the stagetop environment chamber.
- **ECU-HOC**—Performs like the **ECU-HCP**. In addition to controlling the temperature and CO<sub>2</sub> (0–10% CO<sub>2</sub>), this unit also controls the O<sub>2</sub> level (0–20% O<sub>2</sub>). 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%.

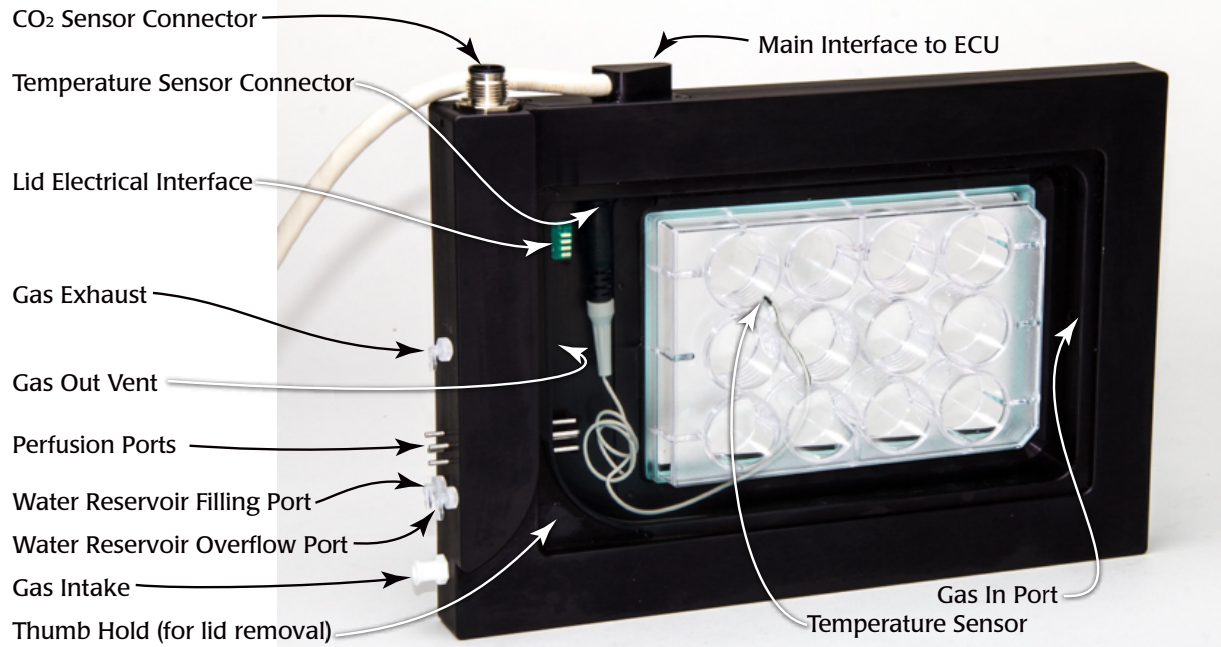
## Features

- Four programmable digital control loops:
  - Independent incubator base temperature PID control with ±0.1°C precision
  - Independent incubator lid temperature PID control with ±0.1°C precision
  - CO<sub>2</sub> digital PID control with ±0.1% precision
  - Airflow digital PID control from 0–900 SCCM
- Electronic flow meter
- Programmable alarm for out of tolerance condition on all four channels



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The base unit (STEV) above has the lid removed, showing the placement of the temperature sensor in one of the wells of a 12-well plate.

## SPECIFICATIONS

Power	110/240V, 50/60Hz
Operating Temperature (ambient)	10 – 50°C (50 – 122°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-HCP and 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.

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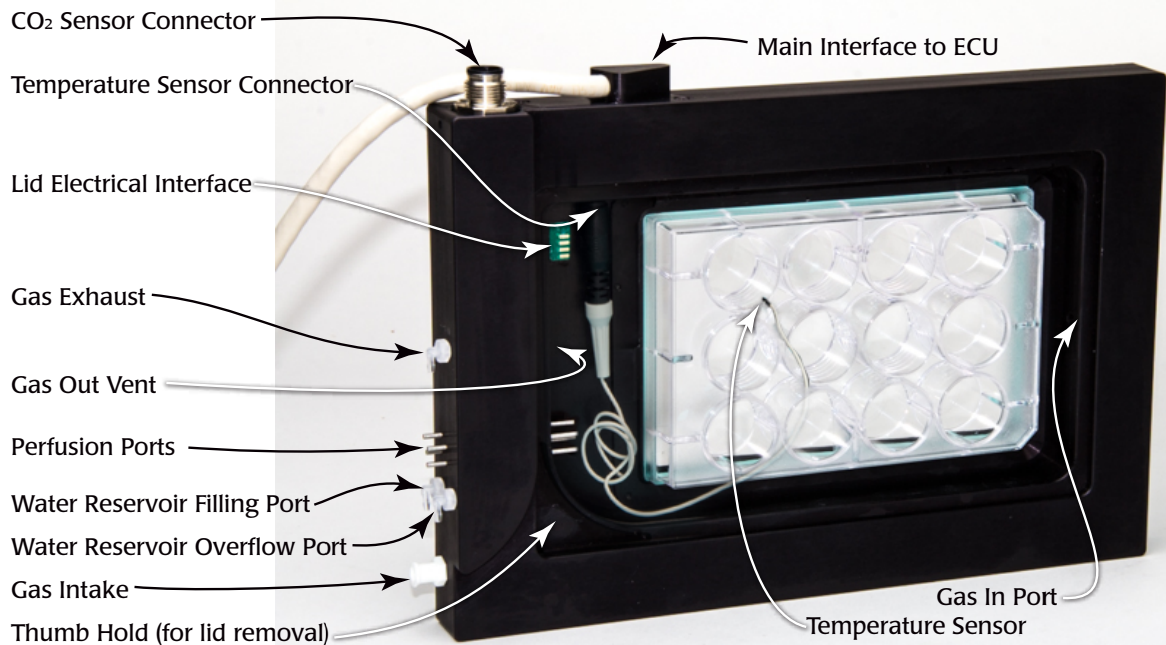
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