

## Harvard CO<sub>2</sub> Gas/pH Controller



This compact stand-alone pH controller was designed to precisely regulate the pH level of liquid biological solutions. It can be used in a number of biological experiments requiring regulated pH, such as: isolated organs (heart, lung, kidney, etc.) or isolated tissues.

Maintaining the pH is accomplished by either 'bubbling' CO<sub>2</sub> gas through the solution or flowing the CO<sub>2</sub> gas over the surface of the solution or medium. To maintain the desired pH level, the 'set-point' of the controller is adjusted to the desired level. When the pH level exceeds the programmed set point, the flow of acidifying CO<sub>2</sub> gas is started. Adjusting the controller's flow-rate regulator will determine at what rate the pH will decrease, the higher the flow -rate the faster the drop in pH. The controller's flow-rate regulator will allow the end user to adjust the CO<sub>2</sub> gas between 0 to 2.0 liters per minute. Once the pH reaches the set point, the gas flow automatically stops. Should the pH increase the process is repeated.

A three-position (manual override) switch on the front panel provides several ways to control the CO<sub>2</sub> gas delivery.

**By-Pass Mode:** (up) the flow of CO<sub>2</sub> gas is continuous and the flow rate will be controlled by adjusting the regulator.

**Momentary Mode:** (down) the flow of CO<sub>2</sub> gas is allowed as long as the switch is depressed. The switch is spring loaded and will return to the Auto Mode when released.

**Auto Mode:** (center) the controller will use the set-point to activate the on/off flow of CO<sub>2</sub> gas automatically.

- Precise pH level control of liquid biological solutions using CO<sub>2</sub> gas flow
- CO<sub>2</sub> flow regulation from 0 to 2 liters per minute
- Microminiature combination pH glass electrode included with system
- Easy setup
- Analog recorder output
- 12 V DC powered

When used with the Harvard series of heating/cooling micro-incubators, this controller provides a complete pH/temperature controlled environment, ideal for long term cell or tissue studies. The pH controller has a 4-digit LCD display capable of displaying the full pH range from 0 to 14 pH. The microminiature combination glass pH electrode that is supplied with the system is ideal for application involving placement of the pH electrode in a small area such as in our line of temperature controlled micro incubators.

The system is also compatible with any standard type of combination pH electrode for additional selections.

A BNC connector on the rear of the unit provides a pH output (0 to 5 V) signal. This connection can be used to continuously log the pH values to a chart recorder, data acquisition system or other recording device. The unit is powered by 12 VDC universal power supply for benchtop use. The pH controller is shipped with: controller, power supply, AC/DC adaptor, combination pH electrode and quick disconnect fittings matching front panel connectors for input and output hoses.

### Specifications

Range	0 to 14 pH
Resolution	0.01 pH
Accuracy	±0.02 pH
Input Resistance	12 W
Calibration:	
Offset	±2 pH through offset trimmer
Slope	80 to 110% through slope trimmer
CO <sub>2</sub> Flowmeter	2 L per min.
Gas Input/Output Connectors	Quick disconnect fittings
pH Analog Output	BNC connector 005 VDC output
Electrode Response Time	~0 sec
Electrode Slope	55 mV/pH in pH range of 1 to 14
Electrode Impedance	200 MW
Electrode Stability	0.05 pH/day
Electrode Dimensions, L x D	1.5 x 0.03 in (38.1 x 0.75 mm)
System Power	12 VDC (Universal 90/240 VAC, 50/60 Hz adapter)
Dimensions, H x W x D	12.2 x 15.2 x 12.7 cm (4.8 x 6 x 5 in)
Weight	0.8 kg (1.75 lb)

Catalog No.	Product
CGS 8769.75	Harvard CO <sub>2</sub> Gas/pH Controller
CGS 8770.75	Replacement pH Electrode
CGS 8771.75	Input/Output Connector Fitting (5121-065)
CGS 8772.75	Tygon Tubing (R-3603), 1/8 x 1/16 in (OD x ID)