



Turn-Key System

Nearly maintenance-free with the vortex intake and auto zero/span

Overview

The CPEC200 is a turn-key, closed-path eddy-covariance (EC) flux system for long-term monitoring of atmosphere-biosphere exchanges of carbon dioxide, water vapour, heat, and momentum. A complete system consists of a closed-path gas analyzer ([EC155 closed-path gas analyzer](#) with updated vortex intake design), sonic anemometer ([CSAT3A sonic anemometer](#)), datalogger ([CR3000 datalogger](#)), and

sample pump. A valve module is also available for automated zero and span.

The gas analyzer's intake design and small sample cell volume (5.9 mL) provide excellent frequency response (4.3 Hz cutoff frequency) with low total system power (12 W). Additionally, the vortex intake greatly reduces maintenance and maintains frequency response compared to traditional inline filters.

Benefits and Features

- › Fully integrated system with all the plumbing
- › Low-power operation
- › Excellent frequency response
- › Optional automatic zero and span

Technical Description

The gas analyzer's small sample cell volume minimizes the sample residence time (50 ms at the system's nominal flow rate, 7 LPM). This gives excellent frequency response (5.8 Hz half-power bandwidth) with low total system power (12 W).

The CPEC200 system enclosure can be mounted to a tripod mast, CM106 tripod leg base, tower legs, or a large diameter pole.

Eddy-Covariance Measurements

CO₂ and H₂O are measured with an EC155 Closed-Path Gas Analyzer. Three-dimensional wind speed and sonic air temperature are measured with a CSAT3A sonic anemometer head.

CPEC200 Pump Module

The pump module, a standard component of the CPEC200 system, consists of a small dual-head diaphragm pump with a brushless DC motor mounted inside a fiberglass enclosure. An integral cable connects the pump module to the CPEC200 system enclosure, which provides power, temperature measurement and control, pressure measurement, and pumping speed measurement and control.

CPEC200 System Enclosure

A fiberglass enclosure houses the datalogger, optional data storage peripheral, optional valve module, and the electronics that interface with the CPEC200 pump module.

Valve Module (Optional)

Campbell Scientific offers two valve module versions. The basic three-valve module (pn #27559) enables the CPEC200 system to automatically perform zero, CO₂ span, and H₂O span measurements. The six-valve module (pn #26578) includes three additional valves to allow more CO₂ span tanks to be measured. The valve module is housed inside the CPEC200 system enclosure. The outlet of the manifold has a proportional valve to automatically control the flow of zero/span gas.

Scrub Module (Optional)

A scrub module (pn #27423) is available for the CPEC200 which provides a zero air reference source for the CPEC200 without the need for an extra cylinder which can be useful in remote applications. The CPEC200 scrub modules pulls ambient air through three bottles of molecular sieve, effectively scrubbing CO₂ and water vapour from ambient air to produce the reference zero. The scrub module and its small diaphragm pump are housed within a weather-tight fiberglass enclosure which is compatible with a variety of mounting options.

Specifications

Operating Temperature Range	-30° to +50°C
Input Voltage Range	10.5 to 16.0 Vdc
Power	› 35 W (maximum, at cold startup) › 12 W (typical)

System Enclosure

Dimensions	52.1 x 44.5 x 29.7 cm (20.5 x 17.5 x 11.7 in.)
Weight	› 1.9 kg (4.2 lb) for six-valve module › 1.5 kg (3.3 lb) for three-valve module › 154 g (5.4 oz) for CFM100/NL116 › 1.6 kg (3.7 lb) for CR3000 › 11.6 kg (25.5 lb) for basic system

Pump Module

Inlet Connection	3/8-in. Swagelok
Pumping Speed	3 to 9 LPM (automatically controlled at the setpoint, typically 7 LPM)
Pressure Sensor Range	15 to 115 kPa
Cable Length	3.0 m (10 ft)
Dimensions	35.6 x 29.2 x 13.5 cm (14.0 x 11.5 x 5.3 in.)

Weight	5.4 kg (11.8 lb) without mounting bracket
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Valve Module

Inlets for Three-Valve Module	Zero, CO ₂ , span, and H ₂ O span
Inlets for Six-Valve Module	Zero, CO ₂ span 1 to CO ₂ span 4, and H ₂ O span
Outlets	Analyzer and H ₂ O bypass
Connections	1/4-in. Swagelok
Dimensions	14.0 x 12.7 x 14.0 cm (5.5 x 5.0 x 5.5 in.)
Weight of Three-Valve Module	1.5 kg (3.3 lb)
Weight of Six-Valve Module	1.9 kg (4.2 lb)

Scrub Module

Power	› 0 W (quiescent) › 2 W (with pump running) › 8 W (with heater running)
Cylinder Volume	480 cm ³ each (29.29 in. ³)
Molecular Sieve Size	1.6 to 2.5 mm beads
Enclosure Dimensions	39.4 x 34.3 x 20.3 cm (15.5 x 13.5 x 8.0 in.)
Weight	9.6 kg (21.1 lb)

For comprehensive details, visit: www.campbellsci.eu/cpec200 



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