

Technical Specifications

CIRAS-4 Portable CO₂/H₂O Gas Analysis System

Analysis Method			
Non-dispersive infrared, configured as an absolute absorptiometer with microprocessor control of linearization. Four independent gas analyzers simultaneously measure absolute CO ₂ and H ₂ O for both the reference and analysis gas streams. All measurements ARE corrected for temperature and pressure.			
CO₂ Measurement Range	0 – 10000 $\mu\text{mol mol}^{-1}$ (Optimized for 0-2000 $\mu\text{mol mol}^{-1}$)	USB Flash Drive	Two USB flash drive ports for transferring stored data files, response curve scripts, and updating system firmware and software.
CO₂ Accuracy	$\pm 3 \mu\text{mol mol}^{-1}$ at 300 $\mu\text{mol mol}^{-1}$ Within 1% of reading > 300 $\mu\text{mol mol}^{-1}$	Internal Memory	32 GB
CO₂ Precision	0.1 $\mu\text{mol mol}^{-1}$	Microprocessor	528 MHz ARM® Cortex™
CO₂ Control Range	0 – 2000 $\mu\text{mol mol}^{-1}$	Touch Display	7.0" capacitive touch LCD display (800 x 480 pixels). Sunlight readable.
H₂O Measurement Range	0 – 75 mmol mol ⁻¹	Power Supply	Two internal, rechargeable 7.2V Li-ion battery packs (Primary) provide up to 16 hours of continuous use. A third interchangeable battery pack (Reserve) further extends operation time. The power supply/charger can charge all three batteries simultaneously.
H₂O Accuracy	$\pm 0.08 \text{ mmol mol}^{-1}$ up to 5 mmol mol ⁻¹ Within 1.5% of reading > 5 mmol mol ⁻¹	Operating Temperature Range	-5 to 50 °C, non-condensing. External air filtration may be required in dusty environments.
H₂O Precision	0.01 mmol mol ⁻¹	Enclosure	Rugged, ergonomic, lightweight aluminum with polyurethane base.
H₂O Control Range	0-Dewpoint or 0-100% Ambient	Dimensions	28 cm (W) x 14.5 cm (D) x 24 cm (H)
Pressure Range	55 – 115 kPa	Weight	4.8 kg (including 2 battery packs) 5.2 kg (including 3 battery packs)
Air Sampling	User-adjustable from 50 – 200 cc min ⁻¹ using integral DC pumps. Both analysis and reference pumps are fitted with mass flow controllers.		
Cuvette Air Supply Unit (Integral)	0 – 500 cc min ⁻¹ measured and controlled by a mass flow meter.		
Auxiliary Port	For connection to the SRC-2 Soil Respiration Chamber and CPY-5 Canopy Assimilation Chamber.		

PLC4 Leaf Cuvettes

Construction	<ul style="list-style-type: none"> Handle: Aluminum Leaf Gasket: Closed cell foam 	PAR Sensor (External)	Filtered silicon cell quantum sensor (cosine corrected). <ul style="list-style-type: none"> Response: 400 – 700 nm Range: 0 – 3000 $\mu\text{mol m}^{-2} \text{ s}^{-1}$ Accuracy: $\pm 5 \mu\text{mol m}^{-2} \text{ s}^{-1}$ Precision: 1 $\mu\text{mol m}^{-2} \text{ s}^{-1}$
LCD Display	2 x 16 character display	Air Temperature Sensor	Precision thermistor <ul style="list-style-type: none"> Range: -10 to 50 °C Accuracy: $\pm 0.5 \text{ }^\circ\text{C}$ at 25 °C
Keypad	2 tactile keys for recording and parameter selection.	Temperature Control	12 °C below ambient to 15 °C above ambient. <ul style="list-style-type: none"> Control limits: 0 – 45 °C Setpoint resolution: 0.1 °C
PAR Sensors (Internal)	2 silicon photodiode sensors. <ul style="list-style-type: none"> Range: 0 – 3000 $\mu\text{mol m}^{-2} \text{ s}^{-1}$ Precision: 1 $\mu\text{mol m}^{-2} \text{ s}^{-1}$ For use with LED light unit.	Broad/Narrow/Conifer	Air mixing fan plus two additional miniature air mixing fans <ul style="list-style-type: none"> <i>Broad/Narrow:</i> Glass <i>Conifer:</i> Scratch resistant glass <i>Broad:</i> 30 mm x 30 mm (9 cm²) <i>Narrow:</i> 86 mm x 37 mm <i>Conifer:</i> 86 mm x 37 mm
Leaf Temperature Sensor Accuracy	$\pm 0.5 \text{ }^\circ\text{C}$ at 25 °C	Universal	Air mixing fan
Cuvette Stirring	Air mixing fan	Broad/Narrow/Conifer	Air mixing fan plus two additional miniature air mixing fans
Window	Glass		
Apertures	<ul style="list-style-type: none"> 25 mm x 7 mm (1.75 cm²) 25 x 18 mm (4.5 cm²) 18 mm Diameter (2.5 cm²) 		
Leaf Temperature Sensor Type	Infrared sensor for accurate, non-contact measurement.		
Dimensions	27.5 cm (L) x 3.75 cm (Handle Diameter) Head: 4.5 cm (L) x 4.5 cm (W) x 2.3 cm (H)		
Weight	0.7 kg (not including cable)		

PLC4 LED Light Units (RGBW-FR)

Automatic Control Range	0 – 2500 $\mu\text{mol m}^{-2} \text{ s}^{-1}$		
LED Specification	Wavelength (RGBW)		
	Color	Peak	Full Width at Half Maximum
	Red	625 nm (± 5 nm)	15 nm
	Green	528 nm (± 8 nm)	40 nm
	Blue	475 nm (± 10 nm)	28 nm
	White	425 – 700 nm	
	Far-Red	730 nm (± 5 nm)	31 nm
	Universal		
		Broad/Narrow/Conifer	
Dimensions	6.4 cm (L) x 6.0 cm (W) x 5.1 (H)		
Weight	0.2 kg		

SRC-2 Soil Respiration Chamber

Construction	Rugged PVC with a convenient handle for placement on the soil surface.
Soil Ring	Aluminum. Provides good seal directly on soil or on soil collars (available from PP Systems)
Volume	1171 ml
Area	77.6 cm ²
Cable Length	1.5 m
Temperature Sensor	Precision thermistor <ul style="list-style-type: none"> Range: -10 to 50 °C Accuracy: $\pm 0.5 \text{ }^\circ\text{C}$ at 25 °C
Dimensions	150 mm (H) x 100 mm (Diameter)
Weight	0.9 kg

CPY-5 Canopy Assimilation Chamber

Construction	Rugged polycarbonate
Soil Ring	Aluminum. Provides good seal directly on soil or on soil collars (available from PP Systems)
Area	167 cm ²
Cable Length	1.5 m
Temperature Sensor	Precision thermistor <ul style="list-style-type: none"> Range: -10 to 50 °C Accuracy: $\pm 0.5 \text{ }^\circ\text{C}$ at 25 °C
Quantum Sensor	Filtered, silicon cell sensor (cosine corrected) for PAR. <ul style="list-style-type: none"> Response: 400 – 700 nm Range: 0 – 3000 $\mu\text{mol m}^{-2} \text{ s}^{-1}$ Accuracy: $\pm 5 \mu\text{mol m}^{-2} \text{ s}^{-1}$ Precision: 1 $\mu\text{mol m}^{-2} \text{ s}^{-1}$
Dimensions	145 mm (H) x 146 mm (Diameter)
Weight	0.9 kg


Insect Respiration Chamber

Construction	Clear acrylic
Gas Connections	Barb fittings for connection to 1/8" flexible tubing.
Chamber Volume	33 cm ³ (not including gas tubing)
Dimensions	15.1 cm (Length) x 25 cm (Diameter)
Weight	65 g

CFM-4 Chlorophyll Fluorescence Module

Modulating Beam	625 nm ± 5 nm (Red)
Saturation Light	0 – 10000 $\mu\text{mol m}^{-2} \text{ s}^{-1}$
Far Red Light	730 nm (± 5 nm)
Detector	PIN photodiode with >700 nm filter
Detector Method	Rapid pulse peak tracking
Leaf Area	1.75 cm ² , 2.5 cm ² , and 4.5 cm ²
Dimensions	8 cm (L) x 6 cm (W) x 6.2 cm (H)
Weight	0.3 kg

For further information, please contact us at:


 110 Haverhill Road, Suite 301
 Amesbury, MA 01913 U.S.A.
 TEL +1 978-834-0505
 FAX +1 978-834-0545
 ppsystems.com EMAIL sales@ppsystems.com


LABCONTROL
 Instrumentos Científicos

Rua São Mateus, 611 - Granja Julieta - CEP: 04721-020
 São Paulo - SP - Brasil - Tel/Fax: (11) 5181-1173
 vendas@labcontrol.com.br - www.labcontrol.com.br