



TARGAS-1

Portable Photosynthesis System

- Photosynthesis
- Soil Respiration
- Canopy Assimilation
- Environmental Monitoring

PP SYSTEMS
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TARGAS-1 | Main Console

CO₂ & H₂O Gas Analysis

The **TARGAS-1** console is compact, lightweight (2.1 kg) and is packaged in a rugged, aluminum enclosure with a shock absorbing polyurethane base making it extremely robust and reliable under harsh environmental conditions. It incorporates two non-dispersive infrared gas analyzers for CO₂ and H₂O ensuring accurate measurement and control of both CO₂ and H₂O. An internal air supply unit provides accurately controlled reference air to the leaf cuvette and another pump draws the sample (analysis) air to the gas analyzer. Both pumps are user controlled and accuracy is ensured by two internal electronic flow sensors.

The **TARGAS-1** is perfectly suited for applications that demand portability and a high degree of accuracy and control with minimal maintenance. The design of the instrument ensures an inherent calibration stability that has been confirmed by many years of experience in gas analysis technology.



Rear Panel

The **TARGAS-1** gas analyzers should not require frequent recalibration, although we do recommend periodic checks to confirm system integrity. Both the CO₂ and H₂O gas analyzers employ a non-dispersive, infrared measurement technique, coupled with microprocessor-based signal processing, to achieve excellent stability and specificity to CO₂ and H₂O. Our innovative "Auto-Zero" technology ensures fast warm-up, long term stability, accuracy and analyzer calibration. It also minimizes the effects on span gas sensitivity, sample cell contamination, IR source aging, changes in detector sensitivity and electronics.

All electrical and gas connections, USB interface, power and desiccants are conveniently located on the console rear panel.

Powerful Battery Technology

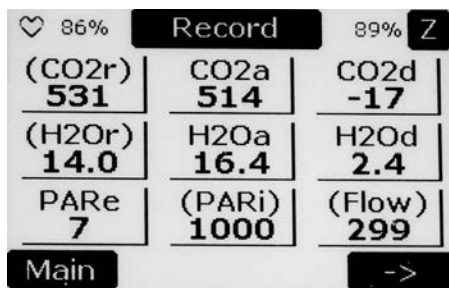
The **TARGAS-1** is supplied with a very efficient, powerful and rechargeable Li-ion battery capable of providing operation in the field for up to 10 hours. The instrument can also be used with an AC power supply (included) for continuous operation from mains power.

Data Storage

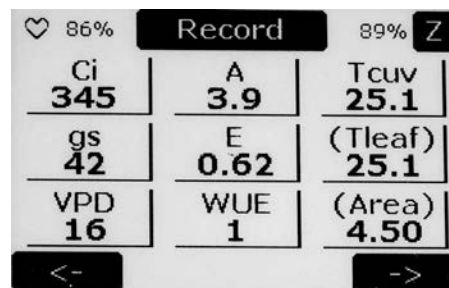
Data storage is virtually unlimited. Data is stored on a USB flash drive (memory stick) for safe storage and easy transfer of data to your PC.

Touch Display

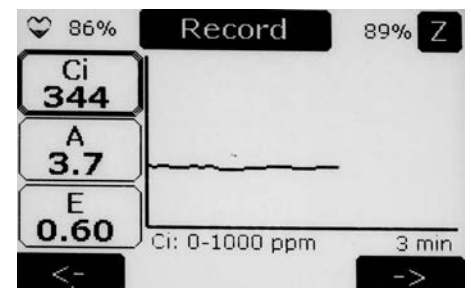
An innovative, large, touch display (EPD) features simple and intuitive system navigation and it offers excellent viewing under high sunlight.



Measured Data



Calculated Data



Graphic Data

PLC5 Leaf Cuvette



The **PLC5 Leaf Cuvette** is extremely versatile and light weight (0.7 kg) making it ideal for measurement on a wide variety of vegetation including broad leaves, narrow leaves, grasses and small needle conifers. It includes sensors for measurement of air temperature and PAR. All leaf cuvette materials are carefully selected to minimize influences such as infrared radiation, water sorption, CO₂ effects and leaks. The leaf gaskets provide an air-tight seal without causing damage to vegetation.

Light Unit (Optional)

An optional, low power LED based light unit is available for light control if required. It is a useful option for light response curves and for use on cloudy days. The unit clips onto the head of the PLC5 Leaf Cuvette and it can easily be removed for measurement under ambient conditions.

- Type: LED (white)
- Measurement Range: 0 - 2500 $\mu\text{mol m}^{-2} \text{s}^{-1}$



Chambers for Use with TARGAS-1

Soil Respiration

Our **SRC-2 Soil Respiration Chamber** can be used with the **TARGAS-1** for easy, accurate and rapid measurement of soil CO₂ efflux. The chamber is constructed out of rugged PVC with stainless steel ring (for sealing) and it includes an internal fan for flushing and mixing the air and an air temperature sensor.

- Dimensions: 150 mm (Height) x 100 mm (Diameter)

Collars (optional) are also available for use with the SRC-2 chamber.



Canopy Assimilation

Our **CPY-5 Canopy Assimilation Chamber** can be used with the **TARGAS-1** for easy, accurate and rapid measurement of net canopy CO₂ flux on low lying vegetation. The chamber is transparent and it includes a fan for flushing and mixing the air and sensors for measurement of air temperature and PAR.

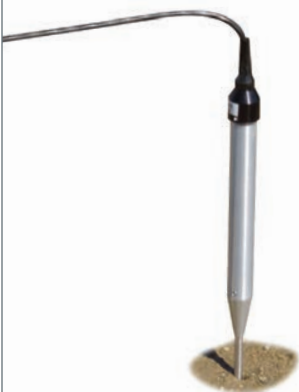
- Dimensions: 145 mm (Height) x 146 mm (Exposed Diameter)
- Exposed Area: 167 cm²

Collars (optional) are also available for use with the CPY-5 chamber.



Environmental Sensors

STP-2 Soil Temperature Probe



A rugged, stainless steel probe for accurate measurement of soil temperature. It is commonly used with our SRC-2 Soil Respiration Chamber and CPY-5 Canopy Assimilation Chamber.

Soil Temperature Range

- 0 – 50°C

Quantum Sensor



For accurate measurement of PAR (Photosynthetically Active Radiation) in the field under ambient conditions.

PAR Range

- 0 – 3000 $\mu\text{mol m}^{-2} \text{s}^{-1}$

TRP-3 Temperature/PAR Probe



A single probe for accurate measurement of air temperature and PAR.

Temperature Range

- 0 – 50°C

PAR Range

- 0 – 3000 $\mu\text{mol m}^{-2} \text{s}^{-1}$

Technical Specifications

Main Console	
Analysis Method	Two non-dispersive infrared gas analyzers, configured as an absolute absorptiometer with microprocessor control of linearization for both CO ₂ and H ₂ O. All readings are automatically corrected for temperature, pressure and foreign gas broadening.
CO₂ Range	0 – 10000 µmol mol ⁻¹ Precision: 1 µmol mol ⁻¹
H₂O Range	0 – 75 mb Precision: 0.1 mb
Pressure Compensation Range	80 – 115 kPa
Absolute Accuracy	< 1% of span concentration over the calibrated range but limited by the accuracy of the calibration mixture
Differential Accuracy	± 1 µmol mol ⁻¹ for CO ₂ differential up to 50 µmol mol ⁻¹
Linearity	< 1% throughout the range
Stability	Auto-Zero at regular intervals corrects for sample cell contamination, source and detector aging and changes in electronics.
Calibration	User programmable calibration (if required)
Warm-up Time	Approximately 15 minutes
Air Supply Unit	Integral pump for supply of reference air to the leaf cuvette <ul style="list-style-type: none"> Range: 200 - 500 cc/min An internal electronic flow sensor monitors flow rate.
CO₂ and H₂O Control	User adjustable from 0 - 100% of ambient.
Sampling Pump	Integral pump for sample (Analysis) air <ul style="list-style-type: none"> Range: 50 - 200 cc/min An internal electronic flow sensor monitors flow rate.
Sampling Rate	10 Hz. Sample data is averaged and output every 1.0 second.
Digital Output	USB
Environmental Sensor Inputs	2 inputs available for use with external chambers and environmental sensors
Alarm	Visual and audible alarm/warnings
Data Storage (USB)	USB Flash Drive port for data storage
Touch Display	2.7" electronic paper touch display with 264 x 176 pixel resolution
Power	Internal, rechargeable 7.2V, 8.7 Ah Li-Ion battery provides up to 10 hours of continuous use
Power Consumption	Warm up: 15W (12V @ 1.2A) Normal operation: 7.2W (12V @ 0.6A)
Enclosure	Rugged, ergonomic, lightweight aluminum with polyurethane base
Gas Connections	Four quick disconnect fittings for use with 1/8" (.125") ID tubing
Operating Temperature	0 – 50 °C, non-condensing External filtration is recommended in dirty/dusty environments.
Dimensions	20 cm (L) x 23 cm (H) 10 cm (W) (Enclosure only)
Weight	2.1 kg

PLC5 Leaf Cuvette	
Cuvette Materials	The materials of construction are carefully selected to ensure maximum accuracy and repeatability of gas exchange measurements.
Stirring Fan	High speed fan provides efficient mixing of the air inside the leaf chamber for rapid measurement and minimal boundary layer resistance.
Cuvette Window	18 mm x 25 mm (4.5 cm ²)
Air Temperature Sensor	Precision Thermistor <ul style="list-style-type: none"> Range: 0 - 50 °C Accuracy: ± 0.3 °C at 25 °C
PAR Sensor (External)	Cosine corrected <ul style="list-style-type: none"> Response: 400 - 700 nm Range: 0 - 3000 µmol m⁻² s⁻¹ Accuracy: 10 µmol m⁻² s⁻¹
Dimensions	30 cm (L) x 3 cm (Handle Diameter)
Weight	0.7 kg

Light Unit (Optional)	
Type	Low power LED light unit (White LEDs) easily mounts to the PLC5 Broad Leaf Cuvette.
Control Range	0 - 2500 µmol m ⁻² s ⁻¹
Dimensions	6 cm (L) x 6 cm (H) x 5 cm (W)
Weight	0.1 kg

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Since 1984, PP Systems has been supplying quality, rugged and reliable instrumentation to customers throughout the world for high level research. We are considered a world leader in the design and manufacture of instrumentation for measurement of photosynthesis, soil respiration, chlorophyll fluorescence, CO₂/H₂O gas analysis and vegetation reflectance. Our customers come from a wide variety of scientific disciplines including agronomy, horticulture, biology, botany, crop and soil sciences, forestry, ecology, meteorology, oceanography and plant physiology to name a few. Our equipment is in use in over 100 countries worldwide and well documented in many prestigious scientific publications.

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We are often able to customize system hardware or software to meet specific user requirements.

- **Development and Production Services**

We offer the use of our facilities for the development and production of equipment. If you have an idea for an instrument, we can assist you in its realization.

- **Guarantee**

All equipment manufactured by PP Systems is guaranteed for 12 months from the date of invoice against manufacturing faults and defective materials/components, parts and labor included. This guarantee does not cover misuse or damage caused due to unauthorized repair. We reserve the right to charge for customs clearance and return shipping/insurance if appropriate. For repairs beyond the warranty period, please contact us directly for advice.

Portable • Accurate • Reliable



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