

PRI-8350 Underground Online CO₂ Isotope Profile Continuous Measurement System



Soil respiration is one of the largest and most important carbon fluxes in terrestrial ecosystems. Surface flux research can not discover entire soil biochemistry processes. Undergrand gas reaserch will help us understand better on soil gas migration and soil biochemistry processes. PRI-8350 is a newly designed automated underground soil isotopic CO₂ profile measurement system, suitable for long term multilevel soil flux measurements.

Standard PRI-8350 includes AMBA i3211w isotopic CO₂ analyzer, 6 sampling channels with semi-permeable membrane gas exchange module, and 3 standard gas channels for calibration. Innovative semi-permeable membrane design can minimize sampling error caused by soil heterogeneity. Scientific and sophisticated gas exchange module also minimizes sampling interference within the soil. The AMBA i3211w makes use of duplicated detection cavities to improve response time and flexibility. Dual cavity measurements enable optimization for different concentrations simultaneously. One Cavity is optimized for a measurement range of 0-10,000ppm CO₂ whilst the other cavity is optimized for up to 50,000ppm CO₂. The breakthrough cavity volume of i3211w is less than 0.1ml. Ultra-small cavity enables fast sample turnover rates with low sample volume requirements, minimal interference of subsequent level soil, results in closed path measurement achieved.

PRI-8350 is a rugged, weatherproof mechanical design intergated with a large dynamic measurement range and dual measurements for both gas concentration and isotope, which can be used for various soil research. The system can be widely used in the fields of ecology, agriculture, forestry, fertilizer, permafrost, plant rhizosphere physiology and ecology.

Key Feature

Innovative membrane gas exchange technology
 Dual measurements for both gas concentration and isotope
 Dual cavity for lower/higher 10,000ppm CO₂

0~5% large dynamic measurement range
 No disturb on soil internal gas circulation metabolism
 Continuous sampling and minimal interference

Specifications

CO ₂ Range	0-5 %
CO ₂ Precision	<80 ppb or 0.01% of range
δ ¹³ C Precision (1σ)	<0.3‰ @ 1 s ; <0.08‰ @ 60 s ; <0.05‰ @ 300 s
H ₂ O Range	0~100%
Interval	4Hz or 1Hz
Rise-Fall(10-90%, 90-10%)	15 mL/min; 5 mL/min
Channels	6 (standard), customizable
Calibration Channels	3 x1m, customizable
Sampling Tube	1 m(standard) for each channel,customizable
Sampling Temp.	-10 ~45 °C
Sampling Flowrate	1 mL/min@760 Torr
Sampling Pressure	300~1000 Torr (40~133 kPa)
Operating Temp.	-10~50°C ; -30~50°C
Dimensions	48 x 80 x 47.5 cm(analyzer); 48 x 80 x 47.5 cm (multiplexer)
Weight	25 kg(analyzer); 20 kg(multiplexer)
Power Requirements	150 W, 110~220 VAC, 50/60 Hz