



# Soil Respiration Chamber



For LC*i* and LC*pro+* portable photosynthesis systems

Field robust accessory for the accurate analysis of CO<sub>2</sub> flux in soil

*Also suitable for grass and fruit photosynthesis*



- Accurate soil flux measurements
- Minimised pressure gradients
- Insensitive to wind
- Easy to fit in field
- Field robust

## Field soil respiration measurements.

Soil respiration or soil CO<sub>2</sub> flux can be defined as the net CO<sub>2</sub> production from soil, primarily as a result of soil microbial biomass decomposition.

Soil flux is the largest natural source of atmospheric CO<sub>2</sub> and therefore there is a growing interest in its activity across a range of environmental research disciplines.

## High quality soil chamber design

ADC BioScientific Ltd. has developed a new high quality soil respiration chamber for use with the ADC LC*i* and LC*pro+* portable photosynthesis systems.

The chamber comprises a lower stainless steel collar and a detachable upper compartment which connects directly to the chamber handle of an LC*i* or LC*pro+* system. Differential CO<sub>2</sub> flux measurements are made by the highly accurate, miniaturised CO<sub>2</sub> IRGA, located directly adjacent to the soil chamber in the handle of the LC*i* and LC*pro+* systems.

The collar is inserted into the soil prior to measurements being made ensuring optimal positioning of the chamber, regardless of soil condition or type. A collar insertion tool is provided to aid this placement.

The chamber is specifically designed for short-term measurements. Great care has been taken in the design to ensure that no unwanted influences affect the soil flux data.

**Minimised pressure gradients:** Pressure variations in some chamber designs can lead to an artificial suppressing or enhancing of CO<sub>2</sub> flux from the soil. The incorporation of a novel pressure release valve ensures that there is no difference between the chamber head space pressure and the outside ambient atmospheric pressure.

The chamber is also insensitive to wind. There is no change in measured data when air flows over the chamber at varying speeds and in different directions.

A soil temperature sensor is supplied as standard with each chamber. The LC*i* or LC*pro+* PAR sensor can be mounted on the top of the soil chamber.

## Automatic configuration

The soil chamber is easily fitted and exchanged in the field. Once connected to either the LC*i* or LC*pro+*, the systems can be automatically configured to measure and display soil flux data rather than photosynthesis measurements.



### Spatial distribution studies

The availability of additional soil collars allows researchers to perform multiple soil flux measurements on a large field site. Each collar being used to define a separate analysis area.

These stainless steel collars can be left in the soil enabling long-term comparative studies to be performed. Alternatively adapters are available allowing researchers to use standard size soil waste pipes as multiple collars.



### Grass photosynthesis

The rugged transparent construction of the upper compartment ensures that a true Net CO<sub>2</sub> Exchange Rate is measured, taking into account any small plant material that may be photosynthesising on the soil surface.

The chamber may also be used to measure ambient photosynthetic activities by whole small plant or grasses.



### Laboratory multiple sample soil respiration (and fruit photosynthesis)

The soil chambers can also be used for measuring multiple soil samples in a laboratory experimental set up.

Specially modified stainless steel collars may be supplied with a sealed base. Soil is placed directly inside the sealed collar. Measurements are made by fitting the upper chamber, attached to the LC*i* or LC*pro+* handle, as normal.

Multiple sealed collars can be used for multiple soil samples.

These sealed base collars can also be used to measure fruit photosynthesis with the LC*i* and LC*pro+* portable photosynthesis systems.



### Specification

#### Chamber construction

**Collar:** Stainless steel

**Upper chamber:** Cast Acrylic

**Chamber volume:** 1L.

**Chamber diameter:** 130mm

#### Chamber height:

**Collar:** 75mm

**Upper chamber:** 70mm

#### Chamber weight:

**Collar:** 325g

**Upper chamber:** 320g

**Direct soil temperature:** Microchip thermistor.

Range: 5°C-50°C

Precision: 1.5%

Linearised to 0.5°C

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