



# SRS-SD series



## Portable soil respiration systems



- Lightweight and compact
- Up to 16 hour battery life
- Highly accurate
- Enhanced data capture and output capabilities
- User-friendly
- Ideal for spatial distribution studies

### Soil respiration

Rapidly rising atmospheric CO<sub>2</sub> concentration and its potential impact on future climatic conditions is an issue of increasing global economic and political significance.

Soil respiration or soil flux can be defined as the net CO<sub>2</sub> production of a soil, largely as a result of microbial decomposition of soil biomass. The amount of gas exchange taking place is frequently used as an indicator of the "health" of that soil. The rate of soil flux is influenced by a variety of environmental parameters especially organic matter content, soil moisture and soil temperature.

Natural biomass respiration from soil is a major carbon source. Understanding soil flux and its relationship with other sources and sinks within the carbon cycle are currently subject to increasing scientific scrutiny in relation to global climatic change.

The measurement of soil respiration is also important in bioremediation and pesticide impact research.

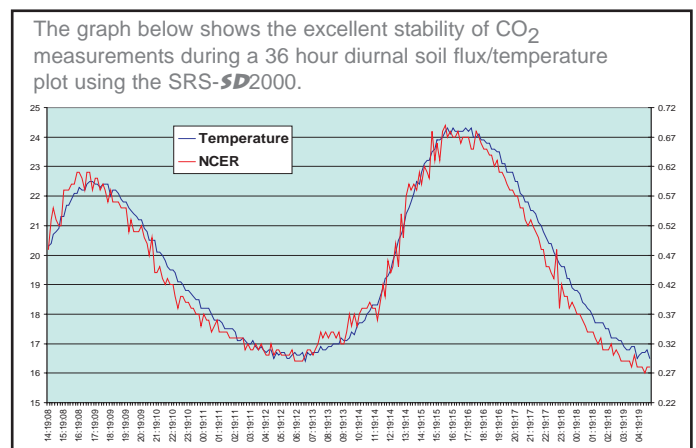
ADC BioScientific has developed the SRS-SD series, the SRS-SD1000 and SRS-SD2000, two truly portable soil respiration systems that offer researchers superior performance for a variety of applications including spatial distribution studies.

### Superior field performance

Both the SRS-SD1000 and SRS-SD2000 consist of a programming console and a soil respiration chamber with an integral CO<sub>2</sub> Infrared Gas Analyser (IRGA), enabling the fastest measurement responses of gas exchanges from the soil.

The systems work in the highly accurate "open system" mode, ensuring that there is no build up of CO<sub>2</sub> concentrations inside the chamber that could potentially suppress soil flux.

The miniaturised IRGA has a standard operating range of 0-2000ppm CO<sub>2</sub>, with a resolution of 1ppm. It has been designed with excellent stability and drift characteristics. All measurements are automatically compensated for atmospheric pressure, temperature and the effects of water vapour broadening and dilution.



## High quality soil chamber design

Both the SRS-**SD**1000 and SRS-**SD**2000 feature a high quality soil respiration chamber, specifically designed for short-term soil flux measurements. The chamber consists of a lower stainless steel collar and detachable upper compartment, together with a PAR sensor and a soil temperature sensor.



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 in pressure between the chamber head space and the outside ambient atmosphere.

**Insensitive to wind:** There is no change in measured data when air flows over the chamber at varying speeds and in different directions.

## Spatial distribution studies

The SRS-**SD**1000 and SRS-**SD**2000 are ideal for conducting soil flux spatial distribution studies over a field site.

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

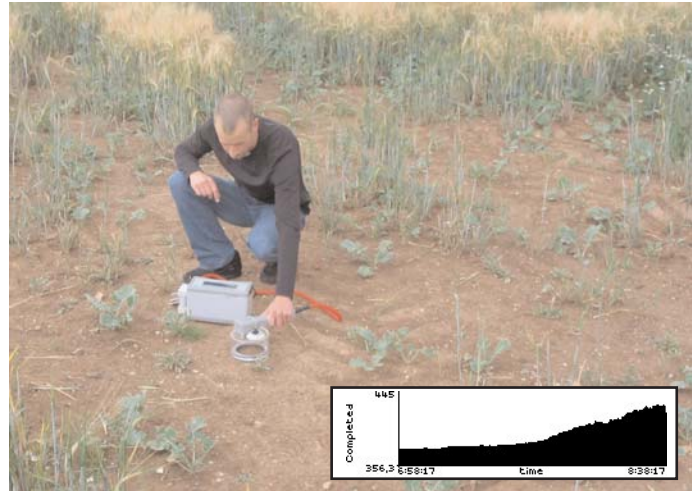
These stainless steel collars can be left in the soil enabling long-term comparative studies to be performed.

Adapters are available allowing researchers to use standard size soil waste pipes as alternative collars.



## Truly portable and easy to use

Both the SRS-**SD**1000 and SRS-**SD**2000 are truly field portable and easy to use. They are battery operated, incorporating the latest in low power consumption technology enabling up to 16 hours of continuous use from a single charge.



Full functionality, flow control and data logging are all contained within the compact console. Experimental programming and operation is achieved with just five keys to drive a series of simple menus. All soil respiration data and calculations are clearly presented on a large high definition liquid crystal, graphic display.

## Unlimited data storage



**Soil flux data presented includes:**

<b>C'ref</b>	<b>e'ref</b>	<b>NCER</b>
<b>C'an</b>	<b>e'an</b>	<b>W'flux</b>
<b>Delta'C</b>	<b>Delta'e</b>	<b>Ce</b>
<b>PAR</b>	<b>Tch</b>	<b>T (soil)</b>

The SRS-**SD** series feature enhanced data capture and output capabilities. Experimental protocols, soil flux data and calculations are stored on easily exchangeable SD cards. This popular feature, already incorporated in other ADC gas exchange instrumentation, allows separate cards to be used by individual users or for specific experimental applications.

Stored experimental data may be recalled on the graphic display and downloaded directly from the cards or very easily via USB.

## SRS-**SD**1000 Ultra compact soil respiration system



- Weighs only 2kg
- 10 hour battery life
- Integral CO<sub>2</sub> chamber analyser
- High quality soil chamber
- Easy to use
- Graphical display
- Affordable research instrument

The SRS-**SD**1000 is a truly portable soil respiration measurement system.

The ultra compact design, weighing only 2kg, makes the SRS-**SD**1000 suitable for even the most remote field locations. It will work continuously for up to 10 hours from a single battery charge.

It is light enough to be carried by a shoulder strap or even worn on a belt.

Working in an "Open system" operational mode means that the SRS-**SD**1000 provides highly accurate analysis in both low and high activity soils.

A graphical display allows easy monitoring of soil flux trends and the real time plotting of experimental curves.

## SRS-**SD**2000 Intelligent portable soil respiration system



### Additional advanced facilities

- 16 hour battery life
- Automatic control of CO<sub>2</sub> and H<sub>2</sub>O
- 0-3000ppm CO<sub>2</sub> range
- Enhanced graphic display functions

The SRS-**SD**2000 features additional facilities for more sophisticated soil flux experiments.

Both CO<sub>2</sub> and H<sub>2</sub>O can be automatically controlled inside the chamber. They can be controlled at single concentrations or automatically at sequential levels.

This allows soil flux to be determined at different CO<sub>2</sub> concentrations, whilst the ability to dry air within the chamber prevents condensation occurring when working with soils of high moisture content.

For working with soils with extremely high levels of CO<sub>2</sub> flux an extended 0-3000ppm CO<sub>2</sub> range is provided with the SRS-**SD**2000.

The SRS-**SD**2000 features a number of expanded graphical functions further enhancing the versatility and interactivity of the system.

Despite these additional features the SRS-**SD**2000 weighs only 4.4kg and will work continuously for up to 16 hours from a single charge.

## 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 SRS-**SD** systems may therefore also be used to measure ambient photosynthesis activities by whole small plants or turf grasses. The SRS-**SD** systems can be easily and quickly configured to display and record full photosynthesis data and calculations.



A number of other plant leaf chambers are available for use with the SRS-**SD1000** and SRS-**SD2000** enabling photosynthesis analysis measurements on a wide variety of plant species.

These multipurpose gas exchange systems can be used for countless soil flux and photosynthesis applications, offering outstanding value for money for any multi-disciplined research facilities.

## ADC: Quality and experience

For over 40 years ADC's name has been synonymous with environmental research, with an outstanding reputation for the development and manufacture of truly field portable instrumentation.

ADC is committed to quality: "Quality of product and quality of service".

From design to delivery, ensuring optimal performance and reliability is of paramount importance to our team of experienced engineers. Once in the field you are supported by our network of over 40 customer support centres worldwide.



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## SRS series Specifications

**Gas exchange:** CO<sub>2</sub>: SRS-**SD1000** 0-2000ppm

SRS-**SD2000** 0-3000ppm

Infrared gas analyser

1ppm resolution

H<sub>2</sub>O: 0-75mbar, 0.1mbar resolution

Two fast response water sensors

### Other sensors:

Chamber temperature: 0°C to 50°C. Precision thermistor

Soil temperature: 5°C to 50°C. Precision thermistor

PAR: 0-3000μmols m<sup>-2</sup> sec<sup>-1</sup> silicon  
photocell

### Automated environmental control: (SRS-**SD2000** only):

Programming: Automatic and independent control of  
CO<sub>2</sub> and H<sub>2</sub>O within the soil chamber.  
Single and sequential control levels.

CO<sub>2</sub>: Up to 2000ppm by integral elevated  
CO<sub>2</sub> supply system.

H<sub>2</sub>O: Above and below ambient conditions by  
on-board self indicating conditioning  
chemicals.

**Flow rate to chamber:** 0-500ml min<sup>-1</sup>

**Warm up time:** 5 minutes @ 20°C

**Display:** Graphic display 240 x 64 super twist LCD

**Recorded data:** Removable SD cards typically store 16  
million sets of data on a 1Gb card

**Data output:** Direct from SD cards and via USB

**Battery:** SRS-**SD1000** 2.6Ah lead acid 12V battery. 10 hr  
battery life

SRS-**SD2000** 6.8Ah lead acid 12V battery. Up to  
16 hr battery life

**Battery charger:** 90-260V, 50/60Hz

**Operating temperature range:** 5°C to 45°C

### Console:

Dimensions SRS1000-**SD** 230 x 110 x 140cm

SRS2000-**SD** 230 x 110 x 170cm

Weight: SRS1000-**SD** 2.4kg

SRS2000-**SD** 4.4kg

### Chamber:

Construction: Collar stainless steel

Upper chamber cast Acrylic

Volume: 1l

Diameter: 130mm

Height: Collar 75mm

Upper chamber 70mm

Weight: Collar 325g

Upper chamber 320g