



SRS series



Portable soil respiration systems



- Lightweight and Compact
- Long battery life
- Highly accurate analysis
- User-friendly
- Ideal for spatial distribution studies

Soil respiration

Rapidly rising atmospheric CO₂ 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 CO₂ 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 series, the SRS1000 and SRS2000, two truly portable soil respiration systems that offer researchers superior performance for a variety of applications including spatial distribution studies.

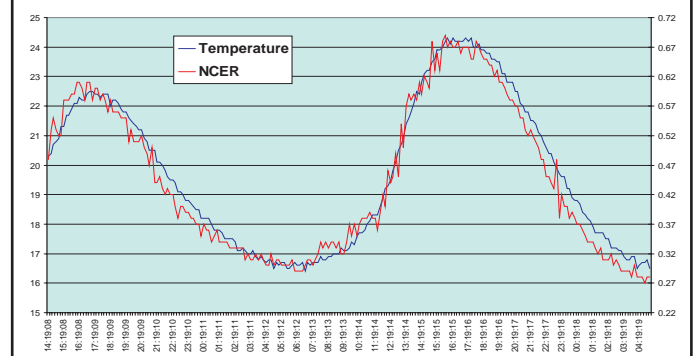
Superior field performance

Both the SRS1000 and SRS2000 consist of a programming console and a soil respiration chamber with an integral CO₂ 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 CO₂ concentrations inside the chamber that could potentially suppress soil flux.

The miniaturised IRGA has an operating range of 0-2000ppm CO₂, with a resolution of 1ppm. It has been designed with excellent stability and drift characteristics. All measurements are automatically compensated for changes in atmospheric pressure and temperature.

The graph below shows the excellent stability of CO₂ measurements during a 36 hour diurnal soil flux/temperature plot using the SRS2000.



High quality soil chamber design

Both the SRS1000 and SRS2000 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 CO₂ 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 SRS1000 and SRS2000 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 SRS1000 and SRS2000 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 in a large high definition liquid crystal display.

Unlimited data storage



Soil flux data presented includes:

C_{ref}	e_{ref}	NCER
C_{an}	e_{an}	W'flux
Delta'C	Delta'e	Ce
PAR	Tch	T (soil)

Both the SRS1000 and SRS2000 feature unlimited data storage. All experimental protocols, soil flux data and calculations are stored on easily exchangeable PC compatible 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 downloaded directly from the cards or via the RS232 output.

SRS1000 Ultra compact soil respiration system



- Weighs only 2kg
- 10 hour battery life
- Integral CO₂ chamber analyser
- High quality soil chamber
- Easy to use
- Affordable research instrument

The SRS1000 is a truly portable soil respiration measurement system.

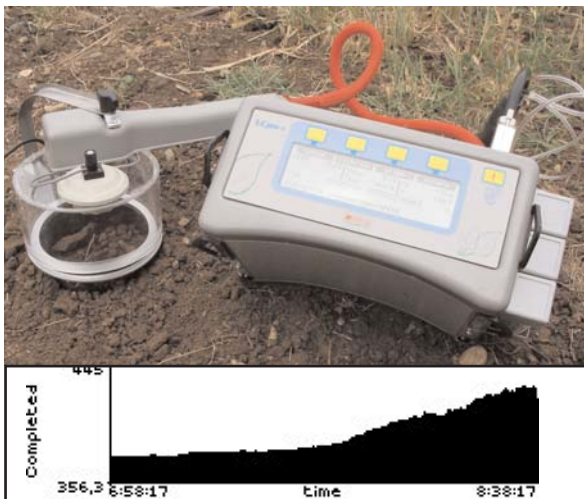
The ultra compact design, weighing only 2kg, makes the SRS1000 suitable for even the most remote field locations. It will work continuously for up to 10 hours from a single battery charge.

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 SRS1000 provides highly accurate analysis in both low and high activity soils.

The SRS1000 is proving to be a valuable and reliable research tool in soil respiration investigations throughout the world.

SRS2000 Intelligent portable soil respiration system



- Weighs only 4kg
- 16 hour battery life
- Integral CO₂ chamber analyser
- High quality soil chamber
- Automatic control of CO₂/H₂O
- Optional 0-3000ppm CO₂ range
- Easy to use
- Graphic display

The SRS2000 features additional facilities for more sophisticated soil flux experiments.

Both CO₂ and H₂O 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 CO₂ concentrations, whilst the ability to dry air within the chamber prevents condensation occurring when working with soils of high moisture content.

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

For working with soils with extremely high levels of CO₂ flux an optional 0-3000ppm CO₂ range is available.

Despite these additional features the SRS2000 weighs only 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 CO₂ Exchange Rate is measured, taking in account any small plant material that may be photosynthesising on the soil surface.

The SRS systems may therefore also be used to measure ambient photosynthesis activities by whole small plants or turf grasses. The 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 SRS1000 and SRS2000 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: CO₂: 0-2000ppm, 1ppm resolution
Infrared gas analyser
H₂O: 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⁻² sec⁻¹ silicon photocell

Automated environmental control: (SRS2000 only):

Programming: Automatic and independent control of CO₂ and H₂O within the soil chamber. Single and sequential control levels.

CO₂: Up to 2000ppm by integral elevated CO₂ supply system.

H₂O: Above and below ambient conditions by on-board self indicating conditioning chemicals.

Flow rate to chamber: 0-500ml min⁻¹

Warm up time: 5 minutes @ 20°C

Display: SRS1000 240 x 64 dot matrix LCD
SRS2000 Graphic display 240 x 64 super twist LCD

Recorded data: Removable PC compatible cards storing unlimited data

Data output: Direct from PC compatible cards and RS232

Battery:

SRS1000 2.6Ah lead acid 12V battery. 10 hr battery life
SRS2000 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 23 x 11 x 14cm
SRS2000 23 x 11 x 17cm
Weight: SRS1000 2.4kg
SRS2000 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