

Precise Water Balance

metergroup.com/environment/products/smart-field-lysimeter/



Measure everything. Miss nothing.

SMART FIELD LYSIMETER

Small scale lysimeter with big possibilities

Measuring every parameter needed for a complete and accurate water balance can leave you making a lot of assumptions. Eddy covariance gives you evapotranspiration (ET) but leaves you guessing as to the fate of soil water. Traditional lysimeters measure water flux in the soil but have no connection to the groundwater, which means the soil column becomes too wet or too dry compared to the field, throwing off the water balance. Some lysimeters get so dry that gaps caused by shrinking reach the bottom plate, making accuracy all but impossible. There's simply been no all-in-one solution accurate enough for discerning scientists who want a precision water balance. Enter the Smart Field Lysimeter.

It doesn't have a brain, but close enough

The Smart Field Lysimeter is more intelligent than other lysimeters. It's the only system in the world with a bi-directional pump that automatically maintains true field conditions within the lysimeter. How? Field moisture (matric potential) is measured and transmitted to the control center. If the soil in the lysimeter is drier than field conditions, water is pumped back into the lysimeter from the drainage reservoir. If the soil in the lysimeter becomes too wet, the pump pulls water out, ensuring true field conditions at all times. Plus, the Smart Field Lysimeter weighs both the lysimeter and the drainage barrel with a high-precision balance.

Increases and losses of stored water are directly measured to the gram, making it one of the most accurate measures of precipitation, evapotranspiration, and deep drainage on the market.

Reveal the unknown with pinpoint accuracy

The Smart Field Lysimeter is the only instrument that can make accurate plot-level estimates of the true field evapotranspiration. Why? Unlike eddy covariance, which relies on rain gauges with known inaccuracies, the Smart Field Lysimeter uses a highly sensitive load cell to weigh how much water deposits or evaporates from leaves or the soil surface—to exactly 5 hectopascals at an incredible one second resolution. Changes are displayed in the gram range. Nothing else can give you this type of ET data—nothing. Larger lysimeters can estimate ET using more ground, but they're expensive, and they usually fail to meet expectations. The Smart Field Lysimeter unlocks the door to accurate ET, without a herculean effort, and at a lower price.

Leaves nothing to the imagination

The precision balance inside the Smart Field Lysimeter is the pinnacle of METER engineering, designed using a quarter century of lysimeter experience. This means, unlike conventional tipping spoon and drip counter rain gauges, every single drop of water that precipitates or condenses on the soil surface is detected and measured—even dew or hoar frost.

The precision scale also accurately determines how much leachate sinks into deeper horizons. Substances dissolved in it, such as nitrates or pesticides, can be analyzed independently by simply drawing a water sample from the drainage reservoir. Not only that, the SFL actually matches its temperature dynamics to field conditions, so nutrients and microorganisms exactly mimic what's happening in the field.

Precision comes in small packages

The Smart Field Lysimeter is small enough to transport in a pickup truck and install by hand. It's available for three different depths, 30, 60, or 90 cm, allowing for customized layouts and giving it the flexibility to fit your application or unique site condition. Excavation is made easier with the SFL toolset and the barrel's smooth stainless steel exterior. In addition, METER offers a complete installation service and advises you personally before, during, and after your purchase.

Go deep. Really deep.

The Smart Field Lysimeter delivers high-resolution data on water, water flux, and mass transport with a depth and field precision no other instrument has. If you want full transparency into water dynamics, measure the water balance parameters with the Smart Field Lysimeter, the only small system in the world that directly and accurately measures the actual evaporation, leachate, and precipitation at your site.

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Features

- A complete small, weighable, tension-controlled lysimeter combined with tensiometers, soil moisture sensors, data logger and optional GPRS modem
- Field identical water conditions and temperature dynamics
- Accurate ET
- Direct measurement of the water balance
- Depth flexibility
- Lightning protection
- Powered by solar panels
- More economical and easier to install than large lysimeters

Specifications

SMART FIELD LYSIMETER BASE STATION SPECIFICATIONS

Modular setup	UMS modular Smart-Field-Lysimeter with bi-directional boundary control, basic setup, extendable to up to four lysimeters. Comes preassembled and tested, includes handbook.
Pump system	Pumping system for bidirectional regulation of the lower hydraulic boundary, controlled by field matric potential or manually.
Leachate weighing platform	PL-10 weighing platform for leachate tank
Leachate tank	10 liters, comes with a buriable box
Included sensors	1 x T8 field reference tensiometer 3 x 5TM ECH ₂ O probes for soil moisture 3 x MPS-6 probes for matric potential Auger set for probes
Data collection	Data logger DT80-M w. integrated GPRS/3G-modem for data transfer and remote access, SIM-ready
Power	Rechargeable battery 12 V/26 Ah, charger and power-management module
Lightning	Integrated lightning protection
SFL-300 cylinder	Stainless steel cylinder, height 300 mm, inner diameter 300 mm, six sensor ports, two each at 8, 15 and 25 cm
SFL-600 cylinder	Stainless steel cylinder, height 600 mm, inner diameter 300 mm, six sensor ports, two each in 10, 20 and 55 cm
SFL-900 cylinder	Stainless steel cylinder, height 1000 mm, inner diameter 300 mm, six sensor ports, two each at 10, 50 and 95 cm

SFL-300 enclosure	Field enclosure with removable sealing and collar, diameter 60 cm, height 45 cm
SFL-600 enclosure	Field enclosure with removable sealing and collar, diameter 60 cm, height 75 cm
SFL-900 enclosure	Field enclosure with removable sealing and collar, diameter 60 cm, height 115 cm
SFL-300 weight platform	PL-50 weighing platform for lysimeter
SFL-600 weight platform	PL-100 weighing platform for lysimeter
SFL-900 weight platform	PL-200 weighing platform for lysimeter
EXTENSION MODULE SPECIFICATIONS	
Leachate weight platform	PL-10 weighing platform for leachate tank
Leachate tank	Leachate tank, 10 liters, comes with buriable box
Pump system	Pumping system for bi-directional regulation of the lower hydraulic boundary, controlled by field matrix potential or manually
Included sensors	1 x T8 field reference tensiometer 3 x 5TM ECH ₂ O probes for soil moisture 3 x MPS-6 probes for matric potential Auger set for probes
Other	Preassembled and tested, includes handbook
SFL-300E cylinder	Stainless steel cylinder, height 300 mm, inner diameter 300 mm, six sensor ports, two each at 8, 15 and 25 cm
SFL-600E cylinder	Stainless steel cylinder, height 600 mm, inner diameter 300 mm, six sensor ports, two each in 10, 20 and 55 cm
SFL-900E cylinder	Stainless steel cylinder, height 1000 mm, inner diameter 300 mm, six sensor ports, two each at 10, 50 and 95 cm
SFL-300E enclosure	Field enclosure with removable sealing and collar, diameter 60 cm, height 45 cm
SFL-600E enclosure	Field enclosure with removable sealing and collar, diameter 60 cm, height 75 cm
SFL-900E enclosure	Field enclosure with removable sealing and collar, diameter 60 cm, height 115 cm

SFL-300E weight platform PL-50 weighing platform for lysimeter

SFL-600E weight platform PL-100 weighing platform for lysimeter

SFL-900E weight platform PL-200 weighing platform for lysimeter

Support

Have a question or problem? Our support team can help.

We manufacture, test, calibrate, and repair every instrument in house. Our scientists and technicians use the instruments every day in our product testing lab. No matter what your question is, we have someone who can help you answer it.

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Downloads

[SmartField Lysimeter manual PDF / 2.63 MB](#)

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