

Soil water sampling with vacuum systems

Extract representative soil water samples with a constant vacuum, a timed vacuum or a tension-controlled vacuum: with the new VS-systems we can offer you an all-purpose and modern vacuum regulation.

The VS product range replaces all previous UMS vacuum stations like the VK-3 case, the SCS7 and the SCS8.

As a system solution all units now incorporate a vacuum pump, sensors and processor controlled regulation, suitable for battery powered in-the-field use.

1 or 2 regulated vacuum outputs

The VS-single supplies one adjustable vacuum, either with a fixed constant value or controlled by a connected Tensiometer.

For taking samples for example in the root zone or leachate water both models VS-twin and VS-pro offer two vacuum outputs which can be adjusted to a differing setting.

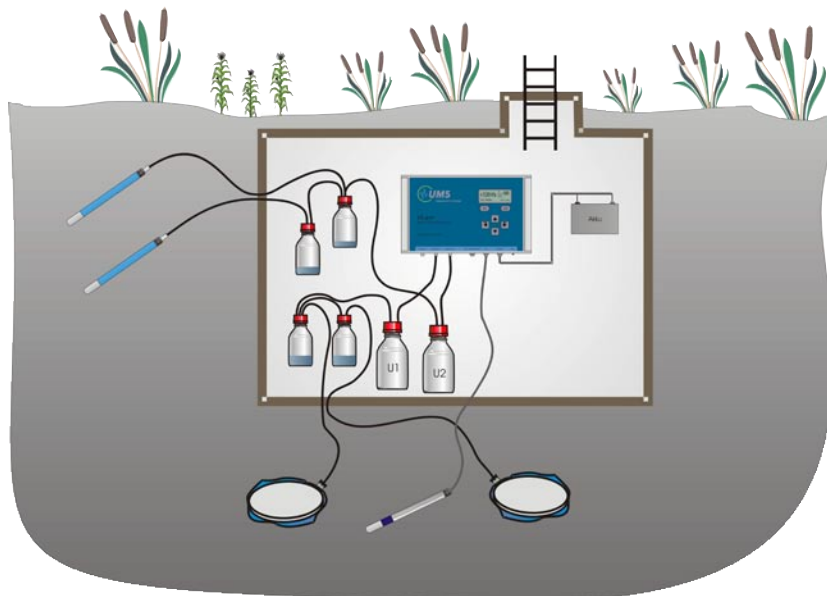
Tension controlled sampling

A Tensiometer measures the soil water tension. The vacuum automatically is set in correspondence to the measured tension. The advantage of this method is that the negative pressure potential which draws on the soil water is always constant (or in an adjustable proportion) and therefore, can be set to a low value. Thus, the soil water balance is disturbed as little as possible by a constant effective potential (i. e. = difference between vacuum in the sampler and the soil water tension). At any time the sampling takes place under defined conditions. Filtration and sorption processes on the cup are constant, memory effects are more or less excluded.

Automated measurements and logging

The vacuum as well as an optionally connected Tensiometer are continuously measured. The readings are stored in a ring buffer and can be downloaded to a PC.

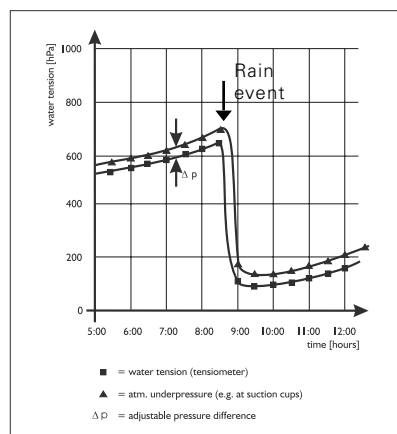
The signals of Tensiometer and vacuum sensor can be measured on two analogue outputs.



The figure shows a possible set-up of a VS controlled sampling site

Easy set-up

Configuration and data download are done with a graphic Windows interface. The VS-pro additionally has a graphic LC-display and keypad for setting the most important functions of the unit, and where readings and status are displayed continuously.



Example for a tension controlled vacuum

Multiple configuration options

All VS units allows many possible configurations options, like setting accuracy, intervals and behaviour of regulation, hysteresis etc.

As a controlling Tensiometer use any UMS Tensiometer with 4 pin plug, e. g. the T4 or T5, or a T8 with 8-pin plug.

Integrated timer

A timer was integrated to allow sampling in intervals. The vacuum is only established within the selected time range. At other times the pressure difference between soil water tension and vacuum is set to zero. This reduces the disturbance of the soil water balance.



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VS



Vacuum unit with one or two vacuum outputs, for constant or tension controlled vacuum.

Applications

- Long term monitoring
- Soil water extraction under defined conditions
- Leachate measurements under defined conditions
- Lysimeter sites

Benefits

- Vacuum pump with high accuracy
- Two vacuum outputs
- Selectable constant or tension controlled vacuum
- Status indicated by multicolor LED
- Optimised for rechargeable battery supply
- One Tensiometer connectable: T8, T4 or T5
- Multiple configuration options
- Integrated data logger

Limits

- Configuration only by PC or Laptop

Supply:	10.5 ...15 VDC
<i>Current consumption</i>	
Operating average:	approx. 15 mA
Standby:	approx. 1 mA
While regulating:	50 ... 800 mA
Interface:	tensioLINK, RS485
Analog output:	2 x 0 ... 1V, ... 2V, ... 5V
<i>Vacuum regulation</i>	
Range:	0 ... -85 kPa
Accuracy:	±0.05 kPa
Memory:	5000 readings
Dimensions:	260 x 160 x 100 mm
Protective rate:	IP 66
Operating temp.:	-10°C ... +45°C
Enclosure:	Aluminium

Item	Art.no.
VS with one vacuum output	VS-single
VS with two vacuum outputs	VS-twin

VS-pro



Vacuum unit with one or two vacuum outputs, for constant or tension controlled vacuum. With keypad and display for basic status check and configuration.

Applications

- Long term monitoring
- Defined pore water sampling
- Defined leachate measurements
- Lysimeter sites

Benefits

- Display and keypad for basic status check and configuration
- Continuous display of readings and status on the LCD
- LCD backlight and multicolor LED
- Vacuum pump with high accuracy
- Two vacuum outputs
- Selectable constant or tension controlled vacuum
- Optimised for rechargeable battery supply
- One Tensiometer connectable: T8, T4 or T5
- Multiple configuration options
- Integrated data logger

Supply:	10.5 ...15 VDC
<i>Current consumption</i>	
Operating average:	ca. 16 mA
Standby:	ca. 2 mA
While regulating:	50 ... 800 mA
Interface:	tensioLINK, RS485
Analog output:	2 x 0 ... 1V, ... 2V, ... 5V
<i>Vacuum regulation</i>	
Range:	0 ... -85 kPa
Accuracy:	±0.05 kPa
Memory:	5000 readings
Dimensions:	260 x 160 x 100 mm
Protective rate:	IP 66
Operating temp.:	-10°C ... +45°C
Enclosure:	Aluminium

Item	Art.no.
VS with display and two vacuum outputs	VS-pro