PERISTALTIC PUMPS FOR USE IN THE FIELD

P2.52
Parts List
Pg 389-390

The peristaltic pumps presented here, are very reliable sampling apparatus for fluids and gasses, for application in very diverse field circumstances.

Specifically where it concerns research for groundwater, errors are introduced easily by not using the equipment properly or the application of less suitable equipment.

The concentrations of the pollutants present in the sample, often are very small. Turbulence, large pressure fluctuations, abrasive particles of the sampling equipment, etc. therefore can not be tolerated. In a peristaltic pump however the fluid (or gas) that is pumped, only is in contact with the inside of a piece of non-toxic silicon rubber tube (the so called pump tube). For this reason there is no risk of abrasive particles from shafts, sealing, piston rings or impellers. Cross-contamination can be avoided by replacing the pump tube, as well as the transport tube before every single sampling.

An electronic- as well as a hand-operated peristaltic pump (for field use) have been developed.

The pump used, is a simple but very durable peristaltic pump, with three pressure rollers. The bearings of the drive shaft and the pressure rollers are water resistant.

The pump is suitable for elastic pump tubes of which the thickness of wall may vary between 1.9 and 2.1 mm. The rigidity of the flexible tube should be about 55 degrees Shore.

The pump can deliver a pump pressure of 3 bar (thus also suitable for use with in-line filters) and an underpressure maximum of 1 bar.

It is a self-priming pump.

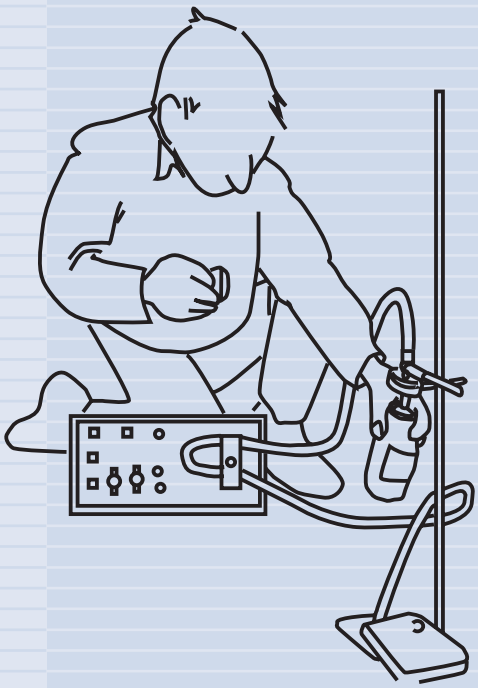
Even when the pump is out of use the pump tube is completely pressed to a close by at least one roller. Fluid and gas can not flow back.

The pump can for instance be used for anaerobe sampling of groundwater.

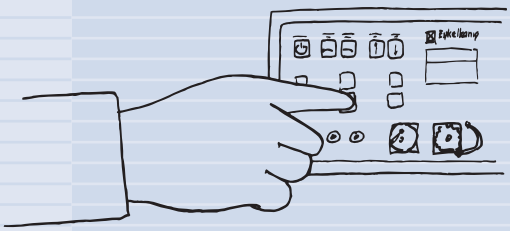
For groundwater sampling the 6 x 10 mm silicon tube is most suitable.

Peristaltic pump 12 Vdc

Using the peristaltic pump 12 Vdc the (ground-) water sample is filtered in-line.



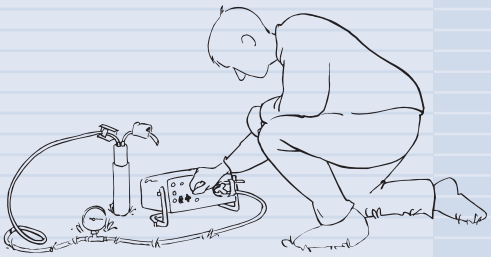
The well-ordered control panel has been fitted with a tactile membrane keypad.



PERISTALTIC PUMPS FOR USE IN THE FIELD

P2.52
Parts List
Pg 389-390

Pumping soil gas with the peristaltic pump 12 Vdc.



The stronger its ability to regain its old round shape, the stronger the suction. For this reason the thinnest pump tube (3 x 7 mm), has the strongest suction (perfect vacuum).

12.25 Peristaltic pump 12 Vdc

This peristaltic pump, specially designed for use in the field, is battery powered and microprocessor controlled. The microprocessor enables an adjustable constant number of revolutions (which can be stored in memory), protection against overload and various modes of external control. The remote control makes the peristaltic pump into a flexible instrument, prepared for future applications.

An important possible function is the fluid level control, to be applied when taking water samples or purging monitoring wells without the danger of aeration of the screened part of the monitoring well or from the water sample.

Controlling the peristaltic pump can be executed either via the key-pad on the front panel or by remote control.

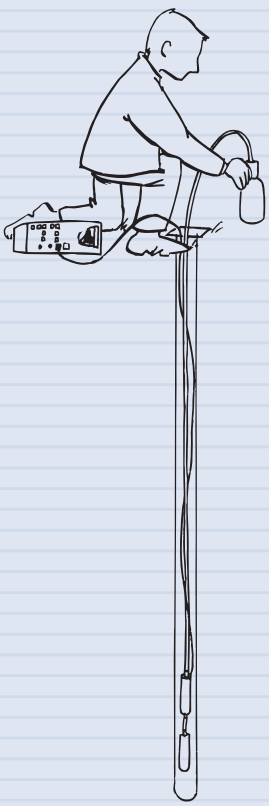
A built-in maintenance free 12 Volt battery enables you to use the pump 2 to 5 hours continuously (depending on load). The pump, with CE certification, is splashproof (IP 64) and can be used in the field without problems. The apparatus can be used in all positions. The pump is designed for long-term professional use in unfavourable circumstances.

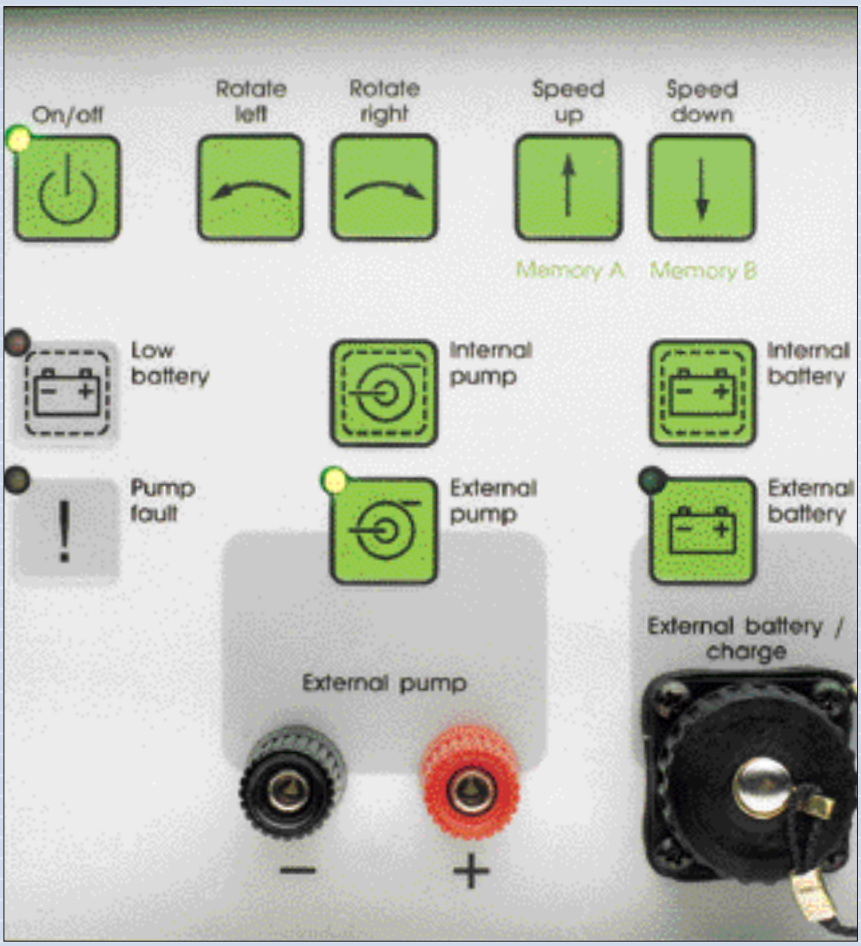
Advantages

Advantages of the peristaltic pump 12 Vdc:

- Light weight, impact resistant plastic, splash-proof housing.
- Microprocessor controlled.
- Immediate deployment.
- Powerful engine and reduction gear unit.
- Reliable and universal peristaltic pump that can create perfect vacuum.
- Large variation in speed and flow. Flow from 0 to up to 2.3 liter per minute.
- Membrane key-pad on a wellordered control panel.

Two submersible impeller pumps connected to the peristaltic pump 12 Vdc.





Control panel with membrane key-pad of peristaltic pump 12 Vdc

PERISTALTIC PUMPS FOR USE IN THE FIELD

P2.52
Parts List
Pg 390-391

- The remote control option makes the peristaltic pump to a flexible instrument.
- Two pumps 12 Vdc can replace one petrol driven pump: No petrol vapors and exhaust gasses.
- Protected against overload.

Applications

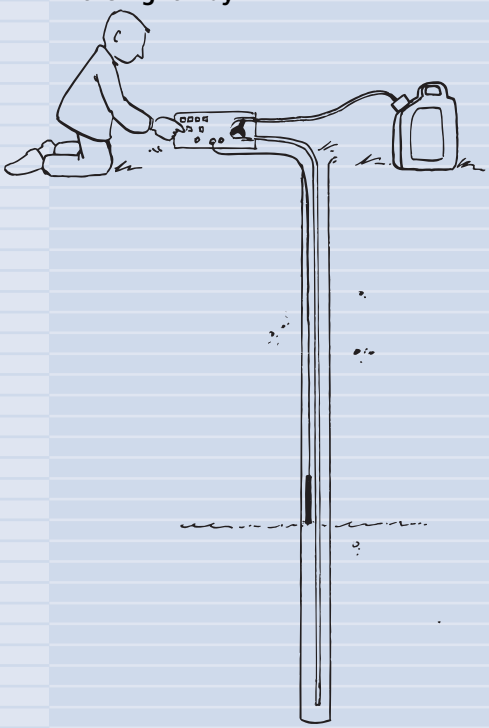
- Suitable for purging monitoring wells for several hours continuously (by using more than one peristaltic pump time can be saved).
- In-line filtration for sampling of groundwater using the filter holder or 0.45 micron disposable filters for removal of soil particles from water samples.
- Impeller pumps can be connected to the peristaltic pump to be able to pump large quantities of water out of monitoring wells, for instance during well development after they have just been placed.
- Pumping up soil gas or taking dust samples from the (outdoor) air.
- The precision and process of in-line measurement can be improved by connecting a flow-through cell, in which for instance pH-, conductivity-, O_2 or Redox electrodes have been placed, to the peristaltic pump.

12.28 Packers

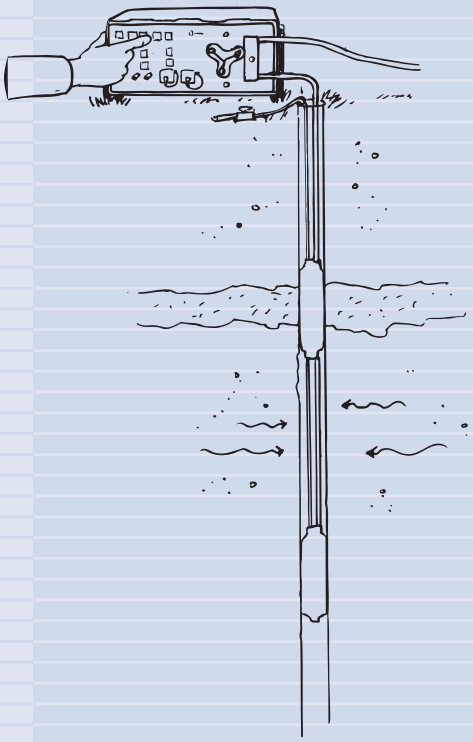
Sampling various layers of groundwater in monitoring wells can be done by using so called packers. The packers, suitable for monitoring wells with an internal diameter of 25 till 45 mm, are inflateable silicon or viton bladders which are used to seal of a part of the monitoring well.

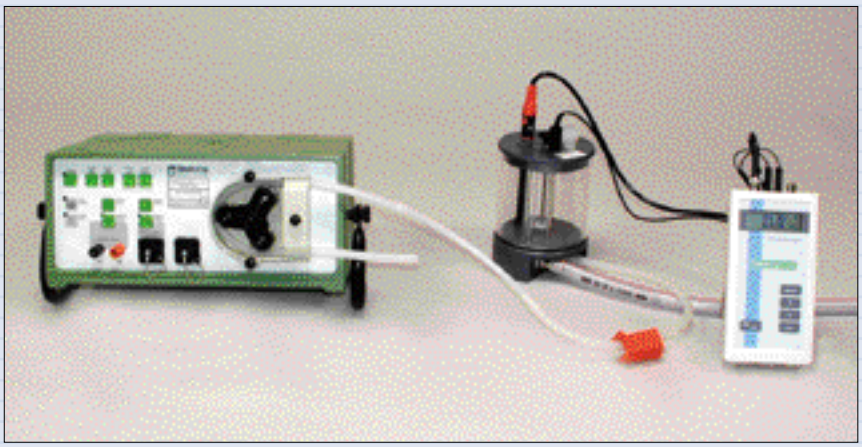
In groundwater remediation situations a combination of a top and bottom packer can be used to selectively remove water from a level in a remediation well that contains, at that moment, the highest concentration pollutants. The remediation zone (as small as 20 cm !) can be varied in time. The packers can be used easily in combination with the peristaltic pumps.

With a fluid level control the monitoring well is purged in the right way.



After inflating the packers, the same pump is used for sampling.





Peristaltic pump with flow-through cell and multimeter

Peristaltic pump with level sensor

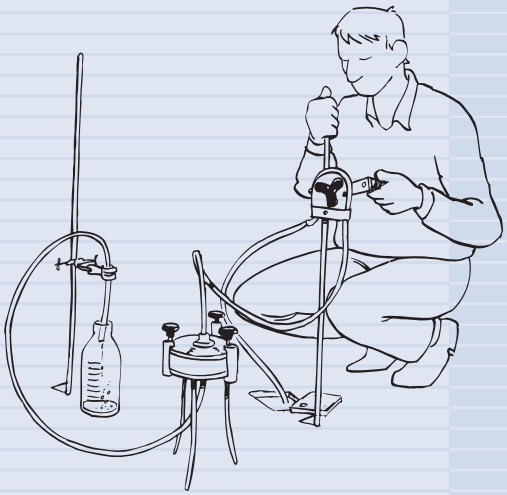
Peristaltic pump with packers

Eijkelkamp Agrisearch Equipment
www.eijkelkamp.com

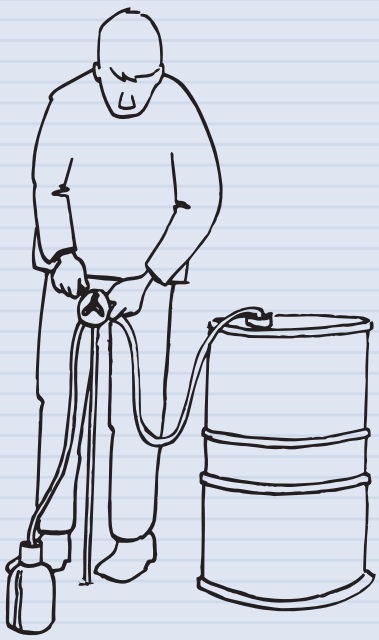
PERISTALTIC PUMPS FOR USE IN THE FIELD

P2.52
Parts List
Pg 389-390

Using the hand-operated peristaltic pump the groundwater is pumped up and filtered.



The reservoir is sampled using the hand-operated peristaltic pump.



12.23 Hand-operated peristaltic pump

The hand-operated peristaltic pump is a very reliable apparatus that is used for pumping of gasses and fluids. The pump used is a simple, but very durable, peristaltic pump with three pressure rollers.

The bearings of the drive shaft and the pressure rollers are waterresistant.

The pump can deliver a pump pressure of 3 bar (thus also suitable for use with in-line filters) and an underpressure maximum of 1 bar. It is a self-priming pump.

Even when the pump is out of use the pump tube is completely pressed by at least one roller. Fluid and gas can not flow back.

Using the hand-operated peristaltic pump water can be pumped from a depth of up to 9.5 meter.

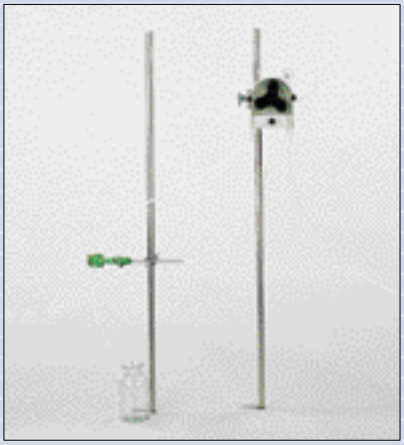
The hand-operated peristaltic pump is fitted with a handle with bearings that operates very light. The stainless steel monopod stand has been fitted with a press-down rim that allows you to press the stand into the soil easily for support.

A 6 x 10 mm silicon tube is most suitable for groundwater sampling.

Advantages

- The fluid (or gas) that has been pumped is only in contact with the inside of a piece of non-toxic silicon rubber tube (the so called pump tube). No mechanical wear and tear of sealings, bearings or membranes is possible. For this reason there is no risk of the medium to be pumped to get in touch with abrasive particles from shafts, sealing or impellers.
- As long as the pump tube used and the other tubes connected are chemically reliable, the integrity of the sampling is guaranteed.
- The pump tube can easily be replaced to avoid any risk of cross-contamination.

Pressure rollers and pump tube



Peristaltic pump with "Third hand"

Hand-operated peristaltic pump