



Foot valve pump (12.13)

Manual



Meet the difference

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On these operating instructions



If the text follows a mark (as shown on the left), this means that an important instruction follows.



If the text follows a mark (as shown on the left), this means that an important warning follows relating to danger to the user or damage to the apparatus. The user is always responsible for its own personal protection.

1. Description

1.1 Essential equipment

- Foot valve pump with tube guides (art. no.: 12.13.01).
- Tripod on which the manually operated foot valve pump can be mounted (art. no.: 17.04.01).
- Roll stiff tube (art. no.: 12.20.16).
- Ball valves, diameter 18 mm (art. no.:12.13.02).
- Clamping strap to connect the end of the tube to the tripod.
- Bucket (99.08.10) and/or sample bottles (art. no.: 99.08.07).

1.2 Operation principle

The foot valve pump consists of a tube with a stainless steel foot valve (ball valve) attached to it at the bottom. Once placed in a monitoring well and submerged in the water, the tube is moved up and down in a relatively fast movement, thrusting the water upwards.

In principle, the movement can be done manually. But can also be exercised via a tripod with lever (see photo 1). This is less tiring and more ergonomically sound. Connecting two tubes to the lever at the same time is also an option, provided that two hoses fit inside the monitoring well. This could double the flow rate. The tube connection is universal; various sizes of tubes and ball valves can be used. The tube should have some rigidity. A polyethylene tube is suitable, with a preference for HDPE over LDPE for greater depths. Tubes of PTFE (polytetrafluoroethylene) can also be used.

Photo 1 Manually operated foot valve

Adjustment options on both the guide block and the lever

Pin + spare pin

Tripod



2. Installation

1. Place the center of the tripod at around 60 cm from the center point of the monitoring well to be purged.
2. If the well is fitted with a protective shaft, then the operating height of the tripod can be adjusted.
3. Next the guide base is mounted at the center of the tripod.
4. Place the lever (with the grip pointing downward) between the guide blocks of the guide base and slide a pin through the middle hole of the guide block. The lever now hinges on this pin. The end of the lever (the end with the tube clamp, see photo 2) should be straight over the monitoring well filter. Finally a second pin is slid through the guide block so that the lever is blocked in a horizontal position. This is advantageous during the mounting procedure.
5. Now place a ball valve at one end of the hose.
6. Slide the tube(s) into the monitoring well until it (they) reach the bottom of the well. Cut the tube so that about 2.5 metres of tube protrudes from the monitoring well.
7. Take the plastic guide profile. This tube is open on one side which allows it to be slid tightly over the polyethylene tube. Once fitted, this guide profile will prevent uncontrolled movement of the tube. Pull the tube upwards, about 0.5 to 1 metres. Now press the plastic guide profile tightly to the tube in such a way that the top side of the guide profile ends at 10 cm below the tube clamp (see photo 2). Next the tube is clamped in the tube clamp.

The tube profile should not be clamped as well. The tube profile should remain 10 cm below the tube clamp.



Photo 2 Foot valve pump with tube and guide profile

The end of the lever should be straight over the monitoring well

Distance between tube clamp and guide profile equals 10 cm

Profile 



8. A second tube can be fitted in the same way, to double the maximum output.



The diameter of the monitoring well should be no less than 25 mm (for one 18 mm ball valve), and should not exceed apr. 100 mm. Otherwise the tube receives a lot of resistance and will tend to move around to much.

9. The end of the tube should be placed over a bucket, vessel or bottle. To avoid movement, secure the hose. To be able to start pumping, one of the two hinge pins is removed from the guiding block. If the pumping is lighter or heavier than expected you can increase or decrease the stroke without having to move the tripod. This can be done by moving the spare pin to another hole in the guide block while the lever remains in a horizontal position. The first pin is then removed so that the lever can be operated again.
10. The foot valve pump is not sensitive to small amounts of sand, but too much sand can lead to problems as that can clog the pump.

If this occurs, remove the tube and empty it, starting at the bottom near the ball valve.

3. Applications

The system can be used for purging monitoring wells and for sampling groundwater. It is suitable for sampling monitoring wells of 25 mm in diameter or more.

The ball valve pumps are permitted as a sampling tool in environmental soil investigations. If ball valve pumps are used for groundwater sampling, the pumping movement must take place above the filter of the monitoring well to prevent the sample from becoming turbid. At the same time, the ball valve should not rise above the water level when moving the hose up and down, otherwise the water will be over-aerated. Consult the relevant standards, such as NEN5744 and NPR5741, for more information.

3.1 Practical tips

1. Necessary filtration of groundwater can be carried out by inserting a thinner tube into the tube. This tube runs to a peristaltic pump (art. no.: 12.35.SB), which, together with an in-line filter, provides the anaerobic filtration.
2. Depending on the water level, pipe diameter, tube material and tube diameter, pumping depths of up to 50 meters can be reached.
3. Preferably do not use pipe material, as it contains various additives.
4. There are two sizes of ball valves: 18 mm external for tube size 12 x 16 mm and 12 mm external for tube size 8 x 10 mm. PTFE tubes too are available in these sizes.
5. Decontamination of the stainless steel valves can be done effectively in a (glass jar with) an alkaline detergent.

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