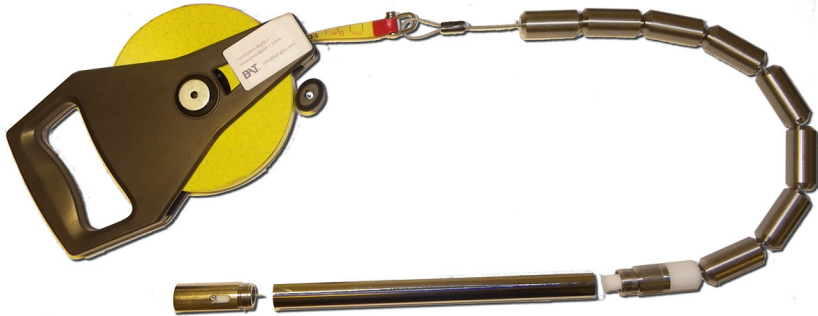


### Measure tape & Weight chain

The weight chain is connected to a measure tape of length 30 m where the sample tube housing in turn is connected.



### Hand vacuum pump

The hand vacuum pump is used for the evacuation of the sample tube. The hose is fitted with a "Luer-lock" coupling for connection of a blue hypodermic needle and a guide sleeve.



### Detail of the Luer-lock coupling



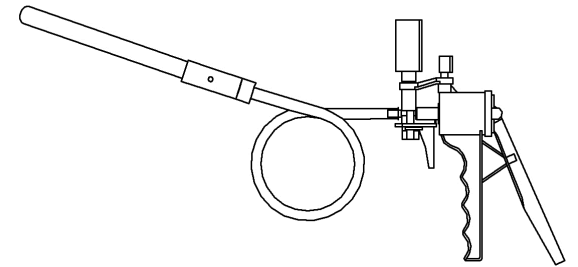
*Luer adapter*

*Blue needle*

*Guide sleeve*

### 1) Evacuation of sample tube

Connect a blue needle to the Luer lock coupling. Puncture the septum of a **clean** sample tube. Evacuate the sample tube using the vacuum pump. Normally, 95% vacuum is achievable.

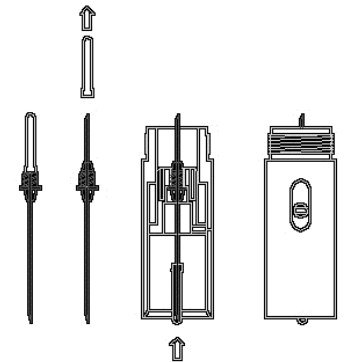


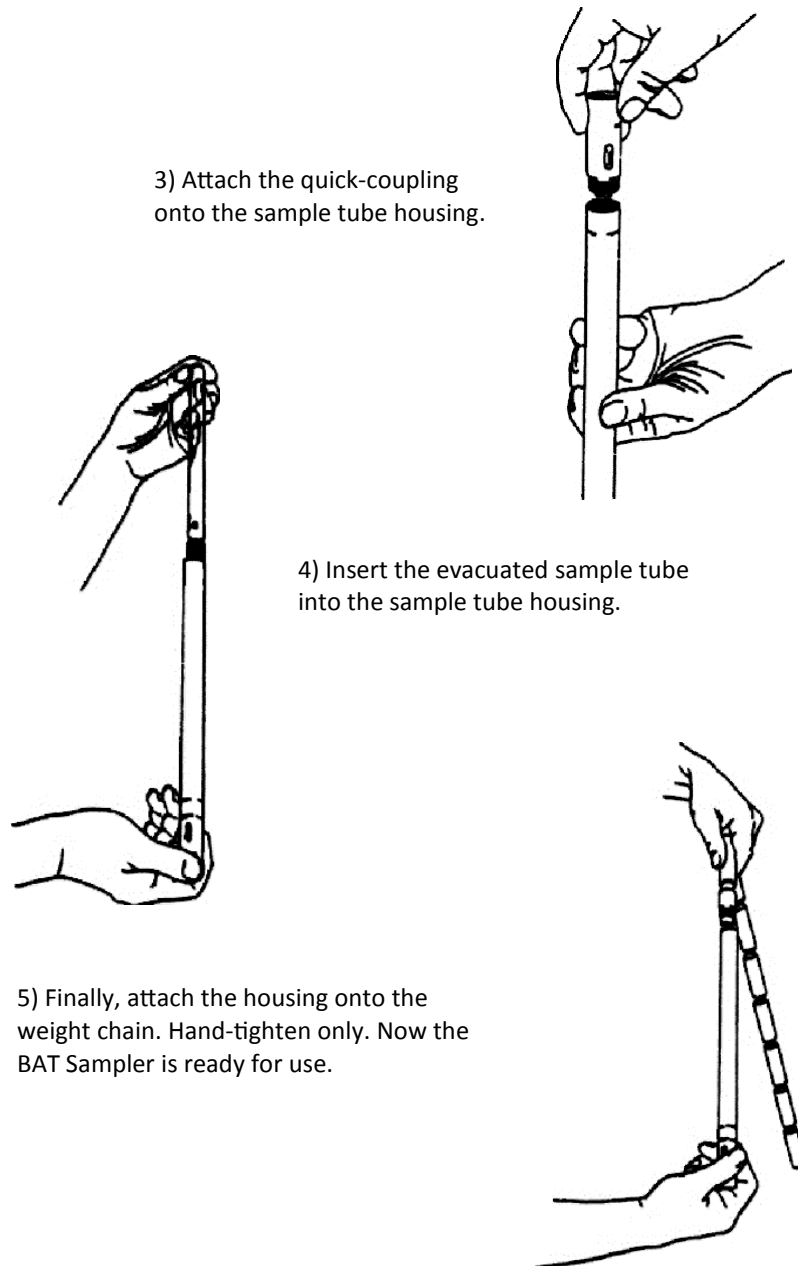
### 2) Preparation of the quick-coupling

a) Unpack the double-ended needle

b) Remove the rubber guard from the short end of the needle.

c) Screw the double ended needle into the needle carrier, using the adapter in the handle of the screw-driver. Make sure the needle seats properly in the thread.





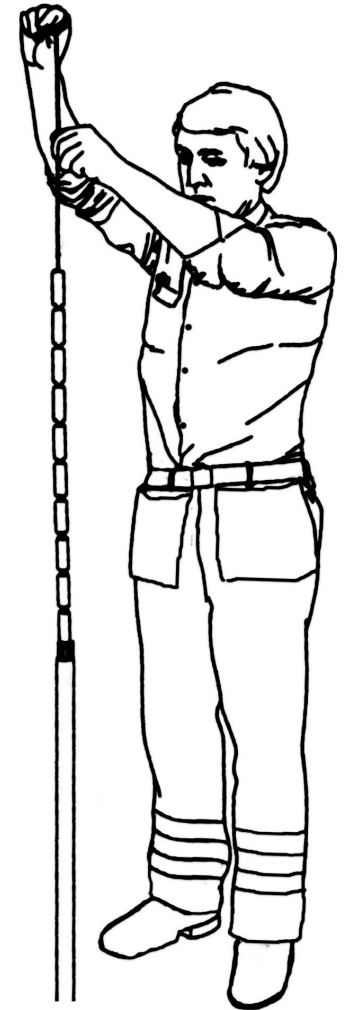
3) Attach the quick-coupling onto the sample tube housing.

4) Insert the evacuated sample tube into the sample tube housing.

5) Finally, attach the housing onto the weight chain. Hand-tighten only. Now the BAT Sampler is ready for use.

- 1) Connect the weight chain to the measuring tape (std. length 30m).
- 2) Lower the BAT Sampler gently down the extension pipe. Don't let the sampler fall free by gravity! To avoid sedimentation inside the extension pipe always wipe off any dirt on the tape by holding a rag around it.
- 3) Simply by gravity, the quick-connection system will automatically go into operation, and a hydraulic connection between the fluid in the BAT MkIII Filter Tip and the sample tube will be established.
- 4) Depending on both the permeability of the surrounding soil and the pressure difference between the groundwater and the sample tube it will take a certain time for the tube to be filled. The initial sampling rates varies between 0.02 ml/min in impervious clays ( $k=10^{-10}$  m/s) and 80 ml/min in porous sands. At most, a sample volume of 35 ml can be collected in one tube. If pressurized samples are desired, you must wait long enough so that the pressure in the sample tube equalizes the groundwater pressure.
- 5) In case the sampler is disconnected from the filter tip before the sampling is considered to be finished you simply reconnect the sampler to the filter tip to continue the sampling process. Due to the action of the quick-coupling, the remaining underpressure in the sample tube will be automatically maintained upon disconnection from the filter tip.

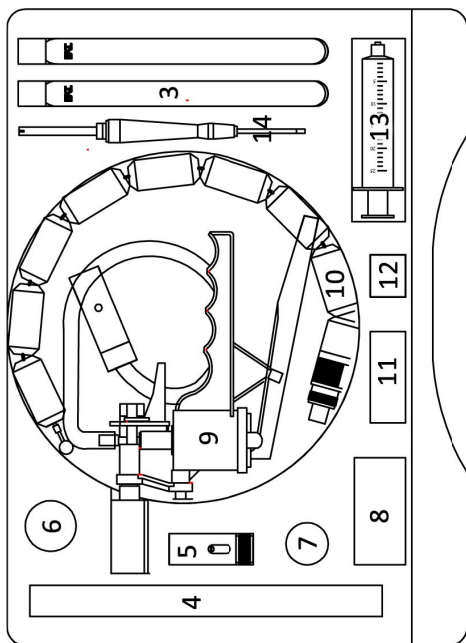
**Purging of the BAT MkIII Filter Tip.** The BAT MkIII Filter Tip has a "dead" volume of 10 ml which ought to be purged before taking a fresh sample of the groundwater. Prior to sampling it is therefore recommended to purge a volume of 20 ml through the filter tip, i.e. two times the "dead" volume of the filter tip.



## BAT Groundwater Sampling Kit

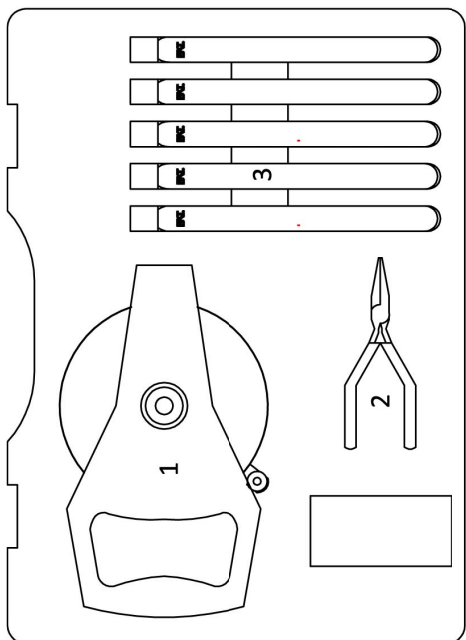


## Maintenance and trouble shooting



### Contents

	art.no
4) Housing for sample tube	5-105
5) Quick coupling	3-305
6) Container for used needles	5-110
7) Blue needle, 10 pcs	3-306
8) Double ended needle, 20 pcs	4-403
9) Hand vacuum pump	3-309
10) Weight chain	5-106
11) Spare septum, 10 pcs	3-306
12) Spare spring and screw for #3-305	3-307
13) Syringe, 25 ml	4-404
14) Screwdriver with needle adapter	3-308



### Contents

	art.no
1) Measure tape, 30m, connected to weight chain (10)	5-107
2) Pliers	3-206
3) Sample tube, 35 ml, 7 pcs	5-102

### Post sampling

When the equipment is subject to storage please do the following steps:

- 1) Remove any visual dirt outside and check the inside of the guide sleeve.
- 2) Disassemble the Groundwater Sampler.
- 3) Remove and discard any needles.
- 4) Remove caps and septa from the sample tubes.
- 5) Let all parts dry out keeping the case-lid opened.

### Trouble Shooting

- No sample is collected

Possible errors:

- 1) The double-ended needle is bent or broken. Check and replace if necessary.
- 2) The individual parts are not tightened enough. Screw them until they seats to each other.
- 3) Check the sample tubes caps and septa. Tight them if necessary and/or replace the septa.
- 4) The sample may consist completely of soil gas.