

SONICSAMPDRILL SYSTEM

Sonic drilling may be a 20 year old method. However Eijkelkamp Agrisearch Equipment spent 4 years of very intense activity trying to improve the principle and to come to an industrially responsible product for small and economic drilling machines. The high penetration speed asked for the development of innovative products in order to be able to efficiently use its advantages. The Direct-well and the Aqua-lock sampler are examples of this innovation.

30.00 Standard drilling machine, Wizard

The Sonic drilling module can be mounted on any vehicle that is capable of providing a hydraulic power of 50 l/min at a minimum pressure of 200 bar. However we can supply you with a complete drilling rig, the Wizard. The Wizard is a versatile, reliable and robust standard machine that for instance can also be used for percussion drilling and (hollow) auger drilling. The basic machine consist of a frame exclusive drill head, Sonic module, hammer, tools etc.



Wizard drilling rig with Sonic drill module

30.01 Sonic drill module

The heart of the Sonic drill module consists of 2 ex-centres that are driven by 2 small highspeed (12.000 rpm) hydro-engines. The high frequent vibrations (200 Hz) that are generated by this are transferred in a smart and effective way to the drilling rods.

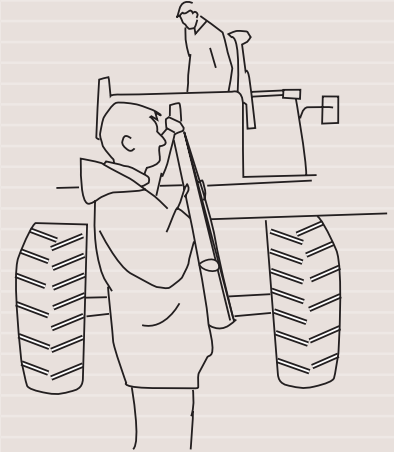
These high frequent vibrations cause the surrounding soil to become fluid. The zone that is made fluid is actually fairly small, between 1 and a max. of 5 mm all round. This reduces the friction and allows the Sonic bodies to penetrate soils that are sandy, rich in gravel or consist of weak clay very quickly. More rigid clay soils prove harder to penetrate, below the water table this process is accelerated however.

The Sonic is fitted also with an integrated drilling engine (max. 600 Nm) allowing for super fast coupling and disconnecting of drilling rods. This drilling engine can not rotate simultaneously with the vibrating, it is either the one or the other.

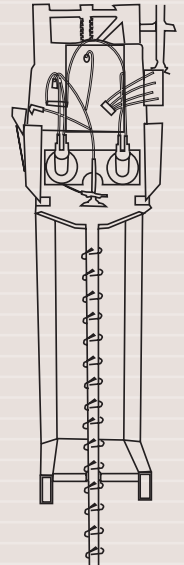


P1.27
Parts List
Pg 313

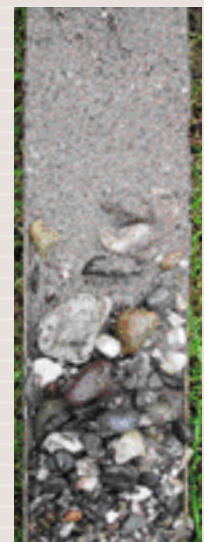
**High quality sampling
with Aqua-lock sampler.**



Auger drilling.



High quality sample.



www.eijkelkamp.com



P1.27
Parts List
Pg 313

Principle of the Sonic drill module.



SONICSAMPDRILL SYSTEM



The Sonic module is housed in a frame which separates the vibrations by hanging the Sonic block in rubber buffers. The pull-up and pull-down forces thus are absorbed by the buffers and should not exceed a maximum of 10 kN.

- ❑ Using Sonic vibrations while pulling ensures recovery of drill casings.
- ❑ Loaded material/equipment will not get stuck in the casing when pulling using sonic vibrations.

Principle

- ❑ Sonic waves for fast penetration into the soil.
- ❑ Rotary for rapid coupling of drill rods.
- ❑ Pulling wrench for quick decoupling.
- ❑ Heavy duty drill rods to withstand high vibrational forces.
- ❑ Lost-cones (special shaped drilling cone) of casted steel for consumable prices.

Performance

- ❑ Penetration speed up to 1 meter in 5 seconds.
- ❑ A 10 meter deep 1"filter placed and plugged with bentonite, ready for use in 20 minutes.
- ❑ Penetrating soil formations with CPT values of over 100 MPa.
- ❑ Recovery rate of 90 to 100 % for soil cores of 2 meter long.

Applications SonicSampDrill system

- ❑ Placing of all types of sensors.
- ❑ Placing of Direct-well filters.
- ❑ Percussion gouge sampling.
- ❑ Sampling with high-grade quality using the Aqua-lock method (for instance for archeological purposes, sand dredging wells, filtration research for drinking water, geophysical research, prospecting for gold veins)
- ❑ Placing of seismic explosive charges in the soil.
- ❑ Placing aeration - and/or rinsing hoses for remediation projects
- ❑ The extension of the possibilities (depth/ diameter) of cone penetration test machines.



Sonic drill module

SONICSAMPDRILL SYSTEM

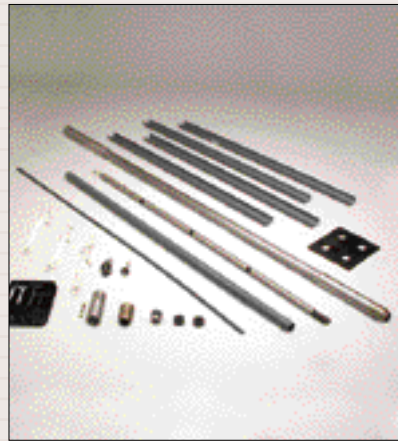
Aqua-lock sampling (undisturbed)

This patented sampling method really becomes effective if applied in combination with the Sonic drill module. The sampler namely is lowered to a certain depth with the same speed as in case of the lost cone method. During the penetration a piston/stop is kept below by filling the interspace with water. This means that there is no drilling cone at the bottom end! Once at the depth where the sample is to be taken, the water is allowed to escape to the rods above.

Using the Sonic vibrations a long quality core can be cut of which only the outer core of 1 to 2 mm is visible influenced by the vibrations. In clay as well as in (crude) sand containing gravel, samples can be taken using this method. Through the previously drilled well the next sampler can be lowered and opened at the desired depth to cut another sample. In this method it is therefore required to place and replace the drilling rod each time. But as this can be done so fast and the sampling proceeds so easily this still is a very effective method.



Pushing out the Aqua-lock sample



Aqua-lock sampler set



Various samples taken with the Aqua-lock sampler

If the sampler is above surface the mast is placed in a sloping position and used as a sort of working bench. Using high pressure water the sample is pressed out of the sampler into a sample gutter after which it can be described, sampled and possibly packaged. The Aqua-lock sampler is available as a complete set, with samplers varying in length.

30.60 Aqua-lock sampling set, 1.5 m

The Aqua-lock sampler (patent pending) is available as a complete set with a sampler (diam. 50 mm and length 1.5 m), 2 spare cutting shoes, tools and spare parts for the Aqua-lock valve, 2 spare Aqua-lock pistons and 2 sample gutters of 1.5 m.

30.61 Aqua-lock sampling set, 2.0 m

Aqua-lock sampler complete set with a sampler with diameter 50 mm and length of 2.0 m.

30.62 Aqua-lock sampling set, 2.5 m

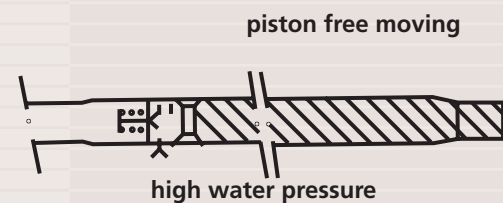
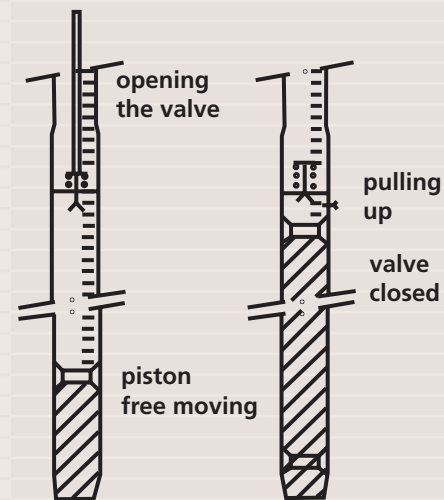
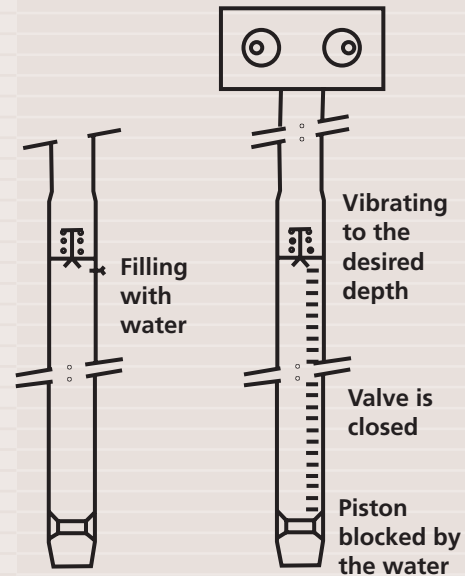
Aqua-lock sampler complete set with a sampler with diameter 50 mm and a length of 2.5 m.



P1.27

Parts List
Pg 313-314

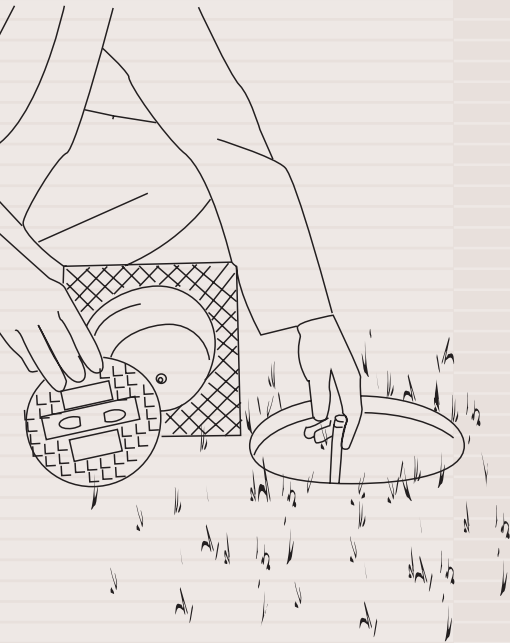
Principle of Aqua-lock sampling in 5 steps.





P1.27
Parts List
Pg 314-315

After installation the Direct-well is finished with an adapted monitoring well cover.



SONICSAMPDRILL SYSTEM



Tooling for Direct-well drilling

The Direct-well is an easy to install filter with a diam. of 32 mm and a length of 1 m, fitted with filter gauze and a stainless steel adapter. The Direct-well can be used in normal augered holes with a diam. between 45 and 70 mm or in percussion casings and sounding rods with an inside diam. from 40 mm on and an outside diam. of max. 70 mm. It can be used for groundwater level measurements as well as ground-water monitoring. The filter is neatly packaged piece by piece. Bentonite collars are slid on the tube and subsequently the tube is fitted to the adapter. The Direct-well is lowered into the casing (drilling rod). The bentonite collars ensure plugging penetrated impermeable layers, preventing cross-flow over different layers or surface water to run down to the filter pipe. After the tube is cut the casing is further filled with bentonite collars. After extracting the casings the top end is finished with an adapted monitoring well cover. Following this method it is possible to install filters very fast.

Tooling for lost cone method

Various tooling for the lost cone drilling method are included in our product range. With this drilling method a cast iron drilling cone (diam. 70 mm) is vibrated, drilled or pushed into the soil. After retraction of the percussion casings, the cone, as well as everything you loaded into the casing (internal diam. 40 mm), is left behind in the soil. Various percussion casings, striking pens, drive cones, drive cone holders, etc. are available.

Tooling for specific drilling

Because of its experience in soil and seismic research and its well equipped production department Eijkelkamp Agrisearch Equipment can offer you the possibility of custom-made drilling tools. On special request custom-made casings, casing shoes, inserts for striking pens, fishing tools, pulling devices for casings, augers, etc. are available.



Direct-well consumables



Drive cones for lost cone drilling



Tooling for specific drilling