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Please send me more information / a quotation about:

- AquaLock
- Direct-well filter
- Quality filter
- Monitoring well pipes
- Sonic drill Module 2 x 2.5 ton
- Sonic drill Module 2 x 7 ton
- SonicMast with hydropack
- Training and Instructions
- Standard drilling rig
-
-

- Send me the complete Eijkelkamp catalogue

Signature: Date:

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www.eijkelkamp.com

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S o n i c S a m p D r i l l

f r o m E i j k e l k a m p

A g r i s e a r c h

E q u i p m e n t



SonicSampDrill

from Eijkelkamp

Agrisearch

Equipment

SonicSampDrill is a unique concept for drilling and sampling that is characterised by speed and quality while causing next to no inconvenience to its environment or disturbance of the soil. Eijkelkamp Agrisearch Equipment already has experience with the Sonic which was originally designed for seismic research since 1995. These days the advantages of the SonicSampDrill are also appreciated in geological and environmental technology. At the same time the Sonic's speed and quality make it increasingly attractive to -for example- the archaeological market. Obviously more possibilities are waiting to be discovered and developed. With the SonicSampDrill we can make sure that your opportunities in the market will take great strides when it comes to speed and quality.



SonicSampDrill

The system

At the heart of the sonic drilling system are the 2 ex-centres that are driven by high-speed hydro engines. The high frequency vibrations that are generated in this way are transferred in an efficient way to the drilling rods. This then has the effect of causing the first layer of surrounding soil around the borehole and drill string to become fluid. This process reduces the friction so that the Sonic bodies are able to rapidly penetrate sandy, gravelly soils and clay.

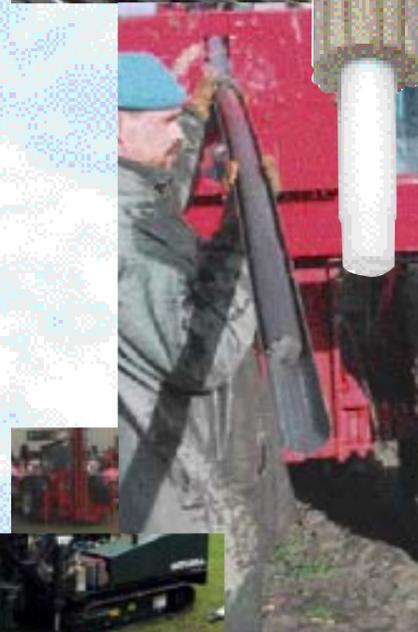
Drilling motor

The Sonic is also fitted with an integrated drilling motor enabling the drilling rods to be coupled or disconnected in no time. As soon as the desired depth has been reached with the drilling rods and the work has been carried out, the drilling rods need to be retrieved from the soil. At this point the special pulling wrench developed for 63 mm tooling can be attached to the Sonic with the use of an attachment. The hard steel fingers of the pulling wrench automatically grip behind the coupling. There is no manual screwing required for either coupling or disconnecting. If the hauling up is not managed by the machine itself, simply set the Sonic going. This helps retrieve any drill string from any depth out of the soil. This is a significant advantage over a method such as hydraulic hammering, for instance.

Applications

SonicSampDrill has many applications and Eijkelkamp Agrisearch Equipment is certain that this is by no means an exhaustive list:

- High-quality sampling for archaeological purposes, sand dredging well studies or filtration research for drinking water, geophysical research, prospecting for minerals (e.g. gold veins)
- Placement of quality or Direct-well filters for environmental research or water monitoring
- Placement of various types of sensors, e.g. Divers® from Van Essen Instruments
- Placement of seismic explosive charges in the ground
- Placement of aeration and/or rinsing hoses for remediation projects
- Increasing the possibilities in terms of depth and diameter for cone penetration test machines
- Placement of heat exchangers for sustainable energy applications



More quality in less time with the SonicSampDrill!

The drill module

At present Eijkelkamp offers a choice of two different drill modules that differ in terms of capacity, namely, $2 \times 2.5 = 5$ tons of vibrational force or $2 \times 7 = 14$ tons of vibrational force. The latter also has a stronger integrated drilling motor. These modules can be supplied for different drilling machines.

Standard drilling machine

Besides the standard drilling machine in addition it is possible to apply the Sonic to other drilling machines and it is also possible to use the SonicMast with hydropack.

SonicMast with hydropack

At the end of 2002 Eijkelkamp Agrisearch Equipment developed a new mast for the heavy Sonic module (2×7). This drilling mast can be trailed behind a farm tractor. The SonicMast makes it possible to buy a Sonic drill module without the customer also having to buy a drilling machine straight away. The mast already provides everything that is needed: Sonic, hydraulic technology and an operating panel. The mast takes up very little floor space and can be stowed away and transported with ease with a fork lift. A great advantage of the SonicMast is that there is no expenditure in terms of hiring or maintenance when there is no work. In addition it is also possible, at each different location, to take into account the need for different track widths depending on how easy or difficult the terrain is to negotiate.

Sampling with Aqualock

The Aqualock is a patented sampling method that really comes into its own when used in conjunction with the Sonic drill module. The sampler that comes in 2, 3 or 4-metre lengths is dropped to its required depth at the same speed as with the lost cone method. For the penetration the space within the Aqualock sampler is filled with water which keeps the piston down at the bottom end. There is no drilling cone involved, therefore. When the required depth has been reached, the water is allowed to escape towards the drilling rods above. The sonic vibrations make it possible to achieve a

nice core where in the case of homogeneous soil types only the outer layer (1 to 2 mm) is visibly affected by the vibrations. Samples can be taken from clay as well as from (coarse) gravelly sand. The sampler can be lowered down the previously drilled hole and at the new depth another sample can be taken. This involves repeatedly inserting and extracting the drilling rod but the sampling is achieved very easily and rapidly with this method. Finally, with the aid of the water the sample is pressed out of the sampler into a trough or a plastic liner.

Augering

With the heavier Sonic 2×7 augering is also immediately possible. To do this a double bearing is attached to the spindle with a pin so that the drive spindle in the vibration block does not damage the block during augering. In the case of the Sonic 2×2.5 one of the options is to push the heavier drilling motor hydraulically to the front to carry out the augering.

Consumables: Direct-well filter

After drilling to the required depth the Direct-well filter is lowered into the drill casing. The bentonite collars take care of the centring, adding weight and later the sealing. The hose is trimmed and the remainder can be filled up with bentonite collars. The top is finished off by covering it with a well cover. This allows filters to be placed very quickly with riser hoses that have a

sufficiently large diameter to allow water samples and water levels to be taken, and eventually for injection or pumping.

Consumables: Quality filter

The quality filter is also a typical Eijkelkamp product. The filter comes pre-filled with filter gravel. The blind tube fitted with bentonite collars can be screwed on at any height. This guarantees that the tube is centred and sealed 100% in the right place.

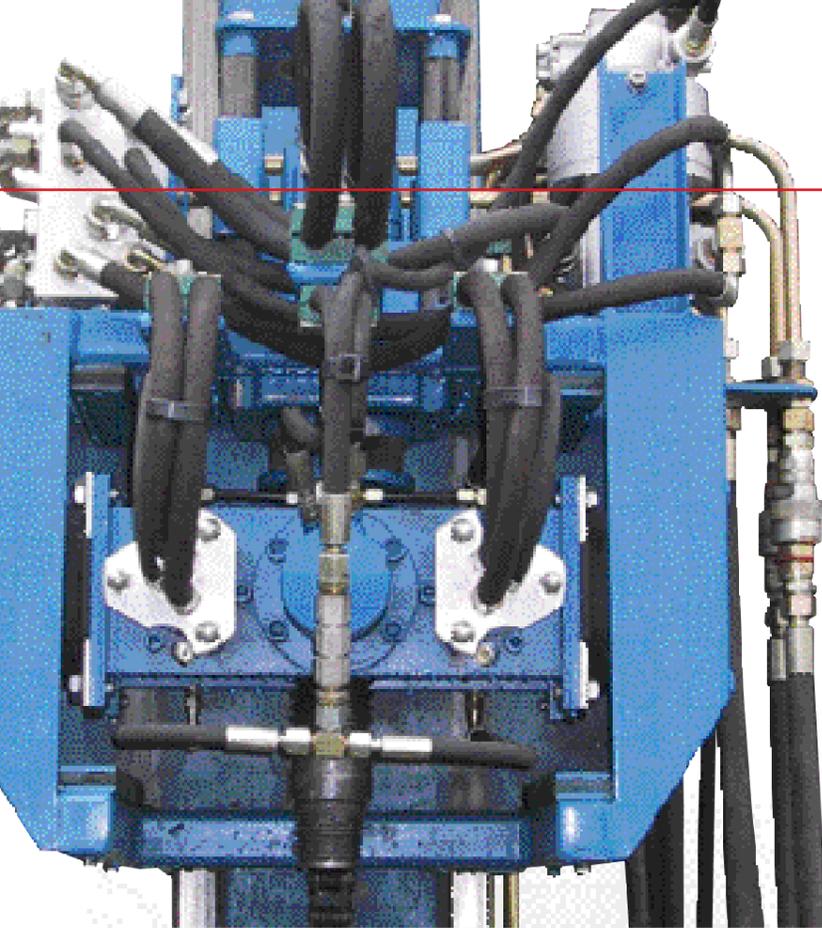
Training & Instruction

Sonic drilling requires a different way of working. High frequency vibrations can cause damage if one doesn't handle the machine and tools properly. The tools are all unique in their own way and specially designed to be used as an integral part of the Sonic drill module. Learning to handle the equipment properly leads to samples of higher quality and greater speed. To invest in the education and training of your people is absolutely essential and is the best way of quickly earning back the investment in the SonicSampDrill!

Sonic drilling success stories

These days there are several companies (for example in NL and UK) who have discovered the strengths and uniqueness of the Sonic drilling system and have started new businesses whose operations are based on our SonicSampDrill technology! Eijkelkamp Agrisearch Equipment is convinced of the possibilities of this extraordinary technology and therefore continues to

engage in further developments and searches for heavier systems, new applications and tools. If you are interested in trying any of our items in your projects, don't hesitate to contact us. Eijkelkamp Agrisearch Equipment would be happy to refer you to companies who can provide these new techniques to fit the requirements of your project.



SONIC S 2X2.5

Technical specifications Sonic S 2x2,5

SonicDrill Head

Total weight	: 140 kg
Dimensions	: height 650 mm width 600 mm
Maximum Pull-up/down (vibration)	: 25 kN (= 2.5 ton)
Maximum Pull-up/down (rotation)	: 7,5 kN (= 0.75 ton)

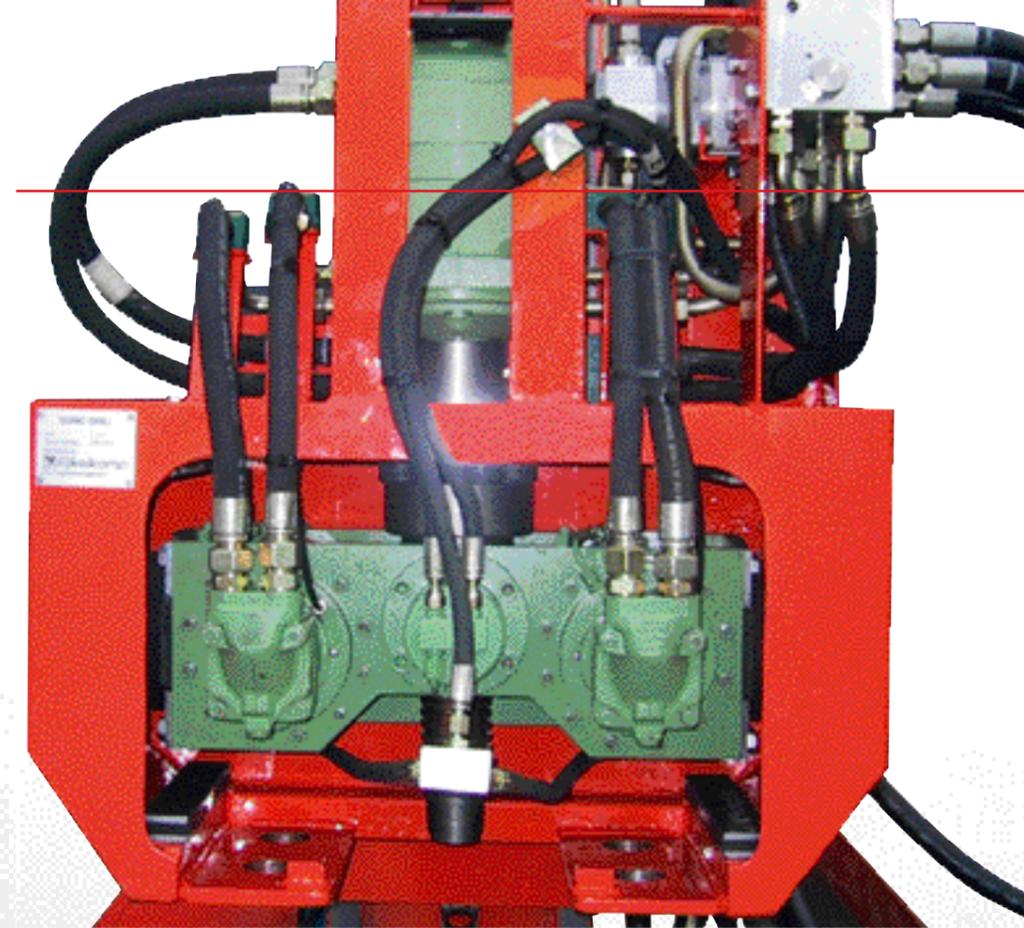
Vibrator

Oil flow	: 36 l/min
Working pressure	: 210 Bar
Maximum pressure	: 250 Bar
Vibration force	: 2 x 25 kN (or 2 x 2,5 ton)
Required hydraulic power	: 14 kW
Frequency	: 200 Hz

Rotary

Oil flow	: 36 l/min
Working pressure	: 210 Bar
Speed at maximum flow	: 205 rpm
Torque maximum input	: 13 kW

To power the S 2x2.5 and the feed on the mast a total oil flow of 80 l/min and a working pressure of 210 bar would be optimal. This requires hydraulic power of 28 kW and an engine with approximately 32 kW in power



SONIC S 2X7

Technical specifications Sonic S 2x7

SonicDrill Head

Total weight	: 240 kg
Dimensions	: height 800 mm width 730 mm
Maximum Pull-down / up (vibration)	: 25 kN (= 2.5 ton)
Maximum Pull-down / up (rotation)	: 15 kN (= 1.5 ton)

Vibrator

Oil flow	: 83 l/min
Working pressure	: 210 Bar
Maximum pressure	: 250 Bar
Vibration force	: 2 x 70 kN (or 2 x 7 ton)
Hydraulic power Input	: 29 kW
Frequency	: 150 Hz

Rotary

Oil flow	: 83 l/min
Working pressure	: 210 Bar
Speed at nominal flow	: 205 rpm
Torque nominal	: 120 daNm (= 1.2 kNm = 1200 Nm)
Hydraulic power input	: 21 kW

To power the S 2x7 as well as the feed on the mast an oil flow of 120 l/min and a pressure difference of 210 bar would be optimal. This requires hydraulic power of 45 kW and an engine with approximately 50 kW in power.