build on reliable data...

a.p. van den berg

Cor-1/01-15

...with a.p. van den berg onshore equipment

CPT Track-Truck®

The versatile high-performance CPT unit was invented by A.P. van den Berg and has a track record of more than 25 years. With its tracks retracted, the Track-Truck can run on the highway as an ordinary truck. After lowering the tracks, the Track-Truck is in its element in soft and hilly terrain where other heavy vehicles get stuck. Even ditches are easily conquered. The track system reduces the wheel load by 60 to 70%.

Manoeuvering the Track-Truck is performed from the driver's cabin or with a remote control from a safe distance.

The renowned CPT penetrometer, the HYSON 200 kN, is standard in the Track-Truck. The penetrometer is operated via the touch screen, the Human-Machine Interface (HMI).

The total weight generally ranges between 18 and 21 tons, but weight can be further de- or increased based on the type of truck, the country of destination and the customer's requirements. Most customers opt for a 4x4 driven truck, but alternatives are possible.

(Ref. Brochure On-9)

CPT Truck

The A.P. van den Berg CPT Truck is a vehicle suitable for soil investigations in pushing capacities from 140 to 200 kN or even more.

A.P. van den Berg has more than 40 years' experience in manufacturing CPT Trucks based on many different trucks and models. The all-wheel drive 6x6 model has proven most popular among customers. The frame of the truck is reinforced with a sub frame to take the forces occurring during the Cone Penetration Tests. The truck's total weight is sufficient to provide the maximum pushing force.

The well-proven twin cylinder HYSON 200 kN penetrometer is installed in the CPT Truck. The hydraulic upper clamp is an efficient addition to the functionality of the HYSON 200 kN. The penetrometer is operated via the touch screen (HMI).

(Ref. Brochure On-8)

CPT Crawler

The CPT Crawler provides the same high production rates and reliability as the CPT Truck, with the advantage of tracks for better manoeuvrability in rough or soft terrain. The crawler is the only option at sites where the maximum allowed height is limited. Of course a separate carriage is required for transport of the crawler.

The twin-cylinder HYSON 200 kN can be built on a 15 tons crawler which is suitable for pushing forces up to 150 kN or on a 20 tons crawler that provides counterforce up to 200 kN. The penetrometer is operated via the touch screen (HMI).

The A.P. van den Berg CPT Crawler design can be based on customer specific requirements and/or existing crawler vehicles/chassis.

(Ref. Brochure On-7)

CPT Morooka Crawler

A CPT Crawler that is based on an existing crawler vehicle is the CPT Morooka Crawler, a relatively fast CPT Crawler for very soft soil.

The unit is built on a low ground pressure 15-ton crawler chassis. The rig is fast (with speeds of over 12 km per hour) and can travel long distances on asphalt or concrete surfaces without causing surface damage. The crawler tracks are made of rubber.

The renowned CPT penetrometer, the HYSON 200 kN, is mounted in the CPT Morooka Crawler. The pusher is limited by means of safety valves, so it will not exceed the 15 tons maximum payload of the Morooka. The penetrometer is operated via the touch screen (HMI).

(Ref. Brochure On-6)

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Midi & Mini CPT Crawler

At locations with restricted access, a compact and easily manoeuvrable CPT system is necessary. Think of building pits, back yards, dikes, wharfs or even inside buildings. The Midi & Mini CPT Crawlers were developed for these working environments.

The Midi CPT Crawler is a compact and manoeuvrable CPT system, with a maximum power of 20 tons. The Midi CPT Crawler consists of the renowned CPT penetrometer (HYSON 200 kN) mounted on an undercarriage with rubber tracks. With a weight of about 3,500 kg and a width of only 1,200 mm the Midi CPT Crawler fits through small passages and can be transported in a small truck.

The most compact & lightest self-propelled unit is the Mini CPT Crawler. The Mini CPT Crawler consists of the well-proven single cylinder HYSON 100 kN-LW with 10 ton pushing force. With a weight well under 1,600 kg and a width of only 780 mm the Mini CPT Crawler fits trough a doorway and can be transported in a mini van. The pusher is dismountable, so it can also be used as a stand-alone unit next to the crawler.

To provide the required reaction force for testing, soil anchors are fitted.

(Ref. Brochure On-4 and On-5)

CPT Trailer

The 20 tons CPT Trailer provides the same high penetration force as the Track-Truck, CPT Truck and CPT Crawler, but at significantly lower capital cost. The main difference between the trailer versus the large self-propelled machines is that those carry their own ballast weight; whereas operations with the lighter trailer require extra time to set soil anchors to provide the required reaction force.

The anchors are set with a hand-operated anchor setting device, or an optional HYGAND hydraulic anchor setting unit powered from the trailer's diesel engine and hydraulic power pack. With the HYGAND, anchor setting is considerably faster and easier.

The trailer is suitable for locations that are difficult to access with heavy units. The total weight of a standard CPT Trailer is no more than 3,500 kg.

(Ref. Brochure On-3)

CPT SKID

The CPT SKID is a versatile, low-budget and easy-to-transport package suitable for both onshore and nearshore soil investigations. It can be mounted on a frame, vehicle or jack-up platform. The high-performance, low maintenance, reliable HYSON 200 kN twin-cylinder penetrometer with control unit and power pack is included.

For easy integration in various setups, customers have the following choices:

- a 1 cylinder Power Pack that offers enough power for the HYSON 200 kN to do its work or a 2 cylinder Power Pack with extra hydraulic capacity for additional options.
- a basic, advanced or professional control unit. The professional control unit consists of a PLC that operates all functions of the CPT SKID and provides a convenient operator interface.
- the low-cost pulling and catching ball clamps or the hydraulic clamps that make it possible to switch between different tube sizes without exchanging parts.

(Ref. Brochure On-2)

LW-CPT System

The light & compact HYSON 100 kN-LW (Light Weight) static cone penetrometer with 10 ton pushing force is designed to perform in-situ geotechnical soil investigations at locations inaccessible to other equipment, such as basements, back yards, swampy and overgrown land. Its main features are: low weight (only 85 kg) due to unique single cylinder design, small footprint (165 x 310 mm without anchors), versatility and reliability. This results in an easy-to-move and easy-to-operate CPT unit.

In order to provide the reaction forces while testing, four rugged soil anchors (footprint is 800 x 800 mm) are provided. Anchors can be set manually or much easer using the HYGAND, a hydraulic anchor setting device driven by the hydraulic power pack.

The stand-alone hydraulic power pack has a 1 cylinder petrol engine and weighs 77 kg (oil included).

(Ref. Brochure On-1)

...with a.p. van den berg offshore equipment

ROSON seabed systems

A.P. van den Berg has been selling its ROSON continuous seabed CPT system since 1982. The ROSON's track record is unequalled in the industry.

A ROSON is deployed from a vessel with an A-frame or crane through a moon pool or over the side. The electrical wheel drive system pushes the pre-assembled string into the seabed. Wheel friction is imposed by hydraulic force. A winch + umbilical provide the power and data communication.

ROSON systems are available for CPT cones of all sizes and for vane testing, all at water depths ranging from 0 to 4,000 m. The systems can also be used for seismic, magneto and conductivity tests at water depths up to 1,000 m. Furthermore with the Seabed Sampler XL high quality samples with a length up to 25 m can be taken from the seabed at water depths up to 4,000 m.

All ROSON systems work in conjunction with A.P. van den Berg's digital Icone data acquisition system, consisting of the Icontrol data logger and Icones.

(Ref. Brochure Off-R1, Off-R2 and Off-R3)

DW ROSON 100 & 2x100 (depths up to 4,000 m)

The DW (Deep Water) ROSON, with its proven wheel drive CPT system, is provided with technology to perform CPT's and samples in harsh offshore conditions at ultra-deep water depths. The DW ROSON is unrivalled in the industry.

The DW ROSON is available in two types:
- The 'DW ROSON 100' with a pushing force of 100 kN consisting of a single wheel drive.
- The 'DW ROSON 2x100' with a pushing force of 200 kN consisting of two stacked wheel drives.

Both types of the DW ROSON are suitable for water depths up to 4,000 m. A CPT depth up to 50 m is achievable.

The optical fibre umbilical guarantees real-time broadband data transmission and power supply over great distances. The self-tensioning electric driven winch is provided with a level winder for proper layering of the umbilical.

(Ref. Brochure Off-R3)

ROSON 50, 2x50 & 100 (depths up to 1,500 m)

The ROSON is available in three types:
- The compact 'ROSON 50' with a pushing force of 50 kN consisting of a single wheel drive.
- The compact 'ROSON 2 x 50' with a pushing force of 100 kN consisting of two stacked wheel drives.
- The 'ROSON 100' with a pushing force of 100 kN consisting of a single wheel drive.

The various ROSON systems come with an electric driven winch with self-tensioning for heave compensation. They are suitable for water depths up to 1,500 m. A CPT depth up to 50 m is feasible.

Data communication from the ROSON to deck level is achieved by a powerline connection through the umbilical. This is realized by a transducer at both ends of the umbilical. These transducers, called Icone Powerline Adapters, convert the Icone signal to a powerline signal and vice versa.

(Ref. Brochure Off-R1 and Off-R2)

Nearshore ROSON (depths up to 300 m)

At water depths up to 300 m two systems can be applied for CPT investigations.

At water depths up to 30 m a jack-up barge or pontoon is often used. As long as the influence of currents and the tide is small, an onshore application with a HYSON top pusher on the operators platform is suitable. Casing tubes between the platform and the riverbed or seafloor are required to support and protect the CPT string.

For water depths between 30 and 300 m the nearshore ROSON is a suitable solution. This ROSON is available with 50 kN, 100 kN or 200 kN pushing force. To avoid the investment in a self-tensioning winch, data communication runs over a free hanging cable to the Icontrol data logger.

(Ref. Brochure Off-R1)

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Seabed Sampler XL

In co-operation with NGI, A.P. van den Berg has developed a piston soil sampler that takes high-quality samples with a diameter of 110 mm and a length up to 20 m from the seabed, at water depths up to 4,000 m. The recovery ratio is higher than 95%. This means that very little disturbances occur to the sample.

The quality of the sampler is based on:

- two types of cutting shoe that perfectly match the type of soil; one with a thinner casing especially designed for soft clays and one with a thicker casing suitable for stiffer soils
- the core retainer which is open during sampling
- a piston that minimizes the forces exerted on the sample
- a positioning system that keeps the piston in its place
- the connection mechanism of the sample tubes that separates the sample on the spot without damaging it

The SBS XL can be pushed into the soil by any ROSON seabed CPT unit. Sample tubes are pre-assembled in the ROSON. Then the total assembly is lowered to the seabed and the SBS XL is pushed into the soil by means of the ROSON drive wheels.

Ref. Brochure Off-S1)

WISON-APB wireline CPT systems

The WISON-APB system is basically a double-acting cylinder with the soil-testing instrument attached to the end of the piston rod.

An umbilical is released from a remote-controlled and electrically driven constant tension winch on deck of the vessel. The WISON-APB is capable of performing CPTs + vane tests and taking soil samples with the Push or Piston Sampler at water depths up to 3,000 m. Seismic, magneto and conductivity tests are possible at water depths up to 1,000 m.

A.P. van den Berg provides a dedicated bottom hole assembly (BHA) to hold the WISON-APB tools. Alternatively a multi-tooling BHA can be delivered, that allows also 3rd party tools, i.e. S-Geobor core barrels, to be used in the same BHA. We can work with various parties to assure correct fitting of these tools.

All WISON-APB tools work in conjunction with A.P. van den Berg's digital Icone data acquisition system, consisting of the Icontrol data logger and Icones.

(Ref. Brochure Off-W1, Off-W2 and Off-W3)

WISON-APB-3000

The WISON-APB-3000 is well suited to operate in the harsh offshore conditions of ultra-deep water depths up to 3,000 m. It requires a drill string with an inner diameter of 4 ¼" (109 mm) and a drill tower clearance of 12 m.

The WISON-APB-3000 has a flexible stroke and is equipped with a multi-purpose down hole tool that consists of:

- an automatic electro-mechanical system for locking itself in the bottom hole assembly. After a CPT, the tool can be unlocked independently of the actual stroke reached.
- a Kevlar-reinforced, high-strength umbilical cable that provides continuous charging of the battery module in the tool. The umbilical includes optical fibres for tool control and high speed communication of CPT data.
- a constant tensioning winch that is optimized for high travel speeds (max 5 m per sec) of the tool inside the drill pipe.

(Ref. Brochure Off-W3)

WISON-APB-Classic & WISON-APB-1000

The WISON-APB-Classic is designed for soil testing at shallow water depths up to 550 m. The WISON-APB-1000 for soil investigations at water depths up to 1,000 m. Both require a drill string with an inner diameter of at least 4" (101.6 mm) and a drill tower clearance of 11 m. Pushing tools are available in three types: 50 kN with a 3 m tool, 100 kN with a 1 m tool and 150 kN with a 1.6 m tool.

Samples can be performed with a Push Sampler or the advanced Piston Sampler. Both samplers can also be used with a hardened cutting shoe for a higher recovery ratio.

The WISON-APB-Classic and 1000 m-version come with a self-tensioning electric winch for heave compensation. The winch allows a travel speed of max 2 m per sec of the tool inside the drill pipe. The umbilical provides data transfer and hydraulic power.

(Ref. Brochure Off-W1 and Off-W2)

...and with a.p. van den berg's innovations,

Wireless data transfer

Achieve more comfortable CPT operations and higher production rates with A.P. van den Berg's Optocone.

The Optocone provides wireless transmission of the CPT data by means of light conduction. An optical adapter behind the cone takes care of conversion, digitalization and transmission of the measuring signals. The light is received by an optical receiver (camera) that is positioned above the CPT string on the upper bridge of the penetrometer. Advanced electronics ensure the recording of measuring signals even whilst adding-on new CPT rods. The signals from the optical receiver are combined with the depth information in the Icontrol data logger.

The Optocone is suitable for all onshore CPT units and any CPT depth by adding optical repeaters as required.

A.P. van den Berg's track record for wireless CPT data transmission is unequalled in the industry.

(Ref. Brochure Da-7)

Continuous CPT system

Faster and more comfortable CPT operations with A.P. van den Berg's COSON in combination with the automatic CPT rod screw.

The COSON is a CPT system with a continuous downward movement of the CPT rods. The penetrometer consists of two sets of cylinders, both fitted with a hydraulic clamp. When the upper clamp has finished its downward stroke, the lower clamp takes over the movement at the same speed. This results in a time saving of about 7 s/m, because in a single clamp system the downward movement is interrupted to move the clamp back to the upper position.

The CPT operator only needs to add and screw new CPT rods. However, this can be realized easier and faster with the automatic CPT rod screw. All the operator has to do is place the rod in the CPT rod screw. A sensor will activate the automatic screw to take over the CPT rod and screw it onto the previous one. During pulling the procedure is reversed.

The COSON works in conjunction with both electrical and wireless CPT.

(Ref. Brochure On-11)

Robot CPT system

A fully automatic CPT robot does all the work, while the operator monitors. The unit sets a new standard in design, control and operation.

Features include:
- revolving carousel for storage and preparation of the CPT rods for the next step
- fully automatic placement and removal of CPT rods with the screw
- fully continuous CPT progression with the COSON
- compact design, making the retractable hatch on the roof superfluous
- the robot is operated from a touch-screen Human-Machine Interface (HMI) as in most A.P. van den Berg CPT systems
- wireless data transmission (Optocone)

The entire CPT operation is out of the operator's hands and he/she can spend more time on other tasks such as planning and preliminary soil data interpretation.

(Ref. Brochure On-12)

MOSTAP Soil Samplers

Soil samples are often required in addition to CPTs or to validate CPTs. It is possible to take these soil samples with your CPT system and A.P. van den Berg's MOSTAP.

The MOSTAP Soil Samplers obtain almost undisturbed in-situ soil samples. This is guaranteed by:
- a nylon sock that ensures minimal friction on the sample during sampling; the nylon sock is cut to the required size and slides into a plastic liner tube
- closing caps and a plastic liner tube that ensure minimal loss during transportation and storage

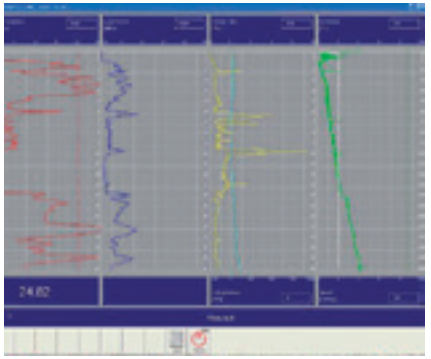
By replacing the plastic tube with a stainless steel tube, samples can be taken in contaminated soil.

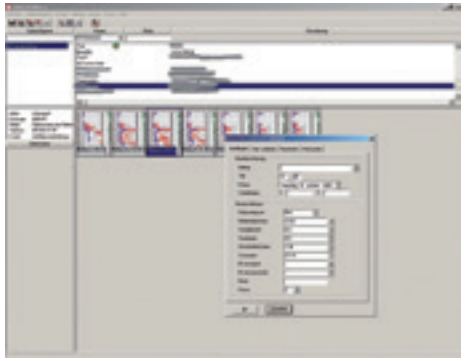
The MOSTAP, for taking in-situ samples, is available in three versions:
- the MOSTAP 35 for samples with a diameter of 35 mm to be pushed by CPT rods
- the MOSTAP 65 for samples with a diameter of 65 mm to be pushed by casing tubes
- the MOSTAP 70 for samples with a diameter of 70 mm to be pushed by CPT rods or casing tubes

All versions can be supplied for sample lengths up to 995 mm, 1,495 mm or 1,995 mm.

(Ref. Brochure Da-8 and Da-9)

data acquisition system





Icone & Icontrol digital data acquisition

The Icone, a digital cone, measures the four standard parameters: cone tip resistance (q_c), sleeve friction (f_s), pore water pressure (u) and inclination (Ix/y).

The Icone is mechanically 40% stronger than its analog predecessor and at the same time more accurate, more reliable and easier to maintain. Calibration data is stored in the cone itself, so separate data holders such as USB sticks are no longer necessary.

Icones come with a pre-pressure & seal assembly that reduces cone maintenance.

The Icontrol, the digital data logger, is placed near the computer on which the data is recorded. It combines the depth information with the obtained CPT data and provides power to the Icone.

Digital technology provides nearly unlimited bandwith for data transfer, so combinations with additional parameters using click-on modules is possible.

(Ref. Brochure Da-1)

Deep Water Icone

The A.P. van den Berg Deep Water Icone is a pressure compensated piezocone, allowing pore water pressure measurements relative to the hydrostatic pressure at cone level, resulting in higher accuracy over the full range of water depths.

The Deep Water Icone measures the four standard parameters cone tip resistance (q_c), friction (f_s), pore water pressure (u) and inclination (Ix/y) to a maximum depth of 4,000 m.

(Ref. Brochure Da-2)

Ifield CPT software

Ifield is a software package pre-installed on every Icone data acquisition system from A.P. van den Berg. Soil data are recorded, shown in real-time on screen and stored in ASCII-format. Output is possible in the following formats: Gorilla, CSV, SPAS, ACI, GEF, GEO and XML. It is also possible to make a printout or send the data via email.

The system can be pre-programmed with the customer's specifications like project name, name of the operator, name of the company etc. Also the screen layouts can be customized to customer requirements.

The software package automatically recognizes cones and click-on modules. Also calibration data are automatically exchanged from the cone.

Ifield runs under Microsoft Windows and is available in four languages: English, German, French and Dutch. Ifield has a built-in function for remote control and a built-in manual that can be accessed any time.

(Ref. Brochure Da-14)

Ibase office software

Ibase is an optional package that complements Ifield. It is meant for further processing of the CPT measuring results in the office.

The data can be stored in GORILLA!, GEF or Excel files. Main functionalities are: downloading, presenting, processing, exporting, storing and printing of the measuring results. Custom graphics presentations are designed with a layout editor.

Just as Ifield, Ibase runs under Microsoft Windows and is available in four languages: Dutch, English, French and German.

(Ref. Brochure Da-14)

and click-on modules.

a.p. van den berg

Icone Seismic

Icone Seismic is used for determining the stability of the ground, by measuring the propagation speed of sound. An Icone Seismic Module contains 3 accelerometers to receive left and right shear waves as well as compression waves.

The following can be calculated as a function of the seismic data and the soil density (usually already known):
- small strain shear modulus & constrained modulus
- elasticity modulus
- Poisson's ratio

To increase the speed or accuracy, it is possible to measure at two or even more depths simultaneously by using extra seismic modules, mounted at fixed distances of 1 or 0.5 m. Furthermore seismic signals from one depth can be stacked in the Ifield software, in order to improve the seismic signal by averaging out the noise.

The Icone Seismic can be used with all onshore and offshore A.P. van den Berg equipment. The maximum water depth is 1,000 m.

(Ref. Brochure Da-3)

Icone Conductivity

Icone Conductivity is used for measuring variations in the electrical conductivity of the soil. The output enables detection of sand/clay layers, tracking of saltwater-carrying layers and detection of contamination.

A.P. van den Berg's Conductivity Module has four electrode rings that are separated by ceramic insulators to ensure accurate determination of the soil conductivity. The module has a built-in temperature sensor to enhance the analysis and evaluation of the measured values for conductivity.

The modular click-on concept facilitates the application of the Conductivity Module as and when required. It can be applied with or without an Icone connected. In case CPT data is not required, the Conductivity Module is used with a dummy tip.

Icone Conducivity can be used with all onshore and offshore A.P. van den Berg equipment. The maximum water depth is 1,000 m.

(Ref. Brochure Da-4)

Icone Magneto

Icone Magneto detects objects in the soil containing magnetisable metal, e.g. unexploded ordnance (UXO), ground anchors, piping, the tip of sheet piles and foundation piles by interpreting anomalies of the earth's magnetic field.

The Magneto Module is equipped with its own inclinometer in X- and Y-direction, to allow for accurate positioning. Anomalies can be detected at a distance up to 2 m depending on the size of the object.

The standard CPT-parameters can also be measured if an Icone is mounted in front of the magneto module. To accurately respond to changes in the measured value, in particular when detecting UXO's, also the gradients of the orthogonal measured anomalies are determined. Alarm values can be set to stop pushing when one of these gradients is exceeded.

When required, Icones and CPT rods are available in non-magnetisable Nitronic metal.

Icone Magneto can be used with all onshore and offshore A.P. van den Berg equipment. The maximum water depth is 1,000 m.

(Ref. Brochure Da-5)

Icone Vane

Icone Vane is used for determining undrained and remoulded shear strength for the stability analysis of soft soils.

A.P. van den Berg's Icone Vane has many features that facilitate an accurate vane test:
- the torque sensor and the drive are positioned as close as possible to the vane for the most accurate measurement
- no need to rotate full CPT string
- an optional robust housing protects the vane; the vane is pushed out at the required depth and is retracted again after the test
- to prevent damage to the transmission, the drive motor is electronically limited at a torque of 100 Nm
- Icone Vane is available in a slow type (with a rotation speed range of 0.1 to 6 °/s) for performing very accurate shear tests and a standard type (with a speed range of 0.2 to 12 °/s) for fast remoulding.

Icone Vane can be used with all onshore and offshore A.P. van den Berg equipment. The maximum water depth is 4,000 m.

(Ref. Brochure Da-6)

a.p. van den berg

a.p. van den berg

At A.P. van den Berg, we provide technical solutions in areas that have traditionally been strong fields of Dutch expertise. Against a background of reclaiming Holland from the sea, controlling water levels in the Low Countries and building an infrastructure in and on soft soils, our industry was - and still is - forced to develop techniques and standards to meet various challenges. A.P. van den Berg's contribution consists of designing and supplying advanced soil investigation technology, innovative hydraulic systems and state-of-the-art machines to customers who are at the forefront of their field of expertise.

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