ROYAL Eijkelkamp

Meet the difference

Cone Penetration Testing Products

Meet the difference

CPT at Royal Eijkelkamp

Royal Eijkelkamp are a specialist developer and manufacturer of high quality and turn-key Cone Penetration Testing (CPT) systems. We manufacture the widest range of CPT cones and modules in the industry, rigs for every environment and provide specialist CPT software to offer our customers a comprehensive CPT solution regardless of the project requirements.

As well as conventional CPT we are also a leading supplier of CPT and drilling combination systems giving our customers the ability to collect data where others cannot.

All Royal Eijkelkamp CPT products are designed and manufactured according to the highest standards. Our CPT cones meet relevant CPT standards, including ISO 22476-1 and ASTM D5778. Royal Eijkelkamp CPT cones were the first on the market to be calibrated in accordance with the latest ISO 22476-1:2022 standard.

Cones and modules

Electrical analogue and digital CPT cones

Royal Eijkelkamp provides high-quality cones. The electrical cone contains temperature-compensated strain gauge transducers to measure the tip resistance and the sleeve friction. In case of a digital cone, built-in analogue to digital conversion (32-bit resolution) and built-in cone ID with calibration factors eliminates the effects of user and system errors on the measurements. The cones can be supplied as compression cones (with independent load cells for the cone tip resistance and the sleeve friction) or subtraction cones (a more robust design and therefore more durable).

Available options for the electrical cones include:
- Analogue cones, with or without built-in amplifier
- 32-bit digital cones
- Subtraction and compression type
- Pore water pressure in u_1, u_2 or u_3 position
- 1, 2, 5, 10 or 15 cm^2 cross-sectional area
- 10 to 200 kN max load
- Ball- or T-bar cone

Expandable with modules to measure and capture:
- Temperature
- Magnetic field
- Video
- Fluorescence
- Electrical conductivity
- Thermal conductivity
- Seismic waves
- Water content/dielectric constant

Other than the seismic module, which can be combined with all electrical cone types, the modules must be used in combination with a 15 cm^2 cone or be applied on a stand-alone basis with a dummy tip.

Electrical SonicCPT cone

When a cone cannot be pushed any deeper due to the encountered friction, applying some vibration can help to reduce the friction along the CPT rods.

A standard electrical CPT cone may not be able to withstand such action, the SonicCPT cone can. Any electrical subtraction cone without pore water pressure measurement can be supplied as a SonicCPT cone.

Seismic module

Seismic cone penetration testing has demonstrated to be a very accurate and reliable method to determine low strain in situ compression (P) and shear (S) wave velocity profiles. These velocities are directly related to the various soil elastic constants, such as the Poisson's ratio, shear modulus, bulk modulus and Young's modulus. They can be used in both static and dynamic soil analysis, for example to assess the response to earthquakes or dynamic loads produced by wind turbines or rotating equipment. Another important use of estimated shear wave velocities in geotechnical design is in the liquefaction assessment of soils, since the shear wave velocity is influenced by many of the same variables that influence liquefaction.

The following options are available for this module:

- use of either geophones or accelerometers as seismic sensor
- use of either single or dual array of seismic sensors

Geomagnetic module

A magnetometer, such as is included in our Geomagnetic module, is a scientific instrument used to measure the strength and/or direction of the magnetic field. A mass of ferromagnetic material creates a detectable disturbance in this magnetic field. The magnetic anomaly produces a weak alternating magnetic field, which can be detected by the magnetometer.

The Geomagnetic module can detect objects within a radius of approximately 2 metres. It's very suitable for:

- Unexploded bomb/ordnance surveys
- Determination of the length of foundation/sheet piles
- Determination of the position of retaining or tieback anchors
- Determination of the position of power cables

Dielectric module

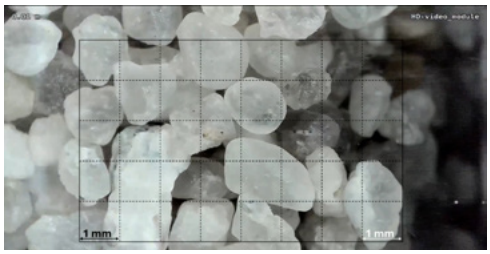
The dielectrical parameters of the soil, the electrical conductivity and electrical permittivity, vary predominantly with the soil's water content and the contamination with hydrocarbons. Furthermore, electrical conductivity is inversely proportional to particle size e.g., clays usually have higher conductivity than sands.

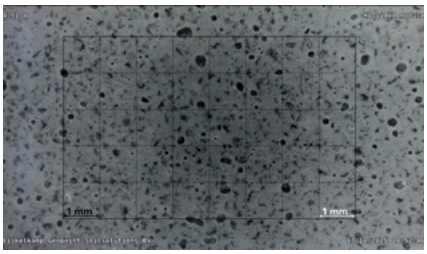
The conductivity is measured between two insulated electrodes, using the soil mass as dielectric correlated material.

HD Video module

The video module records images that show soil texture, colour, grain size and other features of the soil passing the miniature colour camera. When using an ultraviolet (UV) light source, the module can also indicate the presence of hydrocarbon compounds as these generally fluoresce when excited by UV light.

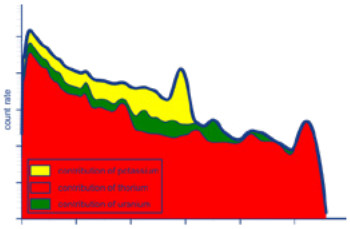
The video module is pushed into the soil on the back of an electrical CPT cone. The video material obtained can be represented as a boring log, to be viewed alongside the CPT data obtained.





Gamma-ray (spectrometer) module

The technique of measuring the natural radiation in the earth's surface is called "radiometry". During a radiometric survey the gamma radiation emitted by the surrounding soil is measured, either by simply recording the intensity of the gamma radiation ("counts") or by determining the spectrum of the intensity. The latter will allow quantification of the various naturally radioactive elements, such as potassium (K), uranium (U) and thorium (Th). The outcome can then be used for soil classifications as every type of soil and mineral has its own so-called fingerprint of these three elements.



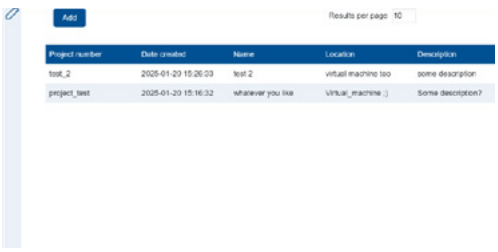
Data acquisition system

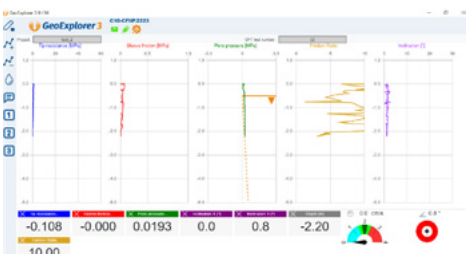
Digital Cone Interface

The Digital Cone Interface is the heart of the data acquisition. It is designed to be used in combination with a standard Windows computer and is controlled with the GeoExplorer software.

GeoExplorer 3 data acquisition software

GE3 is a purpose-built software for CPT data acquisition from Royal Eijkelkamp, and allows users to be compliant with the 2022 revision of the ISO-22476-1 standard. GE3 is designed around efficient and ergonomic CPT operation with customizable real time data plots, quick-adjustable water table and subsequent hydrostatic pressures, and automatic t50 target calculations during dissipation tests.





Equipment to push the cone

Compact Crawler

Our Compact Crawler series offers small, but powerful units to perform CPT even at places where only narrow access is available. In addition, the compact crawler is light enough to be transported in a small van or trailer which makes these units very suitable for use in urban areas.

The Required reaction force is normally generated using four ground anchors, which can be installed with the drill motor mounted on the compact crawler.

For shallow CPT applications, the Compact Crawler 50 kN features an integrated ballast weight, allowing 50 kN of reaction force to generated without anchoring, enabling fast and efficient testing with minimal setup.

The following options are available:

	Compact Crawler 130 kN	Compact Crawler 200 kN	Compact Crawler 50 kN
Pushing force	130 kN (29,200 lbf)	200 kN (44,960 lbf)	50 kN (11,240 lbf)
Stroke	550 mm (22 in)	550/1,050 mm (22/41 in)	550/1,050 mm (22/41 in)
Width	790 mm (31 in)	840 mm (33 in)	1,325 mm (52 in)
Weight	1,100 kg (,2425 lbs)	1,360/1,390 kg (3,000/3,065 lbs)	5,100 kg (11,243 lbs)

Compact Crawler 130 kN

Compact Crawler 200 kN

Driving through narrow access

Stand-alone CPT pushers

For cases where only a CPT pusher is required, the CPT pushers that are part of our Compact Crawlers can be purchased seperately as stand-alone pushers together with the hydraulic power packs. We also offer the SP 35, which is a good option when very small pushing forces are required, for instance in near-surface investigations or in soft soils, and/or when using smaller diameter cones.

The following options are available:

	SP 35	SP 130	SP 200
Pushing force	35 kN (7,870 lbf)	130 kN (29,200 lbf)	200 kN (44,960 lbf)
Stroke	600 mm (24 in)	550 mm (22 in)	550/1,050 mm (22/41 in)
Weight	45 kg (100 lbs)	100 kg (220 lbs)	200/230 kg (440 lbs)

Stand-Alone Pusher 35 kN

Stand-Alone Pusher 130 kN

Stand-Alone Pusher 200 kN

Drill-mounted CPT solutions

The **Drill'n CPT** and **Drill'o CPT** convert a standard drill rig into a CPT unit, providing flexible solutions that bridge drilling and cone penetration testing.

Drill'n CPT is a fully automatic CPT tool mounted in the rig's break out or foot clamping device. It allows continuous CPT soundings or CPT measurements between sampling operations. Hard layers can be penetrated by drilling, after which CPT can be continued. Reaction force is provided by the rig weight and, if required, an additional ground anchor.

	Drill'n CPT 200 kN
Pushing force	200 kN (44,960 lbf)
Stroke	800 mm (32 in)
Width	780 mm (31 in)
Weight	280 kg (617 lbs)

Drill'o CPT is a cost effective solution for true continuous CPT, mounted between the drill head and drill rods. The CPT cone is pushed using the vertical movement of the drill head, making push force dependent on the rig's hydraulic capacity.

Boxed Crawler

The Boxed Crawler 100 kN and 200 kN are ballasted, tracked units designed for efficient Cone Penetration Testing (CPT). These next-generation crawlers feature a compact boxed design, low ground pressure and reduced fuel consumption through auto-idle and low engine speeds.

The BC 100 offers a highly compact solution, while the BC 200 provides increased size and higher push force for more demanding applications. Operation is via a PLC touch screen with manual overrides, remote-controlled driving and leveling, and a load-sense hydraulic system for low power demand.

	BC 100	BC 200
Pushing force (depending on rig weight)	110 kN (24,730 lbf)	200 kN (44,960 lbf)
Pulling force	250 kN (56,200 lbf)	250 kN (56,200 lbf)
Stroke	1,250 mm (4.1 ft)	1,250 mm (4.1 ft)
Length	4,760 mm (15.6 ft)	5,500 mm (18 ft)
Width	2,500 mm (8.2 ft)	2,500 mm (8.2 ft)
Height	2,800 mm (9.2 ft)	3,070 mm (10.1 ft)
Weight	11,500 kg (25,350 lbs)	20,500 kg (45,000 lbs)

Boxed Truck Crawler 180 kN

The Boxed Truck Crawler 180 kN is a ballasted, fully contained, truck-mounted CPT unit. It can drive to the project site without the need for a delivery vehicle; not only reducing mobilisation costs but also allowing for maximum project flexibility. Thanks to the deployable crawlers it is able to traverse wet or boggy ground, allowing it to test on sites that other trucks simply could not reach. The quick positioning between locations, efficient automatic levelling system and lack of a need to install any anchors let you achieve high production rates.

	BTC 180
Pushing force (depending on rig weight)	180 kN (40,470 lbf)
Pulling force	250 kN (56,202 lbf)
Stroke	1,250 mm (49 in)
Length	8,150 mm (27 ft)
Width	2,500 mm (8 ft)
Height	4,000 mm (13 ft)
Weight	17,600 kg (38,801 lbs)



Boxed Truck 200 kN

The Boxed Truck 200 kN is a fully ballasted CPT rig built on a 6x6 truck platform. The 6x6 drive train allows the unit to be built up to 27 tonnes whilst maintaining road legality allowing for deep pushes with its full 200 kN pushing capacity. The 6 wheel drive and rugged suspension also allow the machine to test on difficult ground whilst maintaining a faster speed than crawlers, leading to high production rates on large open sites. As well as quick position between test locations, production rates are boosted with an efficient automatic levelling system and lack of a need to install any anchors.

	BT 200
Pushing force (depending on rig weight)	200 kN (44,962 lbf)
Pulling force	250 kN (56,202 lbf)
Stroke	1,250 mm (4.10 ft)
Length	8,000/9,000 mm (26.25/29.53 ft)
Width	2,500 mm (8.20 ft)
Height	4,000 mm (13.12 ft)
Weight	18t to 27t on 2 or 3 axles (4x4 or 6x6)



Training

Royal Eijkelkamp is proud of its in-house training facility. We have different training programmes to increase your knowledge, safety and productivity. This leads to better profitability and a better market position for your business.

Besides our in-house training programs we can also provide on-site training and support anywhere in the world. We aim to provide all potential operators of the CPT equipment the knowledge and confidence to use the equipment in the best way possible.

After sales, service and calibration

All Royal Eijkelkamp equipment is chosen for reliability, high production and best quality CPT data acquisition. We deliver outstanding service and support for continued quality.

When you buy genuine Royal Eijkelkamp spare parts you can rest assured that they are just as good as the original you're replacing; manufactured and selected by the same people who made your equipment. They fit correctly and work perfectly every time. There will be no risk or hassle, with guaranteed years of high performance.

To maintain cone accuracy, it is necessary to recalibrate them regularly. The calibration interval may vary depending on customer use and application, as well as the CPT standard that is applicable. Our staff is happy to advise you on the most appropriate interval, and when recalibration is required our service staff will perform this expeditiously to minimise the time that a particular cone is not available to you.

24/7 Service contact at +31 313 800 967 or elektro@eijkelkamp-geopoint.com

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