

Robertson Geo brings a proven global reputation for delivering the highest quality calibrated data from the most challenging renewable energy projects globally.



**ROBERTSON
GEO**

RENEWABLES
Unlocking Your GeoData

Renewables Geothermal

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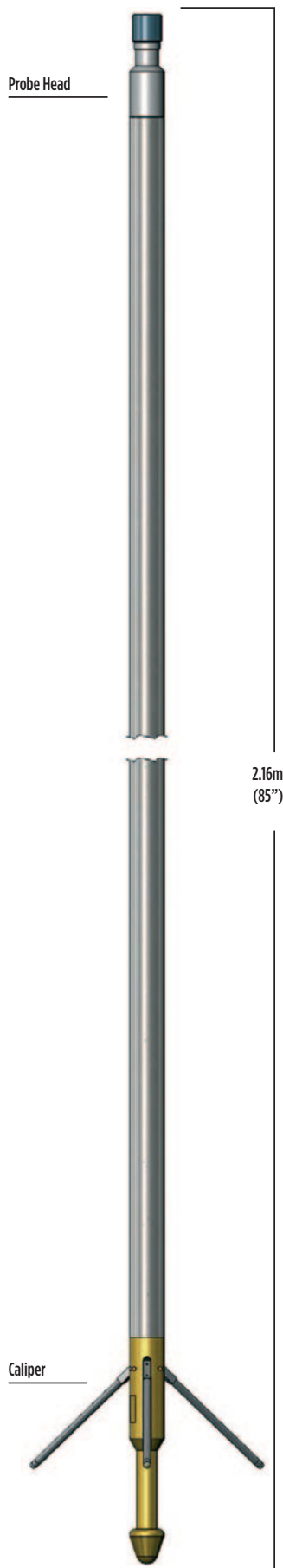


SUBSURFACE HOT WATER SOURCE INVESTIGATION

As geothermal projects gain momentum globally, Robertson Geo equipment is increasingly used for logging and investigation of subsurface hot water sources. Applications include geothermal projects for water supply to homes in rural areas (heating and hot water) and also for heating greenhouses to protect crops in harsh winters. The temperature requirement for geothermal water supply and heating is typically 45-55° but the resources can be up to 2,000m deep, well within the capabilities of our logging tools.

3-Arm Caliper

710mm and 1000mm ranges



3-Arm Caliper Probe

The 3-Arm Caliper probe provides a single continuous log of borehole diameter as recorded by three mechanically coupled arms in contact with the borehole wall.

710mm and 1000mm range calipers are available to suit a range of well diameters. The caliper is a useful first log to determine the borehole conditions before running more costly probes or those containing radioactive sources.

Principle of Measurement:

Opening and closing of the motor-driver caliper arms is by surface command, allowing the probe to run into the borehole with the arms retracted. Once opened, the spring-loaded arms respond to borehole diameter variations as the probe is raised up the borehole.

SPECIFICATION:

Features

- Small diameter for slim-hole operation
- Extension arms supplied as standard for 38mm version
- Optional natural-gamma measurement
- Optional casing collar locator

Measurements

- CCL (optional)
- Borehole volume (derived)
- Natural Gamma (optional)
- Borehole volume

Applications

- Minerals/Water/Engineering
- Location of borehole collapse or obstructions
- Cement volume calculations for grouting
- Identification of hard and soft lithology
- Location of cracks, fissures, caving, faulting, casing breaks
- Correction of other logs affected by borehole diameter

Operating Conditions

- Borehole type: open/cased; water/air-filled
- Centralisation: recommended in large holes
- Centralisation: recommended in inclined holes
- Recommended Logging Speed: 5m/min

Specifications

- Temperature: 125°C
- Max. pressure: 20MPa

3-Arm Caliper (710mm range)

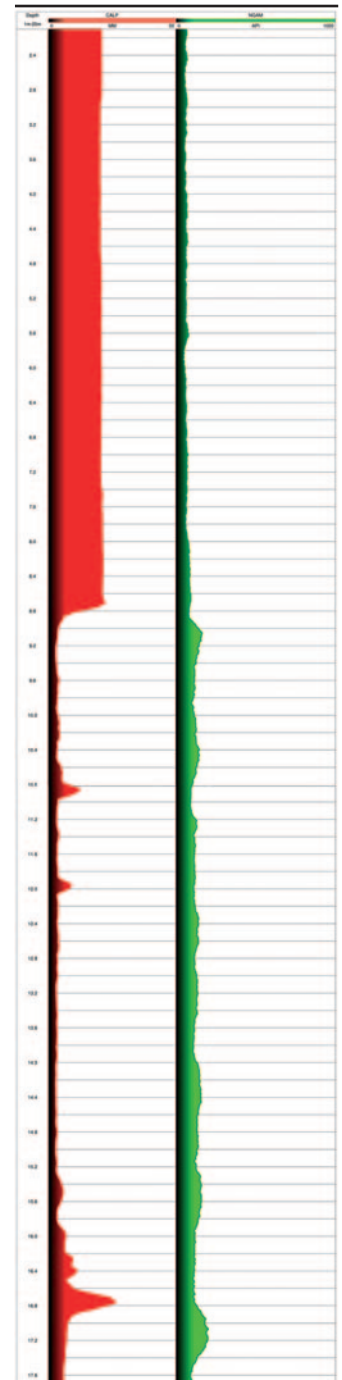
- Diameter: 38mm
- Length: 2.18m-2.68m (depending on CCL and extended arms)
- Weight: 7.5kg
- Range: 40-300mm and 40-710mm

3-Arm Caliper (1000mm range)

- Diameter: 60mm
- Length: 2.83m
- Weight: 15kg
- Range: 65-1000mm

Part Numbers

- 1014703 3-Arm Caliper (710mm range) with arm extension kit and calibrator – including natural gamma
- 1017972 3-Arm Caliper (1000mm range) with calibrator



Example of logging data

4-Arm Dipmeter



4-Arm Dipmeter Probe

The 4-Arm Dipmeter measures microresistivity and tool orientation data.

These can be processed to determine formation dips.

Principle of Measurement:

The probe consists of a microresistivity section and a detachable verticality module. Microresistivity data is acquired by four high-resolution, button electrodes mounted on motorised XY caliper arms and maintained in contact with the borehole walls. A planar formation feature that does not lie perpendicular to the borehole axis is detected by each electrode at a different apparent depth. The four microresistivity measurements are correlated and combined with the verticality data to calculate the dip and dip direction.

SPECIFICATION:

Features

- Small diameter for slim-hole operations
- Operates in all orientations

Measurements

- Formation dip and azimuth
- Microresistivity
- Borehole verticality and drift
- True vertical depth
- Borehole volume
- Natural Gamma

Applications

- Engineering/minerals
- Stratigraphy
- Sedimentology
- Identification of faults and folding
- Fracture identification
- Correlation between wells

Operating Conditions

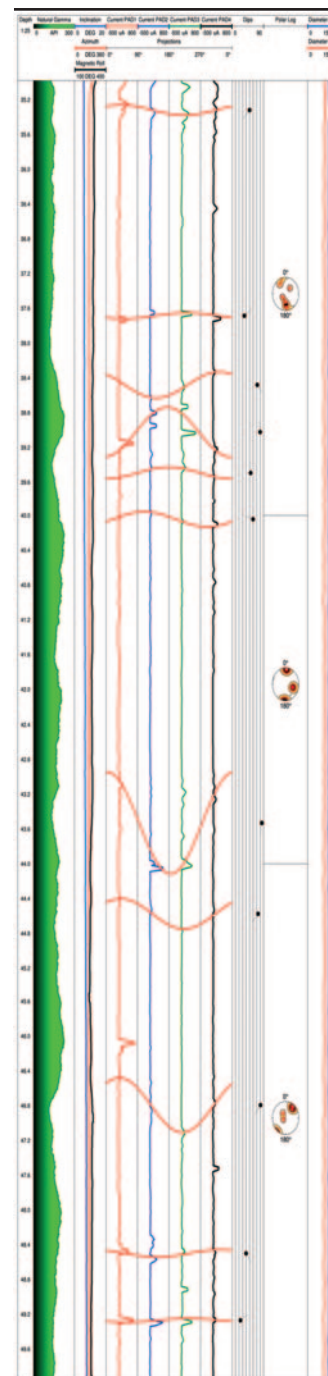
- Borehole type: open, water-filled
- Centralisation: non-magnetic centralisers required for inclined boreholes and/or diameters above 150mm
- Recommended Logging Speed: 3m/min

Specifications

- Diameter: 61mm (when closed 66mm)
- Length: 5.17m
- Weight: 52kg (combined)
- Temperature: 125°C
- Max. pressure: 20MPa
- Resistivity range: 1 to 10,000 ohm-m
- Borehole inclination: any
- Caliper range: 62-380mm

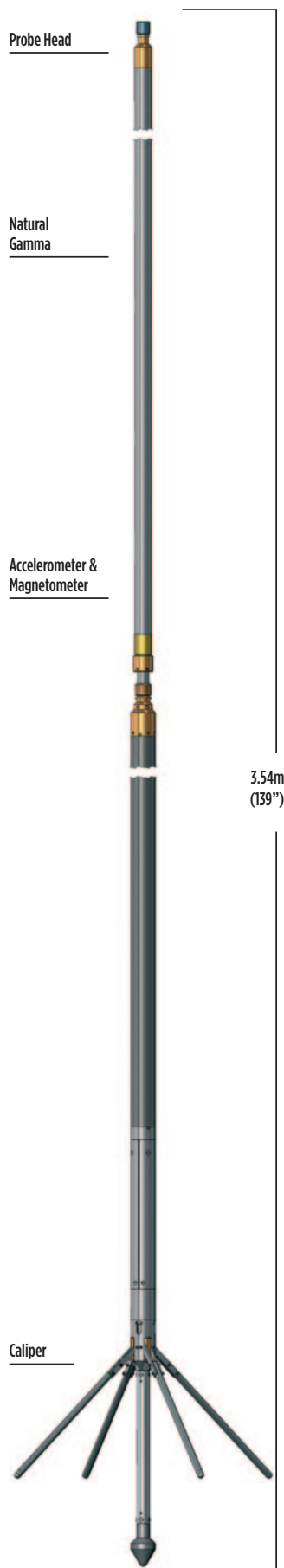
Part Numbers

- I015623 4-Arm Dipmeter probe with natural gamma



Example of logging data

Borehole Geometry



Borehole Geometry Probe

The Borehole Geometry probe consists of a 4-arm caliper combined with a verticality measurement.

The probe can replace the 3-Arm Caliper (710mm range) with advantage where the borehole cross-section departs from circular and where directional information is required for well-completion studies and formation stress analysis. The top section can be logged as a standard verticality.

Principle of Measurement:

The XY caliper provides continuous measurements of borehole diameter from two independent pairs of linked arms. The verticality section includes a triaxial magnetometer and three accelerometers. Data from these are combined by a downhole microprocessor to provide real-time, continuous logs of probe orientation and borehole inclination and direction.

SPECIFICATION:

Features

- Sensitive X-Y caliper
- Continuous orientation log for all borehole inclinations

Measurements

- X and Y calipers
- Borehole deviation and drift
- Borehole volume (derived)
- True vertical depth (TVD)
- Natural gamma

Applications

- Water/minerals/engineering
- Borehole diameter in two axes
- Borehole break-out for stress analysis
- Cracks, fissures and casing defects

Operating Conditions

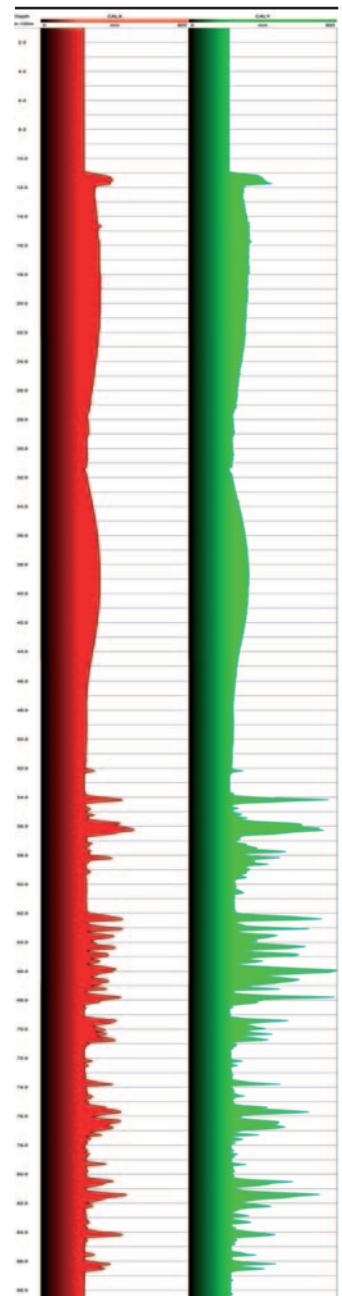
- Borehole type: open/cased, water/air-filled
- Centralisation: recommended, non-magnetic centralisers required
- Recommended Logging Speed: 5m/min

Specifications

- Diameter: 60mm
- Length: 3.54m (in two sections) or 1.81m
- Weight: 19.5kg complete (5.5kg for top section)
- Temperature: 125°C
- Max. pressure: 20MPa
- Caliper range: 75mm to 700mm

Part Numbers

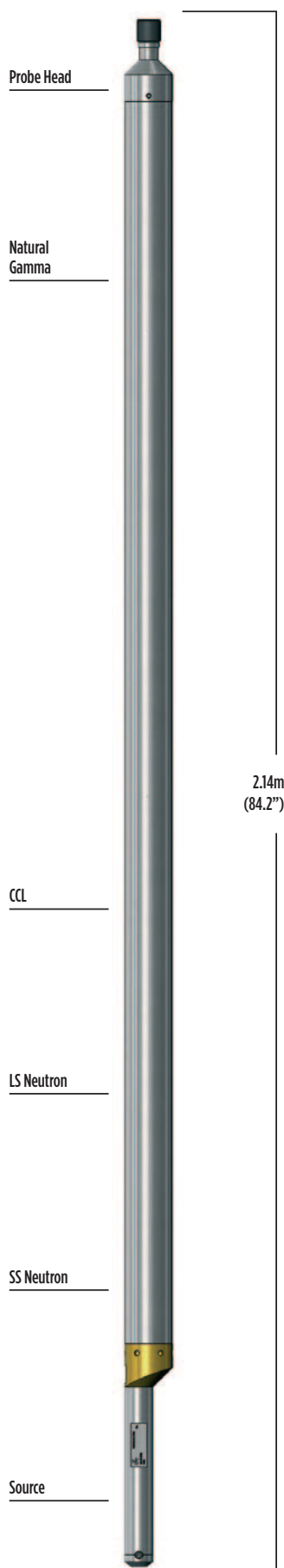
- 1013659 Borehole Geometry probe with natural gamma



Example of logging data

GEOHERMAL

Dual Neutron



Dual Neutron Probe

The Dual Neutron probe provides a calibrated borehole-compensated neutron porosity measurement in mud-filled open holes.

It is the probe of choice for quantitative formation-fluid studies.

A single-detector neutron probe is also available for qualitative porosity logging under most borehole conditions including through steel or plastic casing and drill-pipe.

Principle of Measurement:

The Dual Neutron measurement uses two ^3He proportional detectors and a detachable, sealed $^{241}\text{Am-Be}$ neutron source. Fast neutrons emitted by the source are scattered and slowed to thermal levels, principally by hydrogen in the formation. The ratio of the neutron flux reaching the near and far detectors depends on the hydrogen index and porosity. Use of dual detectors and a ratio method provides a porosity measurement compensated for borehole diameter but not independent of it.

SPECIFICATION:

Features

- Real-time porosity measurement
- Compensation for borehole diameter

Measurements

- Compensated porosity
- Neutron (raw counts)
- Natural gamma
- Option: Casing-collar locator (CCL)

Applications

Minerals / Water / Engineering

- Lithology identification
- Location of aquifer and aquitard
- Fracture analysis in coals
- Correlation between open and cased-hole logs
- Strata correlation between wells

Operating Conditions

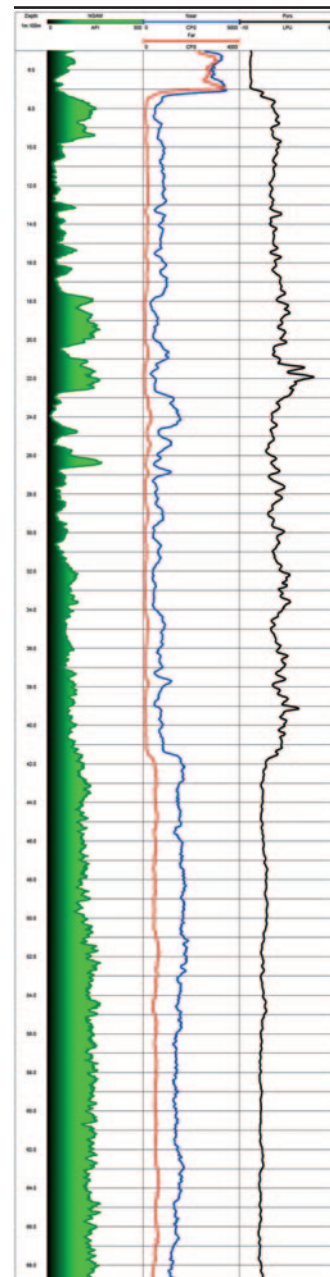
- Borehole type: open/cased, water-filled
- Centralisation: ex-centralised with bowspring
- Recommended Logging Speed: 4m/min

Specifications

- Diameter: 65mm
- Length: 2.14m
- Weight: 19.5kg
- Temperature: 125°C
- Max. pressure: 20MPa
- Range: 15 to 45% Limestone Porosity Units (LPU)

Part Numbers

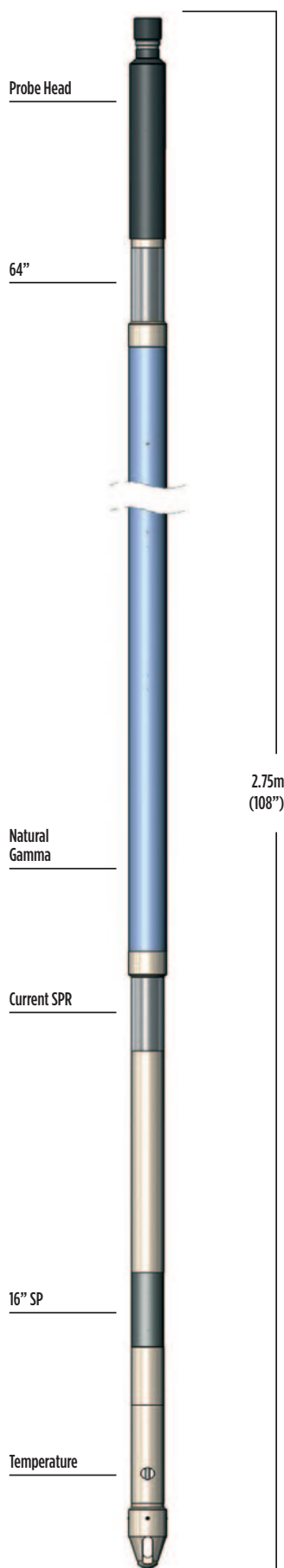
- 1014062 Dual Neutron probe
- 1014702 Dual Neutron probe with natural gamma - includes CCL



Example of logging data

GEO THERMAL

Electric Log



Electric Log Probe

The classic water-well combination probe combining shallow, medium and deep penetrating resistivity measurements with Self-Potential (SP).

Principle of Measurement:

A low-frequency bi-directional electric current from a source electrode on the probe returns through the formation to the cable armour above an insulated bridge. Potentials due to this current flow are measured on various sense electrodes on the probe with respect to a voltage reference 'fish' normally located at the surface. These measurements are converted to apparent formation resistivities within the probe and transmitted to the surface.

SPECIFICATION:

Features

- Digital down-hole measurement avoids errors due to cable effects
- Constant-power down-hole current source

Measurements

- 16" Normal resistivity
- 64" Normal resistivity
- Single-point resistance
- Self-Potential (SP)
- Natural-gamma
- Fluid Temperature
- Optional 8" and 32" Normal resistivity

Applications

- Water
- Determination of water quality
- Indication of permeable zones and porosity
- Minerals/Engineering
- Bed-boundary positions
- Strata correlation between boreholes
- Fracturing Indication

Operating Conditions

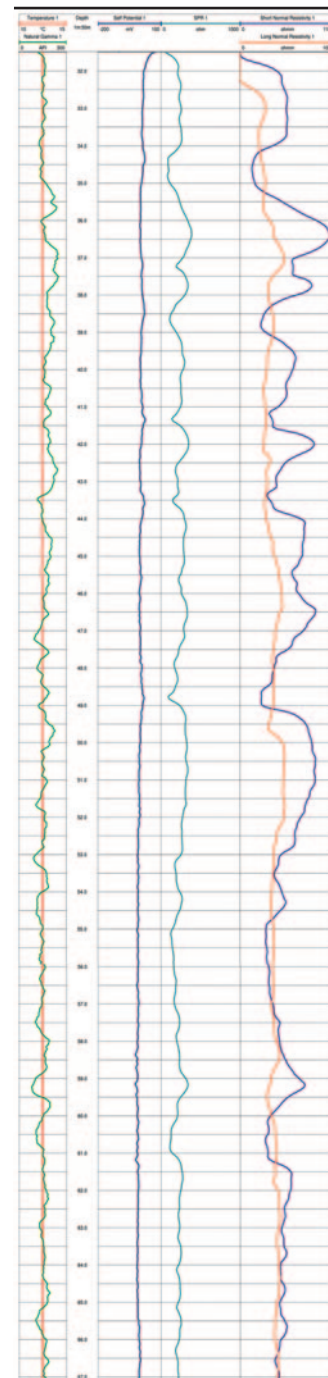
- Borehole type: open-hole, water-filled
- Recommended Logging Speed: 4m per min

Specifications

- Diameter: 45mm
- Length: 2.75m or 3.16m (with 8" and 32" option)
- Weight: 11kg
- Temperature: 125°C
- Max. pressure: 20MPa
- Resistivity range: 1 to 10,000 ohm-m

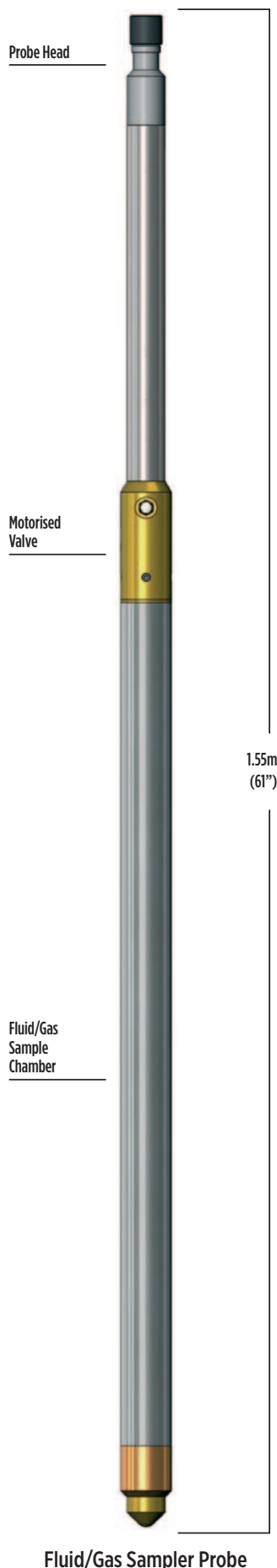
Part Numbers

- I002237 Electric Log probe with natural gamma and temperature
- I002111 - including 8" and 32" normal resistivity



Example of logging data

Fluid/Gas Sampler



Fluid and Gas Sampler probes are used to take a discrete sample of well fluid at a particular depth and to return it uncontaminated to the surface.

Principle of Measurement:

Fluid Sampler: The Fluid Sampler includes a chamber incorporating motor-actuated valves at the top and base. While the probe is being lowered into the borehole, the valves are held open, allowing well fluid to flow freely through the chamber. At the desired depth, the motor is activated under surface control, closing the valves to seal the chamber and contents ready for retrieval.

Gas Sampler: The Gas Sampler is designed to retrieve uncontaminated samples of well fluids comprising or containing gas whilst maintaining the original well pressure. The probes contain a sealed sample chamber with a moveable piston and motor-actuated valve. Prior to logging, the piston is withdrawn manually and locked into position, leaving a partial vacuum within the sample chamber. For sampling, the valve is opened under surface control, allowing the well fluid to enter the chamber. The valve is then closed, enclosing the sample under ambient pressure. At the surface, the fluid can be transferred while still under pressure to a suitable container for analysis.

SPECIFICATION:

Features

- Simple, motor-operated actuation
- Fluid sample chamber easily cleaned
- Fluid/gas sample retained at borehole pressure

Applications

Fluid

- Sampling well fluid at depth for surface analysis
- Groundwater and water well studies

Operating Conditions

- Borehole type: open/cased, water-filled
- Recommended Logging Speed: Static sampling

Specifications

Fluid Sampler

Volume: 0.25L	Diameter: 38mm	Length: 0.96m	Weight: 5kg
Volume: 0.5L	Diameter: 38mm	Length: 1.27m	Weight: 5kg
Volume: 1.0L	Diameter: 38mm	Length: 1.88m	Weight: 5kg
Volume: 1.25L	Diameter: 38mm	Length: 2.19m	Weight: 5kg
Temperature:	125°C		
Max. pressure:	20MPa		

Gas Sampler

Volume: 0.5L	Diameter: 51mm	Length: 1.18m	Weight: 10kg
Volume: 1.0L	Diameter: 51mm	Length: 1.55m	Weight: 10kg
Temperature:	0-70°C (extended ranges available)		
Max. pressure:	20MPa		

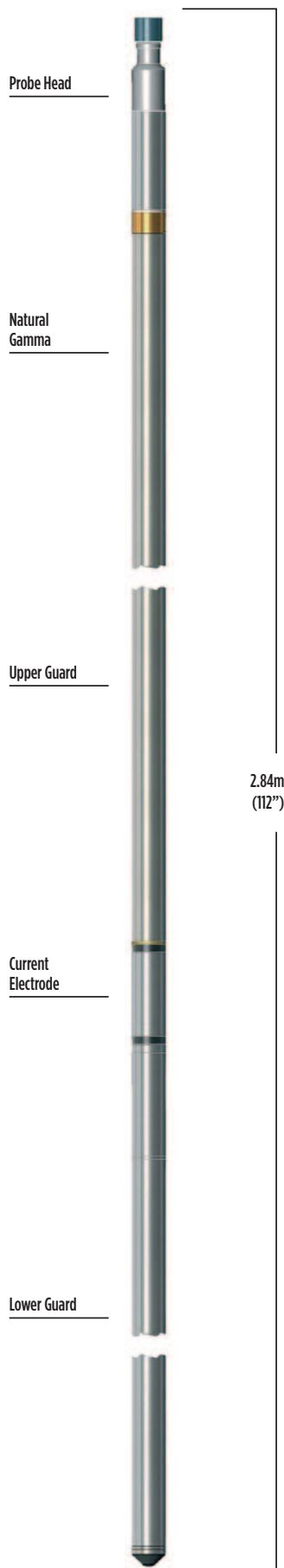
Part Numbers

I016196	Fluid Sampler probe 1li
I002206	Gas Sampler probe 1li



Mechanical valve assembly where the sample is extracted

Focussed Electric (Guardlog)



Focussed Electric (Guardlog) Probe

The focussed resistivity (LL3) measurement provides excellent vertical resolution and a reasonable depth of investigation.

The Guardlog replaces the classic Electric Log in conditions of low mud resistivity and high formation resistivity.

Principle of Measurement:

The probe includes a central current-source electrode between two guard electrodes, maintained at the same potential by internal electronics. Current from the centre electrode is constrained to a thin disk by the presence of the guards and returns to the cable armour above a 10m insulated section. The potential of the central electrode with respect to a surface voltage-reference stake and the measured current are combined by a down-hole microprocessor to calculate apparent formation resistivity.

SPECIFICATION:

Features

- Good depth of penetration with excellent bed-boundary resolution
- Down-hole calibration check using internal resistor
- Digital down-hole measurement avoids errors due to cable effects in deeper boreholes
- Constant-power down-hole current source give 4 decades of measurement without range switching

Measurements

- Focussed resistivity
- Natural Gamma

Applications

Water

- Determination of water quality
- Indication of permeable zones and porosity

Minerals/Engineering

- Strata correlation between boreholes
- Indication of fractures and permeable zones
- Bed-boundary and thickness measurements
- Moisture determination in coal

Operating Conditions

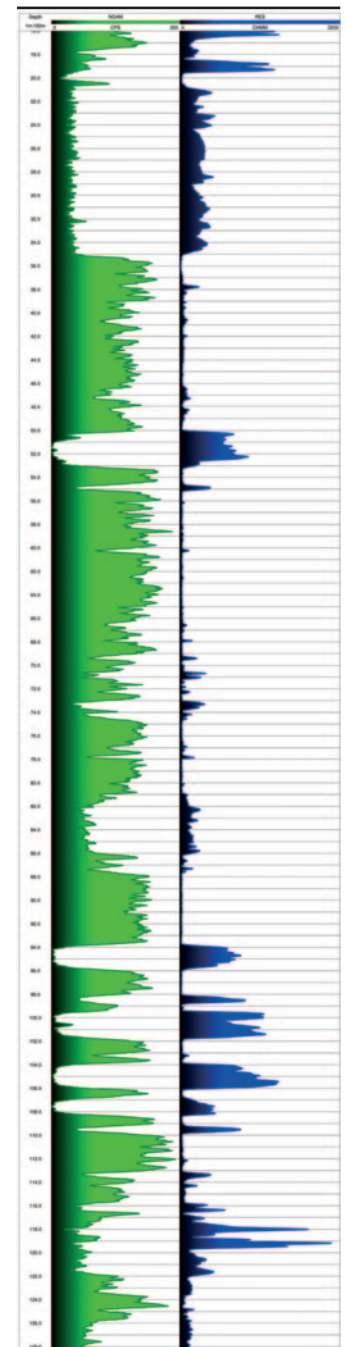
- Borehole type: open-hole, water-filled
- Centralisation: standoff recommended. The logging cable armour should be insulated for 10m above probe head
- Recommended Logging Speed: 4m/min

Specifications

- Diameter: 38mm
- Length: 2.84m
- Weight: 9.5kg
- Temperature: 125°C
- Max. pressure: 20MPa
- Resistivity range: 1 to 10,000 ohm-m

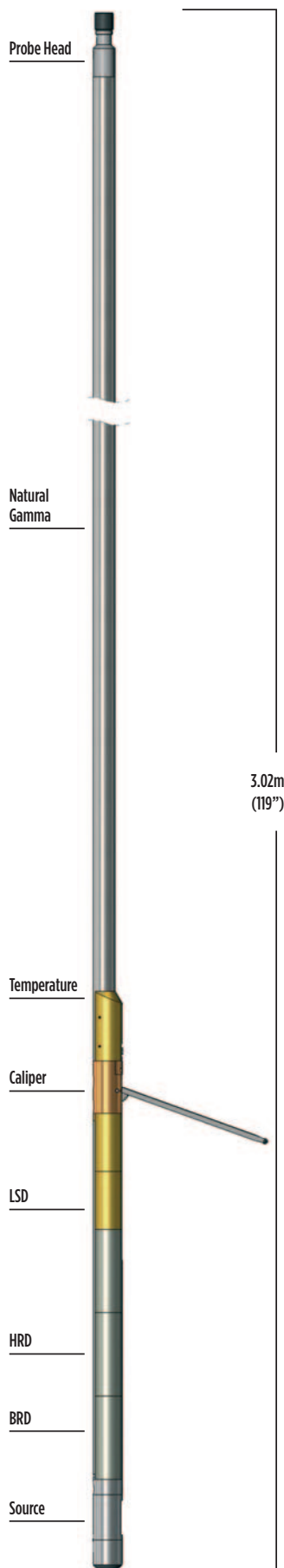
Part Numbers

- I014063 Focussed Electric (Guardlog) probe
- I015482 Focussed Electric (Guardlog) probe includes natural gamma



Example of logging data

Formation Density



Formation Density Probe

The Formation Density probe provides a calibrated, borehole-compensated density measurement using a detachable ^{137}Cs gamma source and dual shielded detectors.

The far spaced detector (LSD) is calibrated, giving the best estimate of formation density as borehole wall effects are minimised. A shorter spaced detector (HRD) is also calibrated which provides improved vertical resolution. An optional shorter spaced third detector (BRD) provides a qualitative log with excellent vertical resolution for bed boundary delineation.

Principle of Measurement:

The source and detectors are held in contact with the borehole wall by a spring-loaded caliper arm measuring diameter for borehole compensation. Gamma radiation from the source is back-scattered (Compton effect) in the formation, reaching the detectors where the relative counts are measured using sodium iodide scintillation detectors. Calibration constants are determined using a water tank and an aluminium block which has previously undergone a primary calibration. The calibration constants are combined with the gamma counts and diameter readings in the supplied software to give a calibrated density in g/cc.

SPECIFICATION:

Features

- Compensated density output in engineering units (g/cc)
- Short-spacing detector for high vertical resolution
- Tungsten shielding reduces borehole effects
- Standard calibration blocks for field or base use

Measurements

- Bulk density
- Dual-calibrated density channels (LSD & HRD)
- Natural gamma
- Caliper
- Options:** Bed-resolution density (BRD) and Temperature

Applications

Minerals:

- Density and porosity
- Lithology
- Bed thickness and boundary location
- Coal ash and moisture content

Engineering:

- Rock strength and elasticity parameters (with sonic log)
- Detection of weathered or fractured zones

Water:

- Location of aquifer and aquitard
- Detection of cavities and missing cement

Operating Conditions

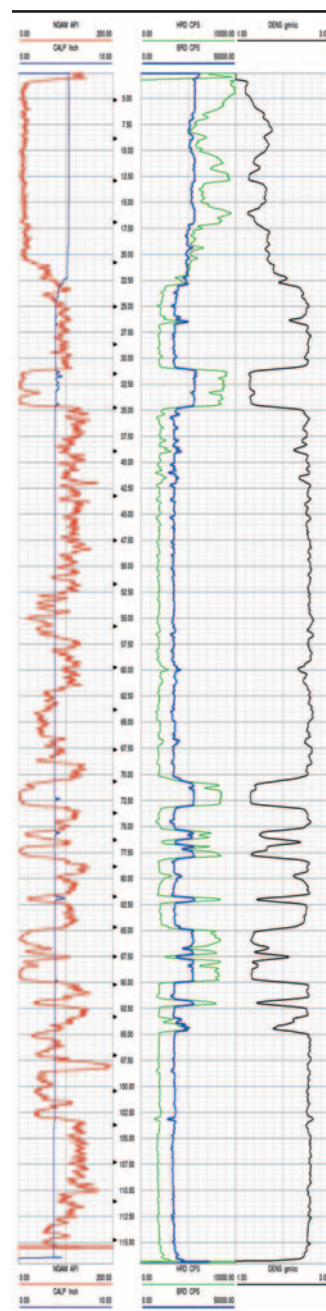
- Borehole type: All, including air filled (qualitative measurement only)
- Recommended Logging Speed: 3m/min

Specifications

- Diameter: 51mm
- Length: 3.02m
- Weight: 24kg
- Temperature: 125°C
- Max. pressure: 20MPa
- Density range: 1.1 to 2.95g/cc
- Caliper range: 51mm to 300mm

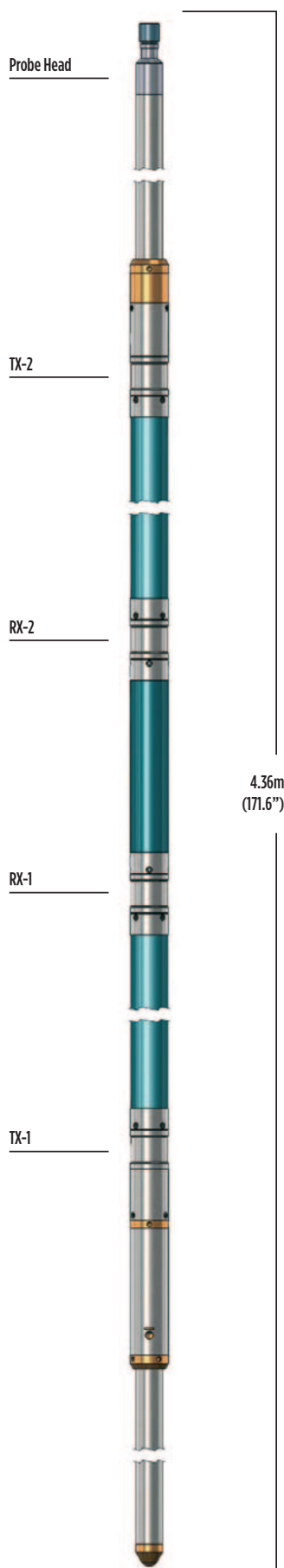
Part Numbers

- I014701 Formation Density probe
– includes BRD and temperature



Example of logging data

Full Waveform Sonic



Full Waveform Sonic Probe

The Full Waveform Sonic probe uses a dual-transmitter dual-receiver array to provide high quality formation acoustic-velocity data.

Options are available for display of full-waveform data and cement-bond data (CBL) in cased boreholes.

Principle of Measurement:

A piezoelectric transmitter stimulated by a high-voltage pulse radiates a high-frequency acoustic wavelet. This is coupled via the borehole fluid and formation to each receiver. An accurate quartz clock measures the first arrival transit time. The first arrival in open hole corresponds to the p-wave path in the formation.

Full Waveform Sonic mode: Two pairs of transmitters and receivers are used to allow cancellation of the borehole fluid path and determination of formation velocity (slowness). The full sonic waveform from both receivers is displayed as a variable-density log (VDL) or waveform ('wiggles') trace.

Cement Bond Log (CBL) mode: The probe records the amplitude and arrival time of the first casing arrival at the near receiver and full sonic waveforms from both receivers.

GeoCAD® Sonic Module: This optional package allows shear wave slowness processing from the full waveform data. These can be combined with additional density data to determine elastic moduli. First arrivals and waveform amplitudes can also be determined by the CBL function to provide cement bond quality reports.

SPECIFICATION:

Features

- Down-hole digitisation of waveform data
- Compensation for poor centralisation or caving
- Variable density log (VDL) or wavelet ('wiggles') display

Measurements

- Formation velocity (slowness)
- Shear (S) velocity (where shear wave exists)
- Full waveform Time of first arrival (delta-t)
- Amplitude of first arrival (CBL)
- Integrated transit time
- Natural Gamma optional

Applications

Water / Minerals / Engineering

- Porosity
- Rock strength and elasticity (with density log)
- Correction of seismic velocity
- Fracture and permeability indication in hard rock
- Location of poor or missing cement behind casing

Operating Conditions

Borehole type:

- Sonic: open-hole, water-filled
- CBL: cased-hole, water-filled
- Centralisation: required
- Recommended Logging Speed: 4m/min

Specifications

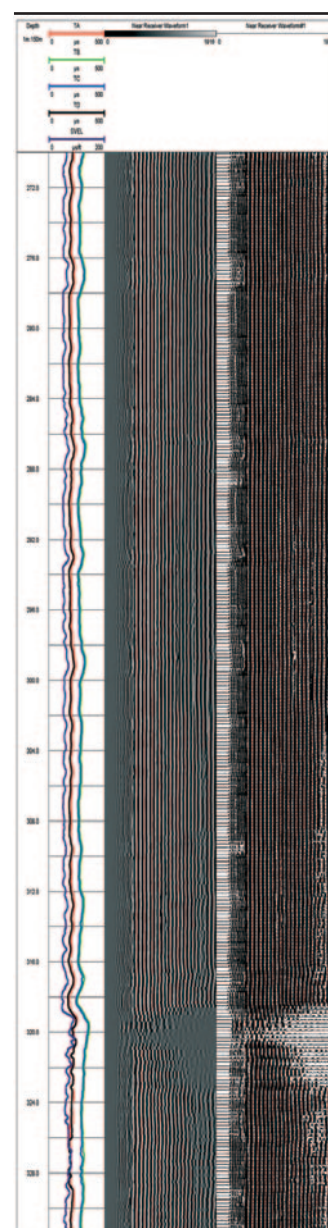
- Diameter: 60mm
- Length: 4.36m (4.78m with gamma)
- Weight: 30kg (33kg with gamma)
- Temperature: 90°C
- Max. pressure: 20MPa

Part Numbers

- I013660 Full Waveform Sonic probe with CBL

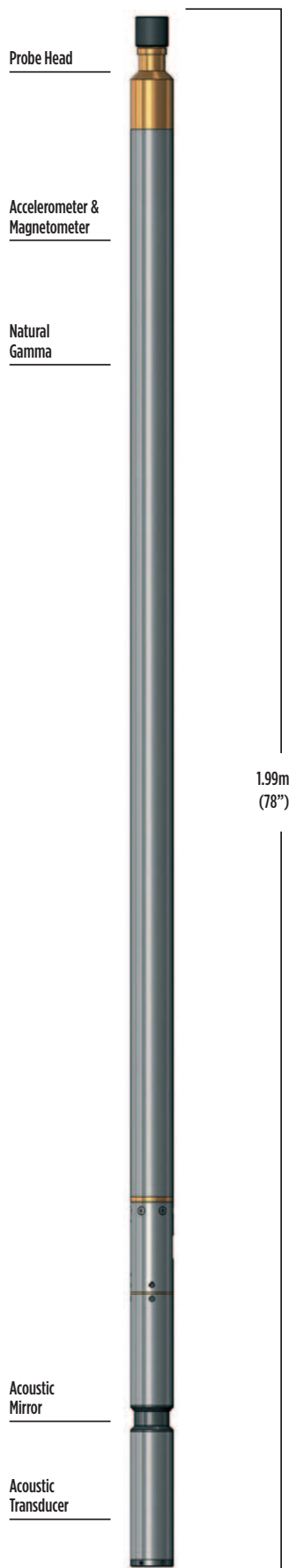
GeoCAD® Sonic Module

- I020983 GeoCAD® Sonic Module



Example of logging data

High Resolution Acoustic Televiewer (HRAT)[®]



High Resolution Acoustic Televiewer (HRAT)[®] Probe

The High Resolution Acoustic Televiewer (HRAT)[®] provides a continuous high-resolution oriented ultrasound image of the borehole wall.

The probe uses a fixed acoustic transducer and a rotating acoustic mirror to scan the borehole walls with a focussed ultrasound beam. The amplitude and travel time of the reflected acoustic signal are recorded as separate image logs.

Features such as fractures reduce the reflected amplitude and appear as dark sinusoidal traces on the log. The travel-time log is equivalent to a 360-arm caliper and shows diameter changes within open fractures and 'break-outs'. Directional information is also recorded and used to orient the images in real time.

GeoCAD[®] Televiewer Module: is a Windows-based package for processing, interpreting and displaying acoustic and optical televiewer image logs. Standard log presentations include tadpole and stick plots, stereographic projections of poles to planes and azimuth frequency diagrams. The synthetic core display allows convenient comparison of log and field data for orientation of fractured or incomplete core sections.

SPECIFICATION:

Applications

- Fracture identification and orientation
- Stratigraphic studies
- Local stress studies (break-out)
- Core orientation
- Cased-hole studies

Operating Conditions

- Borehole Type: Fluid filled
- Recommended Logging Speed: 2.5m/min

Specifications

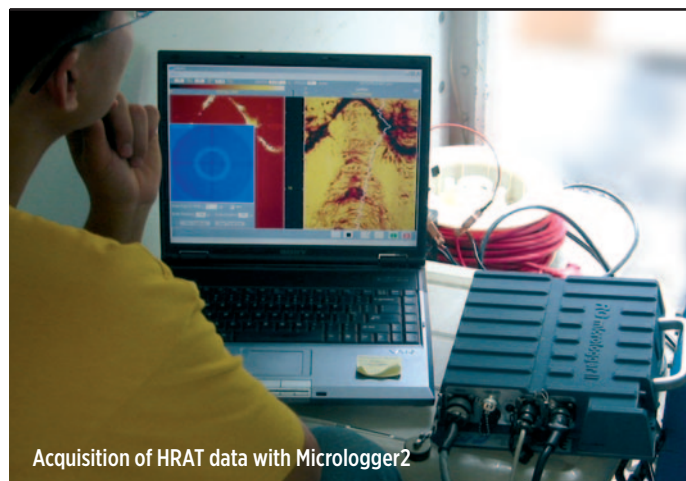
- Diameter: 42mm
- Length: 1.99m
- Weight: 5kg
- Temperature (max): 100°C
- Transducer type: 1.5MHz piezo-composite
- Rotation rate: 5 – 20rev/s
- Sample rate: up to 360/rev

Part Numbers

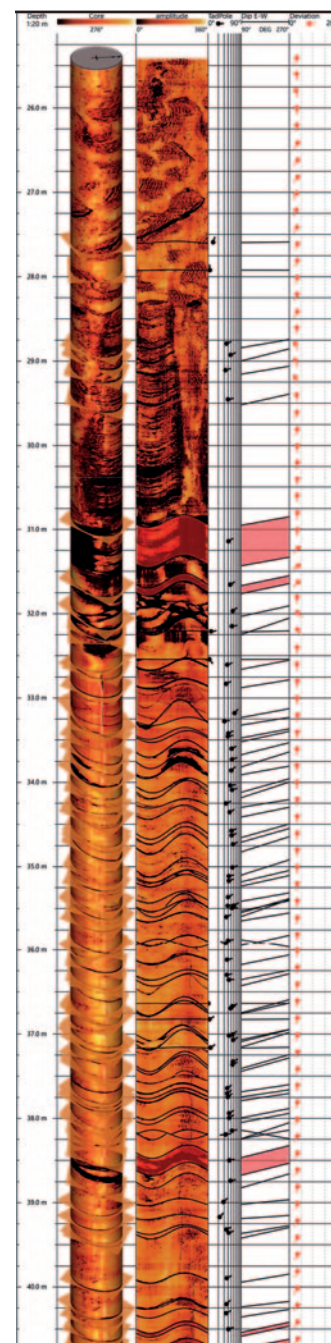
- I002195 HRAT[®] probe
- I017171 HRAT[®] including natural-gamma

GeoCAD[®] Televiewer Module

- I020248 GeoCAD[®] Televiewer Module

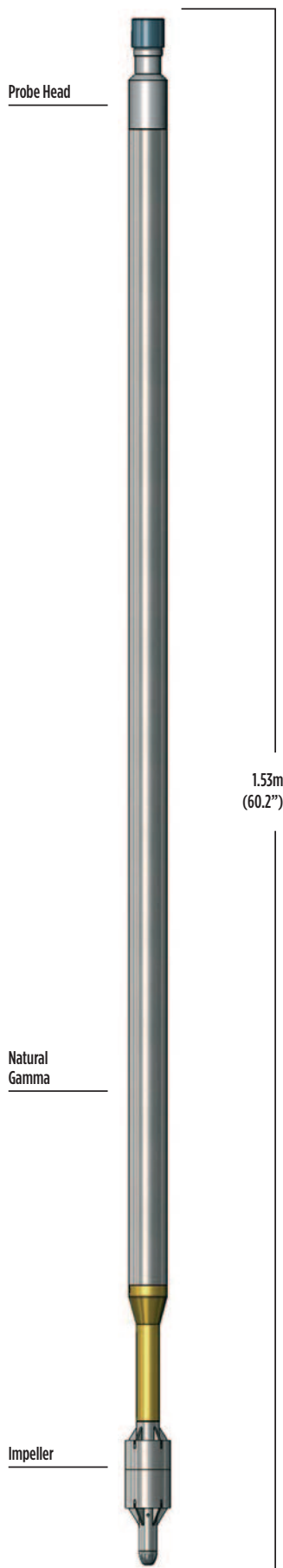


Acquisition of HRAT data with Micrologger2



Example of logging data

Impeller Flowmeter



Impeller Flowmeter Probe

Impellers can detect differential flow rates as low as 1.0m/min.

Logging at a range of speeds allows detection of flow of any rate (although for high precision in low flow rates use of the Heat-Pulse Flowmeter is advised).

Principle of Measurement:

The probes are equipped with lightweight helical impellers mounted on double sapphire bearings. The impellers contain magnets which actuate Hall-effect switches within the probe to detect impeller rotation. Separate log channels record the time of rotation according to fast and slow timebases for improved resolution at high and low flow rates. Uphole and downhole rotations are distinguished within the probe.

SPECIFICATION:

Features

- Jewelled bearings for minimum friction
- Low-drag sensors
- Choice of head diameters
- Cable-speed readout

Measurements

- Flow
- Cable velocity
- Optional natural gamma

Applications

Water

- Flow measurement within a water well
- Location of permeable zones
- Casing leak detection

Operating Conditions

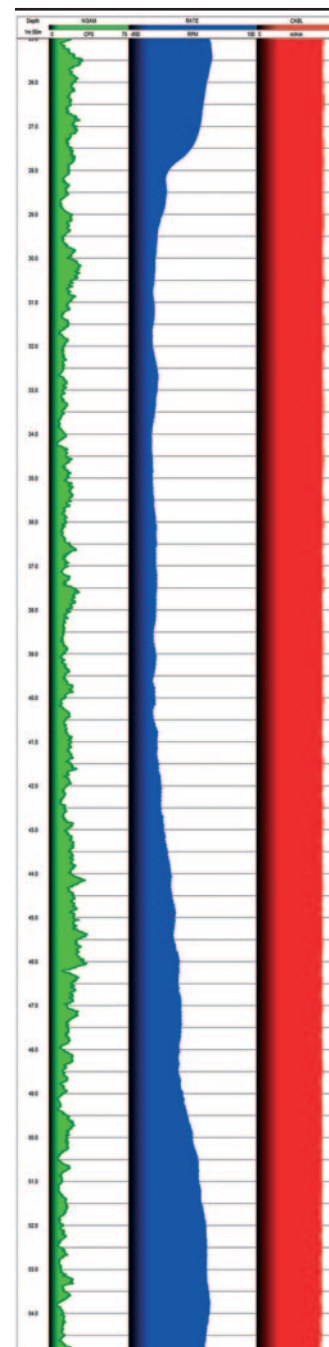
- Borehole type: open/cased, water-filled
- Centralisation: required
- Recommended Logging Speed: Multiple passes, varied speeds 2-7 m/min

Specifications

- Diameter: 45mm
- Length: 1.53m
- Weight: 4.0kg
- Temperature: 125°C
- Max. pressure: 20MPa

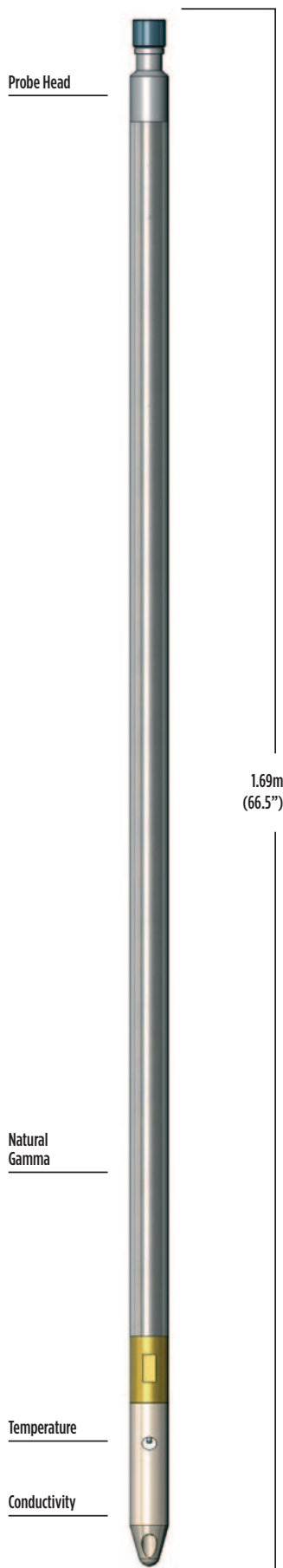
Part Numbers

- I015803 Impeller Flowmeter 45mm



Example of logging data

Temperature Conductivity



This probe combination provides a continuous, depth-based measurement of fluid temperature and conductivity.

Both parameters can be output in absolute and in differential forms. A natural gamma detector is included for correlation purposes.

Principle of Measurement:

The temperature and conductivity sensors are located in an insulated housing at the base of the probe. During logging, borehole fluid flows freely through ports on the side and base of this housing and over the sensors. The log is recorded downwards while running into the hole to minimise fluid disturbance.

SPECIFICATION:

Features

- Stable, high-quality, semiconductor temperature sensor
- Graphite conductivity electrodes resist corrosion and are easily cleaned

Measurements

- Fluid temperature/differential temperature
- Fluid conductivity/differential conductivity
- Natural Gamma

Applications

Water

- Fluid salinity
- Location of zones of different water quality
- Water-well monitoring
- Identification of zones of in-flow/out-flow
- Temperature gradient
- Water-level determination
- Location of grout behind casing
- Temperature compensation of other logs

Operating Conditions

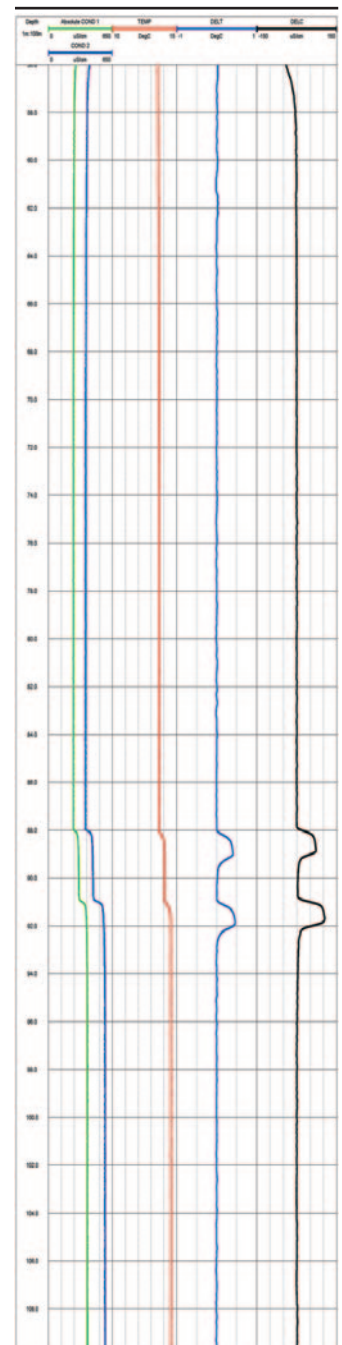
- Borehole type: open/cased holes, water-filled
- Recommended Logging Speed: 5m/min

Specifications

- Diameter: 38mm
- Length: 1.69m
- Weight: 4.5kg
- Temperature: 125°C
- Max. pressure: 20MPa
- Conductivity range: 50 to 50,000 $\mu\text{S} / \text{cm}$

Part Numbers

- 1002234 Temperature Conductivity probe with natural gamma



Example of logging data

GEO THERMAL

Verticality

Probe Head

Natural
Gamma

Accelerometer &
Magnetometer



1.66m
(63.3")

Veracity Probe

The Veracity probe provides accurate, continuous measurements of borehole inclination and direction.

These are output directly as log traces or may be processed further to produce tabular and graphical outputs of borehole position, borehole drift and true vertical depth.

Principle of Measurement:

The probe includes a triaxial magnetometer to determine the bearing of a reference in the probe relative to magnetic North and three accelerometers to measure inclination. The outputs from the transducers are processed by a downhole microprocessor to give final borehole inclination and azimuth data in real time.

SPECIFICATION:

Features

- Small diameter for slimhole operations
- Continuous borehole orientation log
- Suitable for all borehole inclinations and directions

Measurements

- Borehole inclination
- Borehole direction
- Borehole drift
- True vertical depth
- Natural Gamma

Applications

Minerals / Water / Engineering

- Bed-thickness estimation
- Surveying and deviation checks
- True seam depth

Operating Conditions

- Borehole type: open/plastic-cased, water/air-filled
- Centralisation: non-magnetic centralisers required
- Recommended Logging Speed: 4m/min

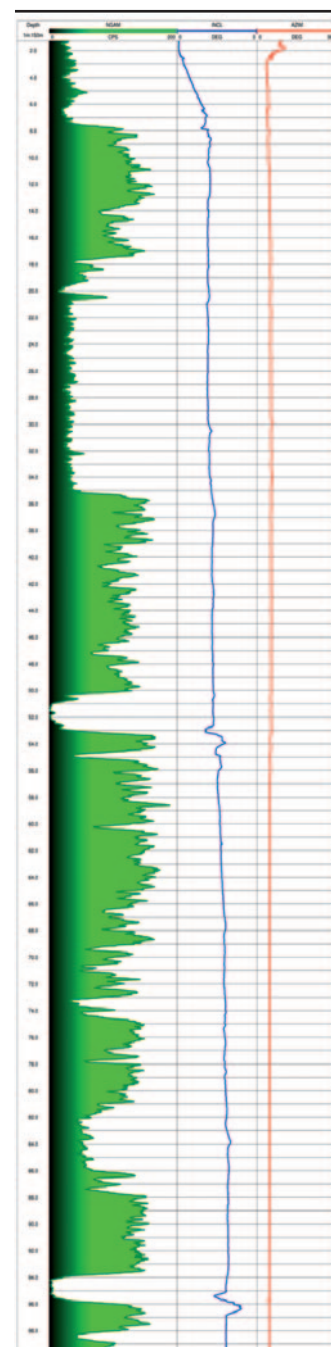
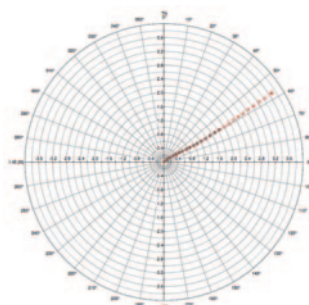
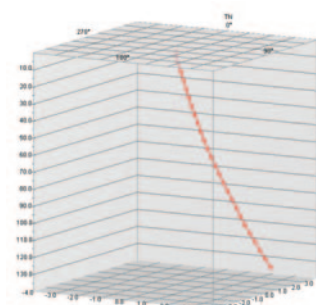
The operation of the probe is limited in steel casing or in the presence of magnetic minerals which affect the magnetometer. Under such conditions, only borehole inclination (without directional information) can be logged. The Gyro probe should be used in preference to the standard veracity probe in such cases.

Specifications

- Diameter: 42mm
- Length: 1.66m
- Weight: 5.5kg
- Temperature: 125°C
- Max. pressure: 20MPa
- Inclination range: Horizontal +/- 90°
- Azimuth range: 0 to 360°

Part Numbers

- I014704 Veracity probe with natural gamma



Examples of logging data

Micrologger2 | Winlogger Software

Micrologger2

Micrologger2 is the surface interface system for handling logging data acquisition. It supports all Robertson Geo probes including acoustic and imaging tools.

Compact and lightweight Micrologger2 is probably the most powerful portable logging system around and with over 600 units used around the globe it has a proven record for its reliability and technology.

SPECIFICATION:

Features

- Logging
- Supports Robertson Geo and many third-party probes
- USB high-speed link to PC Compatible with most winches/cables
- Real-time data display and printing
- Supports Windows™ printers
- Data output in LAS and Robertson Geo formats
- Modular construction for easy field maintenance

Part Numbers

I000184	Robertson Geo USB Micrologger2
I000204	110/220VAC power supply for ML2 and winch (up to 500m)
I000197	Canvas bag for Micrologger2
I013689	Robertson Geo Micrologger2 (video capability installed)
I000192	Micrologger2 12V PSU (Black Box)
I000211	Notebook PC using latest Windows software
I000213	Semi-Ruggedised notebook PC using latest Windows software
I014942	Fast Thermal Printer for continuous plots (Desk Top)
I014946	Fast Thermal Printer for continuous plots (Rack Mounted)

Winlogger Software

Winlogger is the MS Windows based operating system for the Micrologger2, providing field acquisition capability, processing and reporting for the full range of Robertson Geo probes.

It is easy to operate, retaining a standard Windows™ look using familiar tool bars and drop-down menus for all frequently needed functions.

The package incorporates powerful features including a built-in compiler to allow the more advanced user to construct custom 'User Functions' to process multichannel data in real time during logging.

Robertson Geo Winlogger is supplied with a multi-user licence allowing free distribution of the software to any user of Robertson Geo log data.

This policy has proved popular with wireline service companies who may provide Winlogger to clients to allow them to replay or reprocess data in-house without resorting to 3rd-party packages.

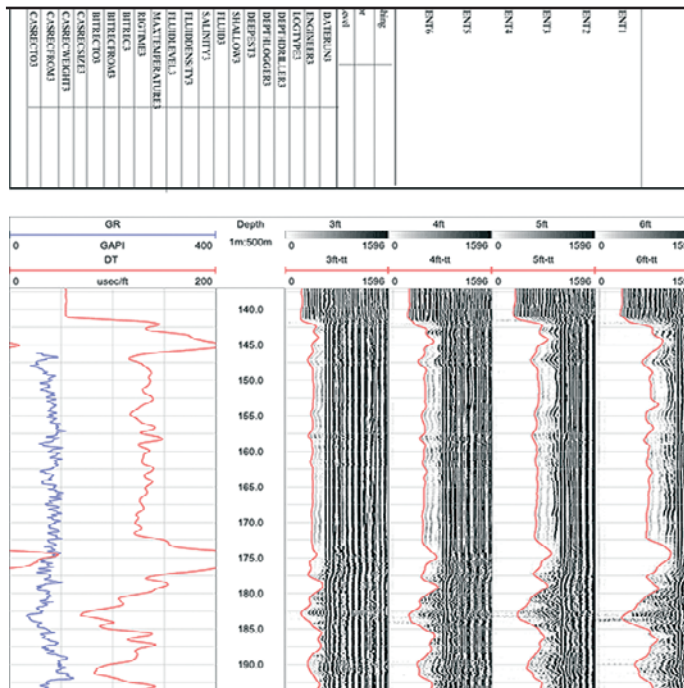
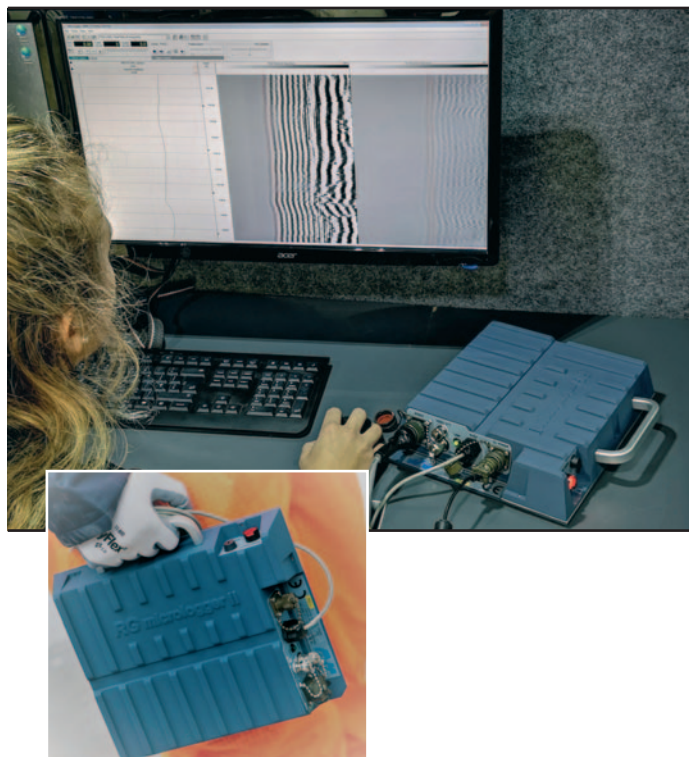
SPECIFICATION:

Features

- Support for all Robertson Geo digital slim-hole probes
- Screen/printer log display in calibrated engineering units
- Selectable depth sample interval (1, 2, 5, 10 cms etc)
- Metric and imperial logs in API format
- Custom logos and headers Data export in ASCII (LAS) format
- Compatible with Windows 10 and earlier OS

Part Numbers

I000466	Winlogger software
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Mini Winch | 500m Winch | 600m Winch

Robertson Geo designs and builds its own range of winches of varying capacities for deploying subsurface probes on 4-core or co-axial cable.

Each winch is precision engineered for reliable use in the most challenging field applications. The winches are fully compatible with the Micrologger2 surface system and the full range of Robertson Geo probes, for depths of up to 3,000m.

Mini Winch

The Robertson Geo Mini Winch is portable, compact and robust. Its basic 'no-frills' design is aimed at long-term reliability under arduous conditions.

SPECIFICATION:

Specifications

Capacity:	175m (575') 4.72, (3/16") cable
Speed:	0 – 17.5m/min (0 – 57ft/min) on full drum (12VDC operation)
Motor:	550W (12 – 24VDC)
Size:	340(w) x 400(l) x 320(h) mm
Weight:	19kg excluding cable

Part Numbers

I013754	Mini Winch includes power and data cables
I001117	Mini Winch Tripod with Encoder



500m Winch

A robust heavy-duty unit, the 500m Winch can be operated from a vehicle battery and is ideal for heavier probes in shallow boreholes.

SPECIFICATION:

Specifications

Capacity:	530m (1738') 3/16" 4-core cable
Speed:	0 – 13m/min (0 – 43ft/min)
Motor:	180W at 12VDC
Size:	582(w) x 482(l) x 414(h) mm
Weight:	52kg excluding cable

Part Numbers

I001019	500m winch including tripod, power and data cable
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600m Winch

Of similar basic construction to the 500m winch, the 600m is mains/generator powered.

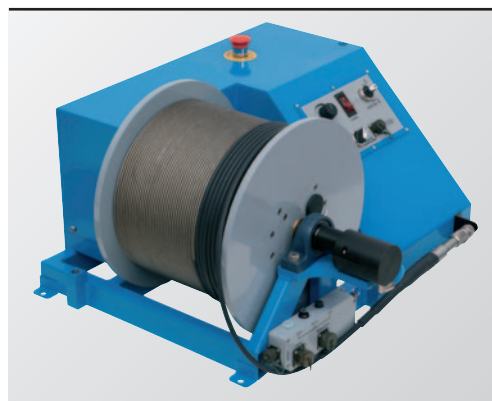
SPECIFICATION:

Specifications

Capacity:	630m (2066') 3/16" 4-core cable
Speed:	0 – 15m/min (0 – 49ft/min)
Motor:	540W at 110/220VAC
Size:	622(w) x 696(l) x 370(h) mm
Weight:	80kg excluding cable

Part Numbers

I001043	600m winch including tripod, power and data cable
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1000m/2000m Winch | 3000m Winch

Robertson Geo designs and builds its own range of winches of varying capacities for deploying subsurface probes on 4-core or co-axial cable.

Each winch is precision engineered for reliable use in the most challenging field applications. The winches are fully compatible with the Micrologger2 surface system and the full range of Robertson Geo probes, for depths of up to 3,000m.

1000m/2000m Winch

The standard unit for truck-mounted operations in deep boreholes, the 2000m winch includes an integral depth wheel and an automatic level wind.

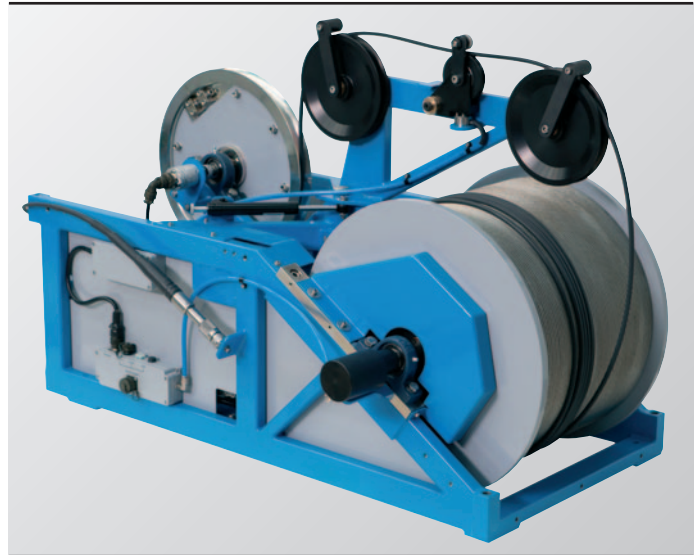
SPECIFICATION:

Specifications

Capacity:	2030m (6658') 3/16" 4-core cable 1030m (3378') 1/4" coaxial cable
Speed:	0 – 30m/min (0 – 99ft/min)
Motor:	2hp (1.5kW) at 110/220VAC
Size:	605(w) x 1060(l) x 735(h) mm
Weight:	142kg excluding cable

Part Numbers

1018194	2000m winch for 3/16" 4-core cable includes tripod, power and data cable
1018193	1000m winch for 1/4" coaxial cable includes tripod, power and data cable



3000m Winch

A heavy-duty electric draw-works designed for deeper hole and oil/gas investigations. *Please note the pressure limits of standard Robertson Geo slimhole tools.*

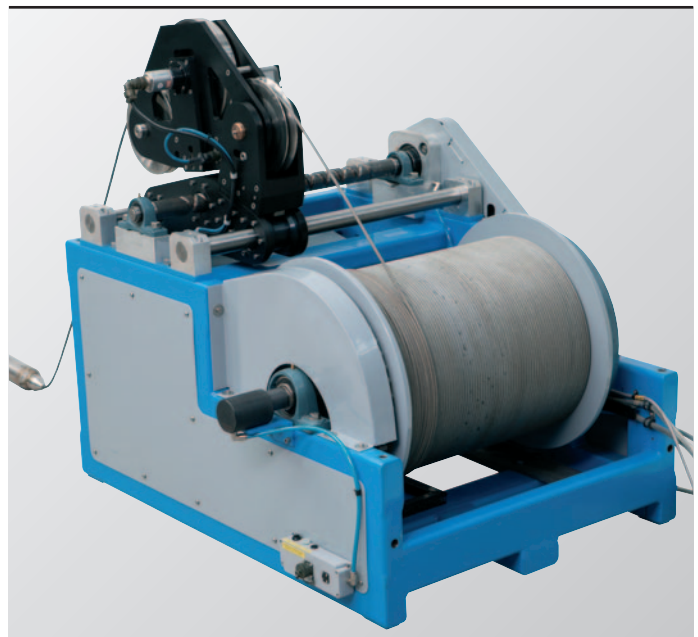
SPECIFICATION:

Specifications

Capacity:	3000m (9840') 3/16" cable
Speed:	0.2 – 34m/min rim: 0.5 – 100m/min
Pull:	1,350kgF Rim: 460kgF
Motor:	440VAC 3-Phase 4kVA
Dimensions:	1000(w) x 1100(l) x 900(h) mm
Weight:	415kg excluding cable

Part Numbers

1013866	3000m winch for 3/16" four-core system includes tripod, power and data cable
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2000m Marine Winch

Robertson Geo designs and builds its own range of winches of varying capacities for deploying subsurface probes on 4-core or co-axial cable.

Each winch is precision engineered for reliable use in the most challenging field applications. The winches are fully compatible with the Micrologger2 surface system and the full range of Robertson Geo probes, for depths of up to 3,000m.

2000m Marine Winch

Working experience by Robertson Geo offshore logging crews has led to the modification of the 2000m Winch and the introduction of a Marine variation to resist corrosive, saline conditions.

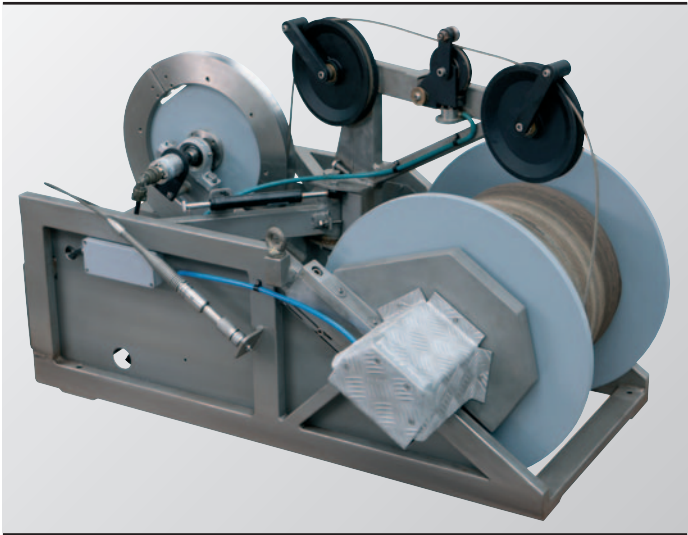
The communications box is waterproofed and filled with silicon to protect the electronics.

Grade 316 stainless steel has been introduced to replace standard steel components. 316 contains the alloy molybdenum, significantly enhancing corrosion resistance, especially for more saline or chloride exposed environments. 316 components include structural frames, depth wheel, panels, spacers, shafts and gears, sprockets and chains.

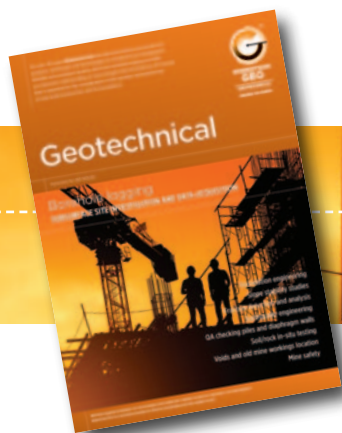
SPECIFICATION:

Specifications	
Capacity:	2030m (6658') 3/16" 4-core cable 1030m (3378') 1/4" coaxial cable
Speed:	0 – 30m/min (0 – 99ft/min)
Motor:	2hp (1.5kW) at 110/220VAC
Size:	605(w) x 1060(l) x 735(h) mm
Weight:	142kg excluding cable

Part Numbers	
1019167	2000m Marine Winch



Our complete range of brochures:



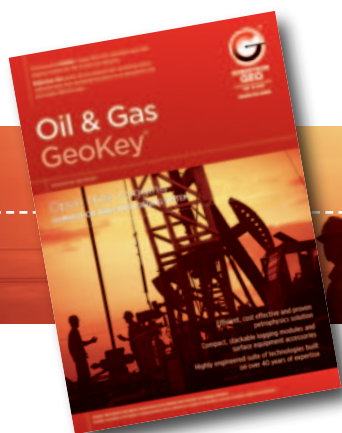
Geotechnical

SUBSURFACE SITE INVESTIGATION AND DATA ACQUISITION



Mining & Minerals

SUBSURFACE RESOURCE EXPLORATION AND MINE SAFETY PLANNING



Oil & Gas GeoKey®

SLIMHOLE OR THRU-PIPE OPEN HOLE LOGGING SYSTEM



Renewables

SUBSURFACE DATA ACQUISITION AND CHARACTERISATION



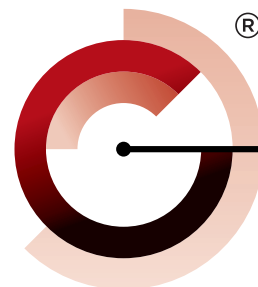
Water & Environmental

SUBSURFACE CHARACTERISATION AND DATA ACQUISITION



Operational Services

COMPREHENSIVE GROUND INVESTIGATION SERVICES, DATA MANAGEMENT AND RENTAL SOLUTIONS



**ROBERTSON
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