PROBES
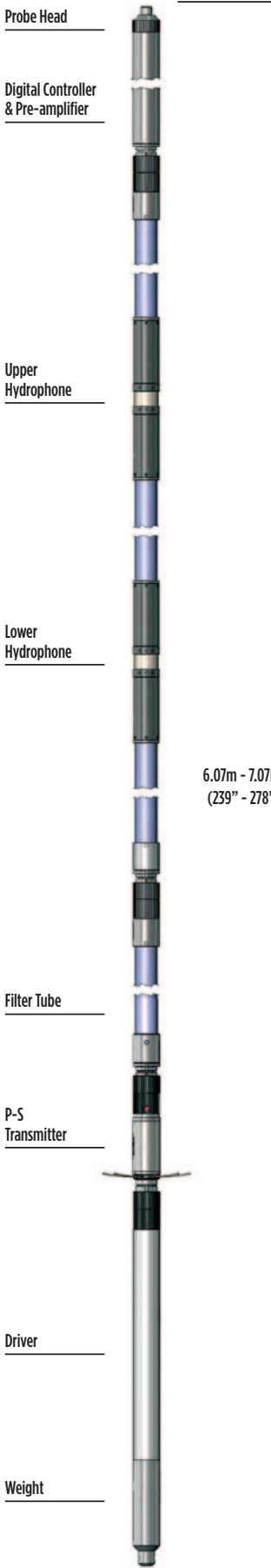## PS LOGGER

The PS Logger probe is a low-frequency acoustic probe designed to measure compressional and shear-wave velocities in soils and soft rock formations.

It operates using indirect excitation rather than mode conversion as in a conventional sonic. It is capable of acquiring high resolution P and S wave data in borehole depths of up to 600m in water.

Principle of Measurement:

The PS Logger probe contains a unique design of powerful hammer source and two receivers, separated by acoustic damping tubes.

To acquire data, the probe is stopped at the required depth and the source is fired under surface command. Firing causes a solenoid-operated shuttle aligned across the borehole axis to strike plates on opposite sides of the probe in turn, setting up a pressure doublet in the surrounding fluid. The resultant fluid motion produces a tube wave at the borehole wall with velocity close to the shear velocity of the formation together with a compressional wave.

As the waves propagate parallel to the borehole axis, they set up corresponding fluid movements that are detected by the two neutral buoyancy 3D hydrophone receivers and geophones, allowing the wave velocity to be determined.

The facility to stack multiple shots and filter the data as in normal seismic data acquisition is included in the operating software.

Probe Head

Digital Controller & Pre-amplifier

Upper Hydrophone

Lower Hydrophone

6.07m - 7.07m (239" - 278")

Filter Tube

P-S Transmitter

Driver

Weight

PS Logger Probe

SPECIFICATION:

Features

High energy shear-wave source has typically 20x power of conventional sonic probes

Low-frequency measurement, more representative of engineering situations

Stacking of multiple shots

Probe separates for shipping

Real-time wavelet (wiggle) display

Compatible with Robertson Geo Micrologger2

Measurements

Formation compressional wave velocity

Formation shear-wave velocity

Applications

Site Investigation - foundation studies, windfarms, offshore structures, dam safety

Physical properties of soil/rock - shear modulus, bulk modulus, compressibility and Poission's ratio

Earthquake engineering - characterization of strong motion sites

Velocity control for seismic reflection surveys

Engineering

Operating Conditions

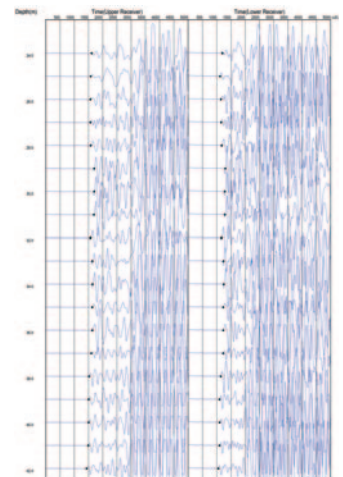|	
Borehole type:	open-hole, water-filled
Recommended Logging Speed:	Static measurements

Specifications

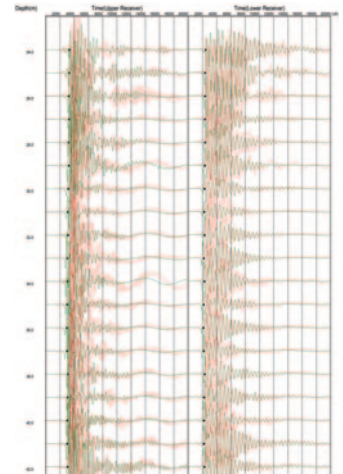|	
Diameter:	50mm
Assembled length:	6.07m - 7.07m (1 or 2m filter)
Shipping case length:	1.45m (4.75ft) supplied in two transport cases
Assembled weight:	26.5kg - 28kg (1 or 2m filter)
Max. temperature:	70°C
Max. pressure:	6.5MPa
Transducer type:	solenoid and hammer
Receiver type:	3D hydrophones (p), geophones (s)
Receiver spacing:	1000mm (3.28ft)
Waveform acquisition period:	5.12mS to 409.6mS
Sampling:	2.5µs minimum
Down-hole gain:	0db to 42db (surface control)

Part Numbers

I002244	PS Logger probe in carrying case

P Waves

S Waves

Examples of logging data