

OPERATING PRINCIPLES AND METHODS



The DHTG borehole geophone has been designed to meet the most demanding Customers request. The system (consisting in a probe, a control unit, the cable together with a cable reel, and a cable clamp) is as a matter of fact characterized by the possibility to get a reliable adhesion to borehole walls, obtained by a progressive flexure of a harmonic steel spring placed parallelly to the probe. After having placed the borehole geophone at the required depth by means of a special cable clamp, a powerful electric DC motor, which is controlled by the surface electronics is to be started. The function of this motor is to move a piston inside the probe checking the spring flexure and thus providing for the approaching ("clamping") and shifting ("unclamping") operations of the geophone body in relation to the borehole wall. Furthermore, a sophisticated safety device will prevent excessive motor efforts caused by the possible presence of a protrusion on the wall of the borehole (in case the adhesion of the probe shouldn't be optimal, we recommend to move the geophone some ten centimeters or so upwards or downwards). Three 10 HZ geophones, oriented according to the x-y-z axis, are housed inside the probe for the determination of the time of arrival of the type "s" seismic waves to the geophone. Developing transversally in the direction of the seismic wave propagation and travelling at a lower speed compared to the "p" waves, the type "s" waves result "hidden" in the seismogram after the arrival of the longitudinal waves, and may only be identified using a 3D-geophone. The acquisition of data normally involves the surface energization and thus the carrying out of several energizations by positioning the 3D-geophone at different measures inside the downhole. Examining the time-distance curve related to the "s" waves, it will be possible to determine their propagation speed, V_s , in a certain medium thus deducing the elasticity module (Young module) of the same for the subsequent insertion in the formulas, which are to be used for foundation studies.

APPLICATIONS



- Stratigraphy studies at shallow and medium depth
- Geological research oriented towards the construction of roads, motorways, oil pipelines
- Foundation studies
- Determination of the Young module

AVAILABLE MODELS



- DHTG-50 (50m cable)
- DHTG-100 (100m cable)



TECHNICAL FEATURES

Cable length	50/100 m (on cable reel with small wheels)
Power supply	12V rechargeable internal battery (with discharge signal)
Motor	Electric, 12V, 10W with mechanical scaling
Protections	Electronic circuit with current overcharge control and protection
Probe diameter	47 mm
Probe length	680 mm
Borehole diameter (standard spring)	Min. 70 mm ; Max. 170 mm
Cable reel dimensions	640x300x680 mm
Control unit dimensions and weight	270x250x130 mm; 3kg
Probe weight	3,5 kg
Total weight	13 kg (probe+50m cable+reel+control unit)



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