

GYROSCOPIC VERTICALITY AND GYROSCOPIC 3D-MAGNETOMETER PROBE

The gyroscopic verticality probe is designed to acquire borehole inclination/ azimuth logs in situations where metal casing or magnetic materials around the borehole influence the measurement. The 3D-magnetometer version also acquires 3D magnetic data and finds application in the location of magnetic ore bodies.

PRINCIPLE OF MEASUREMENT:

The probe includes a gimbal-mounted directional gyroscope for orientational measurement and two accelerometers for inclination. Prior to logging, the operator mounts the probe in a stand and orientates a reference mark towards Magnetic North using a conventional compass. After uncaging by a command from the surface unit, the gyroscope then maintains this direction reference regardless of subsequent rotation of the probe while logging. A high-speed 3D-digital magnetometer continuously measures the X,Y and Z components of the surrounding magnetic field. These separate components and the total resultant field magnitude and direction are recorded as log channels in the gyroscopic 3D-magnetometer probe.

FEATURES

Continuous log of borehole inclination/ azimuth
 Not influenced by metal casing or magnetic materials
 Low drift compared to 'rate' gyroscopes
 Optional natural-gamma measurement
Additional features of 3D-Magnetometer:
 Log of 3D magnetic field

MEASUREMENTS

Borehole inclination
 Borehole direction
 Borehole drift
 True vertical depth
Additional features of 3D-Magnetometer:
 X,Y, Z magnetic components

APPLICATIONS

Water/ minerals/ engineering
 Verticality measurements in steel casing or in the presence of magnetic ores.
Additional features of 3D-Magnetometer:
 Detection of nearby magnetic ore bodies

OPERATING CONDITIONS

Borehole type: open/ cased hole; water/ air-filled
Centralisation: required

SPECIFICATIONS

Diameter: 44mm
Length: 1.14m
Weight: 12kg
Max. temperature: 70°C
 (extended ranges available)
Max. pressure: 20MPa
 (extended ranges available)
Azimuth range: 0 to 360°
Azimuth accuracy: +/-2°
Inclination range: 0 to 30°
Inclination accuracy: +/-0.25
Magnetometer
 range: +/- 60 μ T (+/- 1G)
 accuracy: 1% FS
Noise level: +/- 0.5 μ T (+/- 0.5 μ G)
Orthogonality: better than 0.2°

SALES INFORMATION

Probe:
 25 099 000 Gyroscopic verticality probe
 25 099 003 includes natural gamma
 25 099 002 Gyroscopic 3D-magnetometer probe
 25 099 004 includes natural gamma
Accessories:
 25 099 001 Field calibration jig and compass
 21 030 000 Centraliser range 90 - 180mm
 21 031 000 Centraliser range 180 - 260mm
 21 032 000 Centraliser range 260 - 342mm
 21 033 000 Centraliser range 342 - 472mm
 20 070 000 Natural-gamma API calibrator without source
 30 010 000 3.7MBq ¹³⁷Cs source for natural-gamma calibrator

