TRISTAN TECHNOLOGIES

Magnetometers for Geophysics

Mineral surveys, magnetotellurics, magnetic detection of induced polarization, and other magnetic detection methods are important geophysical tools. Superconducting magnetometers and gradiometers offer several advantages over other detectors commonly used for such measurements.

- **Constant Sensitivity from dc to 10 kHz**
- **Magnetic Field Resolution of 10^{-14} Tesla**
- **Gradient Resolution of 10^{-15} Tesla/meter**
- **True dc Response**
- **Flat Phase Response**
- **Wide Dynamic Range**

Tristan manufactures the most complete line of ultrasensitive geomagnetic measurement systems available. From compact single and three channel magnetometers to 8-channel tensor arrays, Tristan offers a variety of fully configured system packages for geophysical measurements.

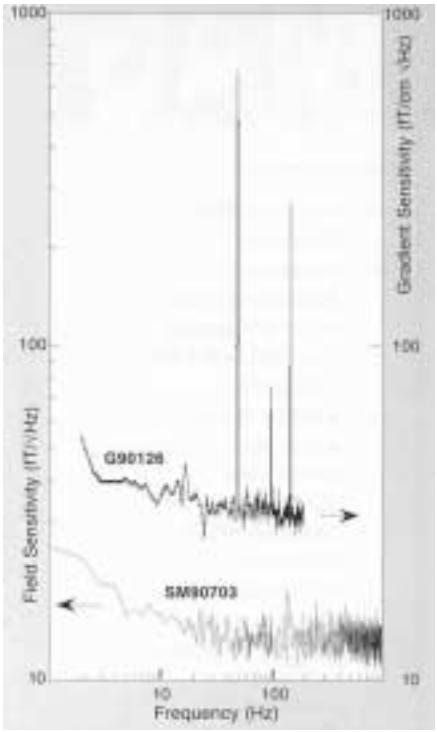
The basic geophysical measurement system offered by Tristan is the model G377. It measures all three vector components of the Earth's magnetic field (B_X, B_Y, B_Z). The small size and portability of the model G377 makes it convenient for field use. It can also be supplied with different size dewars for airborne (model NLD-530 dewar) and borehole (Model NGD-830 dewar) use. Planar Gradiometers can also be substituted if measurements of magnetic field gradients are required.

Model G377 three axis magnetometer system

Tristan offers three basic sensors for geophysical measurements, the HTM-8 and the higher sensitivity HTM-16 are magnetometers (B_x, B_y, B_z); the optional HTG-10R measures planar gradients (dB_z/dx).

The model G377 can be supplied with fewer sensors or a mixture of magnetometers and planar gradiometers if needed. The picture below shows a single channel planar gradiometer (HTG-10R sensor) being used in airborne measurements.

Model 701G system mounted at end of boom



Measured sensitivities of HTM-16 (SM90703) and HTG-10R (G90126) sensors

Tristan offers variants of the model G377. The Model 703 is identical to the G377, but uses the smaller 5” diameter Model 530 dewar. The Model 701G uses a single HTG-10R gradiometer in the Model 530 dewar. Tristan can also offer fast 5 µsec reset times for transient measurements. For even greater sensitivity and dynamic ranges, Tristan can supply liquid helium versions of the G377 and its variants.

OPTIONAL DEWARS

Model NGD-830 borehole dewar

Model NGD-1080 dewar with T877 tensor probe

Model NLD-530 dewar

Model G377

Operation Principle: 3-Axis 77 kelvin dc SQUID Magnetometer - Measuring the relative change in magnetic field simultaneously in B_x, B_y and B_z axes.

Range:	±5 µT/√Hz
Bandwidth:	dc to 10 kHz wider bandwidths available
Slew Rate:	> 1 µT/sec (peak-to-peak)
Sensitivity:	50 fT/√Hz: HTM-8 20 fT/√Hz: HTM-16 1 fT/m√Hz: HTG-10R
Cryogen:	Liquid Nitrogen
Volume:	7 liters
Hold time:	2-3 weeks
Power:	120 or 240 V_{AC}, 50 Watts (12 Volt Battery Supply Optional)
Outputs:	Analog, RS-232 or IEEE-488 Visual Alphanumeric display
Controller:	321 mm x 121 mm x 300 mm (12.6" wide, 4.8" high, 11.8" deep)
Weight:	3.6 kg (8 lbs.)

NGD-1030 dewar (7 liters) *Standard on G377*
406 mm high, 250 mm diameter
(16" high, 9.8" diameter)
Weight: Full - 12.2 kg (27 lbs.)
Empty - 6.6 kg (14½ lbs.)

NGD-830 dewar (¾ liter) *optional*
600 mm high, 83 mm diameter
(24" high, 3¼" diameter)
Weight: Full – 3.5 kg (7½ lbs.)
Empty – 2.7 kg (6 lbs.)

NLD-530 dewar (1 liter) *Standard on 703*
311 mm high, 127 mm diameter
(12¼" high, 5" diameter)
Weight: Full – 1½ kg (5 lbs.)
Empty – 2¼ kg (3¼ lbs.)

Contact Tristan for custom systems, or if you need additional information.

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