S200 High Sensitivity *Seismometer*

Our S-200 and S-400 seismic sensors design is based on our favorite S-100 three-axis seismic sensor, mainly used in Passive Seismic Tomography. The NEW S-200 & S-400 seismic sensors have specially designed for surface installation in oil & gas fields, into small diameter boreholes in order to keep the installation cost low.
Installation depth can be up to 200m, but usually the suggested installation depth is 50 – 150m depending the surface land conditions. Recording hydraulic fracturing events at the surface, is not an easy experiment, and seems to be impossible using ordinary equipment. The instrument performance has to be improved. Efforts were concentrated on minimizing the electronic noise floor, increasing the downhole gain, and increasing the sensor sensitivity. This target has been achieved adding more geophones to the downhole sensor connected in series. The sensor uses double or quad very high gain geophone elements per axis in order to increase signal gain and minimizing the signal noise, giving the ability to record even smaller events.
The electrical characteristics of the new sensors are shown on the table 1 & 2. Four different model types of sensor have been manufactured.

	Sensor Model C100	Sensor Model C200	Sensor Model C400
Geophones per axis (OMNI-2400 15 Hz)	1	2	4
Sensitivity	52 V/m/sec	104 V/m/sec	208 V/m/sec
Coil resistance	2400 Ω	2400 Ω	2400 Ω
Total Resistance	2400 Ω	4800 Ω	9600 Ω
Damping	0.57	0.57	0.57

Table 1 – Sensor Specifications using OMNI-2400 geophone elements

	Sensor Model C100	Sensor Model C200	Sensor Model C400
Geophones per axis (ION SM6-UA10Hz)	1	2	4
Sensitivity	78.9 V/m/sec	157.8 V/m/sec	315.6 V/m/sec
Coil resistance	3500 Ω	3500 Ω	3500 Ω
Total Resistance	3500 Ω	7000 Ω	10500 Ω
Damping	0.284	0.284	0.284

Table 2 – Sensor Specifications using ION SM6 UA10 geophone elements

INSTRUMENT CHARACTERISTICS

GENERAL	
Number of channels	3
Orientation	Vertical, North-South, East-West
Output resistance	500 Ohms
Geophone case cable length	20 meters (up to 100 meters optional)
Connection cable length	1 - 10 meters
Power	+/-11 to +/-36Vdc, 75mW
Max output voltage	+/-9Vdc bipolar, 18Vp-p
FEATURES	
Sensitivity	1000V/m/sec
Electronic output noise	160nV/Sqrt(Hz)
Bandwidth	0.2 – 100Hz
PHYSICAL	
Size (electronic box)	160 X 100 mm
Size (geophone enclosure)	180mm length, 50mm diameter
Weight (electronic box)	900g
Weight (geophone case)	600g
PROTECTION	
Overvoltage protection	All pins are protected, all input signals are protected
ENVIRONMENT	
Temperature range	-20 to +70oC
Humidity	100%, IP67 enclosure

When the Earth whispers we are there!!!

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