

arolla - VE series **Broadband Seismometer**

Overview

Designed and handmade in Switzerland, GeoSIG's **arolla** broadband seismometer is the culmination of years of experience designing high precision, low noise, and reliable seismic equipment.

Its versatile, compact, lightweight, and rugged design make **arolla** an ideal choice for many applications and use cases.

From the beginning, the design goals for the **arolla** seismometer were to make the most accurate, most reliable, easy to use/deploy, and consistent quality sensor on the market. Its triaxial design, wide temperature range, low temperature sensitivity, magnetic shielding, precision factory calibration of the sensor response, and robustness help to achieve these goals and beyond.

Applications

- ▶ Study of local, regional, and teleseismic events
- ▶ National seismic networks
- ▶ Earth mode observations
- ▶ Site surveys



Key Features

- ▶ Flat response from 120 seconds to 50 Hz
- ▶ Output sensitivity of 1200 V/m/s +/-0.5%, factory trimmed
- ▶ Measured self noise below NLNM from 35sec to 10Hz
- ▶ Remote, automatic electronic mass centering via control and digital lines. No re-centering required within +/-45°C
- ▶ No mass locking needed
- ▶ Electromagnetic shielding
- ▶ Corrosion resistant and robust housing

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Specifications

Technology

Feedback:	Electromagnetic force balance with capacitive transducer
Topology:	Orthogonal triaxial X, Y, Z
Mass centering:	Automatic procedure during operation can be remotely initiated either via control line or via serial communication interface
Mass lock:	Not required

Performance

Sensitivity:	2 x 600 V/m/s $\pm 0.5\%$ factory trimmed
Self noise:	Typically below NLNM from 40 sec to 8.5Hz and within +6 dB of NLNM at 120 sec See plot
Bandwidth:	120 sec (0.00833 Hz) to 50 Hz
Cross axis:	$\leq 1\%$ coupling; including misalignment from axis to case reference
Clip level:	17 mm/s up to 1 Hz
Temperature:	No re-centering required within $\pm 45^\circ\text{C}$

Power Supply

Type:	Isolated 9 to 36 VDC
Consumption:	< 1 W typical at 12 VDC
Protection:	Over voltage, reverse voltage, ESD, complies with EMC CE

Interface

Connector:	Single 24 pin IP68 hermetic
Output X, Y, Z:	Velocity; 40 Vpp differential mass position; 10 Vpp single ended
Calibration:	Accepts analogue test signals to be injected into the individual cells via dedicated calibration coils. Calibration function can be remotely activated and inhibited.
Serial:	RS485

Physical & Environmental

Material:	Lightweight rugged aluminium construction (Stainless steel housing optional)
Diameter:	235 mm
Height:	283 mm incl. feet & handle
Weight:	< 10 kg (< 9.8 liter)
Ingress:	IP68 and NEMA6P; survives brief periods of submersion to 1m depth
Operating temp:	-20 to +60 $^\circ\text{C}$
Humidity:	0 to 100% non-condensing
Shock:	MIL STD 810G - 516.6 - Shock (air transport)

Installation

Maximum tilt:	$\pm 2^\circ$
Orientation:	Handle for ease of installation. LED indicators allow quick deployment in the field.
Directional indicators:	Engraved N direction and alignment groove on sensor housing

