

# Güralp Flute



## ULTRA SLIMLINE BOREHOLE BROADBAND SEISMOMETER



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The Flute is ideally suited for rapid installation in medium-noise sites.

The Güralp Flute sensor is a slimline, three-component, force-feedback borehole seismometer with an outer diameter of just 51 mm. The Flute is also available with an optional, single-jaw holelock and comes with 1500 PSI water-proof connector for installation into wet holes.

The sensor response is completely flat and linear across the entire passband. It's high-gain feedback loop eliminates mechanical non-linearity (overall measured linearity exceeding 95 dB) and minimizes resonances in the spring system.

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### Key features

51 mm outer diameter

True broadband, three-component, force-feedback instrument

Direct velocity outputs

Lightweight, waterproof and self-contained

No mass clamping required - plug in and go

High sensitivity and dynamic range (135 dB)

Orthogonal instrument with high cross-axis rejection (> 65 dB)

Single jaw holelock option

The Flute can be supplied with response options of 1 s, 10 s, 30 s, 60 s or 120 s for the long period and 50 Hz, 100 Hz or 200 Hz for the short period.

Optional Smart Sensor interface (IEEE 1451.4 TEDS Compliant)

Low-frequency vibration modes are carefully avoided in the design. The lowest spurious vibration mode of the sensor is a barely measurable resonance at 440 Hz

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### Applications

- > Vertical arrays
- > Vertical seismic profiling
- > Monitoring of microseismicity

## SPECIFICATIONS

SYSTEM	
Configuration / Topology	Triaxial orthogonal (ZNE)
PERFORMANCE	
Acceleration output band	60 s to 100 Hz Long period options: 1, 10, 30, 40 or 120 s Short period options: 50 or 200 Hz
Output sensitivity	2400 V/ms <sup>-1</sup> (2*1200 V/ms <sup>-1</sup> ) differential output - optional sensitivities from 4000 to 8000 V/ms <sup>-1</sup>
Peak / Full scale output	±10 V differential
Sensor Dynamic Range	> 135 dB
Cross axis rejection	> 65 dB
Linearity	> 95 dB
Lowest spurious resonance	> 450 Hz
Self noise	-172 dB (Relative to 1 [m/s <sup>-1</sup> ] <sup>2</sup> Hz <sup>-1</sup> )
Optional High gain sensitivity	2 x 10000 V/m/s (adjustable)
Offset zeroing	Adjustable through case
Transfer function	User manual is available to download from the website. Each sensor is provided with full calibration details including measured sensitivity, measured frequency response and instrument poles and zeros
Calibration controls	Independent signal & enable lines exposed on sensor connector
POWER	
Power consumption (at 12 V DC)	0.5 W
Power voltage range	10– 28 V DC Optional low power 5 V DC supply (output ± 4.5 V)
ENVIRONMENTAL	
Operating temperature	-30 to +60 °C

PHYSICAL	
Diameter	51 mm
Case height including connector	690 mm
Enclosure/Materials	Hard anodised aluminium case Gold plated contacts O-ring seals throughout
Communication / Connectors	Mil-spec connector (optional 1500 psi waterproof connector or user connector)
Borehole install depth	to 250m (other options available: 100m max analogue, 500m max digital)
Borehole install mechanism	Spring-loaded jaw with passive skids or studs (>60 kg force)