5T Borehole
BOREHOLE ACCELEROMETER

A low noise, triaxial, force feedback, borehole instrument.

The Güralp 5T borehole is designed for strong-motion borehole studies with a sensor that is comparable to the surface 5TC accelerometer.

The analogue borehole instrument can be combined with the DM24 borehole digitiser or a surface digitiser to build a fully networked, integrated borehole monitoring system.

The instrument is supplied with surge protection and a strain relief mechanism to isolate the sensors in the instrument from motions in the cable.

Key features
- Flat acceleration output from DC to 100 Hz (200 Hz option)
- 89 mm outer diameter
- Suitable for installation with sand backfill to minimise convection
- Option for installation with single-jaw lock for inner borehole diameter of 99 - 203 mm
- Waterproof and durable with O-ring seals throughout
- Dual output (high and low gain) and optional high/low pass filters
- Optional electronic compass module to determine downhole attitude
- Remote DC offset zeroing
- We can provide tripods, winches and other equipment designed specifically for borehole installations

Applications
- Vertical arrays
- Earthquake Early Warning systems
- Strong motion seismic hazard modelling
- Studies of ground amplification / attenuation

Images show the Güralp 5T borehole accelerometer
### SPECIFICATIONS

#### SYSTEM
- **Configuration / Topology**: Triaxial orthogonal (ZNE)
- **Performance**
  - Acceleration output band: DC to 100 Hz, Options of DC to 200 Hz
  - Output sensitivity: 2 g standard, other solutions available
  - Peak / Full scale output
    - Differential: ±20 V (40 V peak-to-peak)
    - Single-ended (e.g. mass positions): ±10 V (20 V peak-to-peak)
  - Sensor Dynamic Range: 156 dB
    - 140 dB (20 - 200 s)
    - 127 dB (2 - 30 Hz)
  - Self-noise below NHNM: > 0.08 Hz (12.5 s)
  - Cross axis rejection: > 0.001 g/g
  - Linearity: > 77 dB vertical; > 66 dB horizontal
  - Lowest spurious resonance: > 400 Hz
  - Offset zeroing: Via remote control
  - 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 voltage range**: 10 - 36 V DC*
- **Power consumption (at 12 V DC)**: 288 mW

*Power voltage for operation of this unit only. Connection to additional instrumentation or use of longer cables may result in a higher input voltage requirement.

#### ENVIRONMENTAL
- **Operating temperature**: -20 to +70 °C

#### PHYSICAL
- **Diameter**: 89 mm
- **Case height with lifting loop**: 431 mm
- **Enclosure/Materials**: Hard anodised aluminium case
- **Gold plated contacts**: O-ring seals throughout
- **Inner borehole diameter**: 99 mm to 203 mm
- **Borehole install depth**: to 250 m (other options available)
- **Optional borehole install mechanism**: Spring-loaded jaw with passive slots or studs (>60 kg force)

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In the interests of continual improvement with respect to design, reliability, function or otherwise, all product specifications and data are subject to change without prior notice.

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