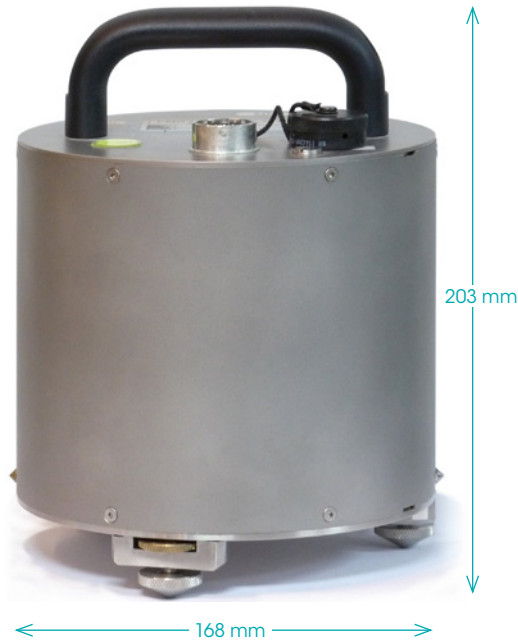


Güralp 40T



COMPACT, ROBUST BROADBAND SEISMOMETER



A rugged and robust, three-component, broadband seismometer.

The Güralp 40T is ideally suited for temporary and semi-permanent installations in areas with moderate noise levels.

Its high-gain feedback loop eliminates mechanical non-linearity (>90 dB) and minimizes resonances in the spring system (the lowest spurious vibration mode of the 40T is a barely measurable resonance at 450 Hz).

The stainless steel casing provides a high degree of protection in highly corrosive environments. A posthole instrument with waterproof connector is available for deeper deployments

Applications

- > Volcano monitoring
- > Local and regional seismic monitoring
- > National and local seismic networks
- > Microseismic monitoring
- > Passive seismic imaging

Images show the Güralp 40T broadband seismometer

Key features

True broadband force-feedback instrument

Direct velocity outputs

Self-contained in a highly robust steel case

Fully adjustable levelling feet

Low power consumption of just 780 mW

No mass locking required - plug in and go

High sensitivity (2000 V/ms^{-1}) and high dynamic range (151 dB at 5 Hz)

The 40T has a standard response of 60 seconds to 100 Hz making it highly suitable for seismic monitoring at local and regional scales

Lowest spurious vibration is a barely measurable resonance at 450 Hz

The active 40T sensor is also available as a 40TDE (www.guralp.com/documents/DAS-040-0004.pdf) which incorporates an integrated digitiser and data acquisition module.

SPECIFICATIONS

SYSTEM	
Technology	Force feedback (force-balance) velocity sensor
Configuration / Topology	Triaxial orthogonal (ZNE)
PERFORMANCE	
Velocity output band (flat response within -3 dB crossing points)	60 s (0.017 Hz) to 100 Hz standard 30 s (0.03 Hz) or 1 s to 100 Hz options available Contact Güralp to discuss other frequency response options
Output sensitivity	2000 V/ms ⁻¹ (2 x 1000 V/ms ⁻¹) differential standard output (full-scale clip level of 8.8 mm/s) Contact Güralp to discuss alternative high sensitivity (high gain) options
Peak full-scale output voltage	Differential: ±20 V (40 V peak-to-peak) Single-ended (e.g. mass positions): ±10 V (20 V peak-to-peak)
Self noise below NLNM (New Low Noise Model; Peterson, 1993, USGS)	7 s (0.15 Hz) to 4 Hz* *Independently tested value - see Tasic & Runovc (2012), Journal of Seismology
Sensor dynamic range (at standard output sensitivity)	148 dB @ 1 Hz 151 dB @ 5 Hz
Cross axis rejection	65 dB
Linearity	>90 dB
Lowest spurious resonance	450 Hz
Damping	70% of critical
Operating tilt range	±2.5°
MASS / MONITORING CONTROL	
Sensor Mass positions	Three independent sensor mass position outputs (single-ended)
Mass locking	No mass locking required
Mass centring / offset zeroing	Manually adjustable via screws located on lid
CALIBRATION	
Calibration input	Independent signal and enable lines exposed on sensor connector
CONNECTORS	
Analogue output	26-pin military specification bayonet connector Posthole option: 100 bar/10 MPa waterproof connector
POWER	
Power supply voltage	10–36 V DC*
Power consumption (at 12 V DC)	0.78 W
<i>*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.</i>	
PHYSICAL / ENVIRONMENTAL	
Operating temperature range	-20 to +75 °C
Operating humidity range	0-100% relative humidity
Enclosure ingress protection	IP68 - protection against effects of prolonged immersion at 3 m depth for 72 hours Posthole option: For deeper, long term immersion, the optional 100 bar/10 MPa waterproof connector is recommended
Enclosure material	Stainless steel case O-ring seals throughout
Diameter	168 mm
Height	With handle: 203 mm Without handle: 177 mm
Weight	7.1 kg
Alignment	Bubble level on lid; north arrow on handle and base; adjustable feet
SUPPORTING DOCUMENTATION	
Calibration values	Measured sensor sensitivity, frequency response, instrument poles and zeros enclosed
Full user's guide	Available online at: https://www.guralp.com/documents/MAN-040-0001.pdf