

## STS-6A

### 360s Borehole Seismometer New Ultra-High Performance Broadband Seismometer of the STS Family

In the 1980's researchers Streckeisen, Steim and Wielandt established standards for digital very broadband (VBB) seismic recording and the Streckeisen STS-1/VBB family of products was introduced to seismological research worldwide. The principles of VBB seismometry have defined research instrumentation since then.

The Streckeisen STS family have set the world standard for broadband seismometers for over 40 years. The legendary STS-1 and STS-2 surface sensors were followed in 2010 by the STS-2.5, and in 2014, the STS-5A expanded this family with a Borehole sensor system of equal performance and reliability.

Based on Streckeisen's field proven sensor technology the new STS-6A is designed to meet the latest USGS requirements for replacing the aging seismometers in the Global Seismographic Network (GSN) – the standard instrumentation for global research. The STS-6A for the first time combines ultra-low frequency and high-dynamic-range coverage across the entire teleseismic and regional frequency bands in a single instrument. The ability to deploy such an instrument in a quiet deep borehole environment opens previously untapped research opportunities.

The sensor provides a motorized gimbal system for in situ leveling and a direct interface to the Quanterra Q330 family of recording systems for control of both the sensor and gimbal systems. It is integrated within a cylindrical 6.0" downhole package, which includes magnetic shielding for operation at high latitudes.

No intervening "host box" is required. Remote control of advanced functions is supported through a bi-directional RS-422 serial interface. The serial interface is not required for typical operation. The sensor package and cabling have been designed to tolerate continuous immersion at depths of 300 meters.

The gimbal system is powered only during sensor deployment, removal or periodic re-leveling "in situ." When not in use, the gimbal and the internal controller are automatically de-powered completely.



## FEATURES

- STS-1 observatory-class ultra-low-noise performance in a borehole
- Automatic levelling system compensates for up to 5 deg tilt
- More than *double* the clip level of the STS-1. Low gain for highest dynamic range
- Bandwidth extends to 50Hz - far above the STS-1 with low noise
- Thermal and magnetic shielding for ultra-low-frequency performance
- Guaranteed orthogonal 3-axis outputs





## SPECIFICATIONS

<b>Generator constant:</b>	1,200 V/(m/s) $\pm$ 1%
<b>Response:</b>	Flat to ground velocity from 2.78mHz (360s) to 50Hz
<b>Clip level:</b>	$\leq$ 20Hz: $\pm$ 17mm/s ground velocity >20Hz: linearly derating from $\pm$ 17mm/s to $\pm$ 6.7mm/s ground velocity
<b>Normalized to frequency:</b>	20..50Hz 0.42g <sub>pp</sub> / 10Hz 0.21g <sub>pp</sub> / 1Hz 0.021g <sub>pp</sub> / 0.1Hz 0.0021g <sub>pp</sub> / 0.01Hz 0.00021g <sub>pp</sub>
<b>Seismic signals output: resistance per line</b>	max. $\pm$ 20V differential, 220 $\Omega$ serial
<b>Boom position output: resistance</b>	max. $\pm$ 10V single-ended, 1k $\Omega$ serial
<b>Calibration input:</b>	max. $\pm$ 3VDC
<b>Case tilt range limit:</b>	+/-5° in any direction
<b>Power supply voltage:</b>	10...30VDC, galvanically isolated
<b>Power consumption:</b>	Average: 0.9W, max. <2W
<b>Control inputs:</b>	3...30VDC, 0.5mA, galvanically isolated
<b>Communication:</b>	RS-422, galvanically isolated
<b>Operating temperature:</b>	-20°C to 70°C (guaranteed), 40°C to 70°C (functional)
<b>Humidity:</b>	0-100% RH
<b>Enclosure rating:</b>	Stainless steel, exceeds IP69
<b>Various:</b>	RoHS and CE Compliant
<b>Size:</b>	Diameter 6.0" (153 mm), Length 24.0" (610 mm)
<b>Weight:</b>	30kg

Specifications subject to change without notice