



STS-5A Broadband Borehole Sensor System

**Antelope User Group Meeting
Papagayo, Costa Rica
November 4 – 6, 2013**

Dr. Mathias Franke

Manager

Open Systems & Services

Kinometrics, Inc

www.kmioss.com



OPEN SYSTEMS & SERVICES
K I N E M E T R I C S

STS-5A Broadband Borehole Sensor System

Key Features:

- Proven Streckeisen sensor reliability & performance
- 145dB dynamic range
- 3 mutually-aligned components
- Motorized gimbal leveling
- Low power



STRECKEISEN STS-5A

STS-5A Sensor System

Around 1985 researchers Streckeisen, Steim and Wielandt established standards for digital very broadband seismic recording and the Streckeisen STS-1/VBB family of products was introduced to our community. The Streckeisen STS-2 and STS-2.5 have set the world standard for broad-band sensors. The growing family of Streckeisen products now includes a borehole sensor that will revolutionize the way seismologists deploy instruments and collect seismic data.



World-standard, Field-proven -
145db dynamic range -
3 Mutually-aligned components,
Motorized Gimbal Leveling - Low power

SPECIFICATIONS FOR STS-5A SENSOR SYSTEM

Introduction:

The STS-5A Borehole Sensor system comprises a Streckeisen triaxial seismic sensor and a motorized gimbal system for in situ leveling, integrated within a cylindrical 5.75" 00 downhole package. The sensor provides a direct interface to the Quanterra Q330 family of recording systems for control of both the sensor and gimbal systems. No intervening "host box" is required. Remote control of advanced functions is supported through a bi-directional RS-485 serial interface. The serial interface is not required for typical operation. The standard STS-5A comes with a 40 meter long downhole cable. The sensor package and cabling has been designed to tolerate continuous immersion at depths that far exceed 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 internal controller is automatically de-powered completely. The STS-5A performance and electrical characteristics are equivalent to the STS-2.5, which is designed for in-vault surface applications. The STS-5A brings extraordinary field-proven Streckeisen sensor reliability and performance to the downhole environment.

STRECKEISEN
SEISMIC INSTRUMENTATION
Daettlikonerstr. 5

CH-8422 Pfungen Switzerland

Phone +41(0)52 315 67 00 | Email: info@streckeisen.biz

metrozet
wetter

21143 Hawthorne Blvd. #456, Torrance, CA 90503

Phone: 866-823-0339

Email: sales@metrozet.com | www.metrozet.com

QUANTERRA
quanterra

2 Shaker Rd F200, Shirley MA 01464

Phone: 978-425-2100

Email: bkemp@quanterra.com

KEY SPECIFICATIONS:

Generator constant: $2 \times 750 \frac{\text{Vs}}{\text{m}} \pm 1\%$

Response: Flat to ground velocity from 8.33mHz (120s) to 50Hz

Clip level: $\leq 20\text{Hz}$: $\pm 13 \frac{\text{mm}}{\text{s}}$ ground velocity

$> 20\text{Hz}$: linearly derating from $\pm 13 \frac{\text{mm}}{\text{s}}$ to $\pm 5.3 \frac{\text{mm}}{\text{s}}$ ground velocity

Normalized to frequency:

20.50Hz 0.34g / 10Hz 0.17 / 1Hz 0.017g / 0.1Hz 0.0017g / 0.03Hz 0.00055g (g=9.81)

Typical no centering range: case tilt: $\pm 0.03^\circ$, Temperature: $\pm 25^\circ\text{K}$

Case tilt range limit: $\pm 5^\circ$ in any direction where a centering is successful

ENVIRONMENTAL:

Operating temperature: -20°C to 70°C (guaranteed), -40°C to 70°C (functional)

Humidity: 0-100% RH

TECHNICAL:

Power supply voltage: 10..30VDC, galvanically isolated

Power consumption: Average: 0.45W

Seismic signals output: max. $\pm 20\text{V}$ differential, 220Ω serial resistance per line

Boom position output: max. $\pm 10\text{V}$ single-ended, $1\text{k}\Omega$ serial resistance

Calibration input: max. $\pm 10\text{VDC}$

Control inputs: 3..30VDC, 0.5mA, galvanically isolated

Communication RS232, 9600Bd, galvanically isolated

PHYSICAL:

Enclosure Rating: Exceeds IP69

Various: RoHS and CE Compliant Unit

Size: Diameter 5.75" (146.1 mm) . Length 22.5" (571.5 mm)

STRECKEISEN
SEISMIC INSTRUMENTATION
Daettlikonerstr. 5

CH-8422 Pfungen Switzerland
Phone +41(0)52 315 67 00 | Email: info@streckeisen.biz

metrozet
wetterzet

21143 Hawthorne Blvd. #456, Torrance, CA 90503
Phone: 866-823-0339
Email: sales@metrozet.com | www.metrozet.com

QUANTERRA
QUANTERRA

2 Shaker Rd F200, Shirley MA 01464
Phone: 978-425-2100
Email: bkemp@quanterra.com