

TRILLIUM 120

SLIM POSTHOLE SEISMOMETER

Nanometrics industry-leading Trillium 120-class posthole seismometer in a slim form-factor of just 104 mm, ideal for use in new or existing narrow, cased boreholes. The Slim Posthole provides a small, light and ultra low power instrument in a durable stainless steel enclosure with a high pressure marine grade connector.

Local, regional & teleseismic studies

The Trillium 120 Slim Posthole is a very broadband seismometer ideal for local, regional and teleseismic studies, having a response of flat to velocity from 120 seconds to 150 Hz and exceptionally low self-noise. Operators will appreciate the low power consumption, remote mass centering and robust no-mass lock design inherent in all Trillium Seismometers. Its many simple-to-use features, such as automatic mass centering that can be remotely initiated, and digital case tilt reporting make for fast and successful installation every time.

Real-Time Tilt and Azimuth Correction

The Slim Posthole has a $\pm 4^\circ$ mass-centering range permitting installations in downhole deployments that are up to 4° from vertical. When used with the Centaur Digital Recorder, an innovative real-time tilt and azimuth correction feature permits the digitizer to correct for any tilt and misalignment at the source, eliminating the need for correction downstream.

Hole-lock Accessory for Borehole Applications

The Slim Posthole can also be paired with Nanometrics' hole-lock accessory kit which is available in 4 different sizes and features a robust stainless steel enclosure and spring actuated hole-lock mechanism.

Also available:

- Trillium Borehole 120 and Trillium Horizon for vault or shallow direct bury



*Polar Certified Model available for
operating temperatures down to -50°C*



Benefits

- A robust, waterproof, stainless steel enclosure ensures the sensor is protected from harsh environments
- Ultra low power consumption of 230 mW minimizes power source requirements at the site
- Tilt tolerance of 0 to 4° from vertical
- True vertical data provided by the Centaur digitizer, informed by Trillium's integrated tilt sensor
- Quiet down-hole deployments benefit from exceptional self-noise (see graph p.2)
- Automatic mass centering that can be remotely initiated

TECHNICAL SPECIFICATIONS TRILLIUM 120 SLIM PH

Specifications subject to change without notice. Refer to User Guide for detailed and comprehensive specifications.

SEISMOMETER

TECHNOLOGY

Topology: Symmetric triaxial

Feedback: Force balance with capacitive transducer

Mass Centering: Automatic motorized re-centering, can be remotely initiated

LEVELING & ALIGNMENT

Digital Bubble Level: Graphical bullseye level is available via Centaur digital recorder GUI

Alignment: Case-top north-south guide for straight-edge, line, or laser level; Vertical scribe marks for north and south on base

Digital Tiltmeter: Reports case tilt from vertical for easy installation and remote troubleshooting when using Centaur digital recorder

PERFORMANCE

Self-noise: See plot

Sensitivity: (Nominal) 1200 V-s/m; (Actual) 1202.5 V-s/m $\pm 0.5\%$

Accuracy: $\pm 0.5\%$ relative to User Guide specification

Bandwidth: -3 dB points at 120 s and 150 Hz

Clip Level: 16.6 mm/s up to 10 Hz and 0.12 g above 10 Hz

Dynamic Range: 168 dB @ 1 Hz

Oper. Tilt Range: 0° to 4° from vertical

Temperature: $\pm 45^\circ\text{C}$ without re-centering

Magnetic Sensitivity: 1 (m/s²)/T (Standard Model)
<0.03 (m/s²)/T (Polar Certified & Magnetic Shield Models)

AVAILABLE MODELS

T120-SPH2: Standard Model

T120-SPH2-XC: Polar Certified Model, Magnetic Shield

T120-SPH2-M: Standard Model, Magnetic Shield

INTERFACE

Connector: 20-pin marine

Velocity Output: 40 V peak-to-peak

- Selectable XYZ or UVW mode

Mass Position Output: Three independent $\pm 4\text{V}$ outputs for UVW

Calibration Input: Single voltage input for all channels, single calibration enable pin for all channels

- Calibration in XYZ or UVW
- Independent channel selection by serial port

Control Lines: Mass Center, Calibration Enable, XYZ/UVW mode

Serial Port:

- RS-232 compatible serial IP (SLIP) with onboard HTTP web server to select sensor operating modes, to mass center, and to access state-of-health, virtual level bubble, firmware updates and metadata
- Plug-and-Play automated workflow interface to select sensor operating modes, and to access state-of-health, virtual level bubble and metadata

POWER

Supply Voltage: 9 to 36 Volts DC isolated input

Power Consumption: 230 mW typical quiescent

Protection:

- Reverse-voltage and over-voltage protected
- Self-resetting over-current protection

PHYSICAL

Case Design: Stainless steel pressure vessel

Diameter: 104 mm (Standard Model)

106 mm (Polar Certified & Magnetic Shield Models)

Height: 444 mm (Standard Model)*

455 mm (Polar Certified & Magnetic Shield Models)*

*Not including handle

Weight: 10 kg (Standard Model)

~11.5 kg (Polar Certified & Magnetic Shield Models)

Hoisting Attachment Point: Handle on lid for lifting cable 1500 lb rated

ENVIRONMENTAL

Operating Temperature:

-20°C to +70°C (Standard & Magnetic Shield Models)

-50°C to 60°C (Polar Certified Model)

Storage Temperature:

-40°C to +70°C (Standard & Magnetic Shield Models)

-60°C to +70°C (Polar Certified Model)

Shock: 20 g half sine, 5 ms without damage, 6 axis

- No mass lock required for transport

Humidity: 0% to 100% (submersible)

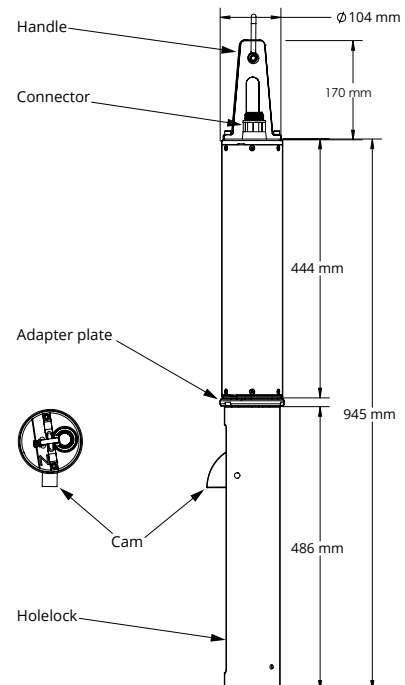
Pressure: Enclosure optimized to be insensitive to atmospheric variations

Depth of Deployment: 500m for a dry, cased or partially water-filled hole

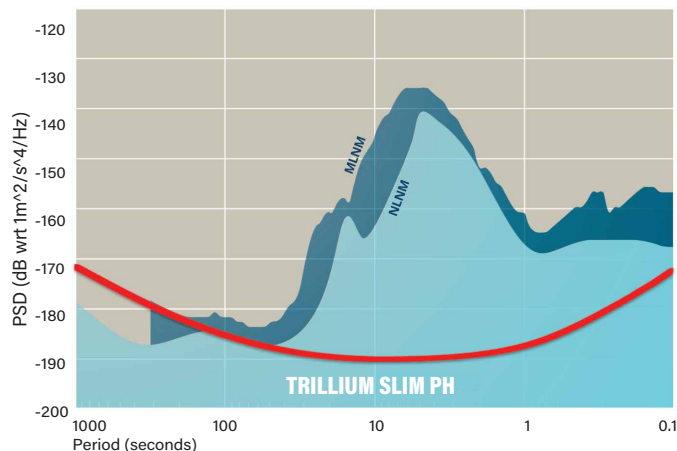
Ingress Protection: Seismometer is rated to IP68 and NEMA6P to 300 m for prolonged immersion

SLIM PH WITH OPTIONAL HOLE-LOCK FOR BOREHOLE APPLICATIONS

(Standard Model shown)



SELF-NOISE GRAPH



Seismometer self-noise plotted against NLNM (after Peterson, 1993) and MLNM (after McNamara and Buland, 2004)

Contact a product expert Toll Free: 1 855 792 6776 | sales_mkt@nanometrics.ca



Listening to the Earth

3001 Solandt Road, Kanata, Ontario, Canada K2K 2M8 | Tel: +1 613 592 6776