TRILLIUM 120
POSTHOLE SEISMOMETER

Nanometrics' industry-leading portfolio of Trillium seismometers includes a posthole variant that is revolutionizing the way seismologists deploy instruments and collect seismic data.

Reliability, repeatability, outstanding performance

The **Trillium Posthole Seismometer** is a very broadband seismometer designed for down-hole deployments. The instrument is housed in a stainless steel enclosure incorporating a high-pressure, marine-grade connector making it suitable for uncased buried/posthole installations. An advanced leveling system allows the instrument to self-correct over a tilt range of ±5 degrees (±10 degrees optional).

Local, regional & teleseismic studies

The Trillium PH is ideal for local, regional and teleseismic studies having a response flat to velocity from 120 seconds to 150 Hz and exceptionally low self-noise. Operators will appreciate the low power consumption, automatic mass centering and robust no-mass lock design inherent in all Trillium seismometers.

A highly integrated station solution

When using the Trillium 120 PH with our popular Centaur digitizer, you'll have access to a digital leveling bubble through the Centaur GUI. The virtual leveling bubble makes for easy leveling down a dark hole, or once buried, gives you the ability to check levelness at any time.

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

Trillium PH

Benefits

- The ability to get beneath the noise, even in urban environments, and keep your assets secure.
- Automatic leveling can be remotely initiated for corrections of up to ±5 degrees (±10 degrees optional), simplifying down-hole installation.
- The axis stack is mechanically leveled to ensure that the vertical axis does not couple horizontal noise.
- A robust, waterproof, stainless steel enclosure ensures the sensor is protected from hostile environments.
- Cylindrical down-hole design with 5.6 inch outside diameter facilitates buried deployments.
- Low power consumption of 490 mW minimizes power source requirements at the site.

TECHNICAL SPECIFICATIONS TRILLIUM 120 PH

Specifications subject to change without notice

TECHNOLOGY

Topology: Symmetric triaxial
Feedback: Force balance with capacitive transducer
Self-Leveling: Internal automated leveling ±5° (±10° optional)
Leveling Initiation: Control line or serial port command
Mass Centering: Motorized recentering automatically initiated during leveling sequence
Alignment: N-S line on cover for down-hole sighting
- Keying features for down-hole alignment rod
- N-S marks on base for pier installation

Digital tiltmeter: Reports case tilt from vertical for easy installation and remote troubleshooting

PERFORMANCE

Self-noise: See plot below
Nominal Sensitivity: 1200 V-s/m (reference User Guide for precise value)
Precision: ±0.5% relative to User Guide specification
Bandwidth: -3 dB points at 120 s and 150 Hz

PERFORMANCE *(CONT'D)*

Clip Level: 16.6 mm/s up to 10 Hz and and 0.12 *g* above 10 Hz
Dynamic Range: > 167 dB @ 1 Hz
Temperature: ±45°C without recentering

INTERFACE

Connector: 20-pin marine
Velocity Output: 40 V peak-to-peak differential
- Selectable XYZ or UVW mode

Mass Position Output: Three independent ±4 V outputs
Calibration Input: Single voltage input for all channels, independent calibration enable for each channel
- Calibration in XYZ or UVW

Control Lines: Auto-level & Mass Center, Calibration Enable, XYZ/UVW mode
Serial Port: RS-232 compatible serial IP (SLIP)
- Onboard web server standard HTTP
- For enhanced instrument control and status: Self-leveling and mass centering, UVW/XYZ mode, short/long period mode, firmware updates, temperature, mass position, case tilt, digital bubble level, serial number and factory info

POWER

Supply Voltage: 9 to 36 Volts DC isolated input
Power Consumption: 490 mW typical at 15 V input
Protection:
- Reverse-voltage and over-voltage protected
- Self-resetting over-current protection

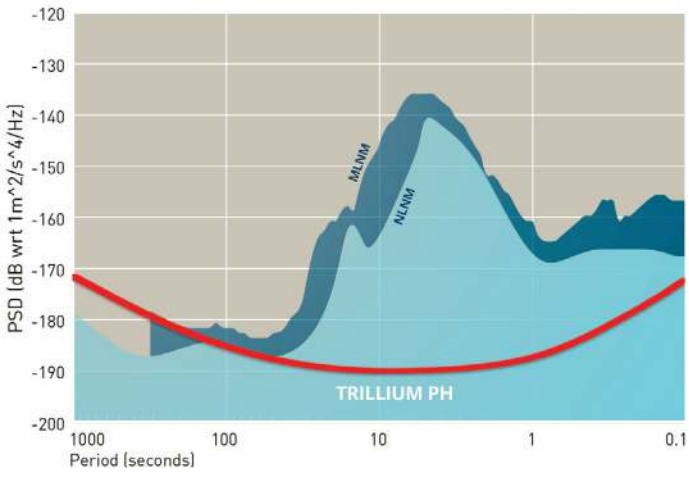
PHYSICAL

Case Design: Stainless steel pressure vessel
Diameter: 143 mm
Height: 432 mm not including connector or feet
Weight: 15.5 kg
Handling: Eye bolt on lid for lifting cable
- 1300 lbf (5800 N) rated

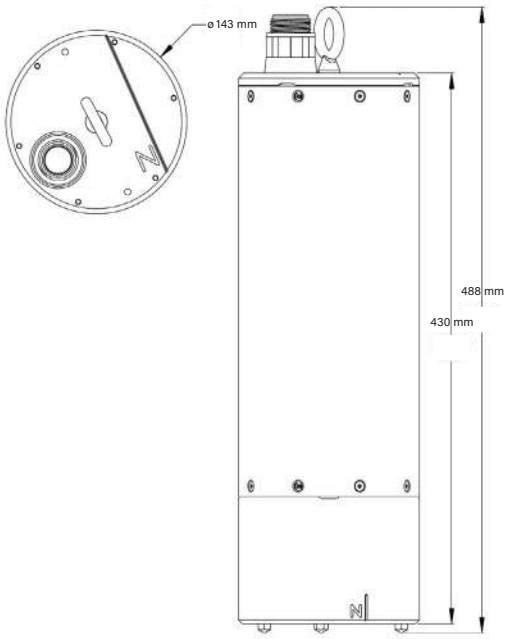
ENVIRONMENTAL

Operating Temperature:
–20°C to 60°C (Standard Model)
–50°C to 60°C (Polar Certified Model)
Storage Temperature: -40°C to +70°C
Ingress Protection: Rated to IP68 and NEMA6P to 300 m for prolonged immersion. A dry hole is recommended for best seismic performance
Shock: 20 *g* half sine, 5 ms without damage, 6 axis
- No mass lock required for transport

SELF-NOISE PERFORMANCE PLOT



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



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