TRILLIUM 120
POSTHOLE SEISMOMETER

Ideal for local, regional, and teleseismic studies, the **Trillium 120 Posthole Seismometer** minimizes onsite power system requirements while providing exceptionally low-noise performance. This easy to deploy instrument makes it possible to efficiently reach quiet down-hole installations that can take advantage of the observatory class performance.

Designed for Down-Hole Deployments

The Trillium 120 Posthole's corrosion resistant, stainless steel enclosure features a high-pressure, marine-grade connector making it suitable for a range of uncased buried and posthole installations. The advanced levelling system allows the instrument to self-correct over a tilt range of ±5 degrees (±10 degrees optional) to ensure a successful down-hole deployment at any site.

Exceptional Performance and Reliability

The Trillium 120 Posthole provides a flat response to velocity from 120 seconds to 150 Hz with an exceptionally low self-noise, maximizing the dynamic range over the passband and providing a more reliable data output.

Complete Station Solutions

The Trillium 120 seismometer series is optimized for use with our popular Centaur digital recorder. Pairing the Trillium 120 with a Centaur provides a range of added functionality including quick and easy configuration of the station and digital leveling tools via the intuitive web-based user interface.

TrilliumPH

Key Features

- Low-power consumption of 230 mW minimizes power system requirements at the site.
- 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 harsh environments.
- Robust design doesn't require a mass lock providing reliable, trouble-free operation
- Also available: Trillium 120 Borehole, Trillium 120 Slim Posthole, and Trillium Horizon for vault or shallow direct bury
- Polar Certified model available for operating temperatures down to -50°C.

TECHNICAL SPECIFICATIONS TRILLIUM 120 POSTHOLE

Specifications subject to change without notice

TECHNOLOGY

Topology: Symmetric triaxial
Feedback: Force balance with capacitive transducer
Self-Leveling: Internal automated leveling ±5º (±10º optional)
Leveling Initiation: Control line or serial port command
Mass Centering: Motorized recentering automatically initiated during leveling sequence

LEVELING & ALIGNMENT

Digital Bubble Level: Graphical bullseye level is available via Centaur digital recorder Web interface
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
Sensitivity: (Nominal) 1200 V•s/m; (Actual) 1202.5 V•s/m ±0.5%
Accuracy: ±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
Operating Tilt Range: ±5º
Temperature: ±45°C without recentering
Magnetic Sensitivity: <0.03 $(m/s^2)/T$ (model T120-PH3-XC)

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 with one active-high control signal for all channels
- Calibration in XYZ or UVW
- Individual channels selectable via web interface

Control Lines: Auto-Level & 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, submersible
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

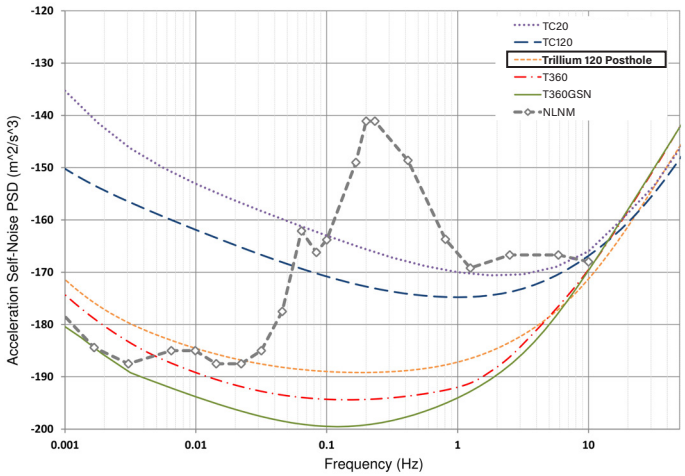
ENVIRONMENTAL

Operating Temperature:
–20°C to 60°C (Standard Model)
–50°C to 60°C (Polar Certified Model)
Storage Temperature:
–40°C to +70°C (Standard Model)
–60°C to +70°C (Polar Certified Model)
Ingress Protection: Rated to IP68 and NEMA6P to 300 m for prolonged immersion. A dry hole is recommended for best seismic performance
Humidity: 0% to 100% (submersible)
Shock: 20 *g* half sine, 5 ms without damage, 6 axis
- No mass lock required for transport

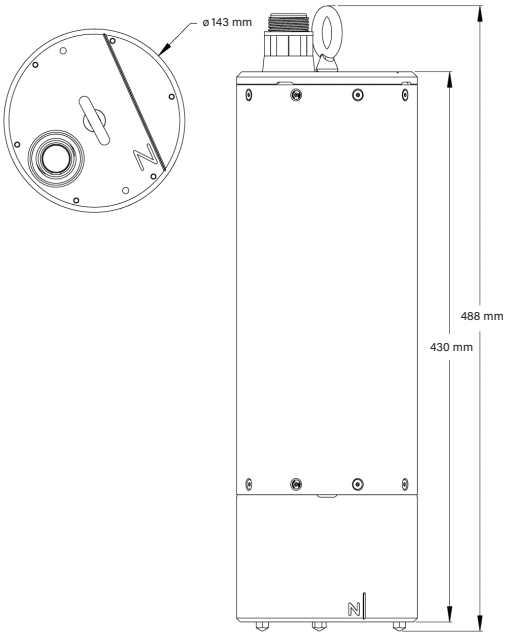
AVAILABLE MODELS

T120-PH3: 5 degree Standard Model
T120-PH3-XC: 5 degree, Polar Certified Model
T120-PH4: 10 degree Standard Model
T120-PH4-XC: 10 degree Polar Certified Model

SELF-NOISE GRAPH



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



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Listening to the Earth

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