



# 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 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.



### Key Features

- Low-power consumption of 230 mW minimizes power system requirements at the site.
- A waterproof, submersible stainless steel enclosure ensures the sensor is protected from harsh environments.
- Automatic leveling can be remotely initiated for corrections of up to  $\pm 5^\circ$  or  $\pm 10^\circ \pm 1^\circ$  (depending on the model), simplifying down-hole installation
- The axis stack is mechanically leveled to ensure that the vertical axis does not couple horizontal noise.
- 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  $-50^\circ\text{C}$



# 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  
**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  $\pm 0.5\%$   
**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  
**Operating Tilt Range:**  $\pm 5^\circ$  or  $\pm 10^\circ \pm 1^\circ$  (model-dependent)  
**Temperature:**  $\pm 45^\circ\text{C}$  without recentering  
**Magnetic Sensitivity:**  $<0.03 (\text{m/s}^2)/\text{T}$   
(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  $\pm 4$  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:

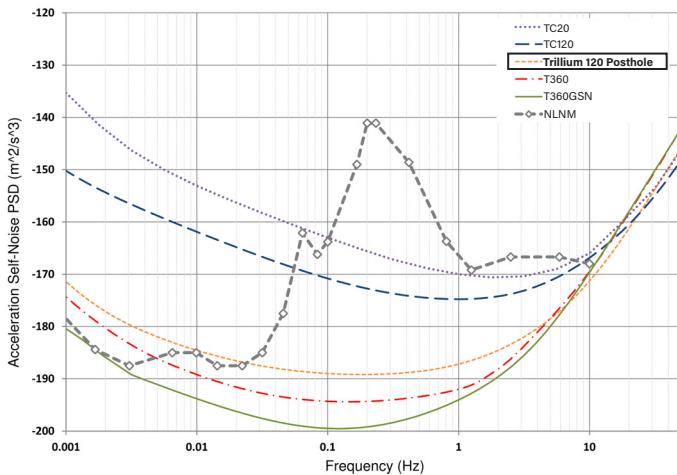
- RS-232 compatible serial IP (SLIP) with onboard HTTP web server to select sensor operating modes, to mass center, and to access state-of-health, virtual level bubble, firmware updates and metadata
- Plug-and-Play automated workflow interface to select sensor operating modes, and to access state-of-health,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

## POWER

**Supply Voltage:** 9 to 36 V DC isolated input  
**Power Consumption:** 230 mW typical quiescent  
**Protection:**

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

## SELF-NOISE GRAPH



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

## PHYSICAL

**Case Design:** Stainless steel pressure vessel, submersible  
**Diameter:**

- 143 mm ( $\pm 5^\circ$  Model)
- 172 mm ( $\pm 10^\circ \pm 1^\circ$  Model)

**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

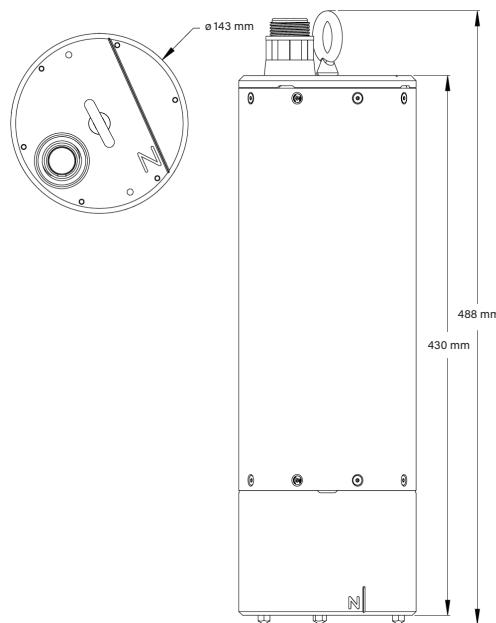
## ENVIRONMENTAL

**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:** Standard Model 143 mm  
**T120-PH3-XC:** Polar Certified Model 143 mm  
**T120-PH4:** Standard Model 172 mm  
**T120-PH4-XC:** Polar Certified Model 172 mm



Note: Figure depicts the TH120-PH3 model

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