



TRILLIUM COMPACT PH

POSTHOLE SEISMOMETER

Small and easy to deploy, the Trillium Compact Posthole seismometer is ideally suited for a variety of onshore downhole deployments in challenging environments, including shallow direct bury and cased postholes. The low power sensor features a rugged, stainless steel enclosure and waterproof connector and is offered in 120s broadband and 20s short period variants.

Quality data within minutes

The exceptionally small size and the fact that no mass lock and no mass centering is needed significantly reduces the time and effort required for site preparation and installation. No further intervention is required for continuous quality data within minutes of deployment.

Ensure Deployment and Experiment Success

The Trillium Compact PH is ideal for those who don't want their experiments to be limited – by a complex deployment of bulky instrumentation, by the overburden by the effects of moisture, by thermal instability, by high power consumption or by installation technique.

No vault required

This rugged seismometer features a stainless steel enclosure with waterproof connector and rating to IP68 for full submersion in water. The Trillium Compact Posthole is ideal for a variety of onshore downhole installations, including shallow, direct burial and deep postholes – even in arid, polar or wet environments.

Ultra-low power consumption

Both variants of the Trillium Compact PH – the 120s and 20s – boast ultra-low power consumption, at <180 mW and <195 mW respectively. And the optional transport case doubles as a thermal insulating cover for surface deployments.

Downhole leveling simplified

When using the Trillium Compact PH with the Centaur Gen5 data logger, a digital levelling bubble can be accessed through the Centaur GUI. The virtual leveling bubble makes for easy leveling down a dark hole, or once buried, provides the ability to check levelness at any time.



 **Trillium**
CompactPH

The Trillium Compact PH is rugged enough to be buried directly in an ice shelf and light enough for easy portability to a mountain deployment.

Available in both 120s broadband and 20s short period variants.



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

TECHNICAL SPECIFICATIONS TRILLIUM COMPACT PH

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

TECHNOLOGY

Topology: Symmetric triaxial
Feedback: Force balance with capacitive transducer
Mass Centering: Not required

SEISMOMETER MODULE PERFORMANCE

Self-noise: See self-noise graph
Nominal Sensitivity: 750 V-s/m (reference User Guide for precise value)
Precision: $\pm 0.5\%$ relative to User Guide specification
Bandwidth/120s: -3 dB points at 120 s and 108 Hz
Bandwidth/20s: -3 dB points at 20 s and 108 Hz
Clip level: 26 mm/s up to 10 Hz and 0.17 g above 10 Hz
Oper. Tilt Range/120s: $\pm 2.5^\circ$
Oper. Tilt Range/20s: $\pm 10^\circ$
Parasitic Resonances: None below 200 Hz
Dynamic Range/120s: 159 dB @ 1 Hz
Dynamic Range/20s: 156 dB @ 1 Hz

LEVELING AND ALIGNMENT

Digital bubble level: Graphical bullseye level is available via Centaur digital recorder GUI
Physical Bubble level: Optional accessory
Alignment: Vertical scribe marks for (N and S); precision guide in cover for straight-edge, line, or laser level

INTERFACE

Connector: 16-pin, marine SubConn, top-mounted (for models TC120-PH2-XH, TC20-PH2-XH) SubConn MCBH16MNM (for all other models) SubConn MCBH16MSS
Velocity Output: 40 V peak-to-peak differential
• Selectable XYZ or UVW mode
Mass Position Output: Single ± 4 V output representing maximum mass position
• 3-channel mass positions available through serial port
Calibration Input: Single voltage input and one active high control signal to enable all 3 channels
• Remote calibration in XYZ or UVW mode
• Independent channel selection by serial port
Control Lines: Cal. Enable or Long/Short Period mode, XYZ/UVW mode
Serial Port:
• RS-232 compatible serial IP (SLIP) with onboard HTTP web server to select sensor operating modes, 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

AVAILABLE MODELS

TC120-PH2: 120 second Standard Model
TC120-PH2-XC: 120 second Polar Certified Model
TC120-PH2-XH: 120 second Plastic Connector
TC20-PH2: 20 second Standard Model
TC20-PH2-XC: 20 second Polar Certified Model
TC20-PH2-XH: 20 second Plastic Connector

Accessories:

- **T-CHL2:** Compact Holelock for 141 mm - 174 mm Borehole

POWER

Supply Voltage: 9 to 36 VDC isolated input
Power Consumption:
• 180 mW typical (model TC120-PH2)
• 220 mW typical (model TC20-PH2)
Protection: Reverse-voltage and over-voltage protected
• Self-resetting over-current protection

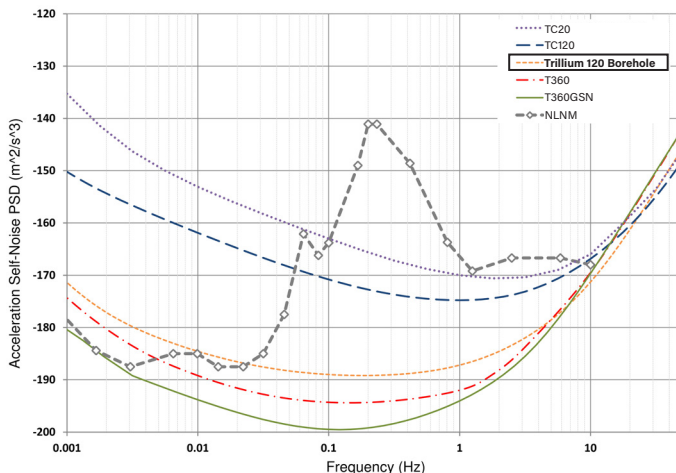
PHYSICAL

Diameter: 97 mm
Height:
• Body & connector: 160 mm
• On fixed studs: 167 mm
Weight/120s: 3.2 kg
Weight/20s: 3.2 kg
Housing: Stainless steel, resistant to corrosion, scratches & chips

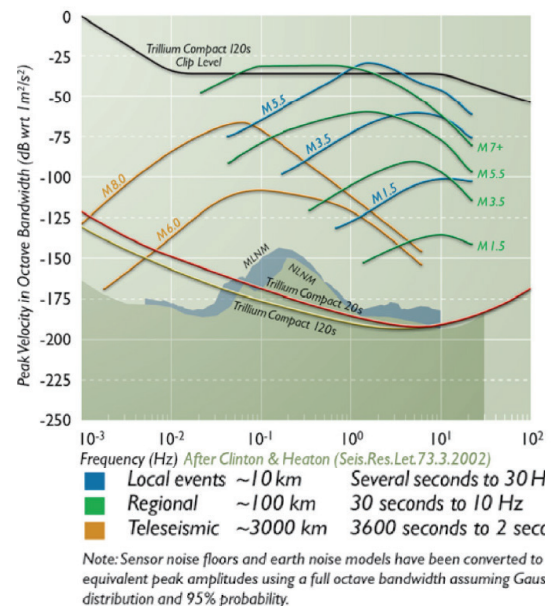
ENVIRONMENT

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)
Shock:
• 100 g half sine, 5 ms without damage, 6 axes
• No mass lock required for transport
Magnetic: Insensitive to natural variations of the earth's magnetic field
Depth of Deployment: 500m for a dry, cased or partially water-filled hole
Ingress Protection: Rated to IP68 to 300 m for prolonged immersion
Humidity: 0% to 100% (submersible)

SELF-NOISE GRAPH



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



Note: Sensor noise floors and earth noise models have been converted to equivalent peak amplitudes using a full octave bandwidth assuming Gauss distribution and 95% probability.

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



Listening to the Earth

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