CASCADIA 120 SLIM POSTHOLE

THE BEST OF BOTH WORLDS

The combined strong and weak motion capabilities of the Cascadia series, now with a higher dynamic range.

The latest addition to the popular Cascadia series of single cased instruments, the Cascadia 120 Slim Posthole, combines the ultra low-noise of the Trillium 120 Slim Posthole seismometer with the high clip level of the Class A Titan accelerometer.

This dual output, ultra-wide dynamic range sensor can be deployed in boreholes as narrow as 104 mm to measure both strong motion and weak motion, with absolutely no compromise in performance. With one hole to dig, a single connector, a single cable and sensor that are guaranteed to be mutually aligned, proper deployment is virtually effortless.

Don't let your data be limited by your instrumentation

The Cascadia maximizes the scientific return on your investment by providing the richest possible data catalog to facilitate local and teleseismic studies. While you are monitoring for strong motion events, your instruments provide a valuable source of weak motion data that helps calibrate and train event detection algorithms, as well as benefit the broader seismology community.

A highly integrated station solution

The Cascadia series is optimized for use with our popular Centaur digital recorder. When used with the Centaur Digital Recorder, 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. The Centaur allows for easy configuration of both sensors via the Centaur's web interface. You'll have full access to extended state-of-health data, including sensor inclinations, temperature and more. A digital leveling bubble in the Centaur GUI makes for easy leveling down a dark hole and gives you the ability to check levelness at any time once the instrument is buried.

Use Cases

- Earthquake Early Warning
- Structural Monitoring
- Volcano Monitoring
- Local/Regional Teleseismic Monitoring and Modelling
- Aftershock Monitoring

Cascadia

- Highly portable, easy to install, no vault required
- Will never go off scale
- Ideally suited for applications where the amplitude range is unpredictable
- Features a digital bubble level for easy downhole levelling
- Suitable for harsh environments, resistant to flooding
- Minimal site footprint
- Low cost of deployment/low cost of ownership

Ask us about our ultra-low temperature options

nanometrics

nanometrics.ca

TECHNICAL SPECIFICATIONS CASCADIA SLIM 120 POSTHOLE

Specifications subject to change without notice

SEISMOMETER MODULE TECHNOLOGY

Topology: Symmetric triaxial
Feedback: Force balance with capacitive displacement transducer
Mass Centering: Automatic motorized recentering, can be remotely initiated

SEISMOMETER PERFORMANCE

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 corners 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
Output Impedance: 2 x 75 Ω±1%
Temperature Sensitivity: ±45°C without recentering
Oper. Tilt Range: 0° to 4° from vertical

ACCELEROMETER MODULE TECHNOLOGY

Topology: Triaxial, horizontal-vertical
Feedback: Force balance with capacitive displacement transducer
Centering: Electronic offset zeroing via user interface or control line
Full-scale Range: Electronically selectable range: ±4 *g*, ±2 *g*, ±1 *g*, ±0.5 *g*, and ±0.25 *g* (peak)
Sensitivity accuracy: ±0.5%

ACCELEROMETER PERFORMANCE

Bandwidth: DC to 430 Hz (-3 dB point)
Dynamic Range:
166 dB @ 1 Hz over 1 Hz bandwidth
155 dB, 3 to 30 Hz
Output Impedance: 2 x 100 Ω
Offset: Electronically zeroed to within ±0.005 *g*
Linearity: 0.015% typical non-linearity and harmonic distortion
Hysteresis: Less than 0.005% of full-scale
Cross-axis Sensitivity: Less than 0.5% total
Offset Temperature Coefficient:
- Horizontal sensor: 60 µg/°C, typical
- Vertical sensor: 320 µg /°C, typical

LEVELING AND ALIGNMENT

Digital Bubble Level: Graphical bullseye level is available via Centaur digital recorder Web interface
Physical Bubble level: optional accessory
Alignment: North line on top cap; realtime azimuth correction with Centaur digital recorder
Digital Tiltmeter: Reports case tilt from vertical for easy installation and remote troubleshooting when using Centaur digital recorder

AVAILABLE MODELS

TTC120-SPH1: Cascadia 120 Slim Posthole

HARDWARE INTERFACE

Connector:
- 26-pin connector
- Submersible
- Glenair 802-013-07Z110-26EA
- Mounted in top of case

Calibration inputs:
- Single voltage input and one control signal to enable all three seismometer channels
- Single voltage input and one control signal to enable all three accelerometer channels

Seismometer Control Lines: Mass Center, Calibration Enable, XYZ/UVW mode
Seismometer Velocity Output:
- Selectable XYZ (east, north, vertical) or UVW mode
- 40 V peak-to-peak differential

Seismometer Mass Position Output:
Three independent ±4 V outputs for UVW
Accelerometer Acceleration Output:
40 Vpp differential
Accelerometer Control Input:
Single control signal can be configured to initiate auto-zero, or enable calibration

DIGITAL COMMAND AND CONTROL INTERFACE

Serial Port (Seismometer Module):
- 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

Serial Port (Accelerometer Module):
RS-232 compatible serial IP (SLIP)
- Gain range selection, auto-zero, or set to specific offset, self-test, calibration enable, firmware updates, sampled XYZ outputs (in volts and g), temperature, serial number and factory info

Seismometer State-of-Health Outputs:
- Independent mass position values
- Instrument temperature
- Output modes (XYZ/UVW, long period/ short period)
- Case tilt angle and X and Y dip angles

Accelerometer Data Outputs:
- Sampled XYZ outputs (in volts and *g*)
- Instrument temperature
- Trimmer settings
- Instrument serial number
- Hardware assemblies and firmware revisions

POWER

Supply Voltage: 9 to 36 V DC isolated inputs
Power Consumption:
- (Seismometer Module) 230 mW typical quiescent
- (Accelerometer Module) 1.1 W typical quiescent

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

Isolation: Supply power is isolated from signal ground

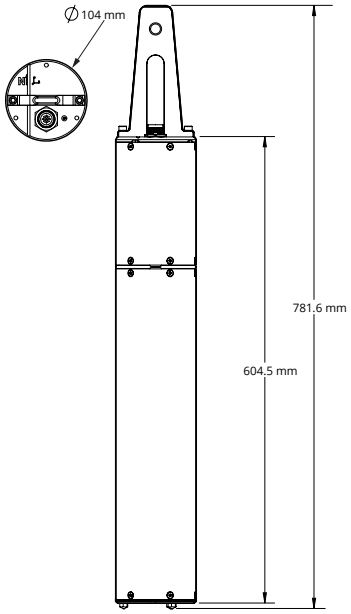
PHYSICAL

Diameter: 104 mm
Height: 604.5 mm, not including handle
Weight: 14 kg
Housing: Stainless steel pressure vessel
Handling: Handle on lid for lifting cable 1500 lb rated

ENVIRONMENT

Operating Temperature: –20°C to 60°C
Storage Temperature: –40°C to 70°C
Pressure: Enclosure designed to be insensitive to atmospheric variations
Humidity: 0% to 100% (submersible)
Shock:
- 20 *g* half sine, 5 ms without damage, 6 axes
- No mass lock required for transport

Ingress Protection: Rated to IP68 and NEMA6P to 300 m for prolonged immersion.



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Listening to the Earth

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