

Instruction Sheet

Triaxial Borehole Geophone for the Minimate Pro4™/Minimate Pro6™ Monitoring Units

The Triaxial Borehole Geophone is designed to be lowered into a borehole to measure vertical, transverse, and longitudinal ground vibrations.

Choose between the four channel Minimate Pro4 base unit and the six channel Minimate Pro6 base unit and configure it to operate with a Triaxial Borehole Geophone that complies with one of the following industry standards:

- International Society of Explosives Engineers (ISEE-2017)
- Deutsches Institut für Normung (DIN 45669-1)

Benefit from the High Frequency Borehole (This is an Advanced sensor and requires THOR Advanced software) for measuring high frequencies up to 1,000 Hz with velocities up to 2540 mm/s (100 in/s).

Tools and Materials Required

- Minimate Pro4 monitoring unit (P/N: 720A2301) or
- Minimate Pro6 monitoring unit (P/N: 720A2401)
- Extension cables, as required
 - 30 m (100 ft) (P/N: 720A3301)
 - 75 m (250 ft) (P/N: 720A3302)
 - Custom Length (P/N: 301-000034-000)
 - Custom Cable Connector Assembly (P/N: 720A3305)
- THOR Advanced software (only for HF Borehole). . (P/N: 72300201)
- Steel cable to position the geophone into the borehole (third party)



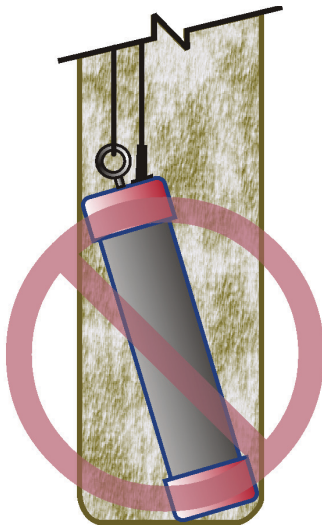
Specifications

	BOREHOLE ISEE	BOREHOLE DIN	HIGH FREQUENCY BOREHOLE
PART NUMBER	720A5601	720A5701	720A5801
RESPONSE STANDARD	ISEE - 2017	DIN 45669-1 CLASS 1	N/A
FREQUENCY RANGE	2 - 250 Hz	1 - 315 Hz	30 - 1,000 Hz
VELOCITY RANGE	Up to 254 mm/s (10 in/s)	Up to 254 mm/s (10 in/s)	2540 mm/s (100 in/s)
RESOLUTION	0.00788 mm/s (0.00031 in/s)	0.00788 mm/s (0.00031 in/s)	0.0788 mm/s (0.0031 in/s)
TRIGGER LEVELS	0.127 - 254 mm/s 0.005 - 10 in/s	0.127 - 254 mm/s 0.005 - 10 in/s	1.27 - 2540 mm/s (0.05 - 100 in/s)
SAMPLE RATE	up to 4,096 S/s (Compliance) up to 65,536 S/s (Advanced)	up to 4,096 S/s (Compliance) up to 65,536 S/s (Advanced)	up to 65,536 S/s (Advanced)
SENSOR DENSITY	1.73 g/cc (108 lbs/ft³)	1.73 g/cc (108 lbs/ft³)	1.73 g/cc (108 lbs/ft³)
CABLE LENGTH	30 m (100 ft)	30 m (100 ft)	30 m (100 ft)
MAXIMUM CABLE LENGTH	75 m (250 ft)	1,000 m (3,280 ft)	1,000 m (3,250 ft)
SENSITIVITY	0.0126874 V/mm/s (0.32226 V/in/s)	0.0126874 V/mm/s (0.32226 V/in/s)	0.00126874 V/mm/s (0.032226 V/in/s)
REQUIRED SOFTWARE	THOR Compliance	THOR Compliance	THOR Advanced

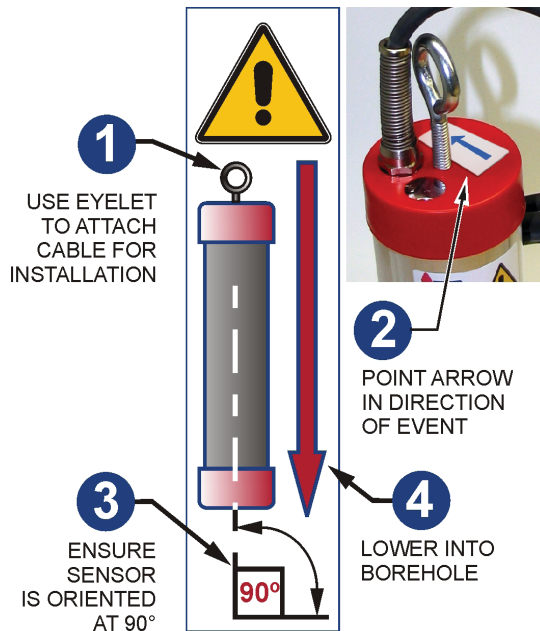
Physical Installation

Installing the Triaxial Borehole Geophone requires a minimum borehole diameter of 76.2 mm (3 inches).

1. Thread a steel cable through the Triaxial Borehole Geophone's mounting eyelet bolt and bind securely.
Note: DO NOT use the connecting cable to lower or raise the geophone as this may damage the cable.
2. Point the arrow located on the top of the geophone in the direction of the event.
3. Maintain this orientation while lowering into the borehole and ensure that the geophone is at a 90° angle.
4. Once positioned, connect the Triaxial Borehole Geophone cable and run a sensor check.
(Not available for the High Frequency Borehole Geophone advanced sensor.)
5. Maintaining the geophone's 90° angle, carefully fill in the hole with cement, grout, or sand to secure its orientation.
6. Repeat the sensor check to ensure the sensor has not moved and all channels still pass the test.



**✗ INCORRECT
INSTALLATION**



**✓ CORRECT
INSTALLATION**

Monitoring Unit Setup

All borehole geophones may be used in both Compliance or Advanced modes of operation (The High Frequency Borehole Geophone must have a THOR Advanced software license). For the advanced module setup, enter the geophone sensitivity in the Unit Tab -> Unit Setup -> Setup Type: Advanced Setup. Refer to the Specifications table to determine the value to input in the sensitivity dialog box.

Example Installation



1. Prepare the borehole geophone by wrapping the connections with electrical tape to keep them clean.



2. Drill the borehole and slide the borehole geophone into place.



3. Fill around the borehole geophone and cable with gravel pack.



4. Fill the hole with cement.



5. Hole filled with connectors ready.



6. Borehole geophone location clearly marked with monitoring unit placed in a secure lock box.

Warranty

Instantel products come with a limited one-year warranty against defects in materials or workmanship unless otherwise stated. The warranty begins on the date of shipment from the Instantel factory to the customer and is subject to certain exclusions and conditions as stated below. Monitoring units and sensors will have the warranty extended for a second year if they are returned to the Instantel factory for service and calibration within 30 days of the 'Next Calibration' date printed on the calibration label located on the product.

If, within a period of one year from the date of shipment to a customer, the instrument fails to perform in accordance with Instantel's published specifications under normal use and operating conditions, it will be repaired or replaced at the sole discretion of Instantel free of charge. Components subject to fair wear and tear in regular use, as solely determined by Instantel, are excluded from this coverage. This warranty will not apply if the damage or malfunction occurs due to (i) adjustments, additions, alternations, abuse, misuse or tampering of the instrument; (ii) instrument operation or use contrary to the operating instructions; (iii) power fluctuations; or (iv) any other cause not within the cause or control of Instantel. If inspection by Instantel fails to disclose any defect covered by this limited equipment warranty, the instrument will be repaired or replaced at customer's expense and Instantel's regular service charges will apply. This warranty is non-transferable.

Any shipments returned directly to Instantel must have prior approval, and all packages must display the Return of Material Authorization (RMA) number issued by Instantel. Shipping charges to Instantel's factory will be paid by the customer and return shipment to the customer will be paid by Instantel.

To protect your warranty, you must complete and return a Warranty Registration Certificate, or complete the online Warranty Registration Form, within ten days of purchase. Products will be assumed out of warranty if no warranty card is on file at Instantel. Retain this warranty statement and the proof of purchase for your records.

Except for the foregoing limited equipment warranty, Instantel makes no other warranties and hereby disclaims and excludes all other warranties, whether statutory, express or implied, whether arising under law or equity or custom or usage, including any implied warranty of merchantability, fitness for a particular purpose, non-infringement, satisfactory quality, or quiet enjoyment, and any warranty that the product supplied may not be compromised, or that the product will in all cases provide the function for which it is intended.

EC Warning

This is a Class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.