Instruction Sheet
Triaxial Borehole Geophone
for the Micromate® Monitoring Unit

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

Each Triaxial Borehole Geophone is coupled with a Micromate Base Unit and calibrated to the same industry standard as the Micromate Base Unit, namely:

- International Society of Explosives Engineers (ISEE-2022)
- Deutsches Institut für Normung (DIN 45669-1)
- Swedish Blasting (SS4604866)
- Swedish Pile Driving (SS025211)

Tools and Materials Required

- Micromate ISEE Base Unit . . . . . .(P/N: 721A2501) or
- Micromate DIN Base Unit . . . . . .(P/N: 721A2601) or
- Micromate Swedish Blasting Base Unit . . . . . .(P/N: 721A3601) or
- Micromate Swedish Pile Driving Base Unit . . . . . .(P/N: 721A3801)
- 30 m (98.4 ft) Triaxial Borehole Geophone . . . . . .(P/N: 721A2401) or
- 75 m (246.1 ft) Triaxial Borehole Geophone . . . . . .(P/N: 721A2402)
- Extension cables, as required
  - 10 m (32.8 ft) . . . . . (P/N: 721A0803)
  - 30 m (98.4 ft) . . . . . .(P/N: 721A0801)
  - 75 m (246.1 ft) . . . . . .(P/N: 721A0802)
  - Custom Extension Cable Kit. . . . . .(P/N: 721A3201)
- Steel cable to position the geophone into the borehole (third party)

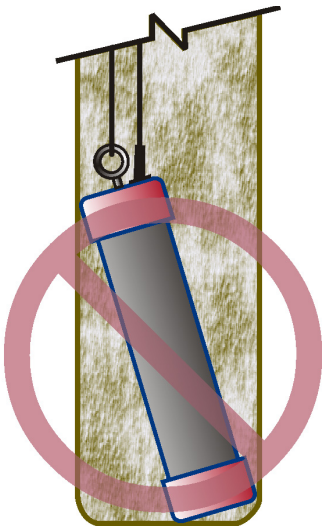
Specifications

	ISEE BOREHOLE GEOPHONE		DIN BOREHOLE GEOPHONE		SWB BOREHOLE GEOPHONE		SWP BOREHOLE GEOPHONE	
PART NUMBER	721A2401 Coupled to the ISEE base unit	721A2402 Coupled to the ISEE base unit	721A2401 Coupled to the DIN base unit	721A2402 Coupled to the DIN base unit	721A2401 Coupled to the SWB base unit	721A2402 Coupled to the SWB base unit	721A2401 Coupled to the SWP base unit	721A2402 Coupled to the SWP base unit
RESPONSE STANDARD	ISEE - 2022		DIN 45669-1 CLASS 1		SS4604866 2011 (SWB)		SS025211 (SWP)	
FREQUENCY RANGE	2 - 250 Hz		1 - 315 Hz		5 - 300 Hz		2 - 150 Hz	
VELOCITY RANGE	Up to 254 mm/s (10 in/s)		Up to 254 mm/s (10 in/s)		Up to 254 mm/s (10 in/s)		Up to 254 mm/s (10 in/s)	
RESOLUTION	0.00788 mm/s (0.00031 in/s)		0.00788 mm/s (0.00031 in/s)		0.00788 mm/s (0.00031 in/s)		0.000788 mm/s (0.000031 in/s)	
SENSOR DENSITY	1.73 g/cc (108 lbs/ft^3)		1.73 g/cc (108 lbs/ft^3)		1.73 g/cc (108 lbs/ft^3)		1.73 g/cc (108 lbs/ft^3)	
CABLE LENGTH	30 m (98.4 ft)	75 m (246.1 ft)	30 m (98.4 ft)	75 m (246.1 ft)	30 m (98.4 ft)	75 m (246.1 ft)	30 m (98.4 ft)	75 m (246.1 ft)
MAXIMUM CABLE LENGTH	1,000 m (3,280.8 ft)		1,000 m (3,280.8 ft)		1,000 m (3,280.8 ft)		1,000 m (3,280.8 ft)	
REQUIRED SOFTWARE	THOR Compliance		THOR Compliance		THOR Compliance		THOR Compliance	

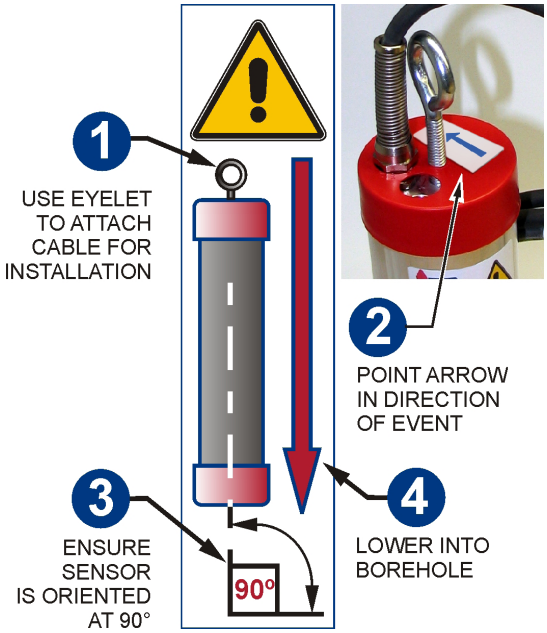
Physical Installation

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.
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

Configuring a Micromate Base Unit (ISEE, DIN, SWB, SWP) with a Triaxial Borehole Geophone follows the same procedure as the Standard Triaxial Geophone. For complete details, please refer to the Micromate Monitoring Unit Operator Manual and THOR Software Operator Manual.

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 Period

One-year limited warranty against defects in materials or workmanship. 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 in the product warranty policy found on our website at: **https://www.instantel.com/service-and-support/warranty-form**.

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.

721U2401 Micromate Triaxial Borehole Geophone Rev 6
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