

Applications

The measurement of soil and rock movements including:

- Lateral strains and settlement in or beneath earth and rockfill embankments and dams.
- Foundation movements and subsidence.
- Control of natural and cut slopes, quarry and mining excavations.
- Displacement across construction joints in concrete, and across joints and faults in rock.
- Displacements of retaining walls, bridge piers and abutments.

Operating Principle

The vibrating Wire Soil Extensometer consists of a vibrating wire displacement transducer in a sealed housing. The transducer comprises of a vibrating wire sensing element anchored at one end and connected to a spring loaded displacement rod at the other end.

Vibrating Wire Soil Extensometer

As the push rod is moved out from the housing the spring is elongated causing an increase in the vibrating wire tension (either compression or tensile strain can be measured). This tension is directly proportional to movement of the displacement rod. The mode of operation is by plucking non-sustained oscillation of the vibrating wire. The wire, vibrating at its natural frequency, which is relative to the tension of the wire, induces an alternating current in a coil, which is detected by the readout/logger. Readings are made by measuring the elapsed time for 100 cycles and displayed in engineering units.

Advantages and Limitations

- Accurate, robust and very good long term stability.
- Accuracy unaffected by cable length.
- Suitable for remote reading and data logging.
- Over voltage surge arrestor fitted to protect against electrical damage.
- Connecting cable is strong, flexible, armoured or screened and can be used in lengths in excess of 1000m.
- Waterproof and sealed to 10bar pressure.



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**DATA SHEET
E7**

Specification

E7-1 Vibrating Wire Soil Extensometer

E7-1.10 Vibrating Wire Soil Extensometer

Comprising a vibrating wire displacement transducer mounted in a cylinder steel body with mounting flange. The displacement transducer incorporates a vibrating wire element, electromagnetic pulsing and sensing unit with over voltage protection, displacement rod and spring. The displacement rod passes through O-ring seals in a front housing and is threaded to receive Extension Rod 2.10. The mounting flange is bolted to Anchor Beam 2.13 to give a positive anchorage in soil or rock. Supplied with 1m of either cable CA-1-2-A or CA-1-4-A (longer lengths fitted to suit customer requirements)

Dimensions:
Length 1000mm
Body diameter Ø50mm,
Flange diameter Ø150mm.
Weight 10Kg.

E7-2 Extension Rod, Tubes and Anchor

E7-2.10 Extension Rod

For use with Vibrating Wire Soil Extensometer 1.10. Comprising Ø12mm solid mild steel rod supplied in 3m lengths, threaded both ends, with one threaded to coupling to connect with further rods or with Adjuster Unit 2.14

E7-2.11 Protective Tube – Internal

Heavy gauge rigid PVC tube supplied in 2m lengths, each end bevelled, and supplied with O-rings for each end.

Dimensions:
Outside diameter Ø33.4mm
Inside diameter Ø24.5mm
Weight 1.2Kg

E7-2.12 Protective Tube – External

Heavy gauge rigid PVC tube supplied in 2m lengths, each end bevelled.

Dimensions:
Outside diameter Ø48.5mm
Inside diameter Ø38mm
Weight 2Kg

E7-2.13 Anchor Beam

Used to key VW Soil Extensometer 1.10 into the surrounding fill, comprising coated steel channel with locating holes for VW Soil Extensometer 1.10 and Adjuster Unit 2.14.

Dimensions:
Length 1.5m
Section 75mm x 38mm
Weight 10Kg

E7-2.14 Adjustment Unit

Used for setting the VW Soil Extensometer displacement rod at optimum travel, comprising a mild steel plated boss with locating flange for bolting to Anchor Beam 2.13 and a Ø12mm threaded adjusting rod coupled to the final extensometer rod. Protective tube 2.12 locates with a double O-ring seal over the boss.

Dimensions:
Length 500mm
Boss length 135mm
Max diameter Ø64mm
Weight 1.8Kg

E7-2.15 Sealing Tape

Used to prevent entry of fill or sand at connections of Protective Tubes 2.11 and 2.12 comprising fabric tape impregnated with petroleum based waterproofing compound.

Tape width 50mm
Roll length 10m
Weight 650g

CA-1 Connecting Cables and Connections

CA-1-2-A 2 Core Armoured Cable

Refer to separate Data Sheet for specification.

CA-1-4-A 4 Core Armoured Cable

Refer to separate Data Sheet for specification.

CA-1.6 Joint Sealing Kit

Refer to separate Data Sheet for specification.

Ordering Information

E7-1.10 VW Soil Extensometer
E7-2.10 Extension Rod
E7-2.11 Protective Tube - Internal
E7-2.12 Protective Tube - External
E7-2.13 Anchor Beam
E7-2.14 Adjustment Unit
W6-4.3 Sealing Tape

CA-1.1-2-A 2 Core Armoured Cable
CA-1.1-4-A 4 Core Armoured Cable
CA-4.1 Joint Sealing Kit

NB One each of E72.11 & E72.12 are required for each E72.10 ordered

Performance

- Range 300mm
- Resolution 0.025% of range
- Accuracy ±0.2% of range
- Operating Frequency 1300 to 2700Hz
- Operating Temperature -20°C to 60°C
- Pressure rating 10 bar



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