

RWE - Resistance Wire Extensometer

ROCK & SOIL DISPLACEMENT INSTRUMENTATION

FEATURES

- High resolution (up to 0.005mm), large tensile range (up to 200mm)
- Insensitive to moderate cross-borehole deformations
- Remote readout capability
- Supplied with quarter or full wheatstone bridge configurations; full bridge can be supplied with integral voltage regulators to assist data logging
- High resistance to moisture ingress
- Can be connected directly to a datalogger
- Available in any length between 1.0m and 4.0m

APPLICATIONS

The Resistance Wire Extensometer (RWE) is designed as a simple low-cost instrument for monitoring rock and soil displacements.

They are installed in underground hard rock mines typically in pillar and stope wall to monitor displacements.

They are a handy tool for monitoring displacement in roof and pillars in underground coal mines.

In dams RWEs are ideal for measuring lateral strains beneath earth and rock fill, as well as displacement across construction joints in concrete.



Other applications include slope stability monitoring of natural and cut slopes and retaining walls.

RWEs have been successfully applied to measure displacement in bridge piers and abutments including many other civil type environments.

TECHNICAL SPECIFICATIONS

Construction:

PVC, 16mm

Length between 1.0-4.0m

Profiled end anchors with tensioning facility

120 Ohm resistance wire configuration with various sensitivities to suit readout instrument

Resistance wire polyolefin insulation housed in grease filled PVC tube

Companion Products:

Digital strain indicator

Single or multi channel data loggers

OPERATING PRINCIPLE

A resistance wire extensometer (RWE) basically consists of an electrical resistance wire element situated inside a 1m-4m long, PVC hollow tube. The wire is attached, under mild tension, to each end of the tube and is configured to have a resistance of 120 Ohms. Thus configured, the RWE can be monitored with a resistance meter, conventional strain gauge measuring equipment, or a data logger.

No additional displacement transducer is required to convert movement of the extensometer into a proportional electrical signal.

A RWE is installed by grouting into a percussive or diamond drilled borehole. A number of RWE's can be installed end to end into a borehole by attaching them to a suitable carrier (such as PVC conduit) to facilitate installation.

The resistance wire is pre-tensioned within the hollow tube enabling up to 0.5% compressional strain to be measured. However, up to 18-20% tensile strain can be measured, with high sensitivity. Due to the hollow tube construction, the RWE has low sensitivity to moderate displacements across a borehole.