

MAGNETIC EXTENSOMETER SYSTEM

MODEL EDS-91V/H



INTRODUCTION

The Encardio-rite model EDS-91V/H magnetic extensometer is used to measure vertical settlement or lateral movement depending on the application. Settlement or heave at various levels within a soil mass may be assessed by monitoring location of magnetic targets which have been positioned over a near-vertical access tube.

The magnetic extensometer system has been designed to measure settlement or heave of soft ground under the influence of loading or unloading due to construction of embankments, fills, buildings, and structures.

FEATURES

- Reliable, accurate, low cost and simple to read
- Any number of points can be monitored
- Probe is portable and can be used at many access locations; only the access tubes and magnets are permanently installed
- Options available on type of probes, access tubes and magnet assemblies.

APPLICATION

- Horizontal and vertical movement in foundations and embankments
- Movement of natural and cut slopes, quarry and mining excavations
- Displacement of retaining walls, piers & abutments
- Displacement around tunnels & underground cavities.

Lateral movement at any level within a soil mass may be assessed by monitoring location of magnetic targets positioned over a near-horizontal access tube. The system is suitable to measure lateral ground movement or horizontal displacement of soft ground under influence of loading or unloading due to construction of embankments, fills, buildings, and structures. The lateral ground movement may be in abutments, foundations or embankments, and in consolidation-induced settlement in embankments and foundations.

OVERVIEW

A probe incorporating a reed switch is made to travel within the access tube to sense the position of magnets outside the access tube. The reed switch closes on entering a magnetic field and activates a buzzer or an indicator light in the signal receiving instrument. The cable of the probe is marked at suitable intervals for measuring the location of each magnet from the end of the access tube. Several types of magnetic targets are available:

- Plate magnets for fills, embankments and horizontal installations.
- Ring magnet fixed at bottom of access tube in a borehole act as a datum or reference.
- Spider magnets with six leaves for installation on access tubes in a borehole.
- Spider magnets with three leaves for shallow boreholes. Maybe pushed down over access tubes with a rod.

DESCRIPTION

Two types of access tubing with telescopic coupling are available for the installation. For monitoring settlement only, regular access tubing is used. For monitoring lateral displacement along with settlement, inclinometer casing with telescopic coupling is used. For vertical installation in an earth fill, 3 m long tubes are connected to each other, one by one, with telescopic couplings to keep pace with the fill operation. The magnets are located centrally on the lower diameter tube.

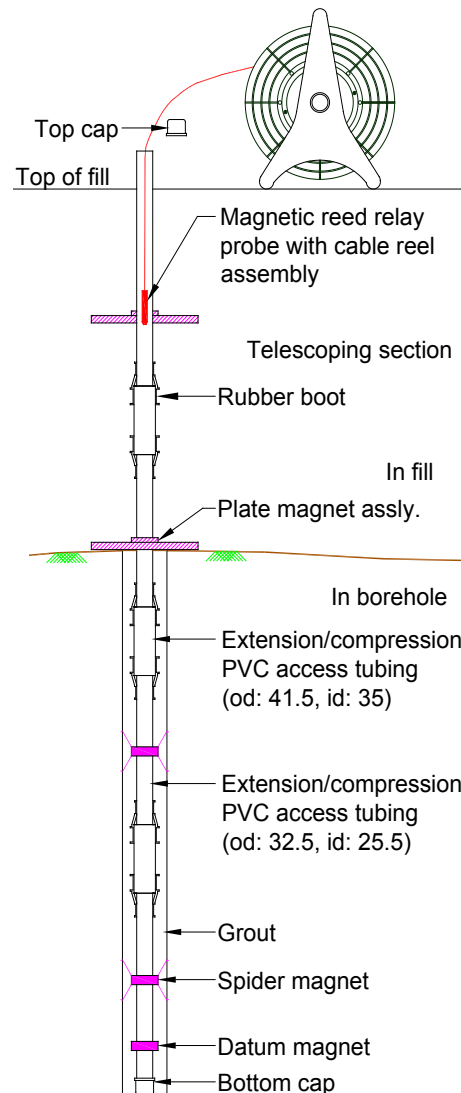
For horizontal installations, similar telescopic access tubes are laid at the base of the trench, with magnet plates embedded in the trench floor. For monitoring a dead end hole, a pull cable with optional reel, cable return pipe and a dead end pulley assembly is available. Alternatively, for small length holes, a push rod may be used.

Guide tubing and coupling

EDS-91/1.1: Vertical PVC access tubing, 26 mm i.d. and 32.8 mm o.d. Length depends on magnet spacing.

EDS-91/1.2: Extension/compression PVC telescopic coupling for above, around 35.5 mm i.d. and 41.5 mm o.d. Length depends on magnet spacing.

EAN-AT70: ABS grooved access tubing (inclinometer casing), 58 mm i.d., 70 mm o.d., length 3 m.



Installation scheme of vertical magnetic extensometer

EAN-TC70: ABS grooved telescopic coupling (allows 150 mm compression).

EDS-91/1.5: Return pipe same as EDS-91/1.1 and EDS-91/1.2 for horizontal installation

EDS-91/1.6: Rubber boot for EDS-91/1.1 tubing and EDS-91/1.2 coupling

EDS-91/1.7: Boot pusher tool for pushing rubber boot

Signal receiver and probe EDS-91/2.1

The probe, 22 mm dia x 150 mm long has a reed switch encapsulated inside it in silicon rubber for protection against shock, corrosion and ingress of water. It is connected to the signal receiver consisting of a reel with a battery pack, an on-off switch, buzzer, LED by a flat measuring tape.

The measuring tape is made of high tensile virtually non-expandable, non-stretch, insulated flat steel tape 10 mm wide x 2 mm thick. The probe is available in tape lengths of:



Length 'L' (m)	30, 50, 100, 150, 200, 300 (Metric)
Resolution	1 mm
Length 'L' (ft)	50, 100, 150, 300, 500 (Imperial)
Resolution	0.01 in

The moisture resistant electronics and standard 9 V PP-3 size battery are housed in a hub on the cable reel. The hub can be easily removed to replace the battery or check the electronics without disassembling the entire cable reel.

EDS-91/2.2: Adapter for locating the probe centrally in larger diameter access tubing, 100 mm long with diameter 6 mm less than that of the access tubing.

Magnet targets

EDS-91/3.1: Plate magnet of 300 mm square size with center hole to slide over the access tubing.

- EDS-91/3.1.1: 34 mm i.d for PVC access tubing
- EDS-91/3.1.2: 71 mm i.d. for ABS inclinometer tubing

EDS-91/3.2: Datum ring magnet fixed permanently at tubing bottom for datum.

- EDS-91/3.2.1: 34 mm i.d for PVC access tubing
- EDS-91/3.2.2: 71 mm i.d. for ABS inclinometer tubing

EDS-91/3.3: Spider magnet with 6 leaves for springing out in correct position.

- EDS-91/3.3.1: 34 mm i.d for PVC access tubing
- EDS-91/3.3.2: 71 mm i.d. for ABS inclinometer tubing

EDS-91/3.4: Spider magnet with 3 leaves for pushing down over access tube.

- EDS-91/3.4.1: 34 mm i.d for PVC access tubing
- EDS-91/3.4.2: 71 mm i.d. for ABS inclinometer tubing

EDS-91/3.1: Plate magnet of 300 mm square size with suitable holes to slide over the access and return tubing for horizontal installation.

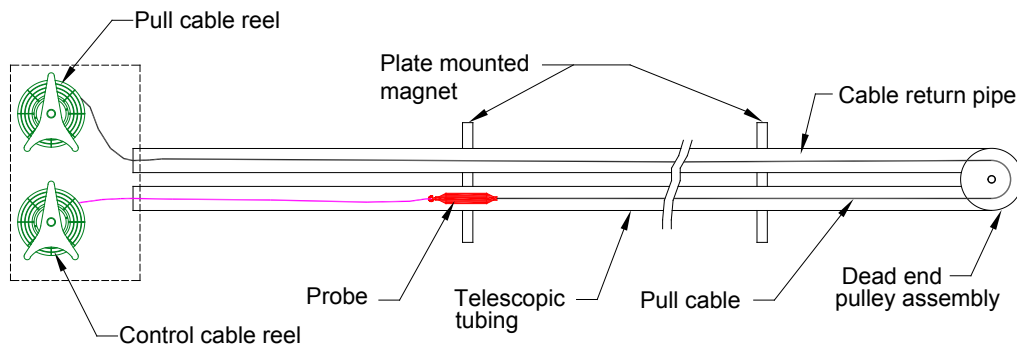


Dead end pulley assembly EDS-91/4.1

Dead end pulley assembly for monitoring a dead end hole in horizontal installation

Pull cable reel EDS-91/5.1

A pull cable reel with cable return pipe is provided to assist in moving the probe backward and forward through access tubing in case of installations required for monitoring horizontal movement.



Installation scheme of horizontal magnetic extensometer

*All specifications are subject to change without prior notice

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