

SETTLEMENT SYSTEM

MODEL EGS-30V



INTRODUCTION

The EGS-30V settlement measuring system is designed for remote measurement of settlement or heave in soils. Some typical examples are measurement of settlement in fills, subsidence due to tunneling or mining, consolidation under storage tanks and settlement or heave in embankments or embankment foundations.

FEATURES

- Reliable, accurate and simple to read
- Suitable for remote reading of settlement
- Atmospheric pressure change does not affect reading
- Easy to install & maintain

APPLICATION

- Settlement or heave in embankments and embankment foundations
- Settlement due to de-watering and percolation
- Subsidence due to mining
- Settlement in marine fills
- Subsidence because of tunneling
- Consolidation under storage tanks



OPERATION

The EGS-30V settlement measuring system consists of a settlement cell that contains a vibrating wire pressure transducer connected to a fluid chamber (cell) which is connected with twin polymer tubing to a remote liquid filled reservoir kept at a constant higher elevation.

The settlement cell is attached to a small plate so that it moves up or down with the surrounding soil. The whole assembly is embedded at the location where settlement measurement is required. As the settlement cell goes down due to settlement or goes up due to heave there is change in the head of fluid above the pressure transducer. The pressure transducer measures the change in resulting pressure from which the change in fluid head in millimetres is obtained by calculation. Settlement can be read on the EDI-51V vibrating wire indicator by noting the difference in pressure readings in terms of mm of water column.

THE SETTLEMENT SYSTEM

Vibrating wire pressure sensor

The vibrating wire pressure sensor is attached to the settlement plate of size 300 mm x 300 mm x 3 mm. This complete unit is placed at the point of settlement.

Nylon tubing

The sensor is connected to the reservoir by dual nylon-6 tubes, each tube with o.d. 6 mm and i.d. 4 mm.

Vented polyurethane signal cable

The 4-core signal cable of the sensor is shielded and vented, with 7/0.20 tinned-copper conductors, Kevlar strainer and polyurethane outer sheathing, o.d. 7 mm and weight 50 gm/m. Vented cable is not required for the 50 m and 70 m capacity sensors.

Reservoir & desiccant chamber

The reservoir along with the desiccant chamber (moisture trap) is mounted in a rugged enclosure. The desiccant is dark blue in color when active and pink when inactive.

De-aired fluid

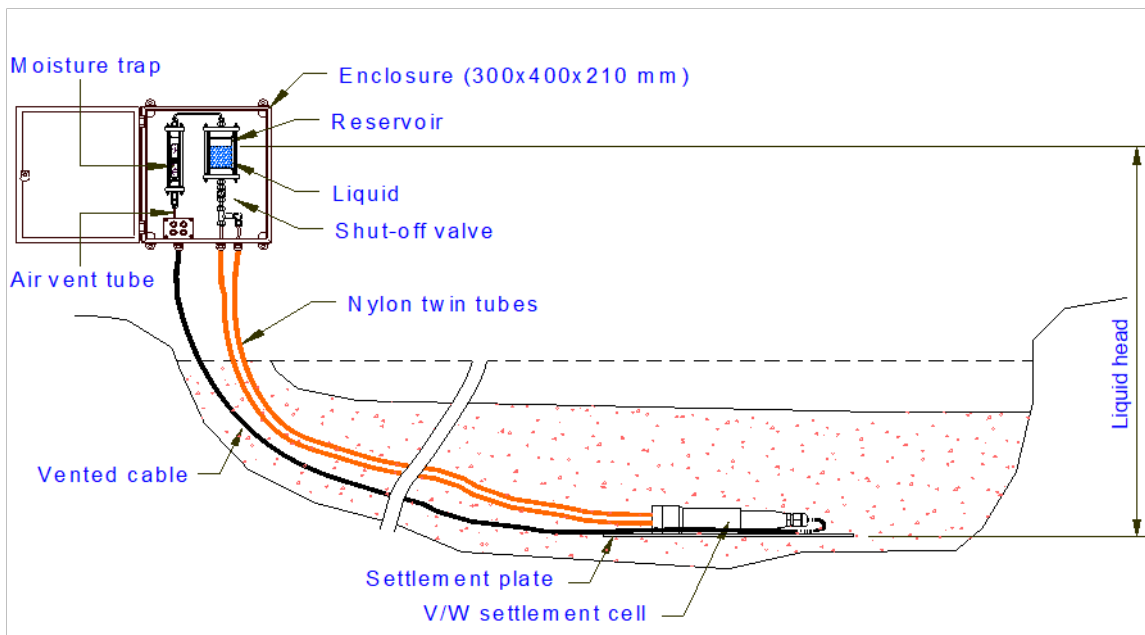
A mixture containing 50 % ethylene glycol and 50 % de-aired water is used for maintaining the fluid level in the reservoir and filling the nylon tubes. The mixture has a relative density of 1.06 at 4°C. Ethylene glycol is a good wetting agent and also an antifreeze.

Foot pump

The foot pump is required to pump the de-aired fluid through the nylon tubes. If air bubbles are present in the tubes, they can cause errors due to air-locking and also because air is lighter than the fluid fill. Any suitable pump may be used instead of a foot pump.

Ordering code:

EGS-30V-X (Capacity)-Y (cable length, nylon tubing's will be of same length)





COMMENTS

- The resolution of the settlement system depends upon the range of the pressure sensor. The accuracy and repeatability depends on proper installation, maintenance of the de-aired fluid and application of temperature correction.
- The sensor and the tubes are completely buried in soil. They do not therefore interfere with any construction activity and are less likely to be damaged. The readings also are taken remotely at a place where the reservoir is located; thus avoiding interruption of construction activity.
- A thermistor is provided in the pressure sensor for measurement of temperature. As density of the fluid changes with temperature, necessary corrections may be made if required. Generally no correction is required as the sensor and nylon tubes are embedded in soil.

SPECIFICATIONS

EGS-30V Settlement System

Range (m)	7, 20, 30, 50, 70
System accuracy	± 0.25% fs to ± 1% fs
Temperature limit	-20°C to 80°C (sensor)
Reservoir housing	400 h x 300 w x 220 d mm

NOTE:

Sensor accuracy	± 0.1 % fs
Sensor non-linearity	± 0.5 % fs
Thermistor	0.1" standard
Cable	CS-1102 (vented) for 7 m range sensor CS-0702 for other sensors
Fluid tube	6 mm o.d, 4 mm i.d. twin nylon tube