Vibrating Wire Settlement Cell

Applications

The measurement & control of vertical movements, including:

- Construction control of road embankments and earth and rockfill dams.
- Settlement and heave of oil tanks and building foundations.
- Monitoring of bridge piers, abutments and retaining walls.
- Control of subsidence.
- Construction control of marine fills

Operating Principle

The cell consists of a Vibrating Wire Transducer with an integral water chamber. A pair of nylon tubes and an armoured cable extends from the cell to a readout terminal located on stable ground. The nylon tubes are filled with water and connected, at one end, to a datum pot and at the other end to the transducer chamber. The cable connects the transducer to a terminal panel. Vertical movement of the cell relative to its readout location results in a change in liquid pressure within the chamber.

To measure the pressure change and hence the amount of settlement or heave, a Vibrating Wire Readout/Logger provides a direct reading of fluid pressure acting on the cell. The pressure is displayed in metres of water and can then be recorded for comparison with previously recorded data.

Advantages and Limitations

- Reliable, simple to install and read.
- Large operating range
- Measurements can be made beneath concrete and earth structures at locations, which are inaccessible to other types of instruments.
- No vertical rods or tubes to interfere with construction.
- Unaffected by lateral movements.
- Twin liquid lines allow for re-circulation of water through the system after installation and insitu calibration test if required.
- Portable readout unit can be used in conjunction with other Vibrating Wire instruments.
- Data may require corrections due to temperature and barometric pressure variations.
- The settlement cell indicates movement at a single point only.

Borehole Type Cell

Trench Type Cell

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DATA SHEET S8

Specification

1. Trench Type Settlement Cell

S8-1.10 VW Trench Settlement Cell
Consists of a Vibrating Wire Transducer fitted in a sealed circular PVC cell with cable glands allowing the exit of armoured cable and tube. The cell is fitted to a square base

Cell Diameter	Ø112mm
Cell Length	380mm
Base Size	300 x 300 x 12mm

2. Borehole Type Settlement Cell

S8-1.11 VW Borehole Settlement Cell
Consists of a Vibrating Wire Transducer fitted in a sealed circular PVC cell with cable glands allowing the exit of armoured cable and tube.

Cell Diameter	Ø112mm
Cell Length	380mm

Connecting Cables and Connections

CA-1.1-2-A 2 Core Armoured Cable
Refer to separate data sheet for specification

CA-1.1-4-A 4 Core Armoured Cable
Refer to separate data sheet for specification

CA-4.1 Joint Sealing Kit
Refer to separate data sheet for specification

CA-4.2 Coloured Adhesive Tape
Refer to separate data sheet for specification

CA-4.3 Crimping Tool
Refer to separate data sheet for specification

CA-4.4 Crimping Sleeves
Refer to separate data sheet for specification

W6-2.5 Twin Water Line Tube
2 cores Ø¼" Nylon Tube with flat LDP outer sheath.

W6-3.7 Straight Compression Coupling
Brass Compression Coupling suitable for joining lengths of Water Line Tube W6-2.5

W6-3.5 Olive & Nut
Spare Olive & nut suitable for Brass Compression Coupling W6-3.7

3. Terminal Equipment

3.10 Terminal and Datum Panels
Consists of a Datum Pot and all necessary valves and connections mounted on a tough panel for between 1 and 10 settlement cells

S8-3.10-1	Panel for 1 cell
S8-3.10-2	Panel for 2 cells
S8-3.10-4	Panel for 4 cells
S8-3.10-6	Panel for 6 cells
S8-3.10-10	Panel for 10 cells

Performance

- 3 bar to 150 bar
- Resolution 0.01% of range
- Accuracy ±1% FSD
- Operating Frequency 1600 to 3000Hz

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