

S8 VIBRATING WIRE SETTLEMENT CELL

Datasheet S8



Description

The Vibrating Wire Settlement Cell measures settlement and heave in soil and rockfill. Using measurement data from the settlement cell can help to control further displacement.

The cell consists of a Vibrating Wire pressure transducer connected via a pair of water filled nylon tubes to a hydraulic datum pot located on stable ground.

Vertical movement of the cell relative to its readout location results in a change in liquid pressure within the chamber, which is recorded in metres of water and is translated into the amount of settlement or heave.

The Vibrating Wire Settlement Cell can take measurements beneath concrete and earth structures at locations that are inaccessible to other types of instruments.

Features

- Uses proven Vibrating Wire technology
- 15m and 30m ranges available
- Borehole, trench and low profile types available
- No vertical rods or tubes to interfere with construction
- Twin liquid lines allow for recirculation of water through the system after installation
- Does not require access above sensor to acquire data

Benefits

- Accurate, repeatable readings over long cable lengths
- Long working life, long-term stability and reliability
- Over-voltage surge arrestor protects against electrical damage
- Connecting cable is strong, armoured and flexible
- Measurements unaffected by lateral movements



Comprehensive information about this product and our full range is available at www.soilinstruments.com
If you would like to speak with someone directly please call +44 (0)1825 765044 or email sales@soilinstruments.com

VIBRATING WIRE PRINCIPLE



A high carbon steel wire is held in tension between a fixed point and a movable point within the sensor.

The physical changes measured by the sensor result in small changes to the position of the movable point which results in a change to the tension of the wire.

The wire may be excited by either plucking or sweeping via a coil adjacent to the wire. The resulting resonant frequency (which is relative to the tension of the wire) is then recorded by the same coil. The reading can be displayed by instrument readout or recorded by data logging equipment.

Operation

The cell is installed in a borehole or trench. Vertical displacement of the cell relative to the datum location results in a liquid pressure change at the transducer.

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

Applications

The Settlement Cell is used for monitoring settlement in soil and rockfill.

Typical monitoring applications include:

- Measuring vertical displacement beneath and within embankments, earth and rockfill dams
- Measuring vertical displacement of oil tanks and building foundations
- Subsidence

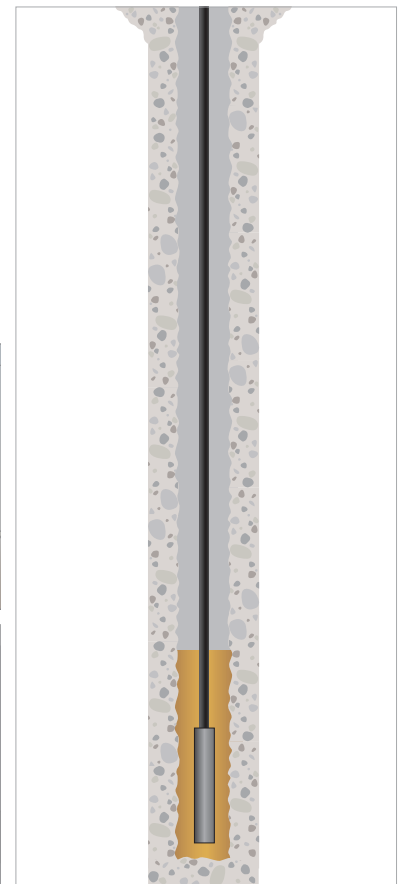
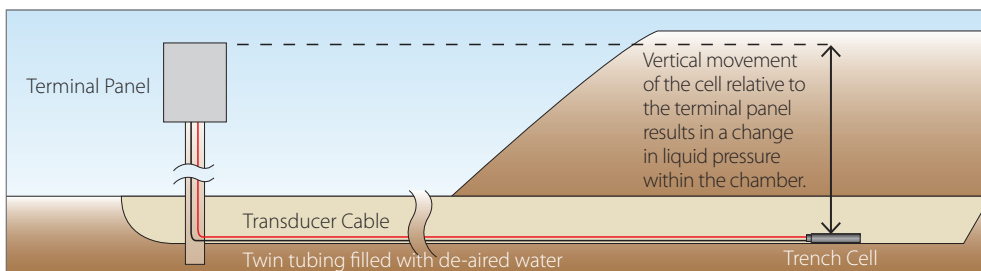
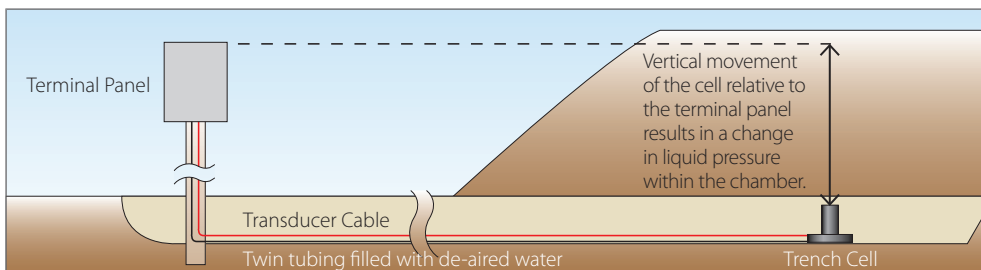
Associated products

For details on:

Catalogue code:

VWnote	RO-1-VW-NOTE
Dataloggers	D1
Terminal and Junction Boxes	RO-TB/JB/TJ

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THE TECHNICAL RATING FOR THIS PRODUCT:

INTERMEDIATE



As the correct installation of any monitoring sensor or system is vital to maximise performance and accuracy, Soil Instruments makes the following recommendations, for the skill level of the installation contractor.

ADDITIONAL SUPPORT

We offer installation and monitoring services to support this system. For more information please email : sales@soilinstruments.com or call : **+44 (0) 1825 765044**

ADVANCED



The installer is trained and experienced in the installation of this type of instrument or systems, and is ideally a specialist Instrumentation and Monitoring contractor.

INTERMEDIATE



The installer already has previous experience and/or training in the installation of this instrument or system.

BASIC



As a minimum the installer has read and fully comprehends the manual, and if possible has observed these instruments or systems being installed by others.

Specifications

Settlement Cell/Transducer	15 metres	30 metres	
Range	150kPa	300kPa	
Material	316 Stainless Steel		
Accuracy	±0.1% full scale		
Linearity	±0.1% full scale		
Resolution ¹	0.025% full scale		
Over range	200% full scale		
Diaphragm displacement	<0.001 cm ³		
Temperature range	-20 to +80°C		
Excitation method	Pluck and sweep		
Operating frequency	1600 to 3000Hz		
Thermistor			
Type	NTC 3k Ω		
Accuracy	0.5°C		
Resolution ¹	0.1°C		
Graduation marker material	Stainless Steel		
Cell Dimensions			
Cell type	Borehole	Trench	Low Profile
Cell diameter	114.5mm	114.5mm	n/a
Cell length	374mm	374mm	n/a
Cell dimensions	n/a	n/a	286mm x 111.8mm x 40mm
Base size	n/a	300mm x 300mm x 12mm	200mm x 420mm x 5mm
Cable			
Type	2 core armoured PVC outer sheath	4 core armoured PVC outer sheath	
Diameter	12mm	13mm	
Weight	220g/m	336g/m	
Tubing			
Type	Twin ¼inch nylon tubes inside polyethylene jacket		

¹ Dependent on readout

Ordering Information

Vibrating Wire Trench Type Settlement Cells

S8-1.10-15	15 metre settlement range
S8-1.10-15-T	15 metre settlement range with thermistor
S8-1.10-30	30 metre settlement range
S8-1.10-30-T	30 metre settlement range with thermistor

Vibrating Wire Borehole Type Settlement Cells

S8-1.11-15	15 metre settlement range
S8-1.11-15-T	15 metre settlement range with thermistor
S8-1.11-30	30 metre settlement range
S8-1.11-30-T	30 metre settlement range with thermistor

Vibrating Wire Low Profile Trench Type Settlement Cells

S8-1.12-15	Low profile 15 metre range settlement (150kPa)
S8-1.12-15-T	Low profile 15 metre range settlement, with thermistor (150kPa)
S8-1.12-30	Low profile 30 metre range settlement (300kPa)
S8-1.12-30-T	Low profile 30 metre range settlement, with thermistor (300kPa)

Ordering Information

Connecting Cables, Tubes and Fittings

CA-1.1-2-A	Armoured cable, 2 cores; 1.5mm ² , PVC jacket, priced per metre
CA-1.1-4-A	Armoured cable, 4 cores; 1.5mm ² , PVC jacket; for instruments with thermistors, priced per metre
W6-2.5	Twin 1/4inch tubing; priced per metre
W6-3.19	Female quick release coupling, 1/4inch
W6-3.20	Male quick release coupling, 1/4inch
W6-3.21	Quick release coupling set, 1/4inch
W6-3.5	Spare nut and olive, Enots 1/4inch
W6-3.7	Straight coupling, Enots 1/4inch, 2No. required per twin tube connection
CA-4.1	Joint sealing kit
CA-4.2	Coloured adhesive tapes, set of 10No.
CA-4.3	Crimping tool
CA-4.4	Crimping sleeves, set of 100No
W3-4.8	Tube cutter
W6-6.1	Nylon ties, 150mm x 3.5mm, pack of 100No.
ST1-3.5	Nylon ties, 370mm x 4.7mm, pack of 100No.

Terminal Panel

Hydraulic Terminal and Datum Panel – 1/4inch tubing

S8-3.10-1	For 1No. settlement cell
S8-3.10-2	For 2No. settlement cells
S8-3.10-3	For 3No. settlement cells
S8-3.10-4	For 4No. settlement cells
S8-3.10-5	For 5No. settlement cells
S8-3.10-6	For 6No. settlement cells
S8-3.10-7	For 7No. settlement cells
S8-3.10-8	For 8No. settlement cells
S8-3.10-9	For 9No. settlement cells
S8-3.10-10	For 10No. settlement cells
S8-3.10-11	For 11No. settlement cells
W6-5.1	Terminal cabinet; 600mm x 600mm x 250mm, includes wall mounting and shuttering. For up to 4No. cell terminal panel
W6-5.2	Terminal cabinet; 800mm x 600mm x 250mm, includes wall mounting and shuttering. For up to 8No. cell terminal panel

Installation Equipment

S8-5.1	Placing head; for borehole installation
S8-5.2	Placing tube; 3 metre length, for use with placing head S8-5.1
W6-7.1	Water circulating unit
C1-1.4	Antifreeze concentrate, 5 litre container
W6-7.2	De-aired water boiler; 240Vac, 50Hz electrical supply
W6-7.3	De-aired water boiler; 110Vac, 60Hz electrical supply

Manual

MAN-140	Vibrating Wire Water Settlement Cell
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