S1 HYDRAULIC OVERFLOW SETTLEMENT CELL

Datasheet S1

Description

The Hydraulic Overflow Settlement Cell is used for measuring vertical movements and controlling subsidence.

The cell itself is housed within a sealed container and operates using a u-tube and overflow principle.

There are three tubes connected to the cell; a nylon water tube attached to a graduated standpipe, a drain tube to allow surplus water to flow from the cell and an air tube that maintains the barometric pressure.

Before readings are taken, compressed air is pumped through the system to remove any water from the air tube and cell, after which the water tube is pumped with de-aired water to remove any air bubbles that may have formed since the previous reading.

Once the level of the water within the standpipe falls to reach equilibrium with the weir within the cell, small differences in the resulting levels remain constant for each reading; therefore the settlement of the cell is reflected by an equal drop in water level at the standpipe.

Features

- **Simple, accurate and inexpensive**
- **Reliable and robust**
- **No vertical rods or tubes to interfere with construction**

Benefits

- **Long working life, long-term stability and reliability**
- **Measurements can be made beneath concrete and earth structures which may be inaccessible to other types of instruments**
- **Measurements unaffected by temperature variations and 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

Operation

The cell is cast into a concrete block within the structure to be monitored and is connected by a nylon water hose to a graduated standpipe within the instrument housing. A second drain tube allows the surplus water to flow from the cell and a third air tube maintains the interior of the cell at barometric pressure.

Before readings are taken, compressed air is used to remove water from the tube and the cell. The water tube is then filled with de-aired water by pumping a sufficient quantity to fill the tube and remove any air bubbles that have formed since the previous reading.

The graduated standpipe, which has also been filled, is then connected directly to the water tube using a three-way valve on the reading panel. The level in the standpipe falls until it reaches equilibrium with the level of an overflow weir within the cell.

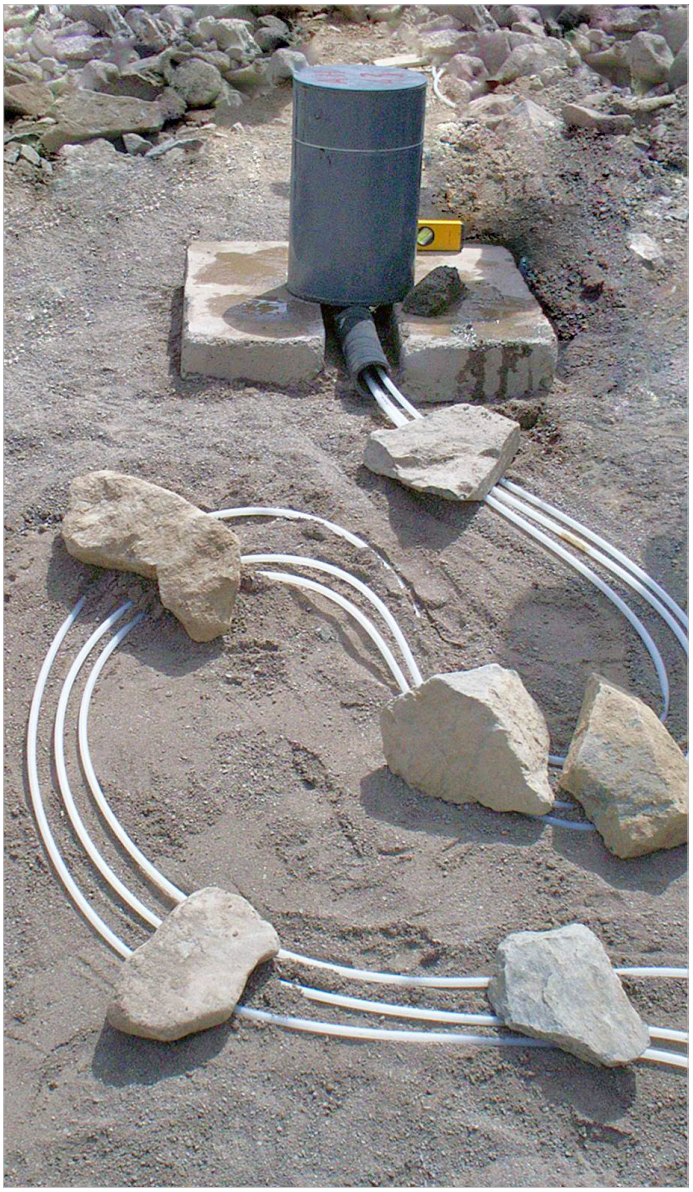
Small difference from the surface tension effects are practically constant from one reading to the next, therefore the settlement of the cell is reflected by an equal drop in water level at the standpipe.

Applications

Hydraulic Overflow Settlement Cells are used for the measurement and control of vertical movement.

Typical monitoring applications include:

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



THE TECHNICAL RATING FOR THIS PRODUCT: **BASIC**

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

Length	340mm
Inside diameter	200mm
Outside diameter	220mm
Internal volume	10 litres
Maximum tubing length	300m
Weight of cell	4.0kg

Tubing

Tubing type	Water tube	Air/drain tube
Inside diameter	5.4mm	6.4mm
Outside diameter	8.0mm	9.5mm
Type	Nylon, polythene coated	Nylon plain tube
Weight	5.4kg per 100m	4.0kg per 100m

Terminal and Reading Equipment

Measuring range	1m	2.5m
Graduations	cm/mm	
Dimensions	1200mm H x 150mm W	2700mm H x 150mm W
Weight (per standpipe unit)	3.3kg	7.1kg

Ordering Information

Hydraulic Overflow Settlement Cell	
S1-1.3	Hydraulic Overflow Settlement Cell
S1-2.19	Air valve
Standpipe Measuring Unit	
S1-3.1-1	1metre, for 1No overflow settlement cell
S1-3.1-2	1metre, for 2No overflow settlement cell
S1-3.1-3	1metre, for 3No overflow settlement cell
S1-3.1-4	1metre, for 4No overflow settlement cell
S1-3.1-5	1metre, for 5No overflow settlement cell
S1-3.1-1-2.5	2.5metre, for 1No overflow settlement cell
S1-3.1-2-2.5	2.5metre, for 2No overflow settlement cell
S1-3.1-3-2.5	2.5metre, for 3No overflow settlement cell
S1-3.1-4-2.5	2.5metre, for 4No overflow settlement cell
S1-3.1-5-2.5	2.5metre, for 5No overflow settlement cell
Hydraulic Overflow Settlement Cell	
S1-2.10	Single 5/16inch tubing; LDP coated, for use as water supply tube, price per metre
S1-2.11	Single 3/8inch tubing; for use as air supply and water drain tubes, price per metre
W6-3.13	Straight coupling, 5/16inch; in-line tubing connections
W6-3.15	Straight coupling, 3/8inch; in-line tubing connections
W6-3.14	Spare nut and olive, 5/16inch
W1-3.16	Spare nut and olive, 3/8inch
CA-4.2	Coloured adhesive tapes; set of 10No
W3-4.8	Tube cutter
W6-6.1	Nylon ties; price each, 150mm x 3.5mm, pack of 100No
ST1-3.5	Nylon ties; price each, 370mm x 4.7mm, pack of 100No
Installation Equipment	
S1-3.12	Instrument house entry duct, for up to 5No instruments
W6-7.1	4 Litre water circulating unit, maximum 4 bar pressure; single cylinder, send pressure only
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
S1-2.21	Standard tool kit; includes, Stanley knife, steel rule, 8inch adjustable spanner, 5/16 inch to 1 inch spanner set, ball hammer, 6 inch combination pliers, flat screwdrivers and a tool box
W6-7.5	Pressure Pump
W2-8.15	Vacuum Pump
Manual	
MAN-51	Hydraulic Overflow Settlement Cell

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