

Push-in Pressure Cell - Spade Cell

Designed to be pushed into the ground where it can measure total earth pressure and pore water pressure within the soil



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Overview



A Push-in Pressure Cell, also called Spade Cell, is designed to be pushed into the ground where it can measure total earth pressure and pore water pressure within the soil. It can be used as a site investigation tool to determine the in-situ stress state, both vertical and horizontal, depending on the direction of installation. In addition, it can be used to monitor the change in active and passive pressure around retaining structures (diaphragm walls etc) as well as in tunnelling, and other earthworks. Typical installations are in fine-grained cohesive soils, including very soft to stiff clays.

Construction consists of two longitudinal stainless steel plates, welded together around their periphery. The annular space between these plates is filled with de-aired glycol. A port and filter for pore water pressure measurement are located on one of the flat sides of the support plate behind the pressure sensitive section of the cell.

The pressure cell and the port for the pore water pressure are connected via stainless steel tubes to two pressure transducers integrated in the cell, typically vibrating wire, or pneumatic, or strain gauged if dynamic measurements are to be performed. A thermistor for temperature measurement is also incorporated.

APPLICATIONS

Site investigation tool for estimation of in situ horizontal stress

Risk assessment of hydraulic fracture of clay cores or cut-off trenches in dams

Stress change adjacent to retaining walls

Measurement of vertical and horizontal stresses to monitor clay cliffs degradation

Monitoring stress redistribution around tunnels in soils

Measurement of earth pressure changes during and after blasting compaction

Measurement of lateral total earth pressure due to vibro stone columns and strip foundation loading

FEATURES

Integrated pore pressure measurement

Long-term stability

High accuracy and sensitivity

Constant monitoring capability

Ease of data logging

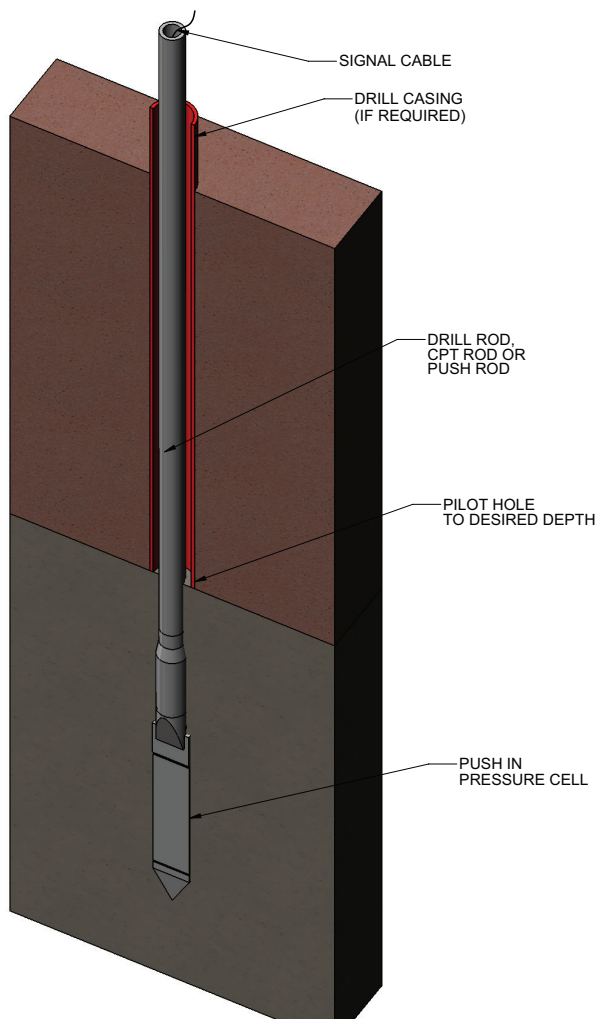
Either vibrating wire, pneumatic, or strain gauge transducers



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Specifications

ITEM	DESCRIPTION
Capacity	350, 700 kPa 1, 2, 3, 5 MPa
Over Range	150% FS (maximum)
Resolution	0.025% FS (minimum)
Accuracy	± 0.1% FS
Temperature Range	-20° to +80°C
Filter	50 micron sintered filter
Dimensions (pressure sensitive section)	Length 200mm x Width 60mm x Thickness 6.5mm
Dimensions (sensor housing)	Length 220mm x Diameter 50mm
Total Length	560mm
Cable	Type - 910. Twisted Pair 4 x 2 with Foil Screen & Drain Wire



INSTALLATION

The installation method involves drilling a pilot hole slightly shorter than the planned installation depth, then pushing the pressure cell about 1 meter past the bottom of the pilot hole using standard drill or CPT rods that will be left in place or retrieved at a later stage. Push rods and a push adapter or an inverse thread adapter on the cell can also be used if the cell is to be pushed and left permanently in place with retrieval of the push rods.



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