Data Digger Equipment
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PRESSURE CELLS

The Total Pressure Cell are used to measure total pressure in soils and embankments, at the interface of two different materials or measurements of stress in concrete. They are also used for measurement of contact pressures on retaining walls, buildings, bridge, abutments, tunnel lining etc.

The Pressure Transducer consists of a rigid cylindrical housing having inside it with vibrating wire sensor with the resonant frequent of vibration of a tensioned steel wire is proportional to the strain or tension in the wire. This fundamental relationship is utilized in variety of configuration for the measurement of pressure. Vibrating Wire sensors are well known for their long term stability.

- Unprecedented sensitivity.
- Long term Stability and Reliability.
- Slim Line Design.
- Robust and steady Construction.
- Isolation of the sensor fron the total stress acting on a body of the Strain gage.

TYPICAL APPLICATION:

As suggested by the name, Total pressure Cells are used to measure to total pressure acting at their point of installation. This pressure is the sum of pore pressure and the stress. To know the value of stress alone, the pore pressure at that point should also be ascertained and deducted from the total stress.

Some important application are:

- To access change in stress distribution within embankments of earth or concrete dams.
- To measure stress at the interface of soil and concrete.
- To determine contact pressure on retaining walls, piers, tunnel lining
- For measuring pressure on and within lining of underground excavation.

DESCRIPTION

The Pressure cell consists of two circular stainless steel plants welded together around their periphery leaving a narrow cavity between them. The cavity is filled with antifreeze fluid. During Installation, care has to be taken to see that the cavity lies perpendicular to the stress to be measured. A small length of high pressure stainless steel tube connects the cavity to a pressure transducer.

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VIBRATING WIRE SENSOR

The Vibrating Wire Sensor is secured inside the rigid the cylindrical housing of the Piezometer. It Comprises of a small stainless steel enclosure having a high tensile strength, heat treated and tempered steel wire. The wire is anchored at one end to the enclosure and to small diaphragm at the other. A magnet coiled assembly is precisely located at the center of the wire inside the same enclosure. This greatly enhances the response characteristics of the vibrating wire sensor. The vibrating wire sensor is self-compensated against temperature variation.

The 'O 'Ring seal provide complete water-proofing and a high degree of protection from humid and corrosive environment conditions. The sensor is completely isolated from the total stress acting on a body.

OPERATION

Any change in pressure on the pressure pad has to be balanced by a corresponding change in the pressure of internal fluid. The latter is communicated to the pressure transducer and changes the tension of vibrating wire. The wire is plucked by energizing the coil magnet so that it vibrates at its natural frequency. The resonant frequency is proportional to the square root of the tension in the wire. A Convenient readout unit can accurately measure the resonant frequency of the wire. A microprocessor based readout unit can display the frequency as well as the value of the measured parameter directly in the engineering units.

Alternatively, Data Loggers can be used to record data, in engineering unit, automatically at pre-determined intervals. By the use of appropriate software, the data logger can present record data in desired format, predict trends of the variation and even generate alarms at pre-determined set points. A thermistor mounted in the transducer enables simultaneous measurement of temperature changes. Transducers with lightning protection are available on request.

EARTH PRESSURE CELL consists of two circular stainless steel plates welded together around their periphery space apart by a narrow cavity filled with de-aired oil.

FLAT BACK PRESSURE CELL has an extra thick back plate to minimize any point loading effect.

SHOTCRETE PRESSURE CELL is designed for measurement of tangential and radial stress in shotcrete tunnel lining.

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EARTH PRESSURE CELL	FLAT BACK PRESSURE CELL	SHOTCRETE STRESS CELL
SPECIFICATION	**SPECIFICATION**	**SPECIFICATION**
MODEL SIS-1101	MODEL SIS-1102	MODEL SISA-1103
Standard Ranges 70, 170, 350, 700 kPa	Standard Ranges 350, 700 kPa 1, 2, 3, 5 MPa	Standard Ranges 2, 3, 5 ,7.5, 20, 35 MPa
1, 2, 3, 5, 7.5, 20 MPa	Over Range 150% F.S. (maximum)	Over Range 150% F.S.
Over Range 150% F.S. (maximum)	Resolution 0.025% F.S.	Resolution 0.025% F.S.
Resolution 0.025% F.S.	Accuracy ±0.1% F.S.	Accuracy ±0.1% F.S.
Accuracy ±0.1% F.S.	Temp. Range −20°C to +60°C	Temp.Range −20°C to +60°C
Temp. Range −20°C to +60°C	Height × Diameter 12 × 230 mm	L × W × H
Height × Diameter 6 × 230 mm		200 × 100 × 6 mm
		250 × 150 × 6 mm

ACCESSORIES:

- Special coating on the surface for salt application.
- Splicing Kit
- Junction Box
- Readout Unit