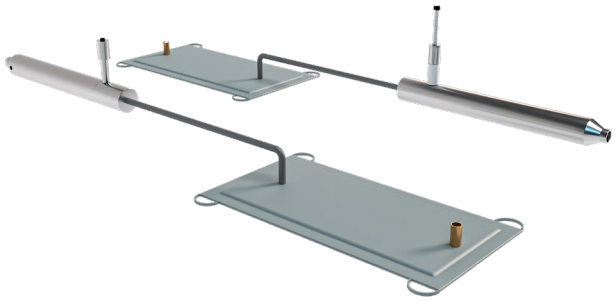
PRESSURE CELLS



INTRODUCTION

The Total Pressure Cell are used to measure totalpressure in soils and embankments, at the interface of two different materials or measurements of stress in concrete. They are alsoused 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 vibratingwire 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.

FEATURES

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

APPLICATION

- To access change in stress distribution within embankments of earth or concretedams.
- 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.

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Overview

A pressure cell sensor is a device used to measure the force or pressure exerted on a specific area. It works by converting mechanical pressure into an electrical signal that can be read by a monitoring system. These sensors are commonly used in industries like aerospace, manufacturing, and hydraulics. Pressure cell sensors can detect both static and dynamic pressures, providing real-time data for precise control and monitoring. They are often made with materials like strain gauges, piezoelectric crystals, or capacitive elements. These sensors offer high accuracy and reliability, even under harsh environmental conditions. Pressure cell sensors are crucial for ensuring the safety, efficiency, and stability of systems that involve pressure management. They help optimize performance and prevent damage due to excessive pressure.

Description

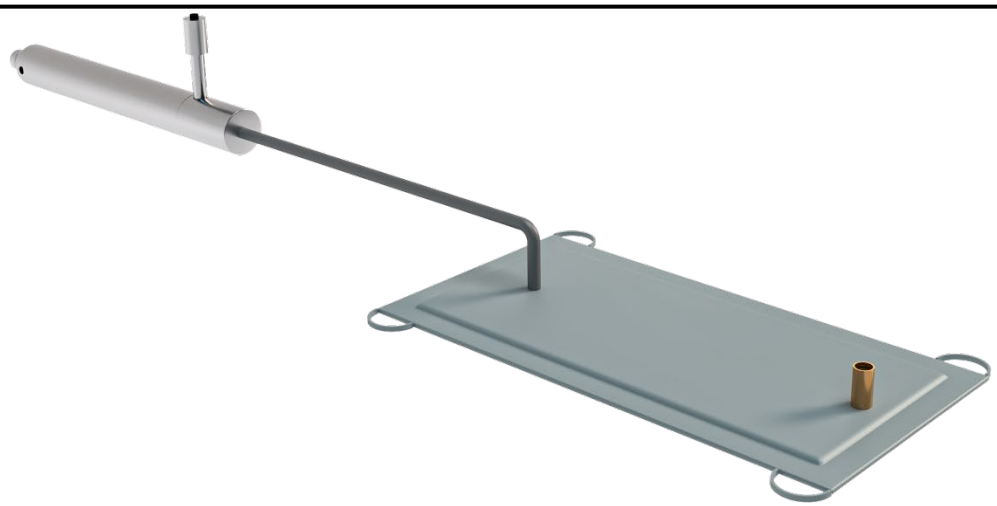
The Pressure cell consists of two circular stainless steel plants welded together around their periphery leaving a narrow cavity between them. The cavity is filled with antifreeze fluid. During Installation, care has to be taken to see that the cavity lies perpendicular to the stress to be measured.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

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.



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

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.

Techincal Specifications:

EARTH PRESSURE CELL	
Model	DDE-1101
Standard Range	350,700 kPa & 1, 2, 3, 5 MPa
Over Range	150% F.S
Resolution	0.025% F.S.
Operating Temperature	-20°C to +60°C
Dimension	6 X200mm
Accuracy	±0.1% F.S.
SHORCRETE PRESSURE CELL	

Model	DDE-1102
Standard Range	2, 3, 5, 7.5, 20, 35 MPa
Over Range	150% F.S
Resolution	0.025% F.S.
Operating Temperature	-20°C to +60°C
Dimension	200X100X6mm and 200X150X6mm(L X B X H)
Accuracy	±0.1% F.S.