ENCARDIO RITE
METASENSING FOR MEGA STRUCTURES

EARTH & CONCRETE PRESSURE CELL

DATASHEET

MODEL EPS-30V

OVERVIEW

Encardio Rite Pressure cells are precison sensors designed to monitor total pressures in various construction environments and to evaluate stress levels in mass concrete structures. These cells consist of a flexible, circular flat capsule connected to a high-precision vibrating wire pressure sensor via a stainless steel tube. The pressure capsule comprises two stainless steel plates welded together at the edges, with the narrow gap between the plates filled with fluid. The size and thickness of the pressure pads (capsule) vary depending on the application whether for earth, concrete, or interface.

When subjected to external pressure from earth or concrete, the fluid pressure within the capsule rise as the steel plates are squeezed together. This pressure is sensed by the pressure sensor's diaphragm, deflection of which alters the tension of the internal vibrating wire, changing its resonant frequency. The measured frequency directly correlates to the applied pressure.

By accurately monitoring total pressure and stress distribution, Encardio Rite pressure cells help engineers verify design assumptions, ensure structural safety, and optimize construction processes. Key applications include assessing total pressure and stress distribution within dam embankments, earth fills; contact pressure on retaining and diaphragm walls, piers, abutments, rafts. They are also vital for monitoring stress distribution in tunnel linings, underground excavations, rock walls of unlined caverns and tunnels and evaluating foundation bearing pressures.

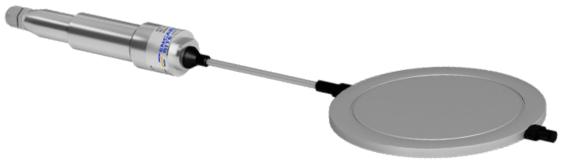
FEATURES

- **Reliable & accurate:** Offer long-term stability, high sensitivity, and a broad pressure range for dependable measurements in various scenarios.
- **Fluid-filled capsule**: The pressure capsule is filled with a special fluid to ensure optimal pressure transmission.
- **Temperature compensation:** Each pressure sensor is individually temperature compensated to 0.03%/°C to minimize measurement errors.
- **Low intrusion, high speed:** Minimal volumetric displacement and fluid-filled design ensure fast, accurate responses, even in dynamic environments.
- **Hermetically sealed sensor**: Hermetically sealed under a vacuum of 0.001 Torr and stainless steel construction ensures protection against severe environmental factors.
- **Integrated temperature monitoring:** Enhances measurement accuracy by accounting for temperature variations.
- **Robust construction**: The stainless steel construction ensures durability and reliability in harsh environments.
- **Versatile options:** Available for soil, concerte as well as soil-concrete/rock interface applications, meeting diverse geotechnical and structural monitoring needs.
- **Long-distance signal transmission:** Maintains signal integrity over long distances, ensuring accurate data collection.
- **Versatile datalogging:** Compatible with various readout units for manual data collection. For continuous monitoring, it can be connected to a suitable datalogger, allowing for data acquisition at desired frequencies.
  Encardio Rite offers a range of NexaWave dataloggers equipped with GSM/GPRS or RF communication capabilities, ensuring reliable and efficient data transmission.
- **Infrastructure data intelligence platform**: Integrates with Proqio software to facilitate data processing, analysis, andreal-time visualization, and generates instant alarms for critical events to keep all stakeholders informed.
  The sensor can work with any manufacturer's Dataloggers and Data Management Systems.

PRODUCT OFFERINGS

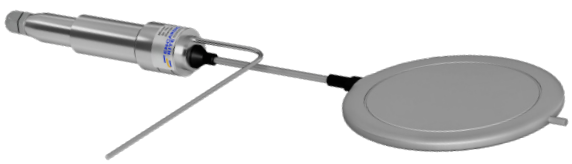
EPS-30V-S Earth pressure cell

Designed for use in soil, earth fills, and embankments, these cells monitor the stress in soil or the pressure exerted by soil on structures. They respond to both soil pressure and groundwater/pore water pressure, thus termed as total pressure or total stress cells.



EPS-30V-C Concrete pressure cell

This cell is embedded within concrete to monitor internal stress. It features a 600 mm long, fluid-filled pinch tube, welded to the sensor. During concrete lining, rising temperatures cause the capsule to expand. As concrete cools, the capsule contracts, forming a gap between the capsule and the concrete, which prevents pressure transmission from concrete to the cell.



SPECIFICATIONS

Once the concrete has fully cured and returned to ambient temperature, the pinch tube is pinched at intervals using pliers. This expels fluid from tube into the capsule, causing it to expand and eliminate the gap. Consequently, the capsule re-establishes contact with the surrounding concrete, enabling accurate monitoring of internal stress.

EPS-30V-I Interface pressure cell

Used at the soil and concrete (or rock) interface, these cells measure contact earth pressure on the surface of concrete or rock. They are commonly employed in raft foundations, base slabs, and footings to measure soil pressure on foundations and structures. These cells have a thicker and more rigid steel plate on the concrete contact side to minimize point loading effects.

Sensor type	Vibrating wire
Range (MPa)	0.5, 1.0, 2.0, 3.5, 5.0, 10.0, specify
Accuracy of pressure sensor	± 0.5 % fs standard ± 0.1 % fs optional
Temperature limit operational	-20 to 80°C
Over range limit	150 % of range
Thermistor	YSI 44005 or equivalent (3 kOhms at 25°C)
Enclosure	Stainless steel
Cable connection	Glass to metal seal cable connection

ORDERING INFORMATION

Model EPS-30V-**S/C/I-Range-Cable housing type**
(suitable for cable Ø 3.5-8 mm or 9-14 mm)

*All specifications are subject to change without prior notice

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