HYDROSTATIC LEVELLING CELLS

SETTLEMENT MONITORING

Applications

Hydrostatic level cells are designed for high resolution automated monitoring of vertical movement in structures (settlement and/or heave).

Typical applications include:

- Monitoring differential settlement in structures affected by nearby excavation and tunnelling.
- Controlling critical activities such as compensation grouting.
- Long-term structural monitoring

Installation

System components include a reservoir, Hydrostatic Levelling Cells, tubing, cabling, deaired liquid, and a datalogger.
One of the cells is assigned as the reference cell and is placed outside the zone of influence. The other cells are fixed to the structure. The reservoir is installed at a slightly higher elevation than the cells and is usually located near the reference cell.
Tubing for liquid and air is connected to each cell and the reservoir to create a continuous circuit and secured to the structure. The fluid circuit and reservoir are filled and signal cables are routed to the data logger.

Specifications

Pressure Sensor w/ 4-20mA output.

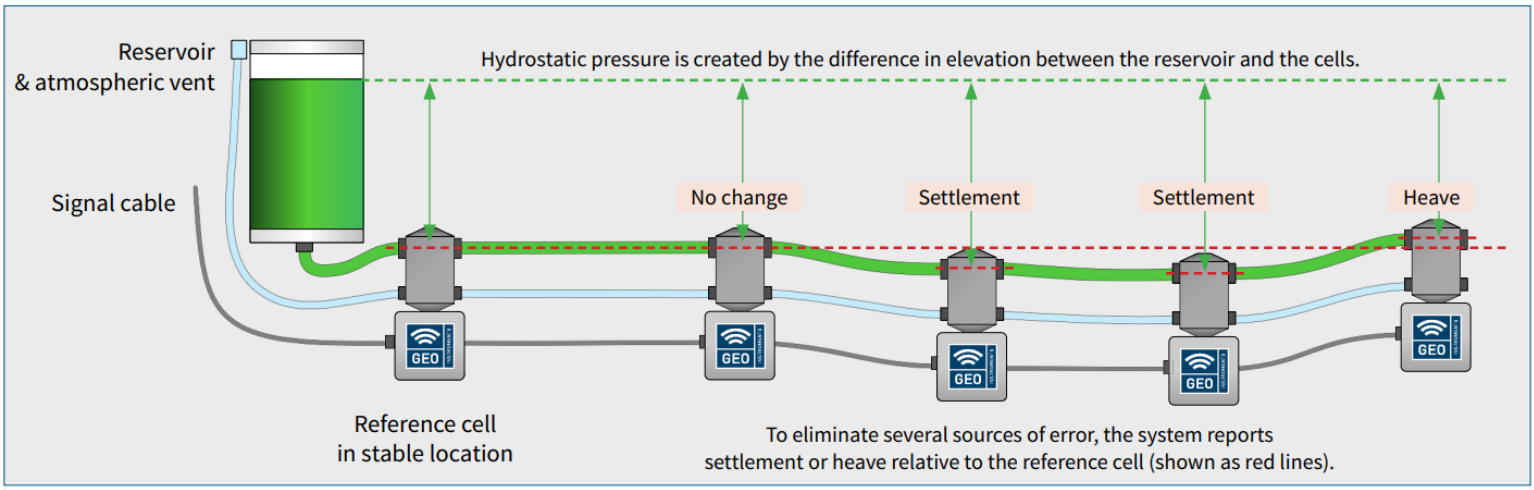
Range:	+/-250 mm
Resolution:	0.024 mm
Temp Rating:	-20 to +80 °C
Dimensions:	200 x 110 x 65mm

Operation

The reservoir connected to the fluid circuit creates hydrostatic pressure that is measured in each cell. When settlement or heave occurs the cells record an increase or decrease in pressure.

Baseline outputs are recorded during commissioning to compare against over time. A reference cell is established away from predicted influences and is assumed as stable for the purposes of comparison.
Pressure readings from monitoring cells are compared to the reference cell and the baseline to accurately calculate changes in elevation across the system.

The use of a reservoir and reference cell in this way eliminates factors that effect the whole system, such as changes in fluid level from evaporation.



Key Advantages

High Resolution and Frequency:
The system detects displacements as small 0.024mm and provide readings every 15 minutes.

Versatile:
The system can be installed on exteriors or interiors, in basements and ceilings. Circuits and cells can even be buried.

Automated and Low Maintenance:
Systems have the potential to run for years, providing high frequency, 24hr data with minimal need for maintenance.