

Applications

Hydrostatic level cells are used for monitoring settlement or heave in structures. Typical applications include:

- Monitoring differential settlements in structures affected by nearby excavation and tunneling.
- Controlling critical activities such as compensation grouting.

Installation

System components include a reservoir, hydrostatic level cells, tubing, cabling, deaired liquid, and a datalogger.

One of the cells is deployed as the reference cell and is placed outside the zone of influence. The other cells are fixed to the structure. The reservoir is usually located near the reference cell and is placed at a higher elevation than any of the other cells.

Tubing for liquid and atmosphere is connected to each cell and the hydraulic circuits are filled with deaired liquid. Signal cables are routed to the data logger.

Operation

The difference in elevation between the reservoir and each cell creates hydrostatic pressure. The sensor within each cell measures this pressure. The difference in elevation increases with settlement and decreases with heave. The cell reports increased or decreased pressure.

Some hydrostatic level systems use the water level in the reservoir as the reference elevation, but such configurations require careful maintenance of the water level, which can be affected by evaporation and temperature changes.

In the GEO system, the reservoir supplies hydrostatic pressure, but is not used as the reference elevation. Instead, pressure readings from each cell are compared to the pressure reading from the reference cell, which is located on stable ground. By monitoring difference readings, the system eliminates reservoir issues and provides higher precision.

Advantages

High Resolution: The system detects displacements as small 0.0008 inch.

Versatile: The system can be installed around corners and obstacles. It has even been buried in trenches.

Compatible: The system is fully compatible with GeoCloud automation services.

System Specifications

Sensor: Capacitive sensor, 4-20mA output.

Range: 8 to 20 inches (200 to 500 mm).

Resolution: 0.0008 inch (0.024 mm).

Linearity: 0.008 inch (0.2 mm).

Stability: 0.008 inch/a (0.2 mm/a).

Temp Rating: -20 to +80 °C.

Cell Size, H x W x D: 6.7 x 2.6 x 2.2 inch.



The HLC system is easily installed around corners and obstacles



Protective cowling reduces temperature effects



Solar powered system with logger

