SOLINST TECHNICAL BULLETIN

Absolute Leveloggers vs. Vented Dataloggers

Solinst Water Level Dataloggers

Solinst offers both absolute (non-vented) and gauged (vented) water level sensors.

The Levelogger® Series of dataloggers feature an absolute sensor. Absolute sensors are sealed from the atmosphere, therefore they measure water pressure, as well as the barometric pressure. As such, data from Leveloggers must be compensated for barometric effects.

The LevelVent and AquaVent loggers feature vented pressure transducers. The pressure sensor is open to the atmosphere via a vented cable to surface. The data is automatically compensated for barometric and altitude effects.

Each type of water level datalogger is better suited to specific applications and conditions, and each has its advantages and disadvantages.

Programming and Operation

Although measurement fundamentals differ, Levelogger and vented datalogger operation and programming are similar. Both are primarily programmed using Levelogger PC Software, through a USB connection. They are set to record at a specific rate, and then installed in the field for the monitoring period.

When finished recording, the readings are downloaded to your PC, or to a field data transfer device. Both also have options to integrate into a telemetry system or a third party datalogger or PLC for remote water level data transmission.

Installation

Because they are all-in-one units, Leveloggers tend to be easier to install. They have the option of being suspended simply by using a stainless steel wireline or Kevlar cord. Installation, therefore, can also be less costly.

Vented dataloggers must be deployed using a vented cable, which can be more cumbersome - especially when dealing with longer lengths. Transporting and installation can be tough in more remote or isolated areas. You also have to make sure the vent tube inside the cable is not kinked or nicked while being handled.

Maintenance

A major advantage of absolute dataloggers is that they are low maintenance. Save for periodic field visits for cleaning and o-ring replacements, Leveloggers can be left in the field for extended periods with little worry.

Traditional vented cable systems have desiccants that need to be replaced regularly to ensure the vent tube remains dry. However, Solinst designed the LevelVent and AquaVent so maintenance is at a minimum, with desiccants that provide moisture protection for the lifetime of the instrument. A custom tool to blow out the vent tube with dry nitrogen, before use or storage, was also designed.

Accuracy

Generally, vented transducers can provide more accurate data in shallow applications, where the pressure sensor is placed close to the surface. However, the deeper you go, or with higher water level fluctuations, it is recommended to use an absolute sensor. Vented transducers may be subject to slow responses to small changes in barometric pressure, especially at greater depths.

Absolute pressure sensors have the advantage of recording barometric data. Barometric data can be used to determine barometric efficiency, which can be very significant, especially in deeper confined aquifers. Vented pressure sensors assume 100% barometric efficiency and provide no barometric data to determine any difference.

The lack of barometric data also makes it difficult to determine if the vented transducer is recording correctly. A crimped, damp, or cut vent tube can cause erroneous barometric compensation, and therefore inaccurate data.

In shallow applications, the vent tube works well to transmit any changes in barometric pressure directly to the sensor. With absolute sensors you have to take into account any inaccuracies in both the level sensor and barometric sensor when looking at the final water level data, even in shallow installations.

Applications

Vented water level dataloggers work well in very shallow applications with low expected water level fluctuations. They are also ideal when it is not convenient to install a barometric datalogger nearby.

Because vented water level dataloggers provide data that is automatically compensated, they can come in handy when real-time data is required, especially in short-term projects like pumping, and other aquifer characterization tests. Vented water level dataloggers can also save you time, reducing post collection data processing.

Absolute pressure sensors also have many advantages; due to their simpler designs, they are more convenient for transporting and installing in remote or hard to reach locations. They also tend to be lower in cost and require less maintenance.

Absolute pressure sensors are suited for a broader range of applications, and have more tolerance and accuracy at greater depths and with high water level fluctuations. Absolute water level dataloggers are also a better choice in areas that are humid, prone to flooding, or exposed to long term freezing conditions.

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High Quality Groundwater and Surface Water Monitoring Instrumentation

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