

## Vented v. Absolute Water Level Dataloggers

**Unless you have a compelling reason for using vented water level loggers always use an absolute one. Vented loggers are generally more expensive and they require a fixed cable with a vent tube. As this can be prone to condensation, often a desiccant pack is added and this means that regular maintenance is necessary. So why would you ever even consider a vented system?**

Choosing the right type of datalogger for your application is crucial in obtaining accurate results. Generally there are two primary types of water level loggers – vented and non-vented (or absolute) and they are very different and within these two categories there are many alternatives from different manufacturers.

Vented loggers incorporate a vent tube built into the cable that enables them to automatically compensate for atmospheric pressure changes. The tube connects the vented datalogger's transducer to ground surface, thereby providing connection to the atmosphere.

Non-vented or absolute dataloggers do not use vent tubes instead these loggers can be barometrically compensated using a barometric pressure logger and a simple software function to perform the mathematics. Barometric pressure values can also be obtained from nearby weather stations within a 10-mile radius.

### **Which type of datalogger is better?**

There is no better. Which you choose will always depend on your application and vary depending on a number of parameters including:

- Monitoring well conditions such as depth, size of well and expected water level fluctuations
- Installation
- Operation
- Data accuracy.

**Monitoring well conditions:** some vented dataloggers are larger than their non-vented equivalent but this does vary from manufacturer to manufacturer but there is always the addition of the tube to take into account during deployment in a monitoring well.

Fluctuations in water level and depth are linked. The key to accurate results is sourcing a datalogger that has been developed for the conditions you plan to deploy it in but the dichotomy when considering datalogger type will be accuracy v. cost. Vented dataloggers will normally be more accurate, particularly at greater depths but you will have the added cost of the vented cable. Generic absolute loggers are better value but generally are less accurate.

Type of water being monitored will also determine the type of datalogger used. In terms of the choice between a vented or non-vented logger the main thing to consider if you are monitoring saltwater intrusion or brackish water is to ensure your datalogger is rated for operation in these conditions. The choice will be between titanium and fully ceramic materials.

**Installation:** when it comes to installation absolute dataloggers are much easier to deploy as they simply need to be lowered into a monitoring well on a cable. Non stretch Dyneema cord or similar is best. If re-deploying then just replace the cord. Installing a vented datalogger involves handling both a cable and vent tube so during deployment care must be taken to ensure that the vent tube is deployed correctly and not kinked. If the cable is too long then it will need to be loosely coiled at the well head. The deeper the monitoring well, the more complex the installation of the vented datalogger however, vented dataloggers are much more accurate at greater depths.

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**Operation:** once a datalogger is deployed, the way they operate is essentially the same. They collect water parameter readings at set intervals while unattended and this data can be downloaded remotely or by retrieval. Retrieval of a datalogger is essentially a repeat of installation. With less elements to go wrong non-vented loggers tend to require less maintenance.

Data collected from a non-vented datalogger requires barometric compensation and therefore needs to be paired with simultaneously collected atmospheric data. For most applications this requires one barometric datalogger for a number of groundwater dataloggers in a region which has the same meteorological status. Barometric compensation calculations are normally carried out using standard data management software so although this represents an increase in workload, this process is automated but there are a minimum of two dataloggers to deploy. Data collected from a vented datalogger does not require barometric compensation.

Because of the relative simplicity of non-vented dataloggers they tend to be used more if the project requires the logger to be used in a variety of different wells as they are less likely to be specific to one installation whereas vented dataloggers will have a specific cable length.

Both types of datalogger can be installed with the addition of telemetry.

**Accuracy:** suppliers' technical specifications reflect many years experience of their equipment but as a general rule if you require mm accuracy for critical data ie. if water levels rise by a very small amount and this would cause flooding and damage to property and place; then vented dataloggers, like the [INW AquiStar](#) range, are more likely to provide this level of accuracy. In addition, for vented loggers you usually have a communication port at the top of a well so data can be retrieved without disturbing equipment which removes an element of human error in redeploying the datalogger.

For groundwater fluctuations in a monitoring well then an absolute logger, like the [LevelSCOUT](#) represents excellent value and delivers best in class accuracy, robustness, offers the latest in logger technology and has replaceable batteries.

At Van Walt we recognise data accuracy is paramount to successful projects but every project is different. Confidence in your datalogger is a good start and choosing the right datalogger for your application is vital. There are arguments for and against both types of datalogger and, at Van Walt, an understanding of the criticality of the data is our starting point.

For more information on INW AquiStar dataloggers and LevelSCOUT call 01428 661 660 or visit [www.vanwalt.com](http://www.vanwalt.com).