

# Is Your Water Level Data Barometrically Compensated Accurately?

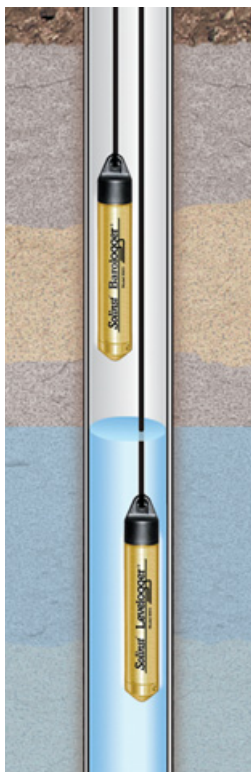
## Absolute vs Vented Cable

### Vented Cable

Barometric compensation has traditionally been performed using a vent tube reaching from the surface to the transducer. This vent tube terminates behind the transducer diaphragm, providing a cancellation effect for barometric pressure. After much experience with erroneous barometric compensation due to crimped, damp, wet or cut tubing, unacceptably slow response to small barometric change, and situations where barometric compensation was not required.

There are several reasons why vented tubing was used by others. It was a cheap, low technology method of balancing out the effect of barometric pressure on a monitored water surface. Also, when the tubing is cared for, inspected and tested for failure regularly, it responds reasonably well to steep barometric gradients such as when a large scale atmospheric front moves across the surface, and in shallow applications. The seldom discussed problem is that the response time to the much more common incremental barometric change is poor. The vented tubing often leaked or its connection to the pressure probe leaked, causing the transducer to fail.

Recognizing the inherent inferiority of passive venting, some manufacturers have adopted a method of automatic vent tube testing whereby a small vacuum pump at the surface constantly clears the vent of water and in some cases provides a warning when the integrity of the tubing has been compromised. This elaborate method of making a cumbersome technology work, requires significant battery power to operate. Add to all these disadvantages the difficulties encountered when handling and transporting heavy vented tubing, a little Barologger looks appealing.



### Absolute Pressure Loggers with a Barometric Logger

Solinst decided that vented tubing did not offer a suitable level of integrity in barometric compensation. It was found that a recording barometer does provide the necessary high integrity barometric compensation data our clients deserve.

The Levelogger measures absolute pressure, so when in water, it measures the total head of water plus the barometric pressure. One Barologger at a site is used to measure barometric pressure only at the same recording intervals. The barometric data is then used, along with a software Wizard, to compensate the Levelogger data, and provide true net water level readings.

The Barologger Gold together with the Levelogger Gold take barometric compensation accuracy to the next level. The program algorithms designed into the Barologger are strictly for use in air, making this instrument extremely accurate. Readings are taken at the same times, which avoids slow response problems. The barometrically compensated data available from the Barologger Gold and Leveloggers will provide users with much more reliable data.

Solinst Levelogger software has a Compensation Wizard that is very simple to use. It provides a record of the raw barometric and total pressure recordings as well as the compensated data. This is not possible with vent tube compensated data files. When analyzing barometric data it is important to keep in mind that storm events commonly reduce total atmospheric pressure by about 1.7% from pre-existing high pressure conditions. 1.7% converts to approximately 0.6 ft or 0.2 m of water level equivalent barometric fluctuation. Raw data can be very useful information for calculating barometric efficiency in tight, confined aquifers, when the investigator has a choice not to compensate the readings.

The use of vented cable technology to provide barometric compensation is cumbersome, expensive and provides less reliable results than the use of data from an absolute pressure datalogger. The use of a Barologger as an on-site barometer or the use of local weather station barometric data is less cumbersome, less expensive and provides more reliable results.