Vibrating Wire Piezometers

Applications
VW piezometers are used to monitor pore-water pressure. They can also be used to monitor water levels. Typical applications include:

- Monitoring pore water pressures to determine safe rates of fill or excavation.
- Monitoring pore water pressures to determine slope stability.
- Monitoring the effects of dewatering systems used for excavations.
- Monitoring the effects of ground improvement systems such as vertical drains and sand drains.
- Monitoring pore pressures to check the performance of earth fill dams and embankments.
- Monitoring pore pressures to check containment systems at land fills and tailings dams.
- Monitoring water levels in stilling basins and weirs.

Operation
The VW piezometer converts water pressure to a frequency signal via a diaphragm, a tensioned steel wire, and an electromagnetic coil.

The piezometer is designed so that a change in pressure on the diaphragm causes a change in tension of the wire. An electro-magnetic coil is used to excite the wire, which then vibrates at its natural frequency. The vibration of the wire in the proximity of the coil generates a frequency signal that is transmitted to the readout device.

The readout or data logger stores the reading in Hz. Calibration factors are then applied to the reading to arrive at a pressure in engineering units.

Types of VW Piezometers

Standard: The standard piezometer is suitable for most applications. It operates equally well in fully-grouted boreholes or sand-filter zones.

Heavy-Duty: The heavy-duty model has a strong, double-wall housing and is supplied with armored cable.

Push-In: The push-in piezometer has can be pushed a short distance into soft soils using an EW drill rod.

Multi-Level: Uses multiple sensors in a single borehole. See separate datasheet.

Low-Pressure: This piezometer is designed to monitor very small changes in pore-water pressure.

Vented: This piezometer is used to monitor water levels in open stand-pipes and wells. See separate datasheet.

Corrosion Resistant: A titanium body protects against corrosive environments.

Advantages

Groutable: VW piezometers can be installed in fully-grouted boreholes and do not require sand filter zones. This greatly simplifies the installation of multiple sensors in the same borehole. It also makes it possible to install piezometers with inclinometer casing within the same borehole.

High Resolution: VW piezometers provide a resolution of 0.025% FS.

High Accuracy: Slope Indicator’s automated, precision calibration system ensures that these sensors meet or exceed specifications.

Rapid Response: VW piezometers respond very quickly to changes in pore-water pressure.

Reliable Signal Transmission: With properly shielded cable, signals from the VW piezometer can be transmitted long distances.
**STANDARD VW PIEZOMETERS**

- 3.5 bar (50 psi) Piezometer ........ 52611020
- 7 bar (100 psi) Piezometer ........ 52611030
- 10 bar (150 psi) Piezometer ........ 52611060
- 17 bar (250 psi) Piezometer ........ 52611040
- 35 bar (500 psi) Piezometer ........ 52611050

The standard VW piezometer is suitable for most applications. The piezometer can be installed without a sand filter when the borehole is backfilled with bentonite-cement grout.

**HEAVY-DUTY VW PIEZOMETERS**

- 3.5 bar (50 psi) Piezometer ........ 52610520
- 7 bar (100 psi) Piezometer ........ 52610530
- 10 bar (150 psi) Piezometer ........ 52610560
- 17 bar (250 psi) Piezometer ........ 52610540
- 35 bar (500 psi) Piezometer ........ 52610550

**LOW-PRESSURE VW PIEZOMETERS**

- 0.7 bar (10 psi) Piezometer ........ 52611610
- 1.8 bar (25 psi) Piezometer ........ 52611625

**CORROSION-RESISTANT VW PIEZOMETERS**

- 3.5 bar (50 psi) Piezometer ........ 52612220
- 7 bar (100 psi) Piezometer ........ 52612230
- 17 bar (250 psi) Piezometer ........ 52612240

The body of the corrosion-resistant VW piezometer is manufactured of titanium while the polyethylene 80 micron filter has a POM (polyoxymethylene) housing and the diaphragm has a heat-bonded PTFE coating.

**SIGNAL CABLE SPECIFICATIONS**

- Signal Cable ..................... 50613824

**READOUT & TERMINAL BOXES**

- VW Data Recorder ................. 52613500
- Jumper Cable for Terminal Box .... 52613557
- Terminal Box for 6 sensors ......... 57711600
- Terminal Box for 12 Sensors ....... 57711600
- Terminal Box for 24 Sensors ....... 97711624

See separate datasheet for VW Data Recorder. Terminal boxes provide terminals for 6, 12, or 24 sensors. Sensors are selected by rotary switch. 6-sensor box is 240 x 190 x 120 mm (9.5 x 7.5 x 4.75”). 12 and 24-sensor boxes are 290 x 345 x 135 mm (11.5 x 13.5 x 5.25”).

**DATA LOGGERS**

VW piezometers connect directly to Wireless VW Data Loggers and the V-Logger. The Campbell Scientific CR300, CR800 and CR1000 require an AVW200 vibrating wire adaptor.