Special-Purpose VW Piezometers

Applications

VW piezometers are used to monitor pore-water pressure. 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.

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 the 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.

Special-Purpose VW Piezometers: Heavy-Duty Piezometer (top), and Push-In Piezometer (bottom)

Special-Purpose Piezometers

These special-purpose piezometers offer features optimized for particular applications.

Heavy Duty VW Piezometer: Designed for installation in rock-fill dams, this piezometer features a thick-wall, stainless steel body and a strong double-jacket armored cable.

Push-In Piezometer: This piezometer is designed to be pushed a short distance into soft soil at the bottom of a borehole. The piezometer should be monitored during installation to ensure that it is not overpressured.

Advantages

Groutable: The Heavy Duty VW piezometer can be installed without a sand filter zone.

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

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 small changes in pore-water pressure, whether they are grouted in, pushed into cohesive soils, or embedded in a sand filter zone.

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

HEAVY-DUTY VW PIEZOMETER

3.5 bar (50 psi) piezometer 52610520
7 bar (100 psi) piezometer 52610530
17 bar (250 psi) piezometer 52610540
35 bar (500 psi) piezometer 52610550

Sensor Type: Pluck-type vibrating wire sensor with built-in thermistor or RTD.

Range: 3.5, 7, 17, 35 bar (50, 100, 250, 500 psi).

Resolution: 0.025%FS.

Accuracy: ±0.1% FS for 3.5 and 7 bar ranges, ±0.3% FS for 17 and 35 bar ranges.

Maximum Pressure: 1.5 x rated range.

Filter: 50-micron sintered stainless steel.

Temperature Coefficient: < 0.04% FS per °C.

Materials: Thick-wall stainless steel.

Dimensions: 29 x 191 mm (1.125 x 7.5").

Weight: 0.45 kg (1 lb).

SIGNAL CABLE

Double-Jacket Armored Cable . . .50613586

Shielded cable with four 22-gauge tinned-copper conductors, inner polyurethane jacket, steel braid armor, and outer high-density, polyethylene jacket.

VW PUSH-IN PIEZOMETER

3.5 bar (50 psi) piezometer 52621020
7 bar (100 psi) piezometer. 52621030
17 bar (250 psi) piezometer. 52621040
35 bar (500 psi) piezometer. 52621050

Sensor Type: Pluck-type vibrating wire sensor with built-in thermistor or RTD. Top of housing is threaded for a drill rod adaptor.

Range: 3.5, 7, 17, 35 bar (50, 100, 250, 500 psi).

Resolution: 0.025% FS.

Accuracy: ±0.1% FS for 3.5 and 7 bar ranges, ±0.3% FS for 17 and 35 bar ranges.

Maximum Pressure: 1.5 x rated range.

Filter: 50-micron sintered stainless steel.

Temperature Coefficient: < 0.04% FS per °C.

Materials: Stainless steel.

Dimensions: 35 x 270 mm (1.375 x 10.5").

Weight: 1.2 kg (2.75 lb).

SIGNAL CABLE

Signal Cable 50613524

Shielded cable with four 22-gauge tinned-copper conductors and polyurethane jacket.

DRILL-ROD ADAPTOR

EW Adapter Rod. 50718042

Optional EW adapter rod is 0.6 m (2') long screws onto piezometer. It has a left hand thread for easy disconnect from the drill rod used to push the piezometer into the ground. Adaptor stays with piezometer after installation.

EW Coupling. 50718010

Optional coupling (pin) has right-hand thread for drill rod and left-hand thread for easy disconnect from EW adapter rod above. Coupling is reused

MANUAL READOUT

VW Data Recorder. 52613500
Jumper Cable for Terminal Box . . .52613557

The VW Data Recorder displays VW sensor readings in Hz or H^2/1000 and thermistor or RTD data in degrees C. It can also record the readings. See separate datasheet.

TERMINAL BOXES

Terminal Box for 6 sensors 57711606
Terminal Box for 12 Sensors 57711600
Terminal Box for 24 Sensors 97711624

Provides terminals for signal cable from 6, 12, or 24 sensors. Sensors are selected by rotary switch. Small 6-sensor box is 240 x 190 x 120 mm (9.5 x 7.5 x 4.75"). Larger 12 and 24-sensor box measures 290 x 345 x 135 mm (11.5 x 13.5 x 5.25").

DATA LOGGERS

VW MiniLogger 52613310

The VW MiniLogger is a reliable, low-cost data logger for one sensor. See separate datasheet.

VW Quattro Logger 52614000

The VW Quattro Logger is a compact data logger designed to monitor four vibrating wire sensors. See separate datasheet.

Campbell Scientific Data Loggers

Campbell data loggers with a VW interface and the AM16/32 multiplexer can accommodate 16 piezometers with temperature readings or 32 piezometers without temperature readings. See separate datasheet.

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