

# 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<sup>2</sup>/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.