



Vibrating Wire Piezometers



The RST Vibrating Wire Piezometer provides excellent long-term accuracy, stability of readings and reliability under demanding geotechnical conditions. Vibrating Wire Piezometers are the electrical piezometers of choice as the frequency output of VW devices is immune to external electrical noise, and able to tolerate wet wiring common in geotechnical applications.

The vibrating wire piezometer senses pressure by means of a metal diaphragm attached to a vibrating wire element. When pressure is applied to the diaphragm, its deflection is sensed by the vibrating wire element – i.e. the tension in the wire is reduced, and the resonant frequency of the vibrating wire is changed as a result. The vibrating wire is induced to vibrate, and then the resonant frequency is measured via an electromagnetic coil circuit. The resulting frequency is precisely related to the pressure.

The frequency signal is exceptionally immune from cable effects, including length (to several kilometers), splicing, resistance, noise pickup, and moisture. The vibrating wire coil circuit contains no semiconductor devices and has built-in ionized gas discharge device protection against transient damage. As a result, the vibrating wire piezometer provides excellent reliability in typical geotechnical situations – i.e. long outdoor cables buried in saturated soil.

The piezometer is equipped with a standard sintered stainless steel porous filter to prevent soil particles from contacting the diaphragm. A thermistor is built into the piezometer body to permit temperature measurement and temperature compensation of the piezometer. Standard construction is all stainless steel. RST vibrating wire piezometers are shipped with extremely tough polyurethane-jacketed foil-shielded cable for maximum endurance in field conditions.

operating principle

Vibrating Wire Piezometers contain a high tensile steel wire with a fixed anchor at one end and are attached to a diaphragm at the other end. The wire is electrically plucked, with the resonant frequency of vibration proportional to the tension in the wire. This frequency induces an alternating current in a coil, which is detected by the readout unit and can then be converted to a pressure.



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applications

Assessing performance and investigating stability of earth fill dams and embankments.

Slope stability investigations.

Monitoring water levels in wells and standpipes.

Monitoring pressures behind retaining walls and diaphragm walls.

Monitoring pore pressures during fill or excavation.

Monitoring pore pressure in land reclamation applications.

features

Field proven reliability and accuracy.

Will tolerate wet wiring common in geotechnical applications.

Immune from external electrical noise.

Signal transmission of several kilometers.

Cable lengths may be changed without affecting the calibration.

High accuracy, IE a low pressure vented model will measure water level changes as small as 0.5 mm (0.02 in.).

Thermistor for temperature measurement is standard.

Negligible displacement of pore water during the measurement process.

Hermetically sealed, stainless steel construction.

Heavy case to minimize reading errors caused by overburden pressure.

Data logger compatible.

Integral lightning protection.



specifications + ordering info

Vibrating Wire Piezometers



vibrating wire piezometer specs

DESCRIPTION	SPECIFICATION
Over range	2 X F.S.
Resolution	0.025% F.S. minimum
Accuracy	0.1% F.S.
Operating Temperature	-20 to 80°C (-4 to 176°F)
Diaphragm Displacement	<0.001 cc at F.S.
Thermal Zero Shift	<0.05% F.S./°C
Materials	Hermetically sealed stainless steel housing
Thermistor Type	NTC 3K Ohms @ 25°C
Thermistor Interchangeability	±0.2°C
Thermistor Resolution	0.1°C
Filter	50 micron sintered filter. (High air entry alumina filter 1, 3, 5 Bar available)

vibrating wire piezometer options

Heavy-duty bodies for embankment use.
Push-in drive points for soft soils
High air entry ceramic filters to exclude air
Low range and vented piezometers
Titanium construction for use with corrosive fluids
Multi-point/mixed type sensor strings
Kevlar® reinforced cable

optional equipment

VW2106 Vibrating Wire Readout
Dataloggers
Terminal stations
Electrical cable
Cable splice kits
Installation geotextile and socks
Increased lightning protection

electrical cable specs

PART #	DESCRIPTION
EL380004	Two twisted pairs cable with polyurethane jacket.

Other types of cables, depending on site conditions and atmospheric reference requirements, are available upon request. These include vented, FEP, PVC, polyurethane, and armored varieties.

ordering info

PART #	DESCRIPTION	PRESSURE RANGE	DIMENSION
VW2100	Standard model for general applications.	0.35, 0.7, 1.0, 2.0, 3.0 MPa	19 mm Ø X 130 mm
VW2100-HD	Heavy duty piezometer for direct burial in fills and large dam embankments.	1.0, 2.0 3.0, 5.0, 7.5, 10 MPa	25.4 mm Ø X 146 mm
VW2100-XHD	Heavy duty piezometer for direct burial in fills and large dam embankments.	1.0, 2.0 3.0, 5.0, 7.5, 10 MPa	38.1 mm Ø X 146 mm
VW2100-HHP	High pressure transducer with NPT port.	5.0, 7.5, 10, 25, 50, 75, 100 MPa	25.4 x 143 mm
VW2100-DP	Drive point model with CPT adapter.	0.07, 0.175, 0.35, 0.7, 1.0, 2.0, 3.0, 5.0, 7.5 MPa	33 mm Ø X 432 mm
VW2100-L	Low Pressure, unvented.	70, 175 kPa	25 mm Ø X 133 mm
VW2100-LV	Low Pressure vented.	70, 175 kPa	25 mm Ø X 133 mm
VW2100-M	Miniature version – 17.5 mm diameter.	0.35, 0.7, 1.0, 2.0, 3.0 MPa	17.5 mm Ø X 133 mm
VW2100-MM	Micro-miniature version – 11.1 mm diameter.	0.35, 0.7 MPa	11.1 mm Ø X 165 mm

High temperature models and metallic cable are available by special order. High temperature ranges include: 0 to 100°C; 0 to 150°C; and 0 to 200°C.

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