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.

operating principle

Vibrating Wire Piezometers contain a high tensile steel wire with a fixed anchor at one end and are attached to a diaphragm in contact with water pressure 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, such as the VW2106 Vibrating Wire Readout, and can then be converted to a pressure. The frequency output is immune to external electrical noise, and able to tolerate wet wiring common in geotechnical applications. Highly reliable lightning protection is incorporated in the vibrating wire transducer.

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.

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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 geotechncial 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.

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ISO 9001 Certified System

ELB0003X

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

- WV2106 Vibrating Wire Readout
- Dataloggers
- Terminal stations
- Electrical cable
- Cable splice kits
- Installation geotextile and socks
- Increased lightning protection

electrical cable specs

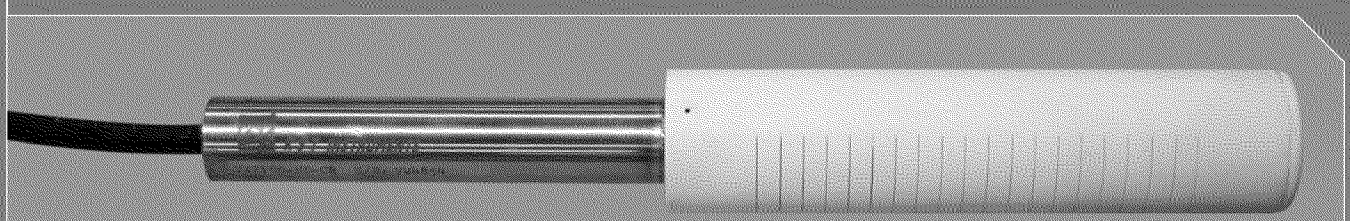
PART #	DESCRIPTION
EL380004	Two twisted pairs cable with polyurethane jacket.

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	PRESSURERANGE	DIMENSION
WV2100	Standard model for general applications.	0.35, 0.7, 1.0, 2.0, 3.0 MPa	19 mm Ø X 130 mm
WV2100-HD	Heavy duty piezometer for direct burial in fills and large dam embankments.	0.35, 0.7, 1.0, 2.0 3.0, 5.0, 7.5, 10 MPa	25.4 mm Ø X 146 mm
WV2100-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
WV2100-HHP	High pressure transducer with NPT port.	5.0, 7.5, 10, 25, 50, 75, 100 MPa	25.4 x 143 mm
WV2100-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
WV2100-L	Low Pressure, unvented.	70, 175 kPa	25 mm Ø X 133 mm
WV2100-LV	Low Pressure vented.	70, 175 kPa	25 mm Ø X 133 mm
WV2100-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
WV2100-MM	Micro-miniature version – 11.1mm diameter.	0.35, 0.7 MPa	11.1mm Ø X 165 mm
PPA0094	Heavy duty piezometer with bladder.	0.35, 0.7, 1.0, 2.0 3.0, 5.0, 7.5, 10 MPa	25.4 mm Ø X 146 mm Bladder O.D.: 1.66 in

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.



PPA0094 - Heavy Duty Piezometer with Bladder

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