Fully Grouted Multi-point Piezometer String

Fully grouted installation permits multiple piezometers to be simply and reliably installed in a single borehole. The piezometer string and grout pipe are placed in the borehole and cement-bentonite grout is pumped until the borehole is filled.

Multi-point Piezometer Strings allow for multiple Vibrating Wire Piezometers to be connected on a single cable. This facilitates the installation of fully grouted multiple piezometers. The single cable prevents vertical void channels. Tough urethane jacketed, Kevlar® reinforced, non-stretch cable is employed to withstand the rigors of installation and is entirely water-blocked to minimize any leakage. No conductors are shared to maximize independent reliability of each sensor.

RST Vibrating Wire Piezometers provide 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 vibrating wire devices is immune to external electrical noise, and able to tolerate wet wiring common in geotechnical applications.

**Fully-grouted piezometers**

Traditionally, multiple piezometer installations in a borehole were slow, complex, and subject to unintended communication between piezometers.

Grouted piezometers are quick and easy to install, have excellent zone isolation, and have rapid response to pore pressure changes.

The fully grouted method is increasingly the preferred standard approach for installing piezometers in boreholes. For more information see:


For further references and information regarding grout mixes, contact RST Instruments Ltd.

**Applications**

Ideal when more than one piezometer reading is needed at various depths - at the same location.

Assessing performance and investigating stability of:
- earth fill dams & embankments
- slope stability

Monitoring of:
- pressures behind retaining walls and diaphragm walls
- pore pressures during fill or excavation
- pore pressure in land reclamation applications

**Features**

- No inter-zone leakage.
- Straightforward installation.
- 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.
- 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.

RST Instruments Ltd. reserves the right to change specifications without notice.

*Kevlar® is a registered trademark of E.I. duPont de Nemours and Company or its affiliates.
Fully Grouted Multi-point Piezometer String

**Vibrating Wire Piezometer Specs**

The following specifications are for an individual vibrating wire piezometer.

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

**Electrical Cable Specs**

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>EL380013P</td>
<td>13 pair, Kevlar® wire with water-blocked polyurethane jacket</td>
</tr>
<tr>
<td>EL380052</td>
<td>26 pair, Kevlar® wire with water-blocked polyurethane jacket</td>
</tr>
</tbody>
</table>

Other types of cables, depending on site conditions, are available upon request.

**Ordering Info**

Due to the semi-custom nature of Multi-point Piezometer Strings, please contact RST Instruments for complete ordering info. Ordering info will be dependent on required cable depth, number of piezometers per string and measurement parameters regarding pressure and/or temperature.

VW2100MP-XXXX Multi-point Piezometer String

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
<th>PRESSURE RANGES</th>
<th>DIMENSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>VW2100MP-XXXX</td>
<td>Multi-point Piezometer String</td>
<td>0.35, 0.7, 1.0, 2.0, 3.0, 5.0, 7.0, and 10.0 MPa (Standard model vibrating wire piezometer ranges shown).</td>
<td>Dimensions dependent on cable and pressure ranges chosen.</td>
</tr>
</tbody>
</table>

**Optional Equipment**

- VW2106 Vibrating Wire Readout
- Dataloggers
- Terminal stations
- Electrical cable
- Cable grip
- VW2100-WT Weight Adapter

A typical installation of a Three-point Piezometer String at various depths in a borehole.