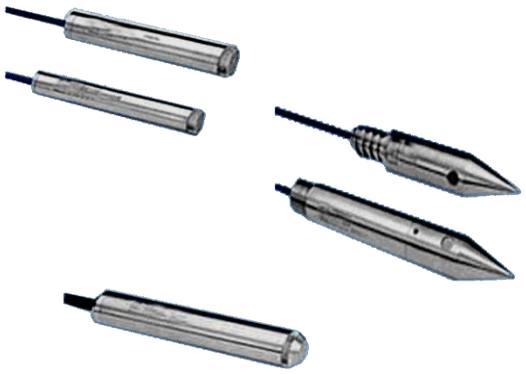
PIEZOMETERS



INTRODUCTION:

Model SIS 2000 Series Piezometer are used to measure groundwater elevations and pore-water pressures in bore holes, embankments, concrete structures, pipe lines, wells etc.

Our Piezometer incorporate vibrating wire sensor with the resonant frequency of vibration of a tensioned steel wire is proportional to the strain or tension in the wire. This fundamental relationship is utilized in a variety of configurations for the measurement of pressure.

Vibrating wire sensors are well known for their long term stability. The design contributes to the outstanding features and performances :

Fast response to pressure changes

Design prevents case stresses from affecting readings ,Over-voltage surge arrestor protects against electrical damage

Connecting cable is strong, screened and flexible

FEATURES:

- Long working life, long term stability and reliability
- Frequency output for transmission over long distances
- Suitable for remote reading, scanning and data logging
- Manufactured from high grade 316 stainless steel for extended operation
- In-built temperature compensation
- Suitable for long-term monitoring
- No electronic components in sensor module
- Fitted with thermistor for temperature monitoring

TYPICAL APPLICATION:

- Measurement of pore water and other fluid pressures for the design and monitoring
- Foundations, retaining walls, hydraulic structures, tunnels, underground works, slopes and open excavations
- Uplift pressure measurement
- Sea water applications

MODEL SIS-2001/2002/2003

The Standard Vibrating Wire Piezometer provides accurate measurement of pore water pressures in fully or partially saturated soil.

The transducer is made from high quality 316 grade stainless steel and designed to handle pressure ranges from -70 kPa. to 20 MPa .It incorporates an over voltage surge arrestor that offers protection from a lightning strike.

The piezometer may be fitted with either a low air entry sintered steel or high air entry ceramic filters. An integral thermistor for temperature monitoring is included.

Accurate, repeatable readings over long cable lengths.

MODEL SIS-2005 (Heavy Duty Piezometer)

Piezometer consists of s rigid cylindrical housing having the Vibrating Wire Sensor inside it. One end of the housing has a high-air or low-air entry filter. The opposite end contains the sealed cable entry. With the filter in place, the main diaphragm of the Piezometer is isolated from the solid particles and senses only the fluid pressure to be measured. The filter is easily removable for calibration and saturation. The Piezometer is designed to be embedded in soil, earth/rock, fills and concrete. It can be inserted in boreholes and small diameter pipes.

MODEL SIS-2004

Piezometer with a threaded adapter permits it to be coupled directly to hydraulic pressure lines. A typical application is for uplift pressure measurement in dams.

VIBRATING WIRE SENSOR

The Vibrating Wire sensor is secured inside the rigid cylindrical housing of the Piezometer. It comprises of a small stainless steel enclosure having a high tensile strength, heat treated and tempered steel wire. The wire is anchored at one end to the enclosure and to a small diaphragm at the other. A magnet coiled assembly is precisely located at the center of the wire inside the same enclosure. This greatly enhances the response characteristics of the vibrating wire. The vibrating wire sensor is self-compensated against temperature variations.

The 'O' ring seal provides complete waterproofing and a high degree of protection from humid and corrosive environment conditions. The sensor is completely isolated from the total stresses acting on the body of the Piezometer.

OPERATION:

Any change in the pressure acting on the diaphragm of the Piezometer is communicated to the sensor and changes the tension of the wire. The wire is plucked by energizing the coil magnet so that it vibrates at its natural resonant frequency. The resonant frequency is proportional to the square root of the tension of the wire. A conventional readout unit can accurately measure the

frequency of the wire. A microprocessor based readout unit can display the frequency as well as the value of the measured pressure directly in engineering units. The Piezometer is suitable for connection to data loggers for recording data in engineering units automatically at pre determined intervals. By the use of appropriate software, the data logger can present recorded data in desired formats, predict trends of variations and even generate alarms at pre-determined set points. The thermistor mounted in the Piezometer enables simultaneous measurement of temperature. This allows any corrections to be made in the observed readings due to temperature changes. Piezometers with lightning protection are available on request.

ACCESSORIES:

- Ceramic or sintered stainless steel filter
- High air entry filter
- Terminal boxes
- Splice kits
- Armored cable

STANDARD PIEZOMETER	**SMALL DIA. PIEZOMETER**	**DRIVE POINT PIEZOMETERS**
SPECIFICATION MODEL SIS-2001	SPECIFICATION MODEL SIS-2002	SPECIFICATION MODEL SIS-2003
Standard Ranges	Standard Ranges	Standard Ranges
2,5,7,10 kg/cm^2	2,5 kg/cm^2	2,5,7,10 kg/cm^2
200,500, 700 kPa	200 ,500 kPa	200,500, 700 kPa
1, 2, 3 MPa	Over Range 2 × rated pressure	1, 2, 3, 5, 7.5 MPa
Over Range 2 × rated pressure	Resolution 0.1% F.S.	Over Range 2 × rated pressure
Resolution 0.1% F.S.	(minimum)	Resolution 0.1% F.S.
Accuracy ± 1% F.S.	Accuracy ± 1% F.S.	(minimum)
Linearity <0.5% F.S.	Linearity <0.5% F.S.	Accuracy ± 1% F.S.
Temperature Range −20°C to +60°C	Temperature Range −20°C to +60°C	Linearity <0.5% F.S.
Length × Diameter	Length × Diameter	Temperature Range −20°C to +60°C
180 × 20mm	165 × 20 mm	Length × Diameter
200 × 20 mm		200 × 28.0 mm

<u>Heavy Duty Piezometer Model</u> SIS-2005

Length × Diameter (200 × 28.0 mm)

Stainless steel, - 50 µm, - 10 kPa, low air entry ; Ceramic, - 1 µm,- 450 kPa, high air entry

PERFORMANCE

Accuracy	- ± 0.1%
Linearity	- < ± 0.5% F.S.
Resolution	- 0.25% F.S. (min.)
Thermal drift	- ± 0.1% F.S. / °C
Thermistar	- 3 kΩ