

VW piezometers



Description

VW piezometers convert water pressure on the diaphragm to be measured into an equivalent frequency signal. The pressure on the diaphragm changed by fluid pressure causes a change in tension of the wire.

The wire excited by the plucking vibrates at its resonant frequency. The frequency signal transmitted through a cable to the readout.

Special stainless steel is used to minimize thermal zero shift in the frequency and the precision of the diaphragm is high when manufactured it.

Also the pressure transducer is equipped with a lightning protection for protecting the sensor electrical shock and a temperature device for compensating for temperature variations.

Features

- Not affected by cable length and resistance change, reproducibility are very excellence
- Optimum design
- Possible to automatic measurement

Dimensions

(Unit : mm)

Model	1510	1515	1520	1530	1540	1545	1500S	1500US
O. D	Ø19.8	Ø26	Ø32	Ø25.4	Ø25.4	Ø25.4	Ø17.5	Ø12.7
L	169.5	169.5	185	151	169.5	219	169.5	151

Applications

The VW piezometers are designed to measure pore water and fluid pressure at the pressure tank and pipe line, borehole, foundation, and dam.

- Measurement of the effects of drainage systems used for excavations.
- Measurement of pore water pressure to determine safety factor under excavation or banking.
- Measurement of water level to check the performance in rivers, reservoirs, standpipes.
- Measurement of pore water pressure to determine slope stability.
- Measurement of flows of underground water and water leakage in embankments, dams and artificial lakes.

[Model 1510 standard]

Model 1510 VW piezometer is designed to be embedded in earth fills and at concrete interfaces or inserted into boreholes and small diameter pipes.



[Model 1520 push-in type]

Model 1520 VW piezometer is placed in consolidated fine grain materials such as sand, silt, or clay.

The external housing is a thick walled cylinder fitted with a tapered shoe at one end, and an EW drill rod or standard pipe thread adapter at the cable entry end. It can withdraw to use again after construction.



[Model 1530 pressure sensor type]

Model 1530 VW piezometer is designed to measure fluid pressure in pipelines for industrial and hydraulic.

Model 1530 was processed as 3/8" pipe thread, so you can directly unite to the female thread part or you can unite to the male thread part using the union. And it is useful to measure up stream pressure in a hydroelectric power plant.



VW piezometers

[Model 1540 heavy duty type]

This model is specially manufactured to use in the site where semi permanent measurement is necessary like dam site. PU sheath cable with aramid fiber and diameter of $\varnothing 7$ is adopted.



[Model 1545 ring filter type]

This model is equipped with a ring type large metal filter. The ring type filter has a very wide contact surface and can be used for all part such as seawater, sand layer, sediment layer, mineral layer. It can use as water level sensor as well.



[Model 1515 low pressure type]

This model is designed to measure low pressure. There are three varieties of measuring range as 1.0/1.5/2.0kg/cm². For measuring water pressure.



[Model 1500S slim type]

This model is made into small size(OD $\varnothing 17.5$ mm) for measuring at ID $\varnothing 19$ mm standpipe.



[Model 1500US ultra slim type]

This model is made into small size (OD $\varnothing 12.7$ mm).



The readout

It is connected to the system such as the VW readout units, data loggers to be data logging and data acquisition system to monitor readings. It is compatible with other company's readout unit.

- ACE-800 (VW readout)
- ACE-1000 (VW data recorder)
- ACE-1100 series (VW mini logger)
- ADL-200 / ARF-100 (Smart logger / Smart controller)

Recommendation

- VW piezometers are sensitive to atmospheric pressure variations. The change in heads caused by atmospheric pressure variations, must be compensated for them, using a barometer to take an accurate reading in field that atmospheric pressure variations is frequent as dams, valleys and reclaimed lands.
- VW piezometer is attached with low density filter of 50μ m, soak it into water over 12hours before establishment and deflate air, then you can get accurate measurement.
- In establishing VW piezometer, please, put signal cable longer enough than depth of perforation by 10~20% so as to prevent from breakdown of cable by settlement.
- A high air entry tip with 1 micron pores and permeability is used in unsaturated soils and where negative pore pressures are anticipated.
- When you install VW piezometer in soft ground, you must protect a signal cable by garden hose. If not, the signal cable is cut down or is short circuit caused by rotation of drill core.

VW piezometers

Specification

Model	1510 (STD)	1520 (Push-in)	1530 (Pressure)	1540 (Heavy duty)	1545 (Ring filter)	1500S (Slim size)	1500US (Ultra slim)	1515 (Low pressure)	
Sensor element	Vibrating wire sensor								
Range	3.5~70kg/cm ²						3.5, 7 kg/cm ²	1.0, 1.5, 2.0 kg/cm ²	
Resolution	0.025% FSR								
Accuracy	±0.1% FSR								
Nonlinearity	±0.5% FSR								
Over range capacity	150% FSR								
Thermal zero shift	Less than 0.05% FSR/°C								
Operating temperature	-40~80°C								
Built-in temperature device	Thermistor (3k Ω)								
Temperature device range	-40~105°C								
Temperature device accuracy	±0.5°C								
Waterproof	1000m H ₂ O								
Materials	Stainless steel. high grade epoxy resin potting								
Filter	Standard : 50 micron sintered stainless filter / air transit pressure : about 5.6kg/cm ² Optional : 1 micron / 100 micron ceramic filter								
Built-in lightning protection	Gas tube arrester (frequency output lines)								
Weight	0.2kg	0.8kg	0.3kg	0.3kg	0.5kg	0.2kg	0.1 kg	0.3kg	
Signal cable	Ø6.4mm, 0.37mm ² × 4C shielded PU sheath cable (For 1540 : Ø7mm, 0.34mm ² × 4C Ø3mm Aramid fiber reinforced PU sheath cable)								

- (Note)
- The accuracy depends on air entry in the filter, compensating thermal zero shift and difference in air pressure.
 - Upon request, it can be manufactured from STS316, anti-corrosion material that can be used in seawater environment.
 - There may be a negative pressure zone in civil engineering sites. Our company is equipped with negative pressure calibration facility and will make a second calibration by -1kg/cm² if requested.

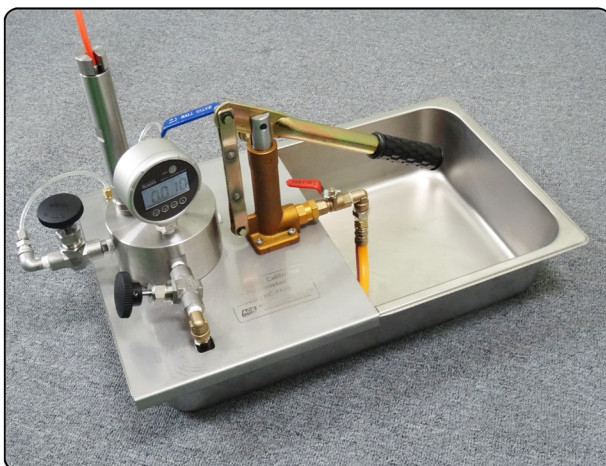
Ordering information

- Model number
- Application field
- Cable length
- Pressure range
- Keeping VW readout unit
- Negative pressure exist or not in installation field
- 200kg/cm² special order for the product that is not in catalogue is possible

Ancillary equipments

- Universal terminal box (model 7012/7024)
- Polyethylene sheath cable for heavy duty
- EW adapter (for 1520)
- Protective cover (PC-40)
- EW coupling (for 1520)
- Barometer

[Digital hydraulic calibrator set]



The digital hydraulic calibrator set is a self-calibrator (model HC-15S) for testing or calibrating a vibrating wire piezometer. It combines a hand pump set with a piezometer clamp that is made differently by model. Calibration by using digital pressure gauge and water pressure makes easy and accurate calibration possible. The calibrator set is mostly made of stainless steel.

Specification

Model	HC-15S
Display	Digital pressure sensor
Pressure range	50 kg/cm ²
Accuracy	±0.25% FSR
Resolution	0.01kg/cm ²
Dimension	125 × 222 × 122 mm
Weight	10 kg
Materials	Stainless steel (Pump : brass)
Liquid used	Clean water equivalent to 10°C at room temperature