



Datasheet W9

# W9 Standard Vibrating Wire Piezometer

## DESCRIPTION

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 -50 to 4000 kPa.

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.

A coned nose piece is available for push in installations.

An integral thermistor for temperature monitoring is included.

## FEATURES

- ✓ Small diameter
- ✓ Uses proven Vibrating Wire (VW) technology  
Manufactured from high grade 316 Stainless Steel for extended operation
- ✓ In built temperature compensation
- ✓ Hermetically sealed
- ✓ Suitable for long-term monitoring
- ✓ No electronic components in sensor module
- ✓ Capable of measuring negative pore pressures to -50 kPa Fitted with thermistors for temperature monitoring

## BENEFITS

- ✓ Accurate, repeatable readings over long cable lengths
- ✓ Long working life, long-term stability and reliability
- ✓ 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

## OPERATION

The Standard Vibrating Wire Piezometer is designed for the accurate measurement of pore water pressures in fully or partially saturated soil.

The piezometer tip has an integral porous filter element containing a diaphragm type Vibrating Wire pressure transducer. A cable connects the transducer to a read-out, terminal unit or data logger.

The readout displays either frequency based units, or by inputting the instrument calibration factor, engineering units.

### Typical applications include:

- ✓ Environmental management including landfill sites
- ✓ Monitoring of aquifers
- ✓ Monitoring of tidal effects on coastal soils
- ✓ Dams
- ✓ Embankments
- ✓ Potential landslide sites
- ✓ Dewatering excavations
- ✓ Tailings lagoons
- ✓ Pumping tests
- ✓ Monitoring seepage
- ✓ Control placement of fill

## APPLICATIONS

Piezometers are used in geotechnical, environmental, and hydrological applications. They can be installed in boreholes, placed in fill materials or open wells to measure water levels or pore water pressures to enable engineers to verify design assumptions and control placement of fill.

With a nose cone fitted the piezometer can also be pushed into soft ground with a CPT rig.

## SPECIFICATIONS

### SENSOR

Range (kPa)	300   500   700   1000   1500   2000   4000
Material	316 grade Stainless Steel
Accuracy	±0.1% full scale
Linearity	±0.5% full scale
Resolution <sup>1</sup>	0.025% full scale (minimum)
Over range	200% of full scale
Diaphragm displacement	< 0.001 cm <sup>3</sup>
Diameter	19mm
Weight (without cable & filter)	190g
Temperature range	-20° to +80°C
Excitation method	pluck or sweep

### HERMETIC SEALING

Sensor	Vacuum sealed by electron beam welding
Piezometer	Cable gland / potting compound / "O" ring seals

### THERMISTOR

Type	NTC 3kΩ
Accuracy	0.5°C
Resolution <sup>1</sup>	0.1°C

FILTER TYPES	Ø	Length	Porosity
HAE ceramic	19mm	15mm	1 Micron
Sintered Stainless Steel	19mm	15mm	50 Micron

### CABLE (WITH THERMISTOR)

Type	4 Core screened PVC outer sheath
Diameter	7.5mm
Weight/m	73g

<sup>1</sup>Dependent on readout

## ORDERING INFORMATION



### Low Air Entry Stainless Steel Sintered Filter Vibrating Wire Piezometer

**Low resistance to air entry (LAE), stainless steel sintered filter (50micron)**

W9-30-SS-T	300kPa pressure range with thermistor
W9-50-SS-T	500kPa pressure range with thermistor
W9-70-SS-T	700kPa pressure range with thermistor
W9-100-SS-T	1000kPa pressure range with thermistor
W9-150-SS-T	1500kPa pressure range with thermistor
W9-200-SS-T	2000kPa pressure range with thermistor
W9-400-SS-T	4000kPa pressure range with thermistor

### Heavy Duty Push-In Piezometers

W9-30-SS-T	300kPa pressure range
W9-50-SS-T	500kPa pressure range
W9-70-SS-T	700kPa pressure range
W9-100-SS-T	1000kPa pressure range
W9-150-SS-T	1500kPa pressure range
W9-200-SS-T	2000kPa pressure range
W9-400-SS-T	4000kPa pressure range

### Installation Accessories

W9-1.1-27	Push-in stainless steel nose cone, For use with 15mm ceramic and stainless steel filters, 27mm outer diameter
W6-8.1	Punner, To compact material in borehole. For use with W6-8.2 or W1-2.7
W1-2.7	Galvanised standpipe tubing, mild steel galvanised, includes coupling, 1 metre length, 3/4inch nominal bore, 3/4inch BSP thread
W6-8.2	Galvanised standpipe tubing, mild steel galvanised, includes coupling, 3metre length, 3/4inch nominal bore, 3/4inch BSP thread
W2-4.11	Standard tool kit, tool kit includes: knife, 3 metre measuring tape, 8 inch adjustable spanner, 2 No flat screw drivers, combination pliers, ball hammer, 6 No English spanners 5/16 to 1inch.

### Spare Filters

W9-1.3	Replacement ceramic HAE, high resistance to air entry (1micron)
W9-1.4	Replacement sintered steel LAE filter, Low resistance to air entry (50micron)

### High air entry ceramic filter vibrating wire piezometer

**High resistance to air entry (HAE), ceramic filter (1micron)**

W9-30-H-T	300kPa pressure range with thermistor
W9-50-H-T	500kPa pressure range with thermistor
W9-70-H-T	700kPa pressure range with thermistor
W9-100-H-T	1000kPa pressure range with thermistor
W9-150-H-T	1500kPa pressure range with thermistor
W9-200-H-T	2000kPa pressure range with thermistor
W9-400-H-T	4000kPa pressure range with thermistor

### Connecting Cables and Fittings

CA-2.3-4-SC	4 core, multicore cable, 16/0.020, screened, Priced per metre, PVC jacket, for instruments with thermistors
CA-4.1	Joint sealing kit

### Manual

MAN-106	Vibrating Wire Standard Piezometer
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