



Datasheet W4

Heavy Duty Vibrating Wire Piezometer

DESCRIPTION

The Heavy Duty Vibrating Wire Piezometer accurately measures pore water pressures in fully or partially saturated soil.

The heavy duty design prevents case stresses from affecting readings in extreme installations (dams and high ground stresses). The transducer is fitted with either a low air entry sintered steel or a high air entry ceramic filter. A cone shaped nose piece is available for push in installations.

The transducer is made from high quality 316 grade Stainless Steel and designed for pressure ranges from -50 to 15,000 kPa.

The Heavy Duty Vibrating Wire Piezometer incorporates an over voltage surge arrestor to offer protection from an indirect lightning strike. The piezometer is also available with a thermistor for temperature monitoring.

FEATURES

- ✓ Heavy duty design
- ✓ Uses proven Vibrating Wire (VW) technology
- ✓ Manufactured from high grade 316 Stainless Steel for extended operation
- ✓ In built temperature compensation
- ✓ Hermetically sealed
- ✓ Highly accurate device
- ✓ Capable of measuring negative pore pressures to -50 kPa
- ✓ Available with thermistor for temperature monitoring
- ✓ Accurate, repeatable readings over long cable lengths

BENEFITS

- ✓ Long working life, long-term stability and reliability
- ✓ Works in extreme installations and pressures up to 15000kPa
- ✓ Fast response to pressure changes
- ✓ Advanced design prevents case stresses from affecting readings
- ✓ Over-voltage surge arrestor protects against electrical damage
- ✓ Connecting cable is strong, armoured and flexible

OPERATION

The Heavy Duty Vibrating Wire Piezometer is designed for the accurate measurement of pore water pressures in fully or partially saturated soil and rock. The piezometer tip has an integral porous filter element integral with 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

SPECIFICATIONS

SENSOR

Range (kPa)	150 300 500 700 1000 1500 2000 4000 6000 10000 15000
Material	316 grade Stainless Steel
Accuracy	±0.1% full scale
Linearity	±0.1% full scale
Resolution ¹	0.025% full scale (minimum)
Over range	200% of full scale
Diaphragm displacement	< 0.001 cm ³
Diameter	28mm
Weight (without cable & filter)	980g
Temperature range	-20° to +80°C
Excitation method	pluck or sweep

HERMETIC SEALING

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

THERMISTOR

Type	NTC 3kΩ
Accuracy	0.5°C
Resolution ¹	0.1°C

FILTER TYPES	Ø	Length	Porosity
HAE ceramic	28mm	15mm	1 Micron
Sintered Stainless Steel	28mm	15mm	50 Micron

CABLE

Type	2 core armoured PVC outer sheath	4 core armoured PVC outer sheath
Diameter	12mm	13mm
Weight/m	220g	336g

¹Dependent on readout

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.

ORDERING INFORMATION

Low Air Entry Stainless Steel Sintered Filter Vibrating Wire Piezometer

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

W4-15-S	150kPa pressure range
W4-30-S	300kPa pressure range
W4-50-S	500kPa pressure range
W4-70-S	700kPa pressure range
W4-100-S	1000kPa pressure range
W4-150-S	1500kPa pressure range
W4-200-S	2000kPa pressure range
W4-300-S	3000kPa pressure range
W4-400-S	4000kPa pressure range
W4-600-S	6000kPa pressure range
W4-1000-S	10000kPa pressure range
W4-1500-S	15000kPa pressure range
W4-15-S-T	150kPa pressure range with thermistor
W4-30-S-T	300kPa pressure range with thermistor
W4-50-S-T	500kPa pressure range with thermistor
W4-70-S-T	700kPa pressure range with thermistor
W4-100-S-T	1000kPa pressure range with thermistor
W4-150-S-T	1500kPa pressure range with thermistor
W4-200-S-T	2000kPa pressure range with thermistor
W4-300-S-T	3000kPa pressure range with thermistor
W4-400-S-T	4000kPa pressure range with thermistor
W4-600-S-T	6000kPa pressure range with thermistor
W4-1000-S-T	10000kPa pressure range with thermistor
W4-1500-S-T	15000kPa pressure range with thermistor

High air entry ceramic filter vibrating wire piezometer

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

W4-15-H	150kPa pressure range
W4-30-H	300kPa pressure range
W4-50-H	500kPa pressure range
W4-70-H	700kPa pressure range
W4-100-H	1000kPa pressure range
W4-150-H	1500kPa pressure range
W4-200-H	2000kPa pressure range
W4-300-H	3000kPa pressure range
W4-400-H	4000kPa pressure range
W4-600-H	6000kPa pressure range
W4-1000-H	10000kPa pressure range
W4-1500-H	15000kPa pressure range
W4-15-H-T	150kPa pressure range with thermistor
W4-30-H-T	300kPa pressure range with thermistor
W4-50-H-T	500kPa pressure range with thermistor
W4-70-H-T	700kPa pressure range with thermistor
W4-100-H-T	1000kPa pressure range with thermistor
W4-150-H-T	1500kPa pressure range with thermistor
W4-200-H-T	2000kPa pressure range with thermistor
W4-300-H-T	3000kPa pressure range with thermistor
W4-400-H-T	4000kPa pressure range with thermistor
W4-600-H-T	6000kPa pressure range with thermistor
W4-1000-H-T	10000kPa pressure range with thermistor
W4-1500-H-T	15000kPa pressure range with thermistor

Installation Accessories

W4-1.4	Push-in Stainless Steel nose cone, for use with 15mm ceramic and Stainless Steel filters, 38mm 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, 1metre 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
W4-1.6	Push in adaptor, threaded to fit 3/4inch BSP tube
W3-4.3	Push in adaptor, threaded to fit 3/4inch BSP tube
W2-4.11	Standard Tool Kit, includes: knife, 3metre measuring tape, 8inch adjustable spanner, 2 No flat screw drivers, combination pliers, ball hammer, 6No English spanners 5/16 to 1inch

Spare Filters

W4-1.2	Replacement ceramic HAE, high resistance to air entry (1micron)
W4-1.3	Replacement sintered steel LAE filter, Low resistance to air entry (50micron)

Connecting Cables and Fittings

CA-1.1-2-A	Armoured cable, 2 core, price per metre, 1.5mm ² , PVC jacket
CA-1.1-4-A	Armoured cable, 4 core, price per metre, 1.5mm ² , PVC jacket (for instruments with thermistors)