

## VW borehole rod extensometer (MPBX)

### Description

Model 1380 **VW borehole rod extensometer** consists of anchors, rods, protective tubes, and VW displacement sensors. The VW transducer measures settlement or heaving and changes frequency signal as movement in layers change. The anchors connected to rods are installed in borehole.

Anchors and anchor rods referenced to stable ground move up or down as movement in borehole occurs.

This changes tension of the vibrating wire inside the VW transducer. When the plucking coil excited, the VW transducer outputs frequency signal. This signal is transmitted to the VW readout unit and is displayed.

The VW borehole rod extensometer can be installed up to six anchors in  $\varnothing 100\text{mm}$  one borehole. Quantity of anchors installed depends on the drilling diameter in borehole and anchor type.

The anchors are available cement grouting anchors for rock and hydraulic anchors for fill and soft ground.

The rods for anchors are assembled with diameter  $\varnothing 6\text{mm}$  fiberglass rod in field. The VW borehole rod extensometer is useful for borehole that heave is expected and the depth is deep. The PE protective tube is installed with rods to prevent injection to rods.

The VW transducer is available 50mm and 100mm range. If the VW transducer of 50mm range is used, it is turned its sleeve to set to 25mm long. It lie distance between extension and compression.

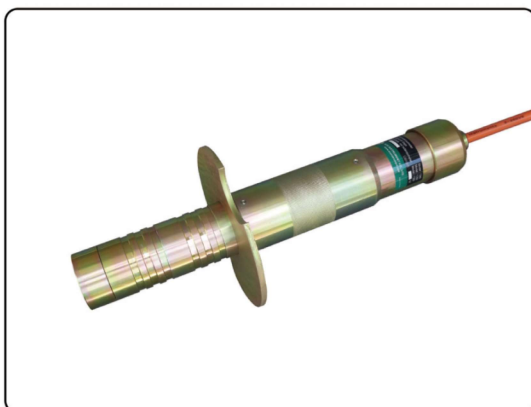
The VW borehole rod extensometer is calibrated of displacement versus frequency by the exclusive device. The calibration sheet is supplied with each sensor.

The VW borehole rod extensometer is equipped with a temperature device for compensating temperature variations.

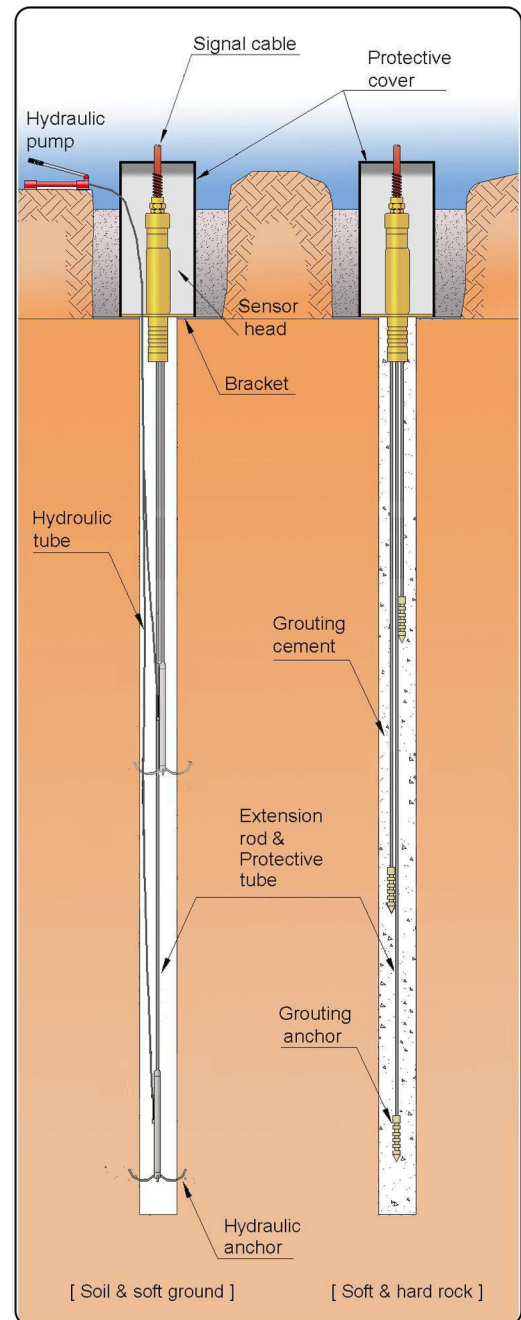
### Applications

VW borehole rod extensometer is designed to measure settlement or heaving in borehole that is installed one to six measuring anchors in each layer.

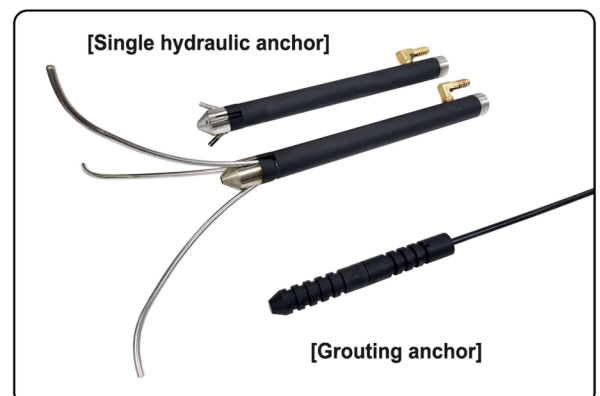
- Measurement of settlement or heaving in foundations
- Monitoring the stability in tunnels, mines, fills and excavations
- Monitoring the stability in adjacent ground during long term structure construction
- Measurement of the deformation in abutments and retaining walls.
- Application to the high-intensity and low coefficient of linear expansion and light fiberglass rod



[Head of VW borehole rod extensometer]



[Hydraulic anchor type] [Grout anchor type]



[Grouting anchor]

## VW borehole rod extensometer (MPBX)

### Specification

Model	1380	
Sensor element	Vibrating wire sensor	
Range	50mm	100mm
Resolution	0.025% FSR (0.01mm)	0.025% FSR (0.02mm)
Accuracy	±0.1% FSR	
Nonlinearity	±0.5% FSR	
Operating temperature	-40~80°C	
Built-in temperature device	Thermistor (3k $\Omega$ )	
Temperature device range	-40~105°C	
Temperature device accuracy	±0.5°C	
Waterproof	50m H <sub>2</sub> O	
Measuring points	1~6 points (selection by customer)	
Length of anchor rod	Order by customer (optional)	
Weight	① Sensor head 4~5kg ② Extension tube 0.15kg/m ③ Hydraulic anchor 2.5kg	
Materials	Sensor part	Stainless steel / alloyed steel (galvanized)
	Anchor rod	Fiberglass rod ( $\varnothing$ 6mm) or stainless steel tube ( $\varnothing$ 4 $\times$ $\varnothing$ 7mm)
	Protection tube	PE tube ( $\varnothing$ 8 $\times$ $\varnothing$ 10mm)
Signal cable	$\varnothing$ 10mm, 0.37mm <sup>2</sup> $\times$ 8C shielded PVC sheath cable	

### 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-16V (VW data logger)
- ADL-200A (Smart logger)
- VL Module (Smart LoRa system)

### Ordering information

- Application field
- Type, depth and quantity of anchors
- Keeping VW readout unit
- Cable length

### Ancillary equipments

- Universal terminal box (model 7012/7024)
- Protective case (PC-60)
- Nylon tube for grout
- Portable hydraulic pump (model 7050)
- Hose kit for the hydraulic anchor

### Recommendation

The settlement on the surface ground may occur deeper than height of anchors. Geodetic meter are recommended to compensate settlement on the VW transducer head.

### Installation depth

	Orient of drilling	Specification
Fiberglass anchor rod ( $\varnothing$ 6mm)	Vertical lower, 45 degree upper slope	About 60mm
	Vertical upper, 45 degree lower slope	About 40mm

### Features

- High precision and reliability
- Stability and reliability in extreme environment
- Not affected by cable length and resistance change, reproducibility are very excellence
- Built-in temperature device
- Possible to automatic measurement
- Permanent anti-corrosive, rustproof materials