

## VW settlement gages



### Description

**Model 1810 VW settlement gage** consists of 3 main parts reservoir, tube that liquid fills and VW pressure sensor kit.

The reservoir is positioned at a stable location, the other at different locations. The transducer converts liquid pressure acting on the diaphragm into the frequency signal.

The settlement gage is connected via a tube filled with liquid to a reservoir. As the transducer settles with the surrounding ground, the transducer senses the pressure of the fluid within the tube and measures the difference in the elevation between the reservoir and the settlement gage. The settlement is calculated by converting the change in pressure to millimeters or liquid head.

The settlement gage utilizes special steels to minimize thermal zero shift. The VW settlement gage is equipped with a lightning protection device for protecting the pressure transducer from electrical shock and a temperature device for compensating for temperature variations.

As barometric pressure is changed, the standard water head is changed. Because barometric pressure has to be corrected at site that the exact measuring required, to correct the barometric pressure automatically, as using the vented tube that the VW pressure device is connect, automatically correct the water head error caused by the change of barometric pressure without specific correction. The signal cable is connected to desiccant case that people can be easily access to. And silica gel for damp proof is inserted.

### Applications

The model 1810 VW settlement gage measures very small changes of elevation under construction.

- Investigation of the stability in bridges
- Measurement of settlement in reclaimed lands
- Measurement of long term settlement in fills, dam foundations and embankments
- Measurement of settlement in storage tanks and foundations

### Features

- High precision and reliability
- Stability and reliability in extreme environment
- Not affected by cable length and resistance change, reproducibility are very excellence
- Possible to automatic measurement

### 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 mini logger)
- ADL-200A (Smart logger)

### Ancillary equipments

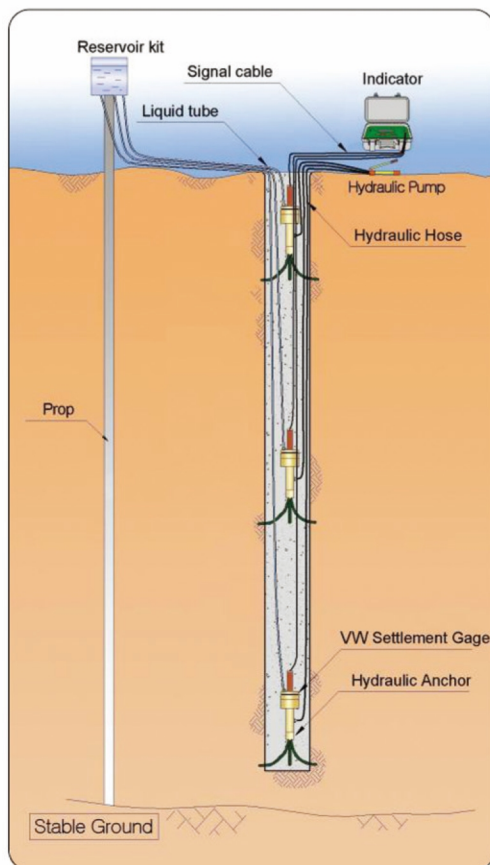
- Terminal structure
- Universal terminal box (model 7012/7024)
- Polyethylene sheath cable for heavy duty
- Overflow system for automatic measurement
- Portable hydraulic pump (model 7050)
- Hydraulic anchor & hose
- Barometer

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### Specification

Model	1810			
Sensor element	Vibrating wire sensor			
Range (kg/cm <sup>2</sup> )	0.7	1.0	1.5	2.0
Liquid head (mH <sub>2</sub> O)	0~7	0~10	0~15	0~20
Resolution	0.025% FSR			
Accuracy	±0.1% FSR			
Nonlinearity	±0.5% FSR			
Thermal zero shift	Less than 0.003kg/cm <sup>2</sup> /°C			
Operating temperature	-40~80°C			
Built-in temperature device	Thermistor (3k $\Omega$ )			
Temperature device range	-40~105°C			
Temperature device accuracy	±0.5°C			
Maximum extensible length in tube	Max. 250 m			
Dimension in tube	ID $\varnothing$ 2.5×OD $\varnothing$ 4mm PE tube			
Maximum pressure in tube	Max. 33kg/cm <sup>2</sup> (@20°C)			
Liquid	Ethylene glycol + distilled pure water			
Water proof	500m H <sub>2</sub> O			
Material	Stainless steel, high grade epoxy potting			
Weight	① Sensor 2.4kg ② Settlement plate (250×250×4t) 2kg			
Signal cable	$\varnothing$ 10.5mm, 0.37mm <sup>2</sup> ×4C, vent tube built-in shielded PVC cable			
Accessories	① Settlement plate ② Reservoir ③ Mounting bracket ④ Desiccant case			

(Note) The accuracy and reliability depends on compensating for temperature variations, atmospheric pressure variations, de-aging in liquid and installation method.



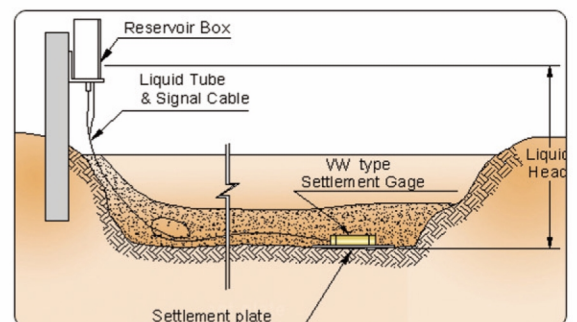
[Installation connecting to the hydraulic anchor as multi layer]

### Ordering information

- Filling height and distance between a settlement gage and a reservoir
- Keeping VW readout unit
- Cable and tubes length
- Range
- Application field

### Recommendation

- Vent tube is attached on end of cable to correct barometric pressure. After connecting the vent tube into plastic case, it has to be used in dried condition that the silica gel is inserted. And use vent tube after drying every 4~6 months.
- In embedment of liquid tubes and signal cables, they must be covered with protective tubes and be back-filled with soft sands to prevent damage due to be pressed down by rock and large stones.



[Installation of VW settlement gage]