



**CAUTUS GEO**

surveying for safety



## Cautus Piezometer

Real-time monitoring of pore pressure

- » Specially designed for use in Nordic environments
- » Vibrating wire (VW) signal
- » Simple drive-in installation with R32 steel rod adapter
- » Complete systems with GSM/GPRS transmission
- » Very low power usage
- » Real-time data on Cautus Web
- » Automatic alarms and alerts

Pore pressure is one of the key factors of soil mechanics, and significant changes in pore pressure can have a direct effect on the stability and amount of settlement of soils and rock formations. Thus, pore pressure can be critical to observe on a wide range of projects including dams, tunnels, embankments and excavations, or any project with activity at or below the groundwater table.

Cautus Geo delivers low-cost, automated pore pressure monitoring systems using vibrating wire piezometers for direct measurement of pore pressure. Data is transmitted in real-time to a web-based platform that provides alarms and alerts in the event of any changes above user-defined threshold limits.



### Applications

- » Dams and reservoirs
- » Tunnels/underground
- » Excavations
- » Sheet pile walls
- » Embankments
- » Drainage/runoff monitoring
- » Hydrogeology
- » Other structures



We have developed an adapter for push-in installation in soft clays. The adapter fits directly onto a 44 mm steel rod with R32 threading and protects the signal cable as it is pressed down. This method makes installation without permanent pipes in the ground possible and is cost and time-efficient.



### Vibrating wire piezometer

We offer a drive-in vibrating wire (VW) sensor specially designed for use in Nordic soils and climate. These types of sensors are supplied individually or on a string for placement of sensors at several depths.

VW sensors have an internal, tensioned steel wire connected at one end to a flexible diaphragm. To take a measurement, the wire receives a brief voltage excitation that causes the wire to oscillate at its resonant frequency, which is recorded by a data logger. The frequency changes based on the pore pressure applied to the diaphragm and is automatically converted to engineering units of pressure through a simple calculation on the web server.

### Real-time solutions

We can deliver complete systems with everything needed to monitor pore pressure - sensors, GSM/GPRS data logger with antenna, power supply (either battery plus solar or 230V mains power), mounting cabinet and hardware, and installation pipes.

Systems arrive preconfigured with loggers programmed to send data to a web solution such as Cautus Web for further analysis, presentation and event notification via email and/or SMS alarms. Additional sensors such as weather and water quality instruments can also easily be integrated into full system solutions.



*Installed system with multiple sensors, solar panel and GSM/GPRS transmission*

### SPECIFICATIONS

Pressure ranges	345, 518, 690, 1034, 2068, 3447, 5171, 6895 kPa
Resolution	0,025% FS
Accuracy	±0,1 FS
Non-linearity	<0,5% FS
Operating temperature	-20 to 80 °C
Thermal effect	<0,5% FS/ °C
Dimensions	Varies, 25 x 151 mm or 38 x 230 mm
Weight	Varies, 210 to 2100 g
Over range	2x rated pressure
Materials	Stainless steel
Frequency	2200-3500 Hz
Nominal zero point	3130 Hz
Thermistor	3k Ohms @ 25 °C
Datalogger VW ports	6
Modem	Quad-band GSM/GPRS, micro-SIM
Communication	TCP/IP or OpenVPN, FTP data transfer