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VW Crack Meter



Introduction

Geosense® VWCM-4000 crack meters are used to measure movement across surface cracks and joints in concrete, rock, soil and structures.

They consist of a sensor outer body tube and an inner free sliding rod which is connected at the internal end to a vibrating wire sensor by a spring. At the sensor end of the outer body and the external end of the rod anchors are attached which can be fixed either side of a crack to be monitored.

VWCM-4000 crack meters are installed by grouting, bolting, bonding or fixing expandable anchors to the structure to be monitored. The anchors incorporate ball joints where they are fixed to the gauge to accommodate any differential cross-axis movement and prevents the inner rod from binding within the outer casing.

Working principle

The gauge operates on the principle that a tensioned wire, when plucked, vibrates at its resonant frequency. The square of this frequency is proportional to the strain in the wire. Around the wire is a magnetic coil which when pulsed by a vibrating readout or data logger interface plucks the wire and measures the resultant resonant frequency of vibration.

A change in distance between the anchors caused by the crack opening or closing causes the inner free-sliding rod to move within the outer body which changes the tension on the spring and the vibrating wire thus altering the resonant frequency of the wire. Temperature information can be used if logging regularly to determine swift temperature changes

during which crack movement readings may be exaggerated

Features

- Simple to install and read
- High resolution & accuracy
- Internal thermistor
- Insensitive to long cable runs
- Datalogger compatible
- Ranges from 5 to 100mm
- Waterproof up to 16 bar

Applications

Measurement of crack movement in:

- Concrete structures
- Stone & brick buildings
- Dams
- Tunnels
- Construction joints
- Pipelines
- Rock formations

Specifications

VWCM-4000 crack meters may be read by the VW-2106 or any vibrating wire readout device and may be readily connected with data loggers with vibrating wire interface modules.

Vibrating wire crack meters output a frequency signal and are therefore insensitive to resistance changes in connecting cables caused by contact resistance or leakage to ground.

Cable may be readily and simply extended on site without special precautions. Gauges may be read up to 1000 metres away from their installed location without change in calibration.



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Description	
Ranges	5, 12.5, 25, 50, 100, 150, 200, 300mm
Resolution	<0.025% FS
Accuracy	±0.1 to ±0.5% FS
Non-linearity	<0.5% FS
Frequency	2200 - 3500 Hz
Body material	Stainless steel
Inner rod	Stainless steel
O-ring	Viton
Anchor material	Mild steel, BZP
Anchor types	Grout, bond, bolt, expandable
Waterproof rating	18 bar

Anchors



The VW Crack Meter may be anchored either using the custom grout able anchors shown, or expanding bolts or other solutions can be constructed by the end user.

Custom datalogger systems for any number of sensors in any configuration are also available and can be designed on request.

Please see our other data sheets for details of readout equipment, terminal boxes and data loggers specific to vibrating wire devices.

Readout Systems



Single Channel VW Readout

This unit allows a user to collect readings from a VW Sensor and Thermistor during installation or for short term jobs where an operator can check manually. With a switching box multiple VW system can be read one after the other.

Single Channel VW Datalogger

A low cost battery powered system for unattended monitoring of a single VW Sensor and thermistor.

Ten Channel VW Datalogger

Each channel records data from a VW sensors or thermistor.

Typically will record data for 5 VW sensors and integral thermistors.



PCTE

PCTE have over 30 years' experience in the measurement and testing of concrete. With experience in research, consulting and construction they are able to assist you in reviewing the issues and developing solutions. PCTE can provide more than just the equipment. They can provide leading technical support for your business.

Other Equipment

GeoSense offer a complete range of structural health monitoring equipment, including VW strain gauges, extensometers, load cells and tilt meters.

The Olson Instrument range includes the NDE360, CTG, Freedom Data PC and DAS as well as the resonance tester.

The full Proceq range of equipment is available for insitu non-destructive concrete measurement, including Schmidt Hammers, Covermeters, Half Potentials, Resistivity, Ultrasonics and Permeability.