

## VW Strain Gauge Embedment VWS-2100 Series

Designed for direct embedment in concrete. Can be used within mass concrete with coarse aggregates as its heavy duty construction resists bending and the large end flanges provide a high contact area.



# VW Strain Gauge Embedment VWS-2100 Series



## Overview



Geosense® VWS-2100 series vibrating wire embedment strain gauges are designed for direct embedment in concrete.

The strain 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.

The gauge consists of two end blocks with a tensioned steel wire between them.

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.

Deformation within the concrete will cause the two end blocks to move relative to each other. The tension in the wire between the blocks will change accordingly thus altering the resonant frequency of the wire.

VWS-2125 can be used within mass concrete with coarse aggregates as it's heavy duty construction resists bending and the large end flanges provide a high contact area.

## APPLICATIONS

Measurement of stress and strain deformation in:

Driven and bored piles

Tunnels and deep excavations

Mass concrete pours

Precast piles

Concrete dams

Retaining walls

Dynamic measurements with auto resonant version

Building foundations

## FEATURES

Reliable long-term performance

Rugged, suitable for demanding environments

High accuracy

Insensitive to long cable lengths

Totally waterproof

Direct embedment in concrete

Auto resonant units available

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## Specifications

### GENERAL

Model number	VWS-2100	VWS-2120	VWS-2125
Gauge length	150mm	50mm	250mm
Overall length	156mm	54mm	260mm
Resolution	1 $\mu\epsilon$	1 $\mu\epsilon$	1 $\mu\epsilon$
Strain range	3000 $\mu\epsilon$	3000 $\mu\epsilon$	3000 $\mu\epsilon$
Accuracy <sup>1</sup>	$\pm 0.1\%$ to $\pm 0.5\%$ FS	$\pm 0.1\%$ to $\pm 0.5\%$ FS	$\pm 0.1\%$ to $\pm 0.5\%$ FS
Non linearity	<0.5% FS	<0.5% FS	<0.5% FS
Coil resistance	180 $\Omega$	180 $\Omega$	180 $\Omega$
Coefficient of thermal expansion	12.0 ppm/ $^{\circ}$ C	12.0 ppm/ $^{\circ}$ C	12.0 ppm/ $^{\circ}$ C
Thermal factor K	<0.1% FS/ $^{\circ}$ C	<0.1% FS/ $^{\circ}$ C	<0.1% FS/ $^{\circ}$ C
Temperature range	-20 $^{\circ}$ C to +80 $^{\circ}$ C	-20 $^{\circ}$ C to +80 $^{\circ}$ C	-20 $^{\circ}$ C to +80 $^{\circ}$ C
Frequency range	850-1550Hz	1350-3150Hz	1350-3150Hz
Cable type	2 pair x Type 900 - VW Sensor with Foil Screen & Drain Wire		
Cable sheath	Orange PUR 5mm $\varnothing$		

### ORDERING INFORMATION

Gauge length

Cable length

Readout

<sup>1</sup>  $\pm 0.1\%$  with individual calibration,  $\pm 0.5\%$  FS with standard batch calibration

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## Further Information

### READOUTS

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VWS-2100 vibrating wire strain gauges may be read by the VWR-1 or any vibrating wire readout device and may be readily data logged using the GeoLogger G8-Plus or any other data loggers with vibrating wire interface modules.

### CABLES

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Vibrating wire strain gauges 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.

### FULLY WATERPROOF

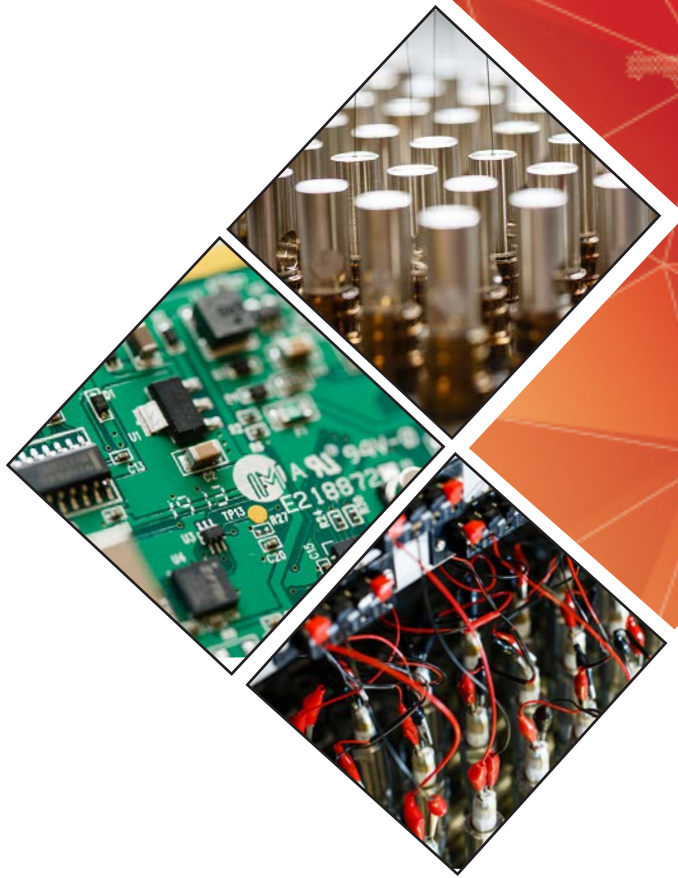
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VWS-2100 strain gauges are fully waterproof all stainless steel construction with coils encapsulated with epoxy resin. The protective tube assembly is totally sealed to the embedment flanges by laser welding, thus eliminating any possibility of seal degradation. During the testing and stressing procedures, the welds are fully checked by tensile testing carried out in excess of the elastic limit of the protective tube assembly.

### ROSETTES & ZERO STRAIN CONTAINERS

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Strain gauge rosettes and zero strain containers are available for VWS-2100 gauge series.



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