

## ST2 VIBRATING WIRE ARC WELDABLE STRAIN GAUGE

Datasheet ST2



### Description

The Vibrating Wire Arc Weldable Strain Gauge measures strain in steel members.

The gauge consists of a coil assembly, Vibrating Wire element and two weldable anchors.

The strain gauge incorporates 'O' ring seals to provide waterproofing, and allows the tube to remain unstressed.

A factory fitted, four core screened cable connects the coil to the readout unit.

### Features

- Suitable for manual or remote reading
- Range is adjustable to suit compression or tension
- Contains an integral thermistor
- 'O' ring seals provide waterproofing

### Benefits

- Accurate, repeatable readings over long cable lengths
- Long working life, long-term stability and reliability
- Robust and reliable
- Gauge and coils are reuseable

## VIBRATING WIRE PRINCIPLE



A high carbon steel wire is held in tension between a fixed point and a movable point within the sensor.

The physical changes measured by the sensor result in small changes to the position of the movable point which results in a change to the tension of the wire.

The wire may be excited by either plucking or sweeping via a coil adjacent to the wire. The resulting resonant frequency (which is relative to the tension of the wire) is then recorded by the same coil. The reading can be displayed by instrument readout or recorded by data logging equipment.

### Operation

The sensor is installed by removing the two mounting blocks and placing them (using a setting bar as a template) onto the steel to be monitored and then arc welding them in place.

Once the welds have cooled, the gauge is fitted into the blocks and tensioned as necessary. The pickup coil is then slid into place and secured with cable ties.

Once installed, changes in strain are monitored by the coil assembly mounted on the gauge. The gauges can be read individually or remotely/automatically as part of a data collection system.

### Associated products

For details on:

Catalogue code:

VWnote

RO-1-VW-NOTE

### Applications

The Vibrating Wire Arc Weldable Strain Gauge measures strain in steel and cast iron members on buildings, bridges, dams and pipelines, as well as on reinforcing bars within mass concrete or piles. It can measure both tension and compression.

Typical applications include:

- Steel members and struts
- Monitoring of strain due to load
- Bridges and dams
- Monitoring strain and load during construction and service life
- Piles and mass concrete
- Monitoring strain in reinforcing bars during construction, pile testing and service life.

### THE TECHNICAL RATING FOR THIS PRODUCT:

**INTERMEDIATE**



As the correct installation of any monitoring sensor or system is vital to maximise performance and accuracy, Soil Instruments makes the following recommendations, for the skill level of the installation contractor.

**ADVANCED**



The installer is trained and experienced in the installation of this type of instrument or systems, and is ideally a specialist Instrumentation and Monitoring contractor.

**INTERMEDIATE**



The installer already has previous experience and/or training in the installation of this instrument or system.

**BASIC**



As a minimum the installer has read and fully comprehends the manual, and if possible has observed these instruments or systems being installed by others.

## Specifications

### Sensor

Range	3000 microstrain
Resolution <sup>1</sup>	1 microstrain
Accuracy <sup>2</sup>	±0.1% full scale
Temperature range	-20 to +80°C
Active gauge length	141.4mm
Excitation method	Pluck or sweep
Material	Stainless Steel
Weight	50g
Dimensions	L 157mm x Ø 12.7mm

### Coil Housing

Type	Encapsulated, detachable with thermistor
Standard cable lengths <sup>3</sup>	3m, 10m, 25m
Thermistor type	NTC 3k Ω
Thermistor accuracy	±0.5°C
Thermistor resolution <sup>1</sup>	±0.1°C
Weight (coil only)	12g
Cable weight /m	30g
Cable type	4 core PUR sheath, foil screen & drain wire

### Mounting Blocks

Material	Steel
Dimensions	L 25mm x H 25mm x W 16mm
Weight / Pair	105g

### Optional Protective Cover

Material	Powder coated steel / polystyrene lining
Dimensions	L 280mm x W 100mm x H 60mm
Weight	670g

<sup>1</sup>Dependent on readout

<sup>2</sup>±0.1% full scale with individual calibration, ± 0.5% full scale with standard batch calibration

<sup>3</sup>Other lengths available

## Ordering Information

### Vibrating Wire Arc Weldable Strain Gauge

3000 $\mu$  strain range. Includes sensor with thermistor, 2No Mounting Blocks. Installation tool ST2-2.1 required for installation.

ST2-1.1	Sensor with specified cable length. Cable CA3.1-4-IC to be ordered separately
ST2-1.2	Sensor with 3metre cable length
ST2-1.3	Sensor with 10metre cable length
ST2-1.4	Sensor with 25metre cable length
ST2-1.5	Protective thermal cover

### Installation Tools

One tool required for multiple installations

ST2-2.1	Installation Kit. Includes setting jig & spacer. Only one required.
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### Connecting Cable and Fittings

CA-3.1-4-IC	Instrument cable, 4 core, 7/0.20, screened. Price per metre, polyurethane jacket
CA-4.1	Joint sealing kit
CA-4.2	Coloured adhesive tapes. Set of 10No
CA-4.3	Crimping tool
CA-4.4	Crimping sleeves. Set of 100No
W6-6.1	Nylon ties. Price each, 150mm x 3.5mm. Pack of 100No.
ST1-3.5	Nylon ties. Price each, 370mm x 4.7mm. Pack of 100No

### Installation Accessories

ST2-3.1	Spare mounting block set. Set of 2No blocks for 1No instrument
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### Manual

MAN-175	Vibrating Wire Arc Weldable Strain Gauge
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