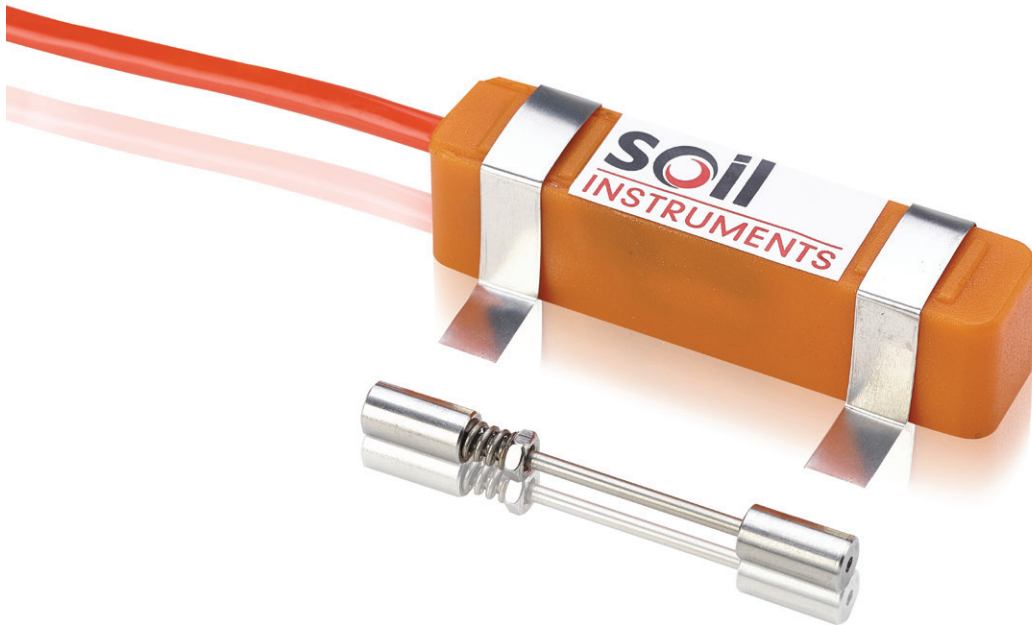


ST1 VIBRATING WIRE SPOT WELDABLE STRAIN GAUGE

Datasheet ST1



**Description**

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

It consists of a sealed tube containing a Vibrating Wire element with weldable anchors at each end.

The anchors are separated by a small floating stainless steel tube with 'O' ring seals that protect the Vibrating Wire from water ingress.

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

**Features**

- Suitable for manual or remote reading
- Removable coil unit
- Range is adjustable to suit compression or tension
- Contains an integral thermistor
- Waterproof to 700kPa

**Benefits**

- Accurate, repeatable readings over long cable lengths
- Long working life, long-term stability and reliability
- Coils are reuseable
- Small, low profile design



Comprehensive information about this product and our full range is available at [www.soilinstruments.com](http://www.soilinstruments.com)  
If you would like to speak with someone directly please call +44 (0)1825 765044 or email [sales@soilinstruments.com](mailto:sales@soilinstruments.com)

## 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.

### Applications

The Spot 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 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
- Pipelines
- Monitoring strains around pipe circumference
- Tunnels
- Monitoring SGI linings and thrust arch beams
- Piles and mass concrete
- Monitoring strains in reinforcing bars during construction, pile testing and service lifts

### Operation

The sensor is installed by cleaning the area corresponding to the fixing pads at either end of the gauge. The gauges are shipped set to mid point tension, this can be adjusted by rotating the nut. Then either spot weld or glue the gauge into place.

The gauge is fully adjustable to monitor compression, tension, or set at mid point. After installation, changes in strain are monitored by the coil assembly mounted over the gauge.

The sensor is readable with any commercially available Vibrating Wire readout and the incorporated thermistor allows you to monitor for variations in temperature. As with all Vibrating Wire instruments, the use of a frequency based signal allows for long cable runs between the instrument and the readout point or data logger.

### Associated products

For details on:	Catalogue code:
VWnote	RO-1-VW-NOTE
Dataloggers	D1
Terminal and Junction Boxes	RO-TB/JB/TJ

View our full product range on [www.soilinstruments.com](http://www.soilinstruments.com)



#### THE TECHNICAL RATING FOR THIS PRODUCT:

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.

#### ADDITIONAL SUPPORT

We offer installation and monitoring services to support this system. For more information please email : [sales@soilinstruments.com](mailto:sales@soilinstruments.com) or call : **+44 (0) 1825 765044**

#### INTERMEDIATE



#### ADVANCED



#### INTERMEDIATE



#### BASIC



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.

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

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

### Sensors

Range	3000 microstrain
Resolution <sup>1</sup>	0.4 microstrain
Accuracy	±0.5% full scale
Temperature range	-20 to +80°C
Active gauge length	50.4mm
Excitation method	Pluck or Sweep
Material	Stainless Steel
Weight	6g
Dimensions	L 65mm x W 13mm x H 6mm

### Coil Housing

Type	Injection moulded ABS, detachable with thermistor
Standard cable lengths <sup>2</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)	22g
Cable weight /m	30g
Cable type	4 core, PUR sheath, foil screen & drain wire
Dimensions	L 77mm x W 16mm x H 18mm

### Spot Welder

Weld power	22 watts/second
Welds per battery charge	>3000

<sup>1</sup>Dependent On Readout Equipment (CR1000)

<sup>2</sup>Other lengths available

## Ordering Information

### Spot Weldable Vibrating Wire Strain Gauge

3000 $\mu$  strain range. Requires one sensor ST1-2 per gauge. Tensioning tool or clip required for installation

ST1-1.1	Strain gauge
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### Strain Gauge Sensor

Includes thermistor, and two weld down straps. Requires one gauge ST1-1.1 per sensor

ST1-2.1	Sensor with specified cable length. Cable CA3.1-4-IC to be ordered separately
ST1-2.2	Sensor with 3metre cable length
ST1-2.3	Sensor with 10metre cable length
ST1-2.4	Sensor with 25metre cable length

### 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

ST1-3.1-220	Spot welder for 220v
ST1-3.1-110	Spot welder for 110v
ST1-3.1-BATT	Spot welder battery pack
ST1-3.2	Chemical metal adhesive
ST1-3.3	Tensioning tool. Precision adjustable
ST1-3.6	Tensioning clip. Set for mid range, not adjustable
ST1-3.4	Spare weld down strap. Spares or replacement. Two required per sensor
ST2-1.5	Protective thermal cover. Price each, 370mm x 4.7mm. Pack of 100No

### Manual

MAN-126	Vibrating Wire Spot Weldable Strain Gauge
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