L2 VIBRATING WIRE LOAD CELL

Datasheet L2

Description

The Vibrating Wire Load Cell is designed to directly measure load in piles, rock bolts and between tunnel supports, as well as tension in cable anchors.

The load cell comprises a set of up to six Vibrating Wire gauges mounted parallel to the cell axis and spaced equidistant radially in a cylindrical housing.

The load cell can be wired directly to a data logger, or connected via sheathed cable and a switched terminal unit to a readout unit.

Load cells are manufactured with a centre hole to accommodate rockbolts, tendons or anchor cables, but can be supplied with top and bottom load plates for use as a solid centre cell.

Features

- **Uses proven vibrating wire technology**
- **Robust construction with no moving parts**
- **Temperature compensated**

Benefits

- **Accurate readings over longer cable lengths exceeding 1km**
- **Extended working life and long-term stability**
- **Negligible temperature effects compared to oil-filled load cells**

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

VIBRATING WIRE PRINCIPLE

VW

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

A bearing plate is placed beneath the Load Cell to spread the load and take up any residual non alignment. Another bearing plate is placed between the cell and the anchor bolt or tensioning device.

The readings from up to six gauges are averaged to produce the total load for the cell.

Calibration factors are provided to enable direct reading in engineering units when using itmsoil VWnote readout.

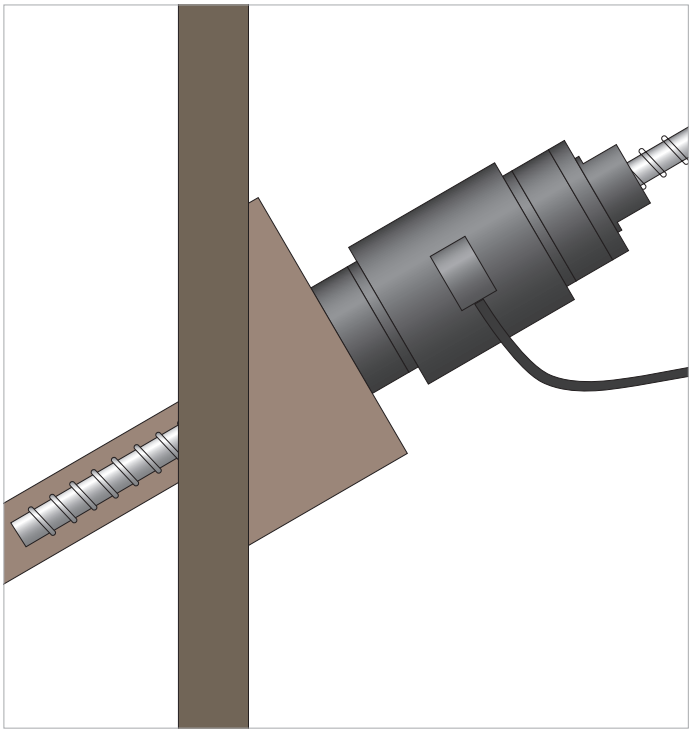
Alternatively, cells can be wired to a datalogger.

Applications

Vibrating Wire Load Cells can be used to measure general or specific loads.

Typical applications include:

- **Rock bolts**
- **Tensions in cable anchors and tendons**
- **Structural beams**
- **Piles**
- **Tunnel supports**
- **Loading and pull-out tests on trial anchors**
- **Loads during pile testing**
- **Loads in arch tunnel supports**
- **Long term loads in concrete dams**



Associated products

For details on:	Catalogue code:
Terminal and Junction Boxes	RO-TB-JB-TJ
VWnote	RO-1-VW-NOTE
Cables	CA

View our full product range on www.soilinstruments.com

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.

ADDITIONAL SUPPORT

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

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

Vibrating Wire Load Cell

kN Range	500	750	1000	1500	2000	3000	4000	5000	6000
Accuracy[1]	±0.25 % FS								
Resolution[2]	0.025 % FS minimum								
Over range	150 % FS								
Temperature range	-20°C to +80°C								
Excitation method	Pluck or sweep								
Frequency range	2200Hz to 2800Hz								
Ingress protection[3]	IP66								
Material	Plated steel								
Thermistor type	NTC 3k								
Thermistor accuracy	±0.5 % FS								
Thermistor resolution[2]	0.1°C								

Load Cell

kN Range	500	500	750	1000	1000	1500	2000	3000	4000	5000	6000
No. strain gauges	3	3	3	3	3	4	4	6	6	6	6
Internal diameter	50mm	75mm	75mm	75mm	100mm	150mm	150mm	150mm	175mm	200mm	240mm
Outside diameter	80mm	100mm	110mm	125mm	135mm	195mm	195mm	225mm	255mm	280mm	325mm
Height	120mm	120mm	140mm	140mm	140mm	160mm	160mm	180mm	180mm	180mm	180mm
Weight	2.8kg	3.1Kg	5.4Kg	8.4Kg	6.9Kg	15Kg	15Kg	30Kg	37Kg	41Kg	52Kg

Bearing Plate

kN Range	500	500	750	1000	1000	1500	2000	3000	4000	5000	6000
Internal diameter	50mm	75mm	75mm	75mm	100mm	150mm	150mm	150mm	175mm	200mm	240mm
Outside diameter	90mm	110mm	120mm	125mm	145mm	190mm	200mm	220mm	255mm	290mm	330mm
Thickness	33mm	33mm	38mm	43mm	43m	48mm	58mm	63mm	68mm	73mm	78mm

[1] Dependent on load bearing conditions
[2] Dependent on readout
[3] Waterproof versions available to 0.5MPa or 1.0MPa

Ordering information

Vibrating Wire Load Cells

Supplied with 1m cable

L2-1.1	500kN load cell; 50mm ID – 3 gauge
L2-1.2	500kN load cell; 75mm ID – 3 gauge
L2-1.3	750kN load cell; 75mm ID – 3 gauge
L2-1.4	1000kN load cell; 75mm ID – 4 gauge
L2-1.5	1000kN load cell; 100mm ID – 4 gauge
L2-1.6	1500kN load cell; 150mm ID – 4 gauge
L2-1.7	2000kN load cell; 150mm ID – 4 gauge
L2-1.8	3000kN load cell; 150mm ID – 6 gauge
L2-1.9	4000kN load cell; 175mm ID – 6 gauge
L2-1.10	5000kN load cell; 200mm ID – 6 gauge
L2-1.11	6000kN load cell; 240mm ID – 6 gauge

Connecting Cable and Fittings

CA-2.3-10-SC	10 core, multicore cable, 16/0.20, screened; priced per metre, PVC jacket, for up to 4 gauge load cells
CA-2.2-18-SC	18 core, multicore cable, 7/0.20, screened; priced per metre, PVC jacket, for up to 6 gauge load cells
CA-2.3-25-SC	25 core, multicore cable, 16/0.20, screened; priced per metre, PVC jacket
CA-2.3-50-SC	50 core, multicore cable, 16/0.20, screened; priced per metre, PVC 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, 150mm x 3.5mm, pack of 100No.
ST1-3.5	Nylon ties, 370mm x 4.7mm, pack of 100No.

Centre Hole Bearing Plates

For use with rock bolts or cable anchors, two per cell

L2-2.1	For 500kN load cell; 50mm ID
L2-2.2	For 500kN load cell; 75mm ID
L2-2.3	For 750kN load cell; 75mm ID
L2-2.4	For 1000kN load cell; 75mm ID
L2-2.5	For 1000kN load cell; 100mm ID
L2-2.6	For 1500kN load cell; 150mm ID
L2-2.7	For 2000kN load cell; 150mm ID
L2-2.8	For 3000kN load cell; 150mm ID
L2-2.9	For 4000kN load cell; 175mm ID
L2-2.10	For 5000kN load cell; 200mm ID
L2-2.11	For 6000kN load cell; 240mm ID

Terminal Units

L2-4.3	Cable end plug
L2-5.2	Selector box; from readout unit to cable end plug L2-4.3
L2-5.3	Selector box; from readout unit to cable ends
RO-TB-S-12	Terminal unit – switching; for 4No. 3 - gauge load cells or 2No. 6 - gauge load cells to readout unit
RO-TJ-S-12	Terminal unit/junction box – switching; for 4No. 3 - gauge load cells or 2No. 6 - gauge load cells to readout unit
RO-TB-S-24	Terminal unit – switching; for 8No. 3 - gauge load cells or 4No. 6 - gauge load cells to readout unit
RO-TJ-S-24	Terminal unit/junction box – switching; for 8No. 3 - gauge load cells or 4No. 6 - gauge load cells to readout unit
RO-TB-S-48	Terminal unit – switching; for 16No. 3 - gauge load cells or 8No. 6 - gauge load cells to readout unit
RO-TJ-S-48	Terminal unit/junction box – switching; for 16No. 3 - gauge load cells or 8No. 6 - gauge load cells to readout unit

Manual

MAN-188	Vibrating Wire Load Cell

soil INSTRUMENTS

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