Vibrating Wire Load Cell

Applications

The measurement of load including:

- Loads in rock bolts.
- Tension in cable anchors and tendons.
- Loads on structural beams.
- Loads in piles.
- Loads between tunnel supports.
- Proof of loading and pull-out tests on trial anchors.

Operating Principle

The Soil Instruments vibrating wire load cell comprises a set of up to six vibrating wire gauges mounted parallel to the cell axis and equally spaced in a ring in an steel alloy cylindrical housing. The method of construction results in a very robust instrument suitable for use where high performance, longevity and mechanical strength are important.

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

A heavy gauge multi-core, PVC sheathed cable connects the load cell to the read-out unit via a switched terminal unit.

The switched terminal unit is required for connecting to each of the VW sensors in the load cell (the readings can be averaged by the VW read-out unit and displayed in engineering units).

Switched terminal units are available for handling multiple Load Cell installations, they can also incorporate a Junction Box to enable the cables to be extended from the switched terminal unit to a central datalogger, this facility enables readings to be taken at the location of the terminal unit and a central datalogger.

For details on vibrating wire readout units please refer to data sheet RO-1. The Load Cells can also be connected to a CR10X datalogger please refer to data sheet D1.

Advantages and Limitations

- Accurate, robust and very good long term stability.
- Negligible temperature effects compared with oil filled load cells.
- Fast response time.
- Accuracy unaffected by cable length.
- Suitable for remote reading and data-logging.
- The connecting cable is strong, screened and flexible and can be used in lengths in excess of 1000m.
- Over-voltage surge arrestors fitted to each vibrating wire gauge to protect against electrical damage.
- The vibrating wire load cell is not susceptible to partial collapse due to fluid leakage which can be experienced with hydraulic load cells.
- Not suitable for dynamic measurements of load.

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DATA SHEET L2

Order Information

L2-1 Vibrating Wire Load Cells

Part No.	Working Load kN	Overall dia. mm	Centre Hole mm	Height mm	Weight kg	VW Sensors
L2-1.1	100	89	30	80	2.4	3
L2-1.2	250	102	40	80	3.9	3
L2-1.3	500	121	50	80	5.3	3
L2-1.4	500	152	90	80	5.9	3
L2-1.5	1000	146	50	80	8.3	3
L2-1.6	1000	165	90	80	8.2	3
L2-1.7	1500	220	150	80	11.0	5
L2-1.8	2000	275	190	80	15.7	6
L2-1.9	3000	292	190	80	27.0	6
L2-1.10	4000	292	190	80	28.5	6
L2-1.11	5000	305	190	80	30.0	6

Please note: *Each load cell is fitted with 5m of cable please instruct if longer cable lengths are required. Please see L2-4 – Connecting Cable and Plugs*

L2-2 Centre Hole Bearing Plates
For use with Rockbolts or Cable Anchors

Part No.	For use with Cell No.	Overall dia. mm	Centre Hole mm	Height mm	Weight kg
L2-2.1	1.1	89	30	20	0.7
L2-2.2	1.2	103	40	23	1.1
L2-2.3	1.3	113	50	33	2.5
L2-2.4	1.4	143	90	33	3.1
L2-2.5	1.5	136	50	43	5.0
L2-2.6	1.6	163	90	43	5.1
L2-2.7	1.7	218	150	48	7.7
L2-2.8	1.8	262	190	58	14.2
L2-2.9	1.9	278	190	63	22.2
L2-2.10	1.10	292	190	68	24
L2-2.11	1.11	315	190	73	25.7

Please note: *Centre hole bearing plates are required above and below the load cell.*

L2-3 Disc Bearing Plates
For Compression Loads on Beams and Columns

Part No.	For use with Cell No.	Overall dia. mm	Height mm	Weight kg
L2-3.1	1.1	89	25	1.1
L2-3.2	1.2	103	28	1.8
L2-3.3	1.3	113	38	3.4
L2-3.4	1.4	143	38	5.4
L2-3.5	1.5	136	48	6.3
L2-3.6	1.6	163	48	8.1
L2-3.7	1.7	218	53	15.8
L2-3.8	1.8	262	63	29.5
L2-3.9	1.9	278	68	39.0
L2-3.10	1.10	292	73	42.0
L2-3.11	1.11	315	78	44.8

Please note: *Centre hole bearing plates are required above and below the load cell.*

L2-4 Connecting Cables and Plugs

CA-2.3-6-SC **Cable for 3 Sensor Cells**
Supplied by the metre

CA-2.2-12-SC **Cable for 5 and 6 Sensor Cells**
Supplied by the metre

L2-4.3 Cable End Plug

L2-6 Installation Equipment

CA-4.1 Joint Sealing Kit

CA-4.4 Crimping Sleeves
100 No.

CA-4.3 Crimping Tool

CA-4.2 Coloured Adhesive Tape
per set

L2-5 Switched Terminal Units

L2-5.1 Selector Box
For 2No x 3-Sensor Load Cells or 1No. x 6-Sensor Load Cells

RO-TB-S-12 Terminal Unit
For 4No x 3-Sensor Load Cells or 2No x 6-Sensor Load Cells

RO-TJ-S-12 Terminal Unit Junction Box
For 4No x 3-Sensor Load Cells or 2No x 6-Sensor Load Cells

RO-TB-S-24 Terminal Unit
For 8No x 3-Sensor Load Cells or 4No x 6-Sensor Load Cells

RO-TJ-S-24 Terminal Unit Junction Box
For 8No x 3-Sensor Load Cells or 4No x 6-Sensor Load Cells

RO-TB-S-48 Terminal Unit
For 16No x 3-Sensor Load Cells or 8No x 6-Sensor Load Cells

RO-TJ-S-48 Terminal Unit Junction Box
For 16No x 3-Sensor Load Cells or 8No x 6-Sensor Load Cells

Vibrating Wire Readout

RO-1-VW-1 Vibrating Wire Readout

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