

# Vibrating Wire Load Cell

## Features



- Versatile design
- No effect of eccentric loading
- Sensor with unique integral magnet design
- Accurate, highly sensitive and reliable
- Frequency output for transmission over long distances
- Suitable for remote reading, scanning and data logging
- Stainless steel construction
- Waterproof
- Unprecedented sensitivity
- Long term stability and reliability
- Isolation of the sensor from the effects of total stresses acting on the body of the load cell
- Robust and sturdy construction

## Applications

The ES&S VW Load Cells are used to measure loads in anchors, tiebacks, rockbolts, tunnel support, piles etc. Manufactured using special steel, the load cells are designed to function under adverse and severe environmental conditions.

Calibration charts are supplied with individual load cells. A hollow center cell that allows for the passage of the anchor is used when the objective is to measure tensile load, while to monitor a compressive load, a solid center cell is used. The most common application in mining is to test and measure loads on rock bolts. This information is used to verify that bolts are installed correctly and the types of loads they are experiencing. Load cells are a valuable

auditing instrument during proof loading and pull out tests performed on trial anchors. In addition, load cells measure and control the loading in foundation anchors or rock bolts. Furthermore, the tension in cable anchors and struts is known. Other useful applications are between structural beam and top of piles. This allows engineers to obtain and cross reference physical values with theoretically calculated loads.

They can be also installed between tunnel lining segments. Load cells are commonly correlated with data obtained from borehole extensometers an efficient check that both load cell and extensometer are operating correctly.



# Technical Specifications

Standard Range	Up to 1000 tons	
Over Range	1.5 x Range	
Sensitivity	0.01% Full Scale	
Accuracy	Less than 1% Full Scale (Optionally 0.5% or better)	
Material	Stainless Steel	
Operating Temperature	-20°C to 80°C (High temperature version load cells on request)	
Electrical Cable	Number of strands varies with no of strain gages and capacity	
Thermistor 3k ohm	Included	
Electrical Surge Protection	Optional	
Wiring Code	V/W sensor Thermistor	Red & Black White & Green

Note: Products and Specifications are subject to change without notice.

## Operating Principle

Our vibrating wire load cells incorporate vibrating wire sensor with a unique integrated magnet design. A miniature magnet coil assembly is located inside the small stainless enclosure of the sensor at a very close proximity to the vibrating wire.

The design contributes to the outstanding features and performances over conventional vibrating wire load cells. VW load cells are manufactured with special steel that enables it to work successfully under rough conditions. 1-6 VW strain gauges are placed along the circumference of the cell. The strain gauges are well protected against any mechanical damage and water infiltration.

The vibrating wire type load cell have proven long-term stability and the housing and cable are permanently sealed for field conditions. Each cell is delivered complete with cable and a small enclosure to protect the cable connection from dirt, moisture and damage. As a local compression strain is induced in the cell by the tension in the anchor, the strain gauge(s), (1-6 in nos.) measure the strain. The average of the readouts is taken, thereby enabling minimisation of eccentric loading.

A conventional readout unit can accurately measure the frequency of the wire. A microprocessor based readout unit can display the frequency as well as the value of the measured pressure directly in engineering units.

The load cell is suitable for connection to data loggers for recording data in engineering units automatically at pre-determined intervals. By the use of appropriate software, the data logger can present recorded data in desired formats, predict trends of variations and even generate alarms at pre-determined set points.

The thermistor mounted in the load cell enables simultaneous measurement of temperature. This allows any corrections to be made in the observed readings due to temperature changes. Load Cells with lightning protection are available on request.

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