

# Stress Capsule

VIBRATING WIRE STRESS MONITOR

## FEATURES

- Passive or combined passive/active cell for stress & modulus determination
- Sensor with unique integral magnet design
- Accurate, highly sensitive and reliable
- Extremely stable for long term operations
- Frequency output for transmission over long distances
- Thermistor for temperature reading
- Suitable for remote reading, scanning & data logging
- Waterproof stainless steel construction
- High temperature application model is available

## APPLICATIONS

The ES&S Stress Capsule is designed to monitor total stresses in soft and hard rocks. The Stress Meter may be used as an active pressure-meter probe and for determination of in situ modulus of deformation.

Mining applications include installation in roof, wall and pillars. The capsule can be installed around tunnels, underground storage caverns and within the linings.

It has many uses in civil projects namely concrete structures, between girders and foundation bearing plates.



## TECHNICAL SPECIFICATIONS

<b>Model</b>	RP-190/190A
<b>Range of Compression</b>	70 MPa
<b>Range of Tension</b>	3 MPa
<b>Operating Temperature</b>	-10°C to 80°C (Higher temperature version available)
<b>Borehole Diameter</b>	38mm / 42mm / specify
<b>Max Borehole Depth:</b>	30m with manual tool and up to 50m with hydraulic tool
<b>Dimensions (L x Dia)</b>	40 x 30 mm
<b>Enclosure:</b>	Stainless Steel
<b>Wiring Code</b>	V/W sensor    Red & Black Thermistor    White & Green
<b>Thermistor 3k ohm</b>	Included
<b>Electrical Surge Protection</b>	Optional

### OPERATING PRINCIPLE

The vibrating wire stress meters incorporate vibrating wire sensor with 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 stress capsule is suitable for use in soft rock or hard rock applications.

Stress Capsule can be used in the borehole diameter from 38mm to 42mm borehole size. It is composed of a hollow cylindrical body with a piano wire stretched across the diameter. Both ends are sealed and the body is electroplated to resist corrosion thus ensuring long-term stability in harsh environments. For excitation and reading purposes, a miniature coil/magnet assembly and a thermistor are used and are connected to a 4 conductor electrical cable. A two part wedge/platen assembly completes the RP-190/190A Stress Capsule. Depending upon whether the installation is being made in hard or soft rock, there are two configuration options available in the wedge/platen assembly.

Stress variations in the host medium will deform the stress meter changing the wire tension and consequently frequency. When a reading of the RP-190/190A is taken, the readout unit generates plucking voltages at variable frequency in coil/magnet assembly, forcing the wire to vibrate. Changes in the frequency or period of vibration are correlated to stress changes.

A vibrating wire readout unit can accurately measure the frequency of the wire. The Stress Capsule is suitable for connection to data loggers for recording data in engineering units automatically at pre determined intervals.

The thermistor mounted in the Stress Capsule enables simultaneous measurement of temperature. This allows any corrections to be made in the observed readings due to temperature changes.

