



Model 3200 Hydraulic Borehole Pressure Cells

The standard Borehole Pressure Cell (BPC) is used to measure rock stress changes and is designed to be grouted inside a borehole. The BPC is manufactured from two steel plates welded together around their periphery. The plates are deformed into a “dog bone” configuration so that they can be expanded easily without damaging the welds. Hydraulic oil fills the space between the two plates and a high-pressure stainless steel tube connects the plates to a stainless steel pressure gauge and/or a pressure transducer.

Specifications

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|--------------------------------|---|
| Ranges ¹ | 20, 35, 75 MPa |
| Resolution | 0.25% of range (approximately) |
| Accuracy ² | ±0.25% F.S. (gauge); ±0.1% F.S. (transducer) |
| Borehole Size | 57 mm |
| Temperature Range ¹ | -20 °C to +80 °C |
| Dimensions (L × W × H) | 210 × 51 × 6 mm |

¹Other ranges available on request. | ²Transducer accuracy established under laboratory conditions.



Model 4300 Borehole Stressmeters

The Model 4300 Vibrating Wire Borehole Stressmeter is designed for long-term measurements of stress changes in rock and can be installed in boreholes up to 100 feet deep. It utilizes a vibrating wire transducer to measure the deformation of a thick-walled steel ring preloaded into the borehole by a wedge and platen assembly. Changes in rock stress cause a related change in the resonant frequency of vibration of the tensioned wire, which is read by the Model GK-404 or GK-405 Readouts.

Specifications

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|-----------------------------------|--|
| Range in Compression ¹ | 35 to 100 MPa |
| Range in Tension | 3 MPa |
| Resolution ¹ | 2 to 140 kPa |
| Temperature Range ² | -20 °C to +80 °C |
| Borehole Diameter | 37 to 39 mm (4300EX) 59 to 61 mm (4300BX) 75 to 77.5 mm (4300NX) |

¹Depends on rock modulus. | ²High temperature versions (up to 200 °C) available on request.



Model 4350 Biaxial Stressmeter

The Model 4350 Vibrating Wire Biaxial Stressmeter is designed to measure compressive stress changes in rock, salt, concrete or ice. Three or six VW sensors oriented at 60° intervals around a high-strength steel cylinder allow the principal stress changes to be measured in the plane perpendicular to the stressmeter axis. The stressmeter is grouted (or frozen, in the case of ice) into a BX (60 mm) size borehole.

Specifications

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|--------------------------------|------------------|
| Range | 70 MPa |
| Resolution ¹ | 14 to 70 kPa |
| Accuracy ² | ±0.1% F.S. |
| Temperature Range ³ | -20 °C to +80 °C |
| Borehole Diameter | 60 mm (BX) |

¹Depends on rock modulus. | ²Transducer accuracy established under laboratory conditions.
³Other ranges available on request.



Model 4360 Soft Inclusion Stress Cells (SISC)

The Model 4360 Vibrating Wire SISC is a larger version of the Model 4300 Borehole Stressmeters. The SISC is pre-loaded by wedging it into a large size diamond drill hole using an integral screw mechanism or hydraulic piston. The SISC can be set to measure both tensile and/or compression stress changes. It has been used successfully in 152 mm diameter overcoring holes (drilled to measure in situ stresses) to measure Aggregate/Alkali Reactions (AAR) in concrete dams.

Specifications

| | |
|--------------------------------|--------------------|
| Range ¹ | ±35 MPa |
| Resolution ¹ | 35 kPa |
| Accuracy ² | ±0.5% F.S. |
| Temperature Range ³ | -20 °C to +80 °C |
| Borehole Diameter ³ | NX, HQ, PQ, 152 mm |

¹Proportional to rock modulus; figures given are for E = 0.03 × 106 MPa.
²Transducer accuracy established under laboratory conditions.
³Other ranges and diameters available on request.



Model 4370 Concrete Stressmeter

The Model 4370 Vibrating Wire Concrete Stressmeter comprises a short vibrating wire load cell in series with a longer cylinder of concrete, which has the same properties as the surrounding concrete but is de-bonded from it by means of a plastic tube. It's coupled at its ends to the surrounding concrete by means of two flanges. The vibrating wire load cell measures the load imposed on the inner concrete cylinder by stresses in the surrounding concrete.

Specifications

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|--------------------------------|-------------------------|
| Range | -3 MPa to +25 MPa |
| Resolution | 10 kPa |
| Accuracy ¹ | ±0.25% F.S. |
| Temperature Range ² | -20 °C to +80 °C |
| Dimensions (L × Ø) | 600 × 76 mm; 66 mm (ID) |

¹Transducer accuracy established under laboratory conditions. | ²Other ranges available on request.



Model 5000 Borehole Deformation Gauge

The Model 5000 Borehole Deformation Gauge is the proven USBM-style gauge used to measure in situ rock stresses using the overcoring technique in rock that is competent and elastic. The measurement of in situ stresses is important in the design of underground openings such as power houses, crushing stations, mines, tunnels and the like. It is also useful for determining the inherent stability of pit slopes, foundation excavations, mine pillars and dam abutments.

Specifications

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|------------------------|---------------------------------------|
| Borehole Diameter | 38 mm EX-size diamond drill hole |
| Resolution | 1.0 µε |
| Minimum Overcore Depth | 203 mm (25 mm with reverse case) |
| Maximum Overcore Depth | 15 m standard (60 m with extra cable) |
| Temperature Range | -20 °C to +80 °C |
| Dimensions (L × Ø) | 267 × 35 mm |