

2024

UNDERGROUND ROCK-MECHANICS INSTRUMENTS

KNOW-HOW IS EVERYTHING.



R
RESPEC

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// CLOSURE POLES

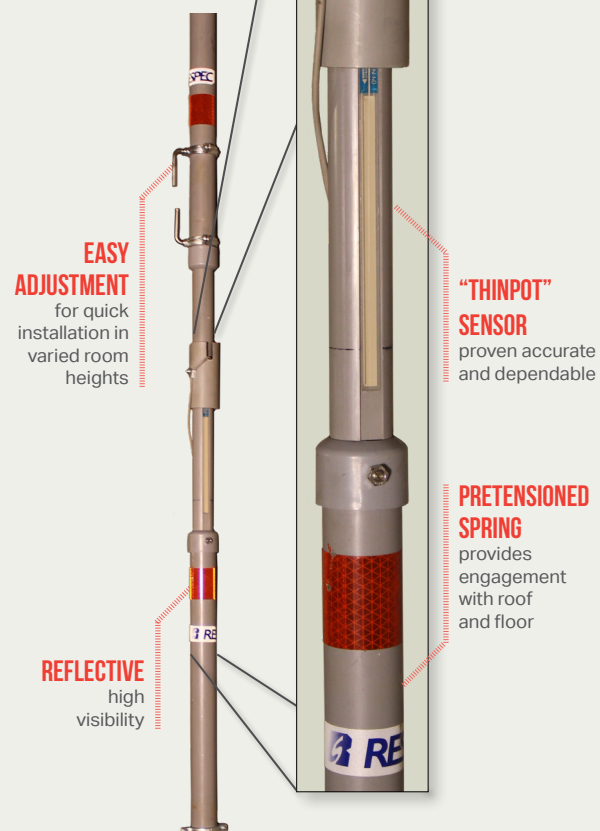
RESPEC'S CLOSURE POLES are used in underground mining operations to typically measure roof-to-floor convergence but can be retrofitted to measure potentially unstable ground. RESPEC's closure poles are easily installed and can be retrieved and redeployed as needed. Closure poles are offered in long-travel "Thinpot™" and short-travel "Springpot" displacement sensor options.



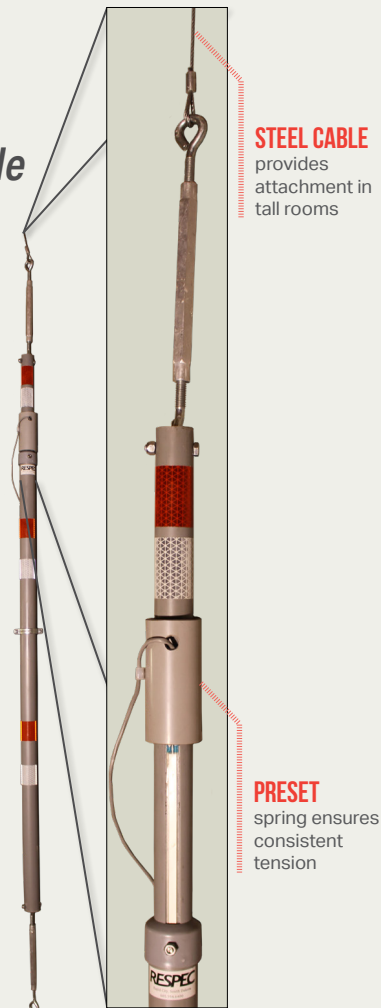
CLOSURE POLE WITH "THINPOT" DISPLACEMENT SENSOR

- // Designed with a displacement measurement range of up to 12 in (30 cm)
- // One percent linearity displacement sensors typically result in installed accuracy of better than 0.002 in (0.03 mm) when using a 16-bit datalogger
- // Conventional closure poles designed for room heights up to 15 ft (4.5 m), but great room heights can be accommodated by using a tension closure pole with a steel cable hung from the roof

Conventional Thinpot Closure Pole



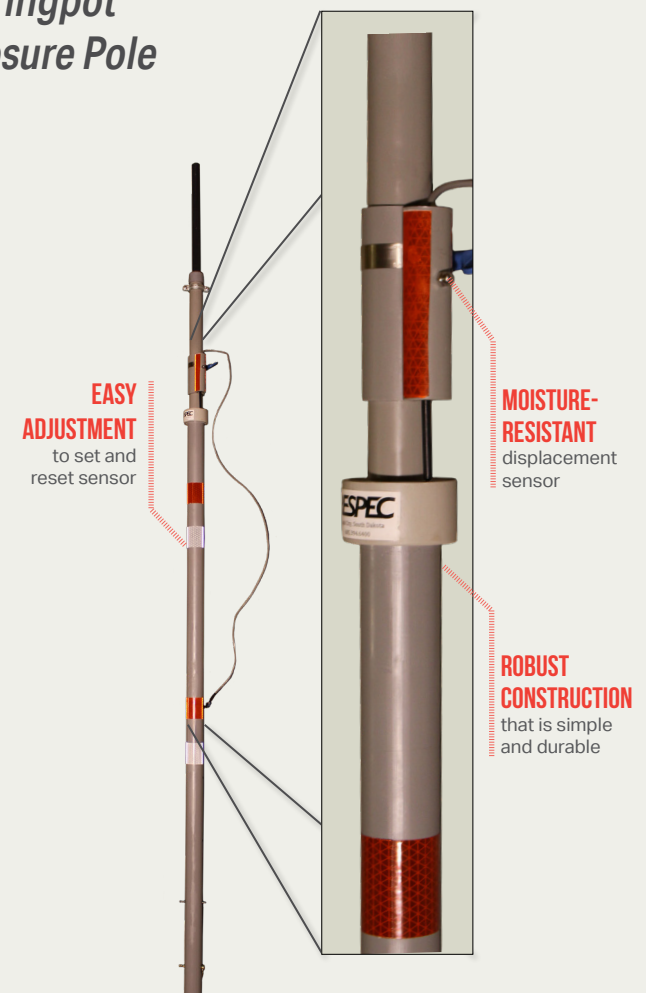
Tension Thinpot Closure Pole



CLOSURE POLE WITH "SPRINGPOT" DISPLACEMENT SENSOR

- // Features a 1.5-in (38-mm) displacement sensor with 0.5 percent linearity
- // Accuracy of approximately 0.001 in (0.02 mm) when combined with a 16-bit datalogger
- // Can be easily reset when closure approaches the stroke of the instrument
- // Can be equipped with warning device

Springpot Closure Pole



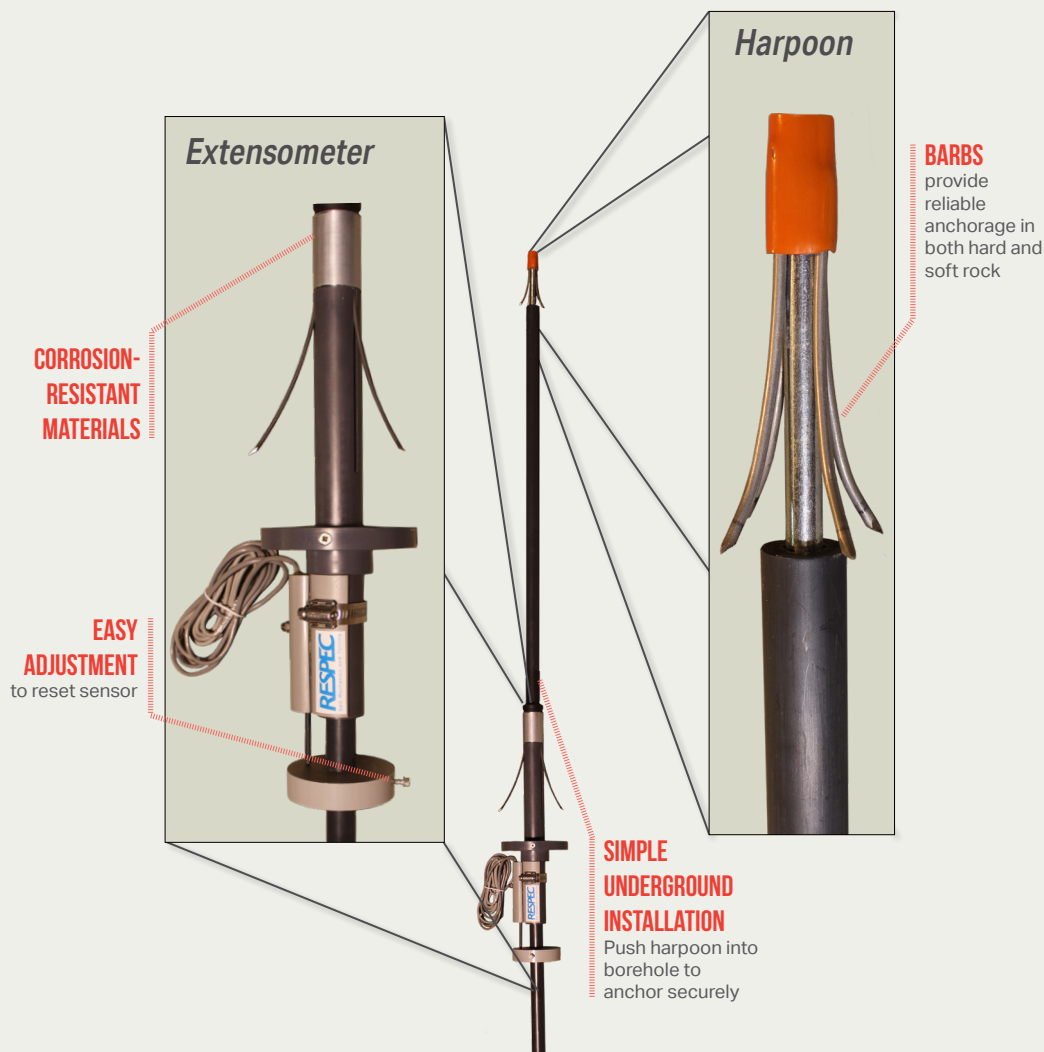
// EXTENSOMETERS

RESPEC OFFERS A LINE OF INEXPENSIVE, nonretrievable single-point borehole extensometers, which are custom built to the client's application. The borehole extensometers measure displacements within the rock mass and are typically configured to include an automatic warning device that triggers when a preset amount of movement is exceeded.



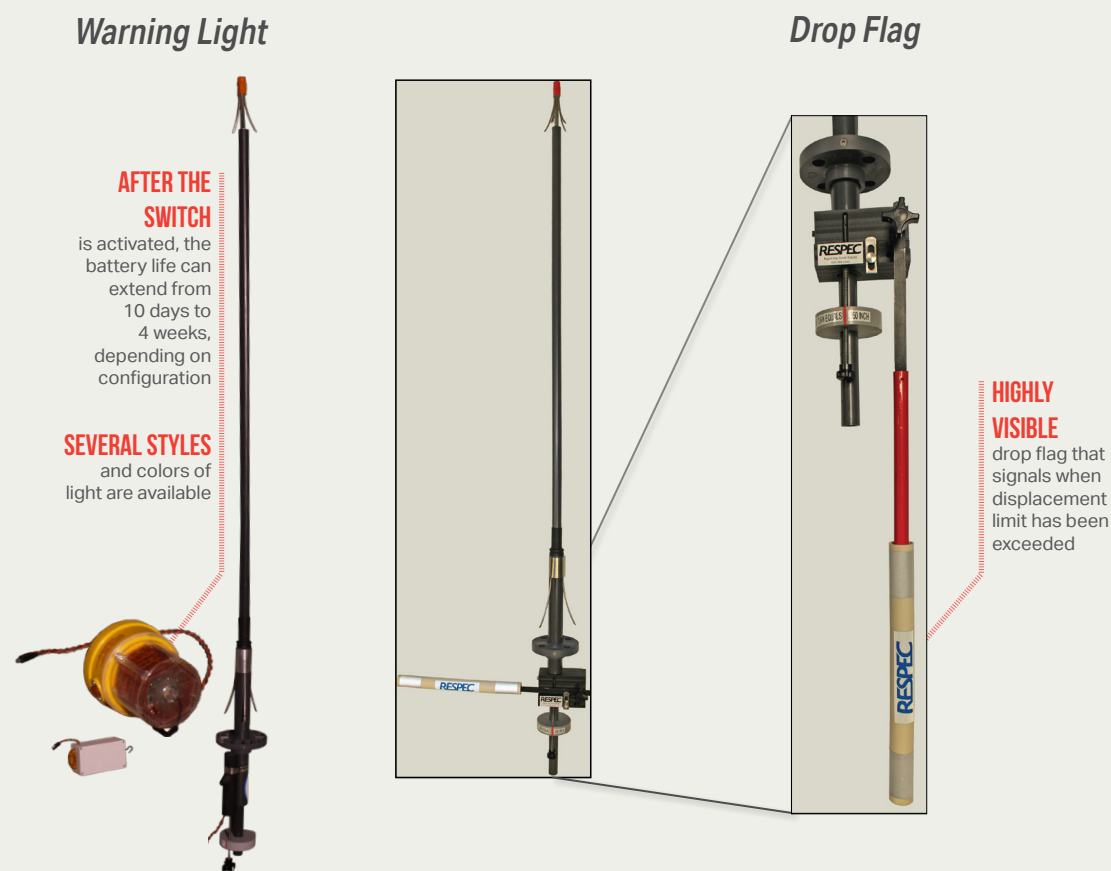
HARPOON™ BOREHOLE EXTENSOMETER

- // No grouting or special equipment required for installation
- // Standard models accommodate 1-3/8 to 2 inch diameter boreholes, but other diameters can be accommodated
- // Typical installation time is 10 minutes after the hole is drilled
- // Corrosion-resistant construction standard
- // Waterproofed sensors available
- // Sensor designed to be reset and serviced after installation
- // Typically equipped with a 1.5-inches (38-mm) displacement sensor
- // Installed accuracy is 0.001 inches



ROOF SENTINEL™ EXTENSOMETER WARNING DEVICE

- // No grouting or special equipment required for installation
- // Standard models accommodate 1-3/8 to 2 inch diameter boreholes, but other diameters can be accommodated
- // Typical installation time is 10 minutes after the hole is drilled
- // Corrosion-resistant construction standard
- // Provides an automatic visual warning when rock displacement exceeds a preset threshold
- // Available in strobe light and drop flag configurations
- // Can be reset in minutes without tools or additional parts
- // Suitable for use in wet or corrosive environments
- // Warning devices tolerant of approximately 1g of vertical acceleration



// CUSTOM INSTRUMENTS

RESPEC PROVIDES UNIQUE instrumentation solutions to match unique applications while maintaining low overall costs.

BUILT TO ORDER

- // RESPEC's mine instruments are built to order and customized depending on client needs.
- // Customization options include:
 - Fully waterproofed electronics, instrument lengths
 - Sensor lengths
 - Displacement sensors to retrofit existing instruments
 - Combine extensometer and warning capability in one instrument



➤ **RESPEC DESIGNED** an extensometer with 12 in of stroke for a client who installed it in a 70-ft-tall room where access to reset it was limited.

➤ **RESPEC DESIGNED** and constructed durable hydraulic load cells to measure pressure in cribbed areas of a mine that was experiencing significant movement.

// DATA ACQUISITION

OFFERING A WIDE-RANGE of products and expertise, RESPEC features a complete line of data acquisition options, from stand-alone dataloggers to research-grade systems.

// For simple applications, RESPEC can provide inexpensive stand-alone dataloggers priced from \$200.

// RESPEC is an official Campbell Scientific Integrator. When more

sophisticated data acquisition systems are required, we design and install sophisticated data-acquisition systems that include real-time notifications and remote data access.



// ANOTHER SUCCESS STORY FOR INTEGRATED TECHNOLOGY SOLUTIONS IN MINING

In the prairie region of Saskatchewan, mine personnel and recording systems (located at the Mosaic Potash K2 Mine) collect tremendous amounts of data, including water-level measurements in surface wells, water-inflow rates, pumping volumes, and underground geotechnical data. Before implementing RESPEC's Water Control Information System (WCIS), the client used several stand-alone computers for storing information. Their outdated system made data difficult to access and interpret. RESPEC developed complementary, web-based software that allowed mine personnel to enter data and quickly retrieve finished reports. As a result, all of the client's operational and project information now resides in a SQL database that is organized specifically for storing, retrieving, and archiving data. RESPEC's interdisciplinary team is proud to continually make industry improvements by applying integrated technology solutions.

BECAUSE EVERY PROJECT IS DIFFERENT

RESPEC's product line features innovative Rock-Mechanics Instrumentation—off-the-shelf or customized—to ensure that the best instrumentation solution is implemented to meet your project goals.

RESPEC'S MINE INSTRUMENTS:

- // Reduce cost of geotechnical performance evaluation
- // Lessen the inconvenience of installation
- // Enhance the ability to monitor hazardous conditions
- // Improve data accuracy and completeness
- // Reduce risks by capturing more and better quality data

FEATURING:

- // Easy installation in minutes
- // Easy steps: place it, plug it in, and program it
- // Thoroughly evaluated, durable technology
- // Accurate data
- // Affordable designs
- // Warning devices and other options
- // Corrosion- and moisture-resistant designs



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