

2018

UNDERGROUND ROCK-MECHANICS INSTRUMENTS

KNOW-HOW IS EVERYTHING.



// CLOSURE POLES

➤ **FEATURING QUICK AND EASY** installation and retrieval, RESPEC's closure poles are used in underground mining operations to measure roof-to-floor convergence and relative displacement of potentially unstable mine areas.



CLOSURE POLE WITH "THINPOT" DISPLACEMENT SENSOR

Priced from \$355

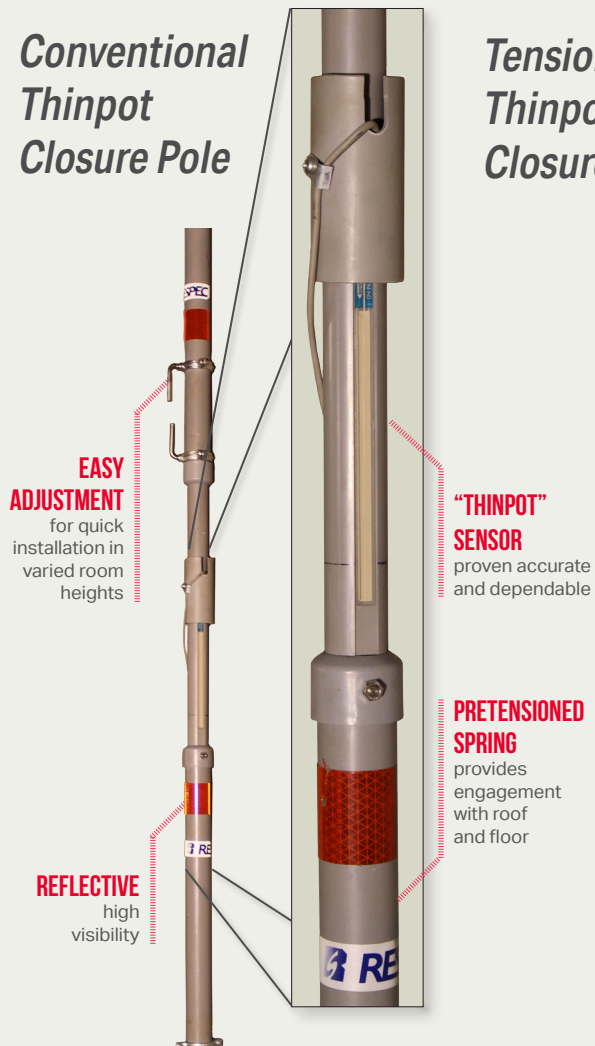
- // Designed with a displacement measurement range of up to 12 in (30 cm)
- // One percent linearity displacement sensors typically result in installed accuracy of better than 0.002 in (0.03 mm) when using a 16-bit datalogger
- // Conventional closure poles designed for room heights up to 15 ft (4.5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

CLOSURE POLE WITH "SPRINGPOT" DISPLACEMENT SENSOR

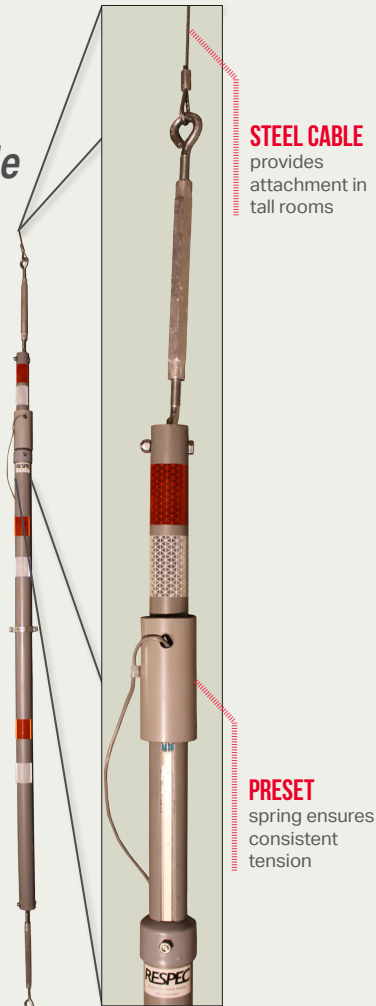
Priced from \$295

- // 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
- // Manual readings and dial gauges also available
- // Can be equipped with warning device

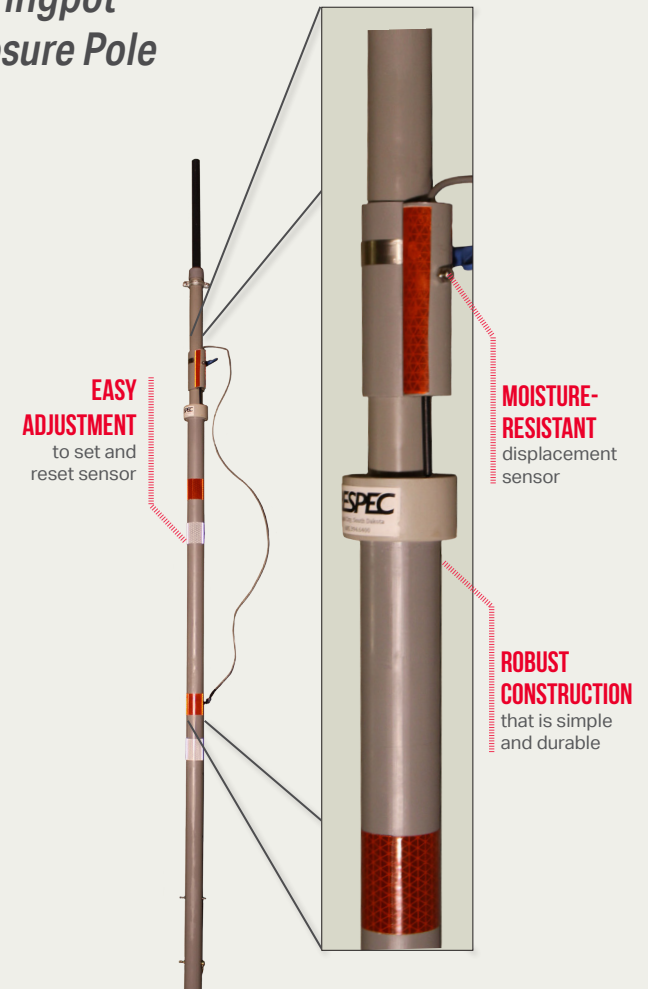
Conventional Thinpot Closure Pole



Tension Thinpot Closure Pole



Springpot Closure Pole



// EXTENSOMETERS

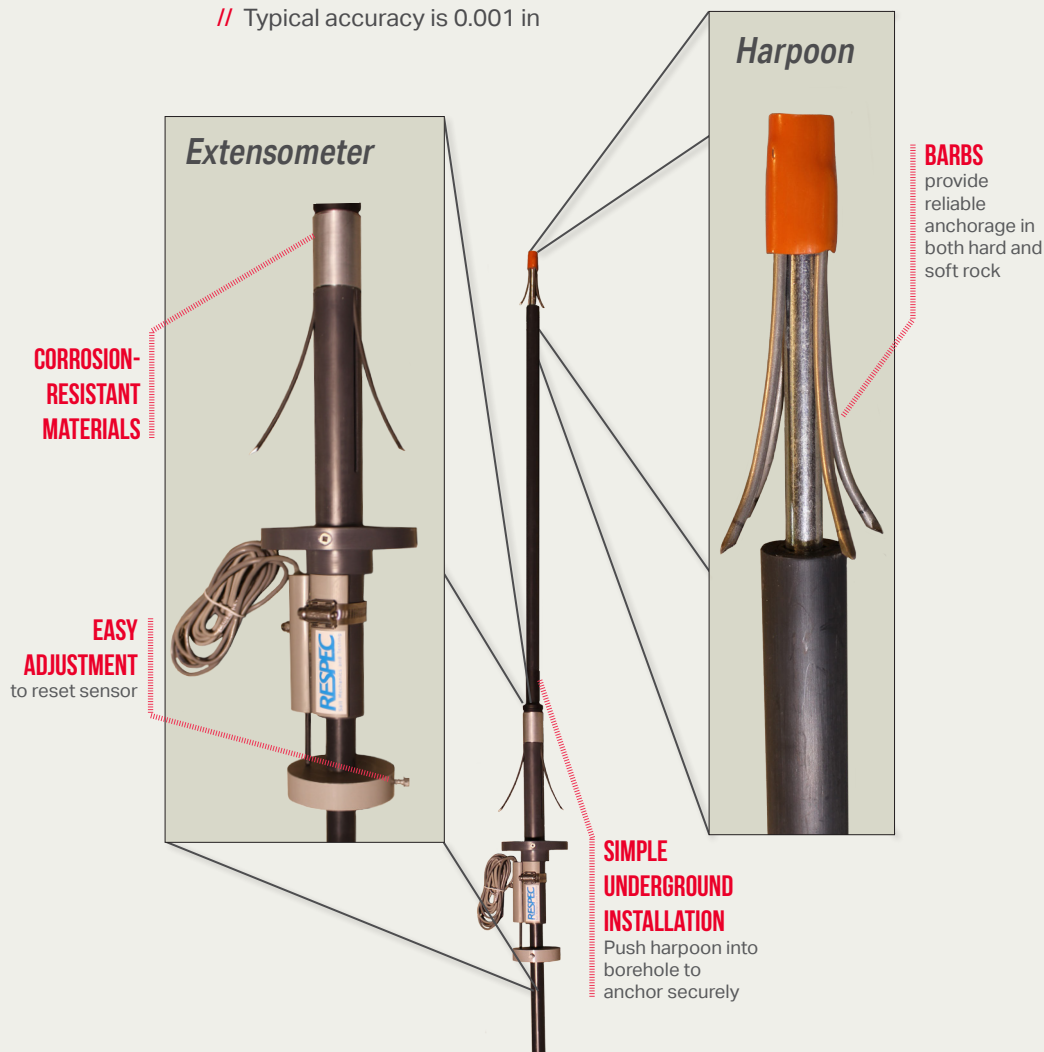
➤ **RESPEC OFFERS A LINE OF INEXPENSIVE,** nonretrievable borehole extensometers, which are custom built to the client's specific application. The self-anchoring extensometer measures relative displacement within the rock.



HARPOON™ BOREHOLE EXTENSOMETER

Priced from \$355

- // No grouting or special equipment required
- // Easy to install in boreholes (1-3/8 inches or larger) with a typical installation time of less than 10 minutes after the hole is drilled
- // Corrosion-resistant construction
- // Sensor designed to be reset and serviced after installation
- // Typically equipped with a 1.5-in (38-mm) displacement sensor
- // Other sensor lengths can be accommodated (up to 12 in)
- // Typical accuracy is 0.001 in



ROOF SENTINEL™ EXTENSOMETER WARNING DEVICE

Priced from \$350

- WARNING LIGHT**
 - // When preset amount of displacement is exceeded, a warning light activates
 - // Preset amount of displacement can be easily set and reset in the field (up to 3 in)
 - // Suitable for use in wet or corrosive environments
 - // Switch activation is reproducible to within 0.005 in (0.2 mm)
- DROP ROD**
 - // Features a reflective rod that signals displacement has exceeded preset limit
 - // Drop-rod activation is reproducible to within 0.010 in (0.3 mm)
 - // Suitable for use near blasting and tolerates over 1 g of vertical acceleration



// CUSTOM INSTRUMENTS

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

BUILT TO ORDER

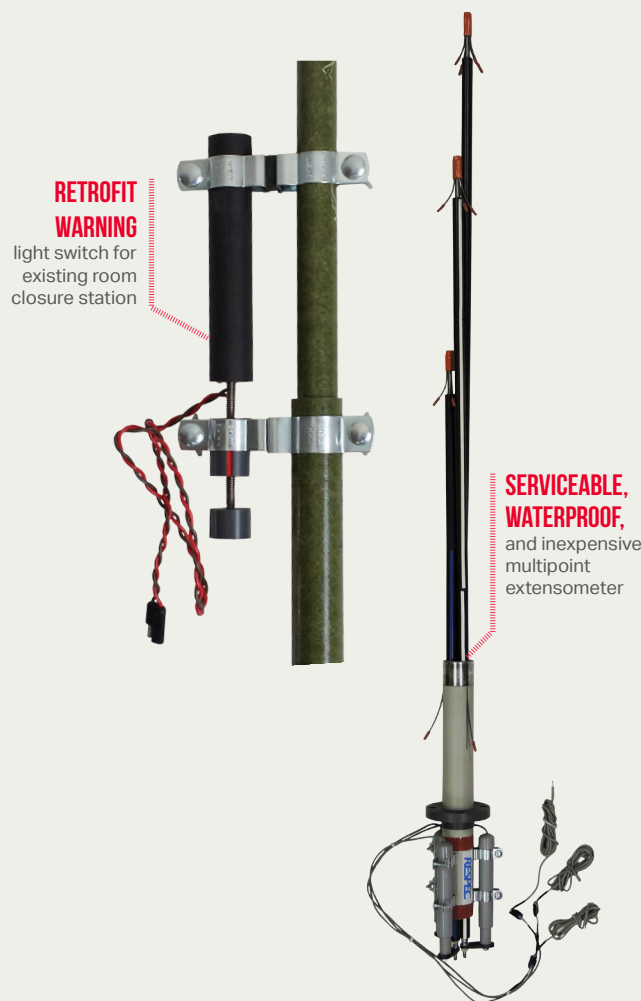
// RESPEC's mine instruments are built to order and customized depending on client needs.

// 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. The benefit is that better data ensure better decisions and reduce risk.

// For simple applications, RESPEC can provide inexpensive stand-alone dataloggers that are less than \$200 for a 4-channel logger.

// 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 warning systems and remote data access.



// ANOTHER SUCCESS STORY FOR INTEGRATED TECHNOLOGY SOLUTIONS IN MINING

In the prairie region of western Canada, 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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