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RST Instruments Ltd.
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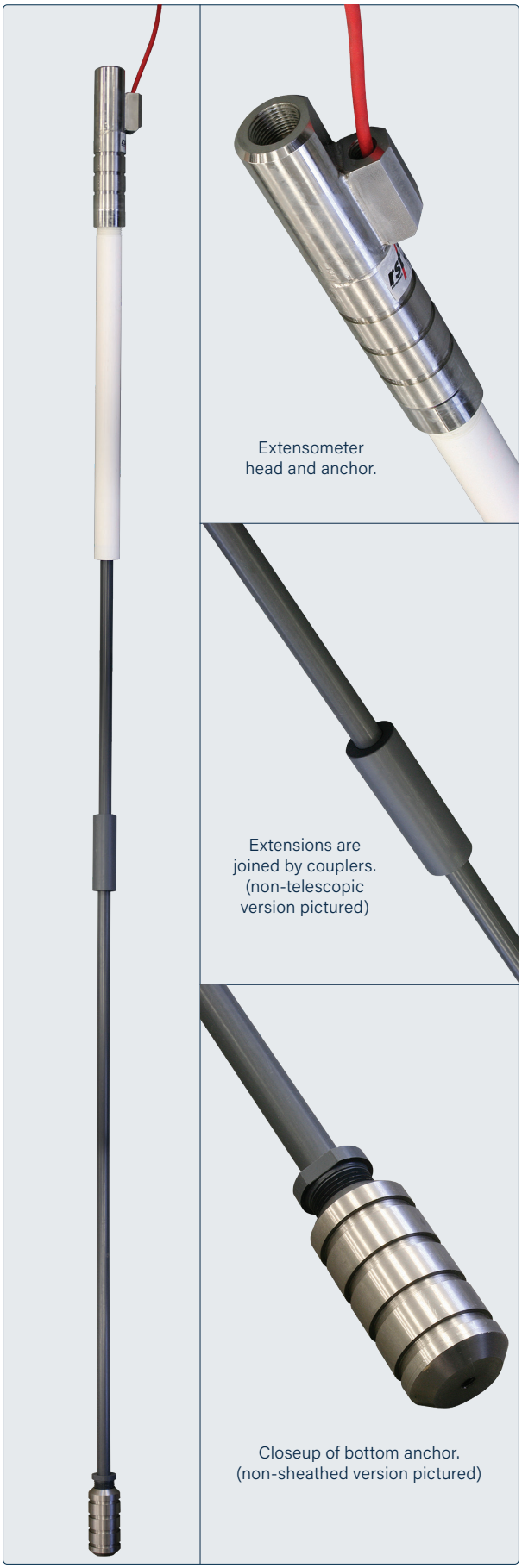
ISO 9001



Extensometer head and anchor.

Extensions are joined by couplers. (non-telescopic version pictured)

Closeup of bottom anchor. (non-sheathed version pictured)

PRODUCT CATEGORY:
EXTENSOMETERS

Vibrating Wire Inline Extensometer

The Vibrating Wire Inline Extensometer is used to determine the stability and movement behavior of soil, rock, and concrete structures. The main advantage of the extensometer is that it has no electrical head protruding out of the borehole, contrary to conventional multi-point borehole extensometers (MPBX). The Inline Extensometer is installed flush with the borehole collar or ground surface and measures movement at different depths in the borehole.

By construction, all displacement transducers are located in the borehole in sealed head/anchor assemblies that are inserted in the borehole and separated by extension sections which can be of variable length depending on the required measurement depths. The extension sections consist of rigid 3/8 inch (9.5 mm) stainless steel rods protected by a 1/2 inch (12.7 mm) SCH40 PVC sheath. The larger diameter of the rigid rod is an additional advantage as compared to the usual 1/4 inch (6.35 mm) of conventional MPBXs, as it provides more accuracy in the measured displacements, both in case of extension and compression movements.

As all displacement transducers are in series in the borehole, the total measurement range of the extensometer is the sum of the individual measurement ranges of each transducers. This allows measurement of considerably larger movements than conventional MPBXs while using lower cost standard range transducers.

> APPLICATIONS

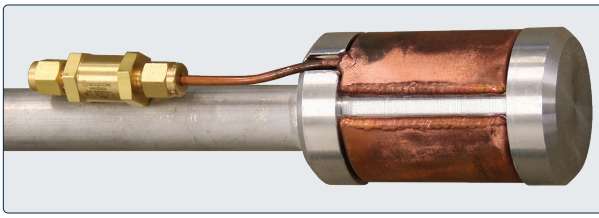
Ground movements around tunnels.	Deformation of concrete piles (tell-tales).
Deformations of dam abutments and foundations.	Ground movement behind retaining walls, sheet piling, slurry walls, etc.
Ground movements in the walls of open pit mines.	Fracturing in the roofs and walls of underground caverns.
Subsidence above tunnels and mine openings.	Settlement and heave of foundations in soft soil.

> FEATURES

Flush with surface: no electrical head protruding out of borehole.	Suitable for extension and compression movements.
Suitable for remote reading and data logging.	Can be installed in 3" (76.2 mm) boreholes.
In-line construction: head/anchors assemblies and extension sections of variable length are inserted in series in the borehole.	
Rigid 3/8 inch (9.5 mm) inner stainless steel rod provides more accurate displacement measurement.	

> BENEFITS

✓ **Increase Safety**	✓ **High Accuracy**
✓ **Increase Productivity**	✓ **High Reliability**



An optional Hydraulic Bladder Anchor is also available for ordering. Please contact RST for more details.

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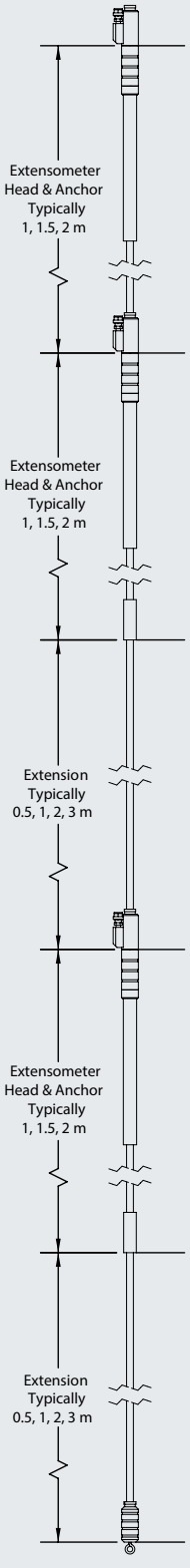
Vibrating Wire Inline Extensometer

PRODUCT CATEGORY:
EXTENSOMETERS

SPECIFICATIONS + ORDERING



Typical Installation of a Vibrating Wire Inline Extensometer

Except the top section (which must be a extensometer head & anchor), all other sections may consist of either an extensometer head & anchor section, or an extension section.

ORDERING INFO CONSIDERATIONS

Sensor range
Extension: compression ratio (10%, 25%, 50%, 75%, 90% - as standard)
Number of anchors, type and depths
Cable length
Accessories & optional equipment
Borehole diameter & orientation
Environmental considerations
Drilling method & soil/rock types
Other environmental considerations

ACCESSORIES & OPTIONAL EQUIPMENT

ITEM	PART #
Grout and/or bleed tubes	Contact RST
Vibrating Wire Readout	VW2106
Dataloggers	Contact RST
Hydraulic Pump for Borros & Bladder Anchors	EXHYDPUMP
1/8 in. Inflation Line for Hydraulic Bladder Anchors	BP0545
3/16 in. Inflation Line for Borros Anchors	BP0557
1/8 in. Tube Union	B-200-6
1/8 in. Ferrule Set	B-200-SET
3/16 in. Tube Union	B-300-6
3/16 in. Ferrule Set	B-300-SET

SPECIFICATIONS

ITEM	DESCRIPTION
Sensor Range	50, 100, 150, 200 mm *Other ranges available on request*
Accuracy	+/- 0.1 % FS
Resolution	0.025% FS
Linearity	<0.5% FS
Thermal Zero Shift	<0.05% FSR/°C
Operating Temperature	-20°C to 80 °C
Min. Borehole Diameter	75 mm
Signal Cable	Two twisted pair cable with polyurethane jacket (one cable per measurement point).

ORDERING INFO

EXTENSOMETER HEAD & ANCHOR ASSEMBLY - PLEASE SPECIFY ANCHOR TYPE	PART #	GAUGE LENGTH
50 mm	EXIN-LINE-1050	1 m
100 mm	EXIN-LINE-1100	1 m
150 mm	EXIN-LINE-1150	1.5 m
200 mm	EXIN-LINE-1200	2 m
EXTENSION KIT LENGTHS	**PART #**	
0.5 m	EXIL-0500	
1.0 m	EXIL-1000	
1.5 m	EXIL-1500	
2.0 m	EXIL-2000	
3.0 m	EXIL-3000	
Imperial lengths available upon request		
CABLE	**PART #**	
Signal Cable	EL380004	
END ANCHORS	**PART #**	
Groutable Anchor	EXIL11000	
Groutable Anchor with Spring Legs	EXIL12000	
Hydraulic Borros Anchors (Double Acting)	EXIL13500	
Hydraulic Bladder Anchor (Please confirm Borehole diameter)	EXIL14000	
TOP	**PART #**	
Anchor kit for mounting top sensor at surface (optional)	EXA0379	