EXTENSOMETERS

INTRODUCTION:

The SIS-7000 Series Borehole Extensometer Electrical/Mechanical (E/M), single or Multi-Point Borehole Extensometers are used to accurately measure longitudinal displacement in rock masses or concrete boreholes. It is particularly useful for distinguishing deep seated movements from surface spelling, which is of value in assessing the need for or determining the efficiency of a rock bolting system.

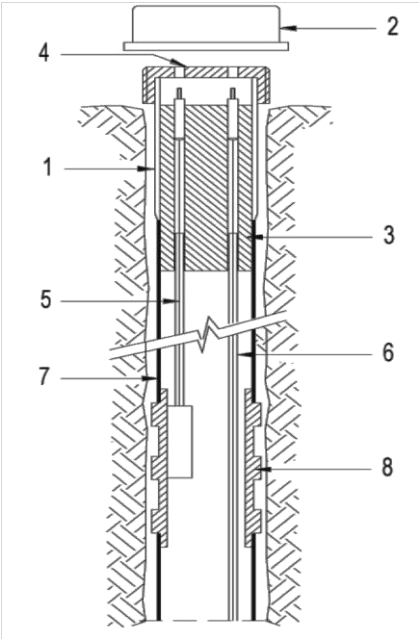
The rugged low cost rod extensometer is designed to be easily installed in difficult locations.

FEATURES:

- Easy to install
- Standard design to use mechanically/electronically
- Highly accurate when used with vibrating wire displacement sensors
- In built Thermistor and gas discharge tube
- Individual sensors for multi point applications
- Light weight

TYPICAL APPLICATION:

- Deformation around tunnels. Mines and other excavations
- Settlement of structures
- Stability of natural and cut slopes
- Deformation in dams and embankments
- Displacement of structures



1: Stainless steel tube

2: Protective cap

3: Rod guide tube

4: Reference plane

5: Spring steel rods

6: Semi-rigid plastic tube

7: External polyethylene sheath

8: Ribbed steel anchors

DESCRIPTION:

The SIS-7000 Series E/M Borehole Extensometer is comprised of a group of 1 to 6 stainless steel/fiber rods individually sheathed in a protective rigid PVC pipe and attached to an anchor. A reference head, anchored at the surface terminate the protective PVC pipe. Movement of the anchor relative to the head changes the distance between the head and the force end of the rod. Two types of head are available. The model (Mechanical) uses a dial or depth gauge to measure change in distance. The depth gauge has an engraved scale or digital readout. The model with remote sensor uses simultaneous Vibrating Wire / LVDT / Potentiometer displacement transducers to measure the change in distance Single-Point and Multi point head configuration is available for both models Vibrating Wire displacement transducers has a built-in thermistor facility to read temperature. All displacement transducers are available to monitor anchor movements remotely and are sealed against moisture and water intrusion. A watertight overall housing seals the former; the transducer casing and housing doubly seals the latter. Both head terminate with protective capes that are removable. The heads are grouted in place at the borehole collar.

READING AND INTERPRETATION:

Both electrical and mechanical readings can be taken. Mechanical readings are taken with either a dial gauge or depth gauge. Electrical readings are obtained from the output of the Vibrating Wire type transducers.

SPECIFICATIONS (MATERIALS):

SERIES	**SIS-7000-BSE**	**SIS-7000-BME**
Extensometer Rod	Stainless Steel	Mild Steel
Reference Head	Stainless Steel	Steel Casting
Casing	PVC/Aluminum	Galvanized Steel
Cover	PVC/Aluminum	Mild Steel

SPECIFICATIONS:

Borehole Diameter		38 mm	48 mm	61 mm	76 mm	101 mm
Maximum No. of Points		1	2-3	3-4-5	3-4-5	5-6
Instrument	**Dial Gauge**	**Depth Gauge**	**Vibrating Wire**	**Vibrating Wire**		**Vibrating Wire**
Measuring Range	0-50 mm	0-150 mm	25,50,75	25,50,75		25,50,75,100
Linearity	0.05%	0.05%	1%	Typically 1%		Less than1%
Resolution	0.02 mm	LCD 0.02	1% F.S.	0.1% F.S.		0.05% F.S.
Operating Temperature	0°to 60°C	0° to 60°C	-20° to 60°C	0° to 60°C		-20° to 80°C
Cable			4 core shielded	4 core shielded		4 core shielded
Thermistor 3k ohm	Included					
Electrical Surge Protection	Optional					
Electrical Cable	4-conductor, shielded					
Wiring Code	V/W sensor :- Red Black Thermistor :- White & green					

SINGLE POINT MECHANICAL ROD EXTENSOMETERS Model SIS 7000-1 **SPECIFICATION** Standard Range up to 100 mm Least Reading 0.025 mm Borehole Diameter 35, 44, 51, 61mm Maximum Length 10 m	**MULTIPOINT MECHANICAL ROD EXTENSOMETER & V.W Displacement Sensors** Model SIS 7001 **SPECIFICATION** Borehole Diameter 76 mm or over Maximum Length 100 m
EXTENSOMETER ANCHOR TYPE **Groutable Anchor**: The preferred anchor for use in downward-directed boreholes. **Hydraulic Anchor** : For use in rough boreholes in rock and soft ground **Snap-Ring Anchor :** For use in hard or competent rock	**READOUT INSTRUMENTS AND SENSORS** Digital Depth Micrometer Dial Indicator VW Displacement Transducer Standard Range up to 100 mm nominal