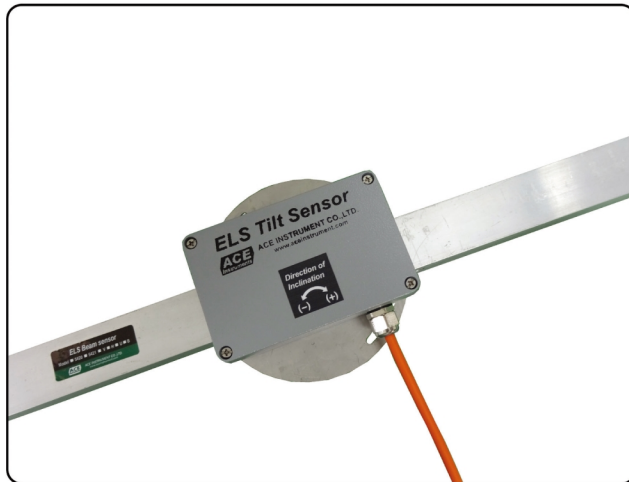


ELS tilt sensor/beam sensor



[ELS beam sensor]

Description

In case of changing the slope of sensor, the electrolyte liquid which is inside of ceramic case will move. At this time, it brings changes in the output voltage. These changes pass to readout unit and it shows changed tilt.

The ELS tilt sensor which has a measuring range of $\pm 1^\circ \sim \pm 3^\circ$ is designed to be able to reset the angle range by adjusting knob by $\pm 4^\circ$ after installation.

Model 5420 series are that 5440 **ELS tilt sensor** put on aluminum pipe which has 1~3m of gage length.

Model 5420 series are divided vertical type and horizontal type. Model 5420 is only available to measure the tilt but, model 5420 series measure even more the tilt than model 5440. These are possible to measure the displacement (settlement or heave) throughout calculation as gage length (L) times tilt and size or outline for subsidence or uplift when it is connected at end of model 5420.

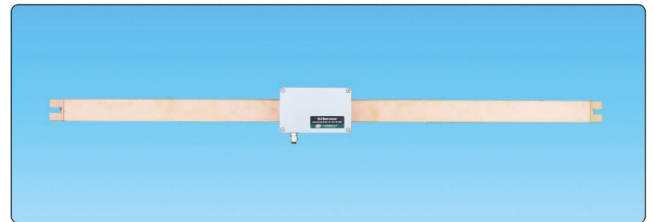
Normally, horizontal type is for subsidence or uplift and vertical type is for size of tilt or displacement of horizontal



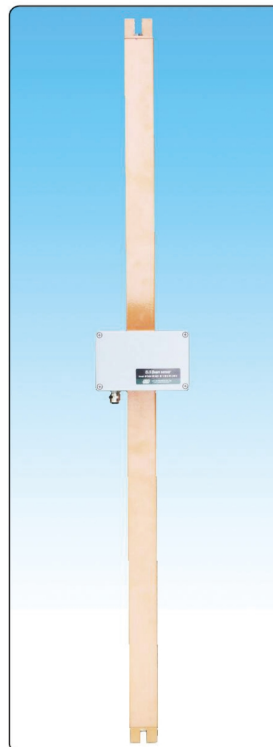
[ELS tilt sensor]

Model 5440 ELS tilt sensor, which is high precise electrolyte tilt sensor, is attached to the aluminum beam case. Basically, the range of ELS tilt sensor is only $\pm 1^\circ \sim \pm 3^\circ$, but it is possible to spread up to $\pm 4^\circ$ throughout adjusting knob after installation.

[Model 5420H horizontal beam sensor]



[Model 5420V vertical beam sensor]



ELS tilt sensor/beam sensor

Specification

Model	ELS beam sensor		ELS tilt sensor
	5420V (vertical)	5420H (horizontal)	5440
Sensor element	ELS sensor (electrolytic level sensor)		
Range	$\pm 1^\circ, \pm 2^\circ, \pm 3^\circ$		
Resolution	1~3arc second		
Accuracy	$\pm 0.1\%$ FSR		
Nonlinearity	$\pm 0.5\%$ FSR		
Operating temperature	-20~70°C		
Adjustment range	$\pm 4^\circ$ (by adjusting knob)		
Gage length	1m~3m		
Dimensions	40×40×1050mm / 2050mm / 3050mm		120×80×42mm
Weight	1.2~3.6kg		0.4kg
Material	Aluminum pipe		Aluminum case
Signal cable	Ø6.4mm, 0.37mm ² ×4C shielded PVC sheath cable		
Accessories	Anchor bolt kit		

Applications

Generally, ELS tiltmeter or portable tiltmeter measures distortion or inclined angle but can not display absolute value of the result or outline of settlement. In this case, you can use ELS beam sensor.

- Measurement of stability of basic foundation
- Measurement of effect from tunnel construction or excavation
- Measurement of settlement in the load impressed bridge or beam
- Measurement of declination or deformation of retaining wall
- Measurement of concentration or movement in subway or tunnel

Features

- High resolution (1 arc seconds)
- High precision and confidence
- Easy installation
- Automated measurement is possible

The readout

It is connected to the system such as the voltage readout units, or data logger as it is the electrical sensor that output mV.

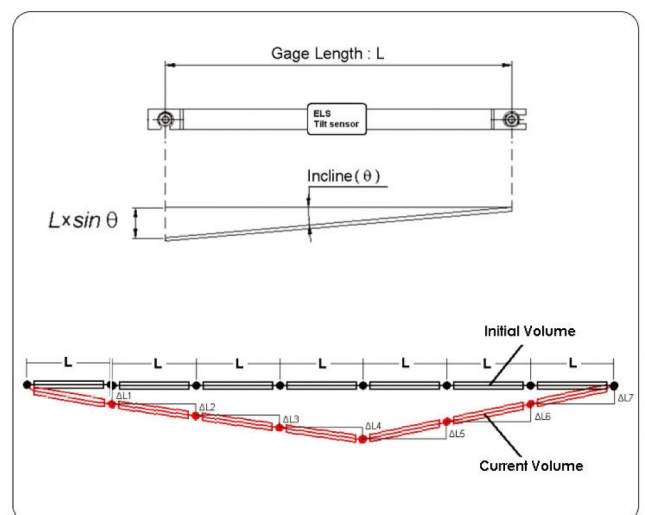
- ACE-1500 (MEMS readout)
- ACE-900 series (MEMS mini logger)
- ADL-200A (Smart logger)

Ordering information

- Decision between vertical and horizontal setting
- Decision between uni-axis and bi-axis
- Place to set and use
- Kind of possessed readout unit
- Length of signal cable

Ancillary equipments

- Universal terminal box (model 7012/7024)
- Protective case



$$\text{Accumulation displacement volume } (\sum \Delta L) \\ = \Delta L_1 + \Delta L_1 + \dots + \Delta L_6 + \Delta L_7$$

[Theory of ELS beam sensor accumulate displacement]