

DISPLACEMENT TRANSDUCER



INTRODUCTION

DATA DIGGER Displacement Transducer measure linear displacement differential expansion by means of Vibrating Wire sensors with resonant frequency of vibration of a tensioned wire is proportional to the strain or tension in the wire. This fundamental relationship is utilized in variety of configuration for the measurement of pressure. Vibrating wire sensors are well known for their long term reliability.

The design contributes to the outstanding features and performances over conventional Vibrating Wire Displacement Transducer.

FEATURES

- Long term reliability and stability.
- Unaffected by changes in atmospheric pressure.
- Rugged, stainless steel body.
- Long term reliability and stability.
- 'O' ring protection against ingress of moisture
- Quick and easy to read, adaptable to data loggers or data acquisition system.

APPLICATION

- In soil extensometers to monitor soil displacement
- In single point or multipoint borehole extensometers to monitor rock mass or concrete displacement.
- As crack meter to monitor movements across surface cracks in structures and rock mass.
- As joint meter to monitor expansion or contractions of joints in concrete structures.



DESCRIPTION

Displacement Transducer are used to measure Linear Displacement in borehole extensometer, Joint Meter or Crack Meters. It is usually suited for application involving transmission of electronic signals over long distances where other types of transducers based on resistance strain gauges or potentiometer cannot be used. The linear displacement between the plunger and the body of the transducer is converted into a stable frequency signal by vibrating wire transducer. The Series of Displacement Transducers offers:

- Unprecedented sensitivity.
- Long Term Stability and reliability.
- Robust and sturdy construction.
- Slim-line Design.

TYPICAL APPLICATION:

As electronic sensors in rod type extensometer for measurement of linear displacement inside the soil, concrete or rock. As electronic sensor in joint meter for measurement of relative movement of two surfaces in X, Y, Z directions.

For electronic monitoring of crack with mounting blocks.

For measurement of displacement in inaccessible location where the mechanical measurement is not possible.

VIBRATING WIRE SENSOR

The Vibrating wire sensor has a unique design. It comprises of a small stainless steel enclosure having a high tensile strength, heat treated and tempered steel wire. The wire is anchored at one end to the enclosure and at the other to a small pin. A coiled assembly or precisely located at the centre of the wire inside the same enclosure. This greatly enhances the response characteristics of the vibrating wire. The sensor is placed in such a way that any movement of the displacement shaft cause its pin to move. The 'O' Ring seal provides complete water proofing and high degree of protection from humid and corrosive environment condition.

OPERATION

Any change in the position of the displacement shaft changes the tension of the wire of the vibrating wire sensor. To measure the change in tension of the wire, its frequency of vibration is measured. The wire is plucked by energizing the coil magnet so that it vibrates at its resonant frequency that is read by the readout units. The resonant frequency is propositional to the square root of the tension of the wire. The convenient read out unit can accurately measure the resonant frequency of the wire. A more sophisticated microprocessor based readout unit can display the frequency as well as the displacement directly in engineering unit. The Transducer is suitable for connection to data logger for recording displacement in engineering units automatically at pre-defined intervals. By the use of appropriate software, the data logger can present recorded data in desired format, predicts trends of variation and even generate alarms at pre-determined set points. A thermistor mounted in the transducer enables reading of temperature at the time of measurement allowing any correction to be made in the observed reading due to temperature changes. Transducers with lightning protection are available on request.



SPECIFICATION

Standard Ranges	:	25, 50, 100, 150mm
Nonlinearity	:	1% F.S
Accuracy	:	$\pm 0.2\%$ F.S Standard
Thermistor	:	3k Ohm @25°C
Temperature Range	:	-10°C to +60°C
Cable	:	4 Core-Shielded 1M Long; Specify
Lengths X Diameter	:	220, 270, 410, 550, 815 mm X 16 mm.

