

# Vibrating Wire Deformation Meter

## Applications

The 4430 Deformation Meter is designed to measure or monitor the...

- Expansion or contraction of joints
- Borehole elongation or shortening
- Closures in underground excavations, tunnels, etc.
- Displacements associated with landslides
- Movement of boulders, snow, etc. on unstable slopes



• Model 4430 Vibrating Wire Deformation Meter installation.



• Model 4430 Vibrating Wire Deformation Meter with hydraulic anchors.



• Model 4430 Vibrating Wire Deformation Meter.

## Description

The Model 4430 Vibrating Wire Deformation Meter is a long-base strain gage, designed to measure axial strains or deformations in rock, concrete or soil. It can also be embedded in soils in embankments such as earth dams and highway fills (see Model 4435 Vibrating Wire Soil Extensometer data sheet). Base lengths of the gage can vary from a minimum of 0.3 meter to over 25 meters.

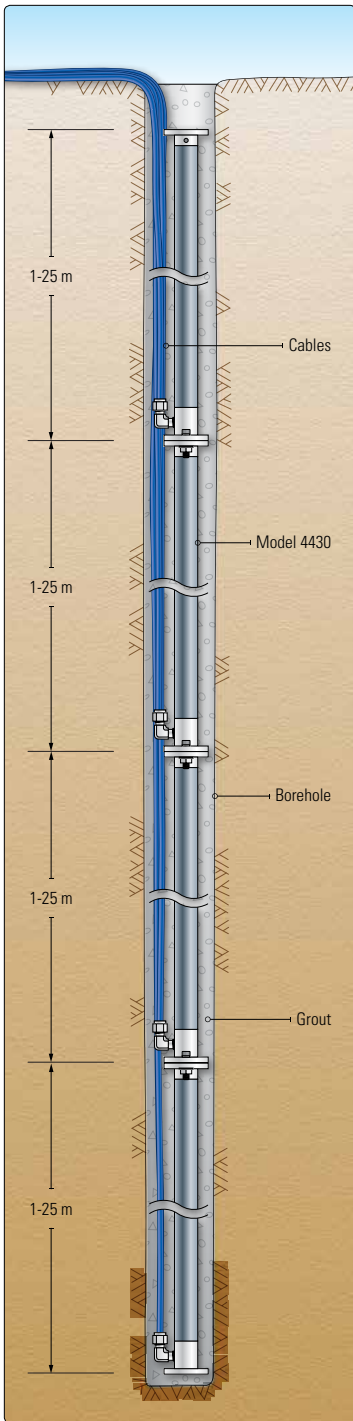
When used in rock, in horizontal or inclined downward boreholes, grouting is the most common method of installation. In overhead boreholes, a special grouting apparatus or hydraulic anchors (see inset at left) are required.

For direct placement into concrete, the deformation meter can be easily tied to the rebar cage.

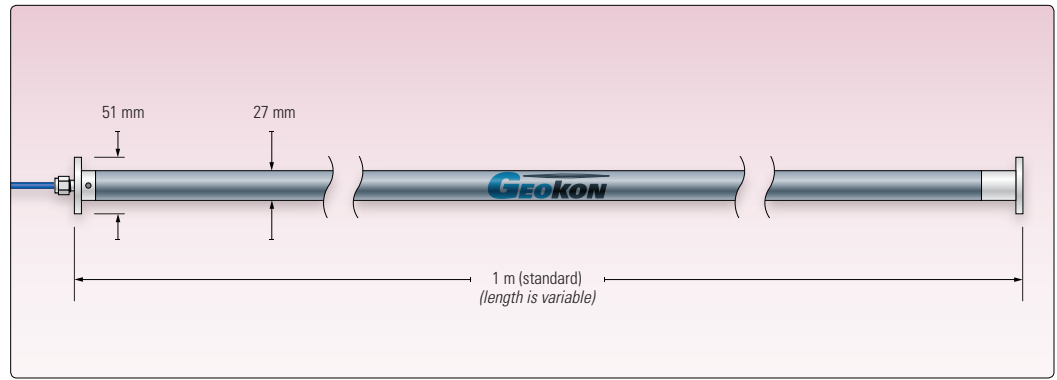
## Construction

The Model 4430 Vibrating Wire Deformation Meter has flanges on either end which enable a series of sensors to be bolted together forming long strings so that complete profiles of deformation or settlement can be monitored.

Each extensometer contains a Model 4450 Vibrating Wire Displacement Transducer which converts extensions between flanges into an electrical signal. The vibrating wire element is subject to increasing tensions as the flanges separate. This causes the fundamental frequency of vibration of the element to increase. The frequency is transmitted through long cables to the readout location where a vibrating wire readouts (Model GK-404 or GK-405) or datalogger (Micro-800 or Micro-1000) measures the frequency and displays and/or stores the values of Hz<sup>2</sup>. These values when multiplied by a calibration constant yield the displacement of the flanges in millimeters or inches.



• Series of Model 4430 Deformation Meters, installed as an incremental extensometer.



• Model 4430 dimensions.

The vibrating wire sensor is housed inside a protective PVC pipe. One end of the vibrating wire sensor is connected to one flange and the other end is connected to the other flange by a stainless steel rod inside the protective PVC pipes. The gage length of the 4430 is specified by the customer at the time of order. Gage lengths can be adjusted in the field by the addition of PVC pipe sections and additional rods. The actual range of movement between flanges, which can be accommodated, depends on the choice of transducer range. Standard ranges are 25-300 mm. Other ranges are available on request.

### Specifications

Standard Ranges <sup>1</sup>	25, 50, 100, 150, 300 mm
Resolution	0.025% F.S.
Accuracy <sup>2</sup>	±0.1% F.S.
Nonlinearity	< 0.5% F.S.
Temperature Range <sup>1</sup>	-20°C to +80°C
Length	1 m (standard); varies by requirements
Pipe Diameter	27 mm
Flange Diameter	51 mm

<sup>1</sup>Other ranges available on request.

<sup>2</sup>Accuracy established under laboratory conditions.