

MEMS TILTMETER



INTRODUCTION

The Data Digger Equipment model DDE-20M-U/DDE-20M-B tilt meter is suitable for monitoring of inclination and vertical rotation in structures. It is a high resolution tilt meter, is rugged in construction and has excellent temperature stability. Tilt changes in structures may be caused due to construction activities such as excavation; tunneling and de-watering that affect the ground that supports the structure. Changes in tilt may also result from loading of a structure, such as loading of a dam during impoundment, loading of a diaphragm wall during excavation or loading of a bridge deck due to wind and traffic. Data from the tilt meter provides early warning of threatening deformations, allowing time for corrective action to be taken or if necessary, for safe evacuation of the area.

FEATURES

- Suitable for severe environment.
- Provides reliable and high resolution readings
- Rugged & robust construction and excellent temperature stability.
- Easy to install and take readings
- Readings can be taken by remote data-logger

APPLICATION

- Monitoring vertical rotation of retaining walls.
- Monitoring inclination and rotation of dams, piers and piles, etc.
- Monitoring stability of structures in landslide areas.
- Monitoring tunnels for convergence and other movements.
- To evaluate performance of bridges and struts under load. To monitor deformation of embankments, retaining walls etc.



OVERVIEW

A MEMS Tilt meter is a precise instrument used to measure the tilt or inclination of an object or surface using Micro-Electromechanical Systems (MEMS) technology. It operates by detecting changes in the orientation of the sensor, converting these movements into measurable electrical signals. MEMS tilt meters offer high accuracy, sensitivity, and low power consumption, making them ideal for continuous monitoring. They are commonly used in civil engineering, geotechnical applications, and infrastructure monitoring to assess structural stability and ground movement. The devices are compact, lightweight, and designed for both portable and fixed installations. MEMS tilt meters can measure tilt in one or two axes, providing versatile data for various applications. Their digital output can be easily integrated into automated systems for real-time monitoring. With minimal maintenance requirements, they are well-suited for use in remote or challenging environments.

DESCRIPTION

Model DDE-20M tilt meter consists of a MEMS sensor, mounted inside stainless steel housing. The sensor output is MODBUS. This output can be carried over long distances without any signal degradation. The sensor provides a relatively low cost system which offers excellent resolution, long term stability and a low thermal sensitivity. The tilt meter (uniaxial and biaxial) is fixed on to a vertical or horizontal surface by means of an adjustable bracket and expandable anchor. Movement of the structure causes change in tilt of the tilt meter, which results in change in output of the sensor. Measurements can be made on horizontal or vertical surfaces. Subsequent sets of readings, shows how the structure is behaving and will give an indication of permanent deformations as time progresses.

MOUNTING VARIANTS

Model DDE-90M tilt meter is supplied with standard mounting bracket suitable for wall mounting/vertical surface. However, options are also available on request for mounting the tilt meter on a roof/suspended from ceiling or on the floor

READOUT/DATALOGGER

Model DDE-20M tilt meter can be read by our DDE-103 series portable digital read-out unit suitable for MEMS tilt-meters. The readings can also be read or logged at a remote location by an automatic data acquisition system like DDE model DDEDAS-10. In the latter case also, it is recommended to take readings with readout unit while installation and for troubleshooting until the tilt meter is connected to DDEDAS-10.





TECHINICAL SPECIFICATIONS:

PORTABLE TILTMETER DDE-70M

Sensor	Uniaxial, Biaxial also available on request.
Standard Range	$\pm 15^\circ$
Accuracy	$\pm 0.1\%$ F.S
Sensitivity	± 10 Arc second
Operating Temperature	-20°C to +80°C
Sensor Dimension	35mm Dia x 230mm lenght
Bracket Dimension (Wall Mounting)	65mm X 65mm X 100mm, 6mm thickness

