

Portable MEMS Tiltmeter

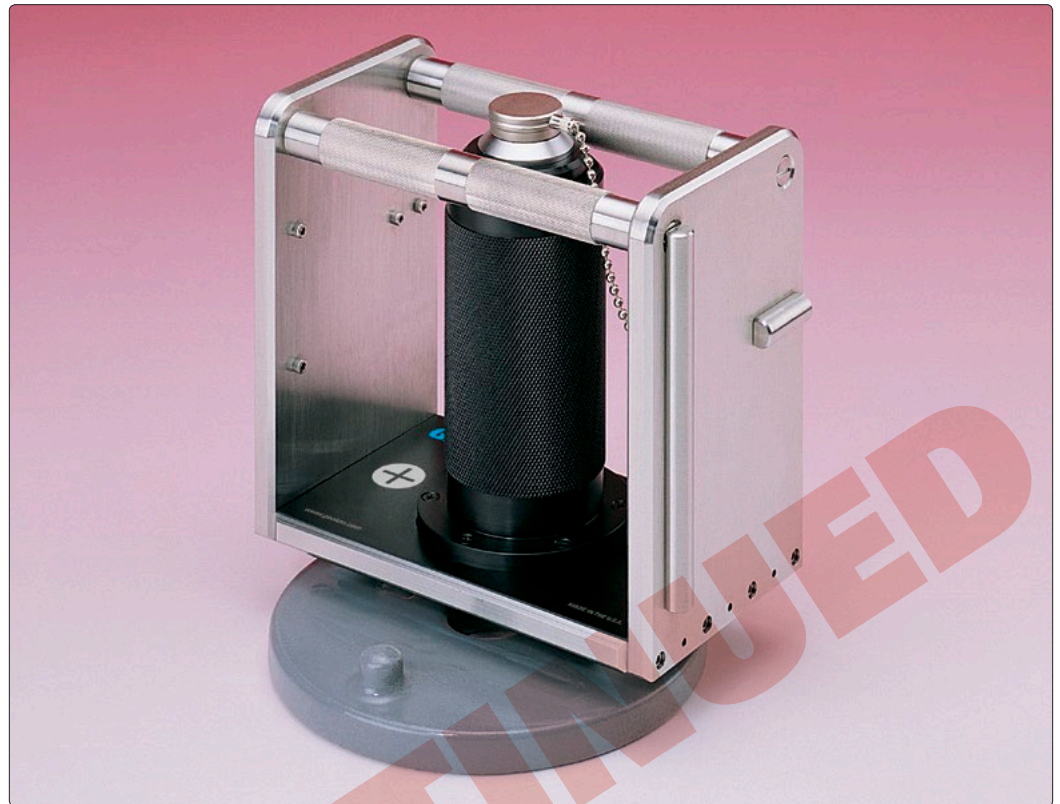
Applications

The Model 6101 Portable MEMS Tiltmeter is designed to measure tilt in structures including...

- Buildings
- Dams
- Embankments
- Slopes
- Excavation walls
- Open pits



• Model 6101 with case and cable.



• Model 6101 Portable MEMS Tiltmeter shown with circular, ceramic tiltplate.

Operating Principle

The Model 6101 MEMS Tiltmeter is a portable device designed to measure tilt in structures such as buildings, dams and embankments and also for measurements related to the stability of slopes, open pits and the walls of excavations (e.g. slurry walls).

In use, the tiltmeter is placed on a tiltplate that has been permanently attached to the structure to be monitored. Measurements can be made on horizontal or vertical surfaces (readings in two orthogonal directions can be obtained on horizontal surfaces). The readings are taken in pairs, 180 degrees to each other, to eliminate instrument bias and thereby obtain true tilt. Subsequent sets of readings show how the structure is behaving and will give an indication of any tilting as time progresses.

Advantages and Limitations

The Model 6101 was designed as a low-cost, portable tiltmeter, for use in various locations, with a standard resolution of 10 arc seconds (when used with the Model RB-500 Readout or Model FPC-1 Field PC and Model GK-604-4 Interface).

The sensor has outstanding temperature stability, with minimal warm-up time and very low power requirements, which consist of a simple unregulated 9 to 15 VDC (no negative voltage is required).

The electronics and sensor are enclosed inside a fully sealed, waterproof housing.

The sensing element is a highly accurate MEMS tilt sensor, which is practically immune to shock. The unit is compatible with most inclinometer readouts.



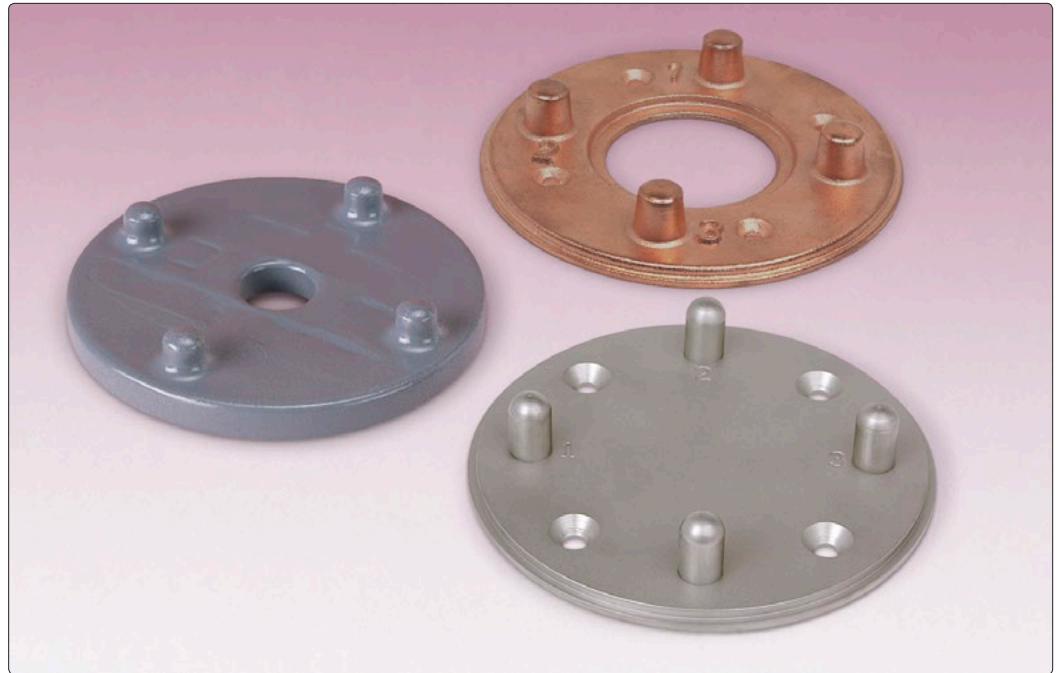
• The Model RB-500 MEMS Readout for use with the Model 6101.



• Model FPC-1 Field PC for use with the Model 6101.



• Model GK-604-4 Interface.



• Model 6201-1C Ceramic, 6201-1A Copper-Plated Aluminum and 6201-1S Stainless Steel Tiltplates (tiltplates are permanently attached to structure being monitored).

System Components

The heart of the tiltmeter is a state-of-the-art MEMS inclinometer, a micro-machined sensor element with onboard self-test electronics and temperature compensation. The MEMS sensor is highly accurate and stable, and practically immune to temperature changes and shocks.

The Model 6101 Portable MEMS Tiltmeter is used in conjunction with the Model RB-500 Readout or Model FPC-1 Field PC and Model GK-604-4 Interface (see inset photos at left).

Three styles of tiltplates are available – ceramic, aluminum and stainless steel. The stainless steel tiltplates are recommended where vandalism may be a problem.

Technical Specifications

Full Scale Range	±15°
Resolution	±0.05 mm/m (±10 arc seconds)
Accuracy ¹	±0.02% F.S.
Non-Linearity & Hysteresis	0.02% F.S.
Output @ 15°	4 VDC (nominal)
Input Supply Voltage	+9 to +15 VDC
Input Supply Current	25 mA
Temperature Range	(operating) 0°C to +50°C (storage) -25°C to +70°C
Shock Survival	20,000 g
Connector	Lemo ERA 3E30CNL
Weight	6.5 kg (including case)
Dimensions (L × W × H)	159 × 89 × 143 mm

¹Established under laboratory conditions.



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