TLT-6 MEMS TILTSENSOR

Datasheet TLT-6

Description

The MEMS Tiltsensor is designed to monitor vertical rotations of structures.

Mounted within the Stainless Steel housing are one or two (uniaxial or biaxial) MEMS sensors that deliver a large measuring range with high sensitivity and relative immunity from the effects of long cable lengths.

Each sensor incorporates an on-board microprocessor which performs an automatic temperature compensation of the tilt (g) data, delivering reliable, accurate and stable data.

The sensors are powered and the readings obtained by a Datalogger. The data can be directly imported into '**Argus**' monitoring software, providing a near real time profile of displacement that is constantly updated and available to view from any PC or mobile device with an internet connection.

Features

- **Accurate and precise measurements using MEMS sensors**
- **Available in uniaxial and biaxial versions**
- **Inbuilt temperature compensation**
- **Stainless Steel construction, waterproof to 2000kPa**

Benefits

- **Easy to automate using data acquisition systems and 'Argus' software**
- **Removes the need for manual monitoring**
- **Suitable for safety critical applications**
- **Low power consumption**

Comprehensive information about this product and our full range is available at www.soil.co.uk
If you would like to speak with someone directly please call +44 (0)1825 765044 or email sales@soil.co.uk

MICROELECTROMECHANICAL SYSTEMS (MEMS)

MEMS

Microelectromechanical Systems, or MEMS, is a technology that uses miniaturised mechanical and electromechanical elements that are made using the techniques of microfabrication. The physical dimensions of MEMS devices can vary from well below one micron all the way to several millimetres.

Our MEMS microsensor is a small discrete device that converts a measured mechanical signal, gravity (g) into a voltage signal.

Operation

Once the location for the MEMS Tiltsensor has been established the position is marked out, ensuring that the sensor is correctly orientated towards the direction of movement.

The marked locations are drilled to depth and the 8mm shell anchors supplied with the Tiltsensor are installed. Studding is screwed into the shell anchors, leaving a sufficient length to incorporate the bracket and the Tiltsensor.

Once the studding is in place, the Tiltsensor bracket is mounted on to the studding, ensuring there is an adequate space between the structure and the Tiltsensor before securing in place using the M8 washers and nuts.

A spirit level is used to check that the Tiltsensor is level in both directions, and then the nuts are securely tightened before the Tiltsensor is finally wired into a datalogger.

The system can be fully automated using '**Argus**' monitoring software, providing a near real time profile of displacement.

Associated products

For details on:	Catalogue code:
Datalogger	D1

View our full product range on www.soil.co.uk

Applications

The MEMS Tiltsensor monitors vertical rotations of structures.

Its most common use is to monitor settlement and heave of existing structures and tunnels caused by adjacent excavations or tunnelling works.

The sensor is especially useful where topographic measurements are precluded or where access is restricted.

Typical monitoring applications include:

- Brick and stone buildings
- Vertical rotation (heave and settlement) due to adjacent construction activities
- Bridges and dams
- Impounding and loading effects in short or long-term
- Differential levels
- Tunnels
- Monitoring vertical rotation and track formation

THE TECHNICAL RATING FOR THIS PRODUCT: **ADVANCED**

As the correct installation of any monitoring sensor or system is vital to maximise performance and accuracy, Soil Instruments makes the following recommendations, for the skill level of the installation contractor.

ADDITIONAL SUPPORT

We offer installation and monitoring services to support this system. For more information please email : **sales@soil.co.uk** or call : **+44 (0) 1825 765044**

ADVANCED	The installer is trained and experienced in the installation of this type of instrument or systems, and is ideally a specialist Instrumentation and Monitoring contractor.
INTERMEDIATE	The installer already has previous experience and/or training in the installation of this instrument or system.
BASIC	As a minimum the installer has read and fully comprehends the manual, and if possible has observed these instruments or systems being installed by others.

Specifications

Sensors

Calibrated Range	±3° | ±5° | ±10° | ±15°
Resolution[1]	0.008% full scale
Sensor accuracy	±0.05% full scale
Operating temperature	-20 to +80°C
Repeatability	±0.01% full scale
Minimum casing internal diameter	56mm
Maximum casing internal diameter	72mm
Weight (without cable)	540g
Dimensions	192mm x Ø32mm
Input voltage	10-16VDC
Signal output at full range	±2.5VDC differential
Current consumption	9mA (uniaxial) / 17mA (biaxial)
Ingress protection	IP68 to 200mH_2O (2000kPa)
Housing material	Stainless Steel

[1]Dependent on readout equipment

Ordering Information

MEMS Tiltsensor - uniaxial

Includes mounting bracket

TLT-6-U-3	Vertical uniaxial ±52.3mm/metre (±3 arc degrees)
TLT-6-U-5	Vertical uniaxial ±87.2mm/metre (±5 arc degrees)
TLT-6-U-10	Vertical uniaxial ±173.6mm/metre (±10 arc degrees)
TLT-6-U-15	Vertical uniaxial ±258.8mm/metre (±15 arc degrees)
CA-3.1-4-IC	Instrument cable 4 core, 7/0.20; screened, priced per metre, polyurethane jacket, for use with uniaxial sensors

MEMS Tiltsensor - biaxial

Includes mounting bracket

TLT-6-B-3	Vertical biaxial ±52.3mm/metre (±3 arc degrees)
TLT-6-B-5	Vertical biaxial ±87.2mm/metre (±5 arc degrees)
TLT-6-B-10	Vertical biaxial ±173.6mm/metre (±10 arc degrees)
TLT-6-B-15	Vertical biaxial ±258.8mm/metre (±15 arc degrees)
CA-3.1-6-IC	Instrument cable, 6 core, 7/0.20; screened, priced per metre, polyurethane jacket, for use with biaxial sensors

Manual

MAN-193	MEMS Tiltsensor (IPI Sensor Based)

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