

ELECTROLEVEL OPERATION AND APPLICATION

The **ELECTROLEVEL** is an extremely robust tilt transducer and low frequency accelerometer which has been tried and proven in such arduous applications as air portable military equipment and offshore exploration platforms.

The **ELECTROLEVEL** is established as a reliable transducer for monitoring or controlling equipment in a wide variety of industries.

The **ELECTROLEVEL** is a gravity sensing angle transducer based on the principle of the spirit level.

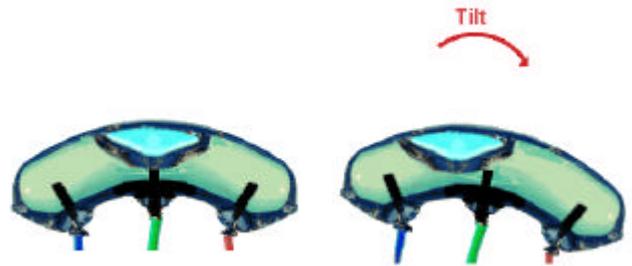
A suitably curved tube contains an electrically conducting liquid, three electrodes, and a gas bubble.

Under the influence of gravity the bubble floats to the highest point in the tube.

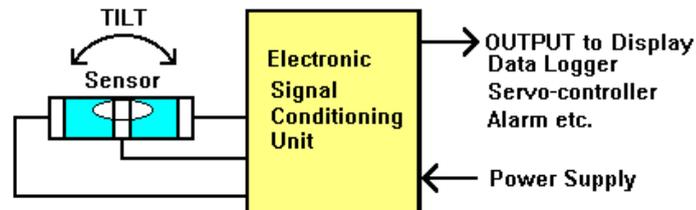
As the tube is tilted the position of the bubble relative to the electrodes changes causing a difference in electrical resistance from electrode to electrode.

With suitable electronic circuitry this difference can be measured accurately and converted to a voltage analogue of tilt angle.

This voltage can be electronically processed in a variety of ways for different applications - for example the difference between two angles can be computed and displayed to facilitate alignment of two parts of a structure.



How an **ELECTROLEVEL** senses a change in tilt



ELECTROLEVEL Schematic System

In the **ELECTROLEVEL** the only moving parts are the conducting liquid and gas bubble. This has many advantages.

First, the liquid will flow after an infinitesimal change in tilt angle - there is no friction in a mechanical pivot to overcome and hence no hysteresis effect - the resolution of the sensor is infinite in a practical and repeatable way.

Secondly, there are no mechanical wearing out mechanisms in the **ELECTROLEVEL** either under normal measurement conditions or under shock and vibration conditions.

The worst that can happen to the 'mechanism' of the **ELECTROLEVEL** under the severest vibration is that the bubble breaks up and forms a foam with the liquid.

However, once the vibration ceases, the bubble forms again and is as good as new.

Some recent applications include:-

dual axis level control systems for missile launch platforms,
attitude monitors for drilling and piling rigs,
subsea anchor chain catenary monitor,
radio telescope datum reference,
deceleration monitor for brake research vehicle,
road gradient sensor for highway inspection vehicle,

automatic trim angle control sensor for oil tankers.

Standard Products are fully described on our website www.tilt-measurement.com

In addition to these standard components, Tilt Measurement supply a variety of complete systems for end-user applications.

Standard Systems include:

Earth Tilt Monitors to measure variations in tilt of earth strata settlement and slip:

Marine Inclination Differential Alignment System (MIDAS) to facilitate alignment and surveying on floating vessels:

Load Attitude Control Equipment (LACE) to synchronise hydraulic or mechanical lifting and moving equipment:

Deck Movement Indicator (DMI) to assess stability of helicopters or other objects on the deck of a moving ship.

For further information on these and other standard systems contact our sales engineers

Tilt Measurements' Engineers are available for discussion of any possible applications and have many years' experience in the design of systems for customers from a diverse range of industries.

All information herein is believed to be correct but no liability is accepted by Tilt Measurement Limited for any application in respect of fitness of purpose, infringement of intellectual property rights, or consequential loss or damage howsoever caused.

TILT MEASUREMENT LIMITED
HORIZON HOUSE LONDON ROAD BALDOCK HERTS.. SG76NG U.K.
TELEPHONE - 44-(0) 1462-894566 FAX - 44-(0) 1462-895990
e-mail sales@tilt-measurement.com www.tilt-measurement.com
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