Penny & Giles

Vibration-Tolerant Tilt Sensor

VTS2021

- **Vibration-tolerant tilt sensor**
- **Thermal compensation**
- **Designed for dynamic applications**
- **Dual-axis – pitch and roll**
- **Dual sensing per axis for error detection**
- **12Vdc or 24Vdc supply**
- **CANopen or J1939 CANbus output**
- **IP67 enclosure**
- **Integrated Deutsch DT04 connector**

The VTS2021 is a dual-axis, vibration-tolerant tilt sensor that offers an optimal combination of performance, safety and cost in dynamic applications, such as industrial vehicles.

IMU technology and fast-acting software algorithms filter out disturbances caused by vibration and vehicle motion, to provide output stability without the measurement delays usually associated with heavily-damped, alternative sensing methods.

Each measurement axis has two sensing elements, which are constantly compared to ensure correct operation. If an error is detected, the condition is communicated to the host electronics; so allowing a safe situation to be assumed. Each output signal is calibrated to account for thermal drift, ensuring accuracy over the operating temperature range.

Powered from a voltage supply range of 6-48Vdc, the sensor provides output data over CANbus using CANopen or J1939 protocol.

The sealed design offers exceptional levels of performance with respect to water, dust, shock, vibration and temperature, meaning the sensor is ideal for use in hostile, on- and off-highway vehicle environments. Electrical connection is via an integrated 4-pin Deutsch DT04 connector.

SPECIFICATIONS

ELECTRICAL	
MEASUREMENT RANGE	Dual axis, ±64°
SUPPLY VOLTAGE	6-48Vdc unregulated (12V and 24V systems)
SUPPLY CURRENT	<40mA at 12Vdc
SHORT-CIRCUIT PROTECTION	All connections to all connections
OVER-VOLTAGE PROTECTION	Up to 60Vdc at ambient temperature
REVERSE POLARITY PROTECTION	Up to -48Vdc
POWER-ON SETTLEMENT	<500ms
OUTPUT	
PROTOCOL	J1939 or CANopen
LINEARITY	<±2%
RESOLUTION	J1939: 16 bit output, 0.002° per bit CANopen: devices up to and including ±30° range, 0.001° per bit CANopen: devices above ±30° range, 0.01° per bit
OUTPUT NOISE	±2bits typical
THERMAL DRIFT	<0.5º total at 10° inclination
REPEATING ACCURACY	≤2% of full scale range
MECHANICAL	
MAXIMUM MEASURABLE OPERATING SPEED	250°/s
WEIGHT	<150g
CONNECTOR	Integrated connector to suit Deutsch DT04
EMC DATA	
RF IMMUNITY	EN61000-6-2, ISO 11452-2
RADIATED EMISSIONS	EN61000-6-3, CISPR25
CONDUCTED IMMUNITY	ISO 11452-4
ELECTROSTATIC DISCHARGE	ISO10605
POWER FREQUENCY FIELD IMMUNITY	EN 61000-4-8
TRANSIENT PROTECTION	ISO7637-2, pulses 1-5
ENVIRONMENTAL	
OPERATING TEMPERATURE RANGE	-40°C to 85°C in accordance with BS EN 60068-2-14
STORAGE TEMPERATURE RANGE	-50°C to 90°C in accordance with BS EN 60068-2-1 and BS EN 60068-2-2
HUMIDITY	BS EN 60068-2-30, BS EN 60068-2-38
SEALING	IP69K, IP67
VIBRATION	BS EN 60068-2-64, 14.7gn rms, 20-2000Hz random
SHOCK	BS EN 60068-2-27, 50g, 11ms, 3 shocks per axis (9 total)
DROP TEST	1m drop onto concrete to BS EN 60068-2-32
MTTFd	> 385 years
SALT SPRAY	EN 60068-2-52 test Kb severity 2 (72 hrs)
CHEMICAL RESISTANCE	Hydraulic Oil Chevron Rando HD, Antifreeze Water mixture 50/50 ethylene glycol, Degreasers, Steam, Battery Acid, Water and Snow, Salt Water, Spray Paint, Acrylic based paints, Epoxy based paints, Oil based paints, Paint strippers, Ether, Hydrochloric Acid, Diesel fuel, Petrol, Phosphoric Acid, Isopropyl Alcohol, Calcium Chloride, Magnesium Chloride, Potassium Chloride, Sodium Hydroxide, Calcium Hydroxide, Ammonium Hydroxide, AdBlue, Herbicide, Fertilizer, Urea Nitrogen, Insect Repellant

All values recorded at room temperature of 23°C, unless otherwise stated

CURTISS-WRIGHT

USA LA
California
T: +1.714.982.1860
cwig.us@curtisswright.com
www.cw-industrialgroup.com

Europe Christchurch
United Kingdom
T: +44.1202.034000
cwig.uk@curtisswright.com
www.cw-industrialgroup.com

Asia Taipei
Taiwan
T: +886.2.2778.1900
cwig.tw@curtisswright.com
www.cw-industrialgroup.com