# positilt®
# Gyro-compensated Inclination Sensors

## PTK29

Dynamic inclination sensor with robust, compact stainless steel housing




- **Measurement range ±180°, 2 axes**
- **Protection class up to IP69**
- **Hermetically sealed stainless steel housing**
- **Longitudinal water barrier; potted electronics**
- **Wear-free MEMS technology**
- **User selectable axis orientation (optional)**

## Product versions

**Digital output CAN**

CAN



PTK29 - Dynamic inclination sensor

**Version with digital output CAN**

## Specifications

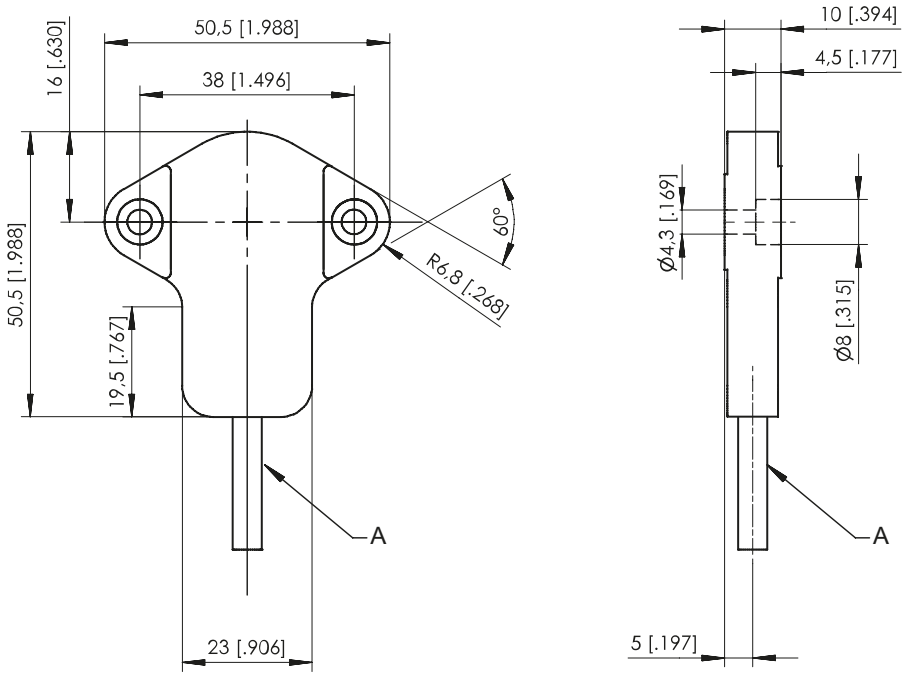
| | | | Order options |
|---|---|---|---|
| **Output** | CANopen<br>SAE J1939 | 1 | **CANOP**<br>**CANJ1939** |
| **Measurement range** | ±180°, 2 axes | | |
| **Resolution** | ≥0.01°<br>Adjustable by the user | | |
| **Linearity (static)** | 0.05° (±30°)<br>0.1° (±60°)<br>0.2° (±180°) | | |
| **Repeatability** | <0.05° | | |
| **Hysteresis** | <0.05° | | |
| **Housing material** | Stainless steel EN 1.4404 (AISI 316L) | | |
| **Mounting** | Screws M4: DIN 912, DIN 6912, DIN 7984 | | |
| **Protection class** | up to IP69 | | |
| **Connection** | Cable 0.3 m with connector M12, 5 pin | 2 | **KAB0,3M – M12/CAN** |
| **Shock** | DIN EN 60068-2-27:2010, 100 g/11 ms, 100 shocks | | |
| **Vibration** | DIN EN 60068-2-6:2008, 20 g 10 Hz-2 kHz, 10 cycles | | |
| **Temperature range** | -40° ... +85°C | | |
| **Weight** | approx. 80 g (without cable) | | |
| **EMC** | DIN EN 61326-1:2013 | | |

## Order code

PTK29 – 1 – 2

**Order example:** PTK29 – CANOP – KAB0,3M – M12/CAN

## Dimensions




A – Cable

Dimensions in mm [inch].
Dimensions informative only.
For guaranteed dimensions consult factory.

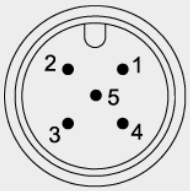
## Output specification

### Digital output CANopen

| | | |
|---|---|---|
| **CANOP**<br>CANopen | Communication profile | CANopen CiA 301, Slave |
| | Encoder profile | CiA 410, Profile „Inclinometer“ |
| | Configuration services | LSS, CiA Draft Standard 305<br>(Transmission rate, node ID) |
| | Error Control | Node guarding, Heartbeat, Emergency message |
| | Node ID | Adjustable via LSS or SDO, default: 127 |
| | PDO | 1 TxPDO, 0 RxPDO, no linking, static mapping |
| | PDO Modes | Event-/Time triggered, Remote-request, Sync cyclic/acyclic |
| | SDO | 1 Server, 0 Client |
| | Certified | yes |
| | Transmission rate | 125 kBit … 1 Mbit, adjustable via LSS or SDO, default: 125 kBit |
| | Bus connection | M12 conncector, 5 pin |
| | Bus, galvanic isolated | no |
| | Error Control Baudrate | 50 kBit/s … 1 MBit/s configurable |
| | Transceiver | 24V-compliant, not isolated |
| | Internal termination resistor | 120 Ohm configurable |

| | | |
|---|---|---|
| **Specifications** | Excitation voltage | 8 ... 36 V DC |
| | Excitation current | 15 mA typical at 24 V DC<br>30 mA typical at 12 V DC<br>100 mA max. |
| | Measuring rate | 0.5 kHz standard |
| | Stability (temperature) | ± 0,2° (-20 … +40 °C)<br>± 0,4° (-40 … +85 °C) |
| | Repeatability | 1 LSB |
| | Operating temperature | -40 … +85 °C |
| | Protection | Reverse polarity, short circuit |
| | EMC | DIN EN 61326-1:2013 |

**Signal wiring**
**Connector M12, 5 pin**




View to the sensor connector

| Output signals | Connector pin no. |
|---|---|
| Shield | 1 |
| Excitation + | 2 |
| GND | 3 |
| CAN-H | 4 |
| CAN-L | 5 |

## Digital output SAE J1939

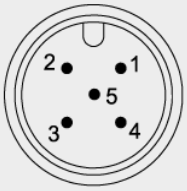
| | | |
|---|---|---|
| **CANJ1939**<br>SAE J1939<br> | CAN Specification | ISO 11898, Basic and Full CAN 2.0 B<br>extended message format with 29-bit identifier |
| | Transceiver | 24V-compliant, not isolated |
| | Communication profile | SAE J1939, 29-bit identifier |
| | Transmission rate | 250 kBit/s |
| | Internal termination resistor | 120 Ω |
| | Address | Default 247d, configurable |

| **NAME - Unique device identifier** | **Name Fields** | **Remark** | **Field value** | **Size [Bit]** | **Byte order** | **Byte value** |
|---|---|---|---|---|---|---|
| | Arbitrary Address Capable | No | 0 | 1 | Byte 8 (MSB) | 00h |
| | Industry Group | Global | 0 | 3 | | |
| | Vehicle System instance | | 0 | 4 | | |
| | Vehicle System | Non specific | 7Fh | 7 | Byte 7 | FEh |
| | Reserved | | 0 | 1 | | |
| | Function | Non specific | FFh | 8 | Byte 6 | FFh |
| | Function Instance | | 0 | 5 | Byte 5 | 00 |
| | ECU Instance | | 0 | 3 | | |
| | Manufacturer | Manufacturer Code | 145h | 11 | Byte 4 | 28h |
| | | | | | Byte 3 | A0h+nn |
| | | Identity Number | n..nh | 21 | | |
| | | | | | Byte 2 | nnh |
| | | | | | Byte 1 | nnh |

| | | | |
|---|---|---|---|
| **Proprietary PGN - Manufacturer specific Parameter Group Numbers** | Configuration data | PGN EFddh | Proprietary-A<br>(PDU1 peer-to-peer) |
| | Process data | PGN FFnnh | Proprietary-B<br>(PDU2 broadcast);<br>nn Group Extension (PS) configurable |

| Specifications | | |
|---|---|---|
| | Excitation voltage | 8 ... 36 V DC |
| | Excitation current | 15 mA typical at 24 V DC<br>30 mA typical at 12 V DC, 100 mA max. |
| | Measuring rate | 0.5 kHz (asynchronous) |
| | Stability (temperature) | ± 0,2° (-20 … +40 °C)<br>± 0,4° (-40 … +85 °C) |
| | Repeatability | 1 LSB |
| | Operating temperature | -40 … +85 °C |
| | Protection | Reverse polarity, short circuit |
| | EMV | DIN EN 61326-1:2013 |

**Signal wiring**
**Connector M12, 5 pin**




View to the sensor connector

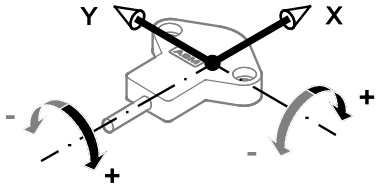
| Output signals | Connector pin no. |
|---|---|
| Shield | 1 |
| Excitation + | 2 |
| GND | 3 |
| CAN-H | 4 |
| CAN-L | 5 |

## PTK29 – Output characteristic and axis orientation

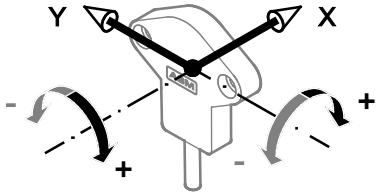
For CAN output, the axis orientation can be set by the user via software.
Sensor position as shown equals 0°.

### 2 measuring axes

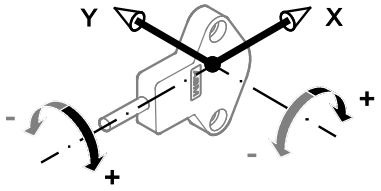
Axis orientation **2A**




Axis orientation **2B**




Axis orientation **2C**




### Output signal

