QG series

QG65N-K0Xv-360-CANS-C(F)M-2d

SIL2 / PLd Certified sensor

Safety inclination sensor
1 axis vertical mounting
Programmable device
Interface: CANopen Safety

SIL CL 2 (acc. to IEC 62061)
PLd (acc. to EN ISO 13849)

Measuring range 360°

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General specifications 12082/12077, v20190501
Reinforced plastic injection molded (Faradex DS, black, EMI shielded by stainless steel fiber in PC)

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
<td>Reinforced plastic injection molded (Faradex DS, black, EMI shielded by stainless steel fiber in PC)</td>
</tr>
<tr>
<td>Dimensions (indicative)</td>
<td>60x50x27 mm</td>
</tr>
<tr>
<td>Mounting</td>
<td>4x M5x25 mm zinc plated pozidrive screws included (optional: 2x Ø4mm positioning pins)</td>
</tr>
<tr>
<td>Ingress Protection</td>
<td>IP67</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>0 - 100%</td>
</tr>
<tr>
<td>Weight</td>
<td>approx. 110 gram</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>8 - 60 V dc SELV</td>
</tr>
<tr>
<td>Polarity protection</td>
<td>Yes</td>
</tr>
<tr>
<td>Current consumption</td>
<td>≤ 25 mA</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-40 .. +85 °C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 .. +85 °C</td>
</tr>
<tr>
<td>Measuring range</td>
<td>360°</td>
</tr>
<tr>
<td>Centering function</td>
<td>Yes (CANout 0 = 0°), range: 360°</td>
</tr>
<tr>
<td>Frequency response (-3dB)</td>
<td>0 - 20 Hz</td>
</tr>
<tr>
<td>Typ. Accuracy @20°C (2σ)</td>
<td>overall 0.15° typ.</td>
</tr>
<tr>
<td>Offset error</td>
<td>&lt; ± 0.05° typ. (&lt; ± 0.1° max.) after centering</td>
</tr>
<tr>
<td>Non linearity</td>
<td>&lt; ± 0.1° typ. (&lt; ± 0.2° max.) not applicable</td>
</tr>
<tr>
<td>Sensitivity error</td>
<td>0.05°</td>
</tr>
<tr>
<td>Resolution</td>
<td>± 0.01°/K typ.</td>
</tr>
<tr>
<td>Temperature coefficient</td>
<td>± 0.01°/K typ.</td>
</tr>
<tr>
<td>Max mechanical shock</td>
<td>10.000 g</td>
</tr>
</tbody>
</table>

According to ISO 11898-1 & ISO 11898-2 (also known as CAN 2.0 A/B)
CANopen Safety protocol: EN 50325-5, CANopen protocol: EN 50325-4 (CiA 301 v4.0 & 4.2.0)
CANopen device profile for inclinometers: CiA 410 version 2.0.0

Baud rate: 125 kbit/s (default, range 10/20/50/100/125/250/500/1000 kbit/s)
Node Id: 01h (default, range: 01h - 3Fh) (01h - 7Fh with adapted COB-ID's)
Sync mode (TPDO's), Heartbeat: 50 ms (default, range 10-500 ms)
Output format: 01h (default, range: 01h - 3Fh) (01h - 7Fh with adapted COB-ID's)
SRDO1 COB-ID1: 100 + 2x node ID (for Node ID=01h: SRDO1 COB-ID1=101h)
SRDO1 COB-ID2: 80ms in CAN object dictionary, worst case 100ms
Safeguard cycle time (SCT): 20ms
Output filter disabled
Emergency message 080h+Node-ID followed by NMT stop state (no CAN communication) < 1 s

Programmed options by CANopen object dictionary (CAN parameters, filtering)
**QG65N-KIXv-360-CANS-C(F)M-2d**

**Transfer characteristic**

\[
\text{CAN output} = 100^\circ \alpha
\]

**Measurement orientation**

Rotation in vertical plane.

Lateral tilt sensitivity error: 
\(< ± 0.03/° \text{ lateral tilt (typ.)}
\]

Max. lateral tilt: 45°

Drawn in the default 0° position.

**Connectivity (length ±10%)**

Male only or Male & Female (internal T-junction) M12 connector (5 pins, A-coding)

(Cia303 V1.8.0) (Brass Nickel coated, contacts copper alloy)

No bus termination inside. A CANbus always has to be terminated properly. For bus termination order separate M12 termination resistor (optional: T-connector)

<table>
<thead>
<tr>
<th>Pin 1:</th>
<th>Pin 2:</th>
<th>Pin 3:</th>
<th>Pin 4:</th>
<th>Pin 5:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shield</td>
<td>Vcc</td>
<td>Gnd &amp; CAN_GND</td>
<td>CAN_H</td>
<td>CAN_L</td>
</tr>
</tbody>
</table>

**Mechanical dimensions (indicative only)**

**CAN-manual, EDS-file, Safety Information, Ordering codes**

A CANopen-safety manual, EDS-files (Cia306 V1.3.0) and a Declaration of Conformity are available on www.dis-sensors.com/downloads

Safety information:
- this datasheet + relevant manual must be read and understood before using this safety device
- certified level: SIL CL 2 (acc. to IEC 62061), PLd (acc. to EN ISO 13849)
- EC type examination by DEKRA EXAM GmbH Reg. no.: ZP/015/16
- hardware architecture: HFT=0 (according IEC 62061, CAT.2 (according to EN ISO 13849)
- only a SELV power supply should be used
- Redundancy Compare Time (error if this time is expired): customer adjustable (default 2000ms)
- Redundancy Compare Angle (error if angle-difference > this value): customer adjustable (default 3°)
- Redundancy error: Redundancy Compare Angle & Redundancy Compare Time exceeded
- Error: any detected error or a redundancy error
- Safety Related Fault Respons Time (SRFRT): 100ms + Redundancy Compare Time (default 2000ms)

As this device is accelerometer-based the sensor is inherent sensitive for accelerations/vibrations. Application specific testing must be carried out to check whether this sensor will fulfill your requirements.

Ordering codes:
- M12 Male: QG65N-KIXv-360-CANS-CM-2d, 12082
- M12 Male & Female: QG65N-KIXv-360-CANS-CFM-2d, 12077