## QG series

**QG65N-KDXYh-090-CANS-C(F)M-2d**

**SIL2 / PLd Certified sensor**

### Safety inclination sensor

- 2 axis horizontal mounting
- Programmable device
- Interface: CANopen Safety

### General specifications 12084/12081, v20190501

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range</td>
<td>± 90°</td>
</tr>
<tr>
<td>Measuring range</td>
<td>Yes (CANout 0 = 0°), range: ±5°</td>
</tr>
<tr>
<td>Frequency response (-3dB)</td>
<td>0 - 20 Hz</td>
</tr>
<tr>
<td>Typ. Accuracy @20°C (2o)</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.)</td>
</tr>
<tr>
<td>Sensitivity error</td>
<td>not applicable</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.05°</td>
</tr>
<tr>
<td>Temperature coefficient</td>
<td>± 0.01°/K typ.</td>
</tr>
</tbody>
</table>

### Housing

- Reinforced plastic injection molded (Faradex DS, black, EMI shielded by stainless steel fiber in PC)
- Dimensions (indicative): 60x50x27 mm
- Mounting: 4x M5x25 mm zinc plated pozidrive screws included (optional: 2x Ø4mm positioning pins)
- Ingress Protection (IEC 60529): IP67
- Weight: approx. 110 gram
- Supply voltage: 8 - 60 V dc SELV
- Polarity protection: Yes
- Current consumption: ≤ 25 mA
- Operating temperature: -40 .. +85 °C
- Storage temperature: -40 .. +85 °C
- Measuring range: ± 90°
- Centering function: Yes (CANout 0 = 0°), range: ±5°
- Centering function: 0 - 20 Hz
- Frequency response (-3dB): overall 0.15° typ.
- Offset error: < ± 0.05° typ. (< ± 0.1° max.) after centering
- Non linearity: < ± 0.1° typ. (< ± 0.2° max.)
- Sensitivity error: not applicable
- Resolution: 0.05°
- Temperature coefficient: ± 0.01°/K typ.
- Max mechanical shock: 10,000 g

### CAN interface (hardware)

- CANopen application layer and communication profile: CANopen device profile for inclinometers: CiA 410 version 2.0.0
- Baud rate: 125 kbit/s (default, range 10/20/50/100/125/250/500/800/1000 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)
- Integer: -9000 to +9000 (SRDO:X=byte 2,1; Y=byte 4,3)
- TPDO1 event time: Ffh + 2x node ID (for Node ID=01h: SRDO1 COB-ID1=101h)
- TPDO2 event time: 100h + 2x node ID (for Node ID=01h: SRDO1 COB-ID2=102h)
- Sync mode (TPDO's), Heartbeat: 80ms in CAN object dictionary, worst case 100ms
- Output filter: 20ms
- Output filter disabled: Emergency message 080h+Node-ID followed by NMT stop state (no CAN communication)
- Boot time: < 1 s

### Programming options

- by CANopen object dictionary (CAN parameters, filtering)
**QG series**

**QG65N-KDXYh-090-CANS-C(F)M-2d**

**Transfer characteristic**

| CANoutput | 100°α |

**Clipping outside measuring range**

**Measurement orientation**

**Default 0°: horizontal (label upwards), no acceleration applied.**

To eliminate mounting offsets the sensor can be centered within ±5° tilt (by the CAN object dictionary).

Cross tilt sensitivity error: $< (0,12 \times \text{cross tilt angle})^2 \% \text{typ.}$

→ one axis <10° tilt for max. accuracy

→ only one axis may exceed 45° tilt

**Connectivity (length ±10%)**

Connection

**Wire / pin coding**

Pin 1: Shield
Pin 2: Vcc
Pin 3: Gnd & CAN_GND
Pin 4: CAN_H
Pin 5: CAN_L

**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.dissensors.com/downloads](http://www.dissensors.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/C015/16
- hardware architecture: HFT=0 (according IEC 62061, CAT.2 (according to EN ISO 13849)
- Standard (-40°C to +45°C); MTTFd: 447 year, DC: 93%, CCF: 70 pt, SFF: 98%, PFHd: 1E-5
- High Temp. ( up to +85°C); MTTFd: 73 year, DC: 93%, CCF: 70 pt, SFF: 98%, PFHd: 91E-09
- 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 Response 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 fulfil your requirements.

Ordering codes:
M12 Male: QG65N-KDXYh-090-CANS-CM-2d, 12084
M12 Male & Female: QG65N-KDXYh-090-CANS-CFM-2d, 12081