### Safety inclination sensor

**2 axis horizontal mounting**

**Programmable device**

**Interface:** CANopen Safety

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

**Measuring range ± 30°**

### General specifications v20190501

<table>
<thead>
<tr>
<th>Property</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stainless steel (AISI 316)</td>
<td>70x60x33 mm</td>
</tr>
<tr>
<td>Included: 4x M4x30 mm stainless steel A4</td>
<td>Hexagon socket head screws</td>
</tr>
<tr>
<td>IP67 (IP68 with optional cable gland)</td>
<td></td>
</tr>
<tr>
<td>0 - 100%</td>
<td></td>
</tr>
<tr>
<td>approx. 700 gram</td>
<td></td>
</tr>
<tr>
<td>8 - 60 V dc SELV</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>≤ 25 mA</td>
<td></td>
</tr>
<tr>
<td>-40 .. +85 °C</td>
<td></td>
</tr>
<tr>
<td>-40 .. +85 °C</td>
<td></td>
</tr>
<tr>
<td>± 30°</td>
<td></td>
</tr>
<tr>
<td>Yes (CANOut 0 = 0°), range: ±5°</td>
<td></td>
</tr>
<tr>
<td>0 - 20 Hz</td>
<td></td>
</tr>
<tr>
<td>overall 0,15° typ.</td>
<td></td>
</tr>
<tr>
<td>&lt; ± 0,05° typ.</td>
<td>(≤ ± 0,1° max.) after centering</td>
</tr>
<tr>
<td>&lt; ± 0,1° typ.</td>
<td>(≤ ± 0,2° max.)</td>
</tr>
<tr>
<td>not applicable</td>
<td></td>
</tr>
<tr>
<td>0,05°</td>
<td></td>
</tr>
<tr>
<td>± 0,01°/K typ.</td>
<td></td>
</tr>
<tr>
<td>10.000 g</td>
<td></td>
</tr>
</tbody>
</table>

### Housing

- **Dimensions (indicative)**: 70x60x33 mm
- **Mounting**: Included: 4x M4x30 mm stainless steel (A4) Hexagon socket head screws
- **Ingress Protection (IEC 60529)**: IP67 (IP68 with optional cable gland)
- **Relative humidity**: 0 - 100%
- **Weight**: approx. 700 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**: ± 30°
- **Centering function**: Yes (CANOut 0 = 0°), range: ±5°
- **Frequency response (-3dB)**: 0 - 20 Hz
- **Typ. Accuracy @20°C (2σ)**: 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 Safety protocol: EN 50325-5, CANopen protocol: EN 50325-4 (CiA 301 v4.0 & and 4.2.0)**
- **CANopen device profile for inclinometers: CiA 410 version 2.0.0**
- **Baud rate**: 125 kbit/s (default, range 10/20/50/100/125/250/500/800/1000 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)
- **Output format**: off (default, range on/off)
- **Integer**: -3000 to +3000 (SRDO:X=byte 2,1; Y=byte 4,3)
- **FFh + 2x node ID (for Node ID=01h: SRDO1 COB-ID1=101h)**
- **100h + 2x node ID (for Node ID=01h: SRDO1 COB-ID2=102h)**
- **80ms in CAN object dictionary, worst case 100ms**
- **20ms**
- **Output filter disabled**
- **Emergency message**: 080h+Node-ID followed by NMT stop state (no CAN communication)
- **< 1 s**

### Boot time

- **Boot time**: < 1 s

### Programming options

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

**QG76N-SDXYh-030-CANS-C(F)M-2d**

**Transfer characteristic**

![Transfer characteristic graph]

**Measurement orientation**

![Measurement orientation diagram]

**Connectivity (length ±10%)**

Male only or Male & Female (internal T-junction) M12 connector (5 pins, A-coding) (CiA 303 V1.8.0) (stainless steel 1.4404 (316L), 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)**

![Mechanical dimensions diagram]

**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/C015/16
- 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: QG76N-SDXYh-030-CANS-CM-2d
- M12 Male & Female: QG76N-SDXYh-030-CANS-CFM-2d