

QG series



SIL2 / PLd Certified sensor

QG76N-SDXYh-090-CANS-C(F)M-UL-2d

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

$\pm 90^\circ$



General specifications 12980A/12935A, v20241216

Stainless steel (AISI 316)

70x60x33 mm

Not Included: 4x M4x30 mm stainless steel (A4) Hexagon socket head screws

IP67, IP69K (with IP69K mating connector), (IP68 with optional cable gland)

0 - 95% (non condensing, housing fully potted)

approx. 700 gram

8 - 32 V dc SELV

Yes

≤ 25 mA For CFM models (daisy-chained CANbus): max. current internal T-junction: 2.5A

$-40 \dots +80^\circ\text{C}$

$-40 \dots +85^\circ\text{C}$

$\pm 90^\circ$

Yes (CANout 0 = 0°), range: $\pm 5^\circ$

0 - 10 Hz

0,15° typ.

$\pm 0,05^\circ$ typ. ($\pm 0,1^\circ$ 2 σ) after centering

$\pm 0,1^\circ$ typ., $\pm 0,15^\circ$ 2 σ , $\pm 0,2^\circ$ max.

not applicable. Repeatability 0,1°

0.05°

$\pm 0,02^\circ/\text{K}$ typ.

10.000g

According to ISO 11898-1 & ISO 11898-2 (CAN 2.0 A/B), Short circuit protected

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

125 kbit/s (default, range 10/20/50/100/125/250/500/800/1000 kbit/s)

01h (default, range: 01h - 7Fh)

50 ms (default, range 10-5000 ms)

off (default, range on/off)

off (default, range on/off)

Integer: -9000 to +9000 (SRDO:X=byte 2,1; Y=byte 4,3) (byte 5,6,7,8: integer 0)

101h (default, range: FFh + 2x Node ID -> 101h-17Fh)

102h (default, range: 100h + 2x Node ID -> 102h-180h)

80ms(default, worst case 100ms)

20ms

Output filter disabled

Emergency message 080h+Node-ID followed by NMT stop state (no CAN communication)

< 1 s

by CANopen object dictionary (CAN parameters, filtering)

Housing

Dimensions (indicative)

Mounting

Ingress Protection (IEC 60529)

Relative humidity

Weight

Supply voltage

Polarity protection

Current consumption

Operating temperature

Storage temperature

Measuring range

Centering function

Frequency response (-3dB)

Accuracy (overall @20°C)

Offset error

Non linearity

Sensitivity error

Resolution

Temperature coefficient

Max mechanical shock

CAN interface (physical layer)

CANopen application layer and communication profile

Baud rate

Node ID

Event timer for TPDO1

Sync mode (TPDO's)

Heartbeat

Output format

SRDO1 COB-ID1

SRDO1 COB-ID2

Safeguard cycle time (SCT)

Safety related validation time (SRVT)

Filtering

Reaction on error

Boot time

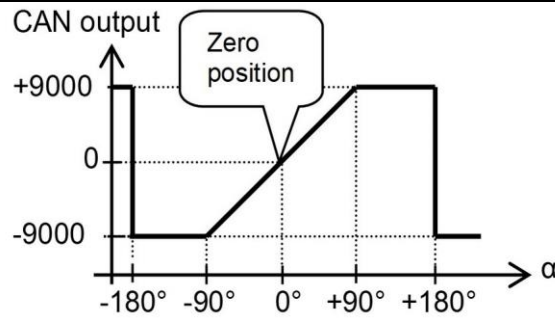
Programming options

QG76N-SDXYh-090-CANS-C(F)M-UL-2d

CANoutput = $100 \cdot \alpha$

Clipping outside measuring range

Transfer characteristic



Default 0°: horizontal (label upwards), no acceleration applied. To eliminate mounting offsets the sensor can be centered within $\pm 5^\circ$ tilt (by the CAN object dictionary)

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

→ one axis $< 10^\circ$ tilt for max. accuracy
 → only one axis may exceed 45° tilt

Measurement orientation

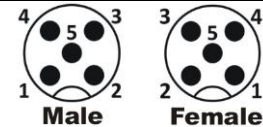


Connectivity (cable length $\pm 10\%$)

Male only or Male & Female (internal T-junction) M12 connector (5 pins, A-coding)
 (CiA303 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)

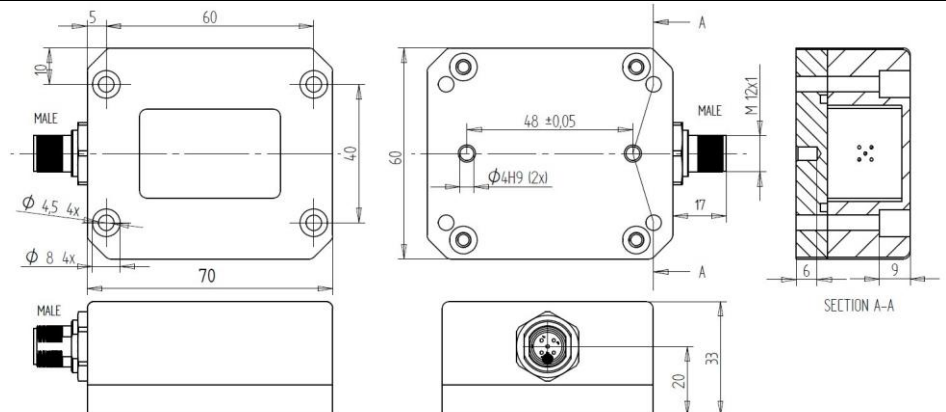
Pin 1: Shield
 Pin 2: Vcc
 Pin 3: Gnd & CAN_GND
 Pin 4: CAN_H
 Pin 5: CAN_L



Connection

Wire / pin coding

Mechanical dimensions (indicative only)



CAN-manual, EDS-file, UL, 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 testing and Certification GmbH Certificate no. 4821024.21001
- Hardware architecture: HFT=1 (according IEC 62061, CAT.3 (according to EN ISO 13849)
- Standard (-40°C to +45°C): MTTFd: 447 year, DC: 93%, CCF: 70 pt, SFF: 98%, PFHd: 14E-09
- 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 Respons Time (SRFRT): 100ms + Redundancy Compare Time (default 2000ms)

QG series sensors are intended to measure inclination/acceleration/tilt. Flawless function (acc. spec.) is ensured only when used within specifications. Modifications or non-approved use will result in loss of warranty and void any claims against the manufacturer.

UL & c-UL listed product (File number E312057, UL508 standards UL60947-5-2 & CSA-C22,2 No. 14)
 Product Identity / Category Code Number (CCN): Industrial Control Equipment / NRKH & NRKH7
 Enclosure rating: type 1, Ambient temperature: max 80 °C (see also datasheet, lowest value applies)
 Electrical ratings: Intended to be used with a Class 2 power source in accordance with UL1310,
 max. input Voltage 32V dc (see also datasheet, lowest value applies), max. current 200mA
 Accessory Cable Assembly: Any UL-listed (CYJV/7) mating connector with mechanical locking, wire
 thickness of at least 30 AWG (0,05 mm²), recommended ≤23 AWG (≥0,25 mm²)

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: QG76N-SDXYh-090-CANS-CM-UL-2d, [12980]

M12 Male & Female: QG76N-SDXYh-090-CANS-CFM-UL-2d [12935]