

SIL2 / PLd Certified sensor

QG65N-KDXYh-030-CANS-C(F)M-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
 $\pm 30^\circ$



CANopen
safety easy to use



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 (typ. and/or 2σ)
Offset error
Non linearity
Sensitivity error
Resolution
Temperature coefficient
Max mechanical shock
CAN interface (hardware)
CANopen application layer and communication profile
Baud rate
Node Id
TPDO1 event time
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

General specifications 12080/12083, v20180117	
Reinforced plastic injection molded (Faradex DS, black, EMI shielded by stainless steel fiber in PC)	
60x50x27 mm	
4x M5x25 mm zinc plated pozidrive screws included (optional: 2x Ø4mm positioning pins)	
IP67	
0 - 100%	
approx. 110 gram	
8 - 60 V dc SELV	
Yes	
≤ 75 mA	
-40 .. +85 °C	
-40 .. +85 °C	
± 30°	
Yes (CANout 0 = 0°), range: ±5°	
0 - 20 Hz	
overall 0,07° typ.	
< ± 0,05° typ. after centering	
< ± 0,05° typ. (< ± 0,1° max.)	
not applicable	
0,01°	
± 0,01°/K typ.	
10.000 g	
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	
125 kbit/s (default, range 10/20/50/100/125/250/500/800/1000 kbit/s)	
01h (default, range: 01h - 3Fh) (01h - 7Fh with adapted COB-ID's)	
50 ms (default, range 10-500 ms)	
off (default, range on/off)	
Integer: -3000 to +3000 (SRDO:X=byte 2,1; Y=byte 4,3) (byte 5,6,7,8: integer 0)	
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	
by CANopen object dictionary (CAN parameters, filtering)	

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CANoutput = $100 \cdot \alpha$

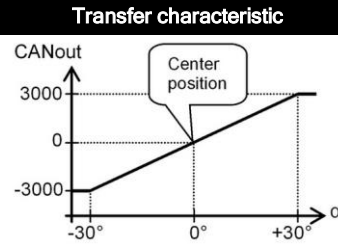
Clipping outside measuring range

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)

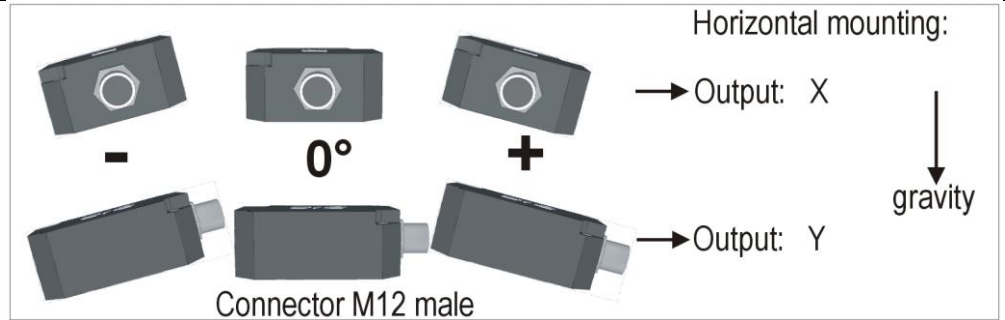
Cross tilt sensitivity error:
 $< (0,12 \cdot \text{cross tilt angle})^2 \%$ typ.

→ one axis $< 10^\circ$ tilt for max. accuracy

Transfer characteristic



Measurement orientation



Connection

Wire / pin coding

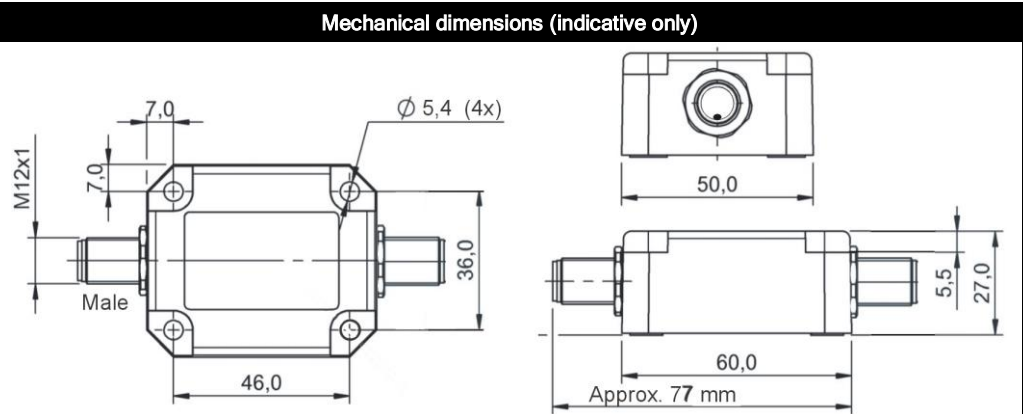
Connectivity (length $\pm 10\%$)

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)

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

Mechanical dimensions (indicative only)



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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)
- 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)

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-030-CANS-CM-2d, 12080

M12 Male & Female: QG65N-KDXYh-030-CANS-CFM-2d, 12083