QG series

SIL2 / PLd Certified sensor

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

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°

General specifications 12082/12077, v20200408	
Housing	Reinforced plastic injection molded (Faradex DS, black, EMI shielded by stainless steel fiber in PC)
Dimensions (indicative)	60x50x27 mm
Mounting	Included: 4x M5x25 mm zinc plated steel pozidrive pan head screws, self-tapping (PZ DIN7500CZ) (optional: 2x Ø4mm positioning pins replacing 2x M5x25 mm)
Ingress Protection (IEC 60529)	IP67
Relative humidity	0 - 95% (non condensing, housing fully potted)
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	360°
Centering function	Yes (CANout 0 = 0°), range: 360°
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 (physical layer)	According to ISO 11898-1 & ISO 11898-2 (also known as CAN 2.0 A/B)
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 - 7Fh)
TPDO1 event time	50 ms (default, range 10-5000 ms)
Sync mode (TPDO's)	off (default, range on/off)
Heartbeat	off (default, range on/off)
Output format	Integer: -17999 to 18000 (SRDO:byte2,1) (byte 3,4,5,6,7,8: integer 0)
SRDO1 COB-ID1	101h (default, range: FFh + 2x node ID -> 101h-17Fh)
SRDO1 COB-ID2	102h (default, range:100h + 2x node ID -> 102h-180h)
Safeguard cycle time (SCT)	80ms(default, worst case 100ms)
Safety related validation time (SRVT)	20ms
Filtering	Output filter disabled
Reaction on error	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)

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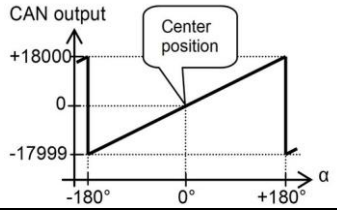
CANoutput = 100*α

Transfer characteristic

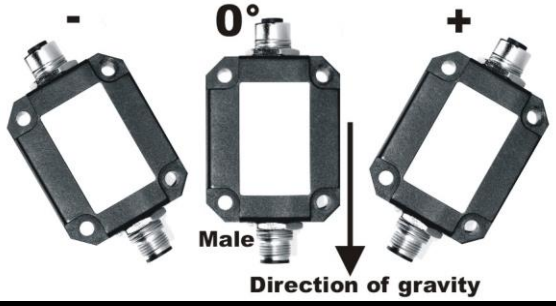


Rotation in vertical plane.

Lateral tilt sensitivity error:
< ± 0,03°/° lateral tilt (typ.)
Max. lateral tilt: 45°

Drawn in the default 0° position.

Measurement orientation



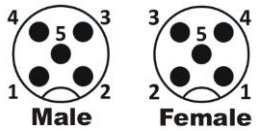
Connectivity (length ±10%)

Connection

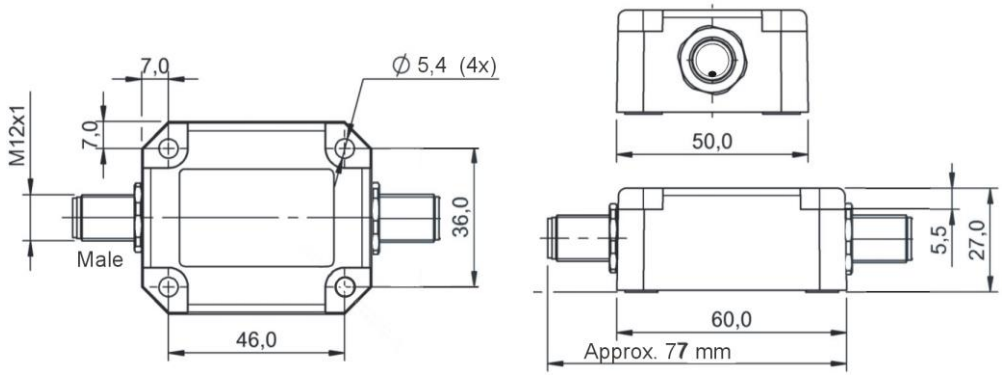
Male only or Male & Female (internal T-junction) M12 connector (5 pins, A-coding)
(CiA303 V1.8.0) (Brass Nickel coated, contacts copper alloy)
No bus termination inside. A CANbus always has to be terminated properly. For bus termination order seperate M12 termination resistor (optional: T-connector)

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 (Dtype), 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-KIXv-360-CANS-CM-2d, 12082
M12 Male & Female: QG65N-KIXv-360-CANS-CFM-2d, 12077