# QG series

## QG65N2 CANopen High accuracy series

QG65N2-KDXYh-030H-CAN-C(F)M-UL

## Inclination sensor

2 axis horizontal mounting

Programmable device
Interface: CANopen

Parameters programmable
by DIS configurator and
CANopen object dictionary

Measuring range
± 30°



| | General specifications 12862, 12865, v20221011 |
|---|---|
| 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)<br>Mounting on flat surface only. Screw crosswise with maximum Torque 2.5 Nm |
| Ingress Protection (IEC 60529) | IP67, IP69K (with IP69K mating connector) |
| Relative humidity | 0 - 95% (non condensing, housing fully potted) |
| Weight | approx. 110 gram |
| Supply voltage | 10 - 32 V dc |
| Polarity protection | Yes |
| Current consumption | 50mA typ. For CFM models (daisy-chained CANbus): max. current internal T-junction: 2.5A |
| Operating temperature | -40 .. +80 °C |
| Storage temperature | -40 .. +85 °C |
| Measuring range | ± 30° |
| Centering function | Yes (CANout 0 = 0°), range: ±5° |
| Frequency response (-3dB) | 0 - 10 Hz |
| Accuracy (overall @20°C) | 0,07° typ. |
| Offset error | ± 0,01° typ. (± 0,02° 2σ) after centering |
| Non linearity | ± 0,06° typ., ± 0,1° 2σ, ± 0,15° max. |
| Sensitivity error | not applicable. Repeatability 0,05° |
| Resolution | 0,01° |
| Temperature coefficient | ± 0.003°/K typ., ± 0.005°/K (2σ) |
| Max mechanical shock | 10,000g (max 0,2ms) |
| CAN interface (physical layer) | According to ISO 11898-1 & ISO 11898-2 (CAN 2.0 A/B), Short circuit protected |
| CANopen application layer and communication profile | CANopen, CiA301 V4.2.0 & EN 50325-4 + Device Profile CiA410 DSP 2.0.0 for inclinometers |
| Baud rate<br>Node Id<br>TPDO<br>Event time<br>Sync mode<br>Heartbeat<br>Programming options<br>Output format<br>Filtering<br>Modes of operation<br>Internal CANbus termination | 250 kbit/s (default, range 10/20/50/100/125/250/500/800/1000 kbit/s<br>01h (range: 01h - 7Fh)<br>For Node ID=01h: TPDO1: 181h, TPDO2: 281h<br>TPDO1: 10 - 500 ms (default: 100 ms)<br>On/off (default: off)<br>On/off (default: on, 2s)<br>Baudrate, Node Id, Event time, Sync mode, Heartbeat, Output format, CANbus termination, filtering<br>Integer: -3000 to +3000 (PDO1:X=byte 2,1;Y=byte 4,3)<br>Bessel LPF 10Hz on, TPDO averaging off, Output filter off<br>Event mode, Sync-mode. Default: auto-startup Event mode<br>120 Ohm on/off (default: off) |
| Boot time | < 0.5 s |
| Programming options | by optional DIS Configurator and CANopen object dictionary (CAN parameters, filtering) |



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# QG series

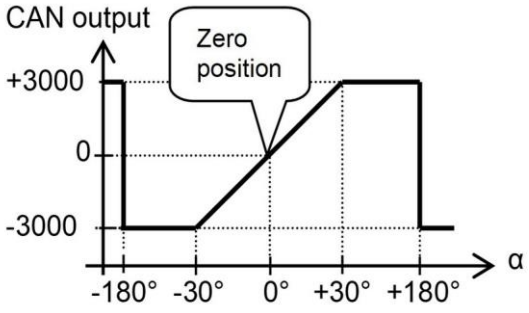
## QG65N2-KDXYh-030H-CAN-C(F)M-UL

CANoutput = 100*α

Clipping outside measuring range

Zeroing can be done to eliminate mounting offsets.

### Transfer characteristic

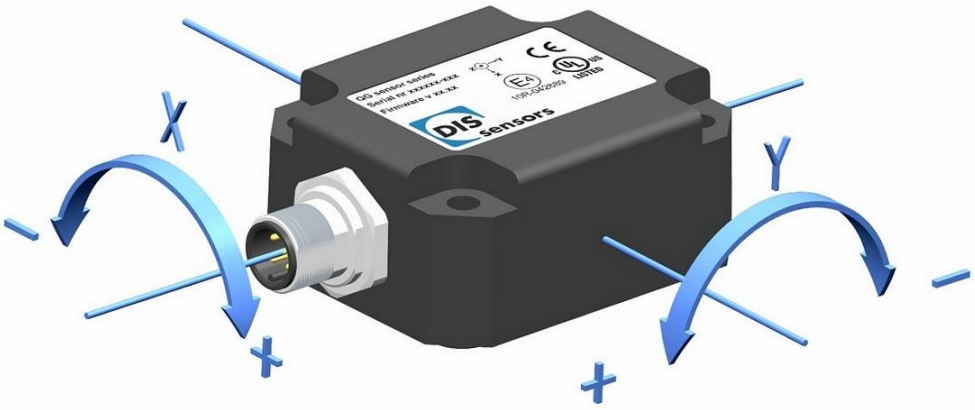



Default 0°: horizontal (label upwards), no acceleration applied. To eliminate mounting offsets the sensor can be zero-ed within ±5° tilt (by the CAN object dictionary)

Cross tilt sensitivity error:
< (0,12 * cross tilt angle)² % typ.

→ one axis <10° tilt for max. accuracy

### Measurement orientation




### Connectivity (cable length ±10%)

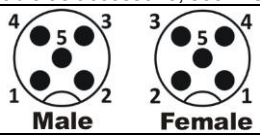
Male only or Male & Female (internal T-junction) M12 connector (5 pins, A-coding)
( CiA303 V1.8.0 ) (Brass Nickel coated, contacts copper alloy)

A CANbus always has to be terminated properly according to customers bus topology and general CAN rules.
The sensor has an on-board internal 120 Ohm CANbus termination resistor that can be switched on by the CANopen dictionary (default: off).
Alternatively an external M12 termination resistor can be connected when using a Male & Female (internal T-junction) model.
External M12 termination resistors and T-connectors are available as accessoire, see DIS website.

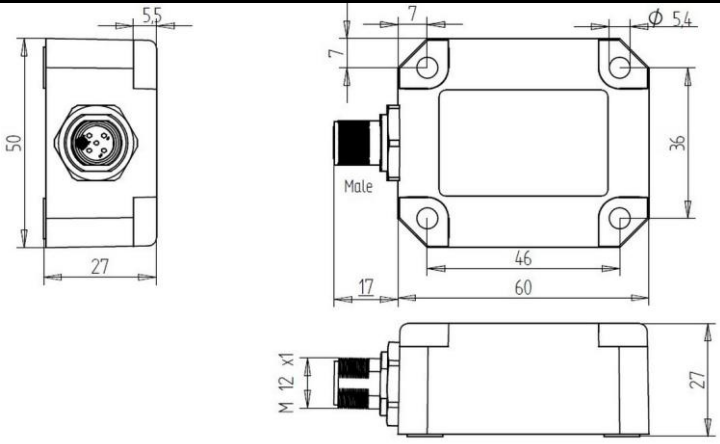
Connection

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)






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## E4ready, UL, CAN-manual, EDS-file, Ordering codes

Before using this device, please read this datasheet, the Manual and the Declaration of Conformity carefully (download from dis-sensors.com)

This product is E4ready and meets Automotive EMC requirements

Connect this sensor only to an approved CAN controller which must have a grounded shield. Alternativelly, connect the sensor housing to a grounded shield. All mentioned EMC standards that are met (see Declaration of Conformity) have been done with the housing connected to a grounded shield.

QG series sensors are intended to measure inclination/acceleration/tilt. Flawless function (acc. spec.) is ensured only when used within specifications. This device is not a safety component acc. to EU Machine Directive (ISO13849). For full redundancy two devices can be used. 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)

Optional: for accurate mounting two factory mounted positioning pins can be mounted (Ø4mm) replacing 2x M5x25 mm.

As this device is accelerometer-based the sensor is inherent sensitive for accelerations/vibrations.

A CAN-manual can be downloaded from www-dis-sensors.com (type I)
EDS-file ( CiA306 V1.3.0) can be downloaded from www.dis-sensors.com (type I)

Ordering codes:
M12 Male: QG65N2-KDXYh-030H-CAN-CM-UL, 12862
M12 Male & Female: QG65N2-KDXYh-030H-CAN-CFM-UL, 12865



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