QG series

QG76N2 CANopen Standard accuracy series

QG76N2-SIXv-360-CAN-C(F)M-UL

Inclination sensor

1 axis vertical mounting

Programmable device
Interface: CANopen

Parameters programmable
by DIS configurator and
CANopen object dictionary

Measuring range
±180°

General specifications 12807, 12809, v20210720	
Housing	Stainless steel (AISI 316)
Dimensions (indicative)	70x60x33 mm
Mounting	Included: 4x M4x30 mm stainless steel (A4) Hexagon socket head screws
Ingress Protection (IEC 60529)	IP67, IP69K (with IP69K mating connector), (IP68 with optional cable gland)
Relative humidity	0 - 95% (non condensing, housing fully potted)
Weight	approx. 700 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	±180°
Centering function	Yes (CANout 0 = 0°), range: 360°
Frequency response (-3dB)	0 - 10 Hz
Accuracy (overall @20°C)	0,15° typ.
Offset error	± 0,05° typ. (± 0,1° 2σ) after centering
Non linearity	± 0,1° typ., ± 0,15° 2σ, ± 0,2° max.
Sensitivity error	not applicable. Repeatability 0,1°
Resolution	0,01°
Temperature coefficient	T>0°C: 0.015°/K typ. en T<0°C: 0.03°/K typ.
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	250 kbit/s (default, range 10/20/50/100/125/250/500/800/1000 kbit/s
Node Id	01h (range: 01h - 7Fh)
TPDO	For Node ID=01h: TPDO1: 181h, TPDO2: 281h
Event time	TPDO1: 10 - 500 ms (default: 100 ms)
Sync mode	On/off (default: off)
Heartbeat	On/off (default: on, 2s)
Programming options	Baudrate, Node Id, Event time, Sync mode, Heartbeat, Output format, CANbus termination, filtering
Output format	Integer: -17999 to +18000 (PDO1:byte 2,1)
Filtering	Bessel LPF 10Hz on, TPDO averaging off, Output filter off
Modes of operation	Event mode, Sync-mode. Default: auto-startup Event mode
Internal CANbus termination	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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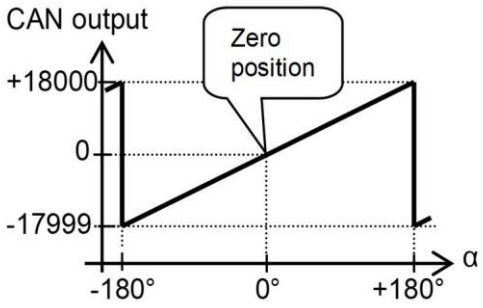
CANoutput = 100*α

Zeroing can be done to eliminate mounting offsets.

Transfer characteristic



Rotation in vertical plane.

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

Drawn in the default 0° sensor orientation position
Zeroing can be done to change the sensor orientation at 0° point

Measurement orientation

Connectivity (cable length ±10%)

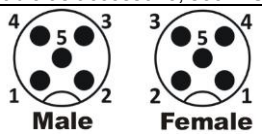
Connection

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)

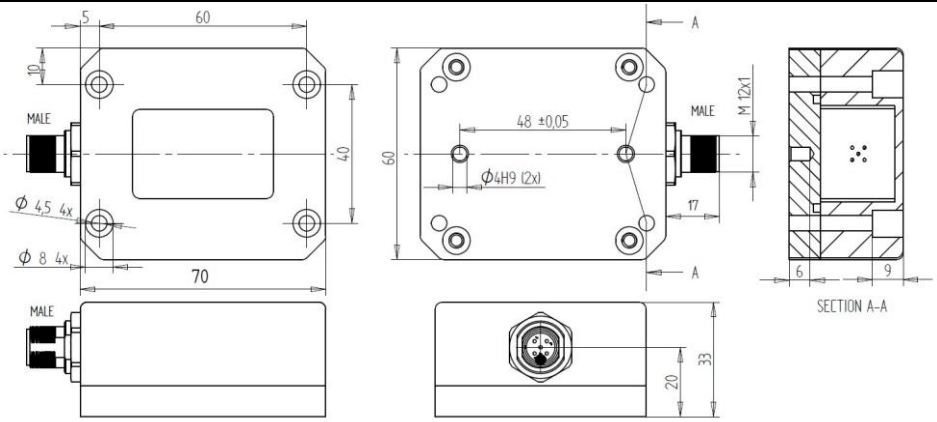
A CANbus always has to be terminated properly according to customers bus topology and general CAN rules.
The sensor has an on-board internal 120 Ohm CANbus termination resistor that can be switched on by the CANopen dictionary (default: off).
Alternatively an external M12 termination resistor can be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

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)



E4, 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 approved for automotive use, approval number: E4-10R-05-4662

Connect this sensor only to an approved CAN controller which must have a grounded shield. Alternatively, 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)

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.dos-sensors.com (Type I)

Ordering codes:
M12 Male: QG76N2-SIXv-360-CAN-CM-UL, 12807
M12 Male & Female: QG76N2-SIXv-360-CAN-CFM-UL, 12808