

QG series



QG76D CAN High accuracy series

QG76D-SIXv-360H-CAN-C(F)M-UL

Dynamic Inclination sensor

1 axis vertical mounting

Programmable device

Interface: CANopen

Parameters programmable
by DIS configurator and
CANopen object dictionary

Measuring range
 $\pm 180^\circ$



CANopen



General specifications 12801, 12802, v20230412

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

10 - 32 V dc

Yes

50mA typ. For CFM models (daisy-chained CANbus): max. current internal T-junction: 2.5A

-40 .. +80 °C

-40 .. +85 °C

$\pm 180^\circ$

Yes (CANout 0 = 0°), range: 360°

0 - 100 Hz, Max angle rate 500°/s

0,07° typ. (static), 0,5° typ. (dynamic)

$\pm 0,01^\circ$ typ. ($\pm 0,02^\circ$ 2 σ) after centering

Static: $\pm 0.06^\circ$ typ., $\pm 0,1^\circ$ 2 σ , $\pm 0.15^\circ$ max, Dynamic: $\pm 0,5^\circ$ typ. (*) (**)

not applicable. Repeatability 0,05°

0,01°

$\pm 0.003^\circ/\text{K}$ typ., $\pm 0.005^\circ/\text{K}$ (2 σ)

10,000g (max 0,2ms)

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

CANopen, CiA301 V4.2.0 & EN 50325-4 + Device Profile CiA410 DSP 2.0.0 for inclinometers

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

01h (range: 01h - 7Fh)

For Node ID=01h: TPDO1: 181h, TPDO2: 281h

TPDO1: 10 - 500 ms (default: 100 ms)

On/off (default: off)

On/off (default: on, 2s)

Baudrate, Node Id, Event time, Sync mode, Heartbeat, Output format, CANbus termination, filtering

Integer: -17999 to +18000 (PDO1:byte 2,1)

0/1/2/3 (factory default: profile 1)

Event mode, Sync-mode. Default: auto-startup Event mode

120 Ohm on/off (default: off)

< 0.5 s

by Optional DIS Configurator set CAN
and CANopen object dictionary (CAN parameters, application profiles, 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

TPDO

Event time

Sync mode

Heartbeat

Programming options

Output format

Application profiles

Modes of operation

Internal CANbus termination

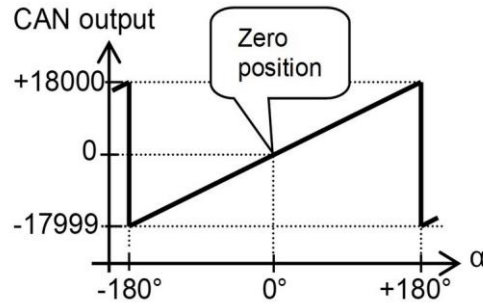
Boot time

Programming options

QG76D-SIXv-360H-CAN-C(F)M-UL

CANoutput = $100 \cdot \alpha$

Transfer characteristic

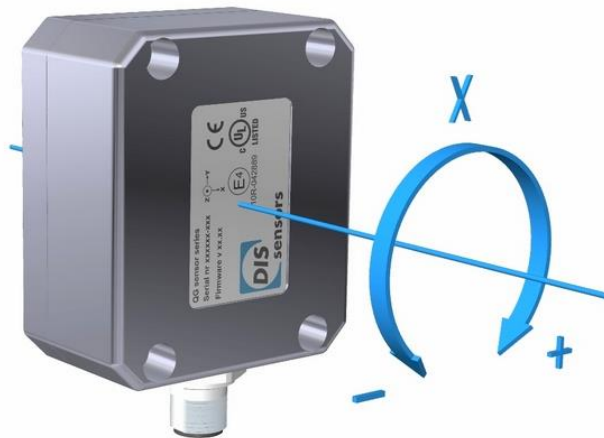


Rotation in vertical plane.

Lateral tilt sensitivity error:
 $< \pm 0,03^\circ/\text{lateral tilt (typ.)}$
 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 $\pm 10\%$)

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)

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).

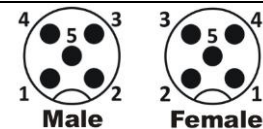
Alternatively an external M12 termination resistor can be connected when using a Male & Female (internal T-junction) model.

External M12 termination resistors and T-connectors are available as accessory, see DIS website.

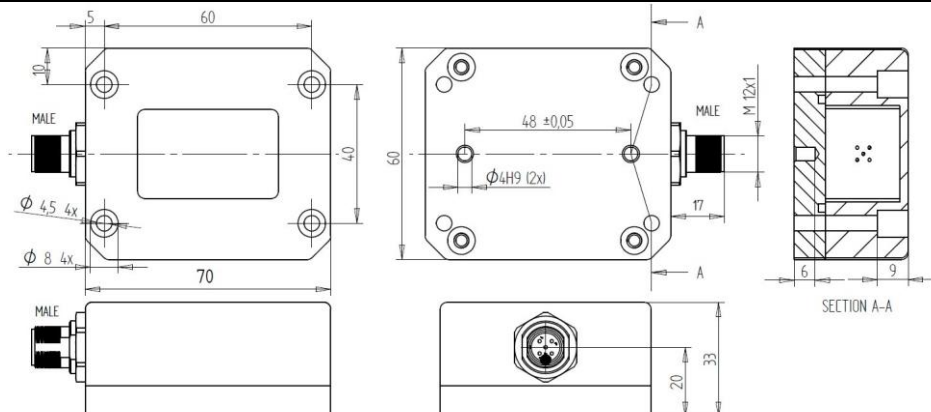
Connection

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)



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

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)

(*) Accuracy within spec : approx.. 30sec after boot-up.

(**) Dynamic accuracy figures based on Robot tests, robot performing actions representative for general mobile machine movements

As this device is accelerometer-based the sensor is inherent sensitive for accelerations/vibrations. The majority of these dynamic effects will be eliminated by the on-board gyroscope. The on-board gyroscope and Kalman filtering are special designed to prevent the inclinometer to become significant inaccurate in dynamic situations. The sensor has pre-programmed Kalman algorithms ('Application profiles') that can be selected via the CANbus
 Application specific testing must be carried out to check which compensation algorithm fits the application best, and whether this sensor will fulfil customers requirements.

A CAN-manual and EDS-file (CiA306 V1.3.0) can be downloaded from the website (Type H)

Ordering codes:

M12 Male: QG76D-SIXv-360H-CAN-CM-UL, 12801

M12 Male & Female: QG76D-SIXv-360H-CAN-CFM-UL, 12802