

QG series

Discontinued: QG76 analog H-series. Successor: QG76N2 High accuracy series

QG76-SD-090H-AV-CM-UL

Inclination sensor

2 axis horizontal mounting

Factory programmable device

Output: 0,5 - 4,5 V

Measuring range programmable
between $\pm 1^\circ$ and $\pm 90^\circ$

Measuring range
Factory defaults: $\pm 90^\circ$



General specifications v20241104

Housing	Stainless steel (AISI 316)
Dimensions (indicative)	70x60x33 mm
Mounting	Not 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	8 - 30 V dc
Polarity protection	Yes
Current consumption	≤ 25 mA
Operating temperature	$-40 \dots +80^\circ\text{C}$
Storage temperature	$-40 \dots +85^\circ\text{C}$
Measuring range	Factory defaults: $\pm 90^\circ$
Centering function	Yes (2,5 V = 0°), range: $\pm 5^\circ$
Frequency response (-3dB)	0 - 10 Hz
Accuracy (overall @20°C)	0,09° typ. ($-60^\circ \dots +60^\circ$)
Offset error	$\pm 0,03^\circ$ typ. ($\pm 0,08^\circ$ 2 σ) after centering
Non linearity	$\pm 0,07^\circ$ typ., $\pm 0,1^\circ$ 2 σ $\pm 0,15^\circ$ max. ($-60^\circ \dots +60^\circ$)
Sensitivity error	not applicable. Repeatability 0,05°
Resolution	0,01°
Temperature coefficient	$\pm 0,005^\circ/\text{K}$ typ.
Max mechanical shock	20.000g
Output	0,5 - 4,5 V
Output load	Rload $\geq 20\text{k}\Omega$, Cload ≤ 20 nF
Short circuit protection	Yes (max 10 s)
Output refresh rate	20 ms
Programming options	Factory programmable (measuring range, filtering)

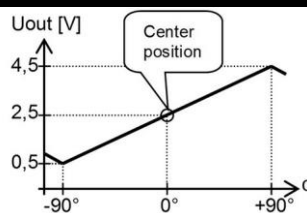
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$$U_{out} = 2,5 + 2 \cdot (\alpha/90) [V]$$

clipping outside measuring range

Transfer characteristic

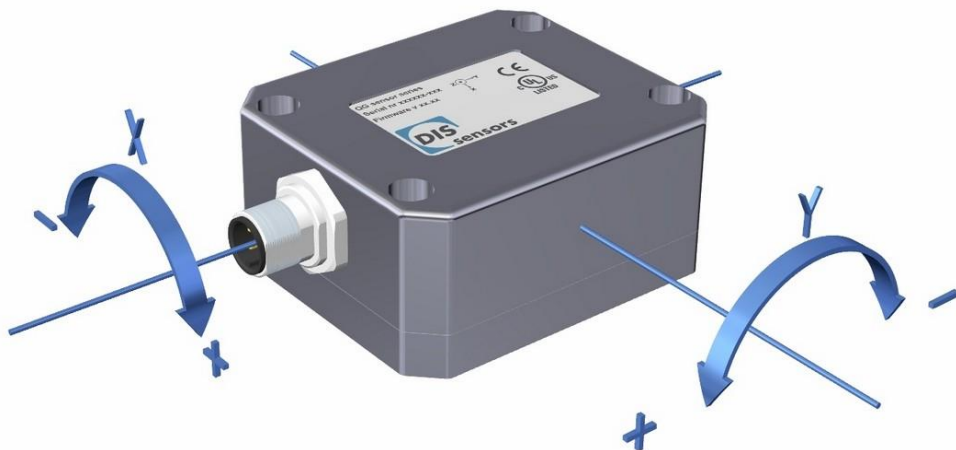


Default 0° : horizontal (top upwards), no acceleration applied.

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

- one axis $<10^\circ$ tilt for max. accuracy
- only one axis may exceed 45° tilt

Measurement orientation



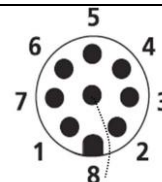
Connection

Wire / pin coding

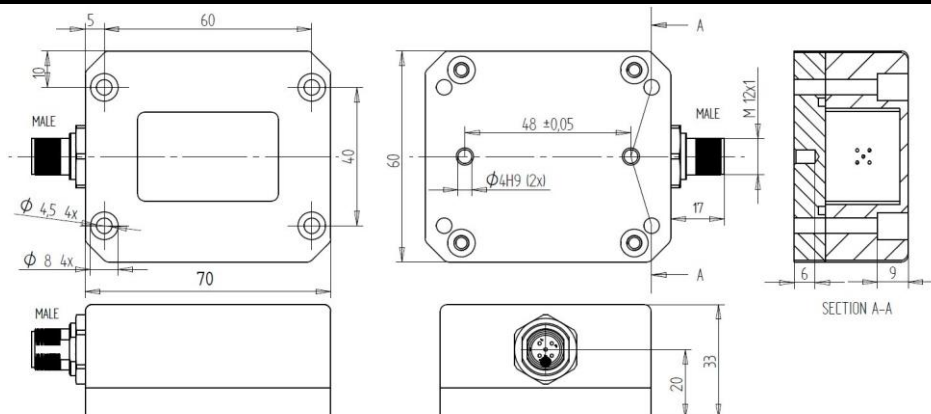
Connectivity (cable length $\pm 10\%$)

M12 male 8p connector (stainless steel 1.4404 (316L), contacts copper alloy)

- | | |
|--------|----------------------|
| Pin 1: | Output Y |
| Pin 2: | Supply voltage |
| Pin 3: | for factory use only |
| Pin 4: | for factory use only |
| Pin 5: | Gnd |
| Pin 6: | Centering input |
| Pin 7: | Output X |
| Pin 8: | Not connected |



Mechanical dimensions (indicative only)



Center function, intended use & UL

Centering can be done to eliminate mechanical offsets. To execute centering connect center input to ground (>0,5sec) within 1 min. after power up. After centering you have 1 min. left for another centering. Normally the center input should be left unconnected.

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. Application specific testing must be carried out to check whether this sensor will fulfil your requirements.