

## QG40N-series SIL CL 1 / PLc

QG40N-KAXYZO-8,0-ASP-CM-UL-1c

### Acceleration switch for SIL CL 1 (acc. to IEC 62061) PLc (acc. to EN ISO 13849) applications

3 axis omnidirectional  
free mounting

Factory programmable only  
Output: PNP

Mode:  
PEAK, 40ms measuring interval  
(optional: RMS-mode,  
factory progr. measuring interval)

Measuring range  
0.1 to 8g (factory programmable)



### General specifications 12715, v20200622

Housing	Plastic injection molded housing (Arnite T06 202 PBT black)
Dimensions (indicative)	40x40x25 mm (download 3D stepfile from <a href="http://dis-sensors.com">dis-sensors.com</a> )
Mounting	Included: 2x M3x25 mm zinc plated steel pozidrive pan head screws, self-tapping (PZ DIN 7500CZ)
Ingress Protection (IEC 60529)	IP67, IP69K (with IP69K mating connector only)
Relative humidity	0 - 95% (non condensing, housing fully potted)
Weight	approx. 45 gram
Supply voltage	5- 32V dc
Polarity protection	Yes
Current consumption	≤ 20 mA
Operating temperature	-40 .. +60 °C
Storage temperature	-40 .. +85 °C
Measuring range	0.1 to 8g (factory programmable)
Centering function	Yes (0°), range: 360° in all mounting positions
Frequency response (-3dB)	0- 1600 Hz
Typ. Accuracy @20°C (2σ)	0,1g typ.
Offset error	0g (after zeroing)
Non linearity	not applicable
Sensitivity error	not applicable
Resolution	0,01 g
Temperature coefficient	± 0,3 mg/K typ.
Max mechanical shock	10.000 g
Output	dual PNP
Output load	2x 200 mA continuously, outputs protected against back EMF
Short circuit protection	Yes
Boot up time / response time	< 1s (non conducting during boot-up) / 40ms
Programming options	Factory only (Peak/RMS mode, switch points, delay time, RMS mode measuring interval)

# QG series

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**PNP-output:**

- Switchpoints  $\pm S$
- Operation zone, conducting
- Critical zone: non-conducting
- Diagnostic error: non-conducting
- Unpowered sensor: non-conducting

**Factory defaults:**

- Mode: peak detection
- Measuring interval: 40ms fixed
- Output 1: S = 8g
- Output 2: S = 8g
- critical\_to\_operation delay : 1 s

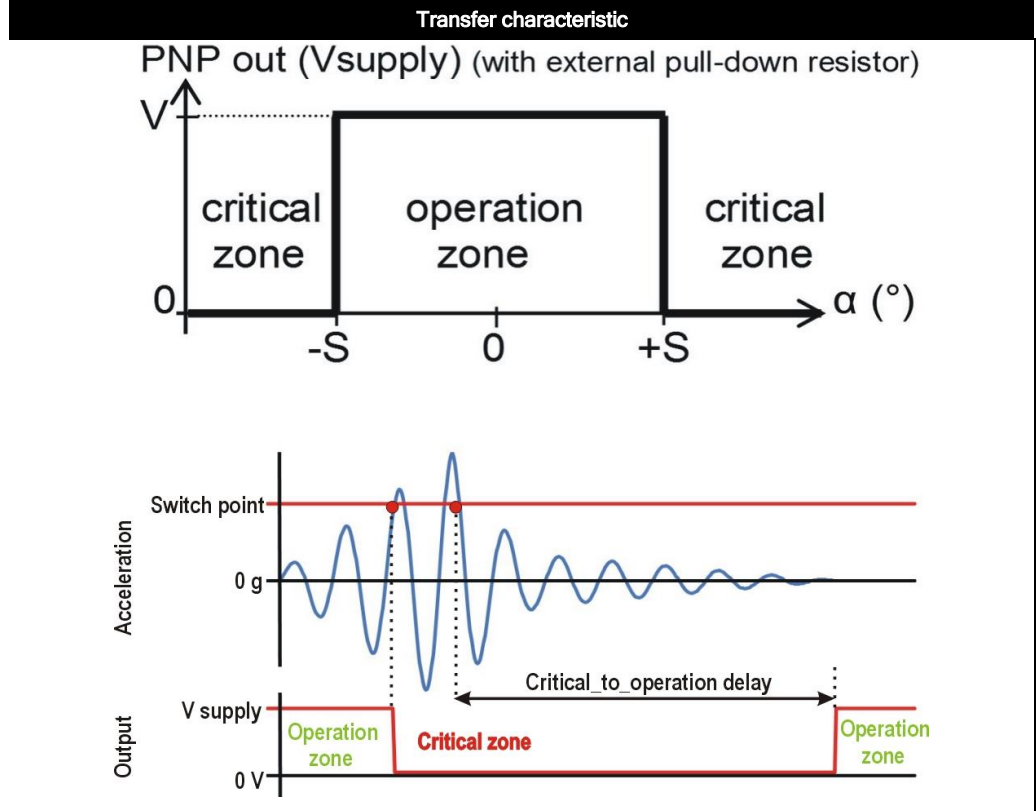
**Measuring data explained:**

**PEAK mode:**

- Sensor samples with 3200Hz
- Fixed 40ms measuring interval
- Both positive and negative accelerations are taken into account
- Each 40ms the measured peak value is checked against the switched point.

**Optional RMS mode:**

- Sensor samples with 3200Hz
- Factory programmable measuring interval ( $n \cdot 40ms$ ), max 10sec
- After each measuring interval the RMS value is checked against the switched point.

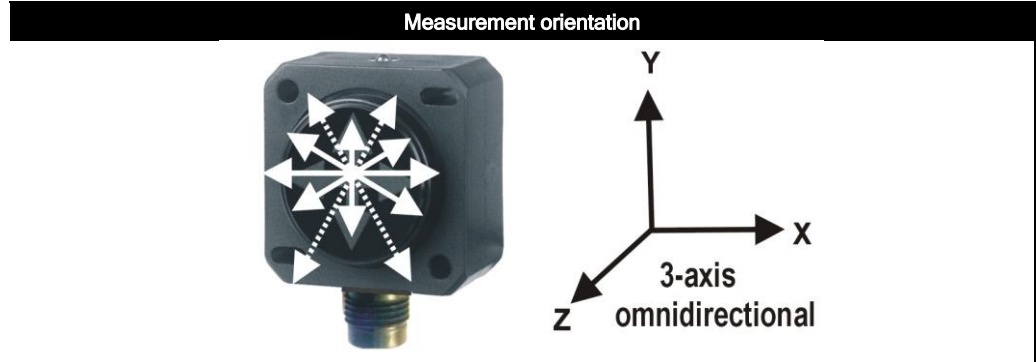


The default 0 g position is when the sensor is mounted in any position and no acceleration is applied.

1g offset is subtracted to remove earth gravity influence

Free mounting

Omnidirectional: X+Y+Z vector



Connection	
Wire / pin coding	

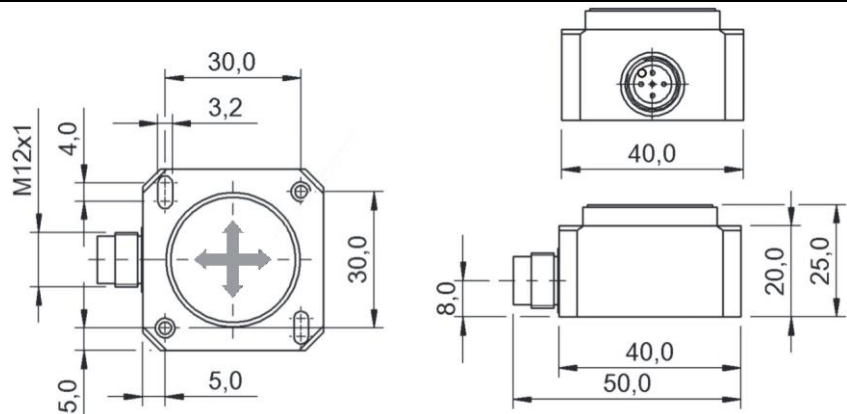
Connectivity (cable length $\pm 10\%$ )	
M12 5p male connector (Glass fibre reinforced grade, contacts CuZn pre-nickeled galv. Au)	
Pin 1:	+ Supply Voltage
Pin 2:	output 2
Pin 3:	Gnd
Pin 4:	output 1
Pin 5:	zeroing

**3 Male**

If connected with M12 F (accessory sold by DIS):

Brown:	'+ Supply Voltage
White:	output 2
Blue:	Gnd
Black:	output 1
Green/yellow:	zeroing

## Mechanical dimensions (indicative only)



## Safety Information, Intended use, UL, Remarks, Ordering

QG series sensors are intended to measure inclination, acceleration or tilt angle after installing in machines, equipment and systems. Flawless function in accordance with the specifications is ensured only when the device is used within its specifications.

Modifications or non-approved use are not permitted and will result in loss of warranty and void any claims against the manufacturer.

### Safety information:

- Read this datasheet carefully before using this device in a safety application
- Read the safety manual first (download from [dis-sensors.com](http://dis-sensors.com))
- Read the Declaration of Conformity (download from [dis-sensors.com](http://dis-sensors.com))
- Safety level: SIL CL 1 (acc. to IEC 62061) , PLc (acc. to EN ISO 13849)
- Judgement if this device can be used as safety device in customers application is the solely responsibility of the customer involved. Calculations can be based on these figures:
  - Hardware architecture: HFT=0 (according IEC 62061), CAT.2 (according to EN ISO 13849)
  - MTTFd: 415 years, DC: >60% ("low"), CCF: 65pt, SFF: >60%., PFHD:1,5E-07
  - Error: any diagnostic error will force both sensor outputs to "non-conducting" (low)
    - MCU Unknown interrupt
    - MCU RAM error
    - MCU FLASH error
    - MCU EEPROM error
    - MCU Watch Dog error
    - Sensor Self-test error
    - Sensor Interrupt error
    - Sensor Data format sensor error
    - Measurement error (fault in sensor element)
    - output error (output is not equal to processor output)
    - voltage error
- If the output is non-conducting (low) the controller of the application involved should consider the sensor as defective and take appropriate action to prevent hazardous situations.
- If the device does not meet the safety requirements for an application it can be used redundant.
- Safety Related Fault Respons Time (SRFRT): <300ms
- Proof test interval (mission time): 20 years

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 mm<sup>2</sup>), recommended ≤23 AWG (≥0,25 mm<sup>2</sup>)

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:

If a different setting for one or more parameters is required we offer a factory program service.

Please specify:

- PEAK or RMS mode (PEAK mode has fixed 40ms measuring interval)
- If RMS mode, specify the required Measuring Interval (n \* 40ms) where n = integer
- switch value Output 1
- switch value Output 2
- Critical to operation delay