

Magnetic gear wheel encoder RGK2H-A-M1Z with analog output signals



Contactless incremental encoder for measuring
rotary motion

- High-resolution measurement of rotational speed and rotational angle
- Magnetic, contactless gauging of the steel gear wheels with module M = 1.0
- Rotational direction recognition
- Robust, not sensitive to dirt
- Temperature stability up to 110°C
- High EMC and ESD stability
- Bespoke specifications due to a flexible design principle
- Potentiometer or I2C interface for the fine-tuning of signal parameters if required
- Use in drive spindles of machine tools
- Installation in drive motors

Output signals

- SIN- and COS signals
- Reference signal
- Remote Sense RS_UB
- Supply voltage UB = 5V
- Reverse voltage protection
- Short-circuit proof

Design

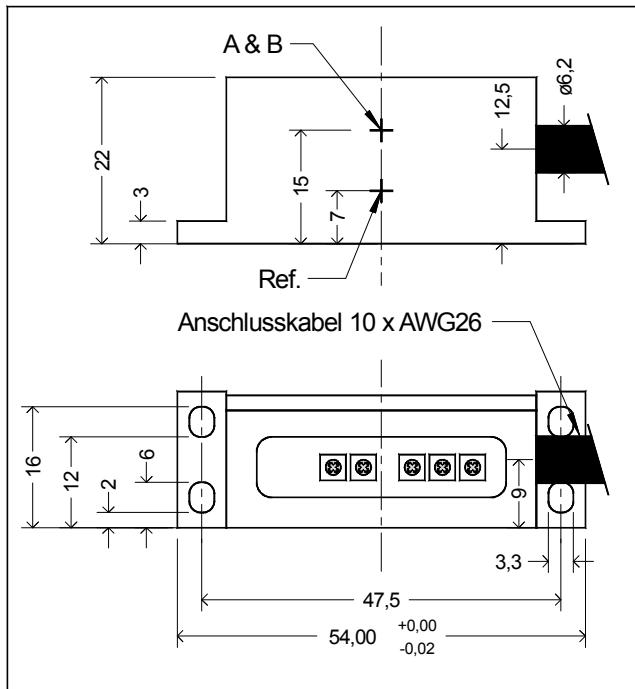
- Robust metal sensor housing
- GMR-Sensor elements
- Frontal coverage of the sensor elements using metal foil to act as extra protection against ESD impulses
- Electronics for signal conditioning
- Complete sealing of sensor interior
- Screened connection cable with AWG26
- Optional connector plug

RGK2H-A-M1Z

... for gear wheel module M = 1.0

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Specifications



Signal parameters

Before delivery, each encoder is balanced at the nominal distance encoder - gear wheel do = 0.5mm on optimal signal values (amplitude - see table, offset 0 mV, phase 90° unambiguousness of the reference pulse).

The signal parameters may deviate from the optimal values due to subsequent tolerances of attached parts, gear wheel quality and the influence of temperature and rotational speed.

- | | |
|------------------------------|---|
| ■ Signal type | Analog, differential signals
SIN (spur A),
COS (spur B)
Ref. pulse
Inverted signals A, B & Ref. |
| ■ Signal amplitude A & B | see table |
| ■ Amplitude differential A/B | 0.9 ... 1.1 |
| ■ Phase A to B | 90° +/- 1° |
| ■ Offset - static | +/- 20mV |
| ■ Freq. of measurement | 0 ... 40kHz |

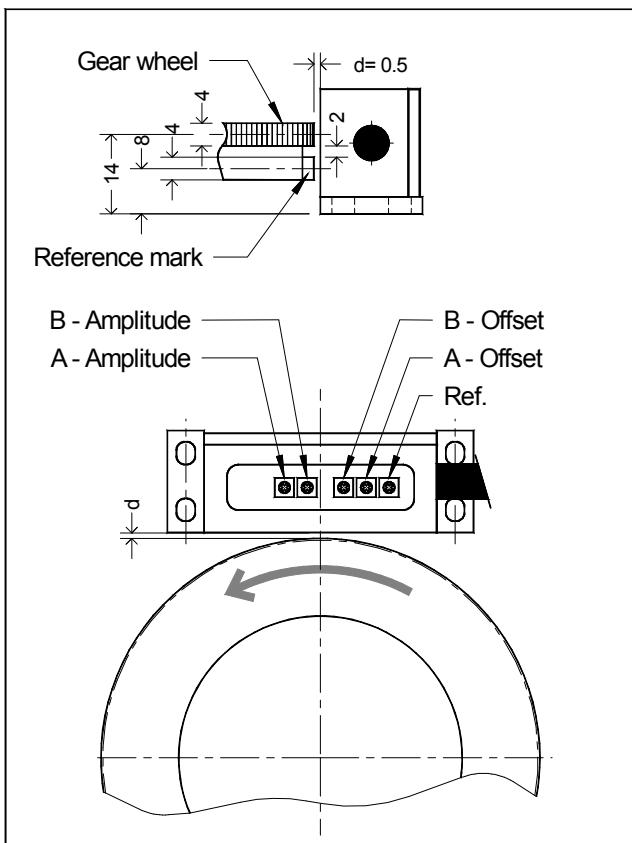
General parameters

- | | |
|---|----------------------------|
| ■ Supply voltage UB | 5VDC +/- 5% |
| ■ Wattage without load | 50mA |
| ■ Operating temperature | -20 ... 100°C |
| ■ Storage temperature | -30 ... 110°C |
| ■ Optimal distance do
encoder - gear wheel | 0.5 +/- 0.02mm for M = 1.0 |
| ■ Vibration resistance | bis 200 m/s ² |
| ■ Shock resistance | bis 2000 m/s ² |
| ■ Type of protection | IP65 |

	Diff.-Signal A&B Amplitude in mVpp	Diff. - Signal Ref. Negative-Peak Amplitude in mV	Offset in mV
RGK2H-AA-M1Z	320 +/- 30	-500 +/- 20	0 ... +/-130
RGK2H-AI-M1Z	900 +/- 300	-500 +/- 100	100 ... +/-100

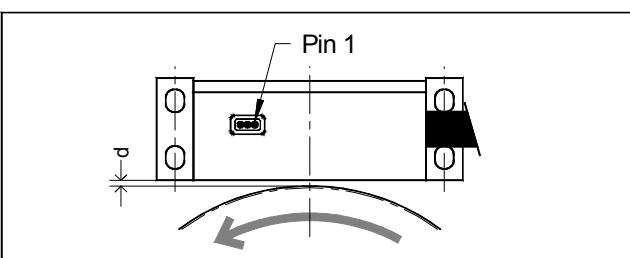
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Assembly & Electrical connection



The arrow indicates the direction of movement during counter-clockwise rotation of the gear wheel with a view to the encoder.

RGK2H-A-M1Z: Position of the trim potentiometers



RGK2H-A-M1Z: Position and configuration of the connection sockets for the I2C interface.

The connection sockets can be reached after partially removing the guard tag.

Assembly

The encoder is assembled using the following procedure:

1. Gauge blocks of the corresponding gauges do are located on the front side of the encoder.
2. Fix the encoder using 4 M3 screws. The screws are still not firmly tightened. The encoder should be loose.
3. Push the encoder slightly against the gear wheel. Completely tighten the screws alternately.
4. After screwing the encoder tightly, remove the gauge block (spacer) in the upward direction.

Distance encoder - gear wheel d (air gap)

The optimal distance encoder - gear wheel **d** is:

- 0.5 +/- 0.02mm for Modul **M = 1.0**

For this distance do the encoders are balanced on optimal signal parameters. If required, the signal parameters can be adjusted via the I2C signal interface or by using the potentiometers provided (see fig.).

Cable assignment

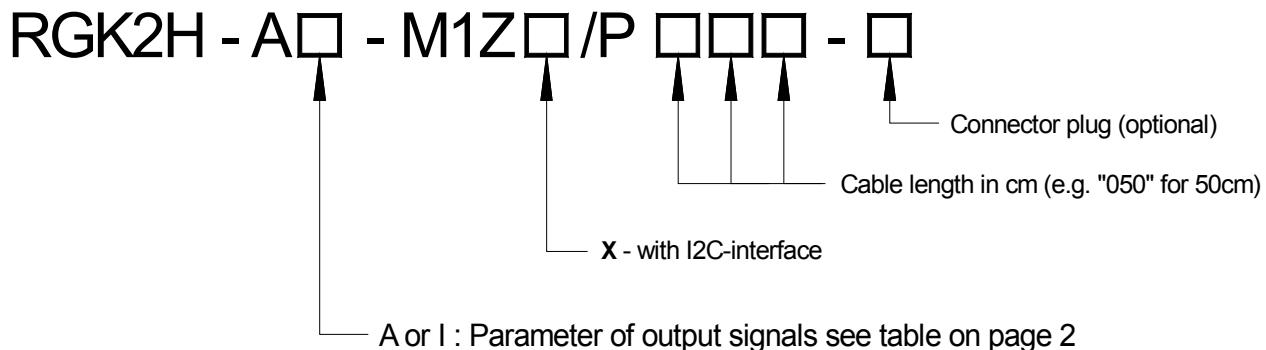
On the output of the encoder is a screened cable with 10 wires AWG26. The cable is assigned as follows:

■ Signal A +	brown
■ Signal A -	green
■ Signal B +	grey
■ Signal B -	orange
■ Signal Ref +	red
■ Signal Ref -	black
■ UB = 5VDC	violet
■ GND (0V)	yellow
■ RS_5V	blue
■ RS_GND (0V)	white

The **shield** is connected to the casing on the encoder side.

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Order identifiers & Accessories



Accessories

External interpolation box for the digitalisation
and interpolation of the analogue encoder signals

PB-RGMA-USB box with **SPB-RGMA-USB** software
for the fine alignment of encoder signals via the
I2C-interface