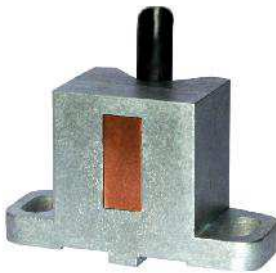# Magnetic gear wheel encoder RGM2G-D with interpolated TTL output signals

Contactless incremental encoder for measuring rotary motion

- High-resolution measurement of rotational speed and rotational angle up to 60,000 1/min
- 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
- Interpolations factor configurable ex works
- I2C interface for the fine-tuning of signal parameters if required

- Use in drive spindles of machine tools
- Installation in drive motors

Output signals

- 90° phase shifted TTL square-wave signals/RS422
- Reference pulse
- Remote Sense RS_UB
- Supply voltage UB = 5V
- Reverse voltage protection
- Short-circuit proof

Principle of measurement

- Magnetic, contactless gauging of the steel gear wheels with module M = **0.3** or **0.5**
- Use of magneto-resistive (GMR) sensor elements
- High degree of measurement accuracy when using e.g. type **ZR3-256/Di** or **ZR5-256/Di** measuring gear wheels
- Internal interpolation electronic

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
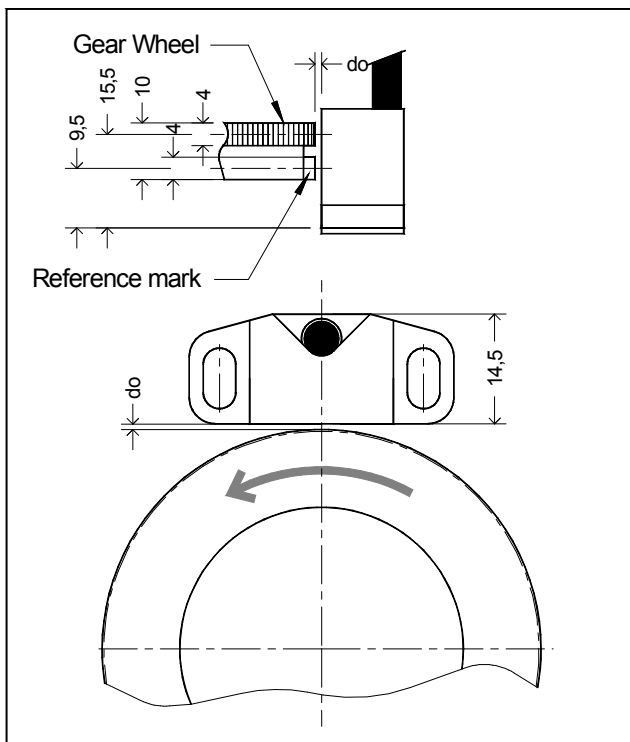- Screened connection cable with AWG28
- Optional connector plug

RGM2G-D-...3

... for gear wheel module M = 0.3

RGM2G-D-...5

... for gear wheel module M = 0.5

Magnetic gear wheel encoder RGM2G-D Specifications

Signal parameters

Before delivery, each encoder is balanced at the nominal distance encoder - gear wheel do = 0.1mm (for M = 0.3) and 0.3mm (for M = 0.5) on optimal signal values.

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
  digital, differential signals
  Spur A,
  Spur B
  Ref. pulse
  Inverted signals A, B & Ref.

- Output level   TTL/RS422
- Output Frequency f   0 ... 200kHz

- Interpolation factor IF   1, 2, 3, 4, 5, 6, 8, 10, 12, 16, 20, 24, 25 oder 32 (higher IF-Factors on request)

General parameters

- Supply voltage UB   5VDC +/- 5%
- Wattage
  without load   50mA
- Operating temperature   -20 ... 85°C (up to 100°C on request)
- Storage temperature   -30 ... 110°C

- Optimal distance **do**   0.1 +/- 0.02mm for **M = 0.3**
  encoder - gear wheel   0.3 +/- 0.02mm for **M = 0.5**

- Vibration resistance   bis 200 m/s²
- Shock resistance   bis 2000 m/s²
- Type of protection   IP68

Connecting cable 9 x AWG28

Position of the signal channels A, B & Ref.

ø5

21 · 4 · 0,5 · 1 · 3,94 +0,00 -0,02 · 6 · 9,5

35 · 13 · 45° · 4,3 · R 3,5 · 14,5 · 10 · 2 · 15,3° · R 3,5 · 19 · 27

Magnetic gear wheel encoder RGM2G-D
Assembly & Electrical connection

15,5
10
4
9,5
4

Gear Wheel

do

Reference mark

do

14,5

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

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 2 M4 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 **do** is:

- 0.1 +/- 0.02mm for Modul **M = 0.3**

- 0.3 +/- 0.02mm for Modul **M = 0.5**

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.
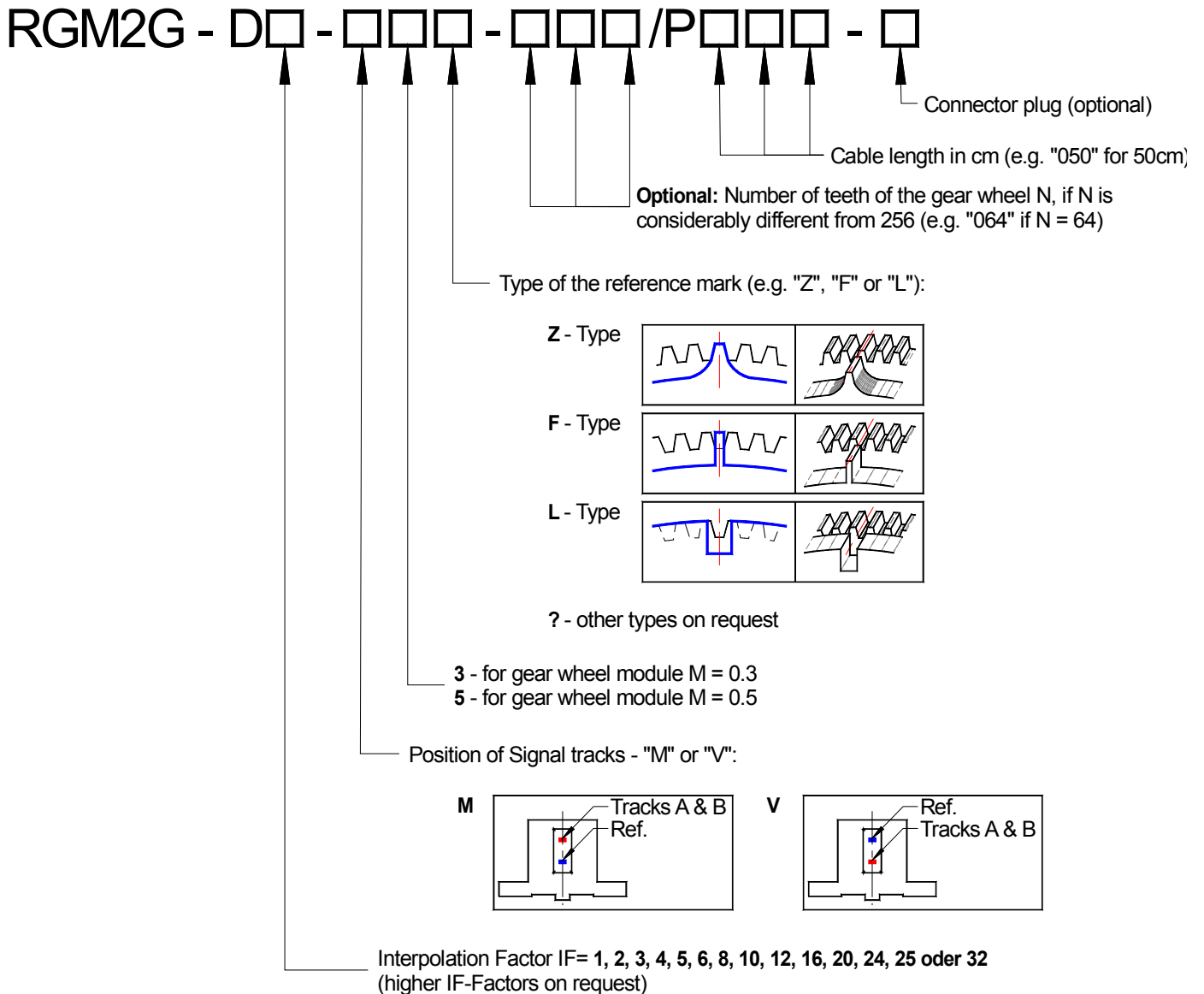
Cable assignment

On the output of the encoder is a screened cable with 9 wires AWG28. 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

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

Magnetic gear wheel encoder RGM2G-D
Order identifiers & Accessories

RGM2G - D☐ - ☐☐☐ - ☐☐☐/P☐☐☐ - ☐

Connector plug (optional)

Cable length in cm (e.g. "050" for 50cm)

Optional: Number of teeth of the gear wheel N, if N is considerably different from 256 (e.g. "064" if N = 64)

Type of the reference mark (e.g. "Z", "F" or "L"):

Z - Type

F - Type

L - Type

? - other types on request

3 - for gear wheel module M = 0.3
5 - for gear wheel module M = 0.5

Position of Signal tracks - "M" or "V":

M   Tracks A & B / Ref.

V   Ref. / Tracks A & B

Interpolation Factor IF= **1, 2, 3, 4, 5, 6, 8, 10, 12, 16, 20, 24, 25 oder 32**
(higher IF-Factors on request)

Accessories

Measuring gear wheels: **ZR3-256/Di** or **ZR5-256/Di**
Other types of gear wheels on request.