# ROTA$^{MAG}$
# Magnetic
# Rotary Encoders

Precise measurement of
angle of rotation, anytime –

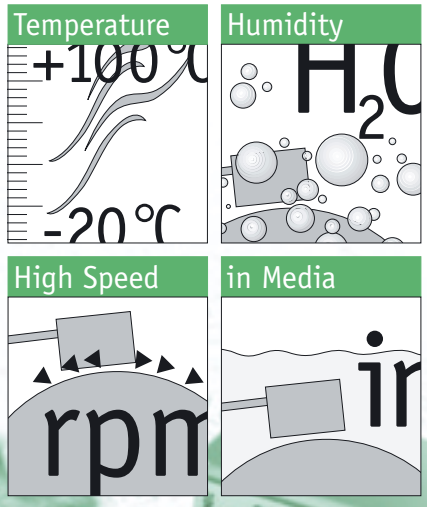
## ... unaffected by dirt and vibration

SIKO

# Short profile

The ROTA$^{MAG}$ family of rotary encoders opens up areas of application where optical measurement of distance, angle and rotational speeed may lead to incorrect results. ROTA$^{MAG}$ encoders are based on an indestructable magnetic scanning technology, which combines decisive advantages:

- Particularly high shock, vibration, and temperature resistance
- Absolutely insensitive to oil, lubricants, dirt and water
- Wear- and maintenance-free sensor unit
- Optional encapsulation of electronics enables its use also in the oil bath
- ROTA$^{MAG}$ is universally applicable owing to different hollow and solid shaft versions
- Compact design thanks to a highly integrated sensor unit



# Contents

## ROTAMAG Magnetic Rotary Encoders





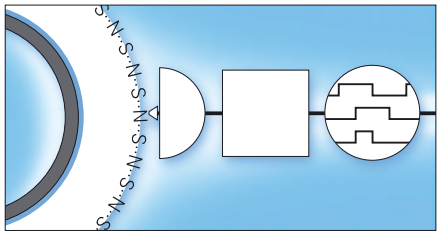



# Magnetic rotary encoders – precise, tireless, and extremely reliable.

Time for a new generation, time for new standards!

Magnetic or optical? Under extreme industrial condition there is only one choice: SIKO's ROTA$^{MAG}$ .

With unprecedented reliability and precision, this SIKO development uses the fascinating advantages of a technology that is based on the varying pole forces of magnetism and is, therefore, not dependent on free sight or tidiness of the system. Resolution, scanning accuracy and sturdiness of these compact measuring systems open new areas of application that go far beyond those possible with optical rotary encoders.



**The signal path:** A sensor scans the north and south poles of the specially magnetized ferrite ring and generates pulses that are processed real-time and provided as digital signals.

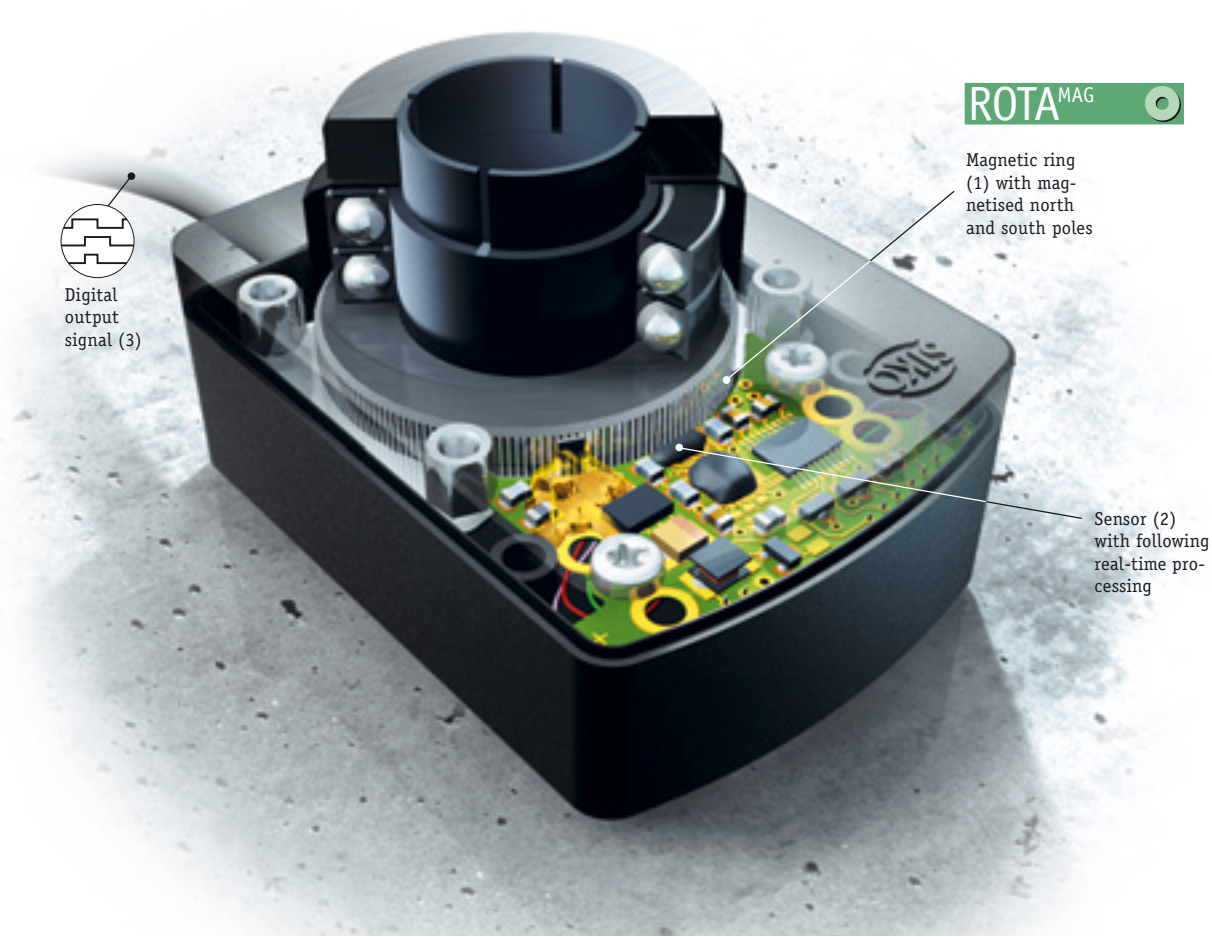
**That's how the technology works:** Rotary movements of shafts or spindles are transmitted to a special electronic sensor system (2) via a magnetic ring (1) attached to the hollow or solid shaft. The pole division magnetised on the magnetic ring is transformed by a purpose-designed translation module into up to 2560 pulses per revolution. The incremental counting pulses are provided as a square-wave signal and can, therefore, be interpreted by any counting electronics. Furthermore, the sealing of the electronic components permits their safe use even in fluid media.

The high integration density of the device and its adjustment to established standards allow easy replacement of previously used encoders.

This technology is intended for operating environments where dirt and humidity prevail or where vibrations caused by the machinery make precise working difficult. The contactlessly measuring rotary encoders are nearly universally usable – even in combination with aggressive solutions such as salt water or in temperature-regulated oily environments.

In many industrial sectors, including food or packing industries, energy production or wood processing, passenger transport or in the complete area of mechanical engineering: the limits of optical measuring systems are insurmountable due to their inherent principle.

In contrast, SIKO's magnetic systems are in top form for these applications.



Extreme vibrations as well as humid, caked abrasion make measurement control in rough wood processing difficult.

Abrasion, a fatty-greasy environment, temperature fluctuation as in lift technology or vibrations from punching or pressing machines that weigh many tons are no problem for the ROTA$^{MAG}$.

Scanning the measuring value under highly dynamic conditions: Balancing wheels involves a greasy environment full of micronised dust.

Many food production processes are accompanied by humidity, temperature fluctuation and aggressive cleaning agents

# Magnetic measurement

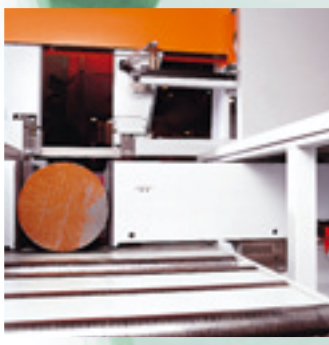
## Heavy-duty industrial applications... – clear advantage

"When you plane, you get shavings." Together with dust and abrasion and in combination with humidity, lubricants, vibration and temperature, these shavings are an absolute "killer environment" for constantly precise measurements. SIKO presents its new ROTA$^{MAG}$ magnetic measuring technology for rotary encoders, which guarantees consistent production safety in all border areas of industrial production.

Everybody understands the difficult conditions of stone working or tunnelling. However, the parallel in wood or metal processing industries should not be underestimated. Here, maintenance-free operation and reliability in a rough competitive environment are indispensable. Where else are so many applications interconnected, which all require similarly high and reliable production quality?

Therefore, the magnetic ROTA$^{MAG}$ rotary encoders are ideal for applications such as...

- Sheet metal processing with punching and deformation techniques
- Lifting techniques
- Offshore environments
- Packaging and food industries
- Chemical-pharmaceutical industries
- Energy production (e.g., wind generators)
- Wherever precise measurement is required under difficult conditions



Vibrations, refrigerants and lubricants determine the atmosphere for metal-cutting saws.

Pictures of Raimann, Handtmann, Kasto, Mabu

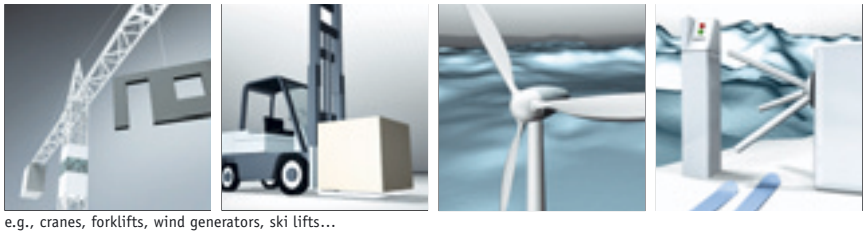
# Main areas of application

Versatile, simple and always ready: SIKO's ROTA$^{MAG}$ rotary encoders

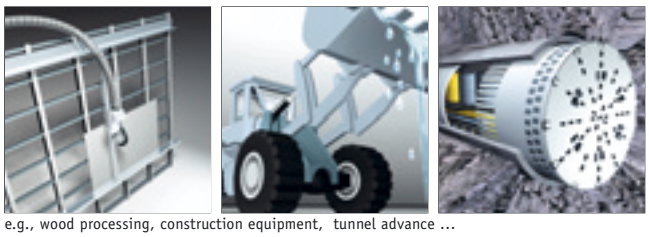
| Environmental conditions | Functioning | Advantages |
|---|---|---|
| **Humidity** | Insensitive to humidity, since the scanning principle does not require visual contact. | • No mounting precautions neccessary with regard to protection from humidity |
| **Shock and vibration** | Imdestructable: The components used are unbreakable; there is no glass pane as known from optical encoders, all components are safely integrated. | • High reliability<br>• No complicated mechanical uncoupling necessary |
| **Fluctuation of climate** | Absolutely safe operation with condensation due to rapid changes of temperature or icing up of components in free-standing installations. | • High operational safety<br>• Maintenance-free |
| **Dirt** | The encapsulated housing as well as scanning without sight and contact make the technique robust against invading particles. | • High operational safety<br>• no additional precautions necessary |

e.g., metal-cutting saws, food production, car washes, stoneworking ...

e.g., pressing and punching machines, construction equipment, lifts, rough wood processing...



e.g., cranes, forklifts, wind generators, ski lifts...



e.g., wood processing, construction equipment, tunnel advance ...

Example of use

# *You can count on it.

ROTA$^{MAG}$ rotary encoders are most reliable partners even under the most difficults conditions. No more problems due to ...

- Shock and vibration
- Oily or salty humidity
- Dirt of any kind
- Significant temperature fluctuation
- Any combination of the above-mentioned factors

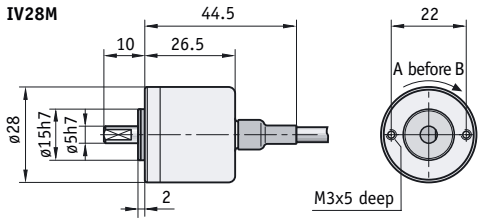
# Incremental encoders IV28M/IH28M

Miniature rotary encoders with high precision: The encapsulated encoders IV28M/IH28M can take a lot with regard to vibration, dirt, and humidity and convince with their particularly compact design.

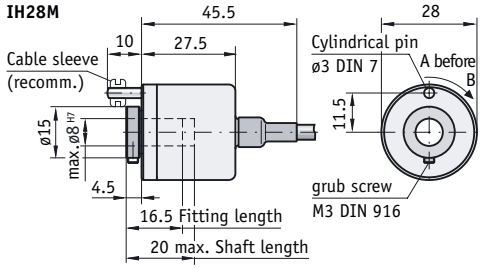
**Features:**

- up to1000 pulses/revolution
- PP output circuit
- solid shafts up to 5 mm diam. or hollow shaft up to 8 mm diam./stainless steel
- IP54 or higher type of protection
- 28 mm flange diameter

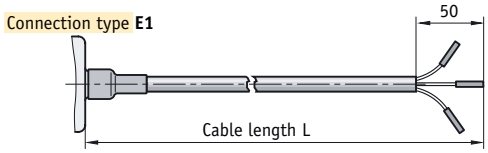
**IV28M**



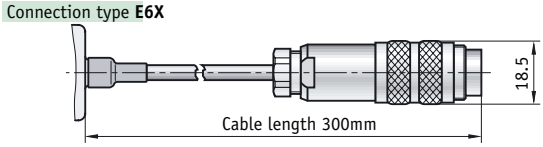

**IH28M**




Connection type **E1**




Connection type **E6X**




**Pin-outs**

| E6X<br>PIN | E1<br>Core colours | PP<br>Signal |
|---|---|---|
| 1 | white | B |
| 2 | brown | +UB |
| 3 | green | O/I |
| 4 | yellow | A |
| 5 | grey | GND |

| Feature | IV28M | IH28M | Technical data | Additional information |
|---|---|---|---|---|
| Type of protection | | | IP54 / IP67 | |
| Max. rotational speed | | | 12000 $min^{-1}$ | |
| Shaft moment of inertia | | | ~0.24 x $10^{-6}$ $kgm^2$ | |
| Starting torque (+20 °C) | | | ≤0.1 Ncm | |
| Load capacity of shaft | | | radial 30 N, axial 15 N | only IV28M |
| Weight | | | ~0.1 kg | |
| Working temperature | | | -20 °C ... +70 °C | storage temperature -20 °C ... +80 °C |
| Cable sheath | | | PUR | |
| Shock resistance | | | 200 g/6 ms | acc. to DIN-IEC 68-2-27 |
| Vibration resistance | | | 10 g/50 Hz | acc. to DIN-IEC 68-2-6 |
| Operating voltage | | | 10 ... 30 V DC | |
| Power cons. without load (typ.) | | | <25 mA | ABO version |
| Perm. load/channel (max.) | | | ±30 mA | short-time up to 100 mA, t < 5 s |
| Pulse frequency (max.) | | | 200 kHz | at 12000 $min^{-1}$ and 1000 increments |
| Phase position | | | 90° ± 15° | |
| Signal level high (min.) | | | 29.2 V DC | Ub = 30 V DC, I oh = -30 mA |
| Signal level low (max.) | | | 0.5 V DC | Ub = 30 V DC, I ol = 30 mA |
| Polarity protection on UB | | | yes | |
| Housing | | | aluminium/plastic | |
| Shaft | | | stainless steel | |
| Test mark | | | CE | acc. to EN 61000-6-2, EN 61000-6-4 |

**Ordering data**

| | | | | |
|---|---|---|---|---|
| Output signals (see appendix) | ABX | ABX | | **standard** |
| | ABO | ABO | | |
| | ABI | ABI | | |
| Pulses/revolution | ... | ... B | 50, 200, 250, 400, 500, 800, 1000 | |
| Type of connection | E1 | E1 C | cable sleeve with flying leads | |
| | E6X | E6X | connector | |
| Cable length [m] | **1.0** | **1.0** D | from 1.0 ... 10.0 m in steps of 1.0 m (E1) | **standard** |
| | 0.3 | 0.3 | only for E6X | |
| Output circuit | **PP** | **PP** E | push-pull | **standard** |
| Shaft diameter | — | ... F | max. 8 mm | **standard**, hollow shaft |
| | 5 x 10 | — | | **standard**, solid shaft |

Accessories in the appendix

Your order: – I...28M – [A] – [B] – [C] – [D] – [E] – [F]

# Incremental encoder IV58M

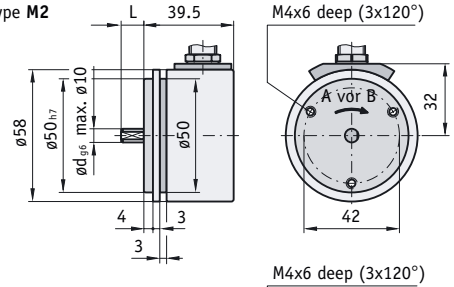
The rotary encoder IV58M is extremely resistant to dirt, humidity, and vibration. Robus in standard design combines the advantages of magnetic scanning and an encapsulated aluminium housing.

**Features:**

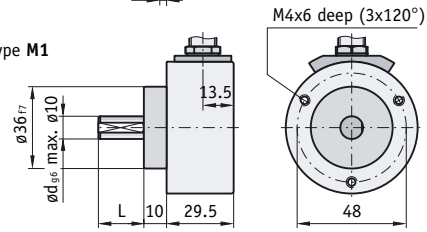
- 58 mm servo or clamping flange
- up to 2560 pulses/revolution
- solid shafts up to 10 mm diameter, stainless steel

- **Options:**
  Sealed electronics (condensation permitted)

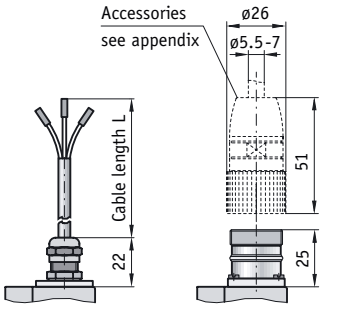
Mounting type **M2**




Mounting type **M1**




**Connection types**




Connection type **E1V** | Connection type **E2**

**Pin-outs**

| **E2** PIN | **E1T, E1V** Core colours | **PP** Signal | **OP/LD24** Signal | **LD5** Signal |
|---|---|---|---|---|
| 1 | blue | | /B | /B |
| 2 | violet | | | +SUB |
| 3 | green | O/I | O | O |
| 4 | red | | /O | /O |
| 5 | yellow | A | A | A |
| 6 | pink | | /A | /A |
| 7 | | | | |
| 8 | white | B | B | B |
| 9 | | | | |
| 10 | grey | GND | GND | GND |
| 11 | blue | | | SGND |
| 12 | brown | +UB | +UB | +UB |

| Feature | IV58M | | Technical data | Additional information |
|---|---|---|---|---|
| Type of protection | | | IP65 | |
| Max. rotational speed | | | 6000 $min^{-1}$ | |
| Shaft moment of inertia | | | ~0.15 x $10^{-6}$ $kgm^2$ | |
| Starting torque (+20 °C) | | | ≤1.5 Ncm | |
| Load capacity of shaft | | | radial 80 N, axial 40 N | |
| Weight | | | 0.4 kg | |
| Working temperature | | | -20 °C ... +100 °C | storage temperature -20 °C ... +100 °C |
| Cable sheath | | | PUR | |
| Shock resistance | | | 200 g/6 ms | acc. to DIN-IEC 68-2-27 |
| Vibration resistance | | | 10 g/50 Hz | acc. to DIN-IEC 68-2-6 |
| Operating voltage | | | 10 ... 30 V DC (PP, OP, LD24) | |
| | | | 5 V DC ± 5 % (LD5) | |
| Power cons. without load (typ.) | | | <25 mA | Ub = 24 V DC, ABO version |
| Perm. load/channel (max.) | | | ±30 mA | short-time up to 100 mA, t < 5 s |
| Pulse frequency (max.) | | | 100 kHz | at 6000 $min^{-1}$ and 1000 increments |
| Phase position | | | 90° ± 15° | |
| Signal level high (min.) | | | 29.2 V DC (PP, OP) | Ub = 30 V DC, I oh = -30 mA |
| Signal level low (max.) | | | 0.5 V DC (PP, OP) | Ub = 30 V DC, I ol = 30 mA |
| Signal level LD5, LD24 | | | RS422 A spec. | |
| Polarity protection on UB | | | yes (PP, OP, LD24) | |
| Housing | | | aluminium | |
| Shaft | | | stainless steel | |
| Test mark | | | CE | acc. to EN 61000-6-2, EN 61000-6-4 |

**Ordering data**

| | | | | |
|---|---|---|---|---|
| Output signals (see appendix) | **ABX** | A | | **standard** |
| | ABO | | | |
| | ABI | | | |
| Pulses/revolution | ... | B | 50, 64, 100, 128, 200, 250, 256, 320, 400, | others on request |
| | | | 500, 512, 1000, 1024, 1280, 1600, 2000, | |
| | | | 2048, 2560 | |
| Type of connection | **E1V** | C | screwing with flying leads | **standard** |
| | E2 | | connector | |
| Cable length [m] | **1.0** | D | from 1.0 to 20.0 m in in steps of 1.0 | **standard** |
| | | | | |
| Mounting mode | M1 | E | clamping flange | |
| | M2 | | servo flange | |
| Output circuit | **PP** | F | push-pull | **standard** |
| (see appendix) | OP | | push-pull, with inverted signals | |
| | LD5 | | line driver, 5 V DC encoder supply | RS422 A spec. |
| | LD24 | | line driver, 24 V DC encoder supply | RS422 A spec. |
| Shaft diameter (diam. x L) | 6 x 10 | G | diam. 6 mm x 10 mm | |
| | 8 x 10 | | diam. 8 mm x 10 mm | |
| | 10 x 20 | | diam. 10 mm x 20 mm | |
| Environmental conditions | **S** | H | condensation not permitted | **standard** |
| | E | | condensation permitted | |

Accessories in the appendix

Your order: – IV58M – [A] – [B] – [C] – [D] – [E] – [F] – [G] – [H]

# Incremental encoder IH58M

The IH58M is SIKO's the most compact hollow shaft encoder With bores up to 22 mm diameter and high precision. Dirt, humidity and vibration do not affect this encoder.

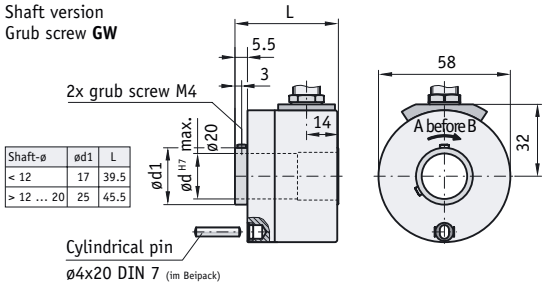
**Features:**

- 58 mm flange diameter
- up to2560 pulses/revolution
- hollow shafts up to 22 mm diam.

**Options:**

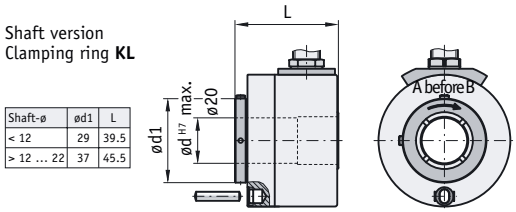
- sealed electronics (condensation permitted)

Shaft version
Grub screw **GW**



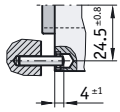

| Shaft-ø | ød1 | L |
|---|---|---|
| < 12 | 17 | 39.5 |
| > 12 ... 20 | 25 | 45.5 |

Shaft version
Clamping ring **KL**

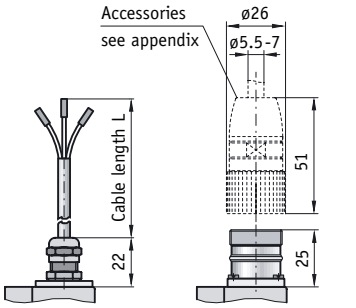



| Shaft-ø | ød1 | L |
|---|---|---|
| < 12 | 29 | 39.5 |
| > 12 ... 22 | 37 | 45.5 |

**Recommended intallation**




**Connection types**




Connection type **E1V** | Connection type **E2**

**Pin-outs**

| **E2** PIN | **E1T, E1V** Core colours | **PP** Signal | **OP/LD24** Signal | **LD5** Signal |
|---|---|---|---|---|
| 1 | blue | | /B | /B |
| 2 | violet | | | +SUB |
| 3 | green | O/I | O | O |
| 4 | red | | /O | /O |
| 5 | yellow | A | A | A |
| 6 | pink | | /A | /A |
| 7 | | | | |
| 8 | white | B | B | B |
| 9 | | | | |
| 10 | grey | GND | GND | GND |
| 11 | black | | | SGND |
| 12 | brown | +UB | +UB | +UB |

| Feature | IH58M | | Technical data | Additional information |
|---|---|---|---|---|
| Type of protection | | | IP65 | |
| Max. rotational speed | | | 6000 $min^{-1}$ | |
| Shaft moment of inertia | | | ~0.3 x $10^{-6}$ $kgm^2$ | |
| Starting torque (+20 °C) | | | ≤4 Ncm | |
| Weight | | | 0.4 kg | |
| Working temperature | | | -20 °C ... +100 °C | storage temperature -20 °C ... +100 °C |
| Cable sheath | | | PUR | |
| Shock resistance | | | 200 g/6 ms | acc. to DIN-IEC 68-2-27 |
| Vibration resistance | | | 10 g/50 Hz | acc. to DIN-IEC 68-2-6 |
| Operating voltage | | | 10 ... 30 V DC (PP, OP, LD24) | |
| | | | 5 V DC ± 5 % (LD5) | |
| Power cons. without load (typ.) | | | <25 mA | Ub = 24 V DC, ABO version |
| Perm. load/channel (max.) | | | ±30 mA | short-time up to 100 mA, t < 5 s |
| Pulse frequency (max.) | | | 100 kHz | at 6000 $min^{-1}$ and 1000 increments |
| Phase position | | | 90° ± 15° | |
| Signal level high (min.) | | | 29.2 V DC | Ub = 30 V DC, I oh = -30 mA |
| Signal level low (max.) | | | 0.5 V DC | Ub = 30 V DC, I ol = 30 mA |
| Signal level LD5, LD24 | | | RS422 A spec. | |
| Polarity protection on UB | | | yes (PP, OP, LD24) | |
| Housing | | | aluminium | |
| Shaft | | | stainless steel | |
| Test mark | | | CE | acc. to EN 61000-6-2, EN 61000-6-4 |

**Ordering data**

| | | | | |
|---|---|---|---|---|
| Output signals (see appendix) | **ABX** | A | | **standard** |
| | ABO | | | |
| | ABI | | | |
| Pulses/revolution | ... | B | 50, 64, 100, 128, 200, 250, 256, 320, 400, | others on request |
| | | | 500, 512, 1000, 1024, 1280, 1600, 2000, | |
| | | | 2048, 2560 | |
| Type of connection | **E1V** | C | PG screwing with flying leads | **standard** |
| | E2 | | connector | |
| Cable length [m] | **1.0** | D | from 1.0 to 20.0 m in in steps of 1.0 | **standard** |
| Output circuit | **PP** | E | push-pull | **standard** |
| (see appendix) | OP | | push-pull, with inverted signals | |
| | LD5 | | line driver, 5 V DC encoder supply | RS422 A spec. |
| | LD24 | | line driver, 24 V DC encoder supply | RS422 A spec. |
| Fixing version | GW | F | fastening with headless screw | diam. 6 ... 20 mm |
| | KL | | fastening with clamping ring | diam. 14 ... 22 mm |
| Shaft diameter | ... | G | 6, 8, 10, 12, 14, 15, 20, 22 | |
| Environmental conditions | **S** | H | condensation not permitted | **standard** |
| | E | | condensation permitted | |

Accessories in the appendix

Your order: – IH58M – [A] – [B] – [C] – [D] – [E] – [F] – [G] – [H]

# Incremental encoder IG07M

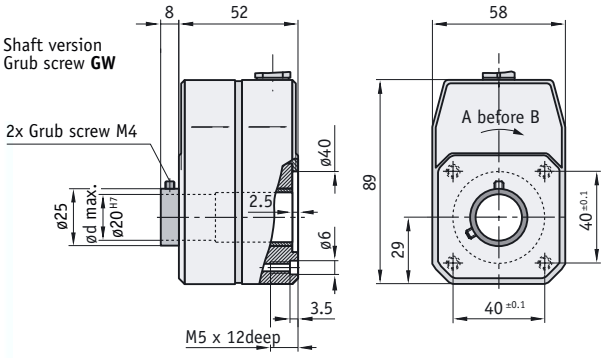
Rough environmental conditions are the business of the IG07M: Robust magnetic scanning in a stable die-casting housing make the IG07M a particularly sturdy rotary encoder solution.

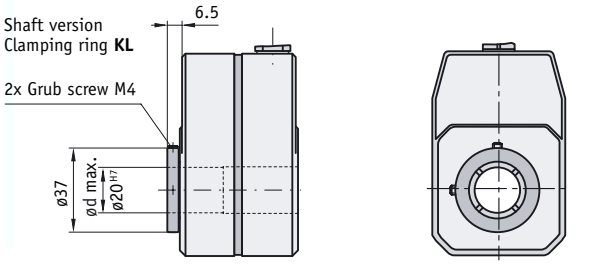
**Features:**

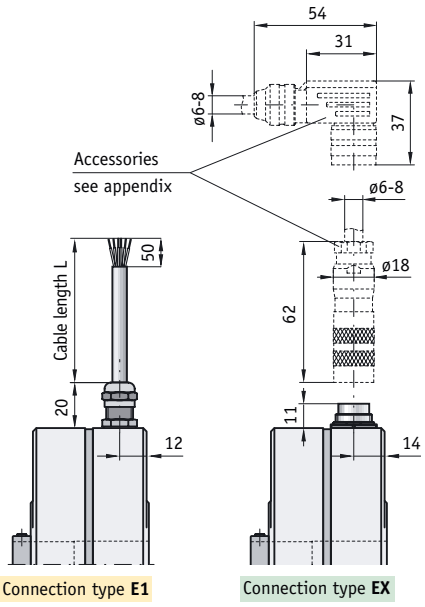
- resolution max. 2560 pulses/revolution
- housing made of zinc die-casting
- solid shafts up to 20 mm diam., stainless steel
- high axial and radial load capacity of shaft

**Options:**

- sealed electronics (condensation permitted)




**Pin-outs**

| **EX** PIN | **E1** Core colours | **PP** Signal | **OP/LD24** Signal | **LD5** Signal |
|---|---|---|---|---|
| A | blue | | /B | /B |
| B | violet | | | +SUB |
| C | green | O/I | O | O |
| D | red | | /O | /O |
| E | yellow | A | A | A |
| F | pink | | /A | /A |
| G | | | | |
| H | white | B | B | B |
| I | | | | |
| K | grey | GND | GND | GND |
| L | black | | | SGND |
| M | brown | +UB | +UB | +UB |

| Feature | | Technical data | Additional information |
|---|---|---|---|
| Type of protection | | IP64 | |
| Max. rotational speed | | 6000 $min^{-1}$ (IP64), 3000 $min^{-1}$ (IP65) | |
| Shaft moment of inertia | | ~0.3 x $10^{-6}$ $kgm^2$ | |
| Starting torque (20 °C) | | ≤6 Ncm (IP64), ≤10 Ncm (IP65) | |
| Load capacity of shaft | | radial 5600 N, axial 1400 N | |
| Weight | | approx. 0.75 kg | |
| Working temperature | | -20 °C ... +100 °C | storage temperature -20 °C ... +100 °C |
| Cable sheath | | PUR | |
| Shock resistance | | 200 g/6 ms | acc. to DIN-IEC 68-2-27 |
| Vibration resistance | | 10 g/50 Hz | acc. to DIN-IEC 68-2-6 |
| Operating voltage | | 10 ... 30 V DC (PP, OP, LD24) | |
| | | 5 V DC ± 5% (LD5) | |
| Power cons. without load (typ.) | | <25 mA | Ub = 24 V DC, ABO version |
| Perm. load/channel (max.) | | ±30 mA | short-time up to 100 mA, t < 5 s |
| Pulse frequency (max.) | | 100 kHz | at 6000 $min^{-1}$ and 1000 increments |
| Phase position | | 90° ± 15° | |
| Signal level high (min.) | | 29.2 V DC | Ub = 30 V DC, I oh = -30 mA |
| Signal level low (max.) | | 0.5 V DC | Ub = 30 V DC, I ol = 30 mA |
| Signal level LD5, LD24 | | RS422 A spec. | |
| Polarity protection on UB | | yes (PP, OP, LD24) | |
| Housing | | zinc die-casting | |
| Shaft | | stainless steel | |
| Test mark | | CE | acc. to EN 61000-6-2, EN 61000-6-4 |

**Ordering data**

| | | | | |
|---|---|---|---|---|
| Output signals (see appendix) | **ABX** | A | | **standard** |
| | ABO | | | |
| | ABI | | | |
| Pulses/revolution | ... | B | 50, 64, 100, 128, 200, 250, 256, 320, 400, | others on request |
| | | | 500, 512, 1000, 1024, 1280, 1600, 2000, | |
| | | | 2048, 2560 | |
| Type of connection | **E1** | C | PG screwing with flying leads | **standard** |
| | EX | | plug connection | |
| Cable length [m] | **1.0** | D | from 1.0 to 20.0 m in in steps of 1.0 | **standard** |
| Output circuit | **PP** | E | push-pull | **standard** |
| (see appendix) | OP | | push-pull, with inverted signals | |
| | LD5 | | line driver, 5 V DC encoder supply | RS422 A spec. |
| | LD24 | | line driver, 24 V DC encoder supply | RS422 A spec. |
| Fixing version | GW | F | fastening with headless screw | |
| | KL | | fastening with clamping ring | |
| Shaft diameter | 20 | G | in mm | **standard** |
| Mounting mode | M1 | H | | **standard** |
| Storage | **MS** | I | high precision sealing gap | **standard** |
| | RS | | enhanced sealing of bearing | |
| Environmental conditions | **S** | K | condensation not permitted | **standard** |
| | E | | condensation permitted | |

Accessories in the appendix

Your order: – IG07M – [A] – [B] – [C] – [D] – [E] – [F] – [G] – [H] – [I] – [K]

# Incremental encoder IG09M

High resolution, robust magnetic scanning, stable plastic housing in very flat design– the hollow shaft encoder IG09M suit many applications.

**Features:**

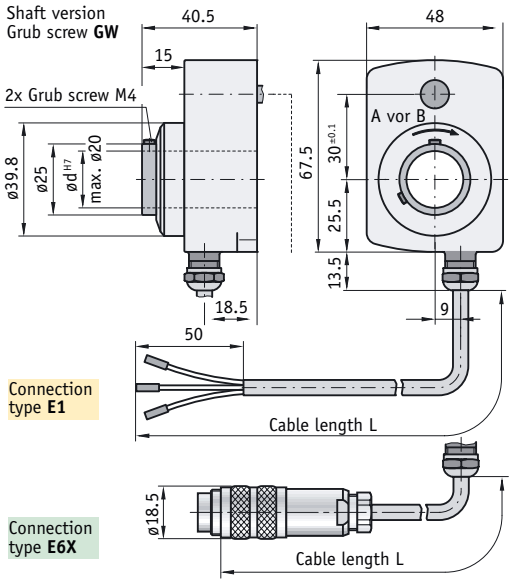
- compact installation depth
- max. resolution 2560 pulses/revolution
- hollow shafts up to 20 mm diam.
- combination with mech. counter, type DA09S

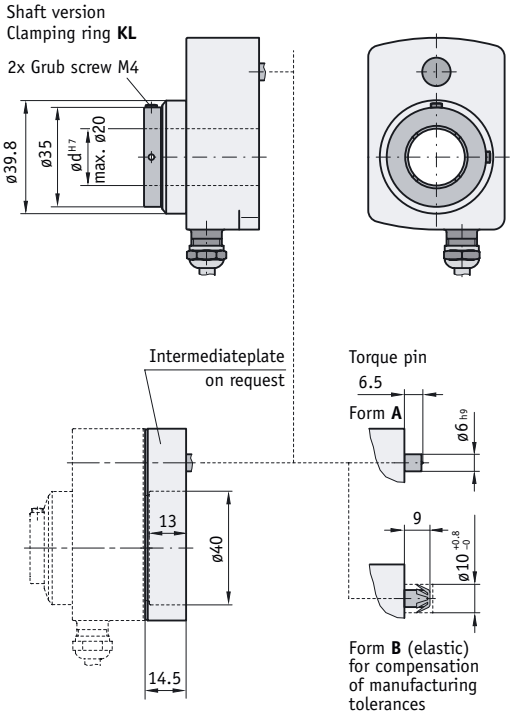
**Options:**

- sealed electronics (condensation permitted)

**Special feature:**

Combination of the IG09M with mechanical DA09S encoders on the same shaft/spindle has been prepared for attaining fast control of adjustment values. Mating on each housing guarantees safe compact installation.




**Pin-outs**

| **E6X** PIN | **E1** Core colours | **PP** Signal | **OP/LD24/LD5** Signal |
|---|---|---|---|
| A | blue | | /B |
| B | | | |
| C | green | O/I | O |
| D | red | | /O |
| E | yellow | A | A |
| F | pink | | /A |
| G | | | |
| H | white | B | B |
| I | | | |
| K | grey | GND | GND |
| L | | | |
| M | brown | +UB | +UB |

| Feature | | Technical data | Additional information |
|---|---|---|---|
| Type of protection | | IP53/IP63 | |
| Max. rotational speed | | 6000 $min^{-1}$ | |
| Shaft moment of inertia | | ~0.15 x $10^{-6}$ $kgm^2$ | |
| Starting torque (+20 °C) | | ≤2 Ncm (IP53), ≤3.5 Ncm (IP63) | |
| Weight | | appr. 0.12 kg | |
| Working temperature | | -20 °C ... +100 °C | storage temperature -20 °C ... +100 °C |
| Cable sheath | | PUR | |
| Shock resistance | | 200 g/6 ms | acc. to DIN-IEC 68-2-27 |
| Vibration resistance | | 10 g/50 Hz | acc. to DIN-IEC 68-2-6 |
| Operating voltage | | 10 ... 30 V DC (PP, OP, LD24) | |
| | | 5 V DC ± 5% (LD5) | |
| Power cons. without load (typ.) | | <25 mA | Ub = 24 V DC, ABO version |
| Perm. load/channel (max.) | | ±30 mA | short-time up to 100 mA, t < 5 s |
| Pulse frequency (max.) | | 100 kHz | at 6000 $min^{-1}$ and 1000 increments |
| Phase position | | 90° ± 15° | |
| Signal level high (min.) | | 29.2 V DC | Ub = 30 V DC, I oh = -30 mA |
| Signal level low (max.) | | 0.5 V DC | Ub = 30 V DC, I ol = 30 mA |
| Signal level LD5, LD24 | | RS422 A Spec. | |
| Polarity protection on UB | | yes (PP, OP, LD24) | |
| Housing | | reinforced plastic | |
| Shaft | | blue steel | |
| Test mark | | CE | acc. to EN 61000-6-2, EN 61000-6-4 |

**Ordering data**

| | | | | |
|---|---|---|---|---|
| Output signals (see appendix) | **ABX** | A | | **standard** |
| | ABO | | | |
| | ABI | | | |
| Pulses/revolution | ... | B | 50, 64, 100, 128, 200, 250, 256, 320, 400, | others on request |
| | | | 500, 512, 1000, 1024, 1280, 1600, 2000, | |
| | | | 2048, 2560 | |
| Type of connection | **E1** | C | PG screwing with flying leads | **standard** |
| | E6X | | plug connection | |
| Cable length [m] | **1.0** | D | from 1.0 to 20.0 m in steps of 1.0 m | **standard** |
| | | | LD5 max. 3 m | |
| Output circuit | **PP** | E | push-pull | **standard** |
| (see appendix) | OP | | push-pull, with inverted signals | |
| | LD5 | | line driver, 5 V DC encoder supply | RS422 A spec. |
| | LD24 | | line driver, 24 V DC encoder supply | RS422 A spec. |
| Fixing version | GW | F | fastening with headless screw | |
| | KL | | fastening with clamping ring | |
| Shaft diameter | ... | G | 12, 14, 15, 20 in mm | |
| Environmental conditions | **S** | H | condensation not permitted | **standard** |
| | E | | condensation permitted | |
| Torque support form | **A** | I | cylindrical pin, diam. 6 mm | **standard** |
| | B | | for mech. tolerance compensation | |
| Type of protection | **IP53** | K | | **standard** |
| | IP63 | | | |

Accessories in the appendix

Your order: _ IG09M - [A] - [B] - [C] - [D] - [E] - [F] - [G] - [H] - [I] - [K]

# Matching Accessories for all ROTA$^{MAG}$ Products

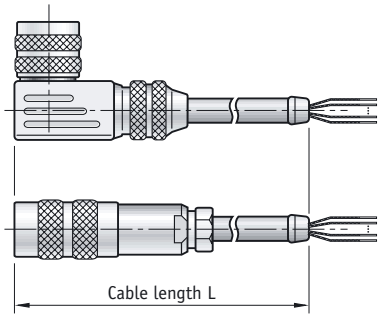


## Cable extensions

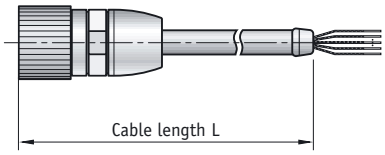
in 7-, 10- and 12-core design with twisted screening braid. The mass-produced product has stripped and tinned cable ends.

**IG07M:**
Cable extension with
angular box "W"

**IH28M, IV28M,**
**IG07M, IG09M:**
Cable extension with
coupling box "GE"

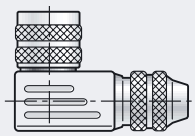



**IV58M, IH58M:**
Cable extension with
coupling box "GE"

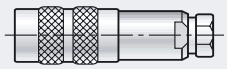



**Ordering information for coupling boxes**
without cable extension

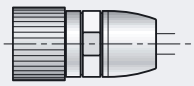
**only angular box:**
IG07M: Item no. 79666
Cable diam. 6–8 mm



**only coupling box:**
IH28M/IV28M: Item no. 76141
IG07M/IG09M: Item no. 76572
Cable diam. 6–8 mm



**only coupling box:**
IV58M/IH58M: Item no. 81935
Cable diam. 5.5–7 mm



| Feature | Ordering data | | | Technical data | Additional information |
|---|---|---|---|---|---|
| Matched to sensor | IV28M | IV58M | IG07M | | |
| | IH28M | IH58M | IG09M | | |
| Cable extension | KV**07**-0 | KV**10**-0 | KV**12**-0 | | |
| | A | A | A | | |
| Type of connection | **GE** | **GE** | **GE** | | straight coupling box |
| | B | B | W B | | angular coupling box |
| Cable length | **1.0** | **1.0** | **1.0** | length in meter | **standard 1.0 m** |
| | C | C | C | 1.0 m to 10.0 m in steps of 0.1 m | |

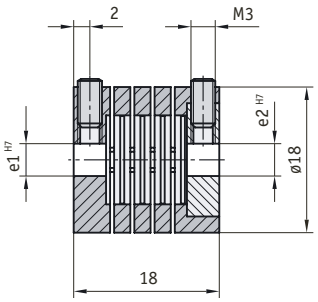
**Pin assignment**

| PIN | KV07-0 | PIN | KV10-0 | PIN | KV012-0 |
|---|---|---|---|---|---|
| 1 | white | 1 | blue | A | blue |
| 2 | brown | 2 | violet | B | violet |
| 3 | green | 3 | green | C | green |
| 4 | yellow | 4 | red | D | red |
| 5 | grey | 5 | yellow | E | yellow |
| 6 | pink | 6 | pink | F | pink |
| 7 | blue | 7 | -- | G | red-blue |
| | | 8 | white | H | white |
| | | 9 | -- | I | grey-pink |
| | | 10 | grey | K | grey |
| | | 11 | black | L | black |
| | | 12 | brown | M | brown |

for all connectors: screen on housing

Your order: KV -0 – [ ] – [ ]
A B C

## Flexible coupling AK18



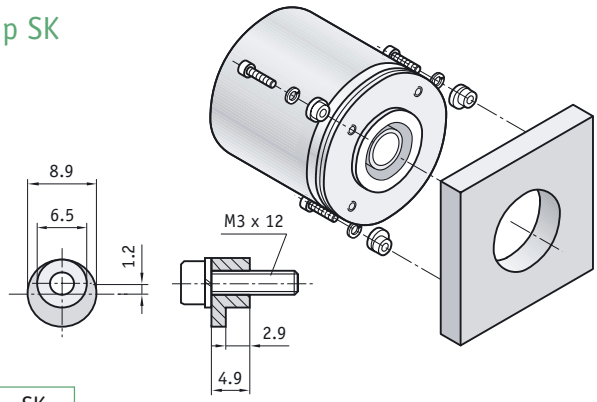

We recommend using a flexible coupling clutch for backlash-free compensation of mechanical errors when mounting solid shaft encoders avoid tension on the bearings (due to shaft displacement caused by misalignment).

| | |
|---|---|
| **Material** | aluminium |
| **Max. rotational speed** | 25000 min$^{-1}$ |
| **Max. perm. displacement** | 0.1 mm (radial/axial) |
| **Bore diameter** | e1/e2, **(e1 = e2/ standard)** |
| **e1/e2** | 4, 5, 6, 8, 10 mm* |

*other diameters on request

Your order: AK18 – [ ] / [ ]
e1 e2

## Servo clamp SK




Incremental encoders with servo flange can be easily and safely mounted by means of servo clamps. Three clamps are recommended for a secure fastening.

**Content per packaging unit(SK):**
1 servo clamp (1 x fastening eccentric, lock washer and cheese-head screw with hexagon socket)

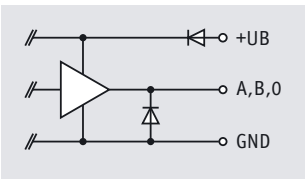
Your order: SK



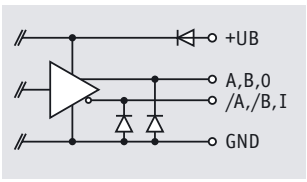
# Appendix/Circuits

## Circuit diagrams

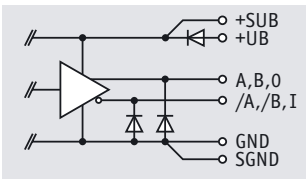
**PP**
(push-pull)



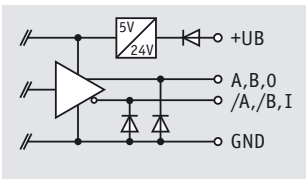

**OP**
(push-pull, complementary)



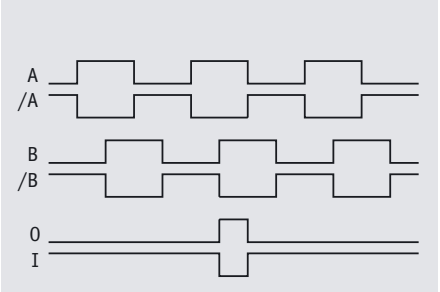

**LD5**
(line driver)

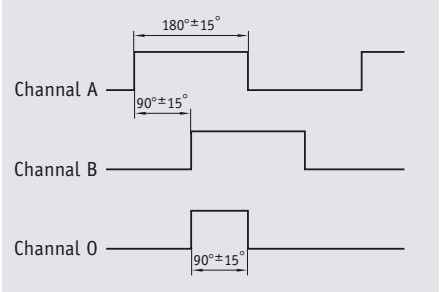



**LD24**
(line driver, 24 V DC supply)




## Output circuits



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