

EAM360-K - CANopen®

Encoder kit

Magnetic single- or multturn encoders 14 bit ST / 18 bit MT

Overview

- Encoder kit single- or multturn / CANopen®
- Precise magnetic sensing
- Angular accuracy up to $\pm 0.15^\circ$
- Additional incremental signals
- High protection up to IP 67
- High resistance to shock and vibrations
- Electronic gear function



Technical data

Technical data - electrical ratings

| | |
|-----------------------|---|
| Voltage supply | 10...30 VDC |
| Consumption typ. | 20 mA (24 VDC, w/o load) |
| Initializing time | ≤ 170 ms after power on |
| Data currency | < 1 ms |
| Interface | CANopen® CANopen®-Lift CANopen® + incremental |
| Function | Multiturn Singleturn |
| Profile conformity | CANopen® CiA communication profile DS 301, LSS profile DSP 305, device profile DS 406, DS 417 |
| Steps per revolution | ≤ 16384 / 14 bit |
| Number of revolutions | ≤ 262144 / 18 bit |
| Absolute accuracy | $\pm 0.15^\circ$ ($+20 \pm 15^\circ\text{C}$) $\pm 0.25^\circ$ ($-40 \dots +85^\circ\text{C}$) (see info working distance) |
| Sensing method | Magnetic |
| Code sequence | CW: ascending values with clockwise sense of rotation; looking at flange |
| Output stages | CAN-Bus, LV (3.3 V) compatible ISO 11898 Incremental: linedriver RS422 or push-pull (option) |
| Incremental output | 1024, 2048, 4096 ppr (other on request) |

Technical data - electrical ratings

| | |
|-----------------------|-----------------------|
| Output signals | A+, A-, B+, B- |
| Output frequency | ≤ 350 kHz |
| Interference immunity | EN 61000-6-2 |
| Emitted interference | EN 61000-6-4 |
| Approval | UL approval / E217823 |

Technical data - mechanical design

| | |
|-----------------------|---|
| Size (flange) | $\varnothing 36$ mm |
| Shaft type | $\varnothing 6$ mm (magnet bore) $\varnothing 8$ mm (magnet bore) $\varnothing 12$ mm (magnet bore) |
| Protection EN 60529 | IP 67 |
| Operating speed | ≤ 6000 rpm |
| Working distance | 1.1 ± 0.9 mm axial / ≤ 0.3 mm eccentricity |
| Material | Housing: steel zinc-coated Flange: aluminium |
| Operating temperature | $-40 \dots +65^\circ\text{C}$ (see general information) |
| Relative humidity | 95 % |
| Resistance | EN 60068-2-6 Vibration 30 g, 10-2000 Hz EN 60068-2-27 Shock 500 g, 1 ms |
| Weight approx. | 170 g |
| Connection | Flange connector M12, 5-pin Flange connector M12, 8-pin Cable 2 m |

Optional

- Protection against corrosion CX (C5-M)

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General information

Self-heating correlated to installation and ambient conditions as well as to electronics and supply voltage must be considered for precise thermal dimensioning. Operating the encoder close to the maximum limits requires measuring the real prevailing temperature at the encoder flange.

Terminal assignment

Cable

for connection reference -L

| Core colour | W/o incremental | With incremental |
|-------------|-----------------|------------------|
| white | 0 V | 0 V |
| brown | +Vs | +Vs |
| green | CAN_H | CAN_H |
| yellow | CAN_L | CAN_L |
| grey | CAN_GND | A+ |
| pink | n.c. | A- |
| blue | n.c. | B+ |
| red | n.c. | B- |

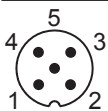
Screen: connected to housing

Cable data: 4 x 2 x 0.14 mm²

Flange connector M12, 5-pin

for connection reference -N

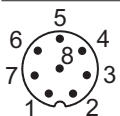
| Pin | W/o incremental |
|-----|-----------------|
| 1 | CAN_GND |
| 2 | +Vs |
| 3 | 0 V |
| 4 | CAN_H |
| 5 | CAN_L |



Flange connector M12, 8-pin

for connection reference -B

| Pin | With incremental |
|-----|------------------|
| 1 | 0 V |
| 2 | +Vs |
| 3 | CAN_H |
| 4 | CAN_L |
| 5 | A+ |
| 6 | A- |
| 7 | B+ |
| 8 | B- |

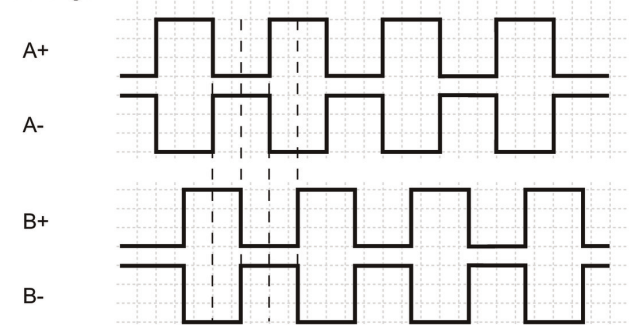


CANopen® features

| | |
|-------------------------|---|
| Operating modes | Timer-driven (Event-Time) Synchronously triggered (Sync) |
| Node Monitoring | Heartbeat Node guarding |
| Programmable parameters | Operating modes Total resolution Scaling Electronic gear function |
| Diagnosis | Multiturn sensing Position error Temperature exceeding Speed exceeding |
| Default | 50 kbit/s, Node ID 1 (DS406) 250 kbit/s, Node ID 4 (DS417) |

Output signals

Incremental signals: clockwise rotating direction when looking at flange.



Trigger level

| | |
|-------------------|--------|
| RS422 | |
| Output level High | >2.3 V |
| Output level Low | <0.5 V |
| Load | <20 mA |

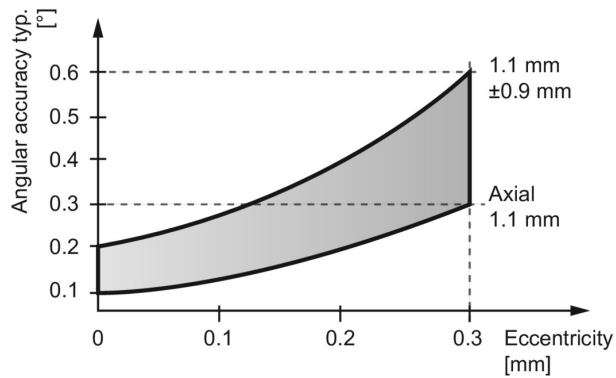
Push-pull

| | |
|-------------------|-------------|
| Output level High | ≥+VS -2.2 V |
| Output level Low | <0.7 V |
| Load | <20 mA |

Applies to standard cable lengths up to 2 m, for longer cables the voltage drop must be taken into account.

Working distance

The ideal working distance of the magnet related to the encoder is at an eccentricity of 0 mm and an axial distance of 1.1 mm. Deviation affects the accuracy as shown in following diagram.

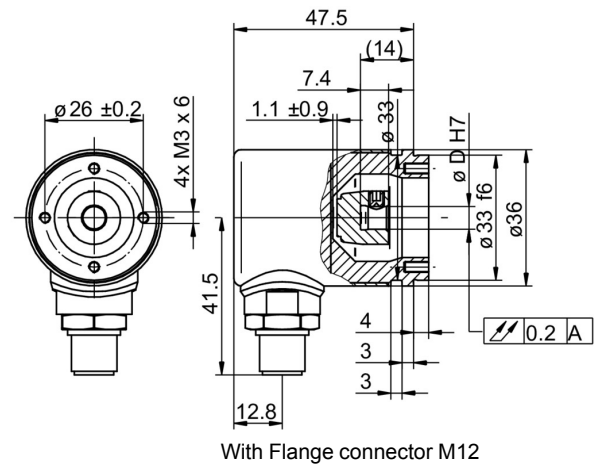
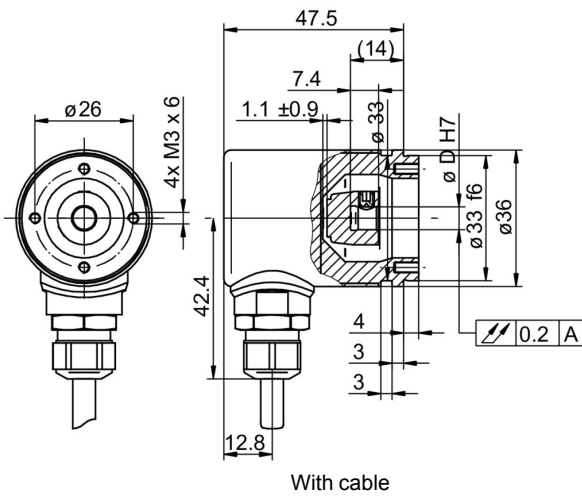


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Dimensions



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Ordering reference

| | | | | | | | | | | | | | | | |
|--|--------|---|---|---|----|---|---|---|----|---|----|----|---|---|---|
| | EAM360 | - | K | W | ## | . | 7 | # | ## | . | 14 | ## | # | . | A |
| Product | EAM360 | | | | | | | | | | | | | | |
| Shaft type | | | | | | | | | | | | | | | |
| Kit | | | | K | | | | | | | | | | | |
| Flange (kit) | | | | | | | | | | | | | | | |
| Synchro flange, ø33 mm, M3 | | | | W | | | | | | | | | | | |
| Magnet holder / bore diameter | | | | | | | | | | | | | | | |
| ø6 mm | | | | | 6 | | | | | | | | | | |
| ø8 mm | | | | | 8 | | | | | | | | | | |
| ø12 mm | | | | | C | | | | | | | | | | |
| Protection class | | | | | | | | | | | | | | | |
| IP 67 | | | | | | 7 | | | | | | | | | |
| Connection | | | | | | | | | | | | | | | |
| Flange socket radial, M12, 8-pin, male contacts, CCW | | | | | | | | B | | | | | | | |
| Cable radial, 2 m | | | | | | | | L | | | | | | | |
| Flange socket radial, M12, 5-pin, male contacts, A-coded | | | | | | | | N | | | | | | | |
| Voltage supply / interface | | | | | | | | | | | | | | | |
| 10...30 VDC, CANopen (DS 406) | | | | | | | | | C6 | | | | | | |
| 10...30 VDC, CANopen Lift (DS 417) | | | | | | | | | C7 | | | | | | |
| Resolution Singleturn | | | | | | | | | | | | | | | |
| 14 Bit | | | | | | | | | | | 14 | | | | |
| Resolution Multiturn | | | | | | | | | | | | | | | |
| No option | | | | | | | | | | | | 00 | | | |
| 18 Bit | | | | | | | | | | | | 18 | | | |
| Resolution supplement | | | | | | | | | | | | | | | |
| No option | | | | | | | | | | | | | 0 | | |
| 4096 ppr TTL (RS422), 4 channels | | | | | | | | | | | | | H | | |
| 2048 ppr TTL (RS422), 4 channels | | | | | | | | | | | | | 8 | | |
| 1024 ppr TTL (RS422), 4 channels | | | | | | | | | | | | | 5 | | |
| Operating temperature | | | | | | | | | | | | | | | A |
| -40...+85 °C | | | | | | | | | | | | | | | |