

## EAM360R-B - CANopen®/SAE J1939

Blind hollow shaft

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

### Overview

- Encoder single- or multiturn / CANopen®/SAE J1939
- E1 compliant design
- High protection IP 67
- High resistance to shock and vibrations
- Protection against corrosion CX (C5-M)
- Wire cross section 0.5 mm<sup>2</sup>
- Electronic gear function
- Applicable up to PLd (ISO 13849)



### 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                                                                                                                                                  |
| Interface             | CANopen®<br>SAE J1939                                                                                                                                                    |
| Function              | Multiturn<br>Singleturn                                                                                                                                                  |
| Profile conformity    | CANopen® CiA communication profile<br>DS 301, LSS profile DSP 305, device profile DS 406                                                                                 |
| Steps per revolution  | ≤16384 / 14 bit                                                                                                                                                          |
| Number of revolutions | ≤262144 / 18 bit                                                                                                                                                         |
| Absolute accuracy     | ±0,15 ° (+20 ±15 °C)<br>±0,25 ° (-40...+85 °C)                                                                                                                           |
| 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<br>ISO 11898                                                                                                                              |
| Interference immunity | EN 61000-6-2<br>ISO 11452-2:2004* / -5:2002*<br>ISO 7637-2:2004*<br>ISO 10605:2008 + Amd 1:2014 (CD ±8 kV / AD ±15 kV)<br>* Severity level according to ECE R10 (Rev. 4) |
| Emitted interference  | EN 61000-6-4<br>CISPR 25:2008 (30...1000 MHz)<br>ISO 7637-2:2004*<br>* Severity level according to ECE R10 (Rev. 4)                                                      |

#### Technical data - electrical ratings

|                               |                                                                                                                                           |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| MTTF <sub>d</sub> (ISO 13849) | High (>100 years)<br>Use in safety functions exclusively based on Application Note and MTTFd reliability prediction (request separately). |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|

#### Technical data - mechanical design

|                       |                                                                                       |
|-----------------------|---------------------------------------------------------------------------------------|
| Size (flange)         | ø36 mm                                                                                |
| Shaft type            | ø10...15 mm (blind hollow shaft)                                                      |
| Protection EN 60529   | IP 67 (with shaft seal)                                                               |
| Operating speed       | ≤6000 rpm                                                                             |
| Starting torque       | ≤2,5 Ncm (+20 °C, IP 67)                                                              |
| Moment of inertia     | 46,75 gcm <sup>2</sup>                                                                |
| Material              | Housing: steel, powder-coated<br>Flange: aluminium<br>Hollow shaft: stainless steel   |
| Corrosion protection  | IEC 60068-2-52 Salt mist<br>for ambient conditions CX (C5-M) according to ISO 12944-2 |
| Operating temperature | -40...+85 °C (see general information)                                                |
| Relative humidity     | 95 %                                                                                  |
| Resistance            | EN 60068-2-6<br>Vibration 30 g, 10...2000 Hz<br>EN 60068-2-27<br>Shock 500 g, 1 ms    |
| Weight approx.        | 170 g                                                                                 |
| Connection            | Flange connector M12, 5-pin<br>Cable 2 m                                              |

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## General information

Self-heating interrelated to speed, protection, attachment method and ambient conditions as well electronics and supply voltage must be considered for precise thermal dimensioning. Self-heating is supposed to approximates 12 K (IP 67 protection) per 1000 rpm. 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

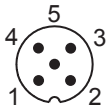
| Core colour | Signals |
|-------------|---------|
| white       | 0 V     |
| brown       | +Vs     |
| green       | CAN_H   |
| yellow      | CAN_L   |
| grey        | CAN_GND |

 Cable data: 5 x 0.5 mm<sup>2</sup>

### Flange connector M12, 5-pin

for connection reference -N

| Pin | Signals |
|-----|---------|
| 1   | CAN_GND |
| 2   | +Vs     |
| 3   | 0 V     |
| 4   | CAN_H   |
| 5   | CAN_L   |



## CANopen® features

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

## SAE J1939 features

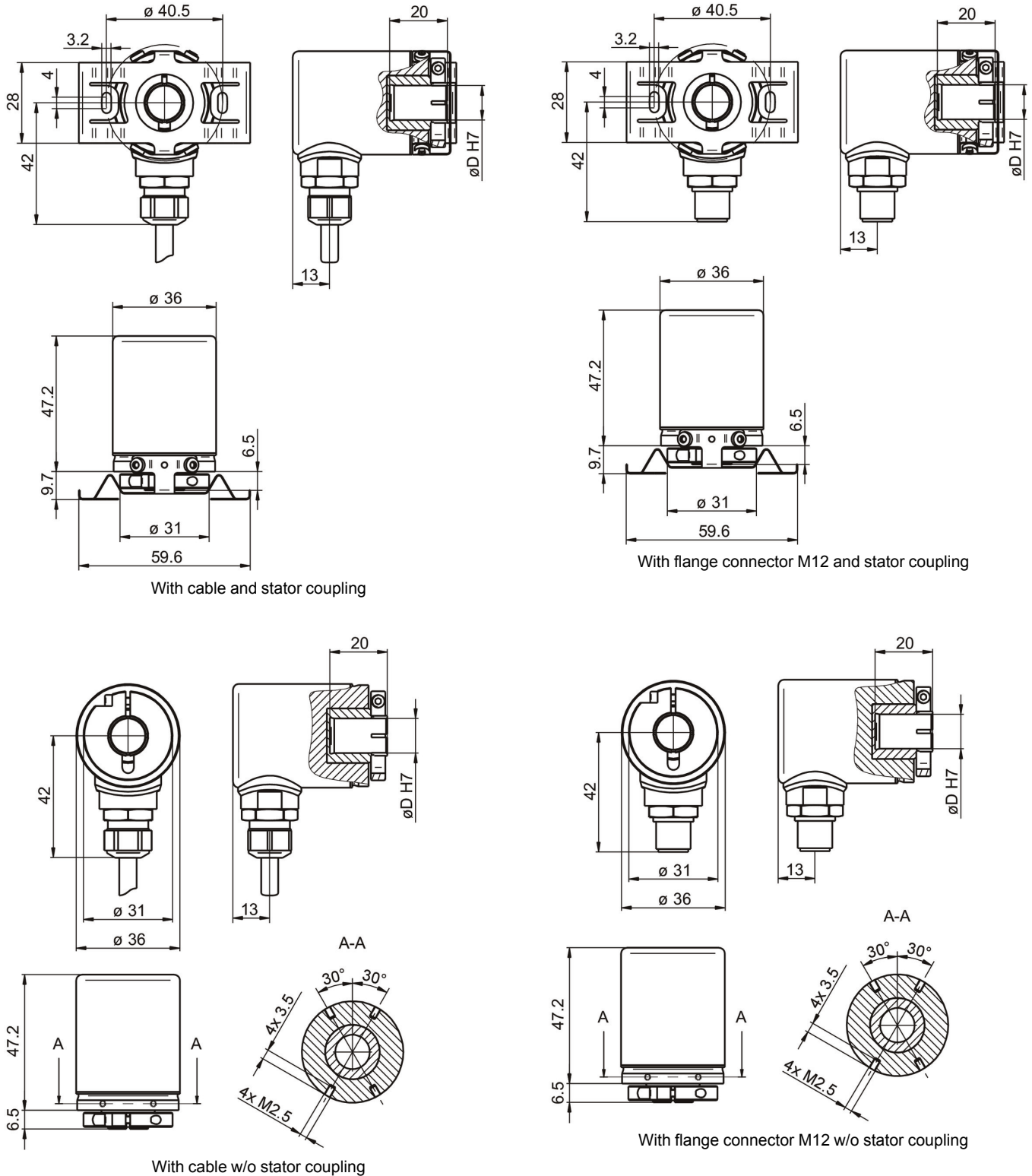
|                         |                                                                                 |
|-------------------------|---------------------------------------------------------------------------------|
| Programmable parameters | Total resolution<br>Scaling                                                     |
| Diagnosis               | Multiturn sensing<br>Position error<br>Temperature exceeding<br>Speed exceeding |
| Default                 | 250 kbit/s<br>ECU address 172                                                   |

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## Dimensions

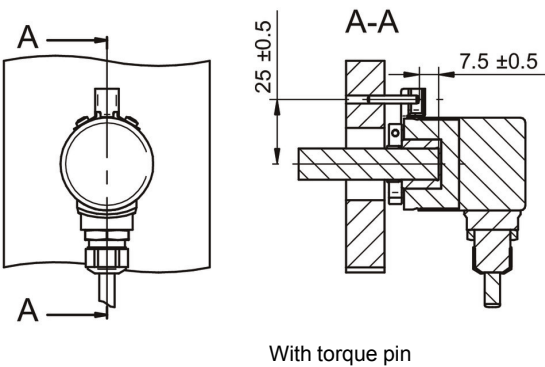
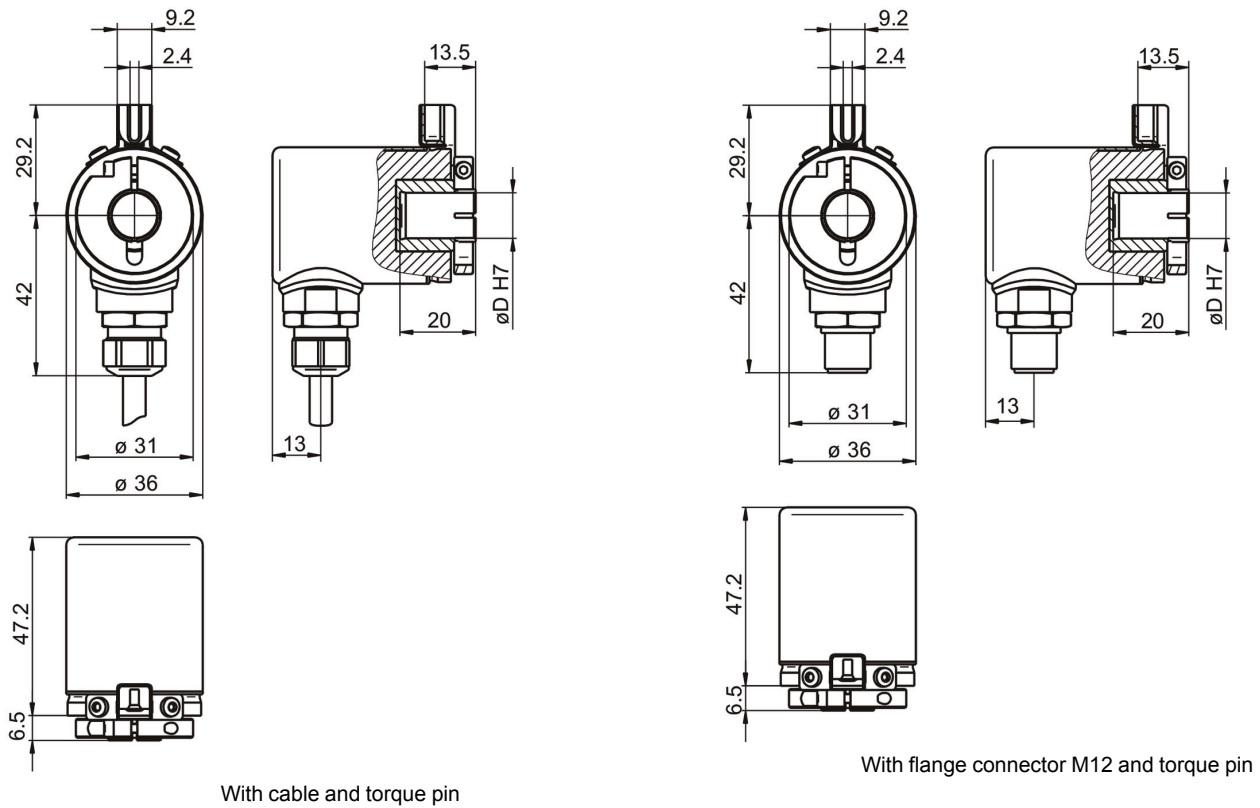


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## Dimensions



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## Ordering reference

|                                                          | EAM360R | - | B | # | ## | . | 7 | ## | ## | . | 14 | ## | 0 | . | A |
|----------------------------------------------------------|---------|---|---|---|----|---|---|----|----|---|----|----|---|---|---|
| <b>Product</b>                                           | EAM360R |   |   |   |    |   |   |    |    |   |    |    |   |   |   |
| <b>Shaft type</b>                                        |         |   |   |   |    |   |   |    |    |   |    |    |   |   |   |
| Blind hollow shaft                                       |         |   | B |   |    |   |   |    |    |   |    |    |   |   |   |
| <b>Flange (Hollow shaft)</b>                             |         |   |   |   |    |   |   |    |    |   |    |    |   |   |   |
| Without stator coupling                                  |         |   |   | N |    |   |   |    |    |   |    |    |   |   |   |
| Pin torque support 3 mm, axial/radial                    |         |   |   | P |    |   |   |    |    |   |    |    |   |   |   |
| With stator coupling 41 mm                               |         |   |   | D |    |   |   |    |    |   |    |    |   |   |   |
| <b>Blind hollow shaft</b>                                |         |   |   |   |    |   |   |    |    |   |    |    |   |   |   |
| ø10 mm, clamping ring, A-side                            |         |   |   |   | A  |   |   |    |    |   |    |    |   |   |   |
| ø12 mm, clamping ring, A-side                            |         |   |   |   | C  |   |   |    |    |   |    |    |   |   |   |
| ø14 mm, clamping ring, A-side                            |         |   |   |   | E  |   |   |    |    |   |    |    |   |   |   |
| ø15 mm, clamping ring, A-side                            |         |   |   |   | F  |   |   |    |    |   |    |    |   |   |   |
| <b>Protection class</b>                                  |         |   |   |   |    |   |   |    |    |   |    |    |   |   |   |
| IP 67                                                    |         |   |   |   |    |   | 7 |    |    |   |    |    |   |   |   |
| <b>Connection</b>                                        |         |   |   |   |    |   |   |    |    |   |    |    |   |   |   |
| Cable radial, 2 m                                        |         |   |   |   |    |   |   |    | L  |   |    |    |   |   |   |
| Flange socket radial, M12, 5-pin, male contacts, A-coded |         |   |   |   |    |   |   |    | N  |   |    |    |   |   |   |
| <b>Voltage supply / interface</b>                        |         |   |   |   |    |   |   |    |    |   |    |    |   |   |   |
| 10...30 VDC, CANopen (DS 406)                            |         |   |   |   |    |   |   |    | C6 |   |    |    |   |   |   |
| 10...30 VDC, SAE J1939                                   |         |   |   |   |    |   |   |    | C9 |   |    |    |   |   |   |
| <b>Resolution Singleturn</b>                             |         |   |   |   |    |   |   |    |    |   |    |    |   |   |   |
| 14 Bit                                                   |         |   |   |   |    |   |   |    |    |   | 14 |    |   |   |   |
| <b>Resolution Multiturn</b>                              |         |   |   |   |    |   |   |    |    |   |    |    |   |   |   |
| no option                                                |         |   |   |   |    |   |   |    |    |   |    | 00 |   |   |   |
| 18 Bit                                                   |         |   |   |   |    |   |   |    |    |   |    | 18 |   |   |   |
| <b>Resolution supplement</b>                             |         |   |   |   |    |   |   |    |    |   |    |    |   |   |   |
| No option                                                |         |   |   |   |    |   |   |    |    |   |    |    | 0 |   |   |
| <b>Operating temperature</b>                             |         |   |   |   |    |   |   |    |    |   |    |    |   |   | A |
| -40...+85 °C                                             |         |   |   |   |    |   |   |    |    |   |    |    |   |   |   |

## Accessories

### Connectors and cables

|          |                                                            |
|----------|------------------------------------------------------------|
| 11046264 | Female connector M12, 5-pin, straight, shielded, 2 m cable |
| 11046266 | Female connector M12, 5-pin, straight, shielded, 5 m cable |