# EAM580R-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 mm²
- 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 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 | |
|---|---|
| $MTTF_d$ (ISO 13849) | High (>100 years)<br>Use in safety functions exclusively based on Application Note and MTTFd reliability prediction (request separately). |
| Approval | UL approval / E217823 |
| **Technical data - mechanical design** | |
| Size (flange) | ø58 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 gcm² |
| 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...+75 °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. | 250 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.

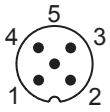
## Terminal assignment

**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 mm² | |

**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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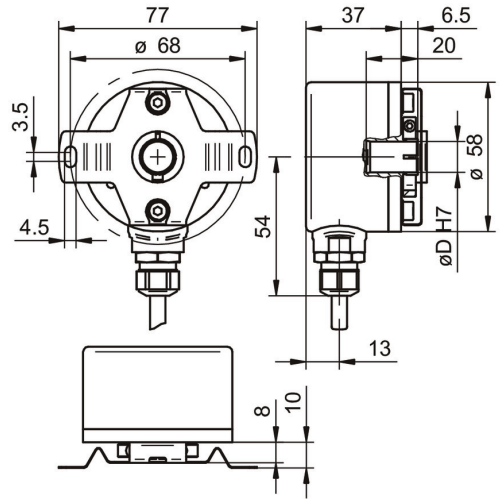
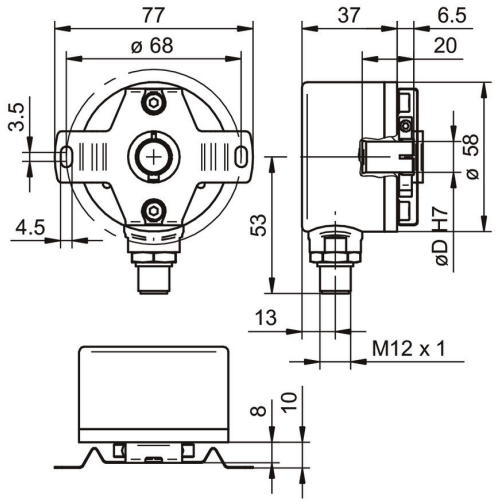
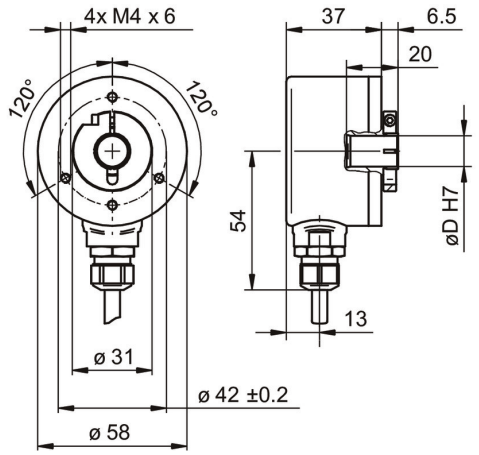
## Dimensions



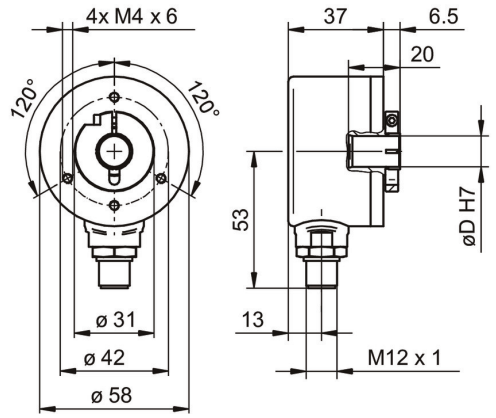

With cable and stator coupling



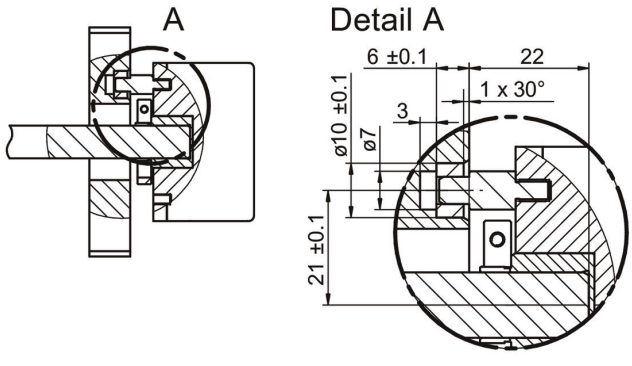

With flange connector M12 and stator coupling




With cable w/o stator coupling




With flange connector M12 w/o stator coupling




Torque pin

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## Ordering reference

| | EAM580R | - | B | # | ## | . | 7 | # | ## | . | 14 | ## | # | . | A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Product** | | | | | | | | | | | | | | | |
| | EAM580R | | | | | | | | | | | | | | |
| **Shaft type** | | | | | | | | | | | | | | | |
| Blind hollow shaft | | | B | | | | | | | | | | | | |
| **Flange (Hollow shaft)** | | | | | | | | | | | | | | | |
| Without stator coupling | | | | N | | | | | | | | | | | |
| With stator coupling 68 mm | | | | A | | | | | | | | | | | |
| Pin torque support 5 mm, axial | | | | E | | | | | | | | | | | |
| **Blind hollow shaft** | | | | | | | | | | | | | | | |
| 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 | | | | | | | | | | |
| **Protection class** | | | | | | | | | | | | | | | |
| IP 67 | | | | | | | 7 | | | | | | | | |
| **Connection** | | | | | | | | | | | | | | | |
| 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, SAE J1939 | | | | | | | | | C9 | | | | | | |
| **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** | | | | | | | | | | | | | | | |
| -40...+75 °C | | | | | | | | | | | | | | | A |

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