

EAM300-S - SSI

Solid shaft with synchro flange

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

Overview

- Encoder single- or multiturn / SSI
- Precise magnetic sensing
- Angular accuracy up to $\pm 0.15^\circ$
- Resolution max. 32 bit (14 bit ST, 18 bit MT)
- High resistance to shock and vibrations
- High protection up to IP 67
- Radial or axial plug and cable connection



Technical data

Technical data - electrical ratings

| | |
|-----------------------|--|
| Voltage supply | 4.5...30 VDC |
| Consumption typ. | 60 mA (5 VDC, w/o load) 20 mA (24 VDC, w/o load) |
| Initializing time | ≤ 170 ms after power on |
| Data currency | Typ. 2 μ s (cyclic request) |
| Interface | SSI |
| Function | Multiturn Singleturn |
| Operating mode | Linear feedback shift register (on request) |
| Steps per revolution | ≤ 16384 / 14 bit |
| Number of revolutions | ≤ 262144 / 18 bit |
| Absolute accuracy | $\pm 0.15^\circ$ (+20 $\pm 15^\circ$ C) $\pm 0.25^\circ$ (-40...+85 $^\circ$ C) |
| Sensing method | Magnetic |
| Code | Gray or binary |
| Code sequence | CW: ascending values with clockwise sense of rotation; looking at flange |
| Inputs | SSI clock: Linereceiver RS422 Zero setting input Counting direction |
| Output stages | SSI data: Linedriver RS422 |
| Interference immunity | EN 61000-6-2 |
| Emitted interference | EN 61000-6-3 (cable length <30 m, no connection to DC network) EN 61000-6-4 |
| Diagnostic function | DATAVALID (on request) |

Technical data - electrical ratings

Approval UL approval / E217823

Technical data - mechanical design

| | |
|-----------------------|--|
| Size (flange) | $\varnothing 30$ mm |
| Shaft type | $\varnothing 5 \times 12$ mm solid shaft $\varnothing 6 \times 12$ mm solid shaft $\varnothing 8 \times 12$ mm solid shaft |
| Flange | Synchro flange |
| Protection EN 60529 | IP 65 (without shaft seal) IP 67 (with shaft seal) |
| Operating speed | ≤ 6000 rpm |
| Starting torque | ≤ 0.75 Ncm (+20 $^\circ$ C, IP 65) ≤ 1.1 Ncm (+20 $^\circ$ C, IP 67) |
| Moment of inertia | 0.98 gcm ² |
| Admitted shaft load | ≤ 10 N axial ≤ 10 N radial |
| Material | Housing: steel zinc-coated Flange: aluminium Shaft: stainless steel |
| Operating temperature | -40...+65 $^\circ$ 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. | 150 g |
| Connection | Flange connector M12, 8-pin 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 approximate 6 K (standstill) and additionally for movement 1.5 K per 1000 rpm (IP 65) or 3.5 K per 1000 rpm (IP 67). 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** and **-U**

| Core colour | Signals | Description |
|-------------|---------|--------------------------|
| brown | +Vs | Voltage supply |
| white | 0 V | Voltage supply |
| green | Clock+ | Clock signal |
| yellow | Clock- | Clock signal |
| grey | Data+ | Data signal |
| pink | Data- | Data signal |
| blue | SET | Zero setting input |
| red | DIR | Counting direction input |

Screen: connected to housing

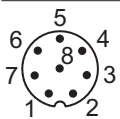
Cable data: 8 x 0.09 mm²

Flange connector M12, 8-pin

for connection reference **-A** and **-B**

| Pin | Signals | Description |
|-----|---------|--------------------------|
| 1 | 0 V | Voltage supply |
| 2 | +Vs | Voltage supply |
| 3 | Clock+ | Clock signal |
| 4 | Clock- | Clock signal |
| 5 | Data+ | Data signal |
| 6 | Data- | Data signal |
| 7 | SET | Zero setting input |
| 8 | DIR | Counting direction input |

Screen: connected to housing



Terminal significance

| | |
|-----|---|
| SET | Zero setting. Input for zero setting at any position. The zero setting operation is triggered by a high pulse and has to be in line with the selected direction of rotation (DIR). Impulse duration >100 ms. Connect to 0 V after zero setting for maximum interference immunity. |
| DIR | Counting direction input. The input is standard on high. For maximum interference immunity connect to +Vs respectively 0 V depending on counting direction. CW HIGH - CCW LOW (Version with DATAVALID does not include the counting direction input). |

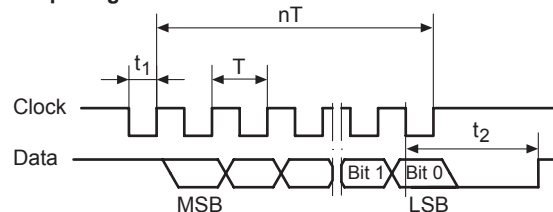
Trigger level

| Control inputs | Input circuit |
|------------------|---------------|
| Maximal | 0...+Vs |
| Input level Low | <1 V |
| Input level High | >2.1 V |

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

Data transfer

Output signal



$T = 0.5 \dots 10 \mu\text{s}$

$t_1 = 0.25 \dots 5 \mu\text{s}$

$t_2 = 20 \pm 2 \mu\text{s}$

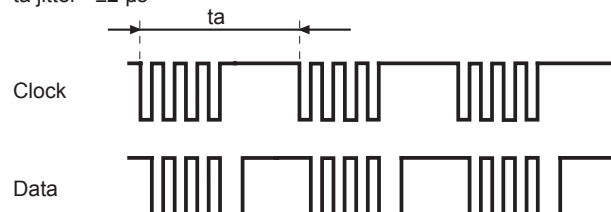
$f_{\text{max.}} = 2 \text{ MHz}$

Data acquisition time t_a

Following timing of the SSI Masters is the requirement for a data refresh rate of typ. 2 μs . If this is not fulfilled the data refresh rate is <50 μs .

$t_a < 5000 \mu\text{s}$

$t_a \text{ jitter} < \pm 2 \mu\text{s}$

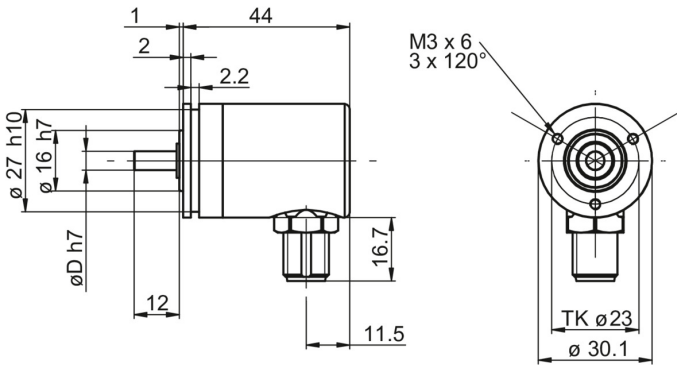


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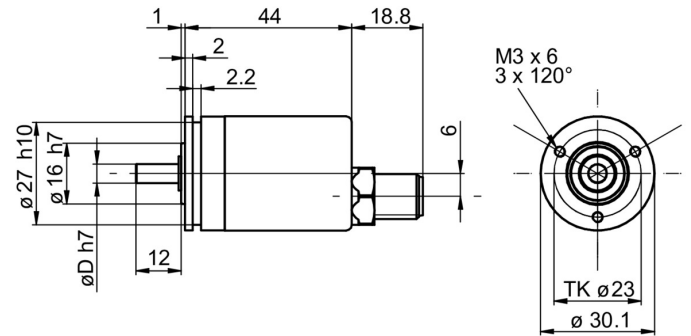
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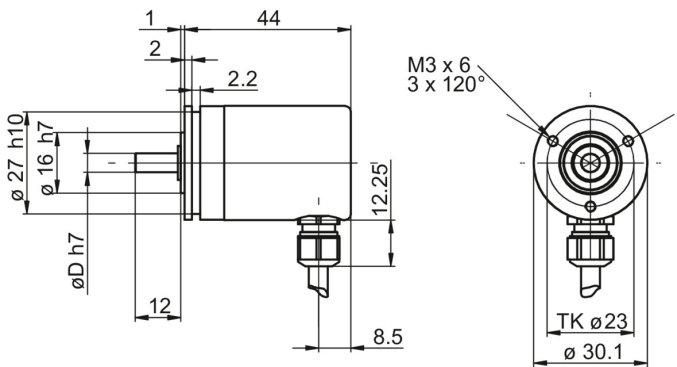
Dimensions



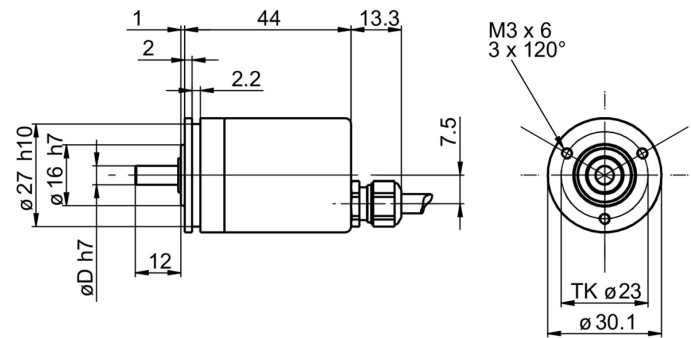
Flange connector M12, radial, IP 65



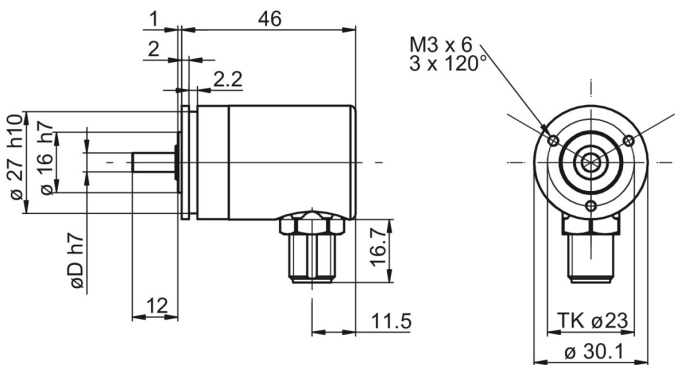
Flange connector M12, axial, IP 65



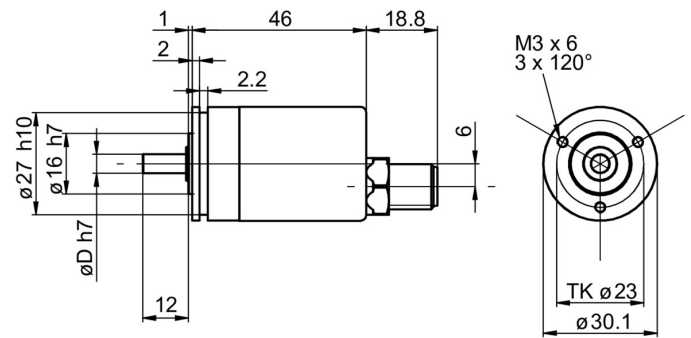
Cable, radial, IP 65



Cable, axial, IP 65



Flange connector M12, radial, IP 67



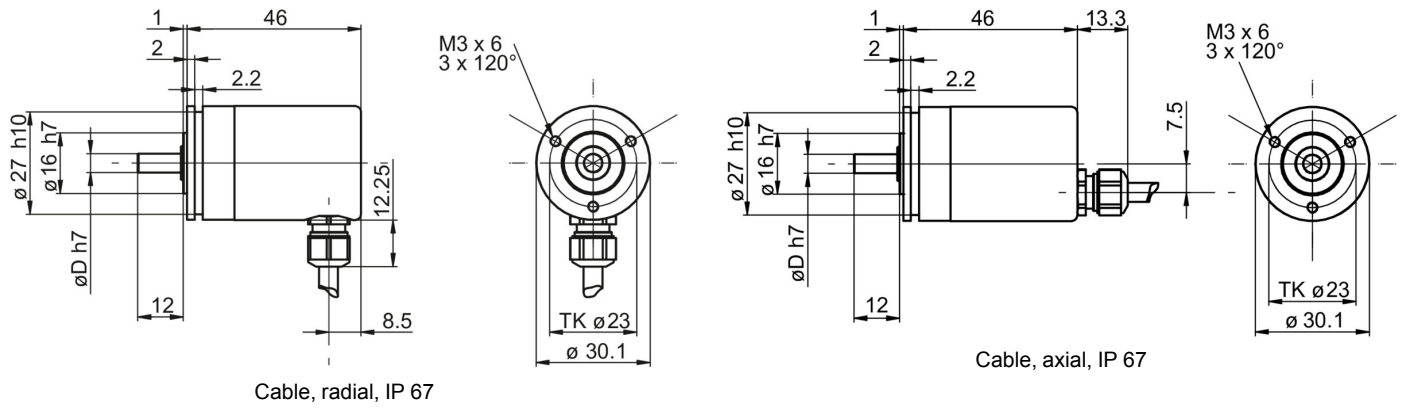
Flange connector M12, axial IP 67

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Dimensions



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Ordering reference

| | EAM300 | - | S | M | # | . | # | ## | ## | . | ## | ## | 0 | . | A |
|--|--------|---|---|---|---|---|---|----|----|---|----|----|----|---|---|
| Product | EAM300 | | | | | | | | | | | | | | |
| Shaft type | | | | | | | | | | | | | | | |
| Solid shaft | | | S | | | | | | | | | | | | |
| Flange (shaft) | | | | | | | | | | | | | | | |
| Bride synchro, ø27mm, M3 | | | | M | | | | | | | | | | | |
| Shaft | | | | | | | | | | | | | | | |
| ø8 x 12 mm | | | | | 8 | | | | | | | | | | |
| ø5 x 12 mm | | | | | 5 | | | | | | | | | | |
| ø6 x 12 mm | | | | | 6 | | | | | | | | | | |
| Protection class | | | | | | | | | | | | | | | |
| IP 65 | | | | | | | | 5 | | | | | | | |
| IP 67 | | | | | | | | 7 | | | | | | | |
| Connection | | | | | | | | | | | | | | | |
| Flange socket axial, M12, 8-pin, male contacts, CCW | | | | | | | | | A | | | | | | |
| Flange socket radial, M12, 8-pin, male contacts, CCW | | | | | | | | | B | | | | | | |
| Cable radial, 2 m | | | | | | | | | L | | | | | | |
| Cable axial, 2 m | | | | | | | | | U | | | | | | |
| Voltage supply / interface | | | | | | | | | | | | | | | |
| 4.5...30 VDC, SSI binary | | | | | | | | | 4B | | | | | | |
| 4.5...30 VDC, SSI gray | | | | | | | | | 4G | | | | | | |
| Resolution Singleturn | | | | | | | | | | | | | | | |
| 12 Bit | | | | | | | | | | | | 12 | | | |
| 13 Bit | | | | | | | | | | | | 13 | | | |
| 14 Bit | | | | | | | | | | | | 14 | | | |
| Resolution Multiturn | | | | | | | | | | | | | | | |
| No option | | | | | | | | | | | | | 00 | | |
| 12 Bit | | | | | | | | | | | | | 12 | | |
| 13 Bit | | | | | | | | | | | | | 13 | | |
| 16 Bit | | | | | | | | | | | | | 16 | | |
| 18 Bit | | | | | | | | | | | | | 18 | | |
| Resolution supplement | | | | | | | | | | | | | | | |
| No option | | | | | | | | | | | | | | 0 | |
| Operating temperature | | | | | | | | | | | | | | | A |
| -40...+85 °C | | | | | | | | | | | | | | | |

Accessories

Mounting accessories

10106004 Clamp set ø10 mm