# Absolute encoders - SSI
## Solid shaft with clamping flange
## Magnetic single- or multiturn encoders 14 bit ST / 18 bit MT

### EAM580-SC - SSI - *MAGRES*



EAM580-SC with clamping flange

| Features |
|---|
| – **Encoder single- or multiturn / SSI** |
| – **Precise magnetic sensing** |
| – **Resolution max. 32 bit (14 bit ST, 18 bit MT)** |
| – **Angular accuracy up to ±0.15°** |
| – **Additional incremental signals** |
| – **High protection up to IP 67** |
| – **High resistance to shock and vibrations** |

| Optional |
|---|
| – **Protection against corrosion C5-M** |

### Technical data - electrical ratings

| | |
|---|---|
| Voltage supply | 4.5…30 VDC (SSI, SSI + TTL/RS422) 5.5…30 VDC (SSI + HTL/Push-pull) |
| 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 µs (cyclic request) |
| Interfaces | SSI, SSI + incremental |
| 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 | ±0.15 ° (+20 ±15 °C) ±0.25 ° (-40...+85 °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 Incremental: linedriver RS422 or push-pull (option) |
| Incremental output | 1024, 2048, 4096 ppr (other on request) |
| Output signals | A+, A-, B+, B- |
| Output frequency | ≤350 kHz |
| Interference immunity | DIN EN 61000-6-2 |
| Emitted interference | DIN EN 61000-6-4 |
| Diagnostic function | DATAVALID (on request) |

### Technical data - mechanical design

| | |
|---|---|
| Size (flange) | ø58 mm |
| Shaft type | ø10 x 20 mm, solid shaft with flat |
| Flange | Clamping flange |
| Protection DIN EN 60529 | IP 65 (without shaft seal), IP 67 (with shaft seal) |
| Operating speed | ≤6000 rpm |
| Starting torque | ≤2 Ncm (+20 °C, IP 65) ≤2.5 Ncm (+20 °C, IP 67) |
| Moment of inertia | 15.38 gcm² |
| Admitted shaft load | ≤40 N axial ≤80 N radial |
| Materials | Housing: steel zinc-coated Flange: aluminium Shaft: stainless steel |
| Operating temperature | -40...+85 °C (see general information) |
| Relative humidity | 95 % |
| Resistance | DIN EN 60068-2-6 Vibration 30 g, 10-2000 Hz DIN EN 60068-2-27 Shock 500 g, 1 ms |
| Weight approx. | 250 g |
| Connection | Flange connector M12, 8-pin Flange connector M12, 12-pin Flange connector M23, 12-pin Cable 2 m |

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## Part number

EAM580-S | C | 0 | . | | | | . | | | | .A

**Resolution incremental signals**
0   Without incremental signals
H   4096 pulses, TTL (RS422)
8   2048 pulses, TTL (RS422)
5   1024 pulses, TTL (RS422)

**Resolution multiturn**
00   No option
12   12 bit
13   13 bit
16   16 bit
18   18 bit

**Resolution singleturn**
12   12 bit
13   13 bit
14   14 bit

**Voltage supply / signals**
4B   4.5...30 VDC / SSI binary
4G   4.5...30 VDC / SSI gray

**Connection**
B   Flange connector M12, 8-pin, radial, male contact, CCW
K   Flange connector M12, 12-pin, radial, male contact, CCW
F   Flange connector M23, 12-pin, radial, male contacts, CCW
L   Cable 2 m, radial

**Protection**
5   IP 65
7   IP 67

**Specification solid shaft**
0   ø10 x 20 mm, with flat

**Flange**
C   Clamping flange, ø36 mm, M3/M4

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#### Accessories

#### Connectors and cables

| | |
|---|---|
| 10146775 | Female connector M12, 8-pin, straight, without cable |
| 11170528 | Female connector M12, 8-pin, straight, shielded, 5 m cable (ESG 34FH0500GVS) |
| 11177375 | Female connector M12, 8-pin, straight, shielded, 10 m cable (ESG 34FH1000GVS) |
| 11091511 | Female connector M12, 8-pin, straight, shielded, 20 m cable |
| 10116717 | Female connector M23, 12-pin, straight, without cable |
| 11078614 | Female connector M12, 12-pin, straight, without cable |
| 11048452 | Female connector M12, 12-pin, straight, shielded, 2 m cable (ESG 34JP0200G) |
| 11043780 | Female connector M12, 12-pin, straight, shielded, 5 m cable (ESG 34JP0500G) |
| 11048455 | Female connector M12, 12-pin, straight, shielded, 10 m cable (ESG 34JP1000G) |

#### Mounting accessories

| | |
|---|---|
| 10106004 | Clamp set ø10 mm |

#### 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 3 K (IP 65 protection) respectively 8 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 significance

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

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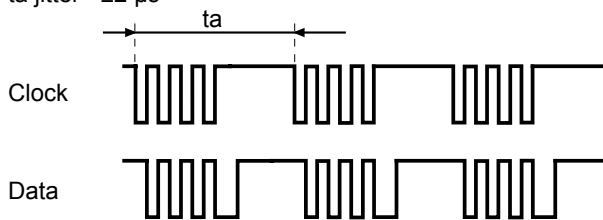
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## Data transfer

### Output signal
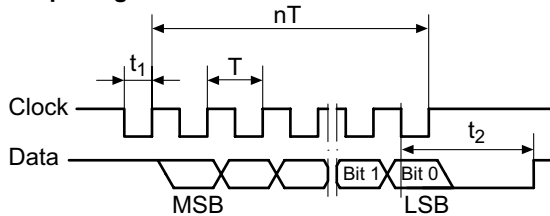


| | |
|---|---|
| T = 0.5...10 µs | $t_1$ = 0.25...5 µs |
| $t_2$ = 20 ±2 µs | f max. = 2 MHz |

### Data acquisition time ta

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.

ta <5000 µs

ta jitter <±2 µs



## Trigger level

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

| 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.

## Output signals

Incremental signals: clockwise rotating direction when looking at flange.
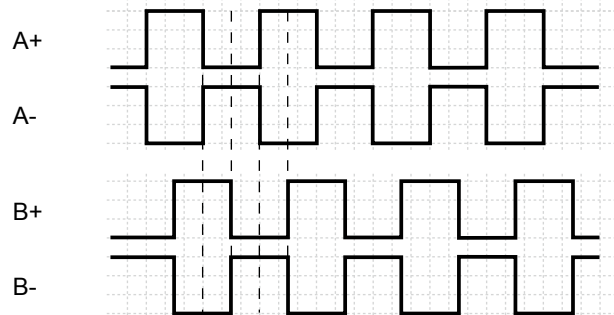
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**Baumer**

www.baumer.com/motion

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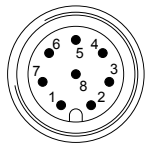
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**Terminal assignment**

**Cable / Flange connector M12, 8-pin / w/o incremental**
for connection reference **-L** and **-B**

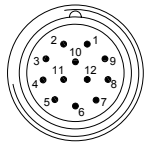| Pin | Core color | Signals | Description |
|---|---|---|---|
| 1 | white | 0 V | Supply voltage |
| 2 | brown | +Vs | Supply voltage |
| 3 | green | Clock+ | Clock signal |
| 4 | yellow | Clock- | Clock signal |
| 5 | grey | Data+ | Data signal |
| 6 | pink | Data- | Data signal |
| 7 | blue | SET | Zero setting input |
| 8 | red | DIR | Counting direction input |
| Screen | connected to housing | | |

Cable data: 4 x 2 x 0.14 mm², twisted in pairs



Male, A-coded

**Cable / Flange connector M12, 12-pin / with incremental**
for connection reference **-L** and **-K**

| Pin | Core color | Signals | Description |
|---|---|---|---|
| 1 | brown | +Vs | Supply voltage |
| 2 | blue | SET | Zero setting input |
| 3 | white | 0 V | Supply voltage |
| 4 | green | Clock+ | Clock signal |
| 5 | pink | Data- | Data signal |
| 6 | yellow | Clock- | Clock signal |
| 7 | black | A+ | Incremental signal |
| 8 | grey | Data+ | Data signal |
| 9 | red | DIR | Counting direction input |
| 10 | violet | A- | Incremental signal |
| 11 | grey/pink | B+ | Incremental signal |
| 12 | red/blue | B- | Incremental signal |
| Screen | connected to housing | | |

Cable data: 6 x 2 x 0.14 mm², twisted in pairs



Male, A-coded

**Flange connector M23, 12-pin / w/o incremental**
for connection reference **-F**

| Pin | Core color | Signals | Description |
|---|---|---|---|
| 1 | pink | Data- | Data signal |
| 2 | – | – | – |
| 3 | blue | SET | Zero setting input |
| 4 | red | DIR | Counting direction input |
| 5 | green | Clock+ | Clock signal |
| 6 | yellow | Clock- | Clock signal |
| 7 | – | – | – |
| 8 | grey | Data+ | Data signal |
| 9 | – | – | – |
| 10 | white | 0 V | Supply voltage |
| 11 | – | – | – |
| 12 | brown | +Vs | Supply voltage |
| Screen | connected to housing | | |

Cable data: 4 x 2 x 0.14 mm², twisted in pairs

**Flange connector M23, 12-pin / with incremental**
for connection reference **-F**

| Pin | Core color | Signals | Description |
|---|---|---|---|
| 1 | brown | +Vs | Supply voltage |
| 2 | white | 0 V | Supply voltage |
| 3 | green | Clock+ | Clock signal |
| 4 | grey | Data+ | Data signal |
| 5 | blue | SET | Zero setting input |
| 6 | pink | Data- | Data signal |
| 7 | yellow | Clock- | Clock signal |
| 8 | red/blue | B- | Incremental signal |
| 9 | red | DIR | Counting direction input |
| 10 | violet | A- | Incremental signal |
| 11 | black | A+ | Incremental signal |
| 12 | grey/pink | B+ | Incremental signal |
| Screen | connected to housing | | |

Cable data: 6 x 2 x 0.14 mm², twisted in pairs
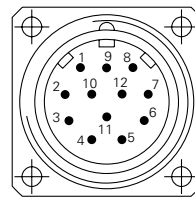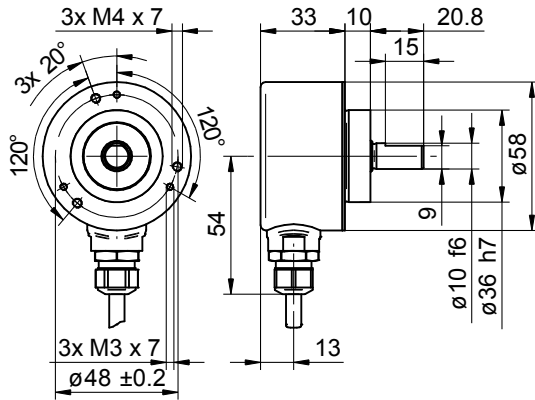
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## Dimensions

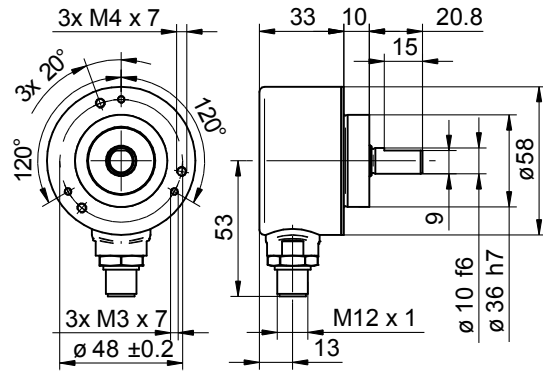**EAM580-SC with cable**



**EAM580-SC with flange connector M12**



**EAM580-SC with flange connector M23**