

## EAM300-B - SSI

Blind hollow shaft

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	$\leq 170$ ms after power on
Data currency	Typ. 2 $\mu$ s (cyclic request)
Interface	SSI
Function	Multiturn Singleturn
Operating mode	Linear feedback shift register (on request)
Steps per revolution	$\leq 16384$ / 14 bit
Number of revolutions	$\leq 262144$ / 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

#### Technical data - electrical ratings

Diagnostic function	DATAVALID (on request)
Approval	UL approval / E217823

#### Technical data - mechanical design

Size (flange)	$\varnothing 30$ mm
Shaft type	$\varnothing 6$ mm (blind hollow shaft)
Protection EN 60529	IP 65 (without shaft seal) IP 67 (with shaft seal)
Operating speed	$\leq 6000$ rpm
Starting torque	$\leq 0.75$ Ncm (+20 $^\circ$ C, IP 65) $\leq 1.1$ Ncm (+20 $^\circ$ C, IP 67)
Moment of inertia	0.71 gcm <sup>2</sup>
Admitted shaft load	$\leq 10$ N axial $\leq 10$ N radial
Material	Housing: steel zinc-coated Flange: aluminium Hollow 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.	130 g
Connection	Flange connector M12, 8-pin Cable 2 m

## EAM300-B - SSI

Blind hollow shaft

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

### 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

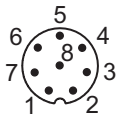
Cable data: 8 x 0.09 mm<sup>2</sup>

#### 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).

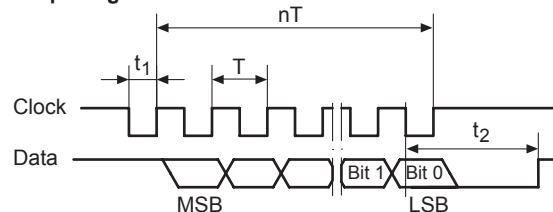
### Trigger level

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



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

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

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

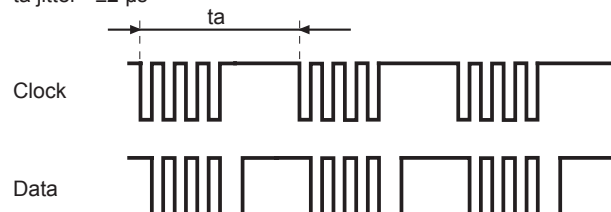
$f_{\text{max.}} = 2 \text{ MHz}$

#### Data acquisition time $t_a$

Following timing of the SSI Masters is the requirement for a data refresh rate of typ. 2  $\mu\text{s}$ . If this is not fulfilled the data refresh rate is <50  $\mu\text{s}$ .

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

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

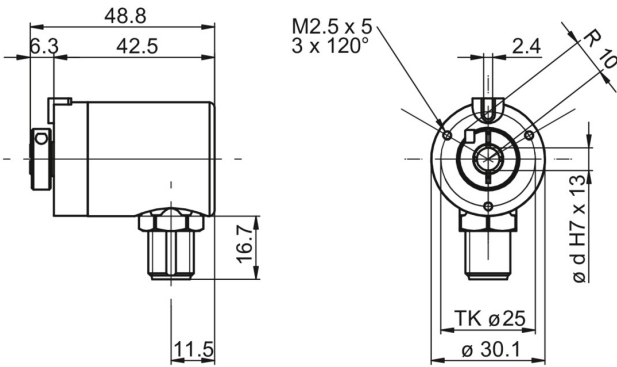


## EAM300-B - SSI

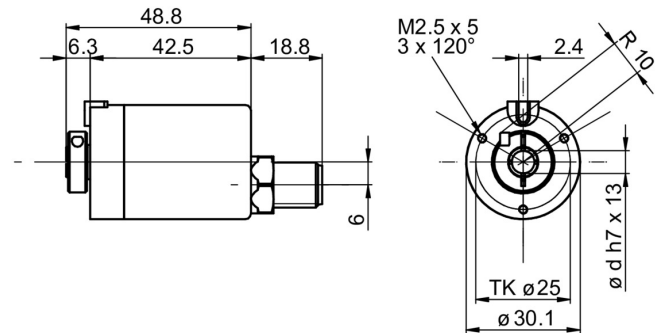
Blind hollow shaft

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

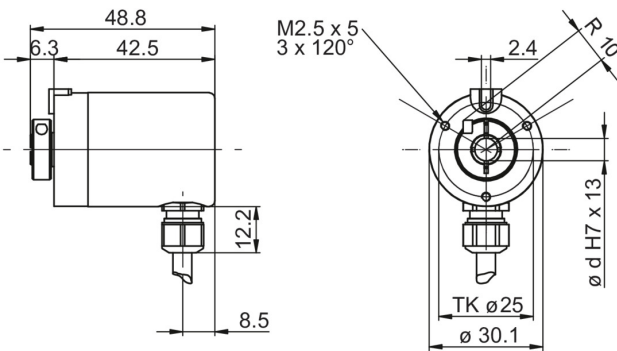
### Dimensions



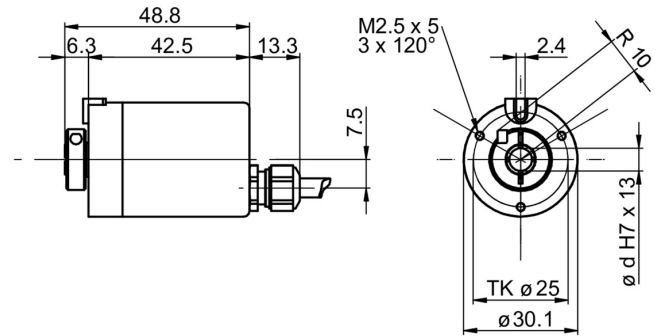
Flange connector M12, radial, IP 65



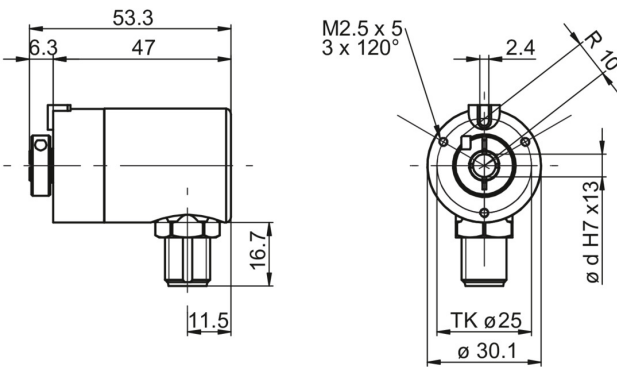
Flange connector M12, axial, IP 65



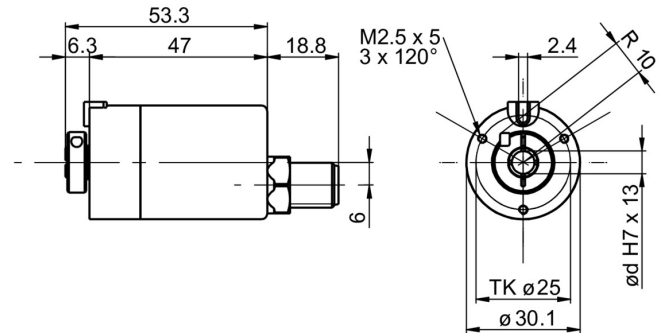
Cable, radial, IP 65



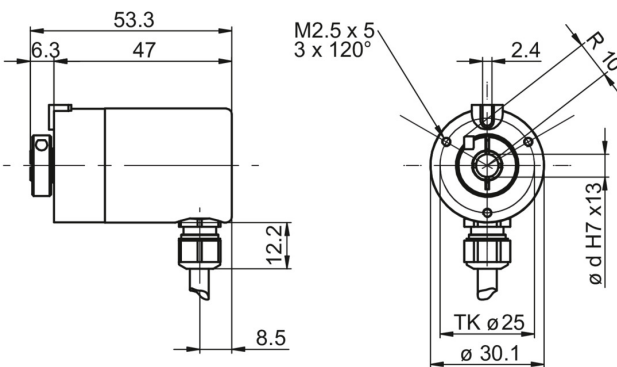
Cable, axial, IP 65



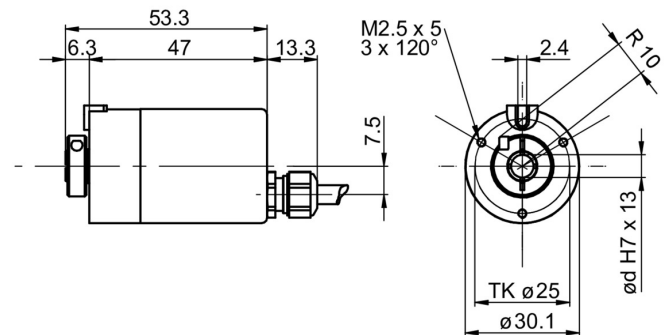
Flange connector M12, radial, IP 67



Flange connector M12, axial, IP 67



Cable, radial, IP 67



Cable, axial, IP 67

## EAM300-B - SSI

Blind hollow shaft

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

### Ordering reference

	EAM300	-	B	#	6	.	#	##	##	.	##	##	0	.	A
<b>Product</b>	EAM300														
<b>Shaft type</b>															
Blind hollow shaft				B											
<b>Flange (Hollow shaft)</b>															
Without stator coupling				N											
With stator coupling 36 mm				F											
<b>Blind hollow shaft</b>															
ø 6 mm, clamping ring, A-side					6										
<b>Protection class</b>															
IP 65								5							
IP 67								7							
<b>Connection</b>															
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						
<b>Voltage supply / interface</b>															
4.5...30 VDC, SSI binary									4B						
4.5...30 VDC, SSI gray									4G						
<b>Resolution Singleturn</b>															
12 Bit												12			
13 Bit												13			
14 Bit												14			
<b>Resolution Multiturn</b>															
No option													00		
12 Bit													12		
13 Bit													13		
16 Bit													16		
18 Bit													18		
<b>Resolution supplement</b>															
No option														0	
<b>Operating temperature</b>															A
-40...+85 °C															

### Accessories

#### Mounting accessories

10164796 Set of spring plate