

EAM580-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
- Resolution max. 32 bit (14 bit ST, 18 bit MT)
- Angular accuracy up to $\pm 0.15^\circ$
- Additional incremental signals
- High protection up to IP 67
- High resistance to shock and vibrations



Technical data

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 μ s (cyclic request)
Interface	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	$\pm 0.15^\circ$ (+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 Incremental: linedriver RS422 or push-pull (option)
Incremental output	1024, 2048, 4096 ppr (other on request)
Output signals	A+, A-, B+, B-

Technical data - electrical ratings

Output frequency	≤ 350 kHz
Interference immunity	EN 61000-6-2
Emitted interference	EN 61000-6-4
Diagnostic function	DATAVALID (on request)
Approval	UL approval / E217823

Technical data - mechanical design

Size (flange)	$\varnothing 58$ mm
Shaft type	$\varnothing 10...15$ mm (blind hollow shaft)
Protection EN 60529	IP 65 (without shaft seal) IP 67 (with shaft seal)
Operating speed	≤ 6000 rpm
Starting torque	≤ 2 Ncm (+20 $^\circ$ C, IP 65) ≤ 2.5 Ncm (+20 $^\circ$ C, IP 67)
Moment of inertia	46.75 gcm ²
Material	Housing: steel zinc-coated Flange: aluminium Hollow shaft: stainless steel
Operating temperature	-40...+85 $^\circ$ 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.	250 g
Connection	Flange connector M12, 8-pin Flange connector M12, 12-pin Flange connector M23, 12-pin Cable 2 m

Optional

- Protection against corrosion CX (C5-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 (IP 65 protection) respectively 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.

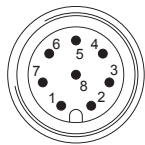
Terminal assignment

Cable / 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



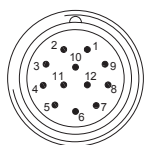
Male, A-coded

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

Terminal assignment

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

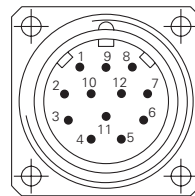
Cable data: 4 x 2 x 0.14 mm², twisted in pairs

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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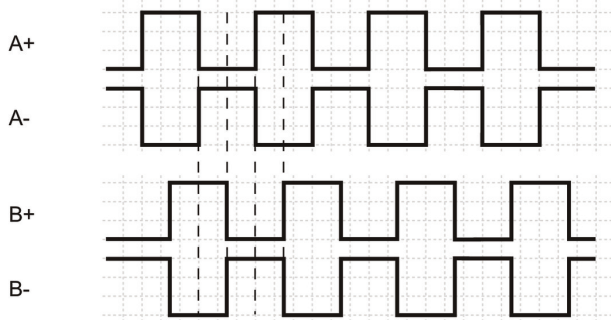
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Terminal significance

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).

Output signals

Incremental signals: clockwise rotating direction when looking at flange.



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

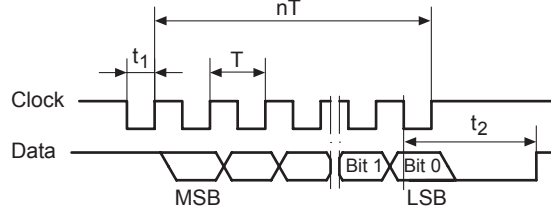
Push-pull

Output level High	$\geq +V_S - 2.2 \text{ V}$
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.

Data transfer

Output signal



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

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

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

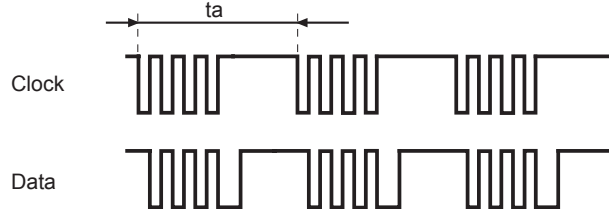
$$f_{\text{max.}} = 2 \text{ MHz}$$

Data acquisition time 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 < $\pm 2 \mu\text{s}$

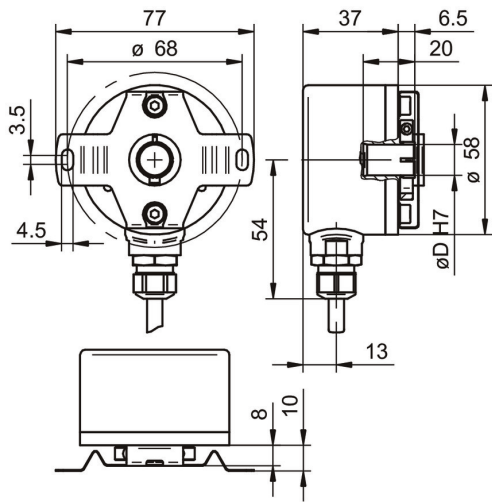


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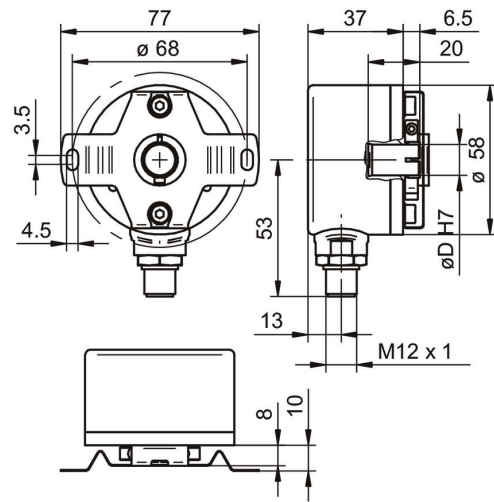
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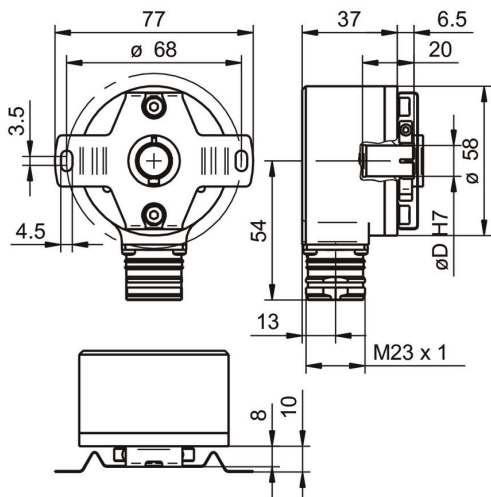
Dimensions



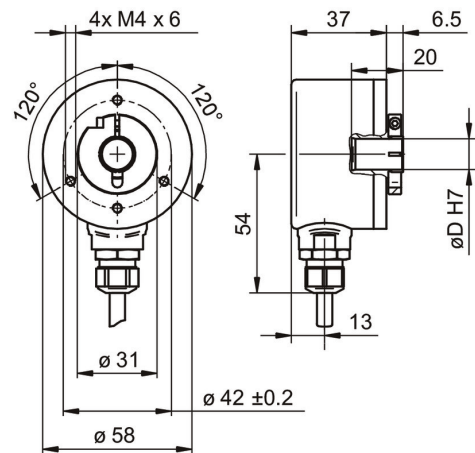
With cable and stator coupling



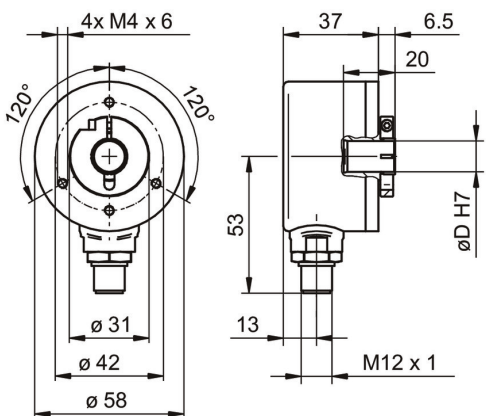
With flange connector M12 and stator coupling



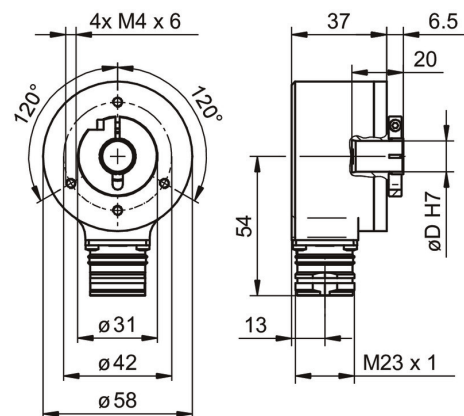
EAM580, M23 with stator coupling



With cable w/o stator coupling



With flange connector M12 w/o stator coupling



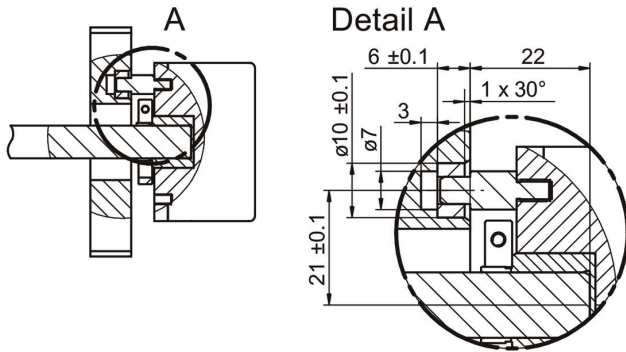
EAM580, M23 w/o stator coupling

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Dimensions



Torque pin

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Ordering reference

	EAM580	-	B	#	##	.	#	#	##	.	##	##	#	.	A
Product	EAM580														
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 65														5
	IP 67														7
Connection	Flange socket radial, M12, 8-pin, male contacts, CCW														B
	Flange socket radial, M23, 12-pin, male contacts, CCW														F
	Flange socket radial, M12, 12-pin, male contacts, CCW														K
	Cable radial, 2 m														L
Voltage supply / interface	4.5...30 VDC, SSI binary														4B
	4.5...30 VDC, SSI gray														4G
Resolution Singleturn	10 Bit														10
	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
	4096 ppr TTL (RS422), 4 channels														H
	2048 ppr TTL (RS422), 4 channels														8
	1024 ppr TTL (RS422), 4 channels														5
Operating temperature	-40...+85 °C														A

Accessories

Mounting accessories

11136718 Set of spring washers - EAM580