

Absolute encoders - SSI

Solid shaft with synchro flange

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

EAM360-S - SSI - MAGRES



EAM360 SSI with shaft

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)

Features

- Encoder single- or multiturn / SSI
- Precise magnetic sensing
- Angular accuracy up to ±0.15°
- Resolution max. 32 bit (14 bit ST, 18 bit MT)
- Additional incremental signals
- Clock frequency up to 2 MHz
- High protection up to IP 67
- High resistance to shock and vibrations

Optional

- Protection against corrosion C5-M

Technical data - mechanical design

Size (flange)	ø36 mm
Shaft type	ø10 x 16 mm, solid shaft with flat
Flange	Synchro 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 gcm ²
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.	170 g
Connection	Flange connector M12, 8-pin Flange connector M12, 12-pin Cable 2 m

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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
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 \varnothing 10 mm
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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 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.

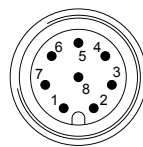
Terminal assignment

Cable / Flange connector M12, 8-pin 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



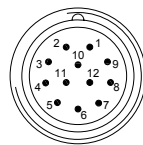
Male, A-coded

Cable / Flange connector M12, 12-pin 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

* Not applicable by option: DATAVALID

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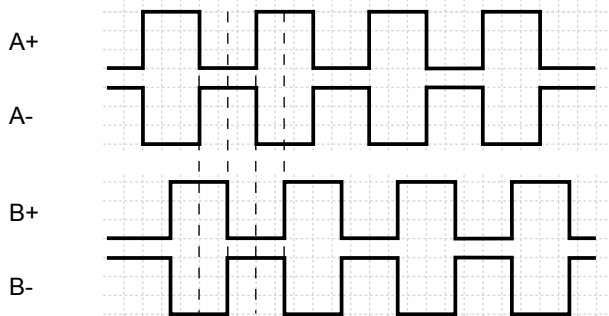
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Terminal significance

SET	<p>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.</p>
DIR	<p>Counting direction input. CW HIGH - CCW LOW The input is standard on high. For maximum interference immunity connect to +Vs respectively 0 V depending on counting direction. (Version with DATAVALID does not include the counting direction input).</p>

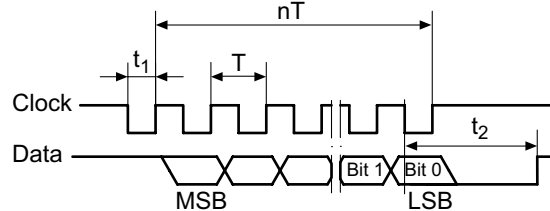
Output signals

Incremental signals: clockwise rotating direction when looking at flange.



Data transfer

Output signal

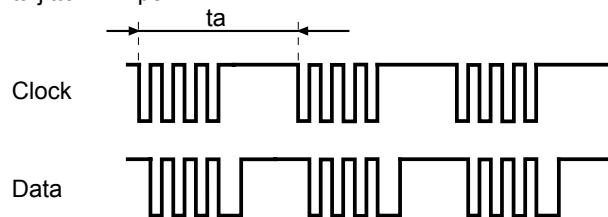


$T = 0.5...10 \mu\text{s}$	$t_1 = 0.25...5 \mu\text{s}$
$t_2 = 20 \pm 2 \mu\text{s}$	$f \text{ max.} = 2 \text{ MHz}$

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 $<50 \mu\text{s}$.

$t_a < 5000 \mu\text{s}$
 $t_a \text{ jitter} < \pm 2 \mu\text{s}$



Trigger level

Control inputs	Input circuit
Maximal	$0...+V_s$
Input level Low	$<1 \text{ V}$
Input level High	$>2.1 \text{ V}$

RS422

Output level High	$>2.3 \text{ V}$
Output level Low	$<0.5 \text{ V}$
Load	$<20 \text{ mA}$

Push-pull

Output level High	$\geq +V_s - 2.2 \text{ V}$
Output level Low	$<0.7 \text{ V}$
Load	$<20 \text{ mA}$

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

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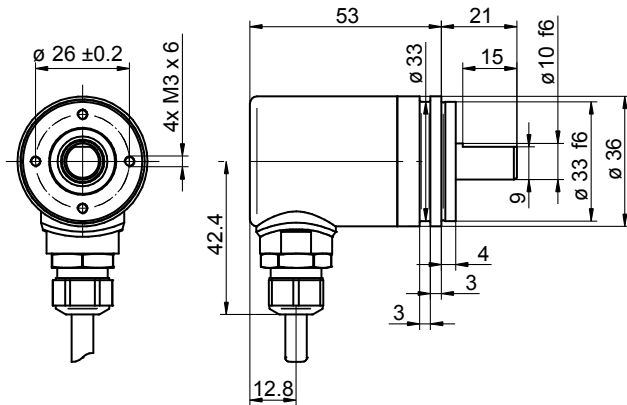
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Dimensions

EAM360, cable



EAM360, M12 radial

