

Absolute encoders - bus interfaces

Encoder kit

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

EAM360-K - CANopen® - MAGRES



EAM360 Kit with M12

Features

- Encoder kit single- or multiturn / CANopen®
- Precise magnetic sensing
- Angular accuracy up to $\pm 0.15^\circ$
- Additional incremental signals
- High protection up to IP 67
- High resistance to shock and vibrations
- Electronic gear function

Optional

- Protection against corrosion C5-M

Technical data - electrical ratings

Voltage supply	10...30 VDC
Consumption typ.	20 mA (24 VDC, w/o load)
Initializing time	≤ 170 ms after power on
Data currency	< 1 ms
Interfaces	CANopen®, CANopen®-Lift, CANopen® + incremental
Function	Multiturn, Singleturn
Profile conformity	CANopen® CiA communication profile DS 301, LSS profile DSP 305, device profile DS 406, DS 417
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) (see info working distance)
Sensing method	Magnetic
Code sequence	CW: ascending values with clockwise sense of rotation; looking at flange
Output stages	CAN-Bus, LV (3.3 V) compatible ISO 11898 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

Technical data - mechanical design

Size (flange)	$\varnothing 36$ mm
Shaft type	$\varnothing 6$ mm (magnet bore) $\varnothing 8$ mm (magnet bore) $\varnothing 12$ mm (magnet bore)
Protection DIN EN 60529	IP 67
Operating speed	≤ 6000 rpm
Working distance	1.1 \pm 0.9 mm axial / ≤ 0.3 mm eccentricity
Materials	Housing: steel zinc-coated Flange: aluminium
Operating temperature	-40...+85 $^\circ$ 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, 5-pin Flange connector M12, 8-pin Cable 2 m

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Accessories

Connectors and cables

11046264	Female connector M12, 5-pin, straight, shielded, 2 m cable
11046266	Female connector M12, 5-pin, straight, shielded, 5 m cable
10127844	Female connector M12, 8-pin, straight, shielded, 2 m cable
11201509	Cable with male/female M12, 5-pin, straight, A-coded, 2 m (ESG 34C/KSG34C)
11201520	Cable with male/female M12, 5-pin, straight, A-coded, 5 m (ESG 34C/KSG34C)

General information

Self-heating correlated to installation and ambient conditions as well as to electronics and supply voltage must be considered for precise thermal dimensioning. 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**

Core colour	W/o incremental	With incremental
white	0 V	0 V
brown	+Vs	+Vs
green	CAN_H	CAN_H
yellow	CAN_L	CAN_L
grey	CAN_GND	A+
pink	n.c.	A-
blue	n.c.	B+
red	n.c.	B-

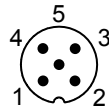
Screen: connected to housing

Cable data: 4 x 2 x 0.14 mm²

Flange connector M12, 5-pin

for connection reference **-N**

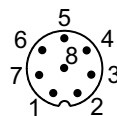
Pin	W/o incremental
1	CAN_GND
2	+Vs
3	0 V
4	CAN_H
5	CAN_L



Flange connector M12, 8-pin

for connection reference **-B**

Pin	With incremental
1	0 V
2	+Vs
3	CAN_H
4	CAN_L
5	A+
6	A-
7	B+
8	B-



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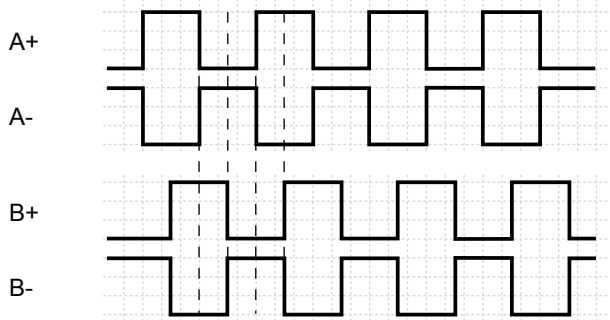
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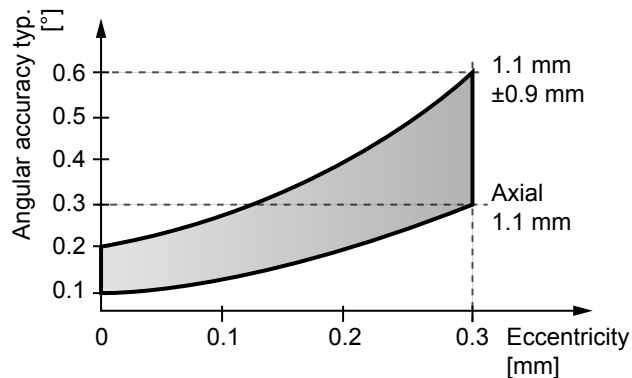
Output signals

Incremental signals: clockwise rotating direction when looking at flange.



Working distance

The ideal working distance of the magnet related to the encoder is at an eccentricity of 0 mm and an axial distance of 1.1 mm. Deviation affects the accuracy as shown in following diagram.



CANopen® features

Operating modes	Timer-driven (Event-Time) Synchronously triggered (Sync)
Node Monitoring	Heartbeat Node guarding
Programmable parameters	Operating modes Total resolution Scaling Electronic gear function
Diagnosis	Multiturn sensing Position error Temperature exceeding Speed exceeding
Default	50 kbit/s, Node ID 1 (DS406) 250 kbit/s, Node ID 4 (DS417)

Trigger level

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.

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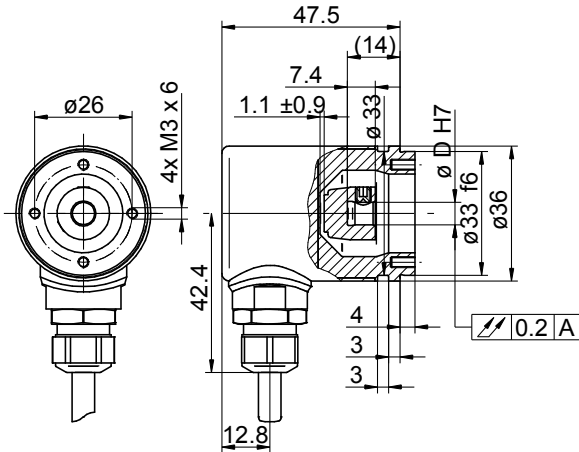
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Dimensions

EAM360 Kit, cable



EAM360 Kit, M12

