



# Absolute rotary encoder

## ENA58IL-S\*\*\*-J1939

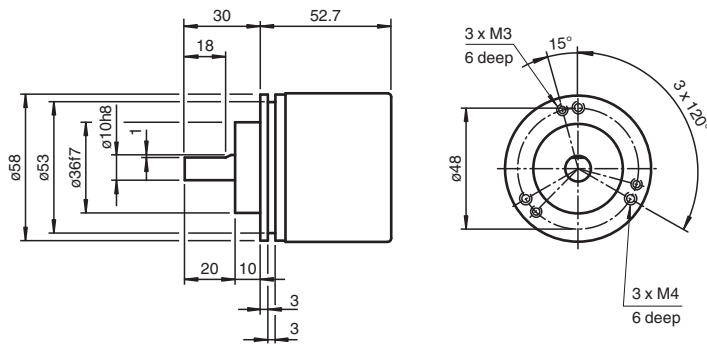
- Solid shaft
- Up to 31 bit overall resolution
- CAN bus with SAE J1939 protocol
- Free of wear magnetic sampling
- High resolution and accuracy



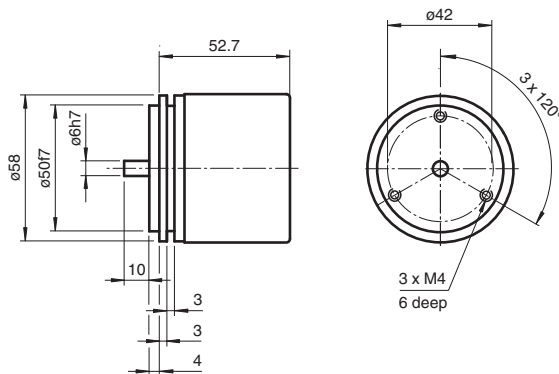
### Function

This absolute rotary encoder provides a position value corresponding to the shaft position on its integrated J1939 interface. The rugged miniature encoders are based on magnetic sampling.

### Dimensions



Clamping flange



Servo flange

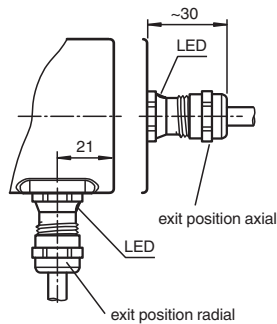
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**Dimensions**

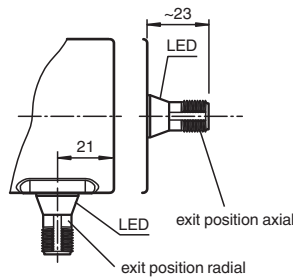
Connections

Dimensions in mm

Cable



Connector M12



**Technical Data**

**General specifications**

Detection type	magnetic sampling	
Device type	Absolute rotary encoder	
Linearity error	≤ ± 0.1 °	
UL File Number	E223176 "For use in NFPA 79 Applications only" , if UL marking is marked on the product.	

**Indicators/operating means**

LED green	Operating mode
LED red	wrong baud rate

**Electrical specifications**

Operating voltage	U <sub>B</sub>	9 ... 30 V DC (with galvanic isolation)
Power consumption	P <sub>0</sub>	≤ 1.2 W
Time delay before availability	t <sub>v</sub>	< 250 ms
Output code	binary code	
Code course (counting direction)	adjustable	

**Interface**

Interface type	J1939	
Resolution		
Single turn	up to 16 Bit	
Multiturn	up to 15 Bit	
Overall resolution	up to 31 Bit	
Transfer rate	min. 20 kBit/s , max. 1 MBit/s	
Cycle time	≥ 1 ms	
Standard conformity	ISO 11898	

**Connection**

Connector	M12 connector, 5 pin
Cable	Ø6 mm, 4 x 2 x 0.14 mm <sup>2</sup>

**Standard conformity**

Degree of protection	DIN EN 60529, IP65 or IP67
Climatic testing	DIN EN 60068-2-3, no moisture condensation
Emitted interference	EN 61000-6-4:2007
Noise immunity	EN 61000-6-2:2005
Shock resistance	DIN EN 60068-2-27, 200 g, 6 ms
Vibration resistance	DIN EN 60068-2-6, 20 g, 10 ... 1000 Hz

**Approvals and certificates**

UL approval	cULus Listed, General Purpose, Class 2 Power Source , if UL marking is marked on the product.
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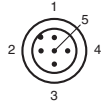
**Ambient conditions**

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## Technical Data

Operating temperature		cable, movable installation: -5 ... 70 °C (23 ... 158 °F), cable, fixed installation: -30 ... 70 °C (-22 ... 158 °F) connector models: -40 ... 85 °C (-40 ... 185 °F)
Storage temperature		-40 ... 85 °C (-40 ... 185 °F)
Relative humidity		98 % , no moisture condensation
<b>Mechanical specifications</b>		
Material		
Housing		nickel-plated steel , painted
Flange		Aluminum
Shaft		Stainless steel
Mass		approx. 300 g
Rotational speed		max. 12000 min <sup>-1</sup>
Moment of inertia		50 gcm <sup>2</sup>
Starting torque		< 5 Ncm
Shaft load		
Axial		40 N
Radial		110 N
<b>Dimensions</b>		
Diameter		58 mm

## Connection

Signal	Wire end	5-pin, M12 x 1 connector
CAN GND	green	1
+Vs	red	2
GND	yellow	3
CAN-High	white	4
CAN-Low	brown	5
Shielding	Shielding	Housing
Pinout		

## Interface

### Example of the transmit commands

Command	Identifier	Data	Comments
Read request Direction	18EA2000	01 EF 00 00 00 00 00 00	
Read request Node	18EA2000	08 EF 00 00 00 00 00 00	
Write Direction	00EF2000	01 01 00 00 00 FF FF FF (CCW increase position)	When you change direction it will give you a different positional value. You will then need to set your preset value.
Write PRESET	00EF2000	04 A8 61 00 00 FF FF FF (value 25.000)	The preset value should be received at positional value 18FFAA20.
Write Save	00EF2000	FA 73 61 76 65 FF FF FF	The settings saved in non-volatile memory

If you change the node number, you will need to cycle power (after you save your settings) for the node number to change. Once you cycle power, you will need to enter the new node number in your identifier. You can confirm everything is saved in non-volatile memory by cycling power.

**Receive:**

18FFAA20: Positional and speed data

18EA2000: Read response

## Type Code



Every encoder manufactured by Pepperl+Fuchs leaves the factory in a perfect condition. In order to ensure this quality as well as a faultless operation, the following specifications have to be taken into consideration:

- Avoid any impact on the housing and in particular on the encoder shaft as well as the axial and radial overload of the encoder shaft.
- The accuracy and service life of the encoder is guaranteed only, if a suitable coupling is used.
- The operating voltage for the encoder and the follow-up device (e. g. control) has to be switched on and off simultaneously.
- Any wiring work has to be carried out with the system in a dead condition.
- The maximum operating voltages must not be exceeded. The devices have to be operated at extra-low safety voltage.

**Notes on connecting the electric screening**

The immunity to interference of a plant depends on the correct screening. In this field installation faults occur frequently. Often the screen is applied to one side only, and is then soldered to the earthing terminal with a wire, which is a valid procedure in LF engineering. However, in case of EMC the rules of HF engineering apply.

One basic goal in HF engineering is to pass the HF energy to earth at an impedance as low as possible as otherwise energy would discharge into the cable. A low impedance is achieved by a large-surface connection to metal surfaces.

The following instructions have to be observed:

- Apply the screen on both sides to a "common earth" in a large surface, if there is no risk of equipotential currents.
- The screen has to be passed behind the insulation and has to be clamped on a large surface below the tension relief.
- In case of cable connections to screw-type terminals, the tension relief has to be connected to an earthed surface.
- If plugs are used, metallised plugs only should be fitted (such as sub D plugs with metallised housing). Please observe the direct connection of the tension relief to the housing.

Advantage:	metallised connector, shield
	clamped with the strain relief
	clamp
Disadvantage:	soldering shield on



**Safety instructions**

Please observe the national safety and accident prevention regulations as well as the subsequent safety instructions in these operating instructions when working on encoders.

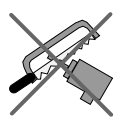
If failures cannot be remedied, the device has to be shut down and has to be secured against accidental operation. Repairs may be carried out only by the manufacturer. Entry into and modifications of the device are not permissible.

Tighten the clamping ring only, if a shaft has been fitted in the area of the clamping ring (hollow shaft encoders).

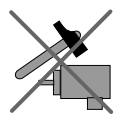
Tighten all screws and plug connectors prior to operating the encoder.



Do not stand on the encoder!



Do not remachine the drive shaft!



Avoid impact!



Do not remachine the housing!

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