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Absolute encoders

ENA58IL-S***-EtherCAT

- Solid shaft
- 30 Bit multiturn
- Free of wear magnetic sampling
- High resolution and accuracy
- Mechanical compatibility with all major encoders with fieldbus interface
- Status LEDs

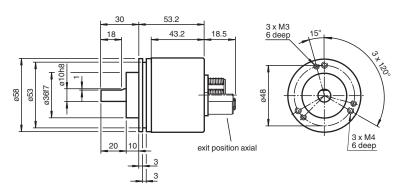




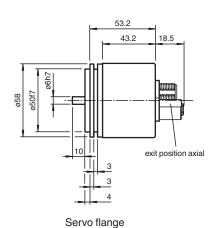
Function

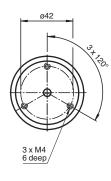
The ENA58IL series are high precision encoders with internal magnetic sampling.

Dimensions



Clamping flange





Technical Data **General specifications** Detection type magnetic sampling Device type Absolute encoders ≤ ± 0.1 ° Linearity error **UL File Number** E223176 "For use in NFPA 79 Applications only", if UL marking is marked on the Functional safety related parameters $MTTF_d$ 256 a at 40 °C Mission Time (T_M) 12 a 55 E+8 revolutions at 40/110 N axial/radial shaft load L_{10} Diagnostic Coverage (DC) **Electrical specifications** U_B 10 ... 30 V DC Operating voltage Power consumption P_0 approx. 4 W Time delay before availability ţ,, < 250 ms Output code binary code Code course (counting direction) adjustable Interface Interface type **EtherCAT** CoE (CANopen over EtherCAT, according to CiA DS-301 and DS-406 device profile CiA) Resolution Single turn up to 16 Bit Multiturn up to 14 Bit Overall resolution up to 30 Bit Transfer rate 10 MBit/s / 100 MBit/s Connection Connector Ethernet: 2 sockets M12 x 1, 4-pin, D-coded Supply: 1 plug M12 x 1, 4-pin, A-coded Standard conformity DIN EN 60529, IP65, IP67 Degree of protection DIN EN 60068-2-3, no moisture condensation Climatic testing EN 61000-6-4:2007 Emitted interference EN 61000-6-2:2005 Noise immunity Shock resistance DIN EN 60068-2-27, 100 g, 6 ms Vibration resistance DIN EN 60068-2-6, 10 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. **Ambient conditions** Operating temperature -40 ... 85 °C (-40 ... 185 °F) Storage temperature -40 ... 85 °C (-40 ... 185 °F) Relative humidity 98 %, no moisture condensation Mechanical specifications Material Zinc plated steel, painted Housing Flange Aluminum Shaft Stainless steel Mass approx. 300 g Rotational speed max. 12000 min -1 Moment of inertia 50 gcm² Starting torque < 5 Ncm Shaft load

Axial

Radial

40 N

110 N

Accessories 9108, 6 Measuring wheel 9109, 6 Measuring wheel for shaft diameter 6 mm 9110, 6 Measuring wheel for shaft diameter 6 mm 9113, 6 Measuring wheel for shaft diameter 6 mm MBT-36ALS Spring-loaded mounting bracket with a diameter of 36 mm

Pin	Male connector M12 x 1, 4-pin, A-coded	Female connector M12 x 1, 4-pin, D-coded
1	Supply voltage +U _B	Tx +
2	-	Rx +
3	0 V	Tx -
4	-	Rx -
	2 4	4 000 2

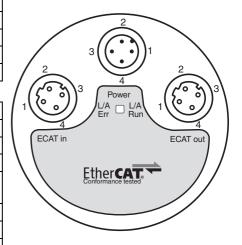
Indication

Port LEDs

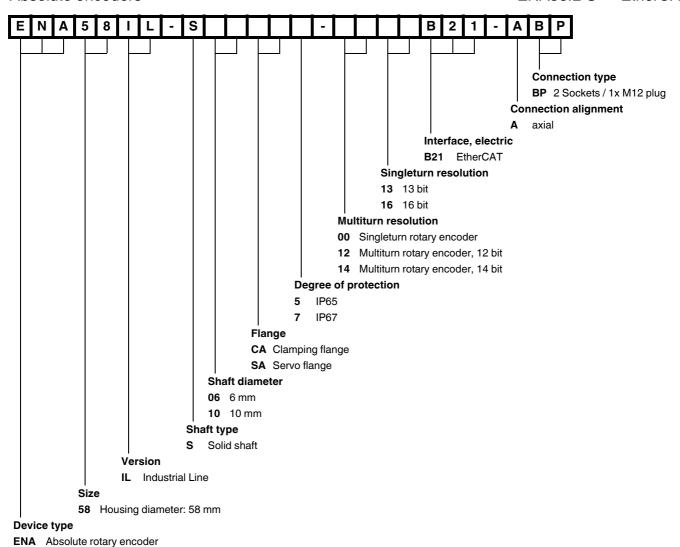
LED	Color	Status	Description
Link/Act IN	green	on	LINK active for HUB port 1
		blinking	Activity on HUB port 1
Link/Act OUT	green	on	LINK active for HUB port 2
		blinking	Activity on HUB port 2

EtherCAT LEDs

LED	Color	Status	Description
Error	red	off	no error
		blinking	invalid configuration
		single flash	local error
		double flash	process data watchdog timeout/ EtherCAT watchdog timeout
		flickering	booting error
		on	application failure
Run	green	off	initialization
		blinking	Pre-Operational
		single flash	Safe-Operational
		flickering	initialization or bootstrap
		on	Operational



Type Code



Installation

Anti-interference measures

The use of highly sophisticated microelectronics requires a consistently implemented anti-interference and wiring concept. This becomes all the more important the more compact the constructions are and the higher the demands are on the performance of modern machines.

The following installation instructions and proposals apply for "normal industrial environments". There is no ideal solution for all interfering environments.

When the following measures are applied, the encoder should be in perfect working order:

- Termination of the serial line with a 120 Ω resistor (between Receive/Transmit and Receive/Transmit) at the beginning and end of the serial line (e. g. the control and the last encoder).
- The wiring of the encoder should be laid at a large distance to energy lines which could cause interferences.
- Cable cross-section of the screen at least 4 mm².
- Cable cross-section at least 0,14 mm².
- The wiring of the screen and 0 V should be arranged radially, if and when possible.
- · Do not kink or iam the cables.
- Adhere to the minimum bending radius as given in the data sheet and avoid tensile as well as shearing load.

Operating instructions

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.



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: metalised 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!