



Model Number

ESM58-PZ

Features

- Industrial standard housing Ø58 mm
- Ethernet interface with Powerlink
- 30 Bit multiturn
- Two Ethernet connectors with built in hub
- Recessed hollow shaft

Description

Absolute rotary encoders deliver an absolute step value for each angle setting.

On account of the high number of measuring steps, this type of absolute rotary encoder can be used to divide very long linear distances into small measuring steps.

The Ethernet interface of this absolute encoder supports the Powerlink V2 protocol. An integrated hub allows wiring in a line structure (daisy chain). In addition to various functions like resolution adjustment, rotation direction, node number setting or limit switch adjustment, the following operation modes can be selected:

- Polled mode
- Multiplexed mode
- Poll response chaining

The device is mounted directly onto the application shaft, without any coupling. Rotation of the absolute encoder is prevented by a torque rest.

Technical data

General specifications

| | |
|----------------|----------------------------|
| Detection type | photoelectric sampling |
| Device type | Multiturn absolute encoder |

Functional safety related parameters

| | |
|--------------------------------|--|
| MTTF _d | 120 a |
| Mission Time (T _M) | 20 a |
| L _{10h} | 1.9 E+11 at 6000 rpm and 20/40 N axial/radial shaft load |
| Diagnostic Coverage (DC) | 0 % |

Electrical specifications

| | |
|----------------------------------|---|
| Operating voltage U _B | 10 ... 30 V DC , safe galvanic isolation per EN 50178 |
| Power consumption P ₀ | max. 3 W |
| Linearity | ± 0.5 LSB (12 Bit) , ± 2 LSB (16 Bit) |
| Output code | binary code |
| Code course (counting direction) | programmable, cw ascending (clockwise rotation, code course ascending) cw descending (clockwise rotation, code course descending) |

Interface

| | |
|--------------------|--------------------|
| Interface type | Ethernet Powerlink |
| Resolution | |
| Single turn | up to 16 Bit |
| Multiturn | 14 Bit |
| Overall resolution | up to 30 Bit |
| Physical | Ethernet |
| Transfer rate | 100 MBit/s |

Connection

| | |
|-----------|---|
| Connector | Ethernet: 2 sockets M12 x 1, 4-pin, D-coded Supply: 1 plug M12 x 1, 5-pin, A-coded |
|-----------|---|

Standard conformity

| | |
|----------------------|---|
| Degree of protection | DIN EN 60529, shaft side: IP64 (without shaft seal)/IP66 (with shaft seal) housing side: IP65 |
| 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, 100 g, 6 ms |
| Vibration resistance | DIN EN 60068-2-6, 10 g, 10 ... 2000 Hz |

Ambient conditions

| | |
|-----------------------|----------------------------------|
| Operating temperature | -40 ... 79 °C (-40 ... 174.2 °F) |
| Storage temperature | -40 ... 85 °C (-40 ... 185 °F) |
| Relative humidity | 98 % , no moisture condensation |

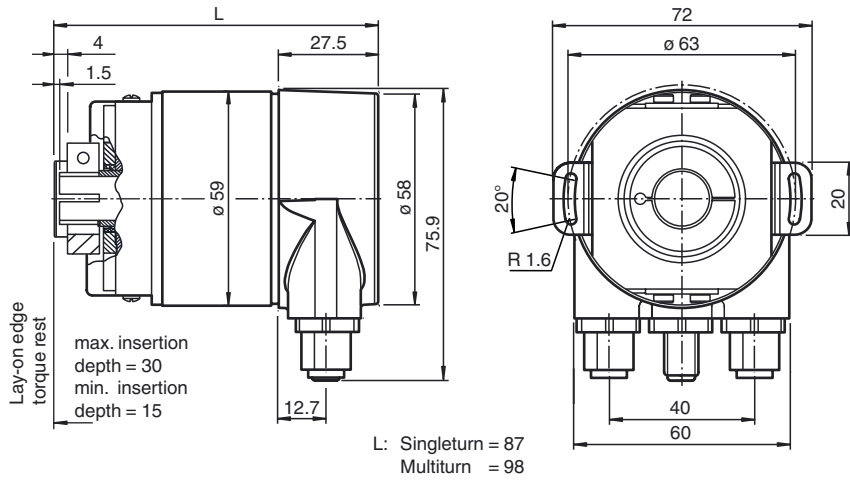
Mechanical specifications

| | |
|-------------------------------------|---|
| Material | housing: powder coated aluminum flange: aluminum shaft: stainless steel |
| Mass | approx. 700 g |
| Rotational speed | max. 12000 min ⁻¹ |
| Moment of inertia | 30 gcm ² |
| Starting torque | ≤ 3 Ncm (version without shaft seal) |
| Tightening torque, fastening screws | max. 1.8 Nm |
| Shaft load | |
| Angle offset | ± 0.9 ° |
| Axial offset | static: ± 0.3 mm, dynamic: ± 0.1 mm |
| Radial offset | static: ± 0.5 mm, dynamic: ± 0.2 mm |

Approvals and certificates

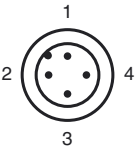
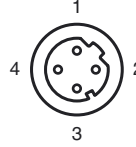
| | |
|--------------|--|
| UL approval | cULus Listed, General Purpose, Class 2 Power Source |
| CCC approval | CCC approval / marking not required for products rated ≤36 V |

Dimensions



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Electrical connection

| Pin | Male connector M12 x 1, 4-pin, A-coded | Female connector M12 x 1, 4-pin, D-coded |
|-----|---|--|
| 1 | + 24 V | Tx + |
| 2 | - | Rx + |
| 3 | 0 V | Tx - |
| 4 | - | Rx - |
| |  |  |

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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

Pepperl+Fuchs Group
www.pepperl-fuchs.com

USA: +1 330 486 0001
fa-info@us.pepperl-fuchs.com

Germany: +49 621 776 4411
fa-info@de.pepperl-fuchs.com

Singapore: +65 6779 9091
fa-info@sg.pepperl-fuchs.com

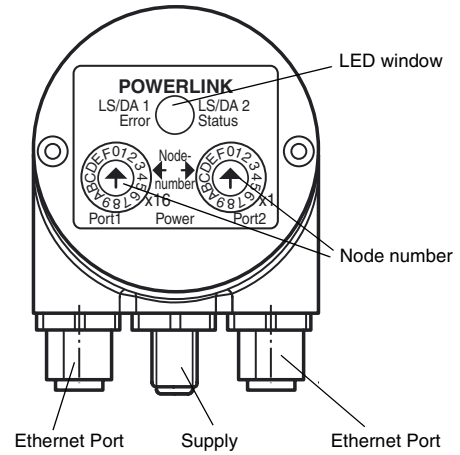
Indicators and operation means

LEDs for HUB Port

| LED | Color | Status | Meaning |
|---------|-------|----------|----------------------------|
| LS/DA 1 | green | on | LINK active for HUB Port 1 |
| | | blinking | Activity on HUB Port 1 |
| LS/DA 2 | green | on | LINK active for HUB Port 2 |
| | | blinking | Activity on HUB Port 2 |

LEDs for Powerlink

| LED | Color | Status | Meaning |
|--------|-------|------------|--|
| Error | red | on | - not allowed node number - internal communication error - buffer underrun/overflow - collision - CRC error - loss of SoC |
| | | off | no error |
| Status | green | off | not active |
| | | flickering | Basic Ethernet mode |
| | | flashes 1x | Pre-Operational 1 |
| | | flashes 2x | Pre-Operational 2 |
| | | flashes 3x | ready to operate |
| | | on | Operational |
| | | blinking | Stopped |



Node number adjustment

The setting of the controlled node number is achieved by 2 hexadecimal switches x16 and x1.

Allowed node numbers range is 1 ... 239. The adjusted node number is calculated as follows:

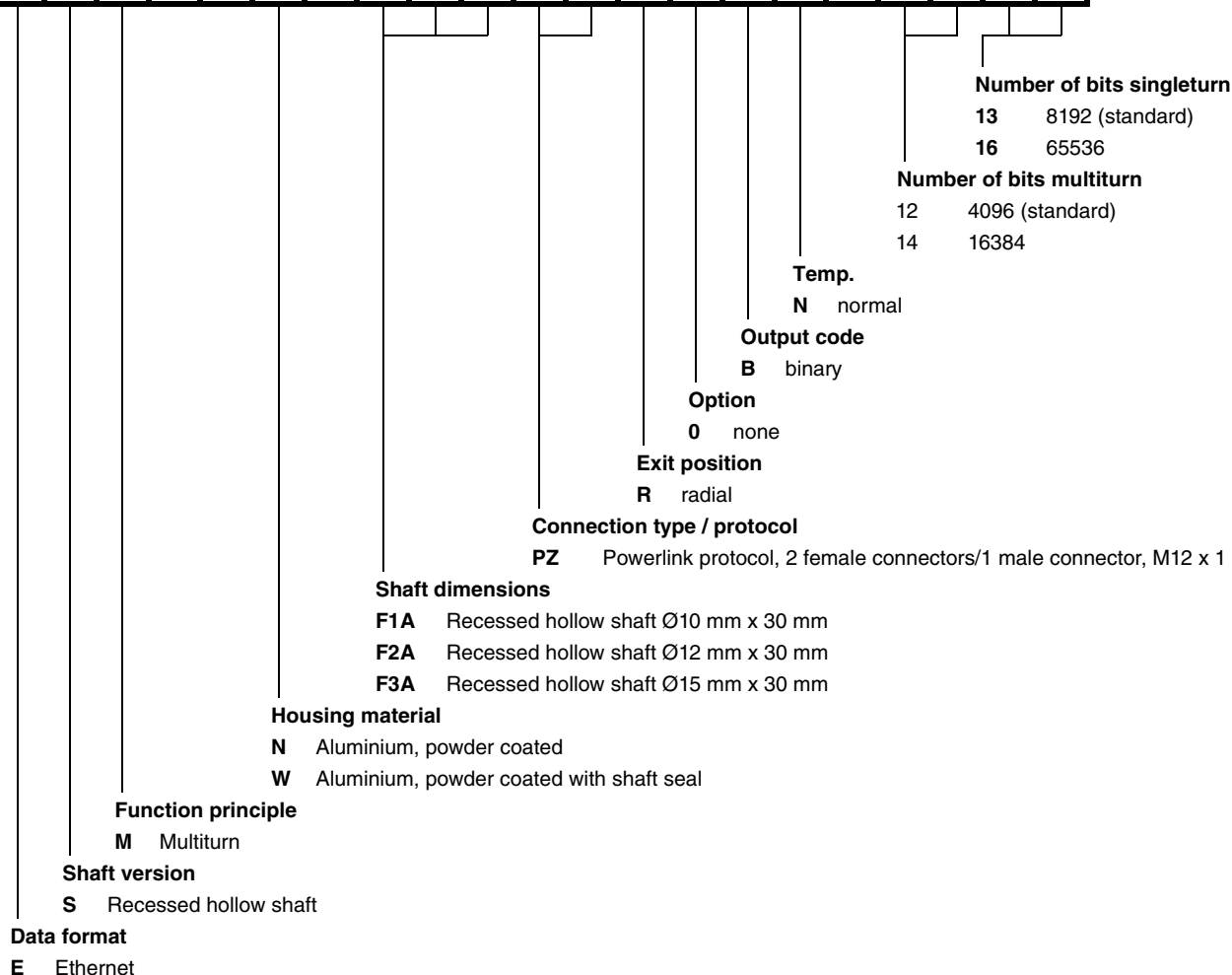
$$\text{Node number} = \text{Decimal value}_{[\text{switch x16}]} \times 16 + \text{Decimal value}_{[\text{switch x1}]} \times 1$$

Example:

$$[\text{switch x16}] = A, [\text{switch x1}] = 5$$

$$A_{\text{hex}} = 10_{\text{dec}} \times 16 = 160 + 5 = 165$$

Order code



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