



## Absolute encoders AFS/AFM60 EtherNet/IP, Rotary

AFS60A-BEIB262144



**Model Name** > [AFS60A-BEIB262144](#)  
**Part No.** > [1055358](#)



*Illustration may differ*

#### At a glance

- High-resolution, 30-bit absolute encoder (18 bit singleturn and 12 bit multiturn)
- Device Level Ring (DLR functionality)
- Extensive diagnostics: Min/max values for temperature, position, speed.  
Operating hours counter, display of flags, alarms and warnings using e.g. a fault header (32 bit)
- Status display via 5 duo LEDs
- Rotary axis function
- IP address via DHCP / DEC switches
- Ethernet/IP interface (extended profile 0x22)
- Function block

#### Your benefits

- DLR functionality for reliability with simple maintenance and a simple adaptation to existing network topologies
- Lower installation costs due to fewer external switches
- High level of productivity thanks to superior diagnostics with 32-bit fault header, fast communication and high level of redundancy
- Optimal machine availability thanks to early warning and fault detection system
- Simple setting for various applications thanks to rotary axis function
- Simple installation due to user-friendly on-board configuration assembly
- Industrial-application design for use in particularly cramped space conditions



#### Performance

|                                      |             |
|--------------------------------------|-------------|
| Max. number of steps per revolution: | 262,144     |
| Max. number of revolutions:          | 1           |
| Resolution power:                    | 262,144 x 1 |
| Error limits:                        | ± 0.03 °    |
| Repeatability (Ta not constant):     | 0.002 °     |
| Measuring step deviation:            | ± 0.002 °   |
| Initialization time:                 | Ca. 12 s    |

#### Mechanical data

|                       |                    |
|-----------------------|--------------------|
| Mechanical interface: | Blind hollow shaft |
| Shaft diameter:       | 12 mm              |
| Mass:                 | 0.2 kg             |
| Start up torque:      | 0.8 Ncm (+20 °C)   |
| Operating torque:     | 0.6 Ncm (+20 °C)   |

|                                             |                                   |
|---------------------------------------------|-----------------------------------|
| Maximum operating speed:                    | 6,000 /min <sup>1)</sup>          |
| Moment of inertia of the rotor:             | 40 gcm <sup>2</sup>               |
| Bearing lifetime:                           | 3.0 x 10 <sup>9</sup> revolutions |
| Max. angular acceleration:                  | 500,000 rad/s <sup>2</sup>        |
| Permissible movement axial static/dynamic:  | ± 0.5 mm, ± 0.1 mm                |
| Permissible movement radial static/dynamic: | ± 0.3 mm, ± 0.05 mm               |
| Shaft material:                             | Stainless steel                   |
| Flange material:                            | Zinc diecast                      |
| Housing material:                           | Aluminum                          |

<sup>1)</sup> The maximum singleturn resolution (= 18 bit) can be operated with the respective maximum operating speed

## Electrical data

|                                        |                                     |
|----------------------------------------|-------------------------------------|
| Operating voltage range:               | 10 V DC ... 30 V DC                 |
| MTTFd: mean time to dangerous failure: | 80 a (EN ISO 13849-1) <sup>1)</sup> |
| Connection type:                       | 3 x connector M12, 4-pin, axial     |
| Reverse polarity protection:           | 1                                   |
| Power consumption max. without load:   | 3 W                                 |

<sup>1)</sup> This product is a standard product and does not constitute a safety component as defined in the Machinery Directive.

Calculation based on nominal load of components, average ambient

temperature 40°C, frequency of use 8760 h/a. All

electronic failures are considered hazardous. For more information, see document no. 8015532.

## Interfaces

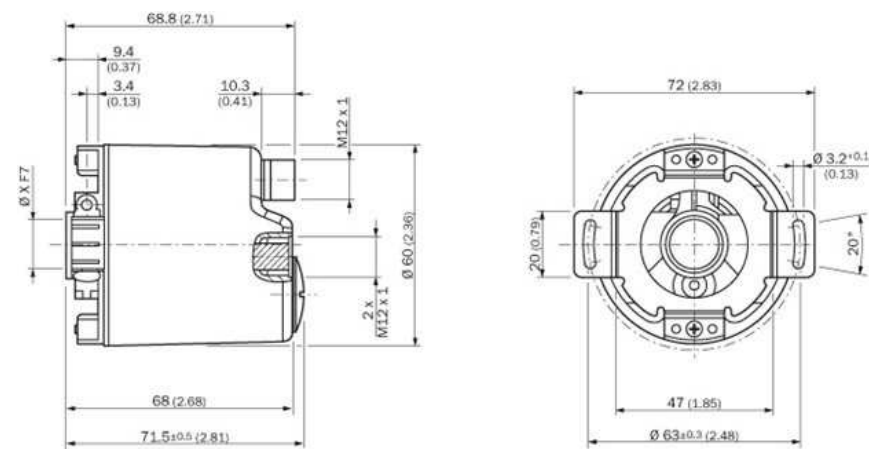
|                                     |                         |
|-------------------------------------|-------------------------|
| Electrical interface:               | EtherNet/IP             |
| Bus interface:                      | EtherNet/IP IEC 61784-1 |
| Data transmission rate (baud rate): | 10 Mbit/s 100 Mbit/s    |
| Encoder profile:                    | 0 x 22                  |
| RPI (requested packet interval):    | 5 ms ... 750 ms         |
| DLR (Device Level Ring):            | 1                       |
| Endless operating functionality:    | 1                       |

## Ambient data

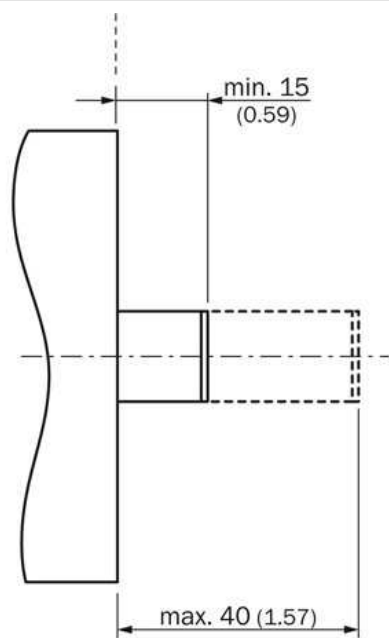
|                                |                                                                                                        |
|--------------------------------|--------------------------------------------------------------------------------------------------------|
| EMC:                           | (according to EN 61000-6-2 and EN 61000-6-3) <sup>1)</sup>                                             |
| Enclosure rating:              | IP 65 (according to IEC 60529), shaft side, IP 67 (according to IEC 60529), housing side <sup>2)</sup> |
| Permissible relative humidity: | 90 % (condensation of the optical scanning not permitted)                                              |
| Working temperature range:     | -30 °C ... +85 °C                                                                                      |
| Storage temperature range:     | -40 °C ... +100 °C, without package                                                                    |
| Resistance to shocks:          | 100 g, 6 ms (according to EN 60068-2-27)                                                               |
| Resistance to vibration:       | 30 g, 10 Hz ... 2,000 Hz (according to EN 60068-2-6)                                                   |

<sup>1)</sup> <sup>2)</sup> With mating connector fitted

Dimensional drawing



Proposed fitting



All dimensions in mm (inch)

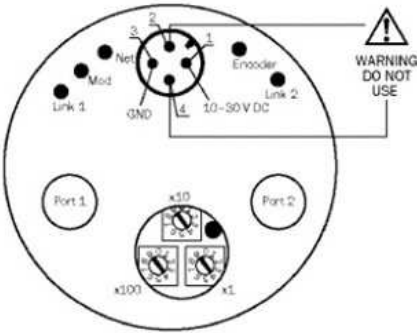
PIN assignment

M12 – 4 x D coding



| Port 1 |        |        |        |        |
|--------|--------|--------|--------|--------|
| Signal | T x D+ | R x D+ | T x D- | R x D- |
| Pin    | 1      | 2      | 3      | 4      |

| Port 2 |        |        |        |        |
|--------|--------|--------|--------|--------|
| Signal | T x D+ | R x D+ | T x D- | R x D- |
| Pin    | 1      | 2      | 3      | 4      |



M12 – 4 x A coding



| Power supply |             |               |     |               |
|--------------|-------------|---------------|-----|---------------|
| Signal       | 10 ... 30 V | Not connected | GND | Not connected |
| Pin          | 1           | 2             | 3   | 4             |

**Australia**

Phone +61 3 9457 0600  
1800 33 48 02 – tollfree  
E-Mail sales@sick.com.au

**Belgium/Luxembourg**

Phone +32 (0)2 466 55 66  
E-Mail info@sick.be

**Brasil**

Phone +55 11 3215-4900  
E-Mail marketing@sick.com.br

**Canada**

Phone +1 905 771 14 44  
E-Mail information@sick.com

**Česká republika**

Phone +420 2 57 91 18 50  
E-Mail sick@sick.cz

**China**

Phone +86 4000 121 000  
E-Mail info.china@sick.net.cn  
Phone +852-2153 6300  
E-Mail ghk@sick.com.hk

**Danmark**

Phone +45 45 82 64 00  
E-Mail sick@sick.dk

**Deutschland**

Phone +49 211 5301-301  
E-Mail info@sick.de

**España**

Phone +34 93 480 31 00  
E-Mail info@sick.es

**France**

Phone +33 1 64 62 35 00  
E-Mail info@sick.fr

**Great Britain**

Phone +44 (0)1727 831121  
E-Mail info@sick.co.uk

**India**

Phone +91-22-4033 8333  
E-Mail info@sick-india.com

**Israel**

Phone +972-4-6881000  
E-Mail info@sick-sensors.com

**Italia**

Phone +39 02 27 43 41  
E-Mail info@sick.it

**Japan**

Phone +81 (0)3 5309 2112  
E-Mail support@sick.jp

**Magyarország**

Phone +36 1 371 2680  
E-Mail office@sick.hu

**Nederland**

Phone +31 (0)30 229 25 44  
E-Mail info@sick.nl

**Norge**

Phone +47 67 81 50 00  
E-Mail sick@sick.no

**Österreich**

Phone +43 (0)22 36 62 28 8-0  
E-Mail office@sick.at

**Polska**

Phone +48 22 837 40 50  
E-Mail info@sick.pl

**România**

Phone +40 356 171 120  
E-Mail office@sick.ro

**Russia**

Phone +7-495-775-05-30  
E-Mail info@sick.ru

**Schweiz**

Phone +41 41 619 29 39  
E-Mail contact@sick.ch

**Singapore**

Phone +65 6744 3732  
E-Mail sales.gsg@sick.com

**Slovenija**

Phone +386 (0)1-47 69 990  
E-Mail office@sick.si

**South Africa**

Phone +27 11 472 3733  
E-Mail info@sickautomation.co.za

**South Korea**

Phone +82 2 786 6321/4  
E-Mail info@sickkorea.net

**Suomi**

Phone +358-9-25 15 800  
E-Mail sick@sick.fi

**Sverige**

Phone +46 10 110 10 00  
E-Mail info@sick.se

**Taiwan**

Phone +886 2 2375-6288  
E-Mail sales@sick.com.tw

**Türkiye**

Phone +90 (216) 528 50 00  
E-Mail info@sick.com.tr

**United Arab Emirates**

Phone +971 (0) 4 88 65 878  
E-Mail info@sick.ae

**USA/México**

Phone +1(952) 941-6780  
1 (800) 325-7425 – tollfree  
E-Mail info@sickusa.com

More representatives and agencies  
at [www.sick.com](http://www.sick.com)