



## Absolute encoders AFS/AFM60 EtherCAT

AFS60A-BDEB262144



**Model Name** > **AFS60A-BDEB262144**  
**Part No.** > **1059068**



*Illustration may differ*

#### At a glance

- High-resolution 30-bit absolute encoder (18-bit singleturn and 12-bit multiturn)
- Face mount flange, servo flange and blind hollow shaft
- Connection type: 3 x M12 axial connector
- Up to 125 µs on-the-fly data transfer speed
- EtherCAT® interface CoE (CiA DS-301) Device profile (CiA DS-406)
- Round axis functionality
- Alarms, warnings and diagnostics functions for speed, position, temperature, operating time, etc.
- Status display via 5 LEDs
- Up to 16 adjustable electronic cam switches

#### Your benefits

- Increased productivity as a result of intelligent diagnostics functions and rapid data transfer
- Increase in network reliability due to early error detection
- Simple installation with various configuration options
- Flexible, easy setup and high resolutions for various applications with binary, integer and "decimal point" values based on round axis functionality
- Maximum system availability through embedded switch technology
- Compact and cost-efficient design



#### Performance

|                                      |                   |
|--------------------------------------|-------------------|
| Max. number of steps per revolution: | 262,144           |
| Max. number of revolutions:          | 1                 |
| Resolution power:                    | 262,144 x 1       |
| Resolution:                          | 18 bit            |
| Error limits:                        | ≤ 0.03 °          |
| Repeatability (Ta not constant):     | ≤ 0.002 °         |
| Measuring step deviation:            | ± 0.002 °         |
| Initialization time:                 | Ca. 6 s           |
| Cycle time:                          | 125 µs ... 100 ms |

#### Mechanical data

|                       |                    |
|-----------------------|--------------------|
| Mechanical interface: | Blind hollow shaft |
| Shaft diameter:       | 10 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 Hz <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                   |
| Type of mounting shaft:                     | Blind hollow shaft                |

<sup>1)</sup> Self warming of 3.3 K per 1000 revolutions/min when applying note working temperature range

## 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:           | 0                                   |

<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:               | EtherCAT                                 |
| Bus interface:                      | EtherCAT, CoE (CiA DS-301) <sup>1)</sup> |
| Data transmission rate (baud rate): | 10 Mbit/s / 100 Mbit/s                   |
| Encoder profile:                    | CiA DS-406                               |
| Endless operating functionality:    | 0                                        |

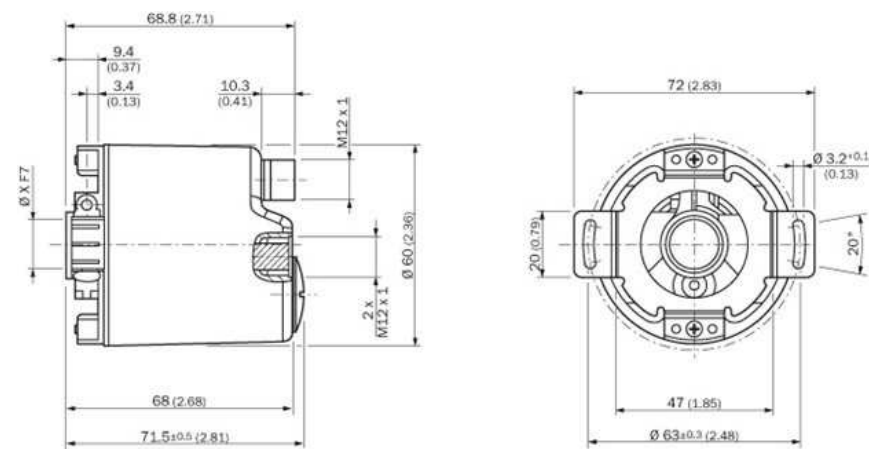
<sup>1)</sup> EtherCAT® is registered trademark and patent technology, licensed by Beckhoff Automation GmbH, Germany.

## Ambient data

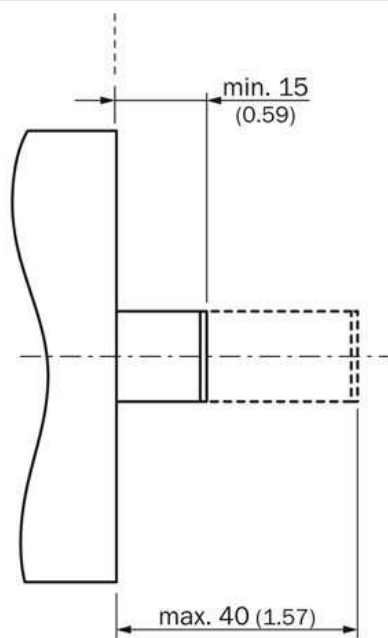
|                                |                                                                                                        |
|--------------------------------|--------------------------------------------------------------------------------------------------------|
| EMC:                           | (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> The EMC according to the standards quoted is achieved if screened cables are used. <sup>2)</sup> With mating connector fitted

Dimensional drawing



Proposed fitting



All dimensions in mm (inch)

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