



## Absolute encoders AFS/AFM60 SSI

AFM60B-S4SA032768

**Model Name** > [AFM60B-S4SA032768](#)  
**Part No.** > [1054222](#)



#### At a glance

- High-resolution absolute encoders with up to 30 bits (AFM60) or up to 18 bits (AFS60)
- Face mount flange, servo flange, blind or through hollow shaft
- SSI, SSI + Incremental or SSI + Sin/Cos interface
- Programmable resolution and offset (dependent on type)
- Connection system: M12, M23 connector or cable outlet
- Enclosure rating: IP 67 (housing), IP 65 (shaft)
- Operating temperature: -30 °C to +100 °C (depends on type)

#### Your benefits

- Programmability of the encoders means less storage, greater machine availability and easy installation
- Precise positioning due to high resolutions
- Large selection of mechanical interfaces and electrical contacting possibilities: Suitable for all applications
- Suitable for applications with limited space requirements (extremely short installation depth of 30 mm)
- Very good rotation accuracy due to increased bearing distance
- One programming tool and software with automatic encoder detection for AFS60/AFM60/DFS60



#### Performance

|                                      |                     |
|--------------------------------------|---------------------|
| Max. number of steps per revolution: | 32,768              |
| Max. number of revolutions:          | 4,096               |
| Resolution power:                    | 32,768 x 4,096      |
| Resolution:                          | 15 bit x 12 bit     |
| Error limits:                        | ± 0.05 °            |
| Repeatability (Ta not constant):     | 0.002 °             |
| Measuring step deviation:            | ± 0.01 °            |
| Initialization time:                 | 50 ms <sup>1)</sup> |

<sup>1)</sup> Valid positional data can be read once this time has elapsed

#### Mechanical data

|                       |                                          |
|-----------------------|------------------------------------------|
| Mechanical interface: | Solid shaft with flat, Face mount flange |
| Shaft diameter:       | 10 mm                                    |
| Mass:                 | 0.26 kg                                  |

|                                     |                                   |
|-------------------------------------|-----------------------------------|
| Start up torque:                    | 0.5 Ncm (20 °C)                   |
| Operating torque:                   | 0.3 Ncm (20 °C)                   |
| Permissible Load capacity of shaft: | 40 N (axial), 80 N (radial)       |
| Maximum operating speed:            | 9,000 /min <sup>1)</sup>          |
| Moment of inertia of the rotor:     | 6.2 gcm <sup>2</sup>              |
| Bearing lifetime:                   | 3.0 x 10 <sup>9</sup> revolutions |
| Max. angular acceleration:          | 500,000 rad/s <sup>2</sup>        |

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

## Electrical data

|                                        |                                      |
|----------------------------------------|--------------------------------------|
| Power consumption:                     | 0.5 W (without load)                 |
| Operating voltage range:               | 4.5 V DC ... 32 V DC                 |
| Maximum output frequency:              | 200 kHz                              |
| Load resistance min.:                  | 120 Ω                                |
| MTTFd: mean time to dangerous failure: | 250 a (EN ISO 13849-1) <sup>1)</sup> |

<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:                    | Connector M23, 12-pin, radial                                                     |
| Interface signals:                       | Clock +, Clock -, Data +, Data-, Sin +, Sin -, Cos +, Cos -: analog, differential |
| Clock frequency:                         | 2 MHz <sup>1)</sup>                                                               |
| SET (electronic adjustment):             | H-active (L ≡ 0 - 1,5 V, H ≡ 2,0 - Us V)                                          |
| CW/CCW (counting sequence when turning): | L-active (L ≡ 0 - 1,5 V, H ≡ 2,0 - Us V)                                          |
| Signal before differential generation:   | ± 20 %                                                                            |
| Signal offset:                           | 2.5 V ± 10 %                                                                      |

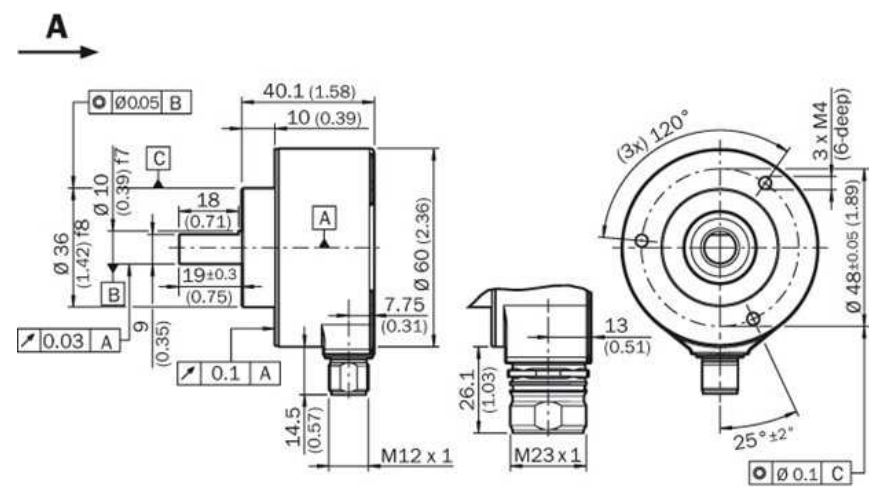
<sup>1)</sup>

## Ambient data

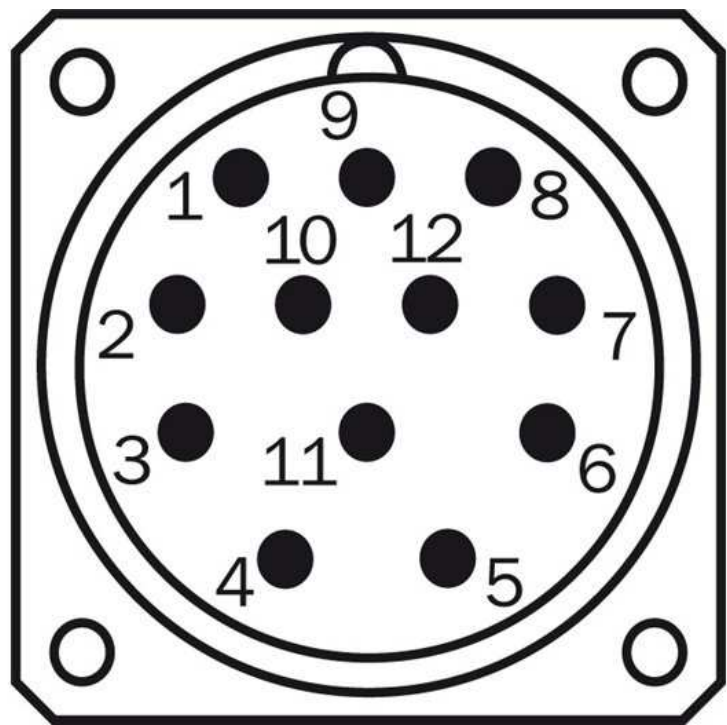
|                                |                                                                                                        |
|--------------------------------|--------------------------------------------------------------------------------------------------------|
| EMC:                           | (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 ... 100 °C                                                                                      |
| Storage temperature range:     | -40 °C ... 100 °C, without package                                                                     |
| Resistance to shocks:          | 70 g (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



PIN assignment



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