



AFM60B-S1LA000S11

AFS/AFM60 SSI

ABSOLUTE ENCODERS

SICK
Sensor Intelligence.



Illustration may differ



Ordering information

| Type | Part no. |
|-------------------|----------|
| AFM60B-S1LA000S11 | 1080817 |

Other models and accessories → www.sick.com/AFS_AFM60_SSI

Detailed technical data

Features

| | |
|----------------------------------|--|
| Special device | ✓ |
| Specialty | Male connector M23, 12-pin Radial with customer specific PIN-allocation |
| Standard reference device | AFM60B-S1LA008192, 1060452 |

Performance

| | |
|---|---------------------------------|
| Number of steps per revolution (max. resolution) | 8,192 (13 bit) |
| Number of revolutions | 4,096 (12 bit) |
| Max. resolution (number of steps per revolution x number of revolutions) | 13 bit x 12 bit (8,192 x 4,096) |
| Error limits G | 0.05° ¹⁾ |
| Repeatability standard deviation σ_r | 0.002° ²⁾ |

¹⁾ In accordance with DIN ISO 1319-1, position of the upper and lower error limit depends on the installation situation, specified value refers to a symmetrical position, i.e. deviation in upper and lower direction is the same.

²⁾ In accordance with DIN ISO 55350-13; 68.3% of the measured values are inside the specified area.

Interfaces

| | |
|---|--|
| Communication interface | SSI |
| Communication Interface detail | SSI + incremental / HTL |
| Initialization time | 50 ms ¹⁾ |
| Position forming time | < 1 μ s |
| Code type | Gray |
| Code sequence parameter adjustable | CW/CCW (V/R) parameter adjustable |
| Clock frequency | \leq 2 MHz ²⁾ |
| Set (electronic adjustment) | H-active (L = 0 - 3 V, H = 4,0 - U _s V) |

¹⁾ Valid positional data can be read once this time has elapsed.

²⁾ Minimum, LOW level (Clock +): 250 ns.

| | |
|--|---|
| CW/CCW (counting sequence when turning) | L-active (L = 0 - 1,5 V, H = 2,0 - Us V) |
| Pulses per revolution | 1/4 of number of SSI steps per revolution |
| Output frequency | ≤ 600 kHz |
| Load current | ≤ 30 mA |

¹⁾ Valid positional data can be read once this time has elapsed.

²⁾ Minimum, LOW level (Clock +): 250 ns.

Electrical data

| | |
|--|--|
| Connection type | Male connector, M23, 12-pin, radial |
| Supply voltage | 4.5 ... 32 V DC |
| Power consumption | ≤ 0.7 W (without load) |
| Reverse polarity protection | ✓ |
| MTTFd: mean time to dangerous failure | 250 years (EN ISO 13849-1) ¹⁾ |

¹⁾ 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.

Mechanical data

| | |
|---------------------------------------|---|
| Mechanical design | Solid shaft, Servo flange |
| Shaft diameter | 6 mm |
| Shaft length | 10 mm |
| Weight | 0.3 kg ¹⁾ |
| Shaft material | Stainless steel |
| Flange material | Aluminum |
| Housing material | Aluminum die cast |
| Start up torque | < 0.5 Ncm (+20 °C) |
| Operating torque | < 0.3 Ncm (+20 °C) |
| Permissible shaft loading | 80 N (radial) 40 N (axial) |
| Operating speed | ≤ 9,000 min ⁻¹ ²⁾ |
| Moment of inertia of the rotor | 6.2 gcm ² |
| Bearing lifetime | 3.0 x 10 ⁹ revolutions |
| Angular acceleration | ≤ 500,000 rad/s ² |

¹⁾ Based on devices with male connector.

²⁾ Allow for self-heating of 3.3 K per 1,000 rpm when designing the operating temperature range.

Ambient data

| | |
|--------------------------------------|--|
| EMC | According to EN 61000-6-2 and EN 61000-6-3 ¹⁾ |
| Enclosure rating | IP65, shaft side (IEC 60529) IP67, housing side (IEC 60529) ²⁾ |
| Permissible relative humidity | 90 % (Condensation not permitted) |

¹⁾ EMC according to the standards quoted is achieved if shielded cables are used.

²⁾ For devices with male connector: with mounted mating connector.

³⁾ Stationary position of the cable.

| | |
|------------------------------------|---|
| Operating temperature range | -40 °C ... +100 °C ³⁾ |
| Storage temperature range | -40 °C ... +100 °C, without package |
| Resistance to shocks | 70 g, 6 ms (EN 60068-2-27) |
| Resistance to vibration | 30 g, 10 Hz ... 2,000 Hz (EN 60068-2-6) |

1) EMC according to the standards quoted is achieved if shielded cables are used.

2) For devices with male connector: with mounted mating connector.

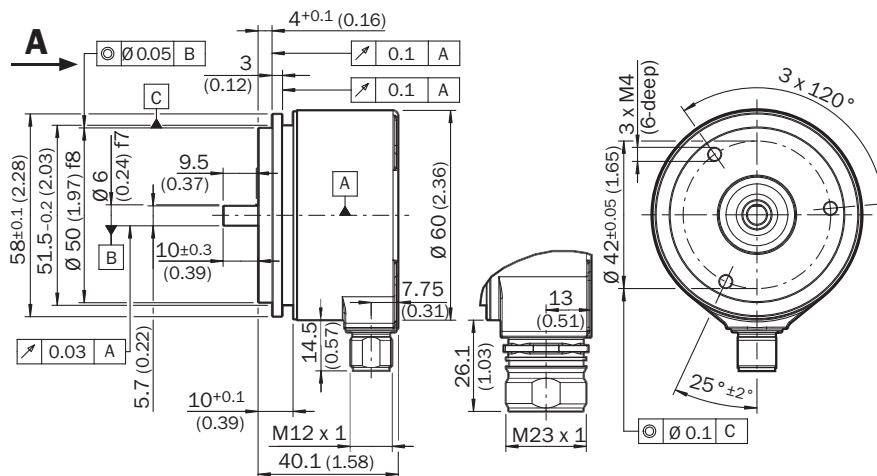
3) Stationary position of the cable.

Classifications

| | |
|-----------------------|----------|
| eCl@ss 5.0 | 27270502 |
| eCl@ss 5.1.4 | 27270502 |
| eCl@ss 6.0 | 27270590 |
| eCl@ss 6.2 | 27270590 |
| eCl@ss 7.0 | 27270502 |
| eCl@ss 8.0 | 27270502 |
| eCl@ss 8.1 | 27270502 |
| eCl@ss 9.0 | 27270502 |
| eCl@ss 10.0 | 27270502 |
| eCl@ss 11.0 | 27270502 |
| eCl@ss 12.0 | 27270502 |
| ETIM 5.0 | EC001486 |
| ETIM 6.0 | EC001486 |
| ETIM 7.0 | EC001486 |
| ETIM 8.0 | EC001486 |
| UNSPSC 16.0901 | 41112113 |

Dimensional drawing (Dimensions in mm (inch))

Servo flange, M12 and M23 radial male connector



General tolerances according to DIN ISO 2768-mk

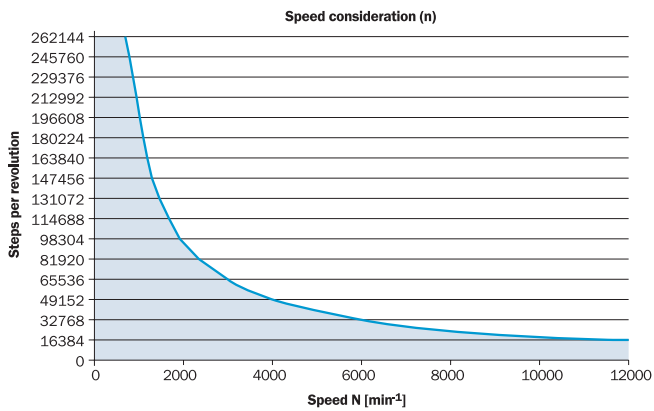
PIN assignment

| PIN | Signal | Explanation |
|-----|-----------------|--|
| 1 | GND | Earth connection |
| 2 | +U _s | Supply voltage (potential free to housing) |
| 3 | Clock + | Interface signals |
| 4 | Clock - | Interface signals |
| 5 | Data + | Interface signals |
| 6 | Data - | Interface signals |
| 7 | Preset | Electronic adjustment |
| 8 | CW/CCW | Counting sequence when turning |
| 9 | A | Signal line |
| 10 | A ₋ | Signal line |
| 11 | B | Signal line |
| 12 | B ₋ | Signal line |
| | Screen | Shield connected to housing on side of encoder. Connected to ground on side of control. |



View of the connector M23

Diagrams



The maximum speed is also dependent on the shaft type.

SICK AT A GLANCE

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