


ONLINE DATA SHEET
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# Motor feedback systems rotary HIPERFACE®
# SFS/SFM60

SFM60-HRAT0K02



SICK
Sensor Intelligence.

# Motor feedback systems rotary HIPERFACE® SFS/SFM60

| | |
|---|---|
| **Model Name** | **> SFM60-HRAT0K02** |
| **Part No.** | **> 1050529** |

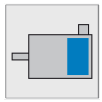




*Illustration may differ*

### At a glance

- HIPERFACE® motor feedback system in singleturn and multiturn design, compatible with the world's leading drive systems
- 1,024 sine/ cosine periods per revolution
- Absolute position with a resolution of 32,768 increments per revolution and 4,096 revolutions with the multiturn system
- HIPERFACE® interface: Programming of the position value and electronic type label
- Mechanical flexibility through different blind hollow shaft and through hollow shaft diameters (8 to 15 mm diameter), available with various torque supports
- Unique ball bearing design, allowing for a ball bearing distance of 30 mm.
- Universal cable outlet and common connector versions
- Protection class IP 65

### Your benefits

- Convenient traceability and simple maintenance thanks to storage of motor-specific data in the electronic type label
- Large ball bearing distances reduce uneven wear and minimize vibration on the encoder housing, which increases the encoder's service life
- The nickel code disk offers a high degree of vibration resistance and an extended temperature range
- Shorter development times through standardized mechanical interface
- Platform for the future, since all electrical interfaces (TTL/HTL, 1Vpp, SSI, PROFIBUS, HIPERFACE DSL®) are or will be available in this mechanical component.

### Performance

| | |
|---|---|
| Number of sine/cosine periods per revolution: | 1,024 |
| Number of the absolute ascertainable revolutions: | 4,096 (Multiturn) |
| Total number of steps: | 134,217,728 |
| Measuring step: | 0.3 angular seconds at interpolation of the sine/cosine signals with e.g. 12 Bit |
| Error limits for the digital absolute value: | ± 90 angular seconds (via RS485) |
| Integral non-linearity typ.: | ± 45 angular seconds (Error limits for evaluating sine/cosine period) without mechanical tension of the stator coupling |
| Differential non-linearity: | ± 7 angular seconds (Non-linearity within a sine/cosine period) |
| Operating speed: | 6,000 /min, up to which the absolute position can be reliably produced |
| Available memory area: | 1,792 Byte (EEPROM 2048) |

## Mechanical data

| | |
|---|---|
| Shaft diameter: | 14 mm |
| Shaft plug-in length: | 15 mm |
| Flange type/stator coupling: | Standard version |
| Dimensions: | See dimensional drawing |
| Mass: | 0.2 kg |
| Moment of inertia of the rotor: | 40 gcm² |
| Maximum operating speed: | 9,000 /min [1)] |
| Maximum angular acceleration: | 50,000 rad/s² |
| Operating torque: | 0.6 Ncm (20 °C) |
| Start up torque: | 0.8 Ncm (20 °C) |
| Permissible shaft movement, radial, static: | ± 0.3 mm |
| Permissible shaft movement, radial, dynamic: | ± 0.1 mm |
| Permissible shaft movement, axial, static: | ± 0.5 mm |
| Permissible shaft movement, axial, dynamic: | ± 0.2 mm |
| Life of ball bearings: | 3.6 x 10^9 revolutions |
| Connection type: | Connector M23, 12-pin, radial |
| Shaft version: | Through hollow shaft |

1) Self-warming 3.3 K/1,000 1/min, when applying note working temperature range

## Electrical data

| | |
|---|---|
| Electrical interface: | HIPERFACE |
| Operating voltage range/supply Voltage: | 7 V DC ... 12 V DC |
| Recommended supply voltage: | 8 V DC |
| Output frequency for sine/cosine signals: | 0 kHz ... 200 kHz |
| Operating power consumption (no load): | < 80 mA [1)] |

1) Without load

## Interfaces

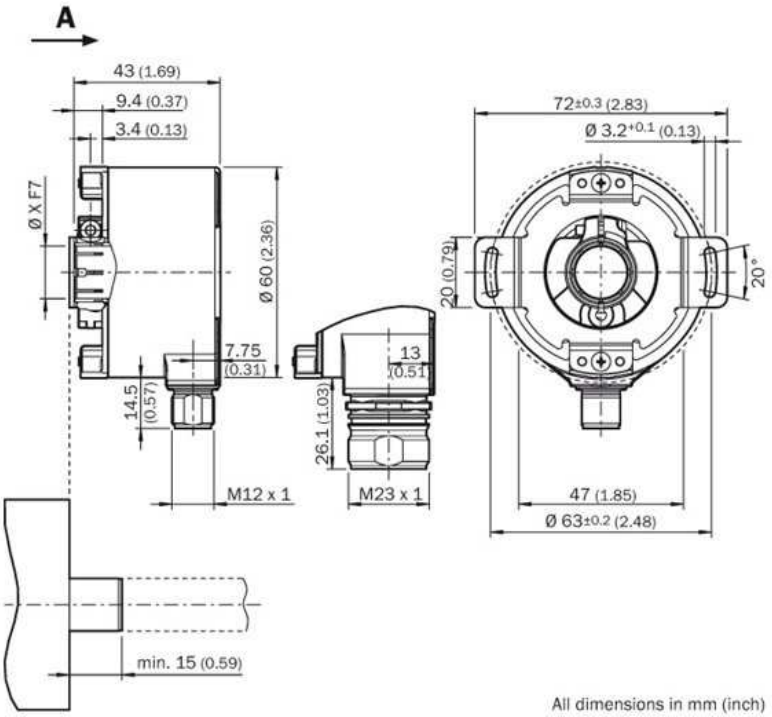
| | |
|---|---|
| Type of code for the absolute value: | Binary |
| Code sequence: | Increasing, for clockwise shaft rotation, looking in direction "A" (see dimensional drawing) |
| Interface signals: | Parameter channel RS 485: digital, Process data channel SIN, REFSIN, COS, REFCOS: analog, differential |

## Ambient data

| | |
|---|---|
| Working temperature range: | -30 °C ... 115 °C |
| Storage temperature range: | -40 °C ... 115 °C, without package |
| Relative humidity/Condensation: | 90 %, Condensation not permitted |
| Resistance to shocks: | 100 g, 6 ms (according to EN 60068-2-27) |
| Resistance to vibration: | 20 g, 10 Hz ... 2,000 Hz (according to EN 60068-2-6) |
| EMC: | According to EN 61000-6-2 and EN 61000-6-3 [1)] |
| Enclosure rating: | IP 65, according to IEC 60529, with mating connector inserted |

1) The EMC according to the standards quoted is achieved when the motor feedback system is mounted in an electrically conductive housing, which is connected to the central earthing point of the motor controller via a cable screen. This is also where the GND (0 V) connection of the power supply voltage is linked to earth. Users must perform their own tests when other screen designs are used.

## Dimensional drawing




All dimensions in mm (inch)

A4 4c int43

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