



DFS60A-S4PC00S81

DFS60

INCREMENTAL ENCODERS

SICK
Sensor Intelligence.



Illustration may differ



Ordering information

| Type | part no. |
|------------------|----------|
| DFS60A-S4PC00S81 | 1084190 |

Other models and accessories → www.sick.com/DFS60

Detailed technical data

Features

| | |
|----------------------------------|---------------------------------|
| Special device | ✓ |
| Specialty | 5000 lines - HTL pre-programmed |
| Standard reference device | DFS60A-S4PC65536, 1036726 |

Safety-related parameters

| | |
|--|--|
| MTTF_D (mean time to dangerous failure) | 300 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.

Performance

| | |
|---|-------------------------------------|
| Pulses per revolution | 65,536 ¹⁾ |
| Measuring step | 90°, electric/pulses per revolution |
| Measuring step deviation at binary number of lines | ± 0.0015° |
| Error limits | ± 0.03° |

¹⁾ See maximum revolution range.

Interfaces

| | |
|---------------------------------------|-----------------------------------|
| Communication interface | Incremental |
| Communication Interface detail | TTL / HTL |
| Factory setting | Factory setting: output level TTL |
| Number of signal channels | 6-channel |
| Programmable/configurable | ✓ |
| Initialization time | 32 ms, 30 ms ¹⁾ |

¹⁾ With mechanical zero pulse width.

| | |
|--------------------------|------------------------|
| Output frequency | ≤ 820 kHz |
| Load current | ≤ 30 mA |
| Power consumption | ≤ 0.7 W (without load) |

¹⁾ With mechanical zero pulse width.

Electronics

| | |
|--|--|
| Connection type | Male connector, M12, 8-pin, radial |
| Supply voltage | 4.5 ... 32 V |
| Reference signal, number | 1 |
| Reference signal, position | 90 °, electric, logically gated with A and B |
| Reverse polarity protection | ✓ |
| Short-circuit protection of the outputs | ✓ ¹⁾ ²⁾ |

¹⁾ Programming TTL with ≥ 5.5 V: short-circuit opposite to another channel or GND permissible for maximum 30 s.

²⁾ Programming HTL or TTL with < 5.5 V: short-circuit opposite to another channel, US or GND permissible for maximum 30 s.

Mechanics

| | |
|---------------------------------------|---|
| Mechanical design | Solid shaft, face mount flange |
| Shaft diameter | 10 mm With flat |
| Shaft length | 19 mm |
| Weight | + 0.3 kg |
| 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 ¹⁾ |
| Moment of inertia of the rotor | 6.2 gcm ² |
| Bearing lifetime | 3.6 x 10 ¹⁰ revolutions |
| Angular acceleration | ≤ 500,000 rad/s ² |

¹⁾ 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 |
| Enclosure rating | IP67, Housing side, male connector (IEC 60529) ¹⁾ IP65, shaft side (IEC 60529) |
| Permissible relative humidity | 90 % (Condensation not permitted) |
| Operating temperature range | -40 °C ... +100 °C ²⁾ -30 °C ... +100 °C ³⁾ |
| Storage temperature range | -40 °C ... +100 °C, without package |

¹⁾ With mating connector fitted.

²⁾ Stationary position of the cable.

³⁾ Flexible position of the cable.

| | |
|--------------------------------|---|
| Resistance to shocks | 100 g, 6 ms (EN 60068-2-27) |
| Resistance to vibration | 30 g, 10 Hz ... 2,000 Hz (EN 60068-2-6) |

¹⁾ With mating connector fitted.

²⁾ Stationary position of the cable.

³⁾ Flexible position of the cable.

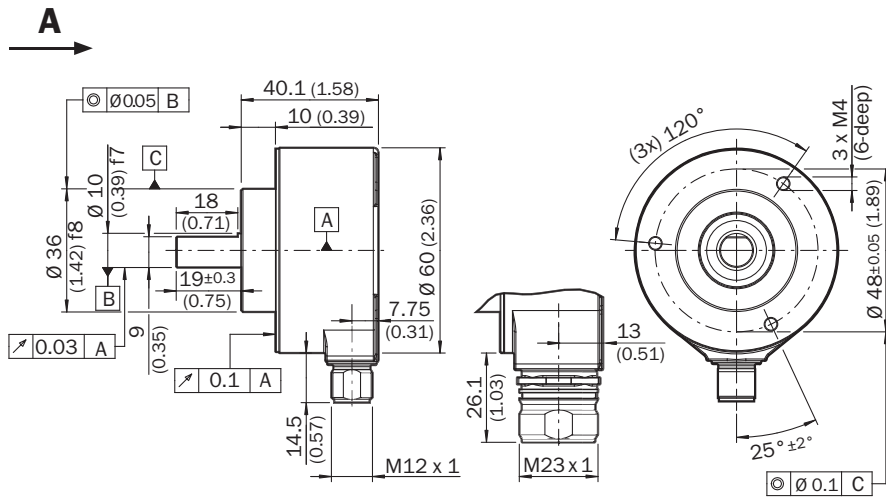
Certificates

| | |
|--|---|
| EU declaration of conformity | ✓ |
| UK declaration of conformity | ✓ |
| ACMA declaration of conformity | ✓ |
| Moroccan declaration of conformity | ✓ |
| China RoHS | ✓ |
| cULus certificate | ✓ |
| Information according to Art. 3 of Data Act (Regulation EU 2023/2854) | ✓ |

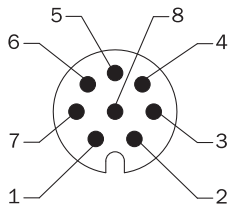
Classifications

| | |
|-----------------------|----------|
| ECLASS 5.0 | 27270501 |
| ECLASS 5.1.4 | 27270501 |
| ECLASS 6.0 | 27270590 |
| ECLASS 6.2 | 27270590 |
| ECLASS 7.0 | 27270501 |
| ECLASS 8.0 | 27270501 |
| ECLASS 8.1 | 27270501 |
| ECLASS 9.0 | 27270501 |
| ECLASS 10.0 | 27270501 |
| ECLASS 11.0 | 27270501 |
| ECLASS 12.0 | 27270501 |
| ETIM 5.0 | EC001486 |
| ETIM 6.0 | EC001486 |
| ETIM 7.0 | EC001486 |
| ETIM 8.0 | EC001486 |
| UNSPSC 16.0901 | 41112113 |

Dimensional drawing



PIN assignment

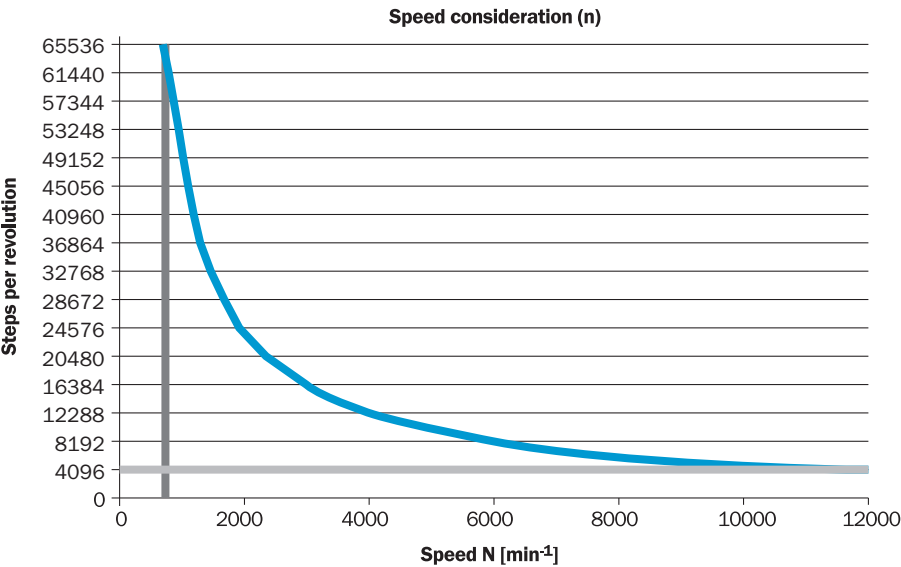


view of M12 male device connector on encoder

| PINMale connector M12, 8-pin | PINMale connector M23, 12-pin | Wire colors (cable connection) | TTL/HTL signal | Sin/Cos 1.0 V _{PP} | Explanation |
|------------------------------|-------------------------------|--------------------------------|---------------------|-----------------------------|---|
| 1 | 6 | Brown | \bar{A} | COS- | Signal wire |
| 2 | 5 | White | A | COS+ | Signal wire |
| 3 | 1 | Black | \bar{B} | SIN- | Signal wire |
| 4 | 8 | Pink | B | SIN+ | Signal wire |
| 5 | 4 | Yellow | \bar{Z} | \bar{Z} | Signal wire |
| 6 | 3 | Purple | Z | Z | Signal wire |
| 7 | 10 | Blue | GND | GND | Ground connection |
| 8 | 12 | Red | +U _S | +U _S | Supply voltage |
| - | 9 | - | N.c. | N.c. | Not assigned |
| - | 2 | - | N.c. | N.c. | Not assigned |
| - | 11 | - | N.c. | N.c. | Not assigned |
| - | 7 ¹⁾ | Orange | 0-SET ¹⁾ | N.c. | Set zero pulse ¹⁾ |
| Screen | Screen | Screen | Screen | Screen | Screen connected to housing on encoder side. Connected to ground on control side. |

| PINMale connector M12, 8-pin | PINMale connector M23, 12-pin | Wire colors (cable connection) | TTL/HTL signal | Sin/Cos 1.0 V _{PP} | Explanation |
|--|-------------------------------|--------------------------------|----------------|-----------------------------|-------------|
| 1) For electrical interfaces only: M, U, V, W with 0-SET function on PIN 7 on M23 plug. The 0-SET input is used to set the zero pulse to the current shaft position. If the 0-SET input is applied to US for longer than 250 ms after it has previously been open or applied to GND for at least 1,000 ms, the current shaft position is assigned zero pulse signal "Z". | | | | | |

maximum revolution range



SICK AT A GLANCE

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