Product data sheet

DFS60A-TEPZ0-S03

DFS60

INCREMENTAL ENCODERS

SICK
Sensor Intelligence.

Illustration may differ

Ordering information

Type	Part no.
DFS60A-TEPZ0-S03	1052704

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

Detailed technical data

Features

Special device	✓
Specialty	Cable, 8-wire, with male connector, M23, 12-pin, universal, 1.5 m
Standard reference device	DFS60A-TEPK65536, 1036964

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 [1] 30 ms
Output frequency	≤ 820 kHz
Load current	≤ 30 mA
Power consumption	≤ 0.7 W (without load)
4.5 V... 5.5 V, TTL/RS-422	
Load current	≤ 30 mA
4.5 V ... 5.5 V, Open Collector	
Load current	≤ 30 mA
TTL/RS-422	
Load current	≤ 30 mA
Power consumption	≤ 0.7 W (without load)
HTL/Push pull	

[1] With mechanical zero pulse width.

Load current	≤ 30 mA
Power consumption	≤ 0.7 W (without load)
TTL/HTL	
Load current	≤ 30 mA
Power consumption	≤ 0.7 W (without load)
Open Collector	
Load current	≤ 30 mA
Power consumption	≤ 0.7 W (without load)

[1] With mechanical zero pulse width.

Electrical data

Connection type	Cable, 8-wire, with male connector, M23, 12-pin, universal, 1.5 m [1]
Supply voltage	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	✓ [2] [3]
MTTFd: mean time to dangerous failure	300 years (EN ISO 13849-1) [4]

[1] The universal cable connection is positioned so that it is possible to lay it without bends in a radial or axial direction.

[2] Programming TTL with ≥ 5.5 V: short-circuit opposite to another channel or GND permissable for maximum 30 s.

[3] Programming HTL or TTL with < 5.5 V: short-circuit opposite to another channel, US or GND permissable for maximum 30 s.

[4] 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	Through hollow shaft
Shaft diameter	12 mm
Weight	+ 0.2 kg
Shaft material	Stainless steel
Flange material	Aluminum
Housing material	Aluminum die cast
Start up torque	0.8 Ncm (+20 °C)
Operating torque	0.6 Ncm (+20 °C)
Permissible shaft movement, axial static/dynamic	± 0.5 mm / ± 0.01 mm
Permissible shaft movement, radial static/dynamic	± 0.3 mm / ± 0.05 mm
Operating speed	≤ 6,000 min^{-1} [1]
Moment of inertia of the rotor	40 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

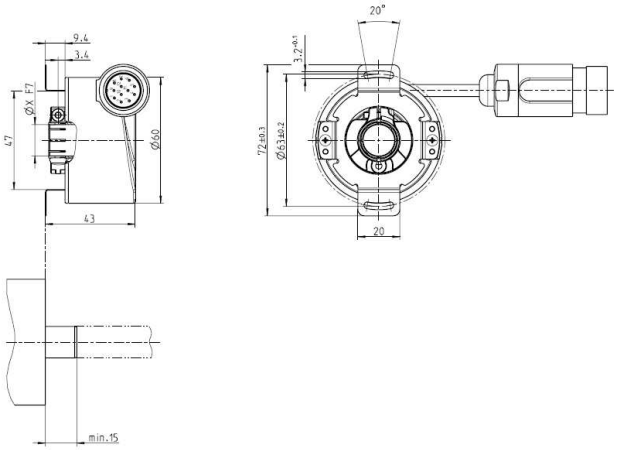
EMC	According to EN 61000-6-2 and EN 61000-6-3
Enclosure rating	IP65, Housing side, male connector (according to IEC 60529) [1] IP65, shaft side (according to IEC 60529)
Permissible relative humidity	90 % (condensation of the optical scanning not permitted)
Operating temperature range	–40 °C ... +100 °C [2] –30 °C ... +100 °C [3]
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)

[1] With mating connector fitted.
[2] Stationary position of the cable.
[3] Flexible position of the cable.

Classifications

ECl@ss 5.0	27270501
ECl@ss 5.1.4	27270501
ECl@ss 6.0	27270590
ECl@ss 6.2	27270590
ECl@ss 7.0	27270501
ECl@ss 8.0	27270501
ECl@ss 8.1	27270501
ECl@ss 9.0	27270501
ECl@ss 10.0	27270501
ECl@ss 11.0	27270501
ETIM 5.0	EC001486
ETIM 6.0	EC001486
ETIM 7.0	EC001486
UNSPSC 16.0901	41112113

Dimensional drawing (Dimensions in mm (inch))

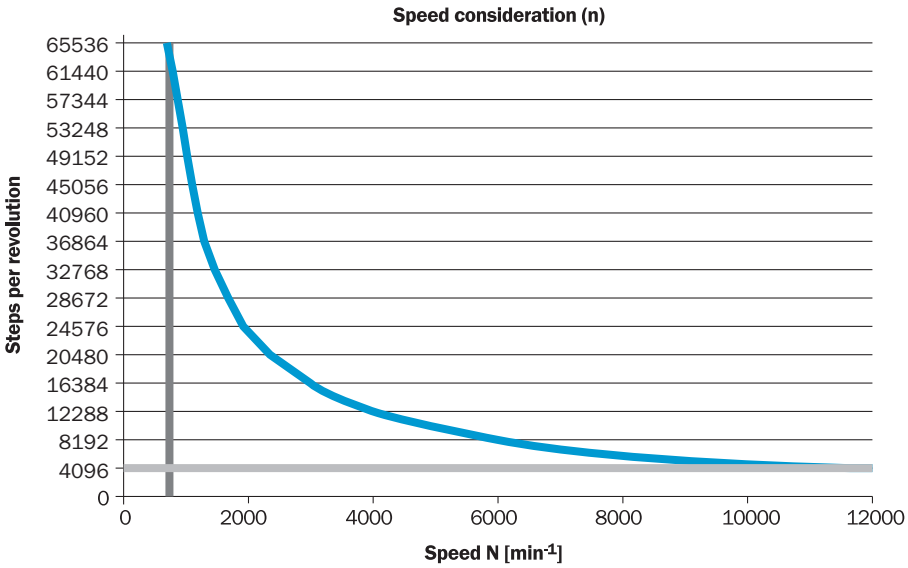


PIN assignment

PIN	Signal	Erklärung
1	B_	Signalleitung
2	N.C.	Nicht belegt
3	Z	Signalleitung
4	Z_	Signalleitung
5	A	Signalleitung
6	A_	Signalleitung
7	N.C.	Nicht belegt
8	B	Signalleitung
9	N.C.	Nicht belegt
10	GND	Masseanschluss des Encoders
11	N.C.	Nicht belegt
12	+ U_s	Versorgungsspannung (potentialfrei zum Gehäuse)
Schirm	Schirm	Schirm encoderseitig mit Gehäuse verbunden. Steuerungsseitig mit Erde verbinden!

Maximum revolution range

Maximum revolution range



SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is “Sensor Intelligence.”

WORLDWIDE PRESENCE:

Contacts and other locations –www.sick.com