Product data sheet

DFS60B-S4EZ00S80

DFS60

INCREMENTAL ENCODERS

SICK
Sensor Intelligence.

Illustration may differ

Ordering information

Type	Part no.
DFS60B-S4EZ00S80	1082933

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

Detailed technical data

Features

Special device	✓
Specialty	Cable, 8-wire, with universal M12 8-pin male connector Total length including connector 130 mm. M12 connector must be protected by an additional strain relief
Standard reference device	DFS60B-S4EA00006, 1037261

Performance

Pulses per revolution	6 [1]
Measuring step	90°, electric/pulses per revolution
Measuring step deviation at non binary number of lines	± 0.08°
Error limits	± 0.05°

[1] See maximum revolution range.

Interfaces

Communication interface	Incremental
Communication Interface detail	HTL / Push pull
Number of signal channels	6-channel
Initialization time	40 ms
Output frequency	≤ 600 kHz
Load current	≤ 30 mA
Power consumption	≤ 0.5 W (without load)

Electrical data

Connection type	Cable, 8-wire, with male connector, M12, 8-pin, universal [1]
Supply voltage	10 ... 32 V
Reference signal, number	1
Reference signal, position	90°, electric, logically gated with A and B
Reverse polarity protection	✓

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

[2] Short-circuit opposite to another channel, US or GND permissable for maximum 30 s.

[3] 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.

Short-circuit protection of the outputs	✓ [2]
MTTFd: mean time to dangerous failure	300 years (EN ISO 13849-1) [3]

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Mechanical data

Mechanical design	Solid shaft, face mount flange
Shaft diameter	10 mm
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 61000-6-4
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
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] With mating connector fitted.

[2] Stationary position of the cable.

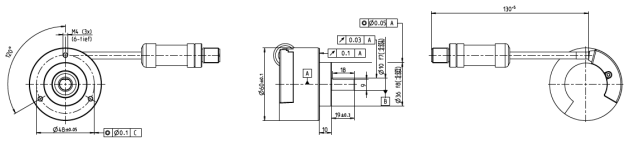
[3] Flexible position of the cable.

Classifications

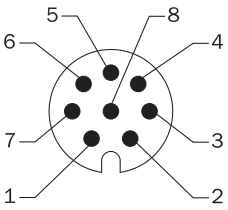
eCl@ss 5.0	27270501
eCl@ss 5.1.4	27270501
eCl@ss 6.0	27270590
eCl@ss 6.2	27270590
eCl@ss 7.0	27270501

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
eCl@ss 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 (Dimensions in mm (inch))



PIN assignment



View of M12 male device connector on encoder

PIN Male connector M12, 8-pin	PIN Male connector M23, 12-pin	Wire colors (cable connection)	TTL/HTL signal	Sin/Cos 1.0 V_{PP}	Explanation
1	6	Brown	$\overline{A}$	COS-	Signal wire
2	5	White	A	COS+	Signal wire
3	1	Black	$\overline{B}$	SIN-	Signal wire
4	8	Pink	B	SIN+	Signal wire
5	4	Yellow	$\overline{Z}$	$\overline{Z}$	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

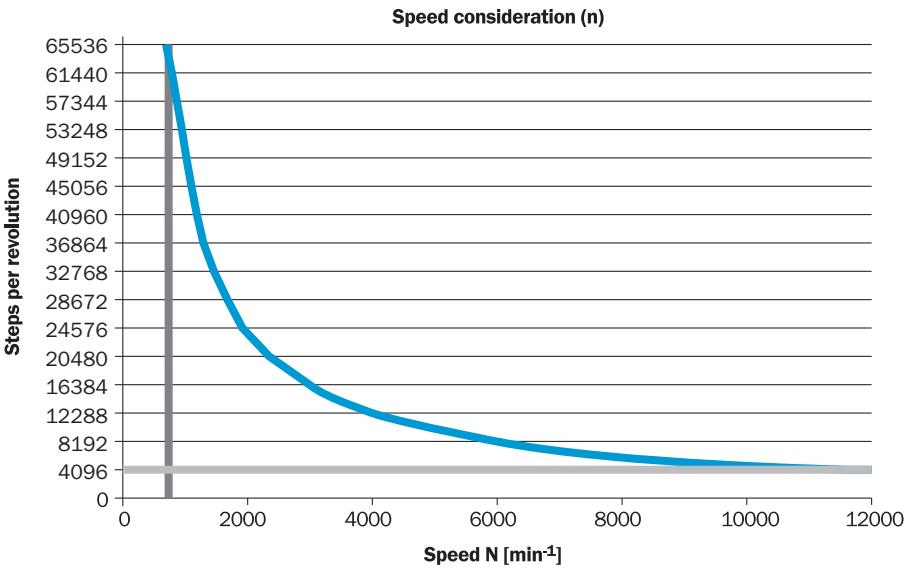
PIN Male connector M12, 8-pin	PIN Male connector M23, 12-pin	Wire colors (cable connection)	TTL/HTL signal	Sin/Cos 1.0 V_{PP}	Explanation
-	7 [1]	Orange	0-SET [1]	N.c.	Set zero pulse [1]
Screen	Screen	Screen	Screen	Screen	Screen connected to housing on encoder side. Connected to ground on control side.

[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”.

Diagrams

Maximum revolution range



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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.

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For us, that is “Sensor Intelligence.”

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