

DFS60B-S4PA10000

DFS60

INCREMENTAL ENCODERS

SICK
Sensor Intelligence.

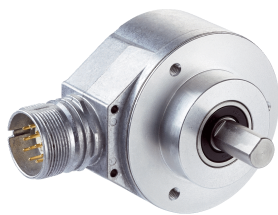


Illustration may differ



Ordering information

Type	Part no.
DFS60B-S4PA10000	1036720

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

Detailed technical data

Performance

Pulses per revolution	10,000
Measuring step	90° / electronically/number of lines
Measuring step deviation at non binary number of lines	± 0.01°
Error limits	± 0.05°
Initialization time	32 ms ¹⁾ 30 ms

¹⁾ With mechanical zero pulse width.

Interfaces

Connection type	Connector M23, 12-pin, radial
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Electrical data

Electrical interface	4.5 V ... 32 V, TTL/HTL programmable
Initialisation time after power on	32 ms ¹⁾ 30 ms
Connection type	Connector M23, 12-pin, radial
Power consumption max. without load	0.7 W (without load)
Operating voltage range	4.5 V ... 32 V
Load current max.	≤ 30 mA
Maximum output frequency	600 kHz
Reference signal, number	1
Reference signal, position	90°, electronically, 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⁾ With mechanical zero pulse width.

²⁾ Programming TTL with ≥ 5,5 V: short-circuit opposite to another channel or GND permissible for maximum 30 s.

³⁾ Programming HTL or TTL with < 5,5 V: short-circuit opposite to another channel, US or GND permissible 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 interface	Solid shaft, Face mount flange
Shaft diameter	10 mm x 19 mm ¹⁾
Mass	0.3 kg
Flange material	Aluminum ²⁾
Housing material	Aluminum die cast ²⁾
Start up torque	0.5 Ncm (+20 °C)
Operating torque	0.3 Ncm (+20 °C)
Permissible shaft loading radial/axial	80 N (radial) 40 N (axial)
Maximum operating speed	9,000 /min ³⁾
Moment of inertia of the rotor	6.2 gcm ²
Bearing lifetime	3.6 x 10 ¹⁰ revolutions
Max. angular acceleration	≤ 500,000 rad/s ²

¹⁾ Other diameters, lengths and expanding shafts on request.

²⁾ Stainless steel on request.

³⁾ Self warming of 3.3 K per 1000 revolutions/min when applying note working temperature range.

Ambient data

EMC	According to EN 61000-6-2 and EN 61000-6-3
Enclosure rating	IP 67, housing side (according to IEC 60529) ¹⁾ IP 65, shaft side (according to IEC 60529) ²⁾
Permissible relative humidity	90 % (condensation of the optical scanning not permitted)
Working temperature range	-40 °C ... +100 °C ³⁾ -30 °C ... +100 °C ⁴⁾
Storage temperature range	-40 °C ... +100 °C, without package
Resistance to shocks	70 g (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.

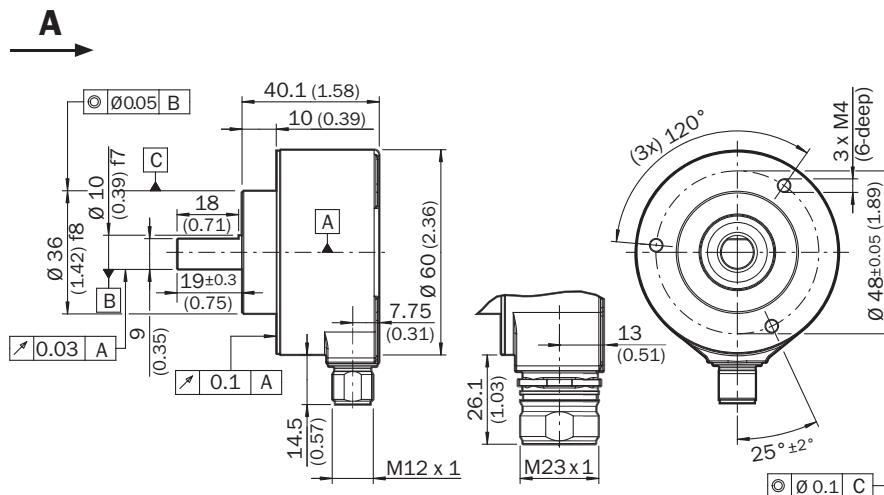
²⁾ IP 67 on request.

³⁾ Stationary position of the cable.

⁴⁾ Flexible position of the cable.

Dimensional drawing (dimensions in mm (inch))

Face mount flange, radial connector outlet M12 and M23

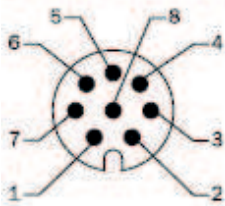


General tolerances as per ISO 2768-mk

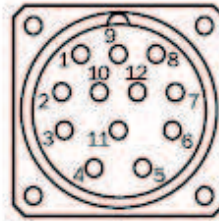
PIN assignment

8-core cable

View of M12 device connector on encoder



View of M23 device connector on encoder

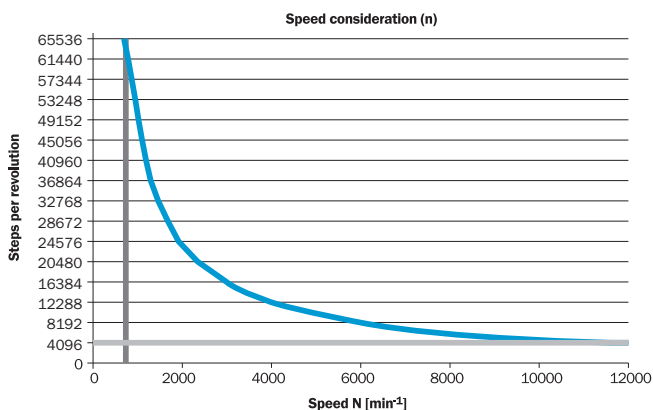


PIN, 8-pin, M12 connector	PIN, 12-pin, M23 connector	Core colors of encoders with cable outlet	TTL/HTL signal	Explanation
1	6	Brown	\bar{A}	Signal cable
2	5	White	A	Signal cable
3	1	Black	\bar{B}	Signal cable
4	8	Pink	B	Signal cable
5	4	Yellow	\bar{Z}	Signal cable
6	3	Lilac	Z	Signal cable
7	10	Blue	GND	Ground connection of the encoder
8	12	Red	+U _s	Supply voltage (volt-free to housing)
-	9	-	N.C.	Not assigned
-	2	-	N.C.	Not assigned
-	11	-	N.C.	Not assigned
-	7 ⁴⁾	-	SET	Zero pulse teach
Shield	Shield	Shield	Shield	Shield connected to housing on side of encoder. Connected to ground on side of control.

⁴⁾ Only at 4.5 ... 32 V, TTL/HTL programmable




The SET input serves to carry out the zero pulse teach function. If the SET input is applied to U_s for longer than 250 ms, after it has been open for at least 1,000 ms or applied to GND, the current shaft position is assigned the zero pulse signal "Z".

Maximum revolution range



Recommended accessories

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

	Brief description	Type	Part no.
Plug connectors and cables			
	Head A: female connector, M23, 12-pin, straight Head B: - Cable: HIPERFACE®, SSI, Incremental, shielded	DOS-2312-G	6027538
	Head A: female connector, M23, 12-pin, angled Head B: - Cable: HIPERFACE®, SSI, Incremental, shielded	DOS-2312-W01	2072580
	Head A: male connector, M23, 12-pin, straight Head B: - Cable: HIPERFACE®, SSI, Incremental, RS-422, shielded	STE-2312-G	6027537

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