

# DFS60B-BEAK00S97

DFS60

INCREMENTAL ENCODERS

**SICK**  
Sensor Intelligence.

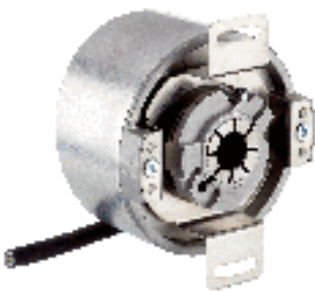


Illustration may differ



## Ordering information

Type	part no.
DFS60B-BEAK00S97	1088233

Other models and accessories → [www.sick.com/DFS60](http://www.sick.com/DFS60)

## Detailed technical data

### Features

<b>Special device</b>	✓
<b>Specialty</b>	Cable, 8-wire, universal, 1.5 m, customized cable connection (10 cm braided shield)
<b>Standard reference device</b>	DFS60B-BEAK10000, 1038931

### Safety-related parameters

<b>MTTF<sub>D</sub> (mean time to dangerous failure)</b>	300 years (EN ISO 13849-1) <sup>1)</sup>
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<sup>1)</sup> 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

<b>Pulses per revolution</b>	10,000 <sup>1)</sup>
<b>Measuring step</b>	90 °, electric/pulses per revolution
<b>Measuring step deviation at non binary number of lines</b>	± 0.01 °
<b>Error limits</b>	± 0.05 °

<sup>1)</sup> See maximum revolution range.

### Interfaces

<b>Communication interface</b>	Incremental
<b>Communication Interface detail</b>	TTL / RS-422
<b>Number of signal channels</b>	6-channel
<b>Initialization time</b>	40 ms
<b>Output frequency</b>	≤ 600 kHz
<b>Load current</b>	≤ 30 mA
<b>Operating current</b>	40 mA (without load)

## Electronics

<b>Connection type</b>	Cable, 8-wire, universal, 1.5 m, customized cable connection (10 cm stripped cables) <sup>1)</sup>
<b>Supply voltage</b>	4.5 ... 5.5 V
<b>Reference signal, number</b>	1
<b>Reference signal, position</b>	90 °, electric, logically gated with A and B
<b>Short-circuit protection of the outputs</b>	✓ <sup>2)</sup>

<sup>1)</sup> The universal cable connection is positioned so that it is possible to lay it without bends in a radial or axial direction.

<sup>2)</sup> Short-circuit opposite to another channel, US or GND permissible for maximum 30 s.

## Mechanics

<b>Mechanical design</b>	Blind hollow shaft
<b>Shaft diameter</b>	12 mmFront clamp
<b>Weight</b>	+ 0.2 kg
<b>Shaft material</b>	Stainless steel
<b>Flange material</b>	Aluminum
<b>Housing material</b>	Aluminum die cast
<b>Start up torque</b>	0.8 Ncm (+20 °C)
<b>Operating torque</b>	0.6 Ncm (+20 °C)
<b>Permissible movement static</b>	± 0.3 mm (radial) ± 0.5 mm (axial)
<b>Permissible movement dynamic</b>	± 0.1 mm (radial) ± 0.2 mm (axial)
<b>Operating speed</b>	≤ 6,000 min <sup>-1</sup> <sup>1)</sup>
<b>Moment of inertia of the rotor</b>	40 gcm <sup>2</sup>
<b>Bearing lifetime</b>	3.6 x 10 <sup>10</sup> revolutions
<b>Angular acceleration</b>	≤ 500,000 rad/s <sup>2</sup>

<sup>1)</sup> Allow for self-heating of 3.3 K per 1,000 rpm when designing the operating temperature range.

## Ambient data

<b>EMC</b>	According to EN 61000-6-2 and EN 61000-6-3
<b>Enclosure rating</b>	IP67, housing side, cable connection (IEC 60529) IP65, shaft side (IEC 60529)
<b>Permissible relative humidity</b>	90 % (Condensation not permitted)
<b>Operating temperature range</b>	-40 °C ... +100 °C <sup>1)</sup> -30 °C ... +100 °C <sup>2)</sup>
<b>Storage temperature range</b>	-40 °C ... +100 °C, without package
<b>Resistance to shocks</b>	70 g, 6 ms (EN 60068-2-27)
<b>Resistance to vibration</b>	30 g, 10 Hz ... 2,000 Hz (EN 60068-2-6)

<sup>1)</sup> Stationary position of the cable.

<sup>2)</sup> Flexible position of the cable.

## Certificates

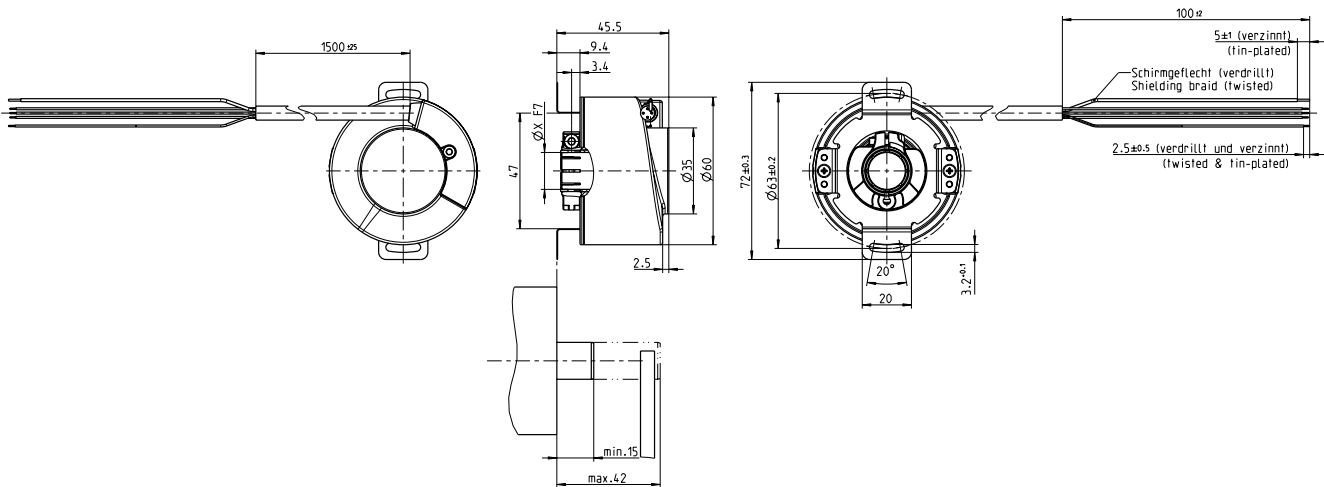
<b>EU declaration of conformity</b>	✓
<b>UK declaration of conformity</b>	✓

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

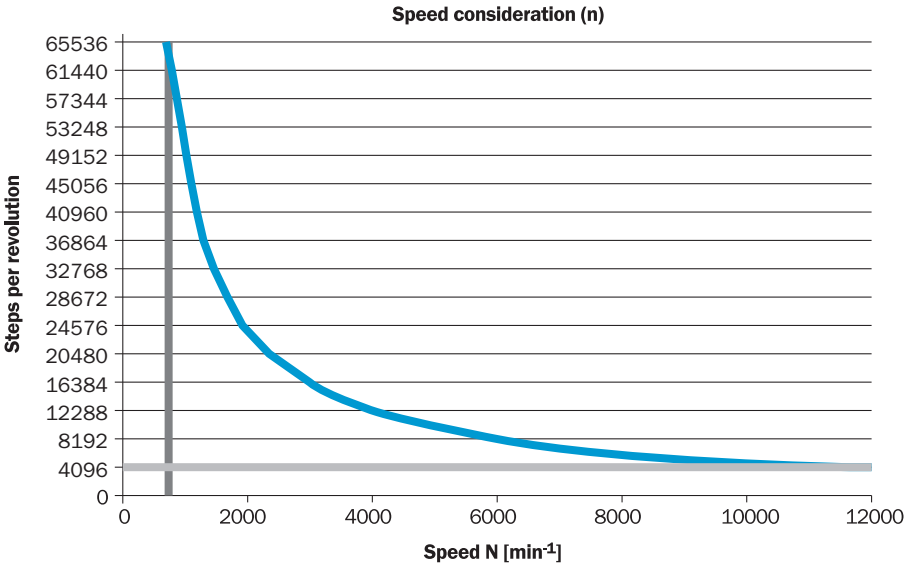
ECLASS 5.0	27270501
ECLASS 5.1.4	27270501
ECLASS 6.0	27270590
ECLASS 6.2	27270590
ECLASS 7.0	27270501
ECLASS 8.0	27270501
ECLASS 8.1	27270501
ECLASS 9.0	27270501
ECLASS 10.0	27270501
ECLASS 11.0	27270501
ECLASS 12.0	27270501
ETIM 5.0	EC001486
ETIM 6.0	EC001486
ETIM 7.0	EC001486
ETIM 8.0	EC001486
UNSPSC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

Dimensional drawing



Dimensions in mm (inch)




maximum revolution range



### Recommended accessories

Other models and accessories → [www.sick.com/DFS60](http://www.sick.com/DFS60)

	Brief description	Type	part no.
connectors and cables			
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, JST, 8-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> SSI, Incremental</li> <li><b>Items supplied:</b> JST including sealing</li> <li><b>Cable:</b> 1.5 m, 8-wire, PUR, halogen-free</li> <li><b>Description:</b> SSI, shielded, Incremental</li> </ul>	DOL-0J08-G1M5AA6	2048590
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, JST, 8-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> SSI, Incremental</li> <li><b>Items supplied:</b> JST including sealing</li> <li><b>Cable:</b> 3 m, 8-wire, PUR, halogen-free</li> <li><b>Description:</b> SSI, shielded, Incremental</li> </ul>	DOL-0J08-G3M0AA6	2048591
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, JST, 8-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental, SSI</li> <li><b>Items supplied:</b> JST including sealing</li> <li><b>Cable:</b> 0.5 m, 8-wire, PUR, halogen-free</li> <li><b>Description:</b> Incremental, shielded, SSI</li> </ul>	DOL-0J08-G0M5AA3	2046873
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, JST, 8-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental, SSI</li> <li><b>Items supplied:</b> JST including sealing</li> <li><b>Cable:</b> 5 m, 8-wire, PUR, halogen-free</li> <li><b>Description:</b> Incremental, shielded, SSI</li> </ul>	DOL-0J08-G05MAA3	2046876
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, JST, 8-pin, straight</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Incremental, SSI</li> <li><b>Items supplied:</b> JST including sealing</li> <li><b>Cable:</b> 10 m, 8-wire, PUR, halogen-free</li> <li><b>Description:</b> Incremental, shielded, SSI</li> </ul>	DOL-0J08-G10MAA3	2046877
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, JST, 8-pin, straight</li> <li><b>Connection type head B:</b> Male connector, M23, 12-pin, straight</li> <li><b>Signal type:</b> Incremental</li> <li><b>Cable:</b> 0.35 m, 8-wire, PUR, halogen-free</li> <li><b>Description:</b> Incremental, shielded</li> </ul>	STL-2312-GM35AA3	2061621
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, JST, 8-pin, straight</li> <li><b>Connection type head B:</b> Male connector, M23, 12-pin, straight</li> <li><b>Signal type:</b> Incremental</li> <li><b>Cable:</b> 1 m, 8-wire, PUR, halogen-free</li> <li><b>Description:</b> Incremental, shielded</li> </ul>	STL-2312-G01MAA3	2061622
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Male connector, M12, 8-pin, straight, A-coded</li> <li><b>Signal type:</b> Incremental</li> <li><b>Cable:</b> CAT5, CAT5e</li> <li><b>Description:</b> Incremental, shielded</li> <li><b>Connection systems:</b> IDC quick connection</li> <li><b>Permitted cross-section:</b> 0.14 mm² ... 0.34 mm²</li> </ul>	STE-1208-GA01	6044892
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Male connector, M23, 12-pin, straight, A-coded</li> <li><b>Signal type:</b> HIPERFACE®, SSI, Incremental</li> <li><b>Description:</b> HIPERFACE®, shieldedSSIIncremental</li> <li><b>Connection systems:</b> Solder connection</li> </ul>	STE-2312-GX	6028548
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Male connector, M23, 12-pin, straight, A-coded</li> <li><b>Signal type:</b> HIPERFACE®, SSI, Incremental</li> <li><b>Description:</b> HIPERFACE®, shieldedSSIIncremental</li> <li><b>Connection systems:</b> Solder connection</li> </ul>	STE-2312-G01	2077273
	<ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, JST, 8-pin, straight</li> <li><b>Connection type head B:</b> Male connector, M23, 12-pin, straight</li> <li><b>Signal type:</b> Incremental</li> <li><b>Cable:</b> 2 m, 8-wire, PUR, halogen-free</li> <li><b>Description:</b> Incremental, shielded</li> </ul>	STL-2312-G02MAA3	2061504

	Brief description	Type	part no.
Mounting systems			
	<ul style="list-style-type: none"><li>• <b>Product family:</b> Stator couplings</li><li>• <b>Description:</b> Standard stator coupling</li></ul>	BEF-DS00XFX	2056812
	<ul style="list-style-type: none"><li>• <b>Description:</b> Bearing bracket for hollow shaft encoders, fastening screws included the Bearing Block is intended for very large radial and axial shaft loads. Particularly for application on: Belt pulleys, Chain pinions, Friction wheels. It is designed this way to enable fitting of encoder with blind hollow shaft with <math>\varnothing 12</math> mm. Operating speed max. 6,000 rpm<sup>-1</sup>, axial shaft load 100 N, radial shaft load 100 N, bearing service life <math>3.6 \times 10^9</math> revolutions</li><li>• <b>Items supplied:</b> Fastening screws included</li></ul>	BEF-FA-B12-010	2042728
	<ul style="list-style-type: none"><li>• <b>Description:</b> Clamping ring for metal hollow shaft</li><li>• <b>Material:</b> Steel</li><li>• <b>Details:</b> Metal</li></ul>	BEF-KR-M	2064709

## 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](http://www.sick.com)