

# DFS60B-ZZAZ0-S01

DFS60

**INCREMENTAL ENCODERS**

**SICK**  
Sensor Intelligence.

Illustration may differ

### Ordering information

Type	part no.
DFS60B-ZZAZ0-S01	1059565

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



### Detailed technical data

#### Features

<b>Special device</b>	✓
<b>Specialty</b>	Servo flange with expanding shaft 10 x 10 mm Cable connection 0.35 m with M23 connector Included in scope of delivery: - Additional connector part no. 6008441 - Mounting tool part no. 2065652 consisting of allen key (7900448) and mounting tool (2065653)
<b>Standard reference device</b>	DFS60B-S1AK02500, 1037202

#### 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>	Special version
<b>Connection type Detail</b>	Cable connection 0.35 m with M23 connector
<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>1)</sup>

<sup>1)</sup> Short-circuit opposite to another channel, US or GND permissible for maximum 30 s.

## Mechanics

<b>Mechanical design</b>	Special version
<b>Mechanical type detail</b>	Solid shaft, servo flange, 10 mm x 10 mm
<b>Weight</b>	+ 0.3 kg
<b>Flange material</b>	Aluminum
<b>Housing material</b>	Aluminum die cast
<b>Start up torque</b>	0.5 Ncm (+20 °C)
<b>Operating torque</b>	0.3 Ncm (+20 °C)
<b>Permissible shaft loading</b>	80 N (radial) 40 N (axial)
<b>Operating speed</b>	≤ 9,000 min <sup>-1</sup> <sup>1)</sup>
<b>Moment of inertia of the rotor</b>	6.2 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, male connector (IEC 60529) <sup>1)</sup> IP65, shaft side (IEC 60529)
<b>Permissible relative humidity</b>	90 % (Condensation not permitted)
<b>Operating temperature range</b>	-40 °C ... +100 °C <sup>2)</sup> -30 °C ... +100 °C <sup>3)</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> With mating connector fitted.

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

<sup>3)</sup> Flexible position of the cable.

## Certificates

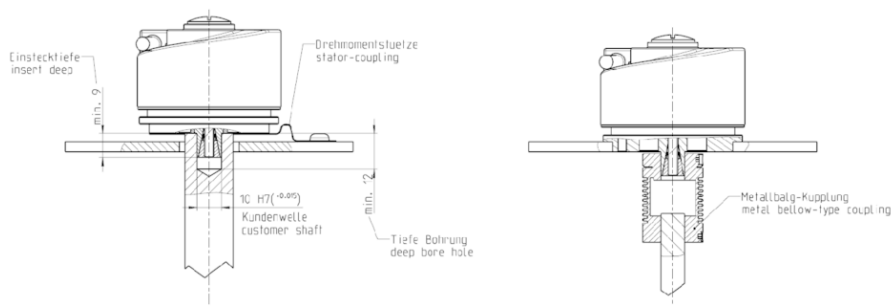
<b>EU declaration of conformity</b>	✓
<b>UK declaration of conformity</b>	✓
<b>ACMA declaration of conformity</b>	✓

<b>Moroccan declaration of conformity</b>	✓
<b>China RoHS</b>	✓
<b>Information according to Art. 3 of Data Act (Regulation EU 2023/2854)</b>	✓

### Classifications

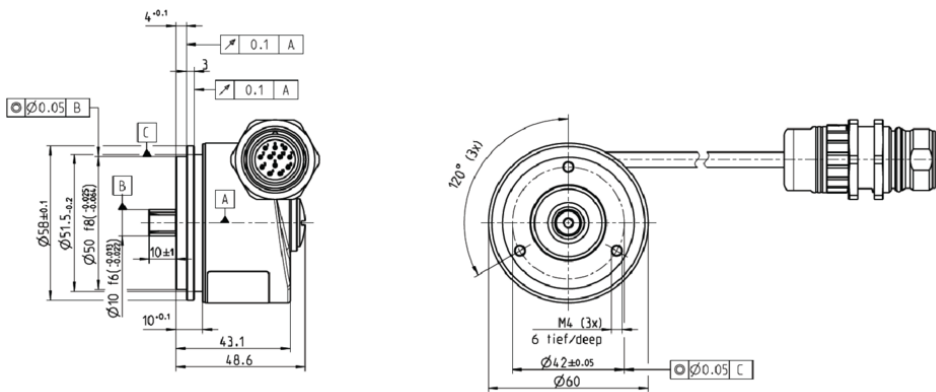
<b>ECLASS 5.0</b>	27270501
<b>ECLASS 5.1.4</b>	27270501
<b>ECLASS 6.0</b>	27270590
<b>ECLASS 6.2</b>	27270590
<b>ECLASS 7.0</b>	27270501
<b>ECLASS 8.0</b>	27270501
<b>ECLASS 8.1</b>	27270501
<b>ECLASS 9.0</b>	27270501
<b>ECLASS 10.0</b>	27270501
<b>ECLASS 11.0</b>	27270501
<b>ECLASS 12.0</b>	27270501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

### Dimensional drawing



Dimensions in mm (inch)

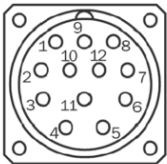
## Dimensional drawing



Dimensions in mm (inch)

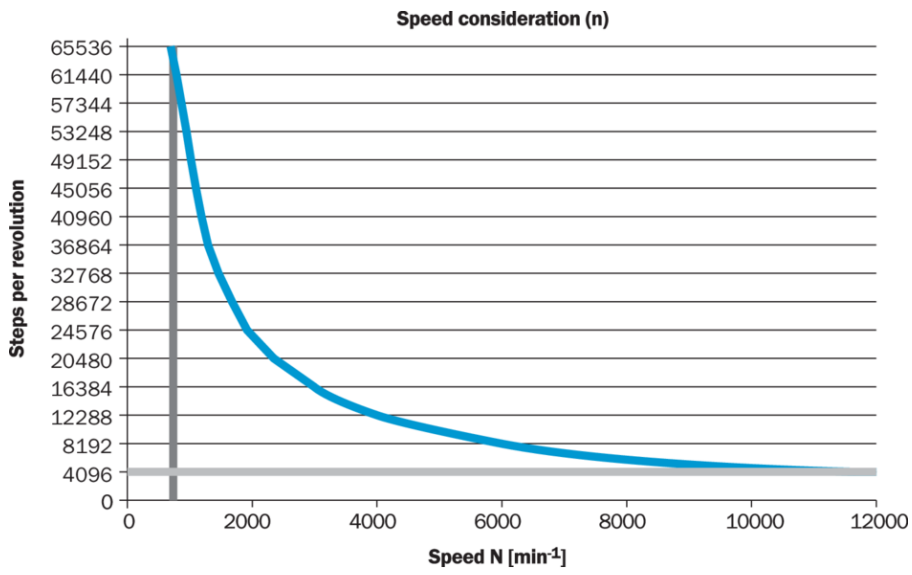
## PIN assignment

PIN	Signal TTL/HTL	Explanation
1	B <sub>-</sub>	Signal line
2	Sense+	Intern mit U <sub>s</sub> verbunden
3	Z	Signal line
4	Z <sub>-</sub>	Signal line
5	A	Signal line
6	A <sub>-</sub>	Signal line
7	N.C.	Not connected
8	B	Signalleitung
9	Screen	Screen on the encoder side with PIN9 connected. On the control side connected to earth.
10	GND	Ground connection of the encoder
11	Sense-	Internal connected with GND
12	+U <sub>s</sub>	Supply voltage (potential free to housing).



View at the M23 connector on the end of the cable.

### 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.”

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