

# DBS36E-SZEMZ0S63

DBS36/50

INCREMENTAL ENCODERS

**SICK**  
Sensor Intelligence.

Illustration may differ

## Ordering information

Type	part no.
DBS36E-SZEMZ0S63	1150094

Other models and accessories → [www.sick.com/DBS36\\_50](http://www.sick.com/DBS36_50)

## Detailed technical data

## Features

<b>Special device</b>	✓
<b>Specialty</b>	60 pulses per revolution Customized stator coupling Customer-specific shaft Cable, 8-wire, 5 m
<b>Standard reference device</b>	DBS36E-S3EJ00020, 1083833

## Safety-related parameters

<b>MTTF<sub>D</sub> (mean time to dangerous failure)</b>	600 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>	60
<b>Measuring step</b>	90°, electric/pulses per revolution
<b>Measuring step deviation</b>	± 18° / pulses per revolution
<b>Error limits</b>	± 54° / pulses per revolution
<b>Duty cycle</b>	≤ 0.5 ± 5 %

## Interfaces

<b>Communication interface</b>	Incremental
<b>Communication Interface detail</b>	HTL / Push pull
<b>Number of signal channels</b>	6-channel
<b>Initialization time</b>	< 3 ms
<b>Output frequency</b>	≤ 300 kHz
<b>Load current</b>	≤ 30 mA
<b>Power consumption</b>	≤ 0.5 W (without load)

## Electronics

<b>Connection type</b>	Cable, 8-wire, universal, 5 m
<b>Supply voltage</b>	7 ... 30 V

<sup>1)</sup> The short-circuit rating is only given if Us and GND are connected correctly.

<b>Reference signal, number</b>	1
<b>Reference signal, position</b>	90°, electric, logically gated with A and B
<b>Reverse polarity protection</b>	✓
<b>Short-circuit protection of the outputs</b>	✓ <sup>1)</sup>

<sup>1)</sup> The short-circuit rating is only given if Us and GND are connected correctly.

## Mechanics

<b>Mechanical design</b>	Special version
<b>Mechanical type detail</b>	Customer-specific shaft, 7 mm x 20 mm
<b>Flange type / stator coupling</b>	Special version
<b>Weight</b>	+ 150 g (with connecting cable)
<b>Shaft material</b>	Stainless steel
<b>Flange material</b>	Aluminum
<b>Housing material</b>	Aluminum
<b>Material, cable</b>	PVC
<b>Start up torque</b>	+ 0.5 Ncm (+20 °C)
<b>Operating torque</b>	0.4 Ncm (+20 °C)
<b>Permissible shaft loading</b>	40 N (radial) <sup>1)</sup> 20 N (axial)
<b>Operating speed</b>	6,000 min <sup>-1</sup> <sup>2)</sup>
<b>Maximum operating speed</b>	≤ 8,000 min <sup>-1</sup> <sup>3)</sup>
<b>Moment of inertia of the rotor</b>	0.6 gcm <sup>2</sup>
<b>Bearing lifetime</b>	2 x 10 <sup>9</sup> revolutions
<b>Angular acceleration</b>	≤ 500,000 rad/s <sup>2</sup>

<sup>1)</sup> Higher values are possible using limited bearing life.

<sup>2)</sup> Allow for self-heating of 3.3 K per 1,000 rpm when designing the operating temperature range.

<sup>3)</sup> No permanent operation. Decreasing signal quality.

## Ambient data

<b>EMC</b>	According to EN 61000-6-2 and EN 61000-6-3 (class A)
<b>Enclosure rating</b>	IP65
<b>Permissible relative humidity</b>	90 % (Condensation not permitted)
<b>Operating temperature range</b>	-20 °C ... +85 °C, -35 °C ... +95 °C on request
<b>Storage temperature range</b>	-40 °C ... +100 °C, without package
<b>Resistance to shocks</b>	100 g, 6 ms (EN 60068-2-27)
<b>Resistance to vibration</b>	20 g, 10 Hz ... 2,000 Hz (EN 60068-2-6)

## Certificates

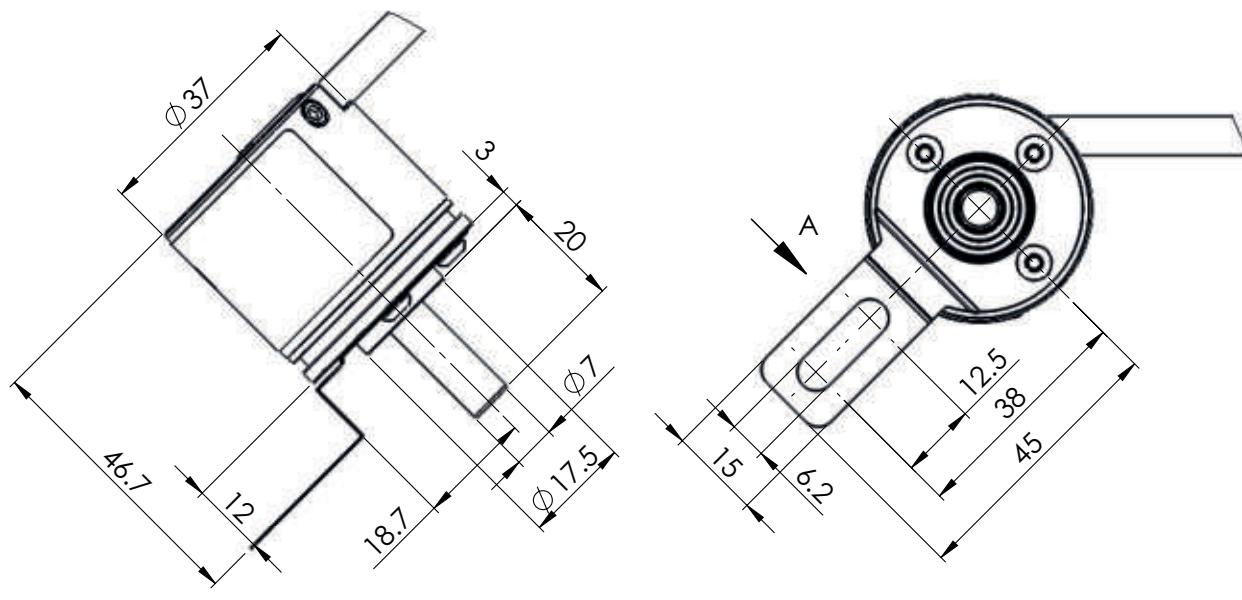
<b>EU declaration of conformity</b>	✓
<b>UK declaration of conformity</b>	✓
<b>ACMA declaration of conformity</b>	✓
<b>China-RoHS</b>	✓
<b>cRUs certificate</b>	✓

Information according to Art. 3 of Data Act (Regulation EU 2023/2854)	✓
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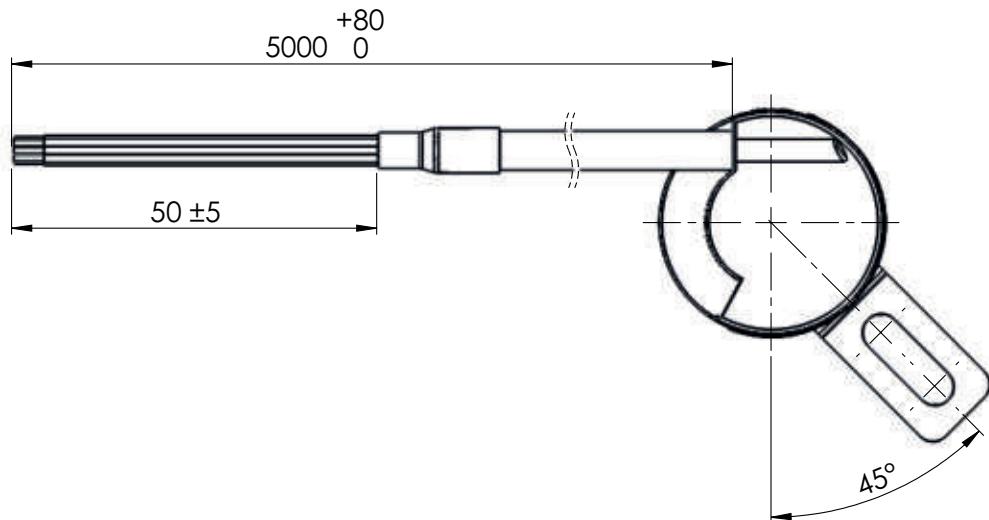
## Classifications

<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

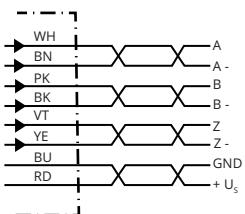


VIEW A



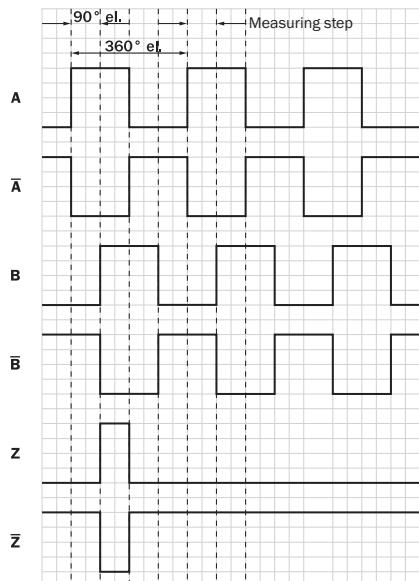
Dimensions in mm (inch)

## PIN assignment



Wire colors (cable connection)	Male connector M12, 8-pin	Male connector M23, 12-pin	TTL/HTL 6-channel signal	Explanation
Brown	1	6	A-	Signal wire
White	2	5	A	Signal wire
Black	3	1	B-	Signal wire
Pink	4	8	B	Signal wire
Yellow	5	4	Z-	Signal wire
Purple	6	3	Z	Signal wire
Blue	7	10	GND	Ground connection
Red	8	12	+U <sub>s</sub>	Supply voltage
-	-	9	Not assigned	Not assigned
-	-	2	Not assigned	Not assigned
-	-	11	Not assigned	Not assigned
-	-	7	Not assigned	Not assigned

## Diagrams Signal outputs for electrical interfaces TTL and HTL



Cw with view on the encoder shaft in direction "A", compare dimensional drawing.

① Interfaces G, P, R only for channels A, B, Z.

Supply voltage	Output
4.5 V...5.5 V	TTL/RS422
7 V...30 V	TTL/RS422
7 V...30 V	HTL/Push Pull
7 V...27 V	HTL/push pull, 3 channel
4.5 V...5.5 V	Open Collector NPN, 3 channel
4.5 V...30 V	Open Collector NPN, 3 channel

## Recommended accessories

Other models and accessories → [www.sick.com/DBS36\\_50](http://www.sick.com/DBS36_50)

	Brief description	Type	part no.
connectors and cables			
	<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 mm<sup>2</sup> ... 0.34 mm<sup>2</sup></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<sup>®</sup>, SSI, Incremental</li><li><b>Description:</b> HIPERFACE<sup>®</sup>, 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> Male connector, M23, 12-pin, straight, A-coded</li><li><b>Signal type:</b> HIPERFACE<sup>®</sup>, SSI, Incremental</li><li><b>Description:</b> HIPERFACE<sup>®</sup>, 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> Flying leads</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Signal type:</b> SSI, Incremental, HIPERFACE<sup>®</sup></li><li><b>Items supplied:</b> By the meter</li><li><b>Cable:</b> 8-wire, PUR, halogen-free</li><li><b>Description:</b> SSI, shielded, Incremental, HIPERFACE<sup>®</sup></li></ul>	LTG-2308-MWENC	6027529
	<ul style="list-style-type: none"><li><b>Connection type head A:</b> Flying leads</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Signal type:</b> SSI, Incremental</li><li><b>Items supplied:</b> By the meter</li><li><b>Cable:</b> 11-wire, PUR</li><li><b>Description:</b> SSI, shielded, Incremental</li></ul>	LTG-2411-MW	6027530
	<ul style="list-style-type: none"><li><b>Connection type head A:</b> Flying leads</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Signal type:</b> SSI, Incremental</li><li><b>Items supplied:</b> By the meter</li><li><b>Cable:</b> 12-wire, PUR, halogen-free</li><li><b>Description:</b> SSI, shielded, Incremental</li></ul>	LTG-2512-MW	6027531
	<ul style="list-style-type: none"><li><b>Connection type head A:</b> Flying leads</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Signal type:</b> SSI, TTL, HTL, Incremental</li><li><b>Items supplied:</b> By the meter</li><li><b>Cable:</b> 12-wire, UV and saltwater-resistant, PUR, halogen-free</li><li><b>Description:</b> SSI, shielded, TTL, HTL, Incremental</li></ul>	LTG-2612-MW	6028516

## 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)