

DBS50E-S5EQ02000

DBS36/50

INCREMENTAL ENCODERS

SICK
Sensor Intelligence.



Illustration may differ

Ordering information

Type	part no.
DBS50E-S5EQ02000	1089239

Other models and accessories → www.sick.com/DBS36_50

Detailed technical data

Safety-related parameters

MTTF_D (mean time to dangerous failure)	600 years (EN ISO 13849-1) ¹⁾
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¹⁾ 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

Pulses per revolution	2,000
Measuring step	90°, electric/pulses per revolution
Measuring step deviation	± 18° / pulses per revolution
Error limits	± 54° / pulses per revolution
Duty cycle	≤ 0.5 ± 5 %

Interfaces

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

Electronics

Connection type	Cable, 8-wire, with male connector, M23, 12-pin, universal, 0.5 m ¹⁾
Supply voltage	7 ... 30 V
Reference signal, number	1
Reference signal, position	90°, electric, logically gated with A and B
Reverse polarity protection	✓
Short-circuit protection of the outputs	✓ ²⁾

¹⁾ M23 male connector for central mounting.

²⁾ The short-circuit rating is only given if Us and GND are connected correctly.

Mechanics

Mechanical design	Solid shaft, face mount flange
Shaft diameter	8 mmWith flat
Shaft length	15.5 mm
Weight	+ 180 g (with connecting cable)
Shaft material	Stainless steel
Flange material	Aluminum
Housing material	Aluminum
Material, cable	PVC
Start up torque	+ 0.9 Ncm (+20 °C)
Operating torque	0.6 Ncm (+20 °C)
Permissible shaft loading	30 N (axial) 50 N (radial)
Operating speed	6,000 min ⁻¹ ¹⁾
Maximum operating speed	8,000 min ⁻¹ ²⁾
Moment of inertia of the rotor	0.65 gcm ²
Bearing lifetime	2 x 10 ⁹ 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.

²⁾ No permanent operation. Decreasing signal quality.

Ambient data

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

Certificates

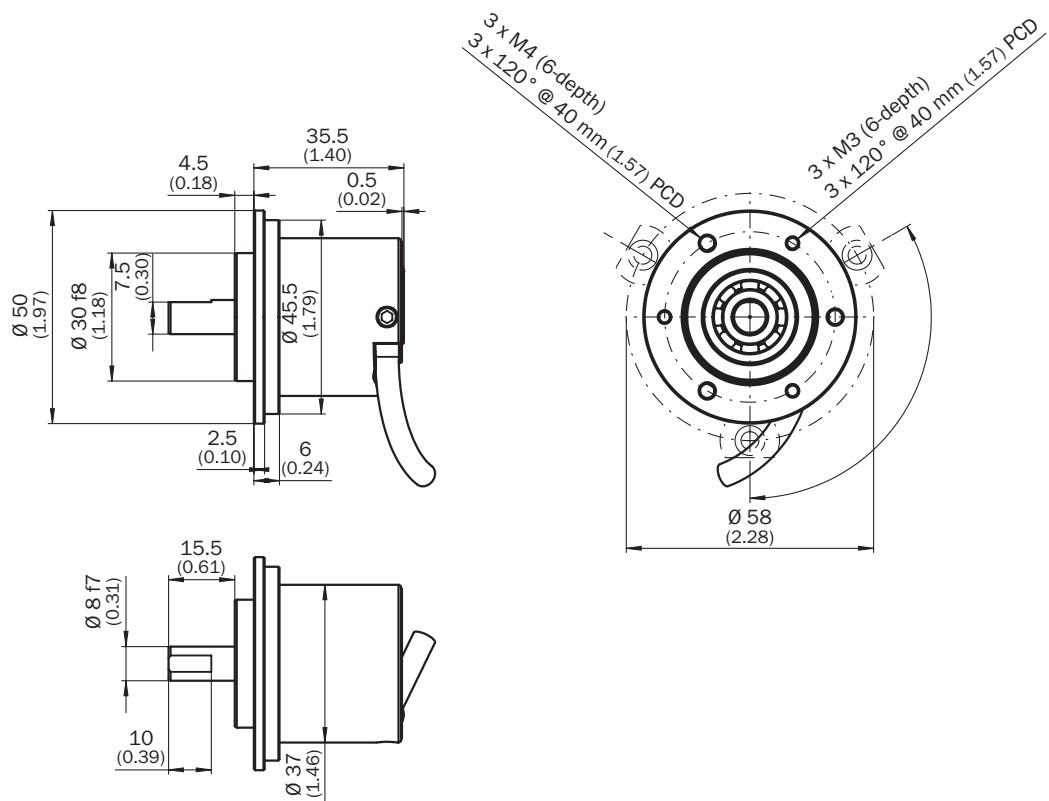
EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
China-RoHS	✓
cRUs certificate	✓
Information according to Art. 3 of Data Act (Regulation EU 2023/2854)	✓

Classifications

ECLASS 5.0	27270501
ECLASS 5.1.4	27270501
ECLASS 6.0	27270590
ECLASS 6.2	27270590

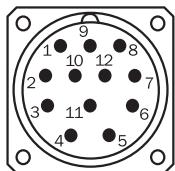
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ECLASS 8.0	27270501
ECLASS 8.1	27270501
ECLASS 9.0	27270501
ECLASS 10.0	27270501
ECLASS 11.0	27270501
ECLASS 12.0	27270501
ETIM 5.0	EC001486
ETIM 6.0	EC001486
ETIM 7.0	EC001486
ETIM 8.0	EC001486
UNSPSC 16.0901	41112113

Dimensional drawing Face mount flange



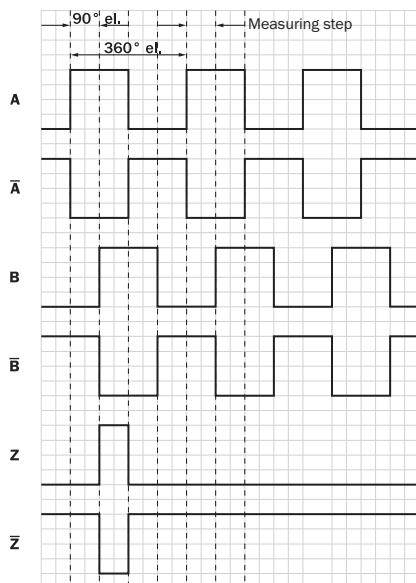
Dimensions in mm (inch)

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 _s	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



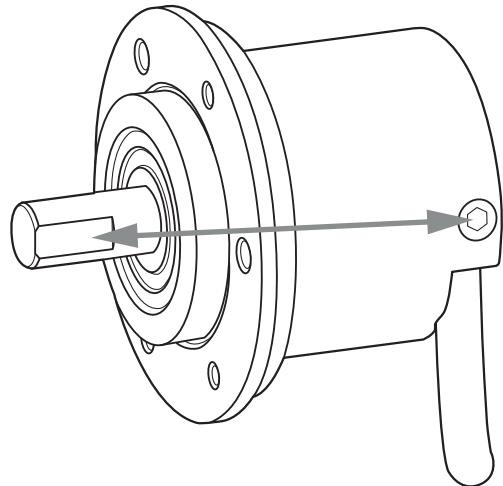
Cw with view on the encoder shaft in direction "A", compare dimensional drawing.

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

Supply voltage	Output
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

Operation note Zero pulse explanation



Recommended accessories

Other models and accessories → www.sick.com/DBS36_50

	Brief description	Type	part no.
connectors and cables			
	<ul style="list-style-type: none">• Connection type head A: Female connector, M23, 12-pin, straight• Connection type head B: Flying leads• Signal type: Incremental• Cable: 2 m, 11-wire, PUR• Description: Incremental, shielded	DOL-2312-G02MLA3	2030682
	<ul style="list-style-type: none">• Connection type head A: Female connector, M23, 12-pin, straight• Connection type head B: Flying leads• Signal type: Incremental• Cable: 7 m, 11-wire, PUR• Description: Incremental, shielded	DOL-2312-G07MLA3	2030685
	<ul style="list-style-type: none">• Connection type head A: Female connector, M23, 12-pin, straight• Connection type head B: Flying leads• Signal type: Incremental• Cable: 10 m, 11-wire, PUR• Description: Incremental, shielded	DOL-2312-G10MLA3	2030688
	<ul style="list-style-type: none">• Connection type head A: Female connector, M23, 12-pin, straight• Connection type head B: Flying leads• Signal type: Incremental• Cable: 15 m, 11-wire, PUR• Description: Incremental, shielded	DOL-2312-G15MLA3	2030692
	<ul style="list-style-type: none">• Connection type head A: Female connector, M23, 12-pin, straight• Connection type head B: Flying leads• Signal type: Incremental• Cable: 20 m, 11-wire, PUR• Description: Incremental, shielded	DOL-2312-G20MLA3	2030695
	<ul style="list-style-type: none">• Connection type head A: Female connector, M23, 12-pin, straight• Connection type head B: Flying leads• Signal type: Incremental• Cable: 25 m, 11-wire, PUR• Description: Incremental, shielded	DOL-2312-G25MLA3	2030699
	<ul style="list-style-type: none">• Connection type head A: Female connector, M23, 12-pin, straight• Connection type head B: Flying leads• Signal type: Incremental• Cable: 30 m, 11-wire, PUR• Description: Incremental, shielded	DOL-2312-G30MLA3	2030702
	<ul style="list-style-type: none">• Connection type head A: Female connector, M23, 12-pin, straight• Connection type head B: Flying leads• Signal type: Incremental• Cable: 1.5 m, 12-wire, PUR, halogen-free• Description: Incremental, shielded	DOL-2312-G1M5MA3	2029212
	<ul style="list-style-type: none">• Connection type head A: Female connector, M23, 12-pin, straight• Connection type head B: Flying leads• Signal type: Incremental• Cable: 3 m, 12-wire, PUR, halogen-free• Description: Incremental, shielded	DOL-2312-G03MMA3	2029213
	<ul style="list-style-type: none">• Connection type head A: Female connector, M23, 12-pin, straight• Connection type head B: Flying leads• Signal type: Incremental• Cable: 5 m, 12-wire, PUR, halogen-free• Description: Incremental, shielded	DOL-2312-G05MMA3	2029214
	<ul style="list-style-type: none">• Connection type head A: Female connector, M23, 12-pin, straight• Connection type head B: Flying leads• Signal type: Incremental• Cable: 10 m, 12-wire, PUR, halogen-free• Description: Incremental, shielded	DOL-2312-G10MMA3	2029215
	<ul style="list-style-type: none">• Connection type head A: Female connector, M23, 12-pin, straight• Connection type head B: Flying leads• Signal type: Incremental• Cable: 20 m, 12-wire, PUR, halogen-free• Description: Incremental, shielded	DOL-2312-G20MMA3	2029216
	<ul style="list-style-type: none">• Connection type head A: Female connector, M23, 12-pin, straight• Connection type head B: Flying leads• Signal type: Incremental	DOL-2312-G30MMA3	2029217

	Brief description	Type	part no.
	<ul style="list-style-type: none"> Cable: 30 m, 12-wire, PUR, halogen-free Description: Incremental, shielded Connection type head A: Female connector, M23, 12-pin, straight, A-coded Signal type: HIPERFACE®, SSI, Incremental Description: HIPERFACE®, shieldedSSIIncremental Connection systems: Solder connection 	DOS-2312-G02	2077057
	<ul style="list-style-type: none"> Connection type head A: Female connector, M23, 12-pin, angled, A-coded Signal type: HIPERFACE®, SSI, Incremental Description: HIPERFACE®, shieldedSSIIncremental Connection systems: Solder connection 	DOS-2312-W01	2072580

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