

DBS60I-BBEM02000

DBS60

INCREMENTAL ENCODERS

SICK
Sensor Intelligence.



Ordering information

Type	part no.
DBS60I-BBEM02000	1125782

Other models and accessories → www.sick.com/DBS60

Illustration may differ



Detailed technical data

Safety-related parameters

MTTF_D (mean time to dangerous failure)	500 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	Measuring step deviation x 3
Duty cycle	≤ 0.5 ± 5 %

Interfaces

Communication interface	Incremental
Communication Interface detail	HTL / Push pull
Number of signal channels	6-channel
Initialization time	< 5 ms ¹⁾
Output frequency	≤ 300 kHz ²⁾
Load current	≤ 30 mA, per channel
Power consumption	≤ 1 W (without load)

¹⁾ Valid signals can be read once this time has elapsed.

²⁾ Up to 450 kHz on request.

Electronics

Connection type	Cable, 8-wire, radial, 5 m
Supply voltage	10 ... 27 V
Reference signal, number	1

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

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

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

Mechanics

Mechanical design	Blind hollow shaft
Shaft diameter	8 mmFront clamp
Flange type / stator coupling	2-sided stator coupling, slot, screw hole circle 63–83 mm
Weight	0.44 kg ¹⁾
Shaft material	Stainless steel V2A
Flange material	Stainless steel V2A
Housing material	Stainless steel V2A
Material, cable	PVC
Shaft sealing ring material	FKM80
Start up torque	2.1 Ncm (+20 °C)
Operating torque	2 Ncm (+20 °C)
Permissible movement static	± 0.3 mm (radial) ± 0.5 mm (axial)
Permissible movement dynamic	± 0.1 mm ± 0.2 mm
Operating speed	≤ 6,000 min ⁻¹ ²⁾
Moment of inertia of the rotor	52 gcm ²
Bearing lifetime	3.6 x 10 ⁹ revolutions
Angular acceleration	≤ 500,000 rad/s ²

¹⁾ Based on encoder with male connector.

²⁾ Maximum speed which does not cause mechanical damage to the encoder. Impact on the service life and signal quality is possible. Please note the maximum output frequency.

Ambient data

EMC	According to EN 61000-6-2 and EN 61000-6-3
Enclosure rating	IP67, cable connection (IEC 60529)
Permissible relative humidity	90 % (Condensation not permitted)
Operating temperature range	-20 °C ... +85 °C
Storage temperature range	-40 °C ... +100 °C, without package
Resistance to shocks	100 g, 6 ms (EN 60068-2-27)
Resistance to vibration	10 g, 10 Hz ... 2,000 Hz (EN 60068-2-6)

Certificates

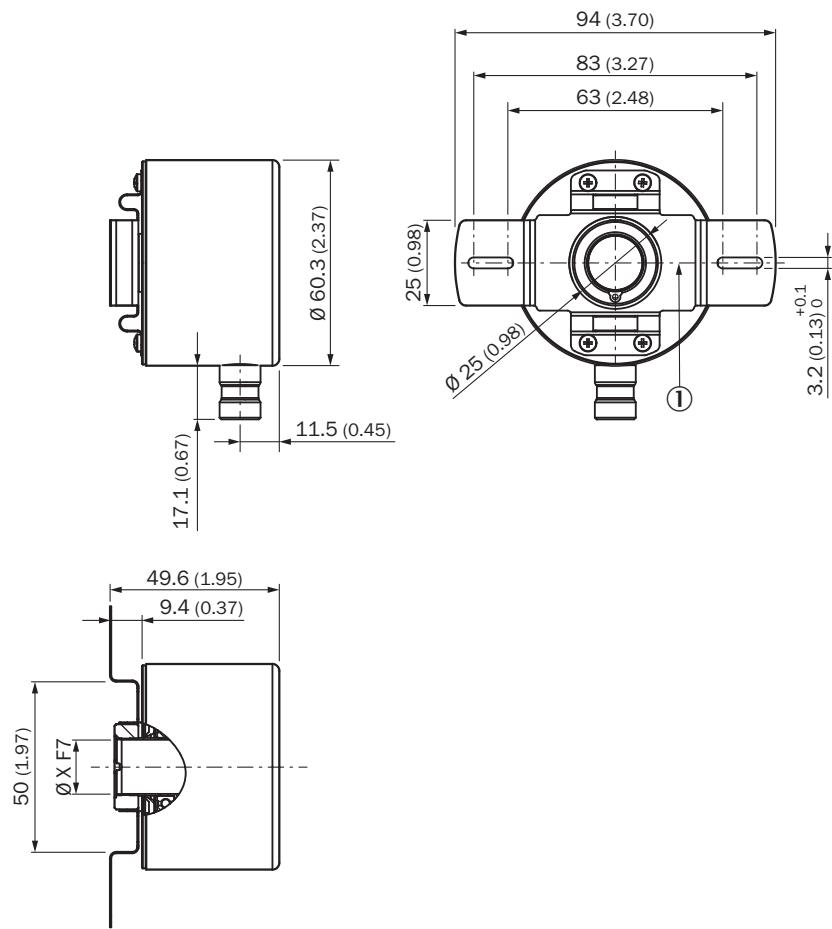
EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
China-RoHS	✓
cULus certificate	✓

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

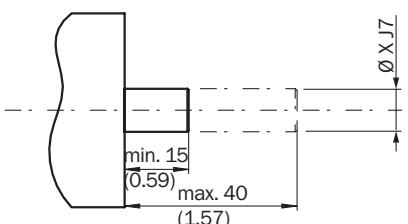
ECLASS 5.0	27270501
ECLASS 5.1.4	27270501
ECLASS 6.0	27270590
ECLASS 6.2	27270590
ECLASS 7.0	27270501
ECLASS 8.0	27270501
ECLASS 8.1	27270501
ECLASS 9.0	27270501
ECLASS 10.0	27270501
ECLASS 11.0	27270501
ECLASS 12.0	27270501
ETIM 5.0	EC001486
ETIM 6.0	EC001486
ETIM 7.0	EC001486
ETIM 8.0	EC001486
UNSPSC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

Dimensional drawing



Dimensions in mm (inch)
① Zero pulse mark on flange

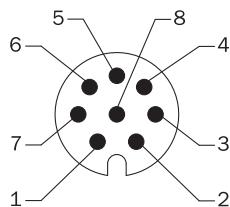
Attachment specifications Blind hollow shaft



customer side

Type	Blind hollow shaft	Shaft diameter xj7
DBS60I-BAxxxxxx		6 mm
DBS60I-BBxxxxxx		8 mm
DBS60I-BDxxxxxx		10 mm
DBS60I-BExxxxxx		12 mm
DBS60I-BGxxxxxx		14 mm
DBS60I-BHxxxxxx		15 mm

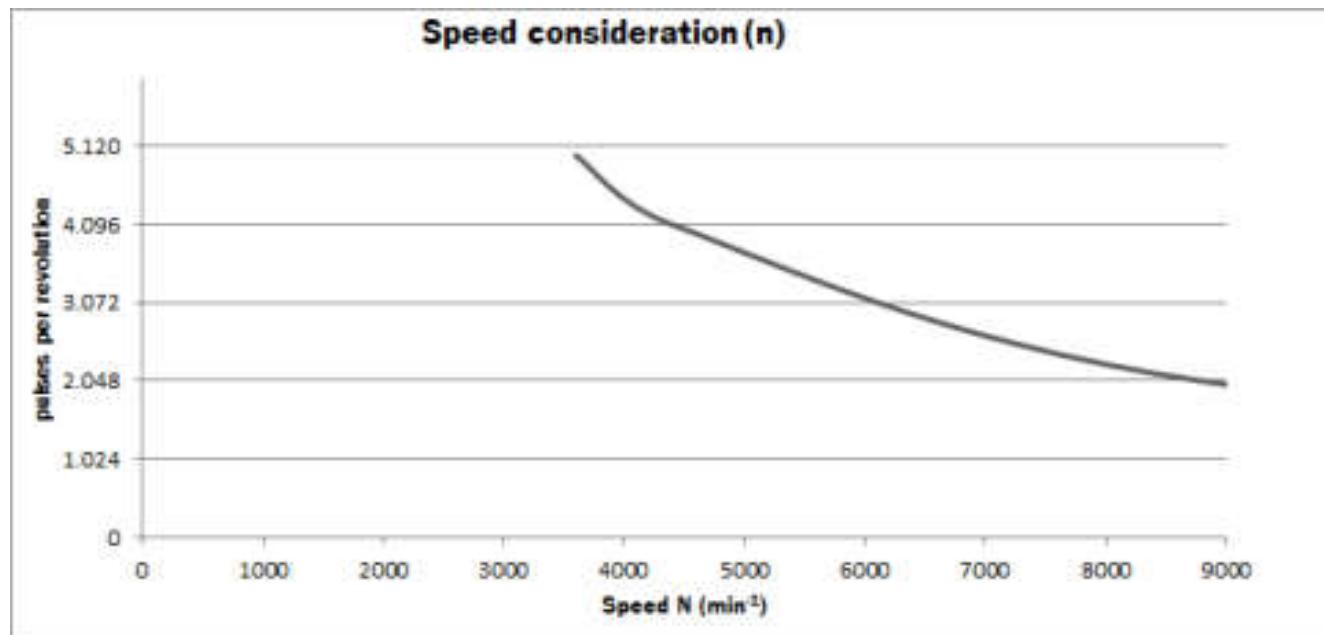
PIN assignment



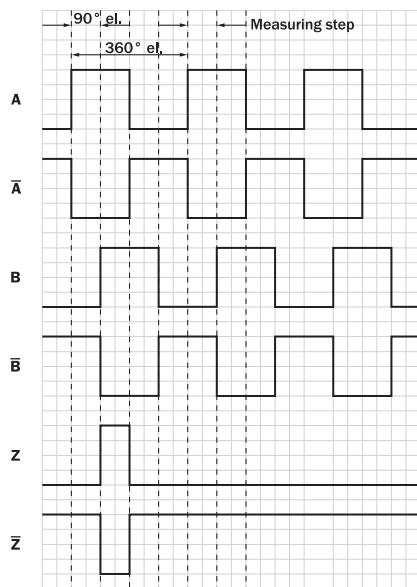
view of M12 male device connector on cable / housing

Wire colors (cable connection)	Male connector M12, 8-pin	TTL/HTL signal	Explanation
Brown	1	A-	Signal cable
White	2	A	Signal cable
Black	3	B-	Signal cable
Pink	4	B	Signal cable
Yellow	5	Z-	Signal cable
Purple	6	Z	Signal cable
Blue	7	GND	Ground connection
Red	8	+U _S	Supply voltage
Screen	Screen	Screen	Screen connected to housing on encoder side

Diagrams



Diagrams Signal outputs for electrical interfaces TTL and HTL



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

Supply voltage	Output
4,5 V ... 5,5 V	TTL
10 V ... 30 V	TTL
10 V ... 27 V	HTL
4,5 V ... 30 V	TTL/HTL universal
4,5 V ... 30 V	TTL

Recommended accessories

Other models and accessories → www.sick.com/DBS60

	Brief description	Type	part no.
connectors and cables			
	<ul style="list-style-type: none"> Connection type head A: Male connector, M12, 8-pin, straight, A-coded Description: Shielded Connection systems: Screw-type terminals Permitted cross-section: $\leq 0.5 \text{ mm}^2$ Application: Hygienic and washdown zones 	YM12ES8-0050S5586A	2097337
	<ul style="list-style-type: none"> Connection type head A: Flying leads Connection type head B: Flying leads Signal type: SSI, Incremental, HIPERFACE® Items supplied: By the meter Cable: 8-wire, PUR, halogen-free Description: SSI, shielded, Incremental, HIPERFACE® 	LTG-2308-MWENC	6027529
	<ul style="list-style-type: none"> Connection type head A: Flying leads Connection type head B: Flying leads Signal type: SSI, Incremental Items supplied: By the meter Cable: 11-wire, PUR Description: SSI, shielded, Incremental 	LTG-2411-MW	6027530
	<ul style="list-style-type: none"> Connection type head A: Flying leads Connection type head B: Flying leads Signal type: SSI, TTL, HTL, Incremental Items supplied: By the meter Cable: 12-wire, UV and saltwater-resistant, PUR, halogen-free Description: SSI, shielded, TTL, HTL, Incremental 	LTG-2612-MW	6028516
	<ul style="list-style-type: none"> Connection type head A: Female connector, M12, 8-pin, straight, A-coded Description: Shielded Connection systems: Screw-type terminals Permitted cross-section: $0.25 \text{ mm}^2 \dots 0.5 \text{ mm}^2$ Application: Hygienic and washdown zones 	YF12ES8-0050S5586A	2097334
	<ul style="list-style-type: none"> Connection type head A: Female connector, M12, 8-pin, straight, A-coded Connection type head B: Flying leads Signal type: Incremental, SSI Cable: 2 m, 8-wire, PUR, halogen-free Description: Incremental, shielded, SSI Connection systems: Flying leads 	DOL-1208-G02MIE1	2120313

	Brief description	Type	part no.
Mounting systems			
	<ul style="list-style-type: none">Product family: Stator couplingsDescription: Two-sided stator coupling, screw hole circle diameter 63 mm, slot width 3.2 mm	BEF-DS-09	2076214
	<ul style="list-style-type: none">Product family: Stator couplingsDescription: Two-sided stator coupling, slot, slot radius 63 mm – 83 mm, slot width 3.2 mm	BEF-DS-10	2076215
	<ul style="list-style-type: none">Product family: Stator couplingsDescription: One-sided stator coupling, slots, slot radius 32.75 mm – 142.65 mm, slot width 4.5 mm	BEF-DS-11	2076216
	<ul style="list-style-type: none">Product family: Stator couplingsDescription: Torque support, 1-sided, slotted hole, screw hole radius 31.5 mm - 48.5 mm, hole width 5.1 mm	BEF-DS-12	2076217
	<ul style="list-style-type: none">Product family: Stator couplingsDescription: One-sided stator coupling, slot, slot radius 32.1 mm – 37.6 mm, slot width 4.5 mm	BEF-DS-14	2076678
	<ul style="list-style-type: none">Description: Flange adapter, adaptation of face mount flange with 36 mm centering hub to 50 mm servo flangeMaterial: Stainless steelDetails: Stainless steelItems supplied: Including 3 countersunk screws with Precote 85-8 coating; M4*12	BEF-FA-036-050-I	2094778
shaft adaptation			
	<ul style="list-style-type: none">Product segment: Shaft adaptationProduct: ColletsDescription: Collet metal for hollow shaft, shaft diameter 8 mm, outer diameter 5/8" (15.875 mm)	SPZ-58Z-008-M	2076219
	<ul style="list-style-type: none">Product segment: Shaft adaptationProduct: ColletsDescription: Collet plastic (PEEK) insulated for hollow shaft, shaft diameter 8 mm, outer diameter 5/8" (15.875 mm)	SPZ-58Z-008-P	2076229

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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