

DBS60E-B7EJC1024

DBS60 Core

INCREMENTAL ENCODERS

SICK
Sensor Intelligence.

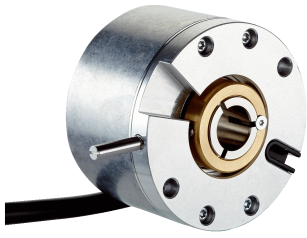


Illustration may differ



Ordering information

Type	Part no.
DBS60E-B7EJC1024	1097748

Other models and accessories → www.sick.com/DBS60_Core

Detailed technical data

Performance

Pulses per revolution	1,024
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)
4.5 V... 5.5 V, TTL/RS-422	
Load current	≤ 30 mA, per channel
4.5 V ... 5.5 V, Open Collector	
Load current	≤ 30 mA, per channel
TTL/RS-422	
Load current	≤ 30 mA, per channel
Power consumption	≤ 1 W (without load)
HTL/Push pull	
Load current	≤ 30 mA, per channel
Power consumption	≤ 1 W (without load)
TTL/HTL	
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.

Open Collector	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.

Electrical data

Connection type	Cable, 8-wire, universal, 0.5 m ¹⁾
Supply voltage	10 ... 27 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⁾
MTTFd: mean time to dangerous failure	500 years (EN ISO 13849-1) ³⁾

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

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

³⁾ 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.

Mechanical data

Mechanical design	Blind hollow shaft
Shaft diameter	14 mm Shaft isolated
Flange type / stator coupling	Axial and radial register pin mounting, for 4 mm register pin
Weight	+ 0.25 kg ¹⁾
Shaft material	Stainless steel with plastic shaft
Flange material	Aluminum
Housing material	Aluminum
Material, cable	PVC
Start up torque	+ 0.5 Ncm (+20 °C)
Operating torque	0.4 Ncm (+20 °C)
Permissible shaft movement, axial static/dynamic	± 0.5 mm / ± 0.2 mm ²⁾
Permissible shaft movement, radial static/dynamic	± 0.3 mm / ± 0.1 mm ²⁾
Operating speed	6,000 min ⁻¹ ³⁾
Maximum operating speed	9,000 min ⁻¹ ⁴⁾
Moment of inertia of the rotor	50 gcm ²
Bearing lifetime	3.6 x 10 ⁹ revolutions
Angular acceleration	≤ 200,000 rad/s ²

¹⁾ Based on an encoder with a male connector outlet or a cable with a male connector outlet.

²⁾ Not applicable for stator coupling type C and K.

³⁾ Allow for self-heating of 2.6 K per 1,000 rpm when designing the operating temperature range.

⁴⁾ 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, housing side (according to IEC 60529) IP65, shaft side (according to IEC 60529)
Permissible relative humidity	90 % (condensation of the optical scanning not permitted)
Operating temperature range	-20 °C ... +85 °C ¹⁾
Storage temperature range	-40 °C ... +100 °C, without package
Resistance to shocks	200 g, 3 ms (according to EN 60068-2-27)
Resistance to vibration	30 g, 10 Hz ... 2,000 Hz (according to EN 60068-2-6)

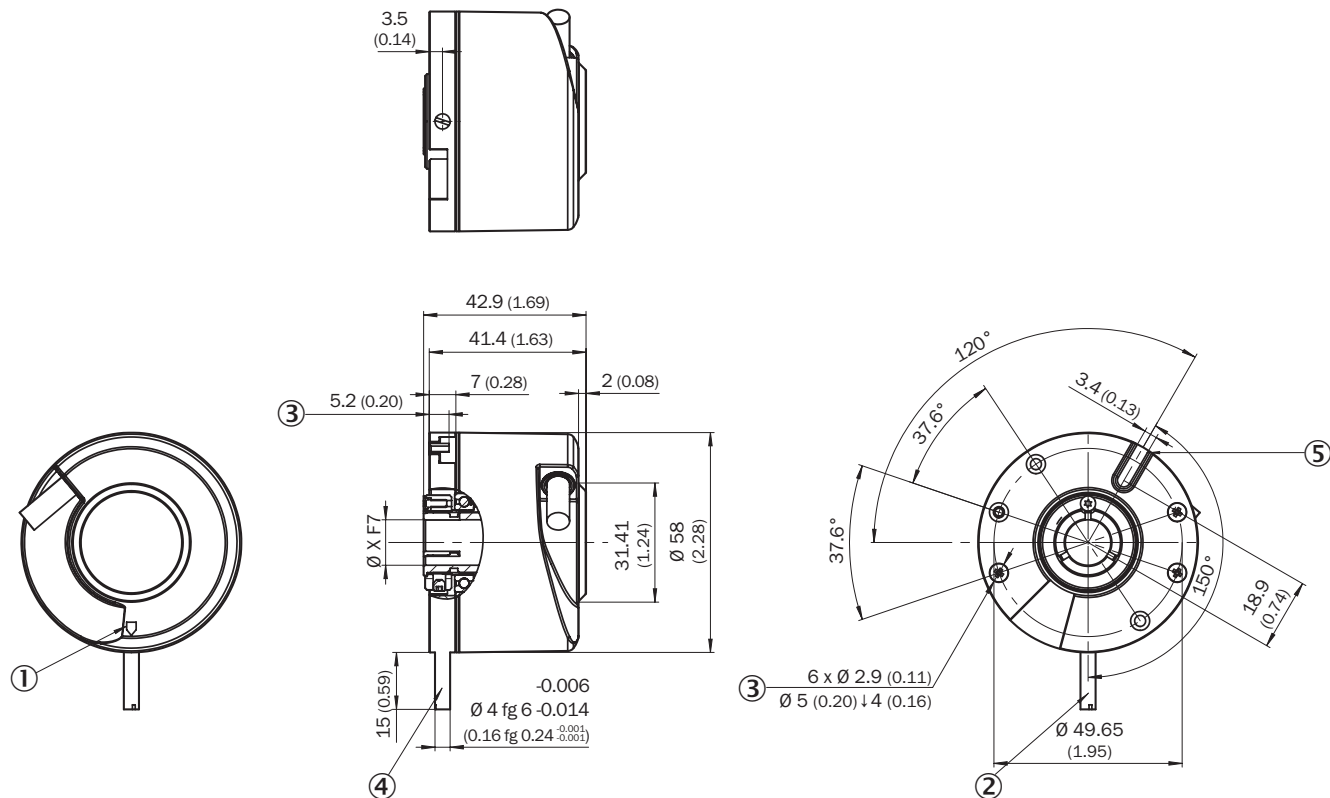
¹⁾ These values relate to all mechanical versions including recommended accessories unless otherwise noted.

Classifications

ECl@ss 5.0	27270501
ECl@ss 5.1.4	27270501
ECl@ss 6.0	27270590
ECl@ss 6.2	27270590
ECl@ss 7.0	27270501
ECl@ss 8.0	27270501
ECl@ss 8.1	27270501
ECl@ss 9.0	27270501
ECl@ss 10.0	27270501
ECl@ss 11.0	27270501
ETIM 5.0	EC001486
ETIM 6.0	EC001486
ETIM 7.0	EC001486
UNSPSC 16.0901	41112113

Dimensional drawing (Dimensions in mm (inch))

Blind hollow shaft, cable connection, axial and radial register pin mounting, for 4 mm register pin



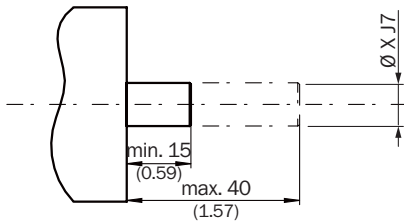
XF7 values see shaft diameter table for blind hollow shaft

- ① Zero pulse mark on housing
- ② Register pin is the zero pulse mark
- ③ Depth
- ④ Register pin can be removed
- ⑤ Rubber insert, material: NBR

Type	Shaft diameter XF7
Blind hollow shaft	
DBS60x-BAxxxxxxx DBS60x-B1xxxxxxx	6 mm
DBS60x-BBxxxxxxx DBS60x-B2xxxxxxx	8 mm
DBS60x-BCxxxxxxx DBS60x-B3xxxxxxx	3/8"
DBS60x-BDxxxxxxx DBS60x-B4xxxxxxx	10 mm
DBS60x-BExxxxxxx DBS60x-B5xxxxxxx	12 mm
DBS60x-BFxxxxxxx DBS60x-B6xxxxxxx	1/2"
DBS60x-BGxxxxxxx DBS60x-B7xxxxxxx	14 mm
DBS60x-BHxxxxxxx DBS60x-B8xxxxxxx	15 mm
DBS60x-BJxxxxxxx	5/8"

Attachment specifications

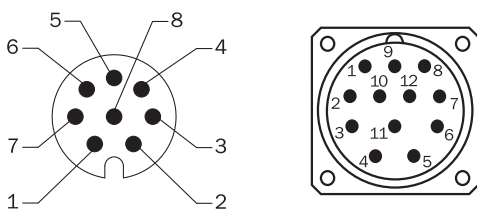
Blind hollow shaft



Customer side

Type Blind hollow shaft	Shaft diameter xJ7
DBS60x-BAxxxxxxx DBS60x-B1xxxxxxx	6 mm
DBS60x-BBxxxxxxx DBS60x-B2xxxxxxx	8 mm
DBS60x-BCxxxxxxx DBS60x-B3xxxxxxx	3/8"
DBS60x-BDxxxxxxx DBS60x-B4xxxxxxx	10 mm
DBS60x-BExxxxxxx DBS60x-B5xxxxxxx	12 mm
DBS60x-BFxxxxxxx DBS60x-B6xxxxxxx	1/2"
DBS60x-BGxxxxxxx DBS60x-B7xxxxxxx	14 mm
DBS60x-BHxxxxxxx DBS60x-B8xxxxxxx	15 mm
DBS60x-BJxxxxxxx	5/8"

PIN assignment



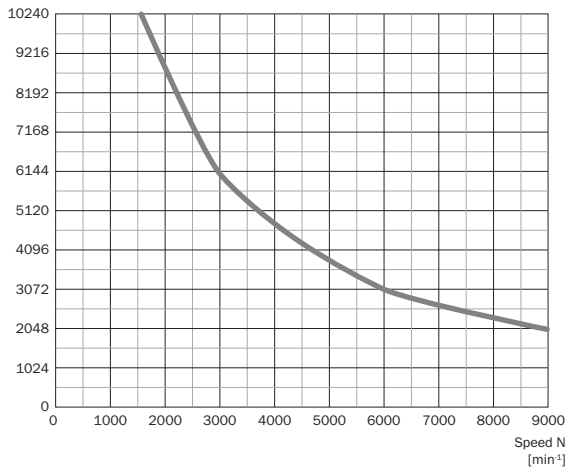
View of M12 / M23 male device connector on cable / housing

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

Wire colors (cable connection)	Male connector M12, 8-pin	Male connector M23, 12-pin	TTL/HTL 6-channel signal	Explanation
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
Screen	Screen	Screen	Screen	Screen connected to encoder housing

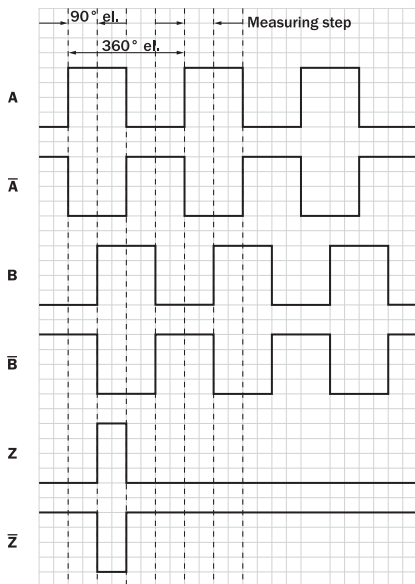
Maximum revolution range

Pulses per revolution



Signal outputs

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_Core

	Brief description	Type	Part no.
Plug connectors and cables			
	Head A: cable Head B: Flying leads Cable: SSI, Incremental, HIPERFACE®, PUR, halogen-free, shielded	LTG-2308-MWENC	6027529
	Head A: cable Head B: Flying leads Cable: SSI, PUR, shielded	LTG-2411-MW	6027530
	Head A: cable Head B: Flying leads Cable: SSI, PUR, halogen-free, shielded	LTG-2512-MW	6027531
	Head A: cable Head B: Flying leads Cable: SSI, TTL, HTL, PUR, halogen-free, shielded	LTG-2612-MW	6028516

	Brief description	Type	Part no.
	Head A: male connector, M12, 8-pin, straight, A-coded Head B: - Cable: Incremental, shielded	STE-1208-GA01	6044892
	Head A: male connector, M23, 12-pin, straight Head B: - Cable: HIPERFACE [®] , SSI, Incremental, shielded	STE-2312-G01	2077273
		STE-2312-GX	6028548

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Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

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