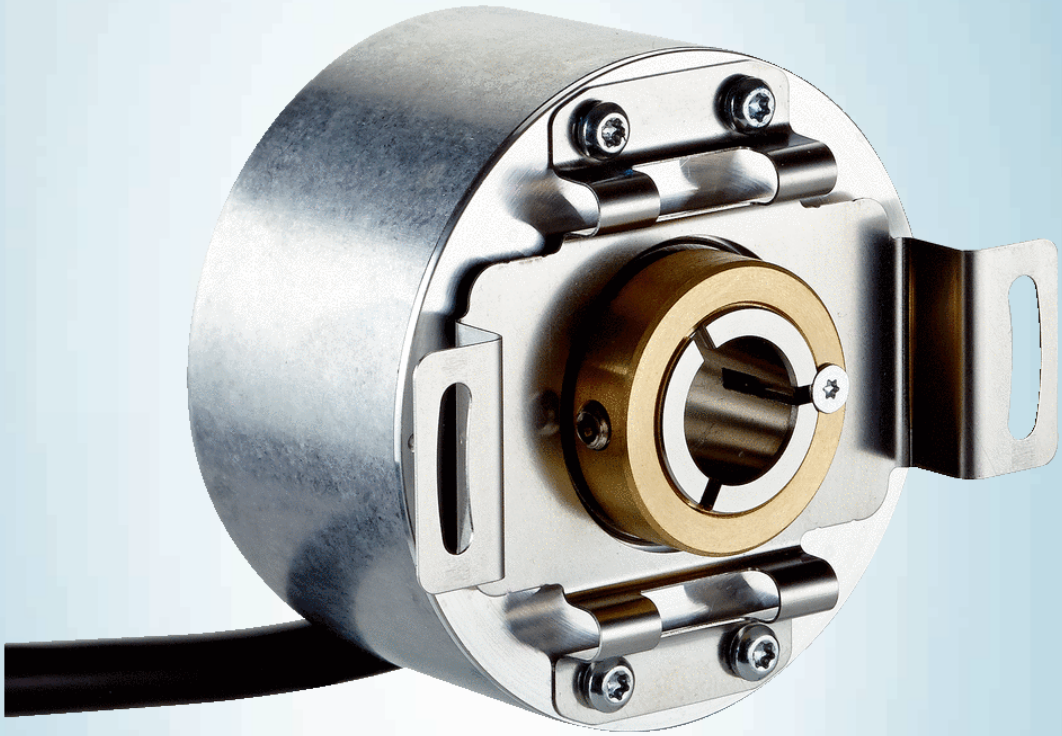
Product data sheet



DBS60E-BHEJB2048

DBS60

INCREMENTAL ENCODERS

SICK
Sensor Intelligence.

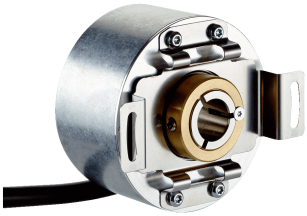


Illustration may differ

Ordering information

Type	Part no.
DBS60E-BHEJB2048	1110509

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

Detailed technical data

Performance

Pulses per revolution	2,048
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.

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 permissable 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	15 mm
Flange type / stator coupling	Stator coupling, 2-sided, screw hole circle 63 mm
Weight	+ 0.25 kg [1]
Shaft material	Stainless steel
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 movement static	± 0.3 mm (radial) ± 0.5 mm (axial) [2]
Permissible movement dynamic	± 0.1 mm (radial) ± 0.2 mm (axial) [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	≤ 500,000 rad/s^2

[1] Based on encoder with male connector or cable with male connector.

[2] Not apllicable 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 (IEC 60529) IP65, shaft side (IEC 60529)
Permissible relative humidity	90 % (Condensation not permitted)
Operating temperature range	–20 °C ... +85 °C [1]
Storage temperature range	–40 °C ... +100 °C, without package
Resistance to shocks	250 g, 3 ms (EN 60068-2-27)
Resistance to vibration	30 g, 10 Hz ... 2,000 Hz (EN 60068-2-6)

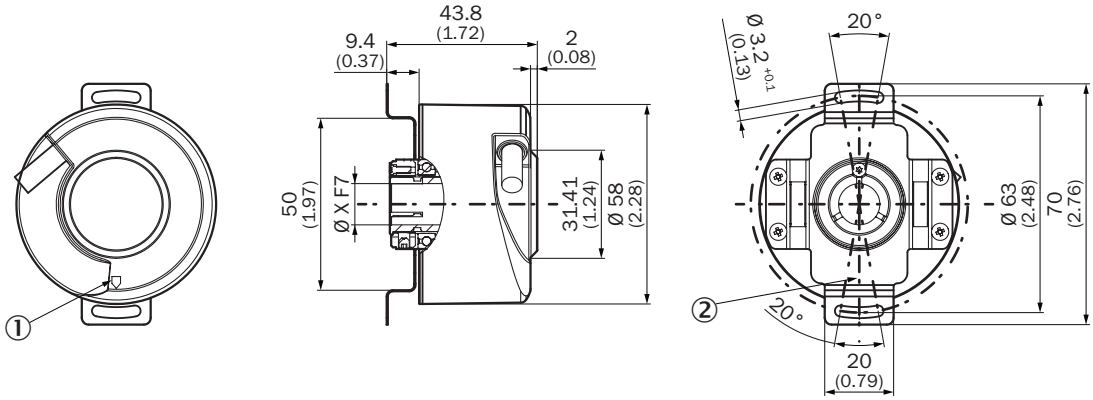
[1] These values relate to all mechanical versions including recommended accessories unless otherwise noted.

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
eCl@ss 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))

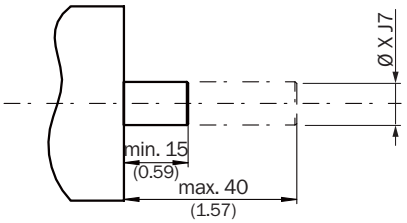


XF7 values see shaft diameter table for blind hollow shaft
① Zero pulse mark on housing
② Zero pulse mark on flange under stator coupling

Type Blind hollow shaft	Shaft diameter XF7
DBS60x-BAxxxxxxxx DBS60x-B1xxxxxxxx	6 mm
DBS60x-BBxxxxxxxx DBS60x-B2xxxxxxxx	8 mm
DBS60x-BCxxxxxxxx DBS60x-B3xxxxxxxx	3/8″
DBS60x-BDxxxxxxxx DBS60x-B4xxxxxxxx	10 mm
DBS60x-BExxxxxxxx DBS60x-B5xxxxxxxx	12 mm
DBS60x-BFxxxxxxxx DBS60x-B6xxxxxxxx	1/2″
DBS60x-BGxxxxxxxx DBS60x-B7xxxxxxxx	14 mm
DBS60x-BHxxxxxxxx DBS60x-B8xxxxxxxx	15 mm
DBS60x-BJxxxxxxxx	5/8″

Attachment specifications

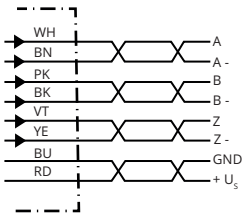
Blind hollow shaft



Customer side

Type Blind hollow shaft	Shaft diameter xj7
DBS60x-BAxxxxxxxx DBS60x-B1xxxxxxxx	6 mm
DBS60x-BBxxxxxxxx DBS60x-B2xxxxxxxx	8 mm
DBS60x-BCxxxxxxxx DBS60x-B3xxxxxxxx	3/8″
DBS60x-BDxxxxxxxx DBS60x-B4xxxxxxxx	10 mm
DBS60x-BExxxxxxxx DBS60x-B5xxxxxxxx	12 mm
DBS60x-BFxxxxxxxx DBS60x-B6xxxxxxxx	1/2″
DBS60x-BGxxxxxxxx DBS60x-B7xxxxxxxx	14 mm
DBS60x-BHxxxxxxxx DBS60x-B8xxxxxxxx	15 mm
DBS60x-BJxxxxxxxx	5/8″

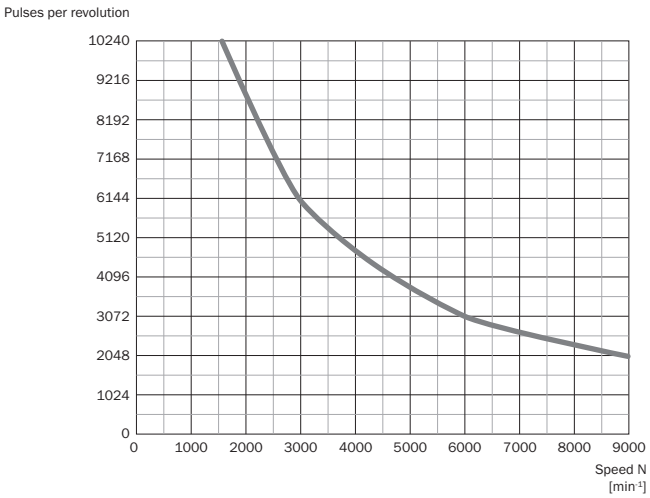
PIN assignment



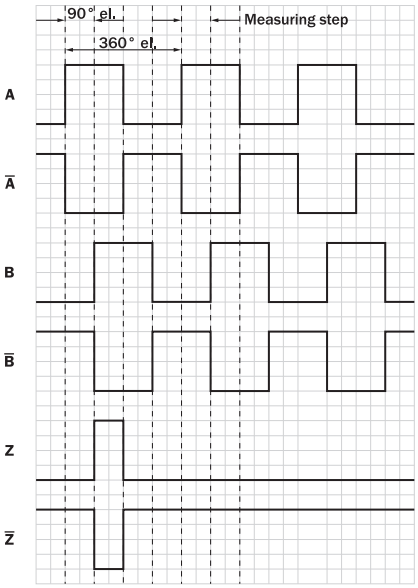
Wire colors (cable connection)	Male connector M12, 8-pin	Male connector M23, 12-pin	TTL/HTL 6-channel signal	Explanation
Brown	1	6	A-	Signal wire
White	2	5	A	Signal wire
Black	3	1	B-	Signal wire
Pink	4	8	B	Signal wire
Yellow	5	4	Z-	Signal wire
Purple	6	3	Z	Signal wire

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

Diagrams



Signal outputs for electrical interfaces TTL and HTL

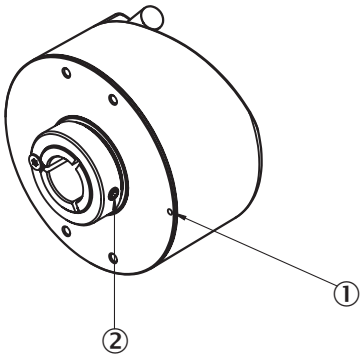


Cw with view on the encoder shaft in direction "A", compare dimensional drawing.

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

Operation note

Hollow shaft

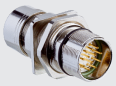


Attention! If stator coupling is mounted, the zero pulse mark can be hidden by the stator coupling
① Zero pulse mark on flange
② Zero pulse is active when screw of clamping is inline with zero pulse mark on flange or housing mark

Recommended accessories

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

	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, Incremental, PUR, shielded	LTG-2411-MW	6027530
	Head A: cable Head B: Flying leads Cable: SSI, Incremental, PUR, halogen-free, shielded	LTG-2512-MW	6027531
	Head A: cable Head B: Flying leads Cable: SSI, TTL, HTL, Incremental, PUR, halogen-free, shielded	LTG-2612-MW	6028516
	Head A: male connector, M12, 8-pin, straight, A-coded Cable: Incremental, shielded	STE-1208-GA01	6044892

	Brief description	Type	Part no.
	Head A: male connector, M23, 12-pin, straight Cable: HIPERFACE®, SSI, Incremental, shielded	STE-2312-G01	2077273
		STE-2312-GX	6028548

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