

DBS60E-TBEK01024

DBS60 Core

INCREMENTAL ENCODERS

SICK
Sensor Intelligence.



Illustration may differ



Ordering information

Type	Part no.
DBS60E-TBEK01024	1094794

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 %
Initialization time	< 5 ms ¹⁾

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

Interfaces

Communication interface	Incremental
Communication Interface detail	HTL / Push pull
Number of signal channels	6-channel

Electrical data

Connection type	Cable, 8-wire, universal, 1.5 m ¹⁾
Power consumption	≤ 1 W (without load)
Supply voltage	10 ... 27 V
Load current	≤ 30 mA, per channel
Output frequency	300 kHz ²⁾
Reference signal, number	1
Reference signal, position	90°, electric, logically gated with A and B
Reverse polarity protection	✓
Short-circuit protection of the outputs	✓ ³⁾
MTTFd: mean time to dangerous failure	500 years (EN ISO 13849-1) ⁴⁾

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

²⁾ Up to 450 kHz on request.

³⁾ Short-circuit opposite to another channel, US or GND permissible for maximum 30 s.

⁴⁾ 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	Through hollow shaft
Shaft diameter	8 mm
Flange type / stator coupling	2-sided stator coupling, slot, screw hole circle 63–83 mm
Weight	+ 0.25 kg ¹⁾
Shaft material	Stainless steel
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	≤ 500,000 rad/s ²

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

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	IP65, housing side (according to IEC 60529) ¹⁾ 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 ²⁾
Storage temperature range	-40 °C ... +100 °C, without package
Resistance to shocks	250 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⁾ With mating connector fitted.

²⁾ These values relate to all mechanical versions including recommended accessories unless otherwise noted.

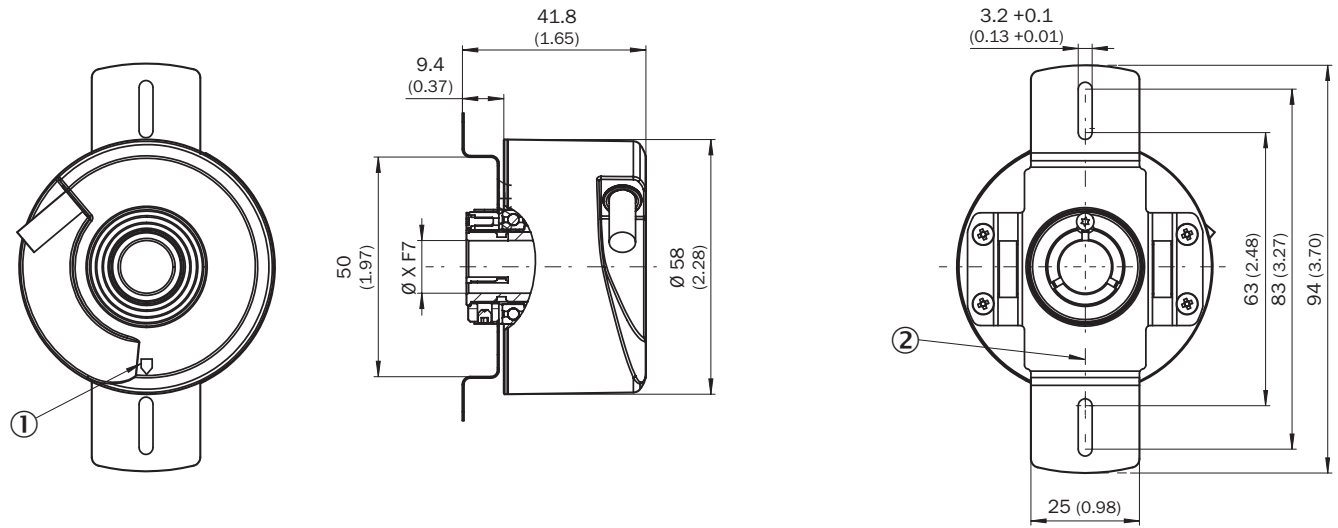
Classifications

ECI@ss 5.0	27270501
ECI@ss 5.1.4	27270501
ECI@ss 6.0	27270590
ECI@ss 6.2	27270590
ECI@ss 7.0	27270501
ECI@ss 8.0	27270501
ECI@ss 8.1	27270501

ECI@ss 9.0	27270501
ETIM 5.0	EC001486
ETIM 6.0	EC001486
UNSPSC 16.0901	41112113

Dimensional drawing (Dimensions in mm (inch))

Through hollow shaft clamping at the front, cable connection, 2-sided stator coupling, slot, screw hole circle 63–83 mm



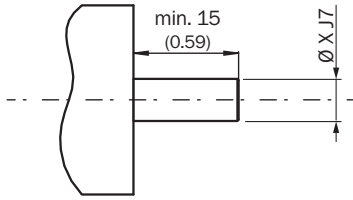
XF7 values see shaft diameter table for through hollow shaft, clamping at the front

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange under stator coupling

Type Through hollow shaft with front clamping	Shaft diameter XF7
DBS60x-TAxxxxxxx DBS60x-T1xxxxxxx	6 mm
DBS60x-TBxxxxxxx DBS60x-T2xxxxxxx	8 mm
DBS60x-TCxxxxxxx DBS60x-T3xxxxxxx	3/8"
DBS60x-TDxxxxxxx DBS60x-T4xxxxxxx	10 mm
DBS60x-TExxxxxxx DBS60x-T5xxxxxxx	12 mm
DBS60x-TFxxxxxxx DBS60x-T6xxxxxxx	1/2"
DBS60x-TGxxxxxxx DBS60x-T7xxxxxxx	14 mm
DBS60x-THxxxxxxx DBS60x-T8xxxxxxx	15 mm
DBS60x-TJxxxxxxx	5/8"

Proposed fitting

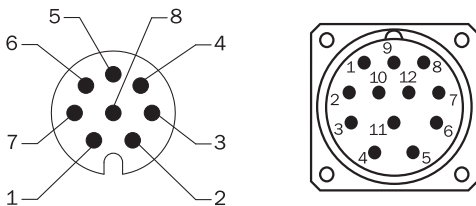
Through hollow shaft with front clamping



Customer side

Type Through hollow shaft with front clamping	Shaft diameter xj7
DBS60x-TAxxxxxxx DBS60x-T1xxxxxxx	6 mm
DBS60x-TBxxxxxxx DBS60x-T2xxxxxxx	8 mm
DBS60x-TCxxxxxxx DBS60x-T3xxxxxxx	3/8"
DBS60x-TDxxxxxxx DBS60x-T4xxxxxxx	10 mm
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DBS60x-TJxxxxxxx	5/8"

PIN assignment

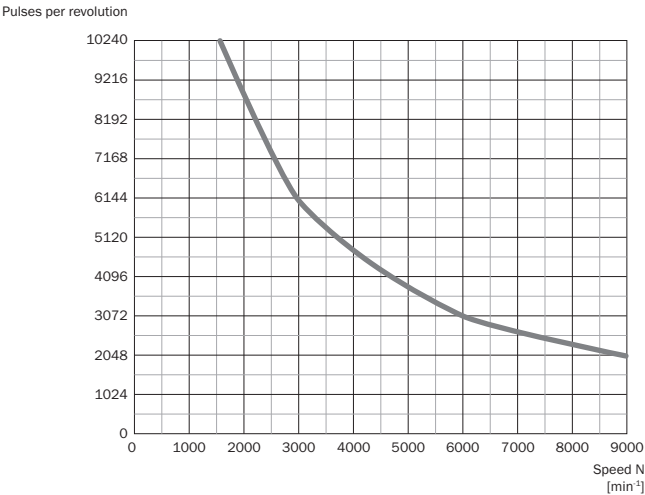


View of M12 / M23 male device connector on cable / housing

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
Blue	7	10	GND	Ground connection

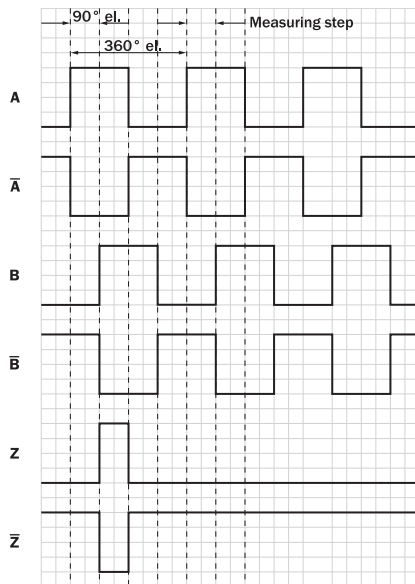
Wire colors (cable connection)	Male connector M12, 8-pin	Male connector M23, 12-pin	TTL/HTL 6-channel signal	Explanation
Red	8	12	+U _s	Supply voltage
-	-	9	Not assigned	Not assigned
-	-	2	Not assigned	Not assigned
-	-	11	Not assigned	Not assigned
-	-	7	Not assigned	Not assigned
Screen	Screen	Screen	Screen	Screen connected to encoder housing

Maximum revolution range



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

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:

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