

DBS60E-TBEK01000

DBS60

INCREMENTAL ENCODERS





Ordering information

Туре	part no.
DBS60E-TBEK01000	1072396

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	1,000
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.

Electronics

Connection type	Cable, 8-wire, universal, 1.5 m ¹⁾
Supply voltage	10 27 V
Reference signal, number	1

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

 $^{^{2)}\,\}mathrm{Up}$ to 450 kHz on request.

 $^{^{2)}\,\}mbox{Short-circuit}$ opposite to another channel, US or GND permissable for maximum 30 s.

Reference signal, position	90°, electric, logically gated with A and B
Reverse polarity protection	✓
Short-circuit protection of the outputs	✓ ²⁾

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

Mechanics

Mechanical design	Through hollow shaft	
Shaft diameter	8 mmFront clamp	
Flange type / stator coupling	2-sided stator coupling, slot, screw hole circle 63–83 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	\pm 0.3 mm (radial) \pm 0.5 mm (axial) $^{2)}$	
Permissible movement dynamic	\pm 0.1 mm (radial) \pm 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/s²	

¹⁾ Based on encoder with male connector or cable with male connector.

Ambient data

EMC	According to EN 61000-6-2 and EN 61000-6-3
Enclosure rating	IP65, 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.

Certificates

EU declaration of conformity	✓
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 $^{^{2)}}$ Short-circuit opposite to another channel, US or GND permissable for maximum 30 s.

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.

DBS60E-TBEK01000 | DBS60

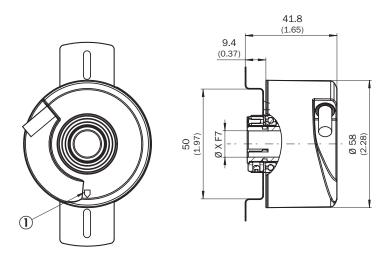
INCREMENTAL ENCODERS

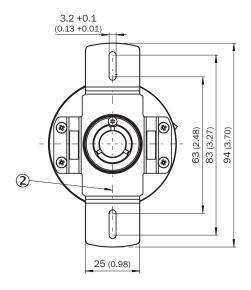
UK declaration of conformity	✓
ACMA declaration of conformity	✓
China-RoHS	✓
cULus certificate	✓
Information according to Art. 3 of Data Act (Regulation EU 2023/2854)	✓

Classifications

ECLASS 5.0 27270501 ECLASS 5.1.4 27270501 ECLASS 6.0 27270590	
ECLASS 6.0 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)

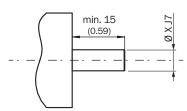
XF7 values see shaft diameter table for through hollow shaft, clamping at the front

① Zero pulse mark on housing

② zero pulse mark on flange under stator coupling

TypeThrough hollow shaft with front clamping	Shaft diameter XF7
DBS60x-TAxxxxxxxxDBS60x-T1xxxxxxxxx	6 mm
DBS60x-TBxxxxxxxxDBS60x-T2xxxxxxxxx	8 mm
DBS60x-TCxxxxxxxxDBS60x-T3xxxxxxxxx	3/8"
DBS60x-TDxxxxxxxxxDBS60x-T4xxxxxxxxx	10 mm
DBS60x-TExxxxxxxxDBS60x-T5xxxxxxxxx	12 mm
DBS60x-TFxxxxxxxxDBS60x-T6xxxxxxxxx	1/2"
DBS60x-TGxxxxxxxxDBS60x-T7xxxxxxxxx	14 mm
DBS60x-THxxxxxxxxDBS60x-T8xxxxxxxxx	15 mm
DBS60x-TJxxxxxxxxx	5/8″
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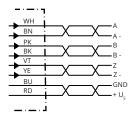
Attachment specifications Through hollow shaft with front clamping



customer side

TypeThrough hollow shaft with front clamping	Shaft diameter xj7
DBS60x-TAxxxxxxxxDBS60x-T1xxxxxxxxx	6 mm
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DBS60x-TExxxxxxxxDBS60x-T5xxxxxxxxx	12 mm
DBS60x-TFxxxxxxxxDBS60x-T6xxxxxxxxx	1/2"
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DBS60x-THxxxxxxxxDBS60x-T8xxxxxxxxx	15 mm
DBS60x-TJxxxxxxxxx	5/8″
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PIN assignment



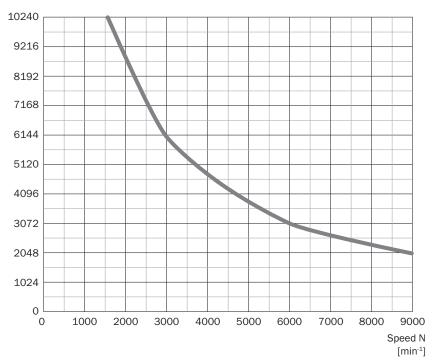
DBS60E-TBEK01000 | DBS60

INCREMENTAL ENCODERS

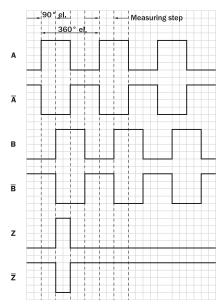
Wire colors (ca- ble connection)	Male connector M12, 8-pin	Male connector M23, 12-pin	TTL/HTL 6- channel signal	Explanation	
Brown	1	6	A-	Signal wire	
White	2	5	Α	Signal wire	
Black	3	1	B-	Signal wire	
Pink	4	8	В	Signal wire	
Yellow	5	4	Z-	Signal wire	
Purple	6	3	Z	Signal wire	
Blue	7	10	GND	Ground connection	
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	
Screen	Screen	Screen	Screen	Screen connected to encoder housing	

Diagrams

Pulses per revolution



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	πL
10 V 30 V	πL
10 V 27 V	HTL
4,5 V 30 V	TTL/HTL universal
4,5 V 30 V	πL

Recommended accessories

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

	Brief description	Туре	part no.			
connectors and cables						
	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			
<u></u>	 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			
_	 Connection type head A: Flying leads Connection type head B: Flying leads Signal type: SSI, Incremental Items supplied: By the meter Cable: 12-wire, PUR, halogen-free Description: SSI, shielded, Incremental 	LTG-2512-MW	6027531			
	 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			
	Connection type head A: Male connector, M23, 12-pin, straight, A-coded Signal type: HIPERFACE®, SSI, Incremental Description: HIPERFACE®, shieldedSSIIncremental Connection systems: Solder connection	STE-2312-G01	2077273			
	Connection type head A: Male connector, M23, 12-pin, straight, A-coded Signal type: HIPERFACE [®] , SSI, Incremental Description: HIPERFACE [®] , shieldedSSIIncremental Connection systems: Solder connection	STE-2312-GX	6028548			
	Connection type head A: Male connector, M12, 8-pin, straight, A-coded Signal type: Incremental Cable: CAT5, CAT5e Description: Incremental, shielded Connection systems: IDC quick connection Permitted cross-section: 0.14 mm² 0.34 mm²	STE-1208-GA01	6044892			

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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