



DBS60E-T5FQ01024

DBS60

INCREMENTAL ENCODERS

SICK
Sensor Intelligence.



Ordering information

Type	part no.
DBS60E-T5FQ01024	1135148

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	1,024
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	TTL / HTL / HTL ¹⁾
Number of signal channels	6-channel
Initialization time	< 5 ms ²⁾
Output frequency	+ 300 kHz ³⁾
Load current	≤ 30 mA, per channel
Power consumption	≤ 0.5 W (without load)

¹⁾ Output level depends on the supply voltage.

²⁾ Valid signals can be read once this time has elapsed.

³⁾ Up to 450 kHz on request.

Electronics

Connection type	Cable, 8-wire, with male connector, M23, 12-pin, universal, 0.5 m ¹⁾ 2)
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¹⁾ The universal cable connection is positioned so that it is possible to lay it without bends in a radial or axial direction.

²⁾ M23 male connector for central mounting.

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

Supply voltage	4.5 ... 30 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	✓ 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) M23 male connector for central mounting.

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

Mechanics

Mechanical design	Through hollow shaft
Shaft diameter	12 mm Front 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 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 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	≤ 200,000 rad/s ²

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

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 (IEC 60529) ¹⁾ IP65, shaft side (IEC 60529)
Permissible relative humidity	90 % (Condensation not permitted)
Operating temperature range	-30 °C ... +100 °C, at maximum 3,000 pulses per revolution ²⁾
Storage temperature range	-40 °C ... +100 °C, without package

1) With mating connector fitted.

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

Resistance to shocks	200 g, 3 ms (EN 60068-2-27)
Resistance to vibration	30 g, 10 Hz ... 2,000 Hz (EN 60068-2-6)

¹⁾ With mating connector fitted.

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

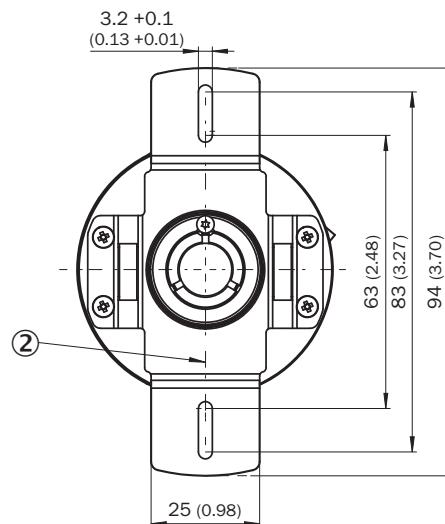
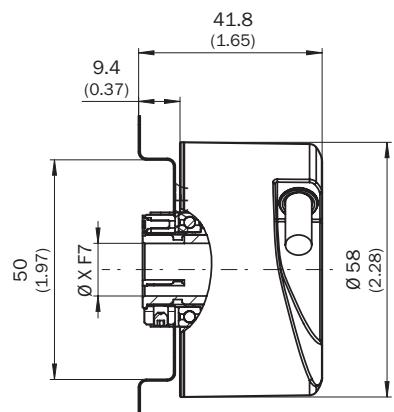
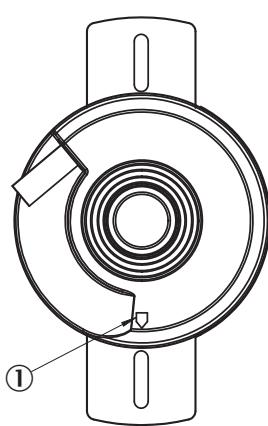
Certificates

EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
China RoHS	✓
cRUs 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 6.2	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)

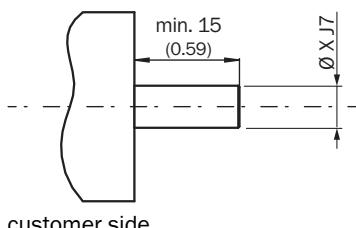
XF7 values see shaft diameter table for through hollow shaft, clamping at the front

① Zero pulse mark on housing

② zero pulse mark on flange under stator coupling

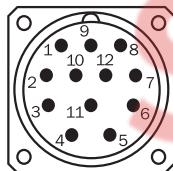
Type	Through hollow shaft with front clamping	Shaft diameter XF7
DBS60x-TAxxxxxx		6 mm
DBS60x-T1xxxxxx		8 mm
DBS60x-TBxxxxxx		3/8"
DBS60x-T2xxxxxx		10 mm
DBS60x-TCxxxxxx		12 mm
DBS60x-T3xxxxxx		1/2"
DBS60x-TDxxxxxx		14 mm
DBS60x-T4xxxxxx		15 mm
DBS60x-TExxxxxx		5/8"
DBS60x-T5xxxxxx		
DBS60x-TFxxxxxx		
DBS60x-T6xxxxxx		
DBS60x-TGxxxxxx		
DBS60x-T7xxxxxx		
DBS60x-THxxxxxx		
DBS60x-T8xxxxxx		
DBS60x-TJxxxxxx		

Attachment specifications Through hollow shaft with front clamping



Type	Through hollow shaft with front clamping	Shaft diameter xj7
DBS60x-TAxxxxxx		6 mm
DBS60x-T1xxxxxx		
DBS60x-TBxxxxxx		8 mm
DBS60x-T2xxxxxx		
DBS60x-TCxxxxxx		3/8"
DBS60x-T3xxxxxx		
DBS60x-TDxxxxxx		10 mm
DBS60x-T4xxxxxx		
DBS60x-TExxxxxx		12 mm
DBS60x-T5xxxxxx		
DBS60x-TFxxxxxx		1/2"
DBS60x-T6xxxxxx		
DBS60x-TGxxxxxx		14 mm
DBS60x-T7xxxxxx		
DBS60x-THxxxxxx		15 mm
DBS60x-T8xxxxxx		
DBS60x-TJxxxxxx		5/8"
		-

PIN assignment

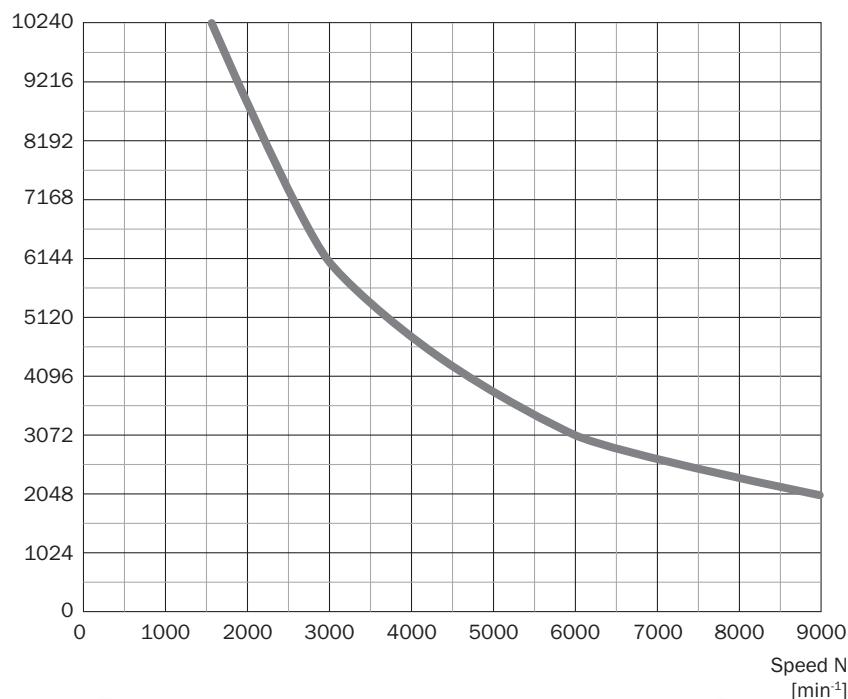


view of M23 male device connector on cable / housing

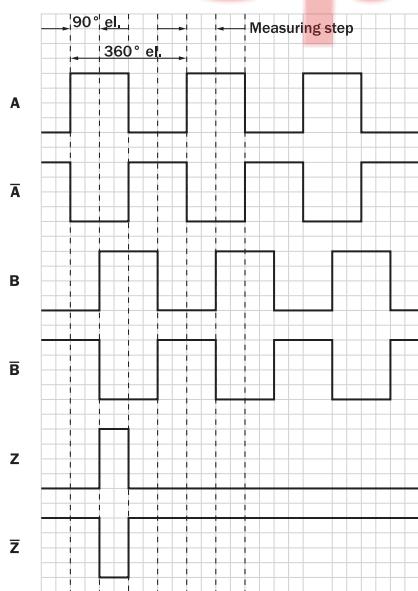
Wire colors (cable connection)	Male connector M12, 8-pin	Male connector M23, 12-pin	TTL/HTL 6-channel signal	Explanation
Brown	1	6	A-	Signal wire
White	2	5	A	Signal wire
Black	3	1	B-	Signal wire
Pink	4	8	B	Signal wire
Yellow	5	4	Z-	Signal wire
Purple	6	3	Z	Signal wire
Blue	7	10	GND	Ground connection
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	TTL
10 V ... 30 V	TTL
10 V ... 27 V	HTL

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

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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: 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, Incremental Items supplied: By the meter Cable: 12-wire, PUR, halogen-free Description: SSI, shielded, Incremental 	LTG-2512-MW	6027531
	<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, M23, 12-pin, straight Connection type head B: Flying leads Signal type: Incremental Cable: 30 m, 11-wire, PUR Description: Incremental, shielded 	DOL-2312-G30MLA3	2030702
	<ul style="list-style-type: none"> Connection type head A: Female connector, M23, 12-pin, straight Connection type head B: Flying leads Signal type: Incremental Cable: 25 m, 11-wire, PUR Description: Incremental, shielded Application: Zones with oils and lubricants 	DOL-2312-G25MLA3	2030699
	<ul style="list-style-type: none"> Connection type head A: Female connector, M23, 12-pin, straight Connection type head B: Flying leads Signal type: Incremental Cable: 20 m, 11-wire, PUR Description: Incremental, shielded 	DOL-2312-G20MLA3	2030695
	<ul style="list-style-type: none"> Connection type head A: Female connector, M23, 12-pin, straight Connection type head B: Flying leads Signal type: Incremental Cable: 15 m, 11-wire, PUR Description: Incremental, shielded Application: Zones with oils and lubricants 	DOL-2312-G15MLA3	2030692
	<ul style="list-style-type: none"> Connection type head A: Female connector, M23, 12-pin, straight Connection type head B: Flying leads Signal type: Incremental Cable: 10 m, 11-wire, PUR Description: Incremental, shielded Application: Zones with oils and lubricants 	DOL-2312-G10MLA3	2030688
	<ul style="list-style-type: none"> Connection type head A: Female connector, M23, 12-pin, straight Connection type head B: Flying leads Signal type: Incremental Cable: 7 m, 11-wire, PUR Description: Incremental, shielded 	DOL-2312-G07MLA3	2030685
	<ul style="list-style-type: none"> Connection type head A: Female connector, M23, 12-pin, straight Connection type head B: Flying leads Signal type: Incremental Cable: 2 m, 11-wire, PUR Description: Incremental, shielded 	DOL-2312-G02MLA3	2030682

	Brief description	Type	part no.
	<ul style="list-style-type: none"> Description: Incremental, shielded Connection type head A: Female connector, M23, 12-pin, angled, A-coded Signal type: HIPERFACE®, SSI, Incremental Description: HIPERFACE®, shieldedSSIIncremental Connection systems: Solder connection 	DOS-2312-W01	2072580
	<ul style="list-style-type: none"> Connection type head A: Female connector, M23, 12-pin, straight, A-coded Signal type: HIPERFACE®, SSI, Incremental Description: HIPERFACE®, shieldedSSIIncremental Connection systems: Solder connection 	DOS-2312-G02	2077057

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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.

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