

DBS60E-TBEZZ0S91

DBS60 Core

INCREMENTAL ENCODERS

SICK
Sensor Intelligence.

Illustration may differ

Ordering information

Type	Part no.
DBS60E-TBEZZ0S91	1099102

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

Detailed technical data

Features

Special device	✓
Specialty	Through hollow shaft, 7 mm Cable, 8-wire, universal, 1.0 m with male connector tie Start up torque max. 0.3 Ncm Customer-specific mounting accessories (elastomer buffer + M4 screw)
Standard reference device	DBS60E-TBEKD2000, 1085250

Performance

Pulses per revolution	400
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, with male connector, Binder, universal, 1 m ¹⁾
Supply voltage	10 ... 27 V
Reference signal, number	1
Reference signal, position	90°, electric, logically gated with A and B

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.

Reverse polarity protection	✓
Short-circuit protection of the outputs	✓ ²⁾
MTTFd: mean time to dangerous failure	500 years (EN ISO 13849-1) ³⁾

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Mechanical data

Mechanical design	Through hollow shaft, Front clamp
Shaft diameter	7 mm
Flange type / stator coupling	1-sided stator coupling, slot, screw hole circle radius 31.5–48.5 mm
Weight	+ 0.25 kg ¹⁾
Shaft material	Stainless steel
Flange material	Aluminum
Housing material	Aluminum
Material, cable	PVC
Start up torque	+ 0.3 Ncm (+20 °C)
Operating torque	0.2 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 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	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)

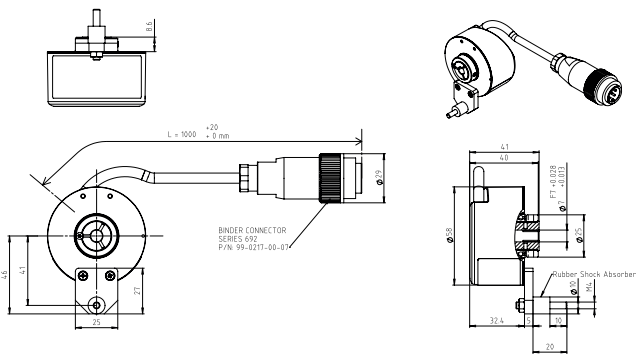
¹⁾ With mating connector fitted.

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
ECI@ss 10.0	27270501
ECI@ss 11.0	27270501
ETIM 5.0	EC001486
ETIM 6.0	EC001486
ETIM 7.0	EC001486
UNSPSC 16.0901	41112113

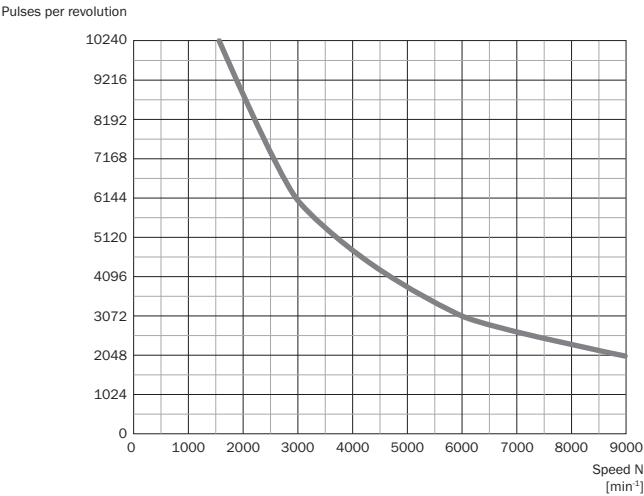
Dimensional drawing (Dimensions in mm (inch))



PIN assignment

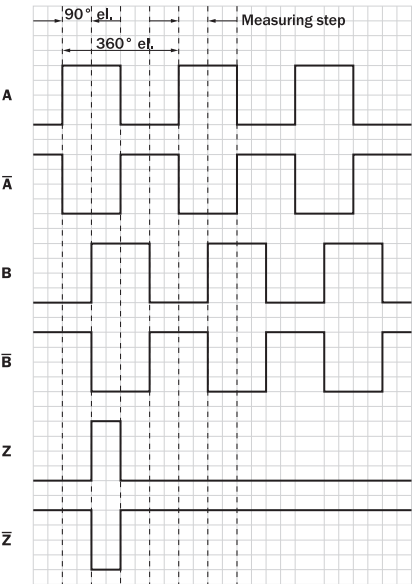
Encoder connector, Pin	Signal	Explanation
1	GND	Ground connection of the encoder
2	0V	Supply voltage (not for housing)
3	+	Signal output
4	-	Signal output
5	0V	Signal output
6	0V	Signal output
7	0V	Signal output
8	0V	Signal output
9	0V	Signal output
10	0V	Signal output
11	0V	Signal output
12	0V	Signal output
13	0V	Signal output
14	0V	Signal output
15	0V	Signal output
16	0V	Signal output
17	0V	Signal output
18	0V	Signal output
19	0V	Signal output
20	0V	Signal output
21	0V	Signal output
22	0V	Signal output
23	0V	Signal output
24	0V	Signal output
25	0V	Signal output
26	0V	Signal output
27	0V	Signal output
28	0V	Signal output
29	0V	Signal output
30	0V	Signal output
31	0V	Signal output
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33	0V	Signal output
34	0V	Signal output
35	0V	Signal output
36	0V	Signal output
37	0V	Signal output
38	0V	Signal output
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56	0V	Signal output
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61	0V	Signal output
62	0V	Signal output
63	0V	Signal output
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86	0V	Signal output
87	0V	Signal output
88	0V	Signal output
89	0V	Signal output
90	0V	Signal output
91	0V	Signal output
92	0V	Signal output
93	0V	Signal output
94	0V	Signal output
95	0V	Signal output
96	0V	Signal output
97	0V	Signal output
98	0V	Signal output
99	0V	Signal output
100	0V	Signal output

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

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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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