Data sheet

DBS60E-BEFAK0S86

DBS60

INCREMENTAL ENCODERS

SICK
Sensor Intelligence.

Illustration may differ

Ordering information

Type	part no.
DBS60E-BEFAK0S86	1092027

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

Detailed technical data

Features

Special device	✓
Specialty	Customer-specific pin assignment
Standard reference device	DBS60E-BEFAK0360

Safety-related parameters

$MTTF_D$ (mean time to dangerous failure)	500 years (EN ISO 13849-1) [1]

[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	360
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 [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	Male connector, M23, 12-pin, radial, Customer-specific pin assignment

[1] Short-circuit opposite to another channel, US or GND permissable 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	✓ [1]

[1] Short-circuit opposite to another channel, US or GND permissable for maximum 30 s.

Mechanics

Mechanical design	Blind hollow shaft
Shaft diameter	12 mm
Flange type / stator coupling	Without stator coupling, flange with 3 x M3, 3 x M4, axial register pin mounting, for 4 mm register pin
Weight	+ 0.25 kg [1]
Shaft material	Stainless steel
Flange material	Aluminum
Housing material	Aluminum
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) [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
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] With mating connector fitted.
[2] These values relate to all mechanical versions including recommended accessories unless otherwise noted.

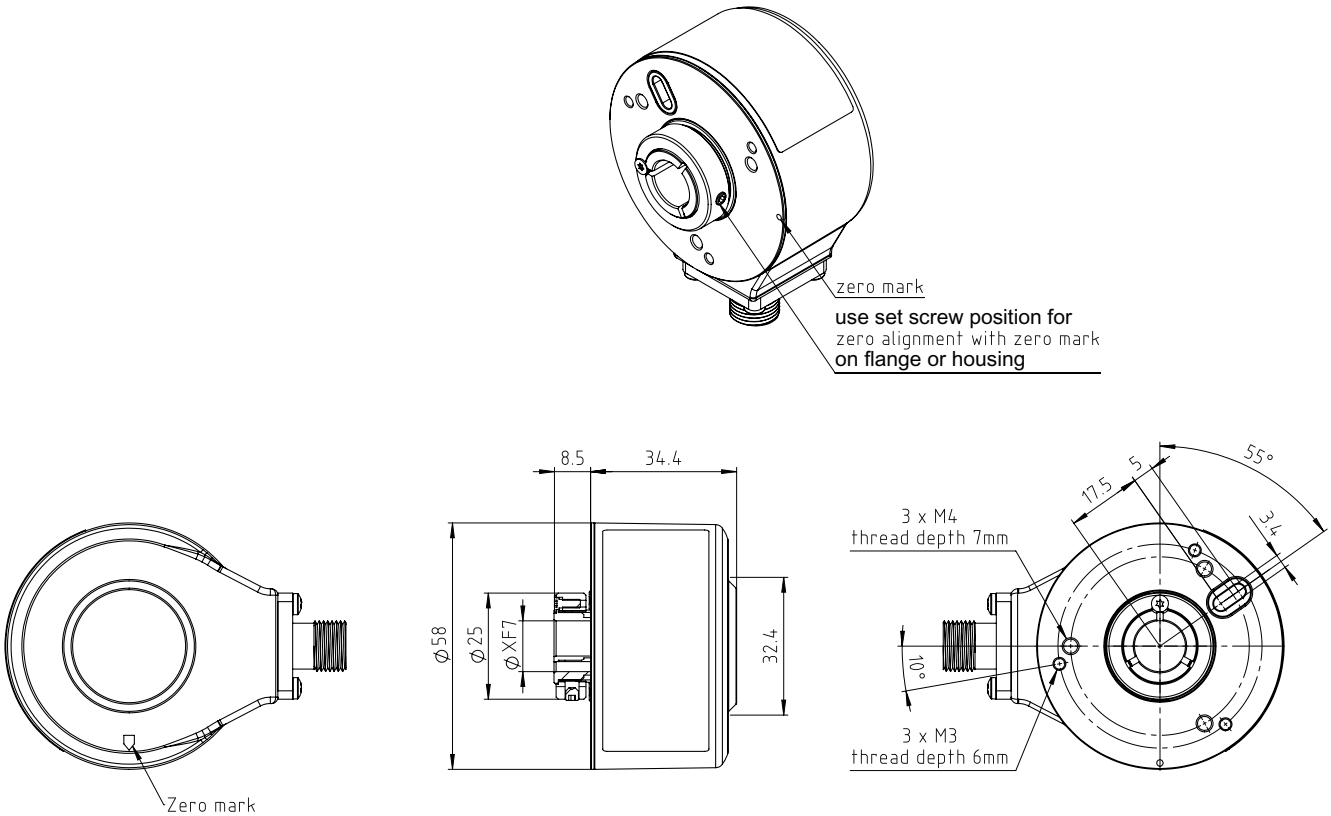
Certificates

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

Classifications

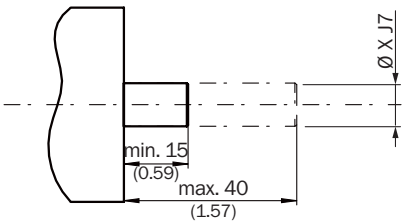
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ECLASS 5.1.4	27270501
ECLASS 6.0	27270590
ECLASS 6.2	27270590
ECLASS 7.0	27270501
ECLASS 8.0	27270501
ECLASS 8.1	27270501
ECLASS 9.0	27270501
ECLASS 10.0	27270501
ECLASS 11.0	27270501
ECLASS 12.0	27270501
ETIM 5.0	EC001486
ETIM 6.0	EC001486
ETIM 7.0	EC001486
ETIM 8.0	EC001486
UNSPSC 16.0901	41112113

Dimensional drawing



Dimensions in mm (inch)

Attachment specifications Blind hollow shaft



customer side

TypeBlind hollow shaft	Shaft diameter xj7
DBS60x-BAxxxxxxxxDBS60x-B1xxxxxxxx	6 mm
DBS60x-BBxxxxxxxxDBS60x-B2xxxxxxxx	8 mm
DBS60x-BCxxxxxxxxDBS60x-B3xxxxxxxx	3/8″
DBS60x-BDxxxxxxxxDBS60x-B4xxxxxxxx	10 mm
DBS60x-BExxxxxxxxDBS60x-B5xxxxxxxx	12 mm
DBS60x-BFxxxxxxxxDBS60x-B6xxxxxxxx	1/2″
DBS60x-BGxxxxxxxxDBS60x-B7xxxxxxxx	14 mm
DBS60x-BHxxxxxxxxDBS60x-B8xxxxxxxx	15 mm
DBS60x-BJxxxxxxxx	5/8″

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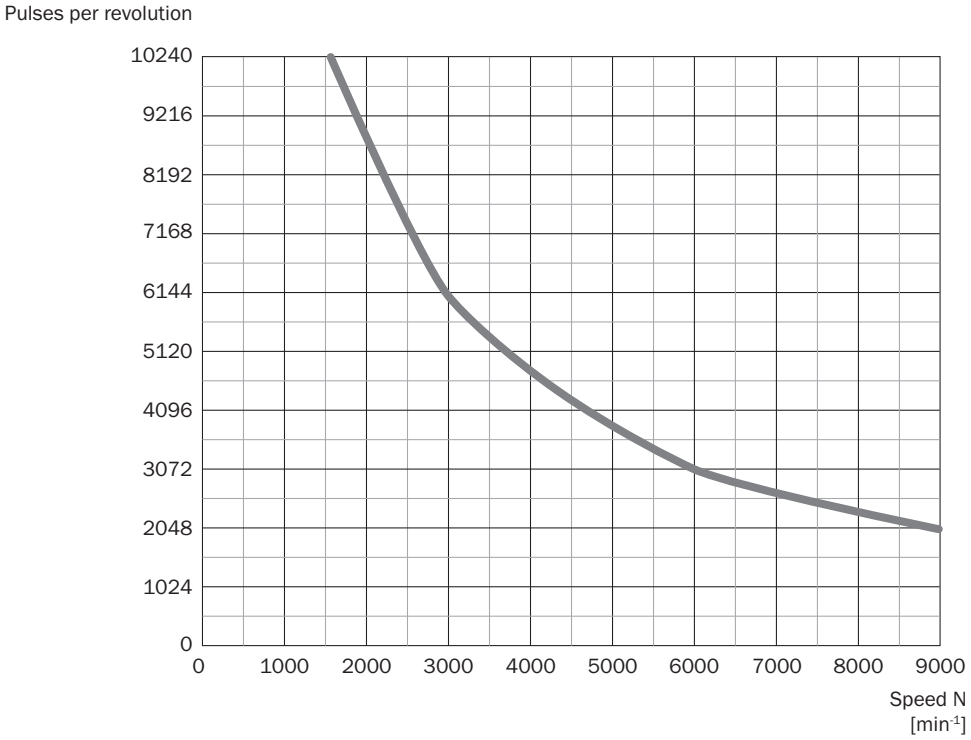
PIN assignment

View of M23 device connector on cable cable/housing

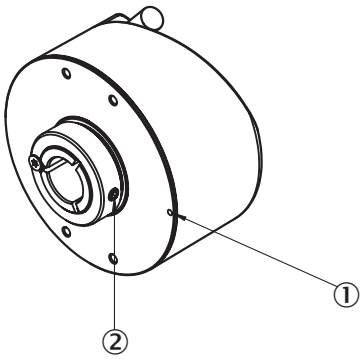


Pin, 12-pin in M23	Signal TTL, HTL	Explanation
1	A_	Signal line
2	$+U_S$	Supply voltage
3	Z	Signal line
4	Z_	Not connected
5	B	Signal line
6	B_	Signal line
7	Not connected	Not connected
8	A	Signal line
9	Screen	Screen connecte to encoder housing
10	GND	Ground connecion of the encoder
11	Not connected	Not connected
12	Not connected	Not connected

Diagrams



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

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