



DBS60E-S4EZ0S250

DBS60

INCREMENTAL ENCODERS

SICK
Sensor Intelligence.



Illustration may differ



Ordering information

Type	Part no.
DBS60E-S4EZ0S250	1130739

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

Detailed technical data

Features

Special device	✓
Specialty	Cable, 5-wire, with male connector, M12, 5-pin, universal, 5 m Customer-specific pin assignment Neutral packaging with customized packaging label
Standard reference device	DBS60E-S4EM05000, 1082526

Performance

Pulses per revolution	5,000
Measuring step	≤ 90°, electric/pulses per revolution
Measuring step deviation	± 36° / pulses per revolution
Error limits	Measuring step deviation x 3
Duty cycle	≤ 0.5 ± 10 %

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, 5-wire, with male connector, M12, 5-pin, universal, 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⁾ 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.

Reference signal, position	90°, electric, logically gated with A and B
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	Solid shaft, face mount flange
Shaft diameter	10 mm ¹⁾
Shaft length	19 mm
Flange type / stator coupling	Flange with 3 x M3 and 3 x M4
Weight	+ 0.3 kg ²⁾
Shaft material	Stainless steel
Flange material	Aluminum
Housing material	Aluminum
Material, cable	PVC
Start up torque	+ 1.2 Ncm (+20 °C)
Operating torque	1.1 Ncm (+20 °C)
Permissible shaft loading	100 N (radial) ³⁾ 50 N (axial) ³⁾
Operating speed	6,000 min ⁻¹ ⁴⁾
Maximum operating speed	9,000 min ⁻¹ ⁵⁾
Moment of inertia of the rotor	33 gcm ²
Bearing lifetime	3.6 x 10 ⁹ revolutions
Angular acceleration	≤ 500,000 rad/s ²

¹⁾ Others on request.

²⁾ Based on encoder with male connector or cable with male connector.

³⁾ Higher values are possible using limited bearing life.

⁴⁾ Allow for self-heating of 3.2 K per 1,000 rpm when designing the operating temperature range.

⁵⁾ 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) 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)

¹⁾ These values relate to all mechanical versions including recommended accessories unless otherwise noted.

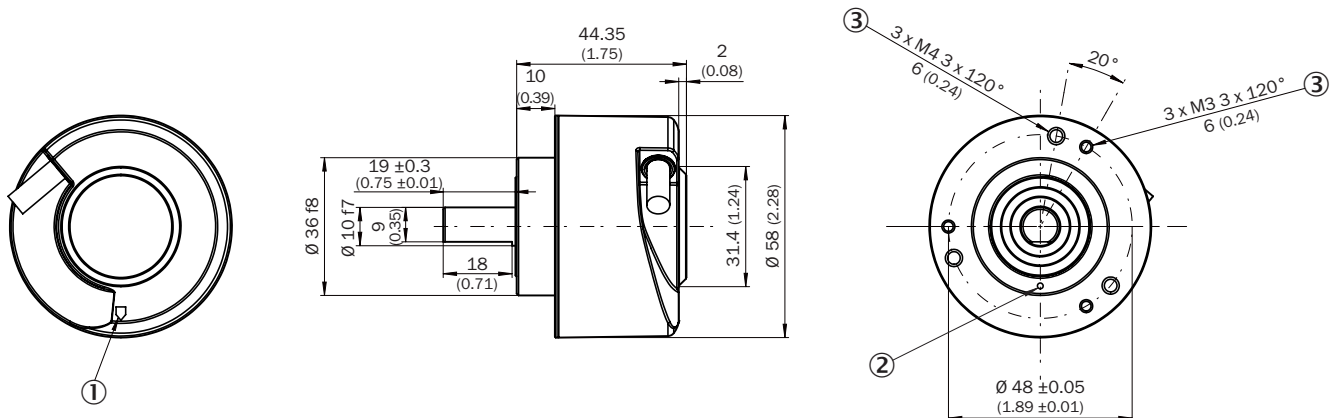
Resistance to vibration	30 g, 10 Hz ... 2,000 Hz (EN 60068-2-6)
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¹⁾ These values relate to all mechanical versions including recommended accessories unless otherwise noted.

Classifications

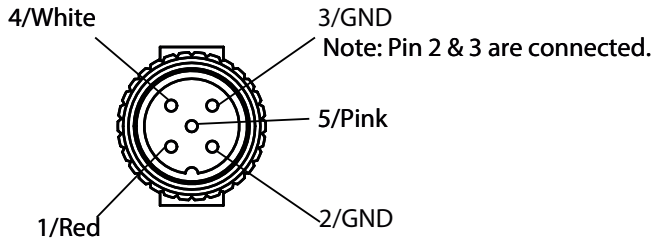
ECLASS 5.0	27270501
ECLASS 5.1.4	27270501
ECLASS 6.0	27270590
ECLASS 6.2	27270590
ECLASS 7.0	27270501
ECLASS 8.0	27270501
ECLASS 8.1	27270501
ECLASS 9.0	27270501
ECLASS 10.0	27270501
ECLASS 11.0	27270501
ECLASS 12.0	27270501
ETIM 5.0	EC001486
ETIM 6.0	EC001486
ETIM 7.0	EC001486
ETIM 8.0	EC001486
UNSPSC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

Dimensional drawing (Dimensions in mm (inch))



- ① Zero pulse mark on housing
- ② Zero pulse mark on flange
- ③ Depth

PIN assignment

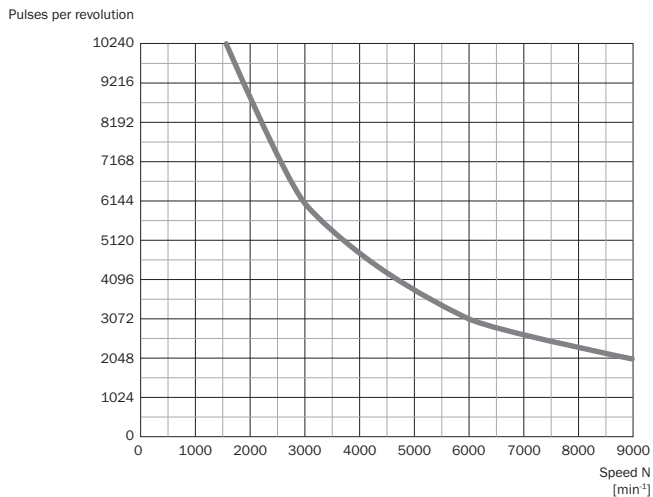


PIN	Signal	Description
1	+U _S	Voltage supply
2	0 V	GND
3	0 V	GND
4	A+	Signal
5	B+	Signal

Type label

Part Number (1P): 10119554 1P10119554	 markem·imaje a DOVER company
Description: ENCODER_5000 PULSES_Ø58 SHAFT 10mm_M12-5	Revision: A Qty: 1
Date: XX/XX/XX Made in Malaysia	

Diagrams



Signal outputs for electrical interfaces TTL and HTL

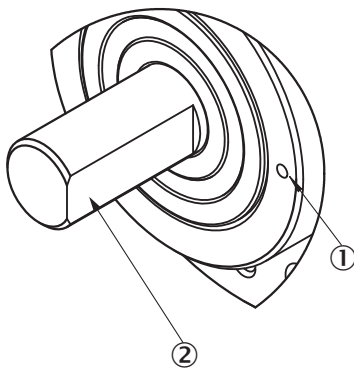


Cw with view on the encoder shaft in direction "A", compare dimensional drawing.

Supply voltage	Output
4,5 V ... 5,5 V	TTL
10 V ... 30 V	TTL
10 V ... 27 V	HTL
4,5 V ... 30 V	TTL/HTL universal
4,5 V ... 30 V	TTL

Operation note

Solid shaft, face mount flange



- ① Zero pulse mark on flange
- ② Zero pulse active when the surface of the shaft shows the zero pulse mark on the flange

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.

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