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DATA SHEET

DBS60I-S4EM05000

DBS60
Incremental encoders

SICK Sensor Intelligence

INCREMENTAL ENCODERS

DBS60I-S4EM05000

ORDERING INFORMATION

| Type | part no. |
|------------------|-------------------------|
| DBS60I-S4EM05000 | 1107569 |

Further device versions and accessories at 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⁾ |
|--|--|

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 | 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 |

¹⁾ Valid signals can be read once this time has elapsed.

²⁾ Up to 450 kHz on request.

| | |
|-------------------|----------------------|
| Power consumption | ≤ 1 W (without load) |
|-------------------|----------------------|

¹⁾ Valid signals can be read once this time has elapsed.

²⁾ Up to 450 kHz on request.

ELECTRONICS

| | |
|---|---|
| Connection type | Cable, 8-wire, radial, 5 m |
| Supply voltage | 10 ... 27 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 permissible for maximum 30 s.

MECHANICS

| | |
|--------------------------------|---|
| Mechanical design | Solid shaft, face mount flange |
| Shaft diameter | 10 mm With flat |
| Shaft length | 19 mm |
| Flange type / stator coupling | Flange with 3 x M3 and 3 x M4 |
| Weight | 0.5 kg ¹⁾ |
| Shaft material | Stainless steel V2A |
| Flange material | Stainless steel V2A |
| Housing material | Stainless steel V2A |
| Material, cable | PVC |
| Shaft sealing ring material | FKM80 |
| Material, cable gland | Stainless steel V2A / Nickel-plated brass |
| Start up torque | 1 Ncm (+20 °C) |
| Operating torque | 0.9 Ncm (+20 °C) |
| Permissible shaft loading | 80 N (radial) ²⁾ 40 N (axial) ²⁾ |
| Operating speed | ≤ 6,000 min ⁻¹ ³⁾ |
| Moment of inertia of the rotor | 34 gcm ² |
| Bearing lifetime | 3.6 x 10 ⁹ revolutions |
| Angular acceleration | ≤ 500,000 rad/s ² |

¹⁾ Based on encoder with male connector.

²⁾ Higher values are possible using limited bearing life.

³⁾ 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.

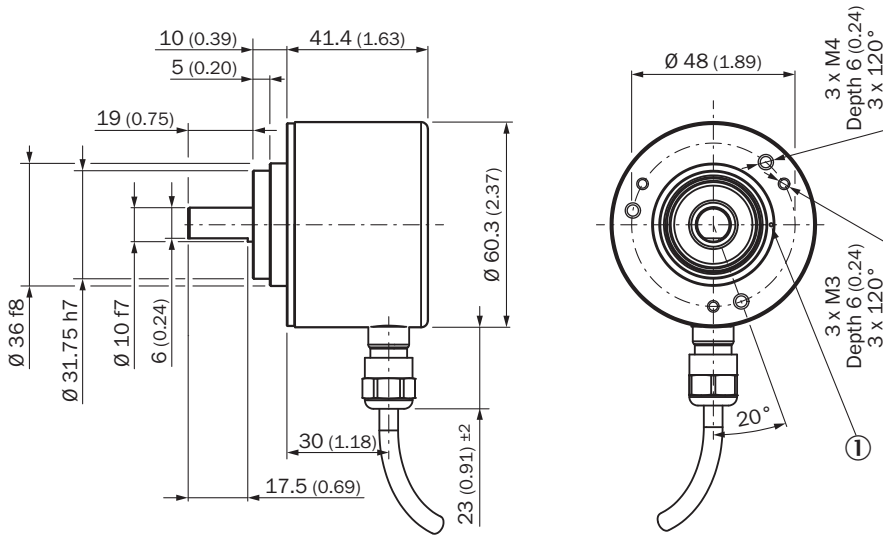
AMBIENT DATA

| | |
|-------------------------------|--|
| EMC | According to EN 61000-6-2 and EN 61000-6-3 |
| Enclosure rating | IP67, cable connection (IEC 60529) |
| Permissible relative humidity | 90 % (Condensation not permitted) |
| Operating temperature range | -20 °C ... +85 °C |
| Storage temperature range | -40 °C ... +100 °C, without package |
| Resistance to shocks | 100 g, 6 ms (EN 60068-2-27) |
| Resistance to vibration | 30 g, 10 Hz ... 2,000 Hz (EN 60068-2-6) |

CERTIFICATES

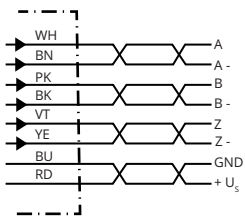
| | |
|---|---|
| EU declaration of conformity | ✓ |
| UK declaration of conformity | ✓ |
| ACMA declaration of conformity | ✓ |
| China RoHS | ✓ |
| cULus certificate | ✓ |
| Information according to Art. 3 of Data Act (Regulation EU 2023/2854) | ✓ |

DIMENSIONAL DRAWING



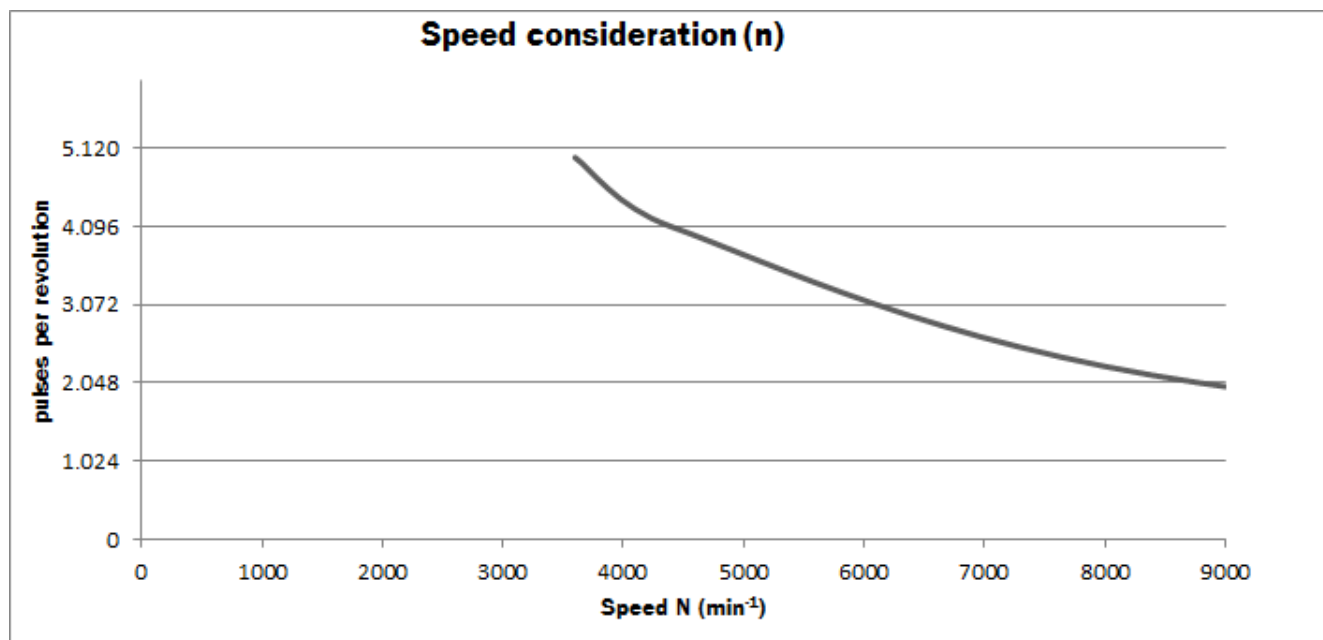
Dimensions in mm (inch)
 ① Zero pulse mark on flange

PIN ASSIGNMENT

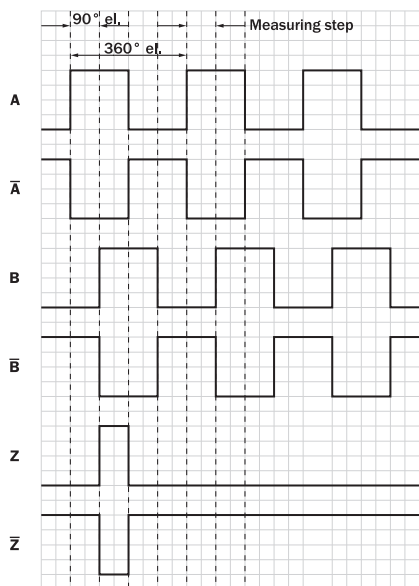


| Wire colors (cable connection) | Male connector M12, 8-pin | TTL/HTL signal | Explanation |
|--------------------------------|---------------------------|-----------------|---|
| Brown | 1 | A- | Signal cable |
| White | 2 | A | Signal cable |
| Black | 3 | B- | Signal cable |
| Pink | 4 | B | Signal cable |
| Yellow | 5 | Z- | Signal cable |
| Purple | 6 | Z | Signal cable |
| Blue | 7 | GND | Ground connection |
| Red | 8 | +U _s | Supply voltage |
| Screen | Screen | Screen | Screen connected to housing on encoder side |

DIAGRAMS



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 |

Further information as well as suitable accessories, example applications and downloads such as CAD dimensional models, operating instructions and software can be found at www.sick.com/1107569



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SICK AT A GLANCE

SICK is a leading global technology company for intelligent sensors and integrated solutions in industrial automation. Our technologies set benchmarks, making your industrial processes more efficient, safer and more sustainable – both in logistics and manufacturing operations.

SICK combines sensor intelligence with industry expertise and certified consulting services. We provide the ideal foundation for scalable as well as tailor-made automation solutions and create added value along the entire value chain. Our close partnerships with our customers are more than just a promise: Together, we optimize productivity, improve quality, protect health and safety, and help build a sustainable future. All with empathy and trust.

Since 1946, we have been developing innovative technologies with passion and a pioneering spirit. With a global network in around 40 countries, SICK has a global presence and is always close by. The company's headquarters are located in Waldkirch near Freiburg, Germany. Our customers benefit from our understanding of both local and global requirements, which enables us to deliver tailor-made solutions

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