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DATA SHEET

# DBS60I-Q4EZ00S05

DBS60
Incremental encoders

SICK Sensor Intelligence

Illustration may differ

## INCREMENTAL ENCODERS

# DBS60I-Q4EZ00S05

### ORDERING INFORMATION

| Type | part no. |
|---|---|
| DBS60I-Q4EZ00S05 | 1132646 |

Further device versions and accessories at www.sick.com/DBS60

## DETAILED TECHNICAL DATA

### FEATURES

| | |
|---|---|
| Special device | ✓ |
| Specialty | Connection cable 20 m<br>Customized wire color<br>Solid shaft, Ø 10 mm x 25 mm<br>Number of lines: 4445<br>Customized packaging (no print) |
| Standard reference device | DBS60I-Q4EJ04555 |

### 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 | 4,445 |
| 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 |

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

[2] Up to 450 kHz on request.

| | |
|---|---|
| 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.

## ELECTRONICS

| | |
|---|---|
| Connection type | Special version |
| Connection type Detail | Connection cable 20 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 permissable for maximum 30 s.

## MECHANICS

| | |
|---|---|
| Mechanical design | Special version |
| Mechanical type detail | Solid shaft, square flange, 10 mm x 25 mm |
| Shaft diameter | With flat |
| Flange type / stator coupling | Flange with 4 x hole 5.5 mm |
| Weight | 0.61 kg [1] |
| Shaft material | Stainless steel V2A |
| Flange material | Stainless steel V2A |
| Housing material | Stainless steel V2A |
| Shaft sealing ring material | FKM80 |
| Start up torque | 1 Ncm (+20 °C) |
| Operating torque | 0.9 Ncm (+20 °C) |
| Permissible shaft loading | 80 N (radial) [2]<br>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, male connector (IEC 60529) [1] |
| Permissible relative humidity | 90 % (Condensation not permitted) |

[1] With mating connector fitted.

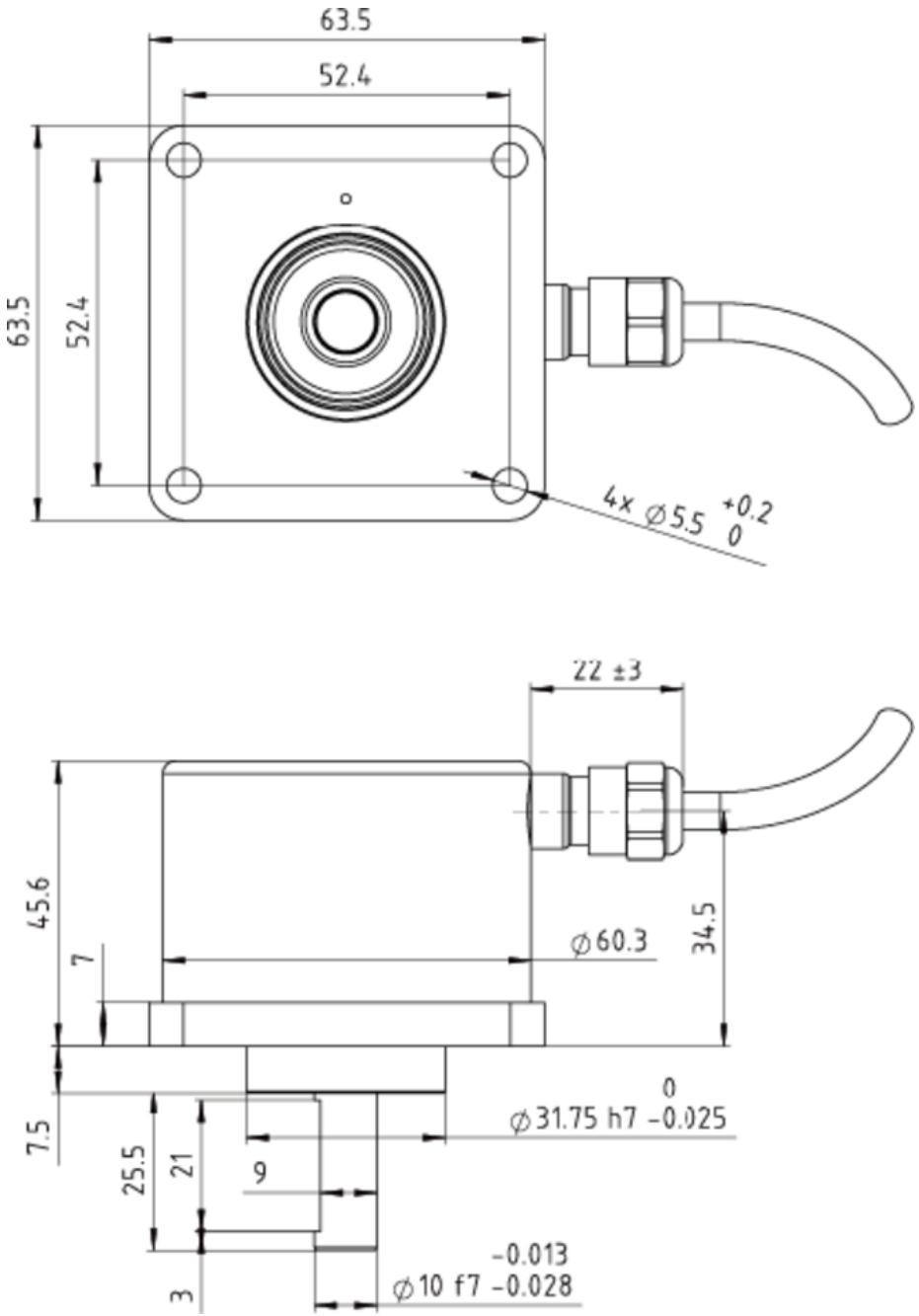
| | |
|---|---|
| Operating temperature range | –20 °C ... +85 °C |
| Storage temperature range | –40 °C ... +100 °C, without package |
| Resistance to shocks | 100 g, 6 ms (EN 60068-2-27) |
| Resistance to vibration | 30 g, 10 Hz ... 2,000 Hz (EN 60068-2-6) |

[1] With mating connector fitted.

## 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**

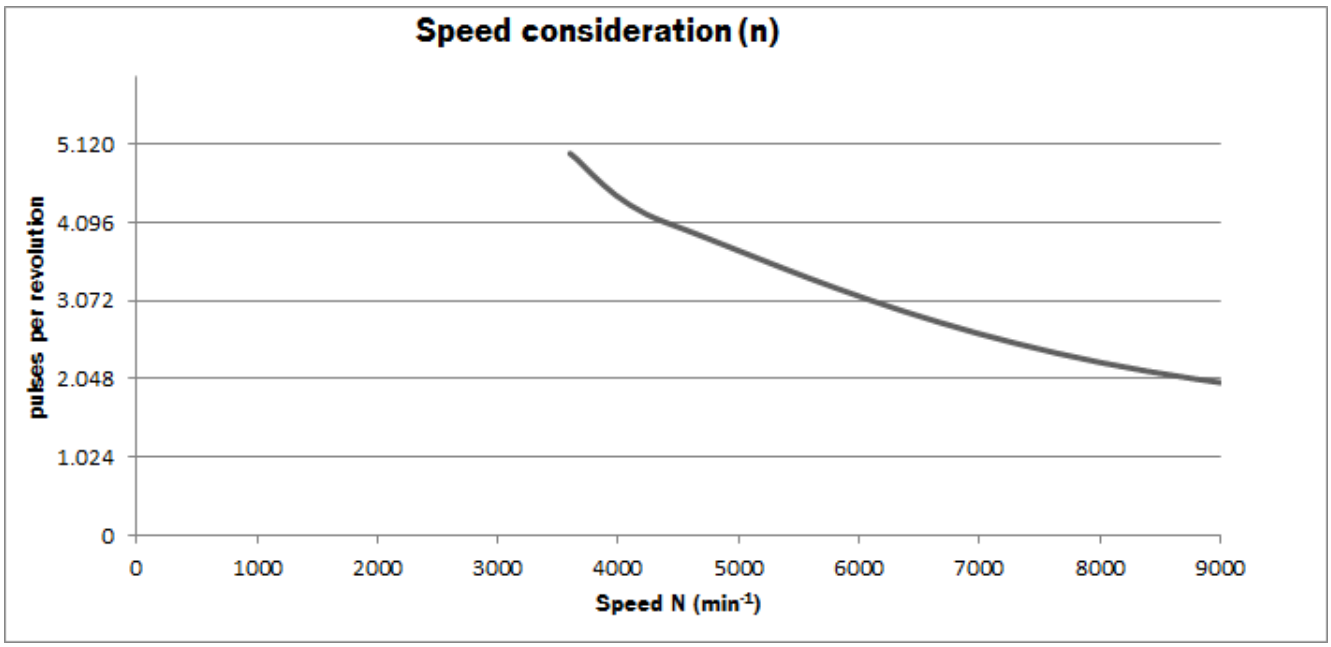



Dimensions in mm (inch)

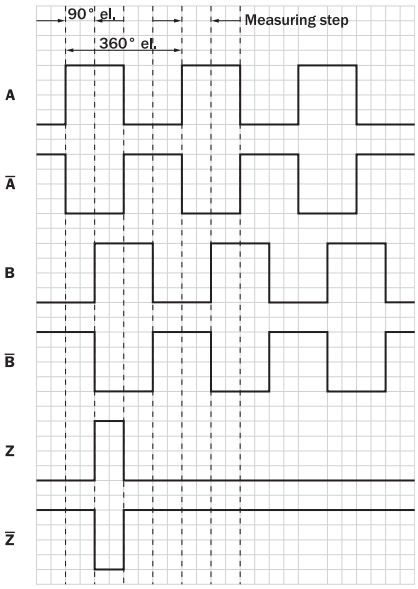
**PIN ASSIGNMENT**

| Adern-farbe | Signal HTL | Beschreibung |
|---|---|---|
| Schwarz | GND | Masseanschluss des Encoders |
| Rot | +Us | Versorgungsspannung |
| Weiß | A | Signalleitung |
| Grün | B | Signalleitung |
| Schirm | Schirm | Schirm encoderseitig mit Gehäuse verbunden. Steuerseitig mit Erde verbinden. |

## 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/1132646



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# SICK AT A GLANCE

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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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