



DBS36E-BBPN02048

DBS36/50

INCREMENTAL ENCODERS

SICK
Sensor Intelligence.



Illustration may differ

Ordering information

| Type | part no. |
|------------------|----------|
| DBS36E-BBPN02048 | 1101402 |

Other models and accessories → www.sick.com/DBS36_50



Detailed technical data

Safety-related parameters

| | |
|--|--|
| MTTF_D (mean time to dangerous failure) | 600 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 | 2,048 |
| Measuring step | 90°, electric/pulses per revolution |
| Measuring step deviation | ± 18° / pulses per revolution |
| Error limits | ± 54° / pulses per revolution |
| Duty cycle | ≤ 0.5 ± 5 % |

Interfaces

| | |
|---------------------------------------|------------------------|
| Communication interface | Incremental |
| Communication Interface detail | Open Collector |
| Number of signal channels | 3 channel |
| Initialization time | < 3 ms |
| Output frequency | ≤ 300 kHz |
| Load current | ≤ 30 mA |
| Operating current | ≤ 50 mA (without load) |

Electronics

| | |
|--|---|
| Connection type | Cable, 5-wire, universal, 10 m |
| Supply voltage | 4.5 ... 5.5 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⁾ The short-circuit rating is only given if Us and GND are connected correctly.

Mechanics

| | |
|---------------------------------------|---|
| Mechanical design | Blind hollow shaft |
| Shaft diameter | 8 mm Front clamp ¹⁾ |
| Weight | + 150 g (with connecting cable) |
| Shaft material | Stainless steel |
| Flange material | Aluminum |
| Housing material | Aluminum |
| Material, cable | PVC |
| 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 | ≤ 8,000 min ⁻¹ ⁴⁾ |
| Moment of inertia of the rotor | 0.8 gcm ² |
| Bearing lifetime | 2 x 10 ⁹ revolutions |
| Angular acceleration | ≤ 500,000 rad/s ² |

¹⁾ Order collets for 5 mm, 6 mm and 1/4" mm separately as accessories.

²⁾ Higher values are possible using limited bearing life.

³⁾ Allow for self-heating of 4.7 K per 1,000 rpm when designing the operating temperature range.

⁴⁾ No permanent operation. Decreasing signal quality.

Ambient data

| | |
|--------------------------------------|--|
| EMC | According to EN 61000-6-2 and EN 61000-6-3 (class A) |
| Enclosure rating | IP65 |
| Permissible relative humidity | 90 % (Condensation not permitted) |
| Operating temperature range | -20 °C ... +85 °C, -35 °C ... +95 °C on request |
| Storage temperature range | -40 °C ... +100 °C, without package |
| Resistance to shocks | 100 g, 6 ms (EN 60068-2-27) |
| Resistance to vibration | 20 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 | ✓ |
| cRUus certificate | ✓ |
| Information according to Art. 3 of Data Act (Regulation EU 2023/2854) | ✓ |

Classifications

| | |
|-------------------|----------|
| ECLASS 5.0 | 27270501 |
|-------------------|----------|

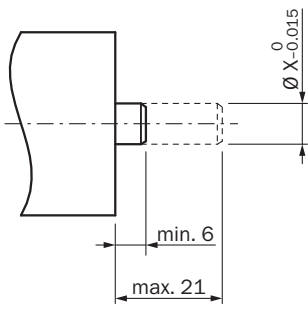
| | |
|-----------------------|----------|
| ECLASS 5.1.4 | 27270501 |
| ECLASS 6.0 | 27270590 |
| ECLASS 6.2 | 27270590 |
| ECLASS 7.0 | 27270501 |
| ECLASS 8.0 | 27270501 |
| ECLASS 8.1 | 27270501 |
| ECLASS 9.0 | 27270501 |
| ECLASS 10.0 | 27270501 |
| ECLASS 11.0 | 27270501 |
| ECLASS 12.0 | 27270501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

Dimensional drawing Blind hollow shaft, cable



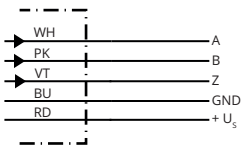
Dimensions in mm (inch)

Attachment specifications



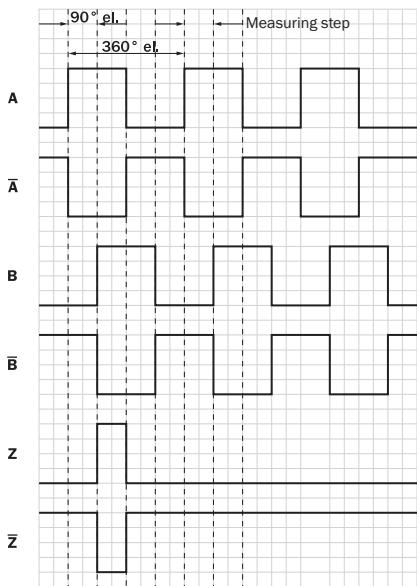
| | Encoder | |
|------|-----------|-------------------|
| 6 mm | DBS36E-BA | 2056390Premounted |
| 5 mm | DBS36E-BB | 2066991 |
| 6 mm | | 2056390 |
| 1/4" | | On request |
| 8 mm | | Not required |

PIN assignment



| Wire colors (cable connection) | Male connector M12, 8-pin | Male connector M23, 12-pin | SignalOpen Collector3 channel | Explanation |
|--------------------------------|---------------------------|----------------------------|-------------------------------|-------------------|
| White | 2 | 5 | A | Signal wire |
| Pink | 4 | 8 | B | Signal wire |
| Purple | 6 | 3 | Z | Signal wire |
| Blue | 7 | 10 | GND | Ground connection |
| Red | 8 | 12 | +U _s | Supply voltage |

Diagrams Signal outputs for electrical interfaces TTL and HTL



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

① Interfaces G, P, R only for channels A, B, Z.

| Supply voltage | Output |
|----------------|-------------------------------|
| 4.5 V...5.5 V | TTL/RS422 |
| 7 V...30 V | TTL/RS422 |
| 7 V...30 V | HTL/Push Pull |
| 7 V...27 V | HTL/push pull, 3 channel |
| 4.5 V...5.5 V | Open Collector NPN, 3 channel |
| 4.5 V...30 V | Open Collector NPN, 3 channel |

Operation note Zero pulse explanation



Recommended accessories

Other models and accessories → www.sick.com/DBS36_50

| | Brief description | Type | part no. |
|---|---|----------------|----------|
| connectors and cables | | | |
|  | <ul style="list-style-type: none"> • Connection type head A: Flying leads • Connection type head B: Flying leads • Signal type: SSI, Incremental, HIPERFACE® • Items supplied: By the meter • Cable: 8-wire, PUR, halogen-free • Description: SSI, shielded, Incremental, HIPERFACE® | LTG-2308-MWENC | 6027529 |
|  | <ul style="list-style-type: none"> • Connection type head A: Flying leads • Connection type head B: Flying leads • Signal type: SSI, Incremental • Items supplied: By the meter • Cable: 11-wire, PUR • Description: SSI, shielded, Incremental | LTG-2411-MW | 6027530 |
|  | <ul style="list-style-type: none"> • Connection type head A: Flying leads • Connection type head B: Flying leads • Signal type: SSI, Incremental • Items supplied: By the meter • Cable: 12-wire, PUR, halogen-free • Description: SSI, shielded, Incremental | LTG-2512-MW | 6027531 |
|  | <ul style="list-style-type: none"> • Connection type head A: Flying leads • Connection type head B: Flying leads • Signal type: SSI, TTL, HTL, Incremental • Items supplied: By the meter • Cable: 12-wire, UV and saltwater-resistant, PUR, halogen-free • Description: SSI, shielded, TTL, HTL, Incremental | LTG-2612-MW | 6028516 |
|  | <ul style="list-style-type: none"> • Description: Unshielded • Connection type head A: Male connector, M12, 5-pin, straight, A-coded • Connection systems: Screw-type terminals • Permitted cross-section: ≤ 0.75 mm² • Note: For field bus technology | STE-1205-G | 6022083 |
|  | <ul style="list-style-type: none"> • Description: PROFIBUS DP, shielded • Connection type head A: Male connector, M12, 5-pin, straight, B-coded • Signal type: PROFIBUS DP • Connection systems: Screw-type terminals • Permitted cross-section: ≤ 0.75 mm² | STE-1205-GQ | 6021354 |
|  | <ul style="list-style-type: none"> • Description: Unshielded • Connection type head A: Male connector, M12, 5-pin, straight, A-coded • Connection systems: Spring-cage connection • Permitted cross-section: 0.14 mm² ... 0.5 mm² • Note: Test voltage 1.25 kV eff/60 s, insulation group C to VDE 0110 | STE-1205-GFE | 6044999 |
|  | <ul style="list-style-type: none"> • Description: Unshielded • Connection type head A: Male connector, M12, 5-pin, angled, A-coded • Connection systems: Screw-type terminals • Permitted cross-section: ≤ 0.75 mm² • Note: For field bus technology | STE-1205-W | 6022082 |
|  | <ul style="list-style-type: none"> • Description: CANopen, shielded, DeviceNet™ • Connection type head A: Male connector, M12, 5-pin, straight, A-coded • Signal type: CANopen, DeviceNet™ • Connection systems: Screw-type terminals • Permitted cross-section: ≤ 0.75 mm² | STE-1205-GA | 6027533 |
|  | <ul style="list-style-type: none"> • Description: PROFIBUS DP, shielded • Connection type head A: Male connector, M12, 5-pin, angled, B-coded • Signal type: PROFIBUS DP • Connection systems: Spring-cage connection • Permitted cross-section: 0.14 mm² ... 0.5 mm² | STE-1205-WQ | 6041428 |
| Mounting systems | | | |
|  | <ul style="list-style-type: none"> • Product family: Stator couplings • Description: Two-sided stator coupling, screw hole diameter 42 to 46 mm, slot width 3.2 mm | BEF-DS-DBS36 | 2066301 |

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