



DBS50E-SKEM02048

DBS36/50

INCREMENTAL ENCODERS

SICK
Sensor Intelligence.



Illustration may differ

Ordering information

| Type | Part no. |
|------------------|----------|
| DBS50E-SKEM02048 | 1109518 |

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 | HTL / Push pull |
| Number of signal channels | 6-channel |
| Initialization time | < 3 ms |
| Output frequency | ≤ 300 kHz |
| Load current | ≤ 30 mA |
| Power consumption | < 0.5 W (without load) |

Electrical data

| | |
|--|---|
| Connection type | Cable, 8-wire, universal, 5 m |
| Supply voltage | 7 ... 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⁾ The short-circuit rating is only given if Us and GND are connected correctly.

Mechanical data

| | |
|---------------------------------------|---------------------------------------|
| Mechanical design | Solid shaft, face mount flange 3xM4 |
| Shaft diameter | 8 mm With face |
| Shaft length | 13 mm |
| Weight | + 180 g (with connecting cable) |
| Shaft material | Stainless steel |
| Flange material | Aluminum |
| Housing material | Aluminum |
| Material, cable | PVC |
| Start up torque | + 0.9 Ncm (+20 °C) |
| Operating torque | 0.6 Ncm (+20 °C) |
| Permissible shaft loading | 30 N (axial) 50 N (radial) |
| Operating speed | 6,000 min ⁻¹ ¹⁾ |
| Maximum operating speed | 8,000 min ⁻¹ ²⁾ |
| Moment of inertia of the rotor | 0.65 gcm ² |
| Bearing lifetime | 2 x 10 ⁹ revolutions |
| Angular acceleration | ≤ 500,000 rad/s ² |

¹⁾ Allow for self-heating of 3.3 K per 1,000 rpm when designing the operating temperature range.

²⁾ 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) |

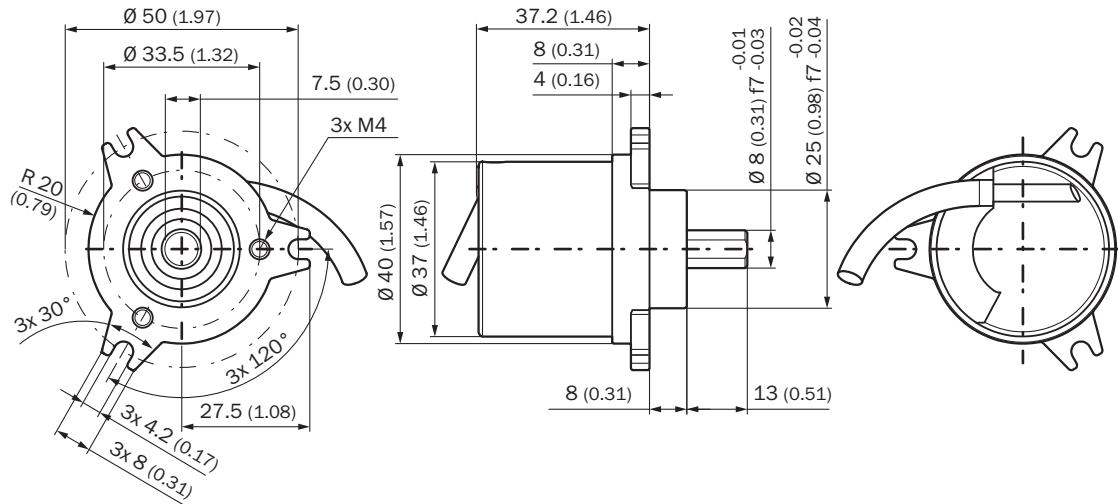
Classifications

| | |
|---------------------|----------|
| 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 |

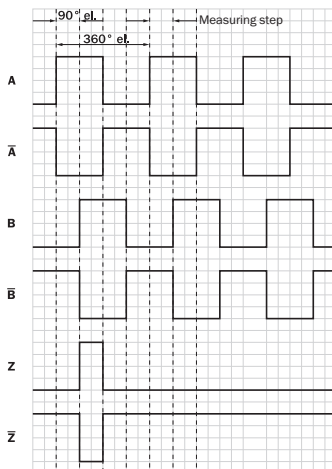
Dimensional drawing (Dimensions in mm (inch))

Face mount flange 3xM4



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 |


| Supply voltage | Output |
|----------------|-------------------------------|
| 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 |

Recommended accessories

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

| | Brief description | Type | Part no. |
|---|---|--------------------|----------|
| Flanges | | | |
|  | Flange adapter, adaption of 25 mm spigot face mount flange to 60s face mount flange with 36 mm centering collar, Aluminum | BEF-FA-025-036 | 2034226 |
|  | Flange adapter, adaption of 25 mm spigot face mount flange to 50 mm servo flange, Aluminum | BEF-FA-025-050 | 2032622 |
|  | Flange adapter, adaption of 25 mm spigot face mount flange to 60 mm square installation plate, Aluminum | BEF-FA-025-060RCA | 2032623 |
|  | Flange adapter, adaption of 25 mm spigot face mount flange to 60 mm square installation plate with shock-absorber, Aluminum | BEF-FA-025-060RSA | 2032624 |
|  | Flange adapter, adapts face mount flange with 25 mm centering collar to 63 mm square mounting plate, Aluminum | BEF-FA-025-063-REC | 2033631 |
| Other mounting accessories | | | |
|  | Aluminum measuring wheel with cross-knurled surface for 8 mm solid shaft, circumference 200 mm | BEF-MR08200AK | 4084741 |
|  | Aluminum measuring wheel with smooth polyurethane surface for 8 mm solid shaft, circumference 200 mm | BEF-MR08200AP | 4084742 |
|  | Aluminum measuring wheel, ground PUR ring covering for greater circumference accuracy, spare parts package consisting of 10 measuring wheels, circumference 200 mm +/-0.2 mm; for shaft with Ø 8 mm | BEF-MR08200APA | 2109902 |
|  | Aluminum measuring wheel with ridged polyurethane surface for 8 mm solid shaft, circumference 200 mm | BEF-MR08200APG | 4084744 |
|  | Aluminum measuring wheel with studded polyurethane surface for 8 mm solid shaft, circumference 200 mm | BEF-MR08200APN | 4084743 |

| | Brief description | Type | Part no. |
|---|--|----------------|----------|
| Shaft adaptation | | | |
|  | Bar coupling, shaft diameter 6 mm / 8 mm, maximum shaft offset radial ± 0.3 mm, axial ± 0.2 mm, angle $\pm 3^\circ$, max. speed 10,000 rpm, torsion spring rigidity 38 Nm/wheel; material: fiber-glass reinforced polyamide, aluminum hub | KUP-0608-S | 5314179 |
| | Bar coupling, shaft diameter 8 mm / 8 mm, maximum shaft offset radial ± 0.3 mm, axial ± 0.2 mm, angle $\pm 3^\circ$; max. speed 10,000 rpm, torsion spring rigidity 38 Nm/wheel; material: fiber-glass reinforced polyamide, aluminum hub | KUP-0808-S | 5314177 |
|  | Double loop coupling, shaft diameter 8 mm / 10 mm, max. shaft offset: radially +/- 0,25 mm, axially +/- 0,4 mm, angle +/- 4 degrees; max. speed 10.000 rpm, -30 to +120 degrees Celsius, torsional spring stiffness of 150 Nm/rad | KUP-0810-D | 5326704 |
|  | Claw coupling, shaft diameter 8 mm / 10 mm, damping element 80 shore blue, maximum shaft offset: radial ± 0.22 mm, axial ± 1 mm angular $\pm 1.3^\circ$, max. speed 19,000 rpm, angle of twist max. 10° , -30 °C to +80 °C, max. torque 800 Ncm, tightening torque of screws: ISO 4029 150 Ncm, material: aluminum flange, damping element: polyurethane | KUP-0810-J | 2128267 |
|  | Bar coupling, shaft diameter 8 mm / 10 mm, max. shaft offset: radial $\pm 0,3$ mm, axial $\pm 0,3$ mm, angular $\pm 3^\circ$; max. speed 10.000 rpm, -10° to +80 °C, max. torque: 80 Ncm, material: fiber-glass reinforced polyamide, aluminum hub | KUP-0810-S | 5314178 |
| Others | | | |
|  | <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, Incremental, HIPERFACE®, shielded | 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, Incremental, shielded | 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, Incremental, shielded | 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, TTL, HTL, Incremental, shielded, Head A: cable Head B: cable Cable: suitable for drag chain, PUR, halogen-free, shielded, UV and saltwater resistant, 4 x 2 x 0.25 mm² + 2 x 0.5 mm² + 2 x 0.14 mm², Ø 7.8 mm | LTG-2612-MW | 6028516 |
|  | <ul style="list-style-type: none"> • Connection type head A: Male connector, M12, 8-pin, straight, A-coded • Signal type: Incremental • Cable: CAT5, CAT5e • Description: Incremental, shielded, Head A: male connector, M12, 8-pin, straight, A coded, shielding for cable diameter 4 mm ... 8 mm Head B: - Operating temperature: -40 °C ... +85 °C • Connection systems: IDC quick connection • Permitted cross-section: 0.14 mm² ... 0.34 mm² | STE-1208-GA01 | 6044892 |
|  | <ul style="list-style-type: none"> • Connection type head A: Male connector, M23, 12-pin, straight, A-coded • Signal type: HIPERFACE®, SSI, Incremental • Description: HIPERFACE®, SSI, Incremental, shielded, M23 female connector with central fixing (for cabinet bushing) • Connection systems: Solder connection | STE-2312-GX | 6028548 |

| | Brief description | Type | Part no. |
|---|--|--------------|----------|
|  | <ul style="list-style-type: none">• Connection type head A: Male connector, M23, 12-pin, straight, A-coded• Signal type: HIPERFACE[®], SSI, Incremental• Description: HIPERFACE[®], SSI, Incremental, shielded, Head A: male connector, M23, 12-pin, straight, for cable diameter 5.5 mm ... 10.5 mm Head B: - Operating temperature: -40 °C ... +125 °C• Connection systems: Solder connection | STE-2312-G01 | 2077273 |

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.

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