



DBS60E-BBEPC1024

DBS60

INCREMENTAL ENCODERS

SICK
Sensor Intelligence.

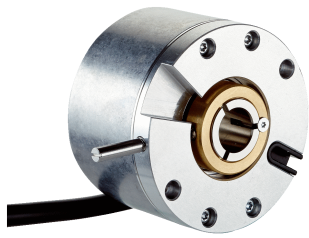


Illustration may differ



Ordering information

| Type | Part no. |
|-----------------|----------|
| DBS60E-BBEP1024 | 1104956 |

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

Detailed technical data

Performance

| | |
|---------------------------------|---------------------------------------|
| Pulses per revolution | 1,024 |
| 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 |
| 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, 8-wire, with male connector, M12, 8-pin, universal, 0.5 m ¹⁾ |
| 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 | ✓ ²⁾ |
| MTTFd: mean time to dangerous failure | 500 years (EN ISO 13849-1) ³⁾ |

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.

Mechanical data

| | |
|---------------------------------------|---|
| Mechanical design | Blind hollow shaft |
| Shaft diameter | 8 mm |
| Flange type / stator coupling | Axial and radial register pin mounting, for 4 mm register pin |
| Weight | + 0.25 kg ¹⁾ |
| 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 | 9,000 min ⁻¹ ⁴⁾ |
| Moment of inertia of the rotor | 50 gcm ² |
| Bearing lifetime | 3.6 x 10 ⁹ revolutions |
| Angular acceleration | ≤ 500,000 rad/s ² |

¹⁾ Based on encoder with male connector or cable with male connector.

²⁾ Not applicable for stator coupling type C and K.

³⁾ Allow for self-heating of 2.6 K per 1,000 rpm when designing the operating temperature range.

⁴⁾ 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) ¹⁾ IP65, shaft side (IEC 60529) |
| Permissible relative humidity | 90 % (Condensation not permitted) |
| Operating temperature range | -20 °C ... +85 °C ²⁾ |
| Storage temperature range | -40 °C ... +100 °C, without package |
| Resistance to shocks | 250 g, 3 ms (EN 60068-2-27) |
| Resistance to vibration | 30 g, 10 Hz ... 2,000 Hz (EN 60068-2-6) |

¹⁾ With mating connector fitted.

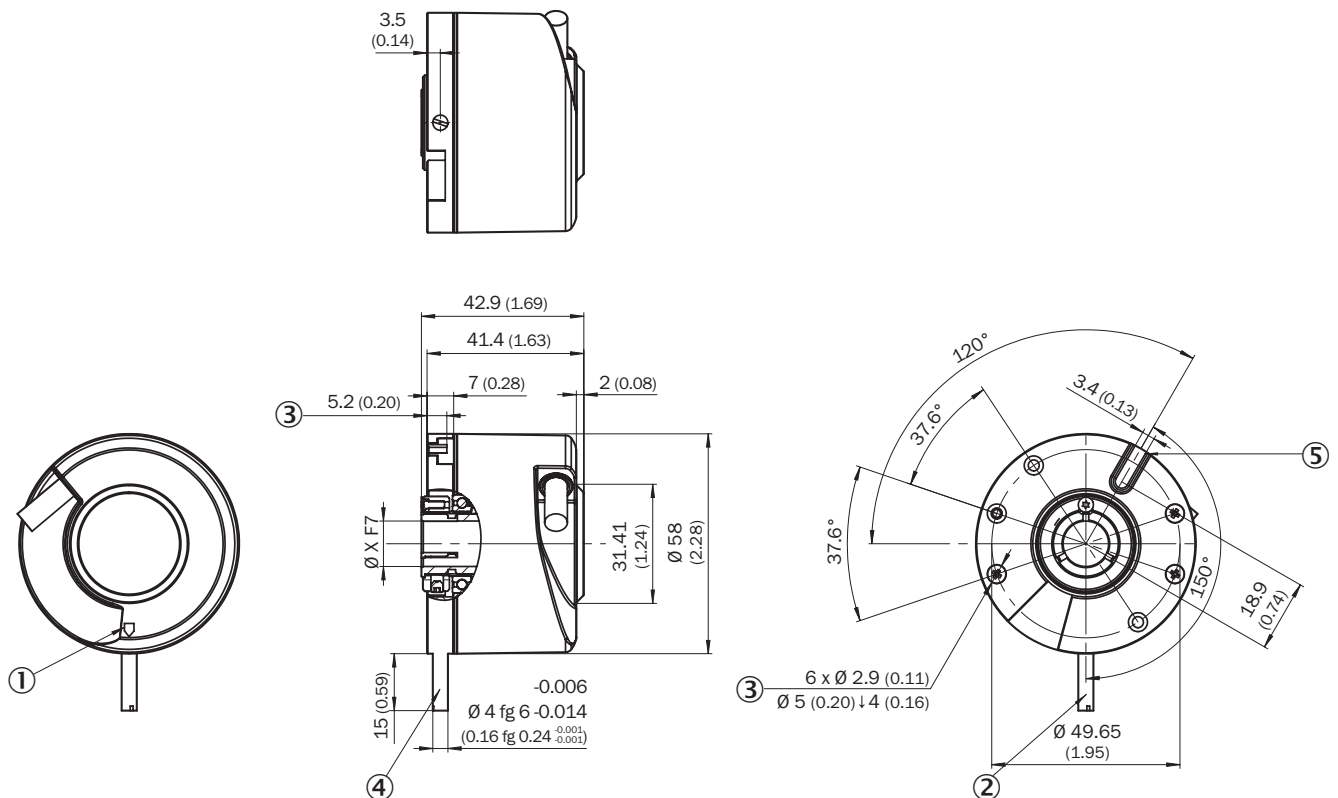
²⁾ These values relate to all mechanical versions including recommended accessories unless otherwise noted.

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))



XF7 values see shaft diameter table for blind hollow shaft

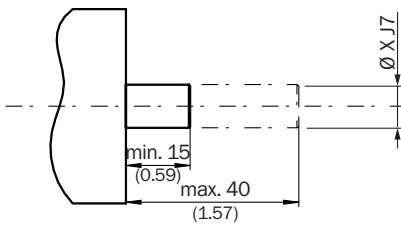
- ① Zero pulse mark on housing
- ② Register pin is the zero pulse mark
- ③ Depth
- ④ Register pin can be removed
- ⑤ Rubber insert, material: NBR

| Type | Shaft diameter XF7 |
|--------------------------------------|--------------------|
| Blind hollow shaft | |
| DBS60x-BAxxxxxxx DBS60x-B1xxxxxxx | 6 mm |
| DBS60x-BBxxxxxxx | 8 mm |

| Type Blind hollow shaft | Shaft diameter XF7 |
|--------------------------------------|--------------------|
| DBS60x-B2xxxxxxx | |
| DBS60x-BCxxxxxxx DBS60x-B3xxxxxxx | 3/8" |
| DBS60x-BDxxxxxxx DBS60x-B4xxxxxxx | 10 mm |
| DBS60x-BExxxxxxx DBS60x-B5xxxxxxx | 12 mm |
| DBS60x-BFxxxxxxx DBS60x-B6xxxxxxx | 1/2" |
| DBS60x-BGxxxxxxx DBS60x-B7xxxxxxx | 14 mm |
| DBS60x-BHxxxxxxx DBS60x-B8xxxxxxx | 15 mm |
| DBS60x-BJxxxxxxx | 5/8" |

Attachment specifications

Blind hollow shaft



Customer side

| Type Blind hollow shaft | Shaft diameter xj7 |
|--------------------------------------|--------------------|
| DBS60x-BAxxxxxxx DBS60x-B1xxxxxxx | 6 mm |
| DBS60x-BBxxxxxxx DBS60x-B2xxxxxxx | 8 mm |
| DBS60x-BCxxxxxxx DBS60x-B3xxxxxxx | 3/8" |
| DBS60x-BDxxxxxxx DBS60x-B4xxxxxxx | 10 mm |
| DBS60x-BExxxxxxx DBS60x-B5xxxxxxx | 12 mm |
| DBS60x-BFxxxxxxx DBS60x-B6xxxxxxx | 1/2" |
| DBS60x-BGxxxxxxx DBS60x-B7xxxxxxx | 14 mm |
| DBS60x-BHxxxxxxx DBS60x-B8xxxxxxx | 15 mm |
| DBS60x-BJxxxxxxx | 5/8" |

PIN assignment



View of M12 male device connector on cable / housing

| Wire colors (cable connection) | Male connector M12, 8-pin | Male connector M23, 12-pin | TTL/HTL 6-channel signal | Explanation |
|--------------------------------|---------------------------|----------------------------|--------------------------|-------------------------------------|
| Brown | 1 | 6 | A- | Signal wire |
| White | 2 | 5 | A | Signal wire |
| Black | 3 | 1 | B- | Signal wire |
| Pink | 4 | 8 | B | Signal wire |
| Yellow | 5 | 4 | Z- | Signal wire |
| Purple | 6 | 3 | Z | Signal wire |
| Blue | 7 | 10 | GND | Ground connection |
| Red | 8 | 12 | +U _s | Supply voltage |
| - | - | 9 | Not assigned | Not assigned |
| - | - | 2 | Not assigned | Not assigned |
| - | - | 11 | Not assigned | Not assigned |
| - | - | 7 | Not assigned | Not assigned |
| Screen | Screen | Screen | Screen | Screen connected to encoder housing |

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

Hollow shaft



Attention! If stator coupling is mounted, the zero pulse mark can be hidden by the stator coupling

- ① Zero pulse mark on flange
- ② Zero pulse is active when screw of clamping is inline with zero pulse mark on flange or housing mark

Recommended accessories

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

| | Brief description | Type | Part no. |
|---|--|------------------|----------|
| Others | | | |
|  | <ul style="list-style-type: none"> • Connection type head A: Flying leads • Connection type head B: Flying leads • Signal type: SSI, Incremental, HIPERFACE® • Cable: 8-wire, PUR, halogen-free • Description: SSI, Incremental, HIPERFACE®, shielded • Items supplied: By the meter | 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 • Cable: 11-wire, PUR • Description: SSI, Incremental, shielded • Items supplied: By the meter | 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 • Cable: 12-wire, PUR, halogen-free • Description: SSI, Incremental, shielded • Items supplied: By the meter | 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 • 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 • Items supplied: By the meter | LTG-2612-MW | 6028516 |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, straight • Connection type head B: Flying leads • Signal type: Incremental, SSI • Cable: 2 m, 8-wire, PUR, halogen-free • Description: Incremental, SSI, shielded, Head A: female connector, M12, 8-pin, straight Head B: cable Cable: suitable for drag chain, PVC, shielded, 4 x 2 x 0.25 mm², Ø 7.0 mm • Connection systems: Flying leads | DOL-1208-G02MAC1 | 6032866 |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, straight • Connection type head B: Flying leads • Signal type: Incremental, SSI • Cable: 5 m, 8-wire, PUR, halogen-free • Description: Incremental, SSI, shielded, Head A: female connector, M12, 8-pin, straight Head B: cable Cable: suitable for drag chain, PVC, shielded, 4 x 2 x 0.25 mm², Ø 7.0 mm • Connection systems: Flying leads | DOL-1208-G05MAC1 | 6032867 |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, straight • Connection type head B: Flying leads • Signal type: Incremental, SSI • Cable: 10 m, 8-wire, PUR, halogen-free • Description: Incremental, SSI, shielded, Head A: female connector, M12, 8-pin, straight Head B: cable Cable: suitable for drag chain, PVC, shielded, 4 x 2 x 0.25 mm², Ø 7.0 mm • Connection systems: Flying leads | DOL-1208-G10MAC1 | 6032868 |

| | Brief description | Type | Part no. |
|---|---|--------------------|----------|
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, straight • Connection type head B: Flying leads • Signal type: Incremental, SSI • Cable: 20 m, 8-wire, PUR, halogen-free • Description: Incremental, SSI, shielded, Head A: female connector, M12, 8-pin, straight Head B: cable Cable: suitable for drag chain, PVC, shielded, 4 x 2 x 0.25 mm², Ø 7.0 mm • Connection systems: Flying leads | DOL-1208-G20MAC1 | 6032869 |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, straight • Connection type head B: Flying leads • Signal type: Incremental, SSI • Cable: 25 m, 8-wire, PUR, halogen-free • Description: Incremental, SSI, shielded, Head A: female connector, M12, 8-pin, straight Head B: cable Cable: suitable for drag chain, PVC, shielded, 4 x 2 x 0.25 mm², Ø 7.0 mm • Connection systems: Flying leads | DOL-1208-G25MAC1 | 6067859 |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, straight, A-coded • Signal type: Incremental, SSI • Cable: CAT5, CAT5e • Description: Incremental, SSI, shielded, Head A: female connector, M12, 8-pin, straight, A encoded, shielded, 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 | DOS-1208-GA01 | 6045001 |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, straight, A-coded • Connection type head B: Male connector, M12, 8-pin, straight, A-coded • Cable: 20 m, 8-wire, PUR, halogen-free • Description: Shielded • Permitted cross-section: ≤ 0.25 mm² • Note: Drag chain use • Application: Drag chain operation | YF2AA8-200S01MKA18 | 2099208 |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, straight, A-coded • Connection type head B: Male connector, M12, 8-pin, straight, A-coded • Cable: 2 m, 8-wire, PUR, halogen-free • Description: Shielded • Permitted cross-section: ≤ 0.25 mm² • Note: Drag chain use • Application: Drag chain operation | YF2AA8-020S01MKA18 | 2099207 |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, straight, A-coded • Connection type head B: Male connector, M12, 8-pin, straight, A-coded • Cable: 5 m, 8-wire, PUR, halogen-free • Description: Shielded • Permitted cross-section: ≤ 0.25 mm² • Note: Drag chain use • Application: Drag chain operation | YF2AA8-050S01MKA18 | 2099209 |
|  | <ul style="list-style-type: none"> • Connection type head A: Female connector, M12, 8-pin, straight, A-coded • Connection type head B: Male connector, M12, 8-pin, straight, A-coded • Cable: 10 m, 8-wire, PUR, halogen-free • Description: Shielded • Permitted cross-section: ≤ 0.25 mm² • Note: Drag chain use • Application: Drag chain operation | YF2AA8-100S01MKA18 | 2099210 |

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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