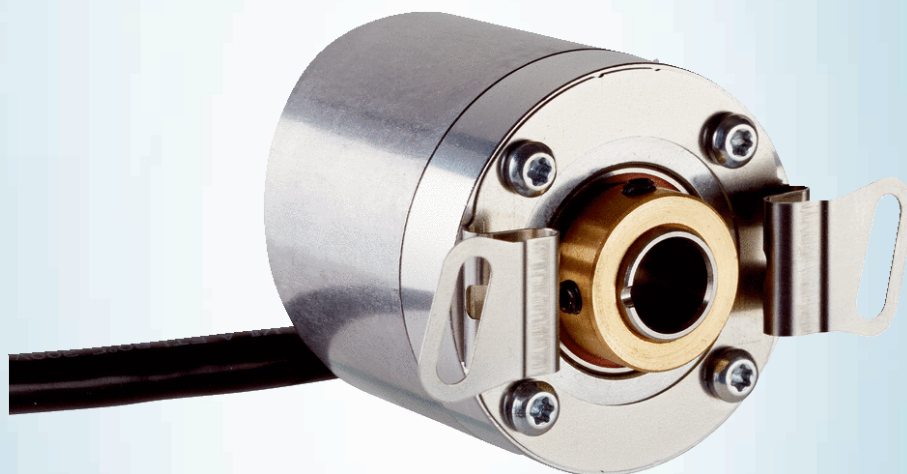




# DBS36E-BBAL02500

DBS36/50

INCREMENTAL ENCODERS

**SICK**  
Sensor Intelligence.

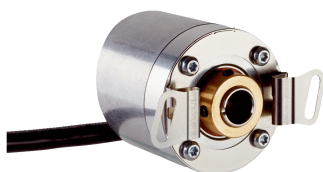


Illustration may differ

### Ordering information

| Type             | part no. |
|------------------|----------|
| DBS36E-BBAL02500 | 1065070  |

Other models and accessories → [www.sick.com/DBS36\\_50](http://www.sick.com/DBS36_50)



### Detailed technical data

#### Safety-related parameters

|                                                          |                                          |
|----------------------------------------------------------|------------------------------------------|
| <b>MTTF<sub>D</sub> (mean time to dangerous failure)</b> | 600 years (EN ISO 13849-1) <sup>1)</sup> |
|----------------------------------------------------------|------------------------------------------|

<sup>1)</sup> 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

|                                 |                                     |
|---------------------------------|-------------------------------------|
| <b>Pulses per revolution</b>    | 2,500                               |
| <b>Measuring step</b>           | 90°, electric/pulses per revolution |
| <b>Measuring step deviation</b> | ± 18° / pulses per revolution       |
| <b>Error limits</b>             | ± 54° / pulses per revolution       |
| <b>Duty cycle</b>               | ≤ 0.5 ± 5 %                         |

#### Interfaces

|                                       |                        |
|---------------------------------------|------------------------|
| <b>Communication interface</b>        | Incremental            |
| <b>Communication Interface detail</b> | TTL / RS-422           |
| <b>Number of signal channels</b>      | 6-channel              |
| <b>Initialization time</b>            | < 3 ms                 |
| <b>Output frequency</b>               | ≤ 300 kHz              |
| <b>Load current</b>                   | ≤ 30 mA                |
| <b>Operating current</b>              | ≤ 50 mA (without load) |

#### Electronics

|                                                |                                             |
|------------------------------------------------|---------------------------------------------|
| <b>Connection type</b>                         | Cable, 8-wire, universal, 3 m               |
| <b>Supply voltage</b>                          | 4.5 ... 5.5 V                               |
| <b>Reference signal, number</b>                | 1                                           |
| <b>Reference signal, position</b>              | 90°, electric, logically gated with A and B |
| <b>Short-circuit protection of the outputs</b> | ✓ <sup>1)</sup>                             |

<sup>1)</sup> The short-circuit rating is only given if Us and GND are connected correctly.

## Mechanics

|                                       |                                                     |
|---------------------------------------|-----------------------------------------------------|
| <b>Mechanical design</b>              | Blind hollow shaft                                  |
| <b>Shaft diameter</b>                 | 8 mm<br>Front clamp <sup>1)</sup>                   |
| <b>Weight</b>                         | + 150 g (with connecting cable)                     |
| <b>Shaft material</b>                 | Stainless steel                                     |
| <b>Flange material</b>                | Aluminum                                            |
| <b>Housing material</b>               | Aluminum                                            |
| <b>Material, cable</b>                | PVC                                                 |
| <b>Start up torque</b>                | + 0.5 Ncm (+20 °C)                                  |
| <b>Operating torque</b>               | 0.4 Ncm (+20 °C)                                    |
| <b>Permissible movement static</b>    | ± 0.3 mm (radial)<br>± 0.5 mm (axial) <sup>2)</sup> |
| <b>Permissible movement dynamic</b>   | ± 0.1 mm (radial)<br>± 0.2 mm (axial) <sup>2)</sup> |
| <b>Operating speed</b>                | 6,000 min <sup>-1</sup> <sup>3)</sup>               |
| <b>Maximum operating speed</b>        | ≤ 8,000 min <sup>-1</sup> <sup>4)</sup>             |
| <b>Moment of inertia of the rotor</b> | 0.8 gcm <sup>2</sup>                                |
| <b>Bearing lifetime</b>               | 2 x 10 <sup>9</sup> revolutions                     |
| <b>Angular acceleration</b>           | ≤ 500,000 rad/s <sup>2</sup>                        |

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

<sup>2)</sup> Higher values are possible using limited bearing life.

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

<sup>4)</sup> No permanent operation. Decreasing signal quality.

## Ambient data

|                                      |                                                      |
|--------------------------------------|------------------------------------------------------|
| <b>EMC</b>                           | According to EN 61000-6-2 and EN 61000-6-3 (class A) |
| <b>Enclosure rating</b>              | IP65                                                 |
| <b>Permissible relative humidity</b> | 90 % (Condensation not permitted)                    |
| <b>Operating temperature range</b>   | -20 °C ... +85 °C, -35 °C ... +95 °C on request      |
| <b>Storage temperature range</b>     | -40 °C ... +100 °C, without package                  |
| <b>Resistance to shocks</b>          | 100 g, 6 ms (EN 60068-2-27)                          |
| <b>Resistance to vibration</b>       | 20 g, 10 Hz ... 2,000 Hz (EN 60068-2-6)              |

## Certificates

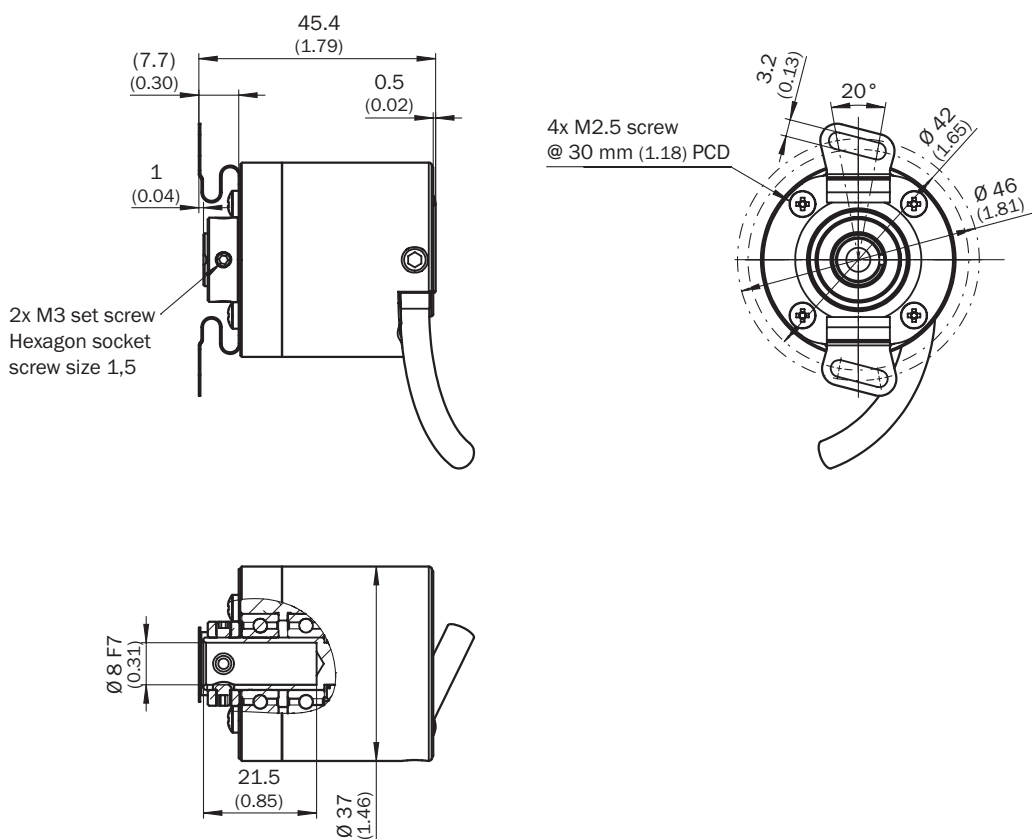
|                                                                              |   |
|------------------------------------------------------------------------------|---|
| <b>EU declaration of conformity</b>                                          | ✓ |
| <b>UK declaration of conformity</b>        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

## Classifications

|                   |          |
|-------------------|----------|
| <b>ECLASS 5.0</b> | 27270501 |
|-------------------|----------|

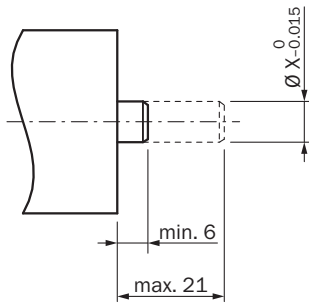
|                       |          |
|-----------------------|----------|
| <b>ECLASS 5.1.4</b>   | 27270501 |
| <b>ECLASS 6.0</b>     | 27270590 |
| <b>ECLASS 6.2</b>     | 27270590 |
| <b>ECLASS 7.0</b>     | 27270501 |
| <b>ECLASS 8.0</b>     | 27270501 |
| <b>ECLASS 8.1</b>     | 27270501 |
| <b>ECLASS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

### Dimensional drawing Blind hollow shaft, cable



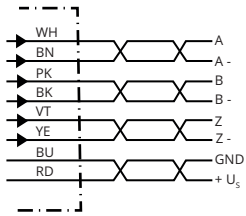
Dimensions in mm (inch)

## Attachment specifications



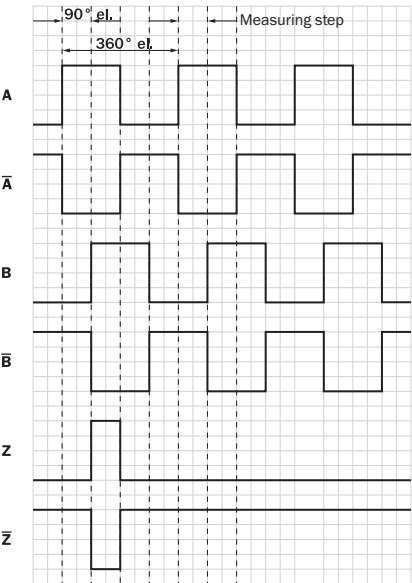
|      | Encoder   |                   |
|------|-----------|-------------------|
| 6 mm | DBS36E-BA | 2056390Premounted |
| 5 mm | DBS36E-BB | 2066991           |
| 6 mm |           | 2056390           |
| 1/4" |           | On request        |
| 8 mm |           | Not required      |

## PIN assignment



| Wire colors (cable connection) | Male connector M12, 8-pin | Male connector M23, 12-pin | 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 <sub>s</sub>          | Supply voltage    |
| -                              | -                         | 9                          | Not assigned             | Not assigned      |
| -                              | -                         | 2                          | Not assigned             | Not assigned      |
| -                              | -                         | 11                         | Not assigned             | Not assigned      |
| -                              | -                         | 7                          | Not assigned             | Not assigned      |

Diagrams Signal outputs for electrical interfaces TTL and HTL

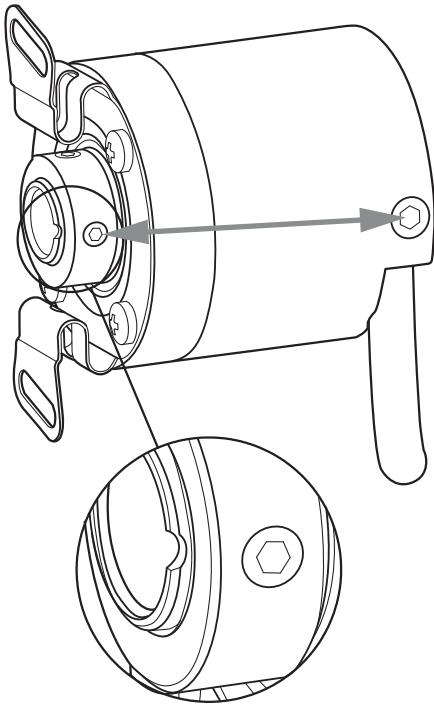


Cw with view on the encoder shaft in direction "A", compare dimensional drawing.

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](http://www.sick.com/DBS36_50)

|                                                                                     | Brief description                                                                                                                                                                                                                                                                                                                                                                                                   | Type           | part no. |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------|
| connectors and cables                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                     |                |          |
|    | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Flying leads</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> SSI, Incremental, HIPERFACE®</li> <li>• <b>Items supplied:</b> By the meter</li> <li>• <b>Cable:</b> 8-wire, PUR, halogen-free</li> <li>• <b>Description:</b> SSI, shielded, Incremental, HIPERFACE®</li> </ul>                          | LTG-2308-MWENC | 6027529  |
|    | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Flying leads</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> SSI, Incremental</li> <li>• <b>Items supplied:</b> By the meter</li> <li>• <b>Cable:</b> 11-wire, PUR</li> <li>• <b>Description:</b> SSI, shielded, Incremental</li> </ul>                                                               | LTG-2411-MW    | 6027530  |
|    | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Flying leads</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> SSI, Incremental</li> <li>• <b>Items supplied:</b> By the meter</li> <li>• <b>Cable:</b> 12-wire, PUR, halogen-free</li> <li>• <b>Description:</b> SSI, shielded, Incremental</li> </ul>                                                 | LTG-2512-MW    | 6027531  |
|    | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Flying leads</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> SSI, TTL, HTL, Incremental</li> <li>• <b>Items supplied:</b> By the meter</li> <li>• <b>Cable:</b> 12-wire, UV and saltwater-resistant, PUR, halogen-free</li> <li>• <b>Description:</b> SSI, shielded, TTL, HTL, Incremental</li> </ul> | LTG-2612-MW    | 6028516  |
|   | <ul style="list-style-type: none"> <li>• <b>Description:</b> Incremental, shielded</li> <li>• <b>Connection type head A:</b> Male connector, M12, 8-pin, straight, A-coded</li> <li>• <b>Signal type:</b> Incremental</li> <li>• <b>Cable:</b> CAT5, CAT5e</li> <li>• <b>Connection systems:</b> IDC quick connection</li> <li>• <b>Permitted cross-section:</b> 0.14 mm² ... 0.34 mm²</li> </ul>                   | STE-1208-GA01  | 6044892  |
|  | <ul style="list-style-type: none"> <li>• <b>Description:</b> HIPERFACE®, shielded, SSI, Incremental</li> <li>• <b>Connection type head A:</b> Male connector, M23, 12-pin, straight, A-coded</li> <li>• <b>Signal type:</b> HIPERFACE®, SSI, Incremental</li> <li>• <b>Connection systems:</b> Solder connection</li> </ul>                                                                                         | STE-2312-GX    | 6028548  |
|  | <ul style="list-style-type: none"> <li>• <b>Description:</b> HIPERFACE®, shielded, SSI, Incremental</li> <li>• <b>Connection type head A:</b> Male connector, M23, 12-pin, straight, A-coded</li> <li>• <b>Signal type:</b> HIPERFACE®, SSI, Incremental</li> <li>• <b>Connection systems:</b> Solder connection</li> </ul>                                                                                         | STE-2312-G01   | 2077273  |
| Mounting systems                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                     |                |          |
|  | <ul style="list-style-type: none"> <li>• <b>Product family:</b> Stator couplings</li> <li>• <b>Description:</b> Two-sided stator coupling, screw hole diameter 42 to 46 mm, slot width 3.2 mm</li> </ul>                                                                                                                                                                                                            | BEF-DS-DBS36   | 2066301  |



## 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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Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

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