



## DBS60E-S1AC05000

DBS60

INCREMENTAL ENCODERS

**SICK**  
Sensor Intelligence.



## Ordering information

| Type             | part no. |
|------------------|----------|
| DBS60E-S1AC05000 | 1092677  |

Other models and accessories → [www.sick.com/DBS60](http://www.sick.com/DBS60)

Illustration may differ



## Detailed technical data

## Safety-related parameters

|  |  |
|--|--|
| <b>MTTF<sub>D</sub> (mean time to dangerous failure)</b> | 500 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>    | 5,000                                 |
| <b>Measuring step</b>           | ≤ 90°, electric/pulses per revolution |
| <b>Measuring step deviation</b> | ± 36° / pulses per revolution         |
| <b>Error limits</b>             | Measuring step deviation x 3          |
| <b>Duty cycle</b>               | ≤ 0.5 ± 10 %                          |

## 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>            | < 5 ms <sup>1)</sup>    |
| <b>Output frequency</b>               | + 300 kHz <sup>2)</sup> |
| <b>Load current</b>                   | ≤ 30 mA, per channel    |
| <b>Operating current</b>              | ≤ 50 mA (without load)  |

<sup>1)</sup> Valid signals can be read once this time has elapsed.

<sup>2)</sup> Up to 450 kHz on request.

## Electronics

|                        |                                    |
|------------------------|------------------------------------|
| <b>Connection type</b> | Male connector, M12, 8-pin, radial |
|------------------------|------------------------------------|

<sup>1)</sup> Short-circuit opposite to another channel or GND permissible for max. 60 s. No protection signal against U<sub>S</sub>.

|  |   |
|--|---|
| <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>Reverse polarity protection</b>             | ✓   |
| <b>Short-circuit protection of the outputs</b> | ✓ <sup>1)</sup>                             |

<sup>1)</sup> Short-circuit opposite to another channel or GND permissible for max. 60 s. No protection signal against U<sub>S</sub>.

## Mechanics

|                                       |  |
|---------------------------------------|--|
| <b>Mechanical design</b>              | Solid shaft, Servo flange                                  |
| <b>Shaft diameter</b>                 | 6 mmWith flat  |
| <b>Shaft length</b>                   | 10 mm  |
| <b>Flange type / stator coupling</b>  | Flange with 3 x M3 and 3 x M4                              |
| <b>Weight</b>                         | + 0.3 kg <sup>1)</sup>                                     |
| <b>Shaft material</b>                 | Stainless steel  |
| <b>Flange material</b>                | Aluminum   |
| <b>Housing material</b>               | Aluminum   |
| <b>Start up torque</b>                | + 1.2 Ncm (+20 °C)   |
| <b>Operating torque</b>               | 1.1 Ncm (+20 °C)   |
| <b>Permissible shaft loading</b>      | 100 N (radial) <sup>2)</sup><br>50 N (axial) <sup>2)</sup> |
| <b>Operating speed</b>                | 6,000 min <sup>-1</sup> <sup>3)</sup>                      |
| <b>Maximum operating speed</b>        | 9,000 min <sup>-1</sup> <sup>4)</sup>                      |
| <b>Moment of inertia of the rotor</b> | 33 gcm <sup>2</sup>  |
| <b>Bearing lifetime</b>               | 3.6 x 10 <sup>9</sup> revolutions                          |
| <b>Angular acceleration</b>           | ≤ 500,000 rad/s <sup>2</sup>                               |

<sup>1)</sup> Based on encoder with male connector or cable with male connector.

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

<sup>3)</sup> Allow for self-heating of 3.2 K per 1,000 rpm when designing the operating temperature range.

<sup>4)</sup> 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

|                                      |  |
|--------------------------------------|--|
| <b>EMC</b>                           | According to EN 61000-6-2 and EN 61000-6-3                                   |
| <b>Enclosure rating</b>              | IP67, housing side (IEC 60529) <sup>1)</sup><br>IP65, shaft side (IEC 60529) |
| <b>Permissible relative humidity</b> | 90 % (Condensation not permitted)  |
| <b>Operating temperature range</b>   | -20 °C ... +85 °C <sup>2)</sup>  |
| <b>Storage temperature range</b>     | -40 °C ... +100 °C, without package  |
| <b>Resistance to shocks</b>          | 250 g, 3 ms (EN 60068-2-27)  |
| <b>Resistance to vibration</b>       | 30 g, 10 Hz ... 2,000 Hz (EN 60068-2-6)                                      |

<sup>1)</sup> With mating connector fitted.

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

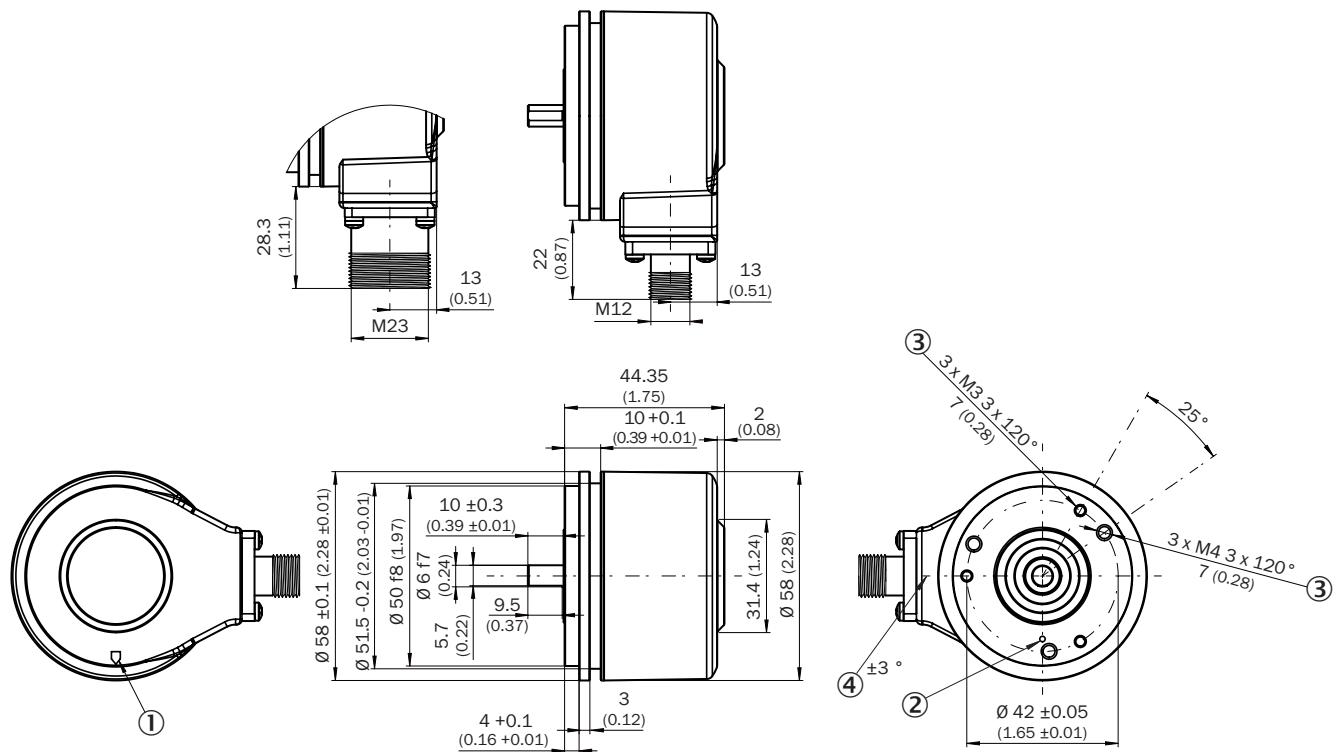
## Certificates

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

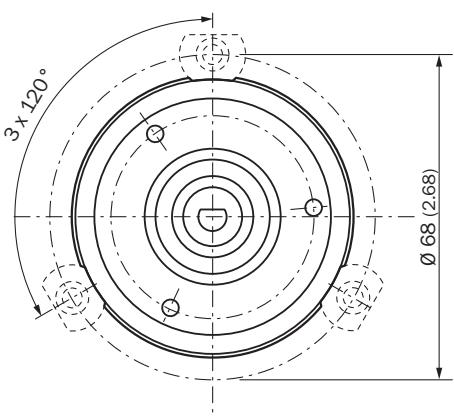
## Classifications

|                       |          |
|-----------------------|----------|
| <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

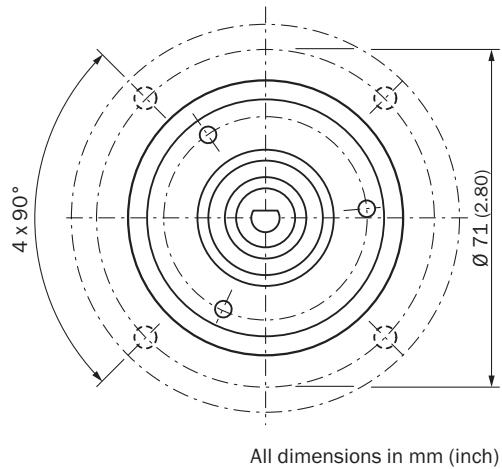


Attachment specifications Mounting requirements for small servo clamp

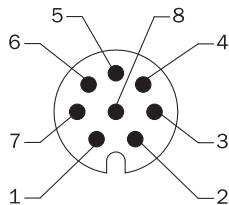


All dimensions in mm (inch)

## Attachment specifications Mounting requirements for half-shell servo clamp



## PIN assignment

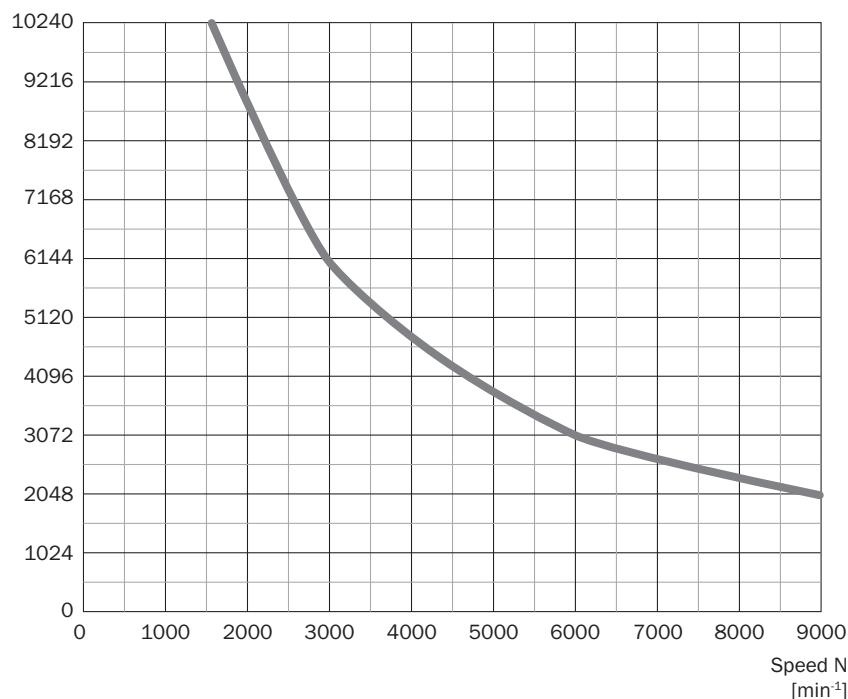


view of M12 male device connector on cable / housing

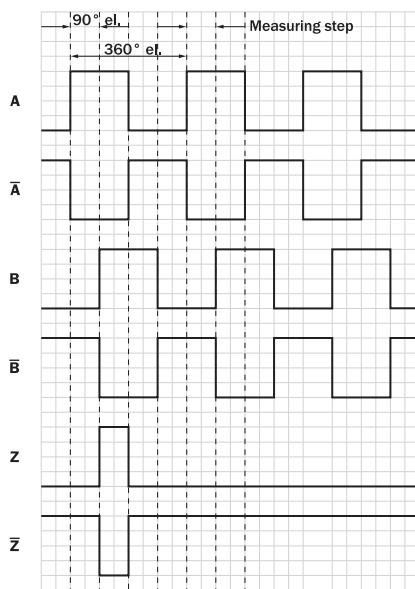
| Wire colors (cable connection) | Male connector M12, 8-pin | Male connector M23, 12-pin | TTL/HTL 6-channel signal | Explanation                         |
|--------------------------------|---------------------------|----------------------------|--------------------------|-------------------------------------|
| 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 <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                        |
| Screen                         | Screen                    | Screen                     | Screen                   | Screen connected to encoder housing |

## Diagrams

Pulses per revolution



## 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    |

| Supply voltage | Output            |
|----------------|-------------------|
| 4,5 V ... 30 V | TTL/HTL universal |
| 4,5 V ... 30 V | TTL               |

## Recommended accessories

Other models and accessories → [www.sick.com/DBS60](http://www.sick.com/DBS60)

|   | 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>Connection type head A:</b> Female connector, M12, 8-pin, straight</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Signal type:</b> Incremental, SSI</li><li><b>Cable:</b> 2 m, 8-wire, PUR, halogen-free</li><li><b>Description:</b> Incremental, shieldedSSI</li><li><b>Connection systems:</b> Flying leads</li></ul>                 | DOL-1208-G02MAC1    | 6032866  |
|  | <ul style="list-style-type: none"><li><b>Connection type head A:</b> Female connector, M12, 8-pin, straight</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Signal type:</b> Incremental, SSI</li><li><b>Cable:</b> 5 m, 8-wire, PUR, halogen-free</li><li><b>Description:</b> Incremental, shieldedSSI</li><li><b>Connection systems:</b> Flying leads</li></ul>                 | DOL-1208-G05MAC1    | 6032867  |
|  | <ul style="list-style-type: none"><li><b>Connection type head A:</b> Female connector, M12, 8-pin, straight</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Signal type:</b> Incremental, SSI</li><li><b>Cable:</b> 10 m, 8-wire, PUR, halogen-free</li><li><b>Description:</b> Incremental, shieldedSSI</li><li><b>Connection systems:</b> Flying leads</li></ul>                | DOL-1208-G10MAC1    | 6032868  |
|  | <ul style="list-style-type: none"><li><b>Connection type head A:</b> Female connector, M12, 8-pin, straight</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Signal type:</b> Incremental, SSI</li><li><b>Cable:</b> 20 m, 8-wire, PUR, halogen-free</li><li><b>Description:</b> Incremental, shieldedSSI</li><li><b>Connection systems:</b> Flying leads</li></ul>                | DOL-1208-G20MAC1    | 6032869  |
|  | <ul style="list-style-type: none"><li><b>Connection type head A:</b> Female connector, M12, 8-pin, straight</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Signal type:</b> Incremental, SSI</li><li><b>Cable:</b> 25 m, 8-wire, PUR, halogen-free</li><li><b>Description:</b> Incremental, shieldedSSI</li><li><b>Connection systems:</b> Flying leads</li></ul>                | DOL-1208-G25MAC1    | 6067859  |
|  | <ul style="list-style-type: none"><li><b>Connection type head A:</b> Female connector, M12, 8-pin, straight, A-coded</li><li><b>Signal type:</b> Incremental, SSI</li><li><b>Cable:</b> CAT5, CAT5e</li><li><b>Description:</b> Incremental, shieldedSSI</li><li><b>Connection systems:</b> IDC quick connection</li><li><b>Permitted cross-section:</b> 0.14 mm² ... 0.34 mm²</li></ul>         | DOS-1208-GA01       | 6045001  |
|  | <ul style="list-style-type: none"><li><b>Connection type head A:</b> Female connector, M12, 8-pin, straight, A-coded</li><li><b>Connection type head B:</b> Male connector, M12, 8-pin, straight, A-coded</li><li><b>Cable:</b> 20 m, 8-wire, PUR, halogen-free</li><li><b>Description:</b> Shielded</li></ul>   | YF2AA8-200S01M-KA18 | 2099208  |

|   | <b>Brief description</b>  | <b>Type</b>         | <b>part no.</b> |
|---|---|---------------------|-----------------|
|    | <ul style="list-style-type: none"> <li><b>Permitted cross-section:</b> ≤ 0.25 mm<sup>2</sup></li> <li><b>Note:</b> Drag chain use</li> <li><b>Application:</b> Drag chain operation</li> </ul>  |                     |                 |
|    | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, straight, A-coded</li> <li><b>Connection type head B:</b> Male connector, M12, 8-pin, straight, A-coded</li> <li><b>Cable:</b> 2 m, 8-wire, PUR, halogen-free</li> <li><b>Description:</b> Shielded</li> <li><b>Permitted cross-section:</b> ≤ 0.25 mm<sup>2</sup></li> <li><b>Note:</b> Drag chain use</li> <li><b>Application:</b> Drag chain operation</li> </ul>  | YF2AA8-020S01M-KA18 | 2099207         |
|    | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, straight, A-coded</li> <li><b>Connection type head B:</b> Male connector, M12, 8-pin, straight, A-coded</li> <li><b>Cable:</b> 5 m, 8-wire, PUR, halogen-free</li> <li><b>Description:</b> Shielded</li> <li><b>Permitted cross-section:</b> ≤ 0.25 mm<sup>2</sup></li> <li><b>Note:</b> Drag chain use</li> <li><b>Application:</b> Drag chain operation</li> </ul>  | YF2AA8-050S01M-KA18 | 2099209         |
|    | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, straight, A-coded</li> <li><b>Connection type head B:</b> Male connector, M12, 8-pin, straight, A-coded</li> <li><b>Cable:</b> 10 m, 8-wire, PUR, halogen-free</li> <li><b>Description:</b> Shielded</li> <li><b>Permitted cross-section:</b> ≤ 0.25 mm<sup>2</sup></li> <li><b>Note:</b> Drag chain use</li> <li><b>Application:</b> Drag chain operation</li> </ul> | YF2AA8-100S01M-KA18 | 2099210         |
|    | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, angled</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> HIPERFACE<sup>®</sup>, Incremental</li> <li><b>Cable:</b> 2 m, 8-wire, PUR, halogen-free</li> <li><b>Description:</b> HIPERFACE<sup>®</sup>, shieldedIncremental</li> </ul>  | DOL-1208-W02MAC1    | 6037724         |
|   | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, angled</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> HIPERFACE<sup>®</sup>, Incremental</li> <li><b>Cable:</b> 5 m, 8-wire, PUR, halogen-free</li> <li><b>Description:</b> HIPERFACE<sup>®</sup>, shieldedIncremental</li> </ul>  | DOL-1208-W05MAC1    | 6037725         |
|  | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, angled</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> HIPERFACE<sup>®</sup>, Incremental</li> <li><b>Cable:</b> 10 m, 8-wire, PUR, halogen-free</li> <li><b>Description:</b> HIPERFACE<sup>®</sup>, shieldedIncremental</li> </ul>   | DOL-1208-W10MAC1    | 6037726         |
|  | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, angled</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> HIPERFACE<sup>®</sup>, Incremental</li> <li><b>Cable:</b> 20 m, 8-wire, PUR</li> <li><b>Description:</b> HIPERFACE<sup>®</sup>, shieldedIncremental</li> </ul>   | DOL-1208-W20MAC1    | 6037727         |
|  | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, angled</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Cable:</b> 2 m, 8-wire, PVC</li> <li><b>Description:</b> Shielded</li> <li><b>Connection systems:</b> Flying leads</li> </ul>   | DOL-1208-W02MA      | 6020992         |
|  | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, angled</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Signal type:</b> Sensor/actuator cable</li> <li><b>Cable:</b> 2 m, 8-wire, PUR, halogen-free</li> <li><b>Description:</b> Sensor/actuator cable, shielded</li> <li><b>Connection systems:</b> Flying leads</li> </ul>   | DOL-1208-W02MAS01   | 6029224         |
|  | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, angled</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Cable:</b> 2 m, 8-wire, PUR, halogen-free</li> <li><b>Description:</b> Unshielded</li> </ul>  | DOL-1208-W02MC      | 6035623         |
|  | <ul style="list-style-type: none"> <li><b>Connection type head A:</b> Female connector, M12, 8-pin, angled</li> <li><b>Connection type head B:</b> Flying leads</li> <li><b>Cable:</b> 5 m, 8-wire, PVC</li> <li><b>Description:</b> Shielded</li> </ul>  | DOL-1208-W05MA      | 6021033         |

|   | <b>Brief description</b>  | <b>Type</b>    | <b>part no.</b> |
|---|---|----------------|-----------------|
|  | <ul style="list-style-type: none"><li><b>Connection systems:</b> Flying leads</li><li><b>Connection type head A:</b> Female connector, M12, 8-pin, angled</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Cable:</b> 5 m, 8-wire, PUR</li><li><b>Description:</b> Unshielded</li></ul> | DOL-1208-W05MC | 6035624         |
|  | <ul style="list-style-type: none"><li><b>Connection type head A:</b> Female connector, M12, 8-pin, angled</li><li><b>Connection type head B:</b> Flying leads</li><li><b>Cable:</b> 10 m, 8-wire, PUR, halogen-free</li><li><b>Description:</b> Unshielded</li></ul>                                  | DOL-1208-W10MC | 6035625         |

## Mounting systems

|   |  |               |         |
|---|--|---------------|---------|
|    | <ul style="list-style-type: none"><li><b>Description:</b> Bearing block for servo and face mount flange encoder. The heavy-duty bearing block is used to absorb very large radial and axial shaft loads. Particularly when using belt pulleys, chain sprockets, friction wheels. Operating speed max. 4,000 rpm^-1, axial shaft load 150 N, radial shaft load 250 N, bearing service life <math>3.6 \times 10^9</math> revolutions</li></ul>   | BEF-FA-LB1210 | 2044591 |
|   | <ul style="list-style-type: none"><li><b>Description:</b> Mounting kit for servo flange encoder on the bearing block, 1 bar coupling SKPS 1520 06/06 1 hexagon socket wrench SW1.5 DIN 911, 3 mounting eccentric BEMN 1242 49 3 screws M4 x 10 DIN 912, 1 hexagon socket wrench SW3 DIN 911</li><li><b>Items supplied:</b> 1 bar coupling SKPS 1520 06/06 1 hexagon socket wrench SW1.5 DIN 911, 3 mounting eccentric BEMN 1242 49 3 screws M4 x 10 DIN 912, 1 hexagon socket wrench SW3 DIN 911</li></ul> | BEF-MK-LB     | 5320872 |
|   | <ul style="list-style-type: none"><li><b>Description:</b> Mounting bell for encoder with servo flange, 50 mm spigot</li><li><b>Items supplied:</b> Mounting kit included</li></ul>   | BEF-MG-50     | 5312987 |
|  | <ul style="list-style-type: none"><li><b>Description:</b> Half-shell servo clamps (2 pcs.) for servo flanges with a 50 mm centering hub</li></ul>  | BEF-WG-SF050  | 2029165 |
|  | <ul style="list-style-type: none"><li><b>Description:</b> Servo clamps, large, for servo flange (clamps, eccentric fastener), 3 pcs, without mounting material</li><li><b>Items supplied:</b> Without mounting hardware</li></ul>  | BEF-WK-SF     | 2029166 |

|   | <b>Brief description</b>   | <b>Type</b> | <b>part no.</b> |
|---|--|-------------|-----------------|
| shaft adaptation  |  |             |                 |
|    | <ul style="list-style-type: none"> <li><b>Product segment:</b> Shaft adaptation</li> <li><b>Product:</b> Shaft couplings</li> <li><b>Description:</b> Bellows coupling, shaft diameter 6 mm / 10 mm, maximum shaft offset: radial <math>\pm</math> 0.25 mm, axial <math>\pm</math> 0.4 mm, angular <math>+</math>/<math>-</math> 4°; max. speed 10,000 rpm, <math>-30</math> °C to <math>+120</math> °C, max. torque 120 Ncm; material: stainless steel bellows, aluminum hub</li> </ul>   | KUP-0610-B  | 5312982         |
|    | <ul style="list-style-type: none"> <li><b>Product segment:</b> Shaft adaptation</li> <li><b>Product:</b> Shaft couplings</li> <li><b>Description:</b> Spring washer coupling, shaft diameter 6 mm / 10 mm, Maximum shaft offset: radial <math>+</math>/<math>-</math> 0.3 mm, axial <math>+</math>/<math>-</math> 0.4 mm, angular <math>+</math>/<math>-</math> 2.5°; max. speed 12,000 rpm, <math>-10</math> ° to <math>+80</math> °C, max. torque 60 Ncm; material: aluminum flange, glass fiber-reinforced polyamide membrane and hardened steel coupling pin</li> </ul>            | KUP-0610-F  | 5312985         |
|    | <ul style="list-style-type: none"> <li><b>Product segment:</b> Shaft adaptation</li> <li><b>Product:</b> Shaft couplings</li> <li><b>Description:</b> Double loop coupling, shaft diameter 6 mm / 10 mm, max. shaft offset: radially <math>+</math>/<math>-</math> 2.5 mm, axially <math>+</math>/<math>-</math> 3 mm, angle <math>+</math>/<math>-</math> 10 degrees; max. speed 3.000 rpm, <math>-30</math> to <math>+80</math> degrees Celsius, torsional spring stiffness of 25 Nm/rad</li> </ul>  | KUP-0610-D  | 5326697         |
|    | <ul style="list-style-type: none"> <li><b>Product segment:</b> Shaft adaptation</li> <li><b>Product:</b> Shaft couplings</li> <li><b>Description:</b> Bar coupling, shaft diameter 6 mm / 10 mm, max. shaft offset: radial <math>\pm</math> 0.3 mm, axial <math>\pm</math> 0.3 mm, angular <math>\pm</math> 3°; max. speed 10.000 rpm, <math>-10</math> ° to <math>+80</math> °C, max. torque: 80 Ncm, material: fiber-glass reinforced polyamide, aluminum hub</li> </ul>   | KUP-0610-S  | 2056407         |
|    | <ul style="list-style-type: none"> <li><b>Product segment:</b> Shaft adaptation</li> <li><b>Product:</b> Shaft couplings</li> <li><b>Description:</b> Claw coupling, shaft diameter 6 mm / 10 mm, damping element 80 shore blue, maximum shaft offset: radial <math>\pm</math> 0.22 mm, axial <math>\pm</math> 1 mm angular <math>\pm</math> 1.3°, max. speed 19,000 rpm, angle of twist max. 10°, <math>-30</math> °C to <math>+80</math> °C, max. torque 800 Ncm, tightening torque of screws: ISO 4029 150 Ncm, material: aluminum flange, damping element: polyurethane</li> </ul> | KUP-0610-J  | 2127056         |
|   | <ul style="list-style-type: none"> <li><b>Product segment:</b> Shaft adaptation</li> <li><b>Product:</b> Shaft couplings</li> <li><b>Description:</b> Bar coupling, shaft diameter 6 mm / 8 mm, maximum shaft offset radial <math>\pm</math> 0.3 mm, axial <math>\pm</math> 0.2 mm, angle <math>\pm</math> 3°, max. speed 10,000 rpm, torsion spring rigidity 38 Nm/wheel; material: fiber-glass reinforced polyamide, aluminum hub</li> </ul>   | KUP-0608-S  | 5314179         |
|  | <ul style="list-style-type: none"> <li><b>Product segment:</b> Shaft adaptation</li> <li><b>Product:</b> Shaft couplings</li> <li><b>Description:</b> Cross-slotted coupling, shaft diameter 6 mm / 6 mm, maximum shaft offset: radial <math>\pm</math> 0.3 mm, axial <math>\pm</math> 0.2 mm, angle <math>\pm</math> 3°; max. speed 10,000 rpm, <math>-10</math> ° to <math>+80</math> °C, max. torque 80 Ncm; material: fiber-glass reinforced polyamide, aluminum hub</li> </ul>  | KUP-0606-S  | 2056406         |
|  | <ul style="list-style-type: none"> <li><b>Product segment:</b> Shaft adaptation</li> <li><b>Product:</b> Shaft couplings</li> <li><b>Description:</b> Bellows coupling, shaft diameter 6 mm / 6 mm, maximum shaft offset: radial <math>\pm</math> 0.25 mm, axial <math>\pm</math> 0.4 mm, angular <math>+</math>/<math>-</math> 4°; max. speed 10,000 rpm, <math>-30</math> °C to <math>+120</math> °C, max. torque 120 Ncm; material: stainless steel bellows, aluminum hub</li> </ul>  | KUP-0606-B  | 5312981         |

|  | <b>Brief description</b>  | <b>Type</b>    | <b>part no.</b> |
|--|---|----------------|-----------------|
| measuring wheels and measuring wheel mechanics |   |                |                 |
|  | <ul style="list-style-type: none"><li>• <b>Product segment:</b> Measuring wheels and measuring wheel mechanics</li><li>• <b>Product family:</b> Measuring wheel mechanics</li><li>• <b>Description:</b> O-ring for measuring wheels (circumference 200 mm)</li></ul>  | BEF-OR-053-040 | 2064061         |
|  | <ul style="list-style-type: none"><li>• <b>Product segment:</b> Measuring wheels and measuring wheel mechanics</li><li>• <b>Product family:</b> Measuring wheel mechanics</li><li>• <b>Description:</b> O-ring for measuring wheels (circumference 300 mm)</li><li>• <b>Items supplied:</b> 2x O-ring</li></ul> | BEF-OR-083-050 | 2064076         |
|  | <ul style="list-style-type: none"><li>• <b>Product segment:</b> Measuring wheels and measuring wheel mechanics</li><li>• <b>Product family:</b> Measuring wheel mechanics</li></ul>   | BEF-OR-145-050 | 2064074         |

|   | <b>Brief description</b>   | <b>Type</b>    | <b>part no.</b> |
|---|--|----------------|-----------------|
|    | <ul style="list-style-type: none"> <li><b>Description:</b> O-ring for measuring wheels (circumference 500 mm)</li> <li><b>Product segment:</b> Measuring wheels and measuring wheel mechanics</li> <li><b>Product family:</b> Measuring wheels</li> <li><b>Description:</b> Aluminum measuring wheel with studded polyurethane surface for 6 mm solid shaft, circumference 200 mm</li> </ul> | BEF-MR06200APN | 4084747         |
|    | <ul style="list-style-type: none"> <li><b>Product segment:</b> Measuring wheels and measuring wheel mechanics</li> <li><b>Product family:</b> Measuring wheels</li> <li><b>Description:</b> Aluminum measuring wheel with smooth polyurethane surface for 6 mm solid shaft, circumference 200 mm</li> </ul>  | BEF-MR06200AP  | 4084746         |
|    | <ul style="list-style-type: none"> <li><b>Product segment:</b> Measuring wheels and measuring wheel mechanics</li> <li><b>Product family:</b> Measuring wheels</li> <li><b>Description:</b> Aluminum measuring wheel with cross-knurled surface for 6 mm solid shaft, circumference 200 mm</li> </ul>  | BEF-MR06200AK  | 4084745         |
|   | <ul style="list-style-type: none"> <li><b>Product segment:</b> Measuring wheels and measuring wheel mechanics</li> <li><b>Product family:</b> Measuring wheels</li> <li><b>Description:</b> Aluminum measuring wheel with ridged polyurethane surface for 6 mm solid shaft, circumference 200 mm</li> </ul>  | BEF-MR06200APG | 4084748         |
|  | <ul style="list-style-type: none"> <li><b>Product segment:</b> Measuring wheels and measuring wheel mechanics</li> <li><b>Product family:</b> Measuring wheels</li> <li><b>Description:</b> Aluminium measuring wheel with O-ring (NBR70) for 6 mm solid shaft, circumference 200 mm</li> </ul>  | BEF-MR006020R  | 2055222         |
|  | <ul style="list-style-type: none"> <li><b>Product segment:</b> Measuring wheels and measuring wheel mechanics</li> <li><b>Product family:</b> Measuring wheels</li> <li><b>Description:</b> Measuring wheel with O-ring (NBR70) for 6 mm solid shaft, circumference 300 mm</li> </ul>  | BEF-MR006030R  | 2055634         |
|  | <ul style="list-style-type: none"> <li><b>Product segment:</b> Measuring wheels and measuring wheel mechanics</li> <li><b>Product family:</b> Measuring wheels</li> <li><b>Description:</b> Aluminium measuring wheel with O-ring (NBR70) for 6 mm solid shaft, circumference 500 mm</li> </ul>  | BEF-MR006050R  | 2055225         |

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