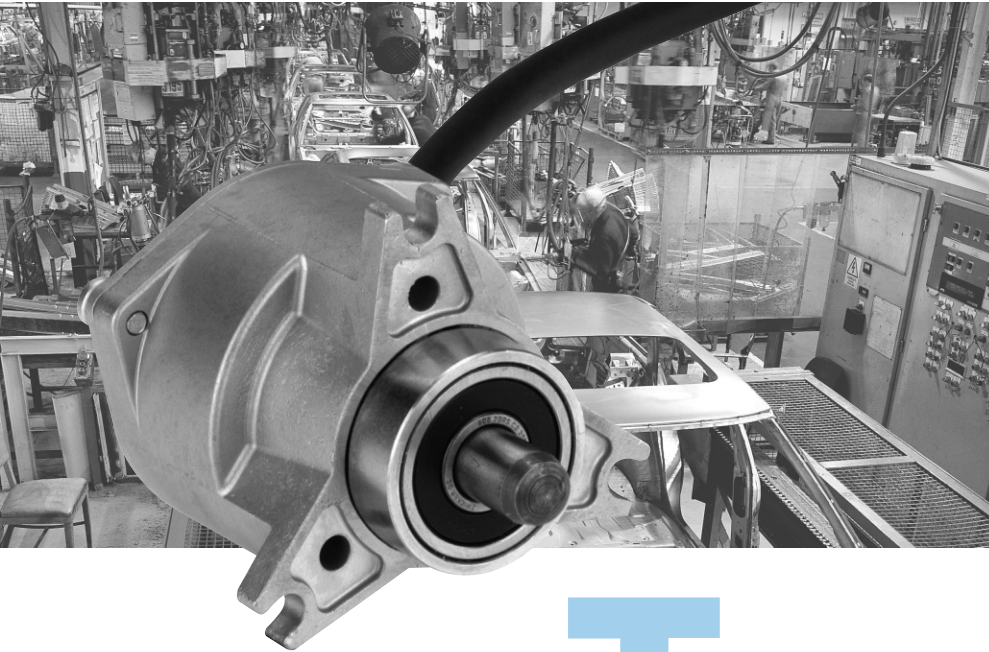


DKS 40: Incremental Encoder



Number of lines
1 to 2,048
Incremental Encoder

The DKS 40 Incremental Encoder offers exceptional quality for its price and its range of application. Its housing is a solid zinc die-casting and is extremely compact in its design, having an external diameter of only 50 mm. As a consequence, valuable space can be spared when installed.

By adopting highly successful Mini-Disc technology, the DKS 40 is extremely robust and can resist high levels of shock and vibration. Besides has the DKS 40 a very high protection class IP 64.

Specify your individual 50 mm dia. Encoder.


Options available:

- Interfaces Open Collector NPN, TTL/RS 422, HTL/push-pull.
- Face mount flange with solid shaft $\varnothing 8 \times 13$ mm,
- Output cable 0.5 m can be used radially or axially

Thanks to product flexibility there are numerous applications, for example in:

- machine tools
- textile machines
- wood processing machines
- packaging machines

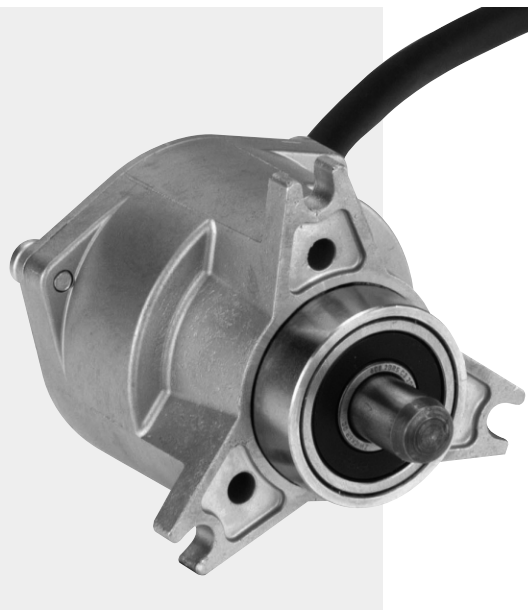
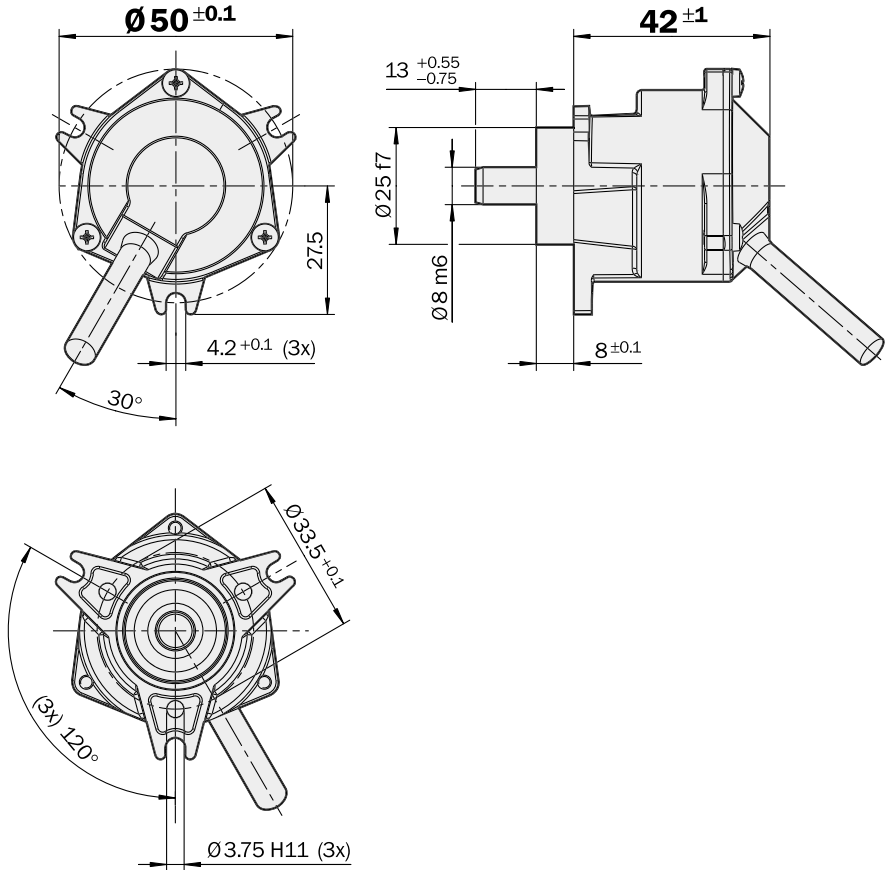
SICK | STEGMANN

 **Number of lines**
1 to 2,048

Incremental Encoder

- Cable outlet
- Enclosure rating IP 64
- Electrical Interfaces
Open Collector NPN,
TTL,
HTL

Dimensional drawing face mount flange



General tolerances according to DIN ISO 2768-mk

Wire allocation/cable 8 core

| Colour of wires | Signal for OC | Signal for TTL and HTL | Explanation |
|-----------------|-----------------|------------------------|--------------------------------------|
| Red | +U _s | +U _s | Supply voltage ¹⁾ |
| Blue | GND | GND | Zero volt connection for the encoder |
| White | A | A | Signal line |
| Pink | B | B | Signal line |
| Lilac | Z | Z | Signal line |
| Brown | N. C. | \bar{A} | Signal line |
| Black | N. C. | \bar{B} | Signal line |
| Yellow | N. C. | \bar{Z} | Signal line |
| Screen | Screen | Screen | Screen |

¹⁾ Potential free to housing

N. C. = Not Connected



Accessories

| |
|--------------------|
| Connection systems |
| Mounting systems |

| Technical data | | DKS 40 | DKS | | | | | | | | | | |
|--|----------------|--|-----|--|--|--|--|--|--|--|--|--|--|
| Number of lines (Z) per revolution | | 1 to 2,048 | | | | | | | | | | | |
| Electrical Interfaces | | 4.5 ... 5.5 V, Open Coll. NPN, 3-channel | | | | | | | | | | | |
| | | 10 ... 30 V, Open Coll. NPN, 3-channel | | | | | | | | | | | |
| | | 4.5 ... 5.5 V, TTL/RS422, 6-channel | | | | | | | | | | | |
| | | 10 ... 30 V, HTL, 6-channel | | | | | | | | | | | |
| Mass | | 0.18 Kg | | | | | | | | | | | |
| Moment of inertia of the rotor | | 6 gcm ² | | | | | | | | | | | |
| Measuring step | | 90°/number of lines | | | | | | | | | | | |
| Reference signal | Number | 1 | | | | | | | | | | | |
| | Position | 90° electr., logic. interlocked with A+B | | | | | | | | | | | |
| Error limits | | | | | | | | | | | | | |
| "binary" number of lines ¹⁾ | | ± 0.09 degree | | | | | | | | | | | |
| "non-binary" number of lines ²⁾ | | ± 0.13 degree | | | | | | | | | | | |
| Measuring step deviation | | | | | | | | | | | | | |
| binary number of lines | | ± 0.03 degree | | | | | | | | | | | |
| non-binary number of lines | | ± 0.07 degree | | | | | | | | | | | |
| Max. output frequency | Open Collector | 50 KHz | | | | | | | | | | | |
| | TTL/RS422 | 200 KHz | | | | | | | | | | | |
| | HTL/push-pull | 200 KHz | | | | | | | | | | | |
| Operating speed | | 6,000 min ⁻¹ | | | | | | | | | | | |
| Angular acceleration | | 3.6 x 10 ⁹ rad/s ² | | | | | | | | | | | |
| Operating torque | | 0.15 Ncm | | | | | | | | | | | |
| Start up torque | | 0.2 Ncm | | | | | | | | | | | |
| Permissible shaft loading | | | | | | | | | | | | | |
| radial | | 40 N | | | | | | | | | | | |
| axial | | 20 N | | | | | | | | | | | |
| Bearing lifetime | | 2 x 10 ⁹ revolutions | | | | | | | | | | | |
| Working temperature range | | 0 ... + 60 °C | | | | | | | | | | | |
| Storage temperature range | | - 40 ... + 70 °C | | | | | | | | | | | |
| Permissible relative humidity ³⁾ | | 90 % | | | | | | | | | | | |
| EMC ⁴⁾ | | | | | | | | | | | | | |
| Resistance | | | | | | | | | | | | | |
| to shocks ⁵⁾ | | 50/7 g/ms | | | | | | | | | | | |
| to vibration ⁶⁾ | | 20/10 ... 2000 g/Hz | | | | | | | | | | | |
| Protection class acc. IEC 60529 | | IP 64 | | | | | | | | | | | |
| Operating voltage range | | 30 mA | | | | | | | | | | | |
| Operating current range at no load | | 40 mA | | | | | | | | | | | |
| Initialisation time after power on | | 40 ms | | | | | | | | | | | |

¹⁾ „Binary“ number of lines
n is integer


²⁾ „Non binary“ number of lines
n is no integer

³⁾ Condensation of optical scanning
system not permitted

⁴⁾ To DIN EN 61000-6-2 and
DIN EN 61000-6-3

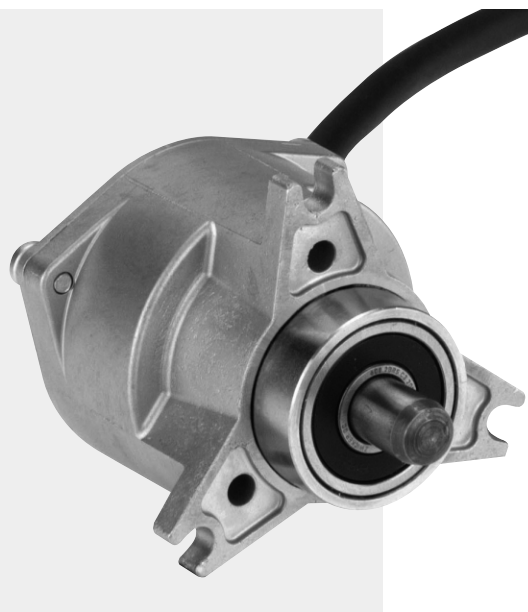
⁵⁾ To DIN EN 60068-2-27

⁶⁾ To DIN EN 60068-2-6

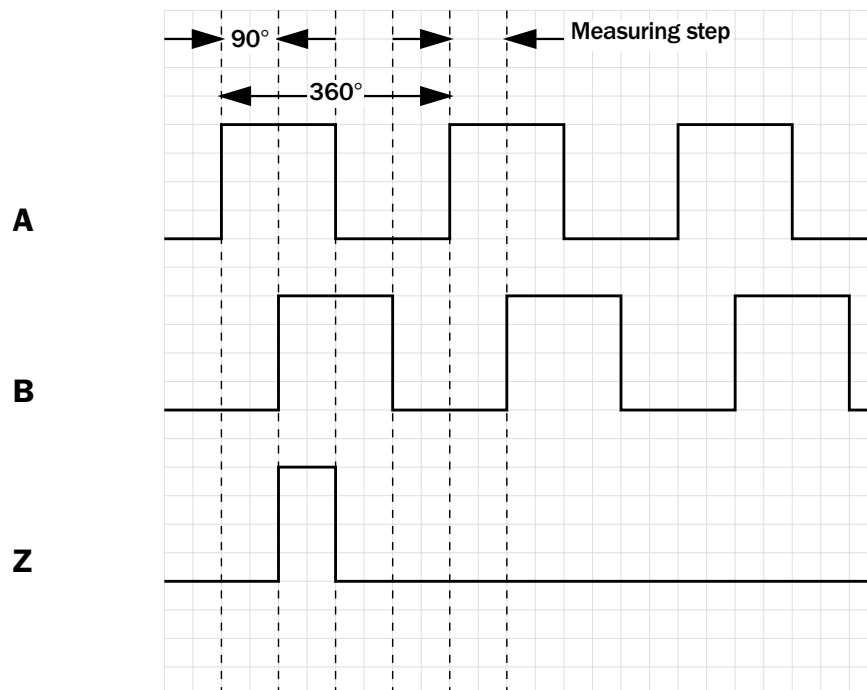
 **Number of lines**
1 to 2,048

Incremental Encoder

- Cable outlet
- Enclosure rating IP 64
- Electrical Interfaces
Open Collector NPN,
TTL,
HTL



Incremental pulse diagram



CW rotation when looking at the encoder shaft

\bar{A} , \bar{B} , \bar{Z} inverted signals to A, B, Z

Electrical interfaces

| | | | | |
|--------------------|----------------|----------------|---------------|---------------|
| Supply voltage | 4.5 ... 5.5 V | 10 ... 30 V | 4.5 ... 5.5 V | 10 ... 30 V |
| Interfaces/drivers | Open Coll. NPN | Open Coll. NPN | TTL/RS422 | HTL/push-pull |



Accessories

Connection systems

Mounting systems

Order information

Incremental Encoder DKS 40, solid shaft

| | | | | | | | | | | | | | |
|----------|----------|----------|----------|----------|----------|---------|----------|----------|----------|----------|----------|----------|----------|
| Point 1 | Point 2 | Point 3 | Point 4 | Point 5 | Point 6 | Point 7 | Point 8 | Point 9 | Point 10 | Point 11 | Point 12 | Point 13 | Point 14 |
| D | K | S | 4 | 0 | - | | 5 | J | | | | | |

| | | | |
|--|--|--|--|
| Electrical interface | Mechanical interface | Connection type | Number of lines |
| 4.5 ... 5.5 V, Open Collector NPN, 3-channel = P | Face mount flange, Solid shaft Ø 8 x 13 mm = 5 | Cable 8 core, universal 0,5 m ¹⁾ = J | Always 5 characters in clear text 1 with leading zeros |
| 10 ... 30 V, Open Collector NPN, 3-channel = R | | | |
| 4.5 ... 5.5 V, TTL/RS422, 6-channel = A | | | |
| 10 ... 30 V, HTL/push-pull, 6-channel = E | | | |

¹⁾ The universal cable output is positioned so that a kink-free cable run is possible in radial or axial direction.

1 Number of lines (Z) per revolution

| | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------------------|
| 00010 | 00050 | 00200 | 00256 | 00500 | 00720 | 01024 | 02048 |
| 00020 | 00100 | 00250 | 00360 | 00512 | 01000 | 02000 | others on request |

Order example: Incremental Encoder DKS 40

4.5 ... 5.5 Volt, TTL; face mount flange, cable 8 core, number of lines: 360

| | | | | | | | | | | | | | |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Point 1 | Point 2 | Point 3 | Point 4 | Point 5 | Point 6 | Point 7 | Point 8 | Point 9 | Point 10 | Point 11 | Point 12 | Point 13 | Point 14 |
| D | K | S | 4 | 0 | - | A | 5 | J | 0 | 0 | 3 | 6 | 0 |

Please enter your individual encoder here

| | | | | | | | | | | | | | |
|----------|----------|----------|----------|----------|----------|---------|----------|----------|----------|----------|----------|----------|----------|
| Point 1 | Point 2 | Point 3 | Point 4 | Point 5 | Point 6 | Point 7 | Point 8 | Point 9 | Point 10 | Point 11 | Point 12 | Point 13 | Point 14 |
| D | K | S | 4 | 0 | - | | 5 | J | | | | | |

| | | | | | | | | | | | | | |
|----------|----------|----------|----------|----------|----------|---------|----------|----------|----------|----------|----------|----------|----------|
| Point 1 | Point 2 | Point 3 | Point 4 | Point 5 | Point 6 | Point 7 | Point 8 | Point 9 | Point 10 | Point 11 | Point 12 | Point 13 | Point 14 |
| D | K | S | 4 | 0 | - | | 5 | J | | | | | |

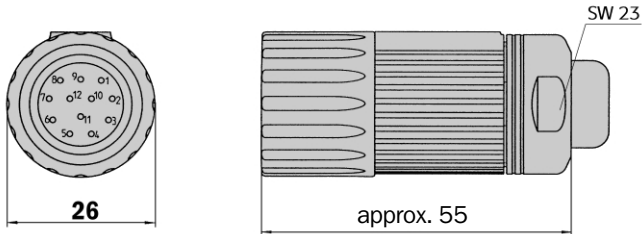
| | | | | | | | | | | | | | |
|----------|----------|----------|----------|----------|----------|---------|----------|----------|----------|----------|----------|----------|----------|
| Point 1 | Point 2 | Point 3 | Point 4 | Point 5 | Point 6 | Point 7 | Point 8 | Point 9 | Point 10 | Point 11 | Point 12 | Point 13 | Point 14 |
| D | K | S | 4 | 0 | - | | 5 | J | | | | | |

Dimensional drawings and order information

Screw-in system M23, 12 pin

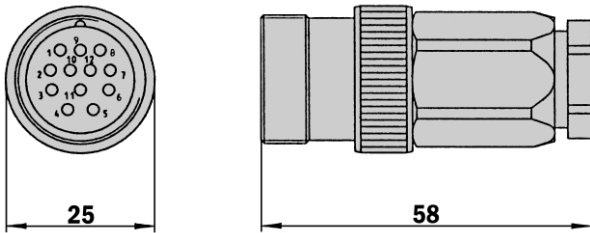
Cable connector M23 female, 12 pin, straight, screened

| Type | Part no. | Contacts |
|------------|-----------|----------|
| DOS-2312-G | 6 027 538 | 12 |



Cable connector M23 male, 12 pin, straight, screened

| Type | Part no. | Contacts |
|------------|-----------|----------|
| STE-2312-G | 6 027 537 | 12 |



Pre-wired cables

Connector M23 female, 12 pin, straight, cable 11 core, 4 x 2 x 0,25 + 2 x 0,5 + 1 x 0,14 mm² with screening

cable diameter 7.8 mm

| Type | Part no. | Contacts | Cable length |
|------------------|-----------|----------|--------------|
| DOL-2312-G02MLA3 | 2 030 682 | 12 | 2.0 m |
| DOL-2312-G07MLA3 | 2 030 685 | 12 | 7.0 m |
| DOL-2312-G10MLA3 | 2 030 688 | 12 | 10.0 m |
| DOL-2312-G15MLA3 | 2 030 692 | 12 | 15.0 m |
| DOL-2312-G20MLA3 | 2 030 695 | 12 | 20.0 m |
| DOL-2312-G25MLA3 | 2 030 699 | 12 | 25.0 m |
| DOL-2312-G30MLA3 | 2 030 702 | 12 | 30.0 m |

Connector M23 female, 12 pin, straight, cable 12 core, 4 x 2 x 0.25 + 2 x 0.5 + 2 x 0.14 mm² with screening, capable of being dragged,

cable diameter 7.8 mm

| Type | Part no. | Contacts | Cable length |
|------------------|-----------|----------|--------------|
| DOL-2312-G1M5MA3 | 2 029 212 | 12 | 1.5 m |
| DOL-2312-G03MMA3 | 2 029 213 | 12 | 3.0 m |
| DOL-2312-G05MMA3 | 2 029 214 | 12 | 5.0 m |
| DOL-2312-G10MMA3 | 2 029 215 | 12 | 10.0 m |
| DOL-2312-G20MMA3 | 2 029 216 | 12 | 20.0 m |
| DOL-2312-G30MMA3 | 2 029 217 | 12 | 30.0 m |

Dimensional drawings and order information

Cable 8 core, per meter, 4 x 2 x 0,15 mm² with screening,

cable diameter 5.6 mm

| Type | Part no. | Cores |
|----------------|-----------|-------|
| LTG-2308-MWENC | 6 027 529 | 8 |

Cable 11 core, per meter, 4 x 2 x 0,25 + 2 x 0,5 + 1 x 0,14 mm² with screening,

cable diameter 7.5 mm

| Type | Part no. | Cores |
|-------------|-----------|-------|
| LTG-2411-MW | 6 027 530 | 11 |

Cable 12 core, per meter, 4 x 2 x 0,25 + 2 x 0,5 + 2 x 0,14 mm² with screening, capable of being dragged,

cable diameter 7.8 mm

| Type | Part no. | Cores |
|-------------|-----------|-------|
| LTG-2512-MW | 6 027 531 | 12 |

Cable 12 core, per meter, 4 x 2 x 0,25 + 2 x 0,5 + 2 x 0,14 mm² with screening, capable of being dragged, UV + saltwater resistant

cable diameter 7.8 mm

| Type | Part no. | Cores |
|-------------|-----------|-------|
| LTG-2612-MW | 6 028 516 | 12 |

Shaft couplings

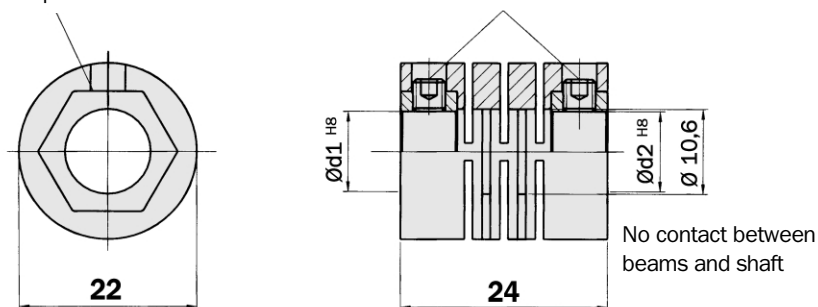
Beam coupling max. shaft displacement radially $\pm 0,3$ mm, axially $\pm 0,2$ mm, angular ± 3 degrees, torsional rigidity 38 Nm/rad,

body: fibre glass reinforced polyamide, hubs made of brass

| Type | Part no. | Type shaft diameter |
|------------|-----------|---------------------|
| KUP-0608-S | 5 314 179 | 6 mm ... 8 mm |
| KUP-0808-S | 5 314 177 | 8 mm ... 8 mm |
| KUP-0810-S | 5 314 178 | 8 mm ... 10 mm |

Shaft clamped around its circumference

Cheese-head screw M 4 x 4 DIN916

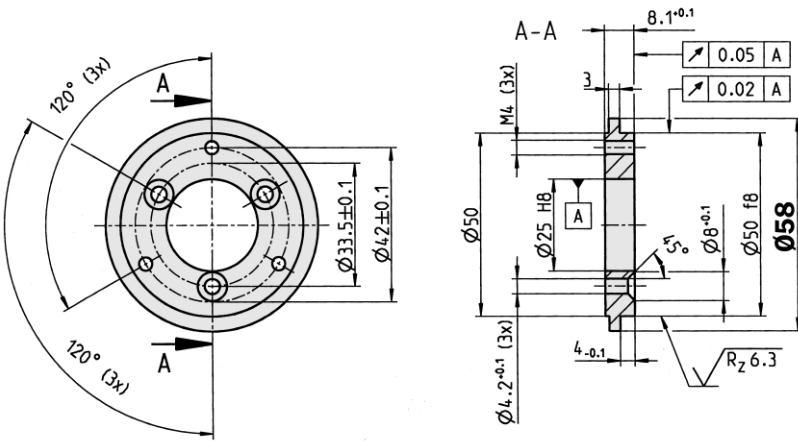


Dimensional drawings and order information

Mechanical Adaptors

Adaptor flange of aluminium for face mount flange, spigot 25 mm

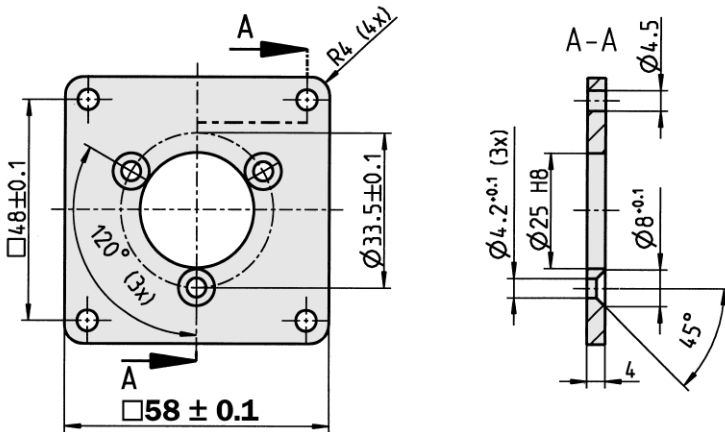
| Type | Part no. | Adaption |
|----------------|-----------|-----------------------|
| BEF-FA-025-050 | 2 032 622 | To 50 mm servo flange |



General tolerances according to DIN ISO 2768-mk

Adaptor flange of aluminium for face mount flange, spigot 25 mm

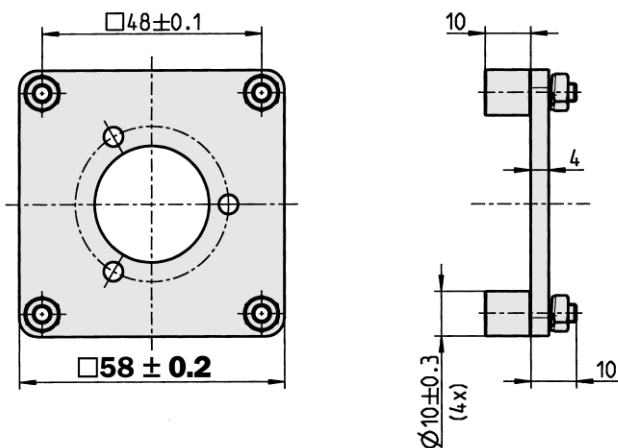
| Type | Part no. | Adaption |
|-------------------|-----------|--------------------------------|
| BEF-FA-025-060RCA | 2 032 623 | To 60 mm square mounting plate |



General tolerances according to DIN ISO 2768-mk

Adaptor flange of aluminium for face mount flange, spigot 25 mm

| Type | Part no. | Adaption |
|-------------------|-----------|---|
| BEF-FA-025-060RSA | 2 032 624 | To 60 mm square mounting plate with shock absorbers |



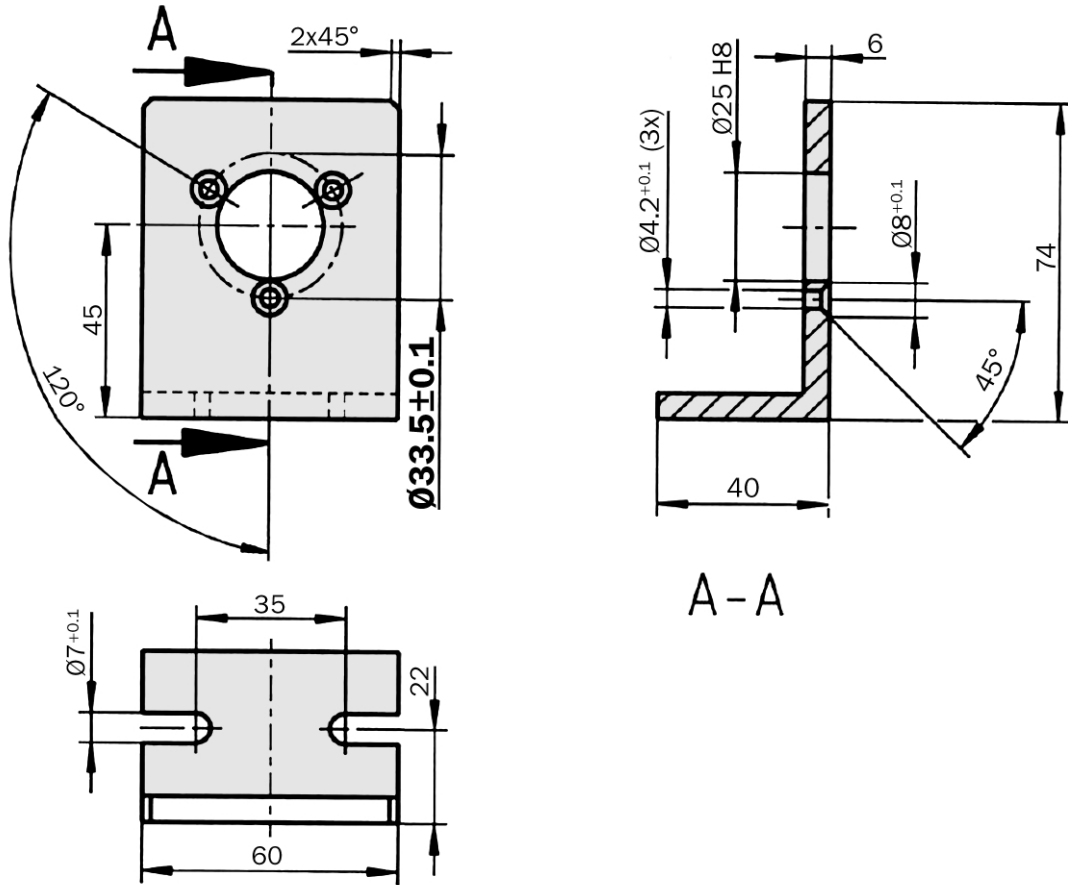
General tolerances according to DIN ISO 2768-mk

Dimensional drawings and order information

Mechanical Adaptors

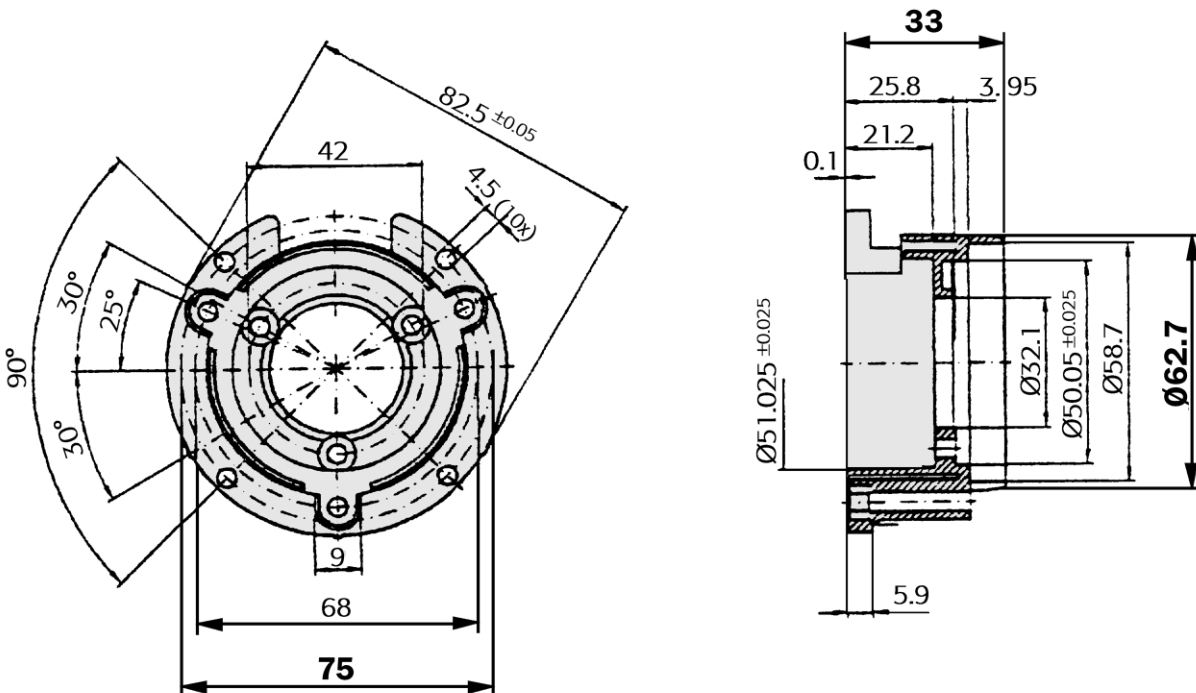
Mounting angle incl. fixing set for encoder with face mount flange

| Type | Part no. | Flange spigot |
|-----------|-----------|----------------|
| BEF-WF-25 | 2 032 621 | Diameter 25 mm |



Mounting bell incl. fixing set for encoder with servo flange

| Type | Part no. | Flange spigot |
|-----------|-----------|----------------|
| BEF-MG-50 | 5 312 987 | Diameter 50 mm |

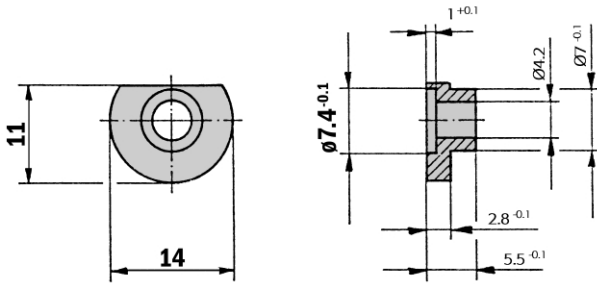


Dimensional drawings and order information

Servo clamps

Servo clamps small, Set (comprises 3 pieces) for servo flanges

| Type | Part no. |
|-----------|-----------|
| BEF-WK-SF | 2 029 166 |



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