



DBS60 Core

RUGGED, VERSATILE INCREMENTAL ENCODERS FOR INDUSTRIAL APPLICATIONS

Incremental encoder

SICK
Sensor Intelligence.

DBS60 CORE
THE STANDARD
PERFECTED:
RELIABLE. PRECISE.
VERSATILE.



A real highlight in every sense

The DBS60 Core is a 60 mm incremental encoder with a universal electrical interface for many applications with various different flange and shaft types. Also with an isolated shaft for increased reliability. The encoder is stable and operationally safe, with a compact installation depth and a high protection class (IP65).

Its rugged structure and the large ball bearing distance enable permanently high bearing loads in addition to a long service life.

The DBS60 Core works reliably from -20°C to $+85^{\circ}\text{C}$ and optimally from -30°C to $+100^{\circ}\text{C}$. Thanks to the flexible cable outlet it offers a large number of connection options. Benefit from its strengths!





Product diversity is the name of the game

Flexible in the design of the electrical interfaces, SICK presents the DBS60 Core in addition to the standard TTL and HTL interfaces, also with a universal interface – in the voltage range from 4.5 V to 30 V, with automatic TTL/HTL adaptation. The encoder combines the 5 V TTL and the HTL interface in one product.

Pleasingly easy to assemble

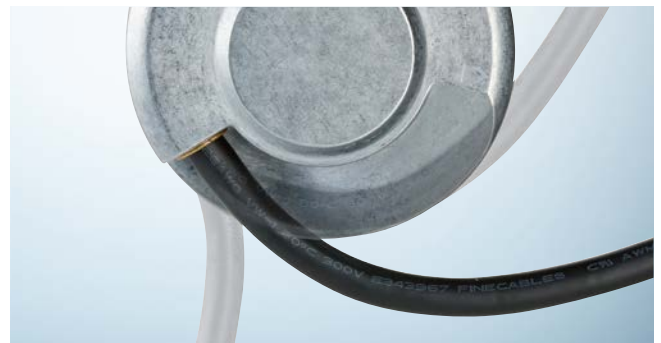
The DBS60 Core wins over fans on the interface as a result of its many features, for example the solid shaft version, available in two variants. With a face mount flange, servo flange and the radial M23 or M12 male connector as well as many flange versions for the variants with through hollow shafts and blind hollow shafts. This means mounting can be achieved without significant effort. Simple and uncomplicated.

DBS60 CORE QUICKLY CONNECTED SOLID SHAFT



More options included

The universal hole pattern in the flange offers users a wide range of mounting options for various different applications without a great deal of effort for exchange encoders too. Its strength: it is particularly suitable for high radial loads.

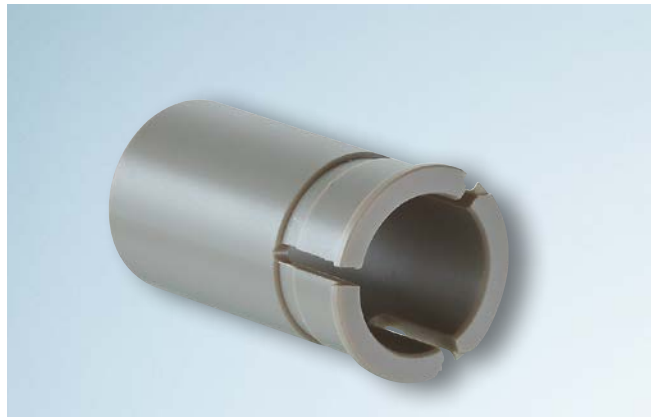


Very flexible

Confined spaces are no problem for the DBS60 Core: its universal cable connection with flexible cabling means it can be used even in the smallest area. The radial connector outputs M12 and M23 ensure an optimal connection.



DBS60 CORE WELL-EQUIPPED AS A HOLLOW SHAFT

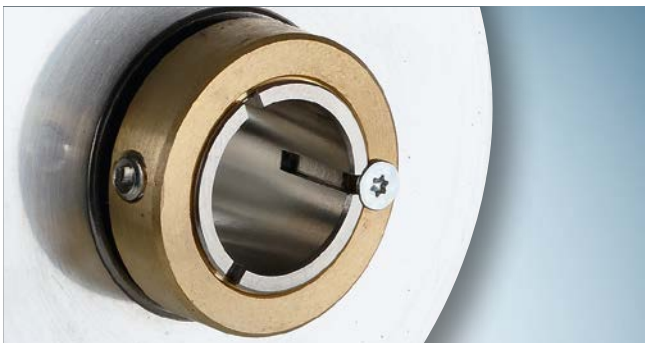


Always the optimal solution

The hollow shaft design of the DBS60 Core is equipped with a through hollow shaft or a blind hollow shaft. With a clamping ring on the front and optionally on the back of the through hollow shaft, facilitating its mounting considerably.

More safety in the detail

Small part with a large effect: the DBS60 Core can be delivered with an isolated shaft connection as desired. The plastic insert provides optimal protection for the encoder against high shaft temperatures and shaft flows.



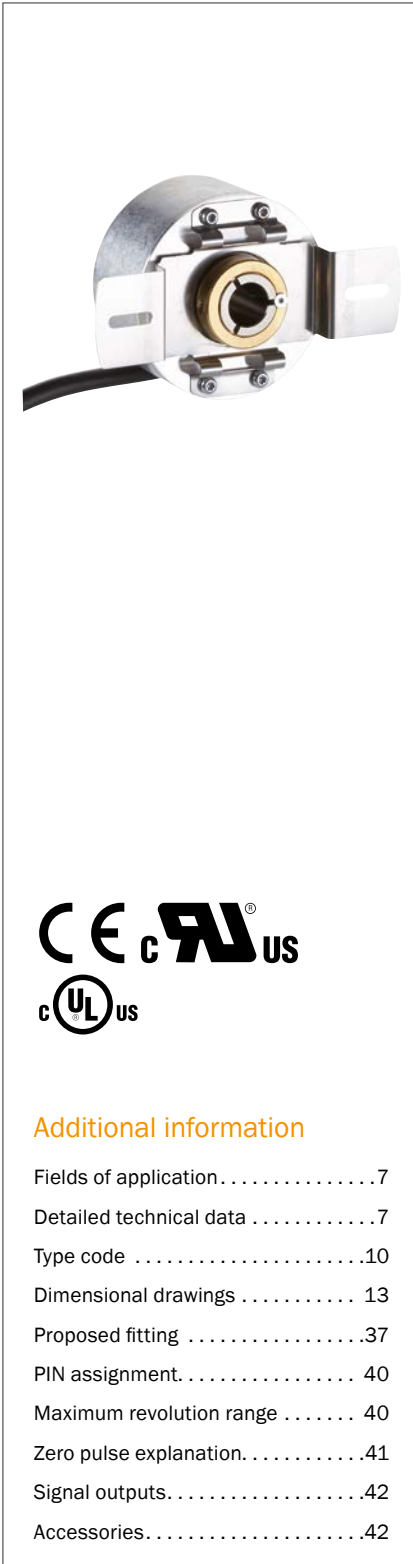
Undetachable: screw secures collet

SICK places a high value on user friendliness: in the hollow shaft version of the DBS60 Core the collet is secured with a screw. This eliminates the risk of this being lost while the encoder is being mounted.

Advancement through diversity

With the universal stator coupling, many different applications are possible with just one encoder variant. If this is not suitable for your use, we have a wide selection for you: one or two-sided stator coupling for various different mounting positions and an adapter flange for register pin mounting, or simply without stator coupling at all.

RUGGED, VERSATILE INCREMENTAL ENCODER FOR INDUSTRIAL APPLICATIONS



Product description

The DBS60 Core is a rugged incremental encoder with a diameter of 58 mm and a compact mounting depth. The portfolio includes solid shaft models with face mount flange and servo flange as well as hollow shaft designs (blind/through hollow shaft) for shafts up to a size of 5/8 inches (15.875 mm). The hollow shafts are available with shaft insulation and with a clamp on the rear housing on request. In addition to the

standard interfaces for TTL and HTL, the DBS60 Core also offers two universal interfaces with a large voltage range which unites the 5 V TTL and 24 V HTL as well as 5 V TTL and 24 V TTL in one version. Due to its high enclosure rating, rugged design and a resolution of up to 10,000 pulses, the DBS60 Core is the ideal product for standard use in various industries.

At a glance

- Face mount and servo flange with various hole patterns
- Hollow shafts up to 5/8 inch in diameter, optionally insulated; front and rear clamping
- Housing diameter 58 mm, compact installation depth
- Number of lines up to 10,000 pulses
- Cable connection, M12 and M23 male connector, radial
- TTL/HTL and TTL interfaces with voltage range 4.5 V DC ... 30 V DC

Your benefits

- Diverse installation options thanks to different flange and shaft versions as well as flange and stator couplings with different assembly hole patterns
- Hollow shaft clamp on the rear housing facilitates mounting
- Various connection types enable flexible cabling
- Compact housing dimensions save valuable space
- The encoder is protected from high shaft temperatures and currents due to the insulated hollow shaft
- Rugged design with large bearing distance allows high shaft loads and a longer service life
- Only a few product variants due to electrical interfaces with a large voltage range, which reduces storage costs

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→ www.sick.com/DBS60_Core

For more information, simply enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



Fields of application

Measuring of position, speed and distance in applications with low to medium requirements on the encoder.

Developed for applications in factory and logistics automation, e.g. in

- Asynchronous motors
- Elevators
- Packaging machines
- Warehousing and transport logistics

Detailed technical data

Performance

Pulses per revolution	
4.5 V ... 5.5 V, TTL/RS422	4 ... 5,000 ¹⁾ (depending on type)
10 V ... 30 V, TTL/RS422	4 ... 5,000 ¹⁾ (depending on type)
10 V ... 27 V, HTL/Push pull	4 ... 5,000 ¹⁾ (depending on type)
4.5 V ... 30 V, TTL/HTL universal	4 ... 5,000 ¹⁾ (depending on type)
4.5 V ... 30 V, TTL/RS422	6,000 ... 10,000 ¹⁾ (depending on type)
Measuring step	90° electric/pulses per revolution
Measuring step deviation	
< 3,600 pulses per revolution	± 18° / pulses per revolution
≥ 3,600 pulses per revolution	± 36° / pulses per revolution
Error limits	Measuring step deviation x 3
Duty cycle	
< 3,600 pulses per revolution	≤ 0.5 ± 5 %
≥ 3,600 pulses per revolution	≤ 0.5 ± 10 %
Initialization time	< 5 ms ²⁾

¹⁾ Available pulses per revolution see type code.

²⁾ Valid signals can be read once this time has elapsed.

Electrical data

Electrical interface	4.5 V ... 5.5 V, TTL/RS422 ¹⁾ 10 V ... 30 V, TTL/RS422 ¹⁾ 10 V ... 27 V, HTL/Push pull ¹⁾ 4.5 V ... 30 V, TTL/HTL universal ^{1) 2)} 4.5 V ... 30 V, TTL/RS422 ¹⁾ (depending on type)
Connection type	Male connector, M23, 12-pin, radial Male connector, M12, 8-pin, radial Cable, 8-wire, universal, 0.5 m ³⁾ Cable, 8-wire, universal, 1.5 m ³⁾ Cable, 8-wire, universal, 3 m ³⁾ Cable, 8-wire, universal, 5 m ³⁾ Cable, 8-wire, universal, 10 m ³⁾ Cable, 8-wire, with male connector, M12, 8-pin, universal, 0.5 m ³⁾ Cable, 8-wire, with male connector, M23, 12-pin, universal, 0.5 m ^{3) 4)} (depending on type)
Operating current	
4.5 V ... 5.5 V, TTL/RS422	≤ 50 mA (without load)
Power consumption	
10 V ... 30 V, TTL/RS422	≤ 0.5 W (without load)
10 V ... 27 V, HTL/Push pull	≤ 1 W (without load)
4.5 V ... 30 V, TTL/HTL universal	≤ 0.5 W (without load)
4.5 V ... 30 V, TTL/RS422	≤ 1 W (without load)
Load current	≤ 30 mA, per channel

Output frequency	300 kHz ⁵⁾
Reference signal, number	1
Reference signal, position	90°, electric, logically gated with A and B
Reverse polarity protection	✓
Short-circuit protection of the outputs	
4.5 V ... 5.5 V, TTL/RS422	✓ ⁶⁾
10 V ... 30 V, TTL/RS422	✓ ⁶⁾
10 V ... 27 V, HTL/Push pull	✓ ⁷⁾
4.5 V ... 30 V, TTL/HTL universal	✓ ⁷⁾
4.5 V ... 30 V, TTL/RS422	✓ ⁶⁾
MTTFd: mean time to dangerous failure	500 years (EN ISO 13849-1) ⁸⁾

¹⁾ With 6-channels unless noted.

²⁾ Output level depends on the supply voltage.

³⁾ The universal cable outlet is positioned in such a way, that it is possible to lay the cable in a radial or axial direction without kinking it.

⁴⁾ M23 male connector for central mounting.

⁵⁾ Up to 450 kHz on request.

⁶⁾ Short-circuit opposite to another channel or GND permissible for max. 60 s. No protection signal against Us.

⁷⁾ Short-circuit opposite to another channel, US or GND permissible for maximum 30 s.

⁸⁾ 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

	Solid shaft	Blind hollow shaft	Through hollow shaft
Mechanical feature	Solid shaft, servo flange Solid shaft, face mount flange (depending on type)	Blind hollow shaft	Through hollow shaft, rear clamping Through hollow shaft (depending on type)
Shaft diameter	6 mm x 10 mm ¹⁾ 10 mm x 19 mm ¹⁾ (depending on type)	6 mm 8 mm 3/8" 10 mm 12 mm 1/2" 14 mm 15 mm 5/8" 6 mm (shaft isolated) 8 mm (shaft isolated) 3/8" (shaft isolated) 10 mm (shaft isolated) 12 mm (shaft isolated) 1/2" (shaft isolated) 14 mm (shaft isolated) 15 mm (shaft isolated) (depending on type)	
Flange type / stator coupling	Flange with 3 x M3 and 3 x M4	2-sided stator coupling, slot, screw hole circle 63–83 mm Without stator coupling, flange with 4 x M2,5 2-sided stator coupling, screw hole circle 63 mm Axial and radial register pin mounting, for 4 mm register pin 1-sided stator coupling, slot, screw hole circle radius 31.5–48.5 mm Without stator coupling, flange with 3 x M3, 3 x M4, axial register pin mounting, for 4 mm register pin (depending on type)	
Weight	0.3 kg ²⁾	0.25 kg ²⁾	

	Solid shaft	Blind hollow shaft	Through hollow shaft
Shaft material	Stainless steel	Stainless steel Stainless steel with plastic shaft (depending on type)	
Flange material	Aluminum		
Housing material	Aluminum		
Material, cable	PVC		
Start up torque	1.2 Ncm (+20 °C)	0.5 Ncm (+20 °C)	
Operating torque	1.1 Ncm (+20 °C)	0.4 Ncm (+20 °C)	
Permissible shaft movement, axial static/dynamic	-	± 0.5 mm / ± 0.2 mm ³⁾	
Permissible shaft movement, radial static/dynamic	-	± 0.3 mm / ± 0.1 mm ³⁾	
Permissible shaft loading radial/axial	100 N (radial) ⁴⁾ 50 N (axial) ⁴⁾	-	
Operating speed	6,000 min ⁻¹ ⁵⁾	6,000 min ⁻¹ ⁶⁾	
Maximum operating speed	9,000 min ⁻¹ ⁷⁾		
Moment of inertia of the rotor	33 gcm ²	50 gcm ²	
Bearing lifetime	3.6 x 10 ⁹ revolutions		
Angular acceleration	≤ 500,000 rad/s ²	≤ 500,000 rad/s ² ≤ 200,000 rad/s ² (shaft isolated) (depending on type)	

¹⁾ Others on request.

²⁾ For an encoder with connector outlet or cable with connector outlet.

³⁾ Not applicable for stator coupling type C and K.

⁴⁾ Higher values are possible using limited bearing life.

⁵⁾ Self warming of 3.2 K per 1000 revolutions/min when applying note working temperature range.

⁶⁾ Self warming of 2.6 K per 1000 revolutions/min when applying note working temperature range.

⁷⁾ 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

	Solid shaft	Blind hollow shaft	Through hollow shaft
EMC	According to EN 61000-6-2 and EN 61000-6-3		
Enclosure rating	IP67, housing side (according to IEC 60529) ¹⁾ IP65, shaft side (according to IEC 60529)		IP65, housing side (according to IEC 60529) ¹⁾ IP65, shaft side (according to IEC 60529)
Permissible relative humidity	90 % (condensation of the optical scanning not permitted)		
Operating temperature range	4.5 V ... 5.5 V, TTL/RS422 -20 °C ... +85 °C ²⁾ 10 V ... 30 V, TTL/RS422 -30 °C ... +100 °C, at maximum 3,000 pulses per revolution ²⁾ -30 °C ... +85 °C, at more than 3,000 pulses per revolution ²⁾ (depending on type) 10 V ... 27 V, HTL/Push pull -20 °C ... +85 °C ²⁾ 4.5 V ... 30 V, TTL/HTL universal -30 °C ... +100 °C, at maximum 3,000 pulses per revolution ²⁾ -30 °C ... +85 °C, at more than 3,000 pulses per revolution ²⁾ (depending on type) 4.5 V ... 30 V, TTL/RS422 -20 °C ... +85 °C ²⁾		
Storage temperature range	-40 °C ... +100 °C, without package		
Resistance to shocks	250 g, 3 ms (according to EN 60068-2-27)	250 g, 3 ms (according to EN 60068-2-27) 200 g, 3 ms, shaft isolated (according to EN 60068-2-27) (depending on type)	
Resistance to vibration	30 g, 10 Hz ... 2,000 Hz (according to EN 60068-2-6)		

¹⁾ With mating connector fitted.

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

Type code

Solid shaft

Type

E	Pulses per revolution 4 ... 5,000
B	Pulses per revolution 6,000 ... 10,000

Medical design

S	1	Servo flange, solid shaft, Ø 6 mm, length 10 mm
S	3	Face mount flange, solid shaft, Ø 6 mm, length 10 mm
S	4	Face mount flange, solid shaft, Ø 10 mm, length 19 mm

Electrical Interface

A	4.5 V ... 5.5 V, TTL/RS-422, 6-Channel ¹⁾
C	10 V ... 30 V, TTL/RS-422, 6-Channel ¹⁾
E	10 V ... 27 V, HTL/push pull, 6-Channel ¹⁾
F	4.5 V ... 30 V, TTL/HTL universal, 6-Channel ¹⁾
H	4.5 V ... 30 V, TTL/RS-422, 6-channel ²⁾

Connection type

A	Male connector, M23, 12-pin, radial
C	Male connector, M12, 8-pin, radial
J	Cable, 8-core, universal, 0.5 m
K	Cable, 8-core, universal, 1.5 m
L	Cable, 8-core, universal, 3 m
M	Cable, 8-core, universal, 5 m
N	Cable, 8-core, universal, 10 m
P	Cable, 8-core, with male connector, M12, 8-pin, universal, 0.5 m
Q	Cable, 8-core, with male connector, M23, 12-pin, universal, 0.5 m

Stator coupling / flange version

0	Flange with 3x M3 3 x M4
1	like 0, but with revolution 10,000 pulses

Resolution

0004 ... 0000 (0000 = 10000) Pulses per revolution possible. For pulses see "Pulses per revolution" ^{3) 4)}

D	B	S	6	0	-										
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¹⁾ Only with type E.

²⁾ Only with type B.

³⁾ Other pulses on request.

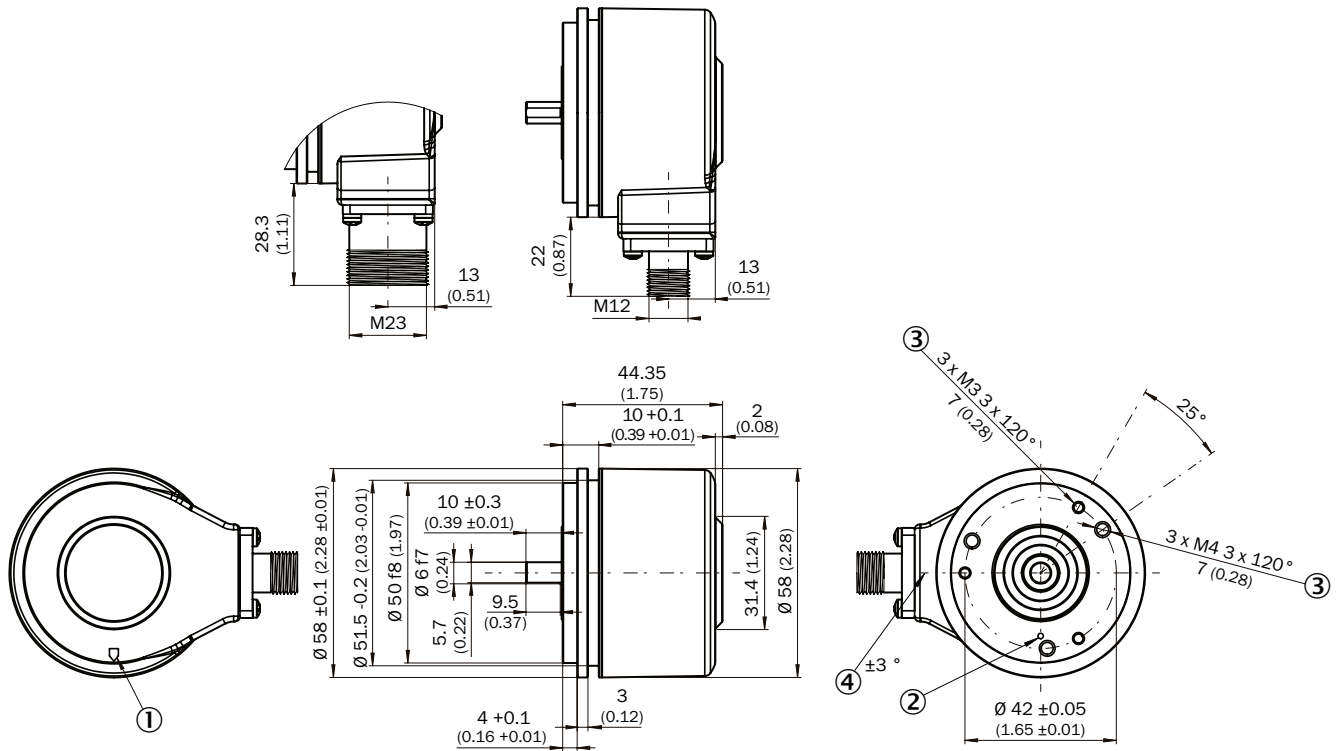
⁴⁾ From 6000 pulses per revolution only with electrical interface H.

Pulse per revolution

	DBS60E	DBS60B (only with electrical interface H)
Pulse per revolution	0004	-
Pulse per revolution	0005	-
Pulse per revolution	0010	-
Pulse per revolution	0020	-
Pulse per revolution	0048	-
Pulse per revolution	0050	-
Pulse per revolution	0060	-
Pulse per revolution	0100	-
Pulse per revolution	0125	-
Pulse per revolution	0128	-
Pulse per revolution	0180	-
Pulse per revolution	0250	-
Pulse per revolution	0360	-
Pulse per revolution	0500	-
Pulse per revolution	0512	-
Pulse per revolution	0600	-
Pulse per revolution	1000	-
Pulse per revolution	1024	-
Pulse per revolution	1200	-
Pulse per revolution	1500	-
Pulse per revolution	2000	-
Pulse per revolution	2048	-
Pulse per revolution	2400	-
Pulse per revolution	2500	-
Pulse per revolution	3000	-
Pulse per revolution	3600	-
Pulse per revolution	4096	-
Pulse per revolution	5000	-
Pulse per revolution	-	6000
Pulse per revolution	-	7200
Pulse per revolution	-	8192
Pulse per revolution	-	10000

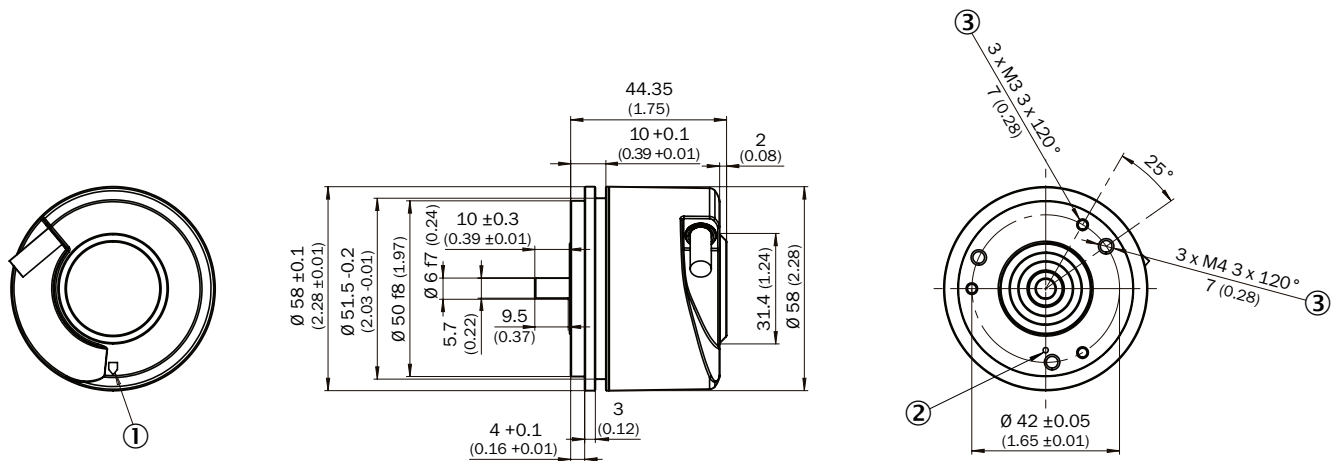
Dimensional drawings (Dimensions in mm (inch))

Solid shaft \varnothing 6 mm, servo flange, connector outlet



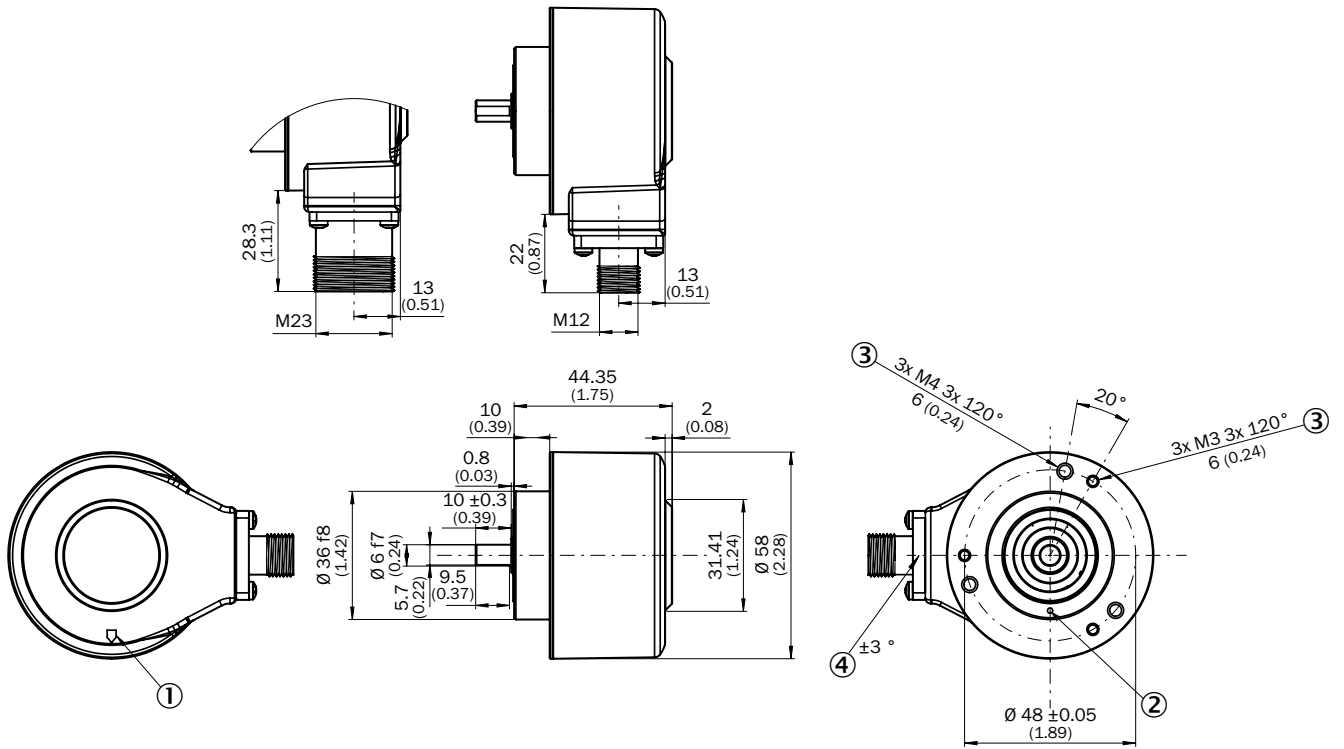
- ① Zero pulse mark on housing
- ② Zero pulse mark on flange
- ③ Depth
- ④ Male connector tolerance in relation to hole pattern

Solid shaft \varnothing 6 mm, servo flange, cable connection



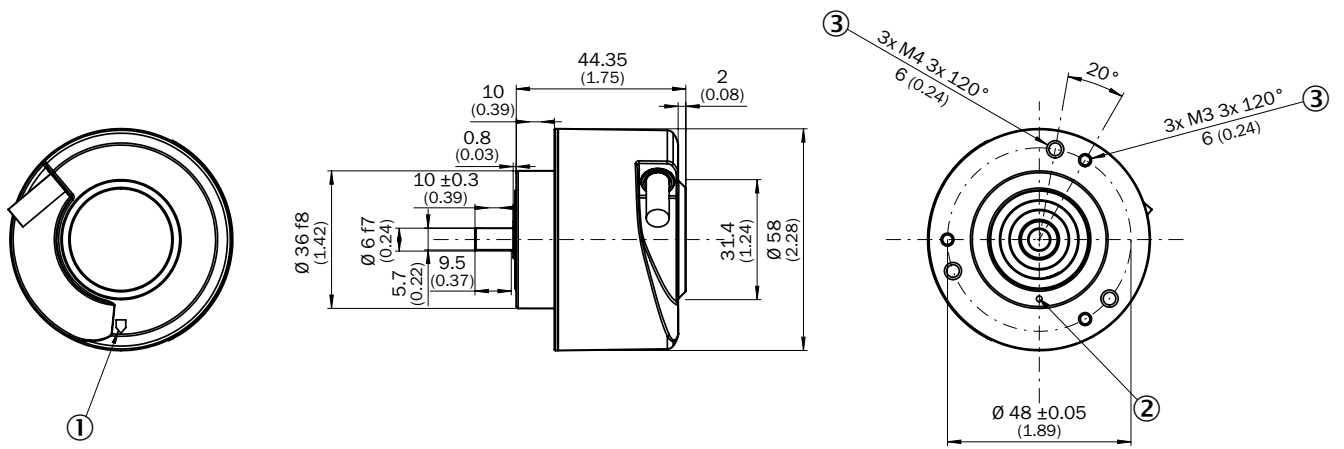
- ① Zero pulse mark on housing
- ② Zero pulse mark on flange
- ③ Depth

Solid shaft \varnothing 6 mm, face mount flange, connector outlet



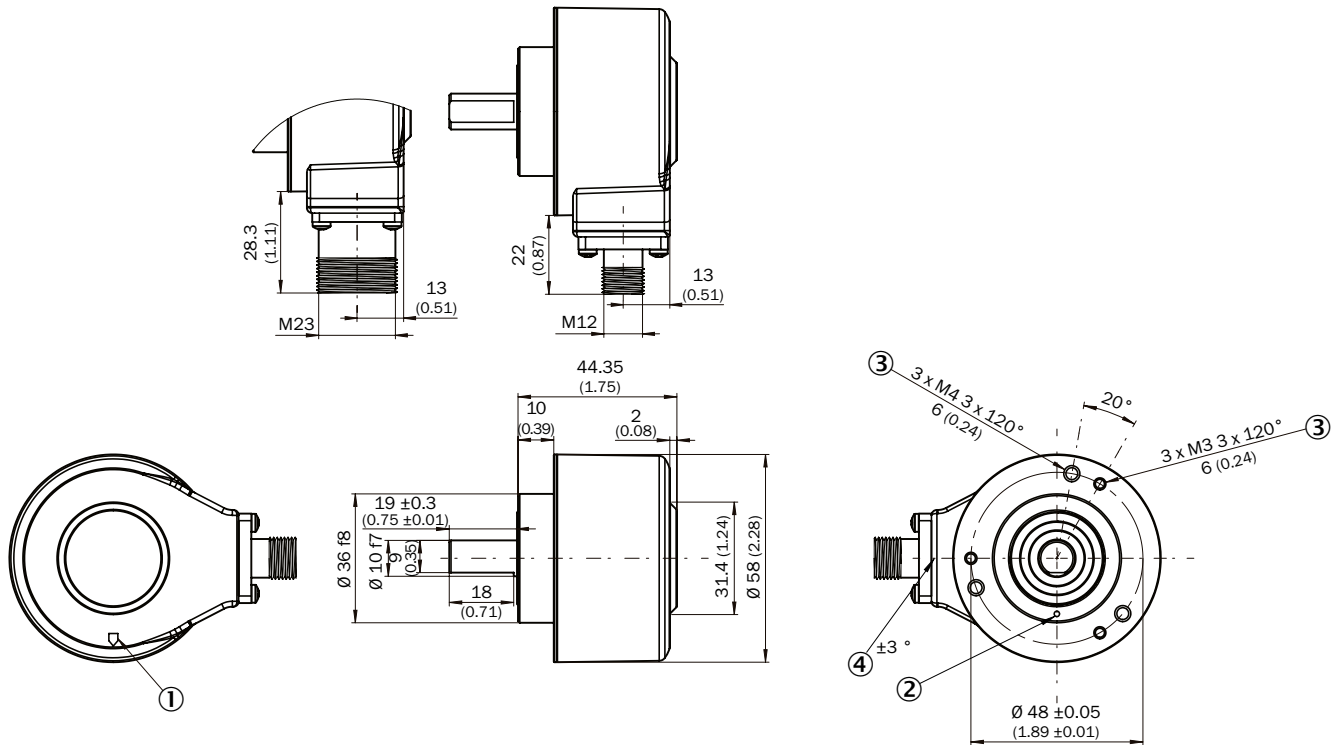
- ① Zero pulse mark on housing
- ② Zero pulse mark on flange
- ③ Depth
- ④ Male connector tolerance in relation to hole pattern

Solid shaft \varnothing 6 mm, face mount flange, cable outlet



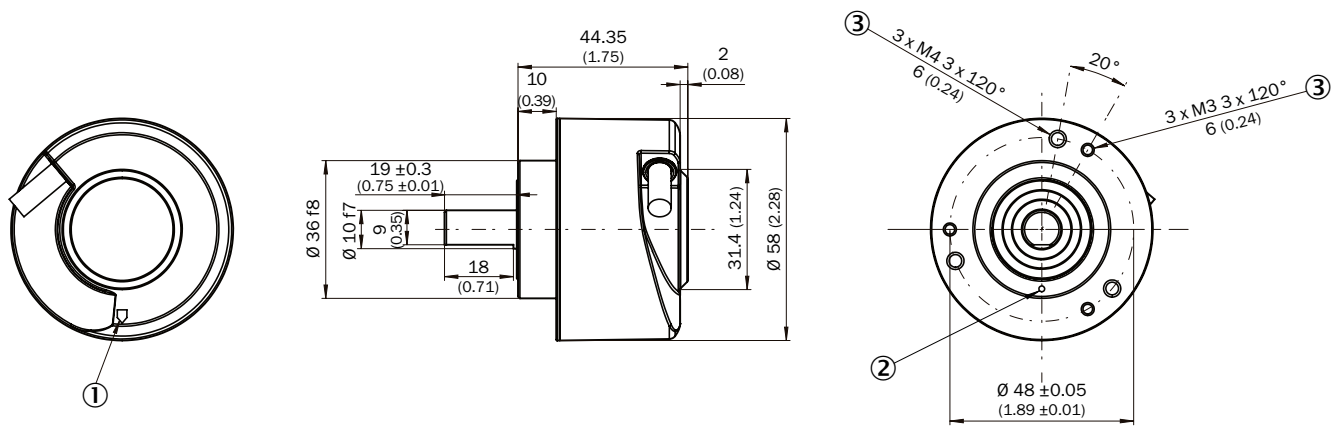
- ① Zero pulse mark on housing
- ② Zero pulse mark on flange
- ③ Depth

Solid shaft \varnothing 10 mm, face mount flange, connector outlet



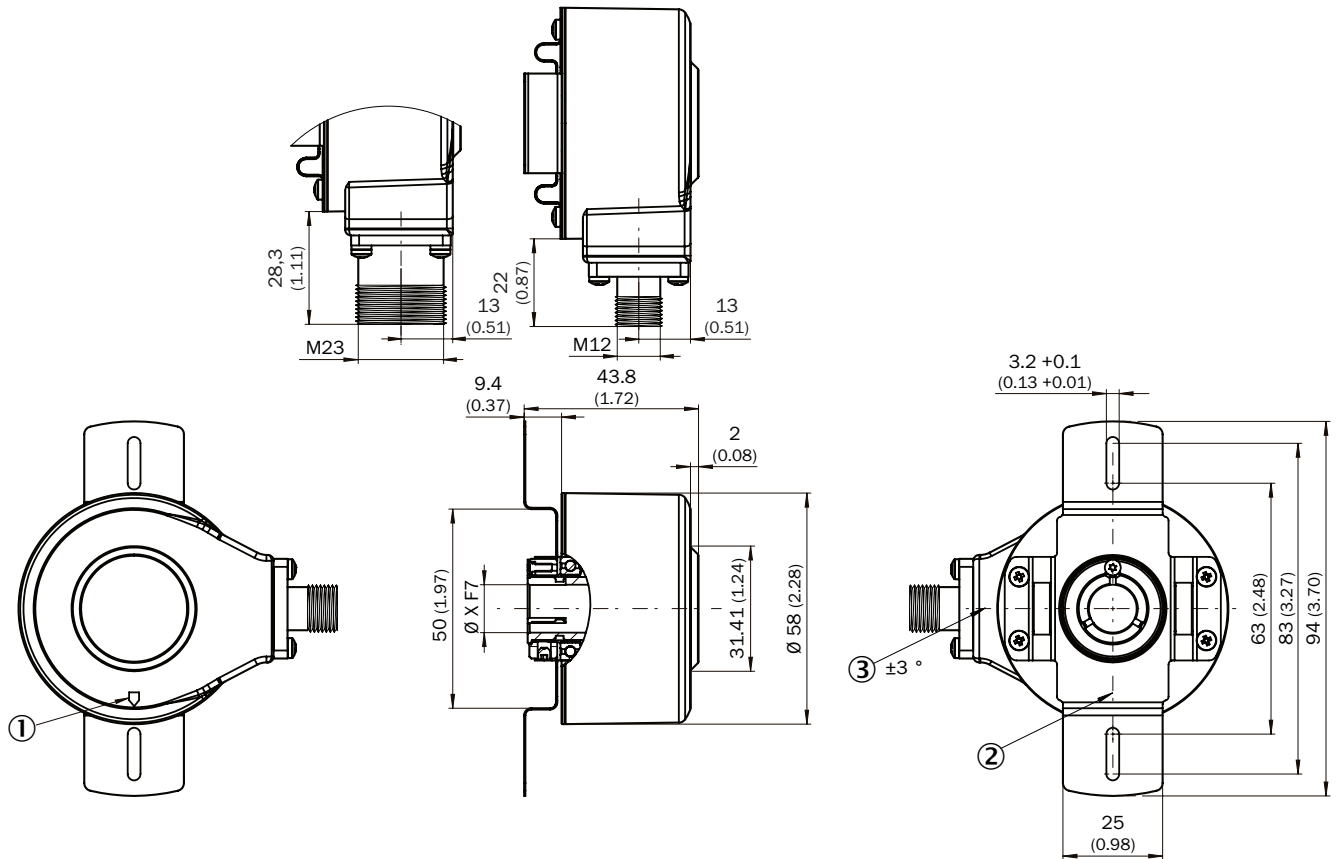
- ① Zero pulse mark on housing
- ② Zero pulse mark on flange
- ③ Depth
- ④ Male connector tolerance in relation to hole pattern

Solid shaft \varnothing 10 mm, face mount flange, cable outlet



- ① Zero pulse mark on housing
- ② Zero pulse mark on flange
- ③ Depth

Blind hollow shaft, male connector connection, 2-sided stator coupling, slot, screw hole circle 63–83 mm

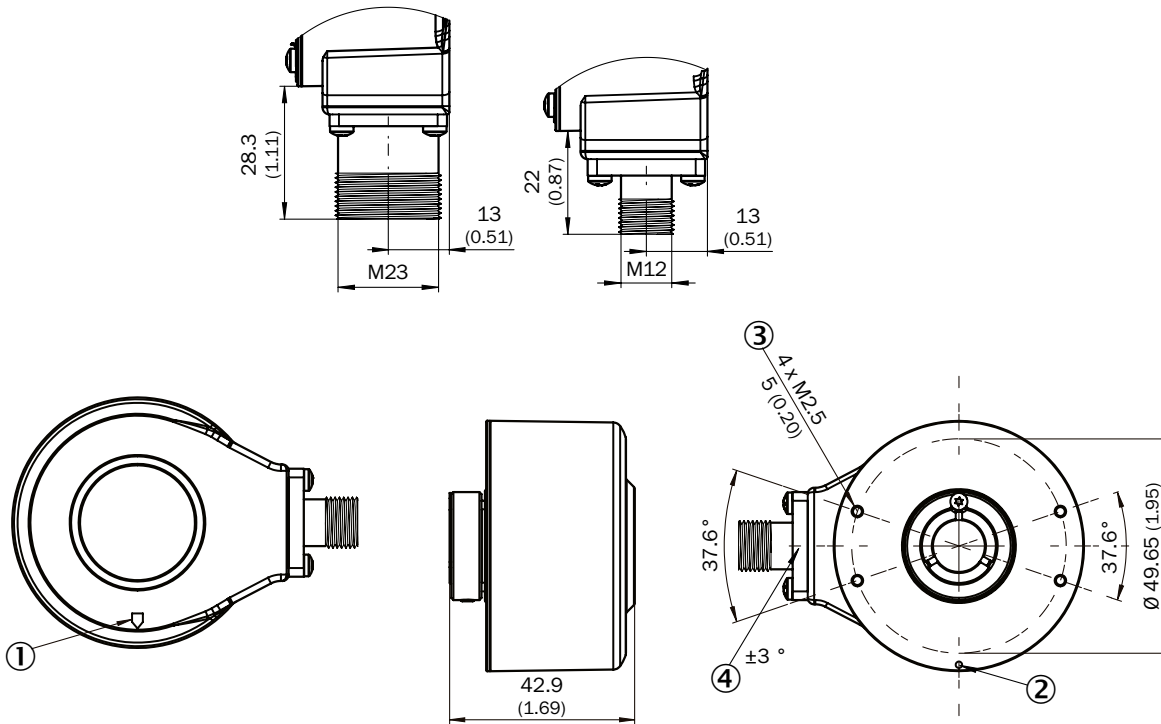


- ① Zero pulse mark on housing
- ② Zero pulse mark on flange under stator coupling
- ③ Male connector tolerance in relation to hole pattern

Type Blind hollow shaft	Shaft diameter XF7
DBS60x-BAxxxxxxxxx DBS60x-B1xxxxxxxxx	6 mm
DBS60x-BBxxxxxxxxx DBS60x-B2xxxxxxxxx	8 mm
DBS60x-BCxxxxxxxxx DBS60x-B3xxxxxxxxx	3/8 "
DBS60x-BDxxxxxxxxx DBS60x-B4xxxxxxxxx	10 mm
DBS60x-BExxxxxxxxx DBS60x-B5xxxxxxxxx	12 mm
DBS60x-BFxxxxxxxxx DBS60x-B6xxxxxxxxx	1/2 "
DBS60x-BGxxxxxxxxx DBS60x-B7xxxxxxxxx	14 mm
DBS60x-BHxxxxxxxxx DBS60x-B8xxxxxxxxx	15 mm
DBS60x-BJxxxxxxxxx	5/8 "

Shaft diameter 1,2,3,4,5,6,7,8 with isolated shaft

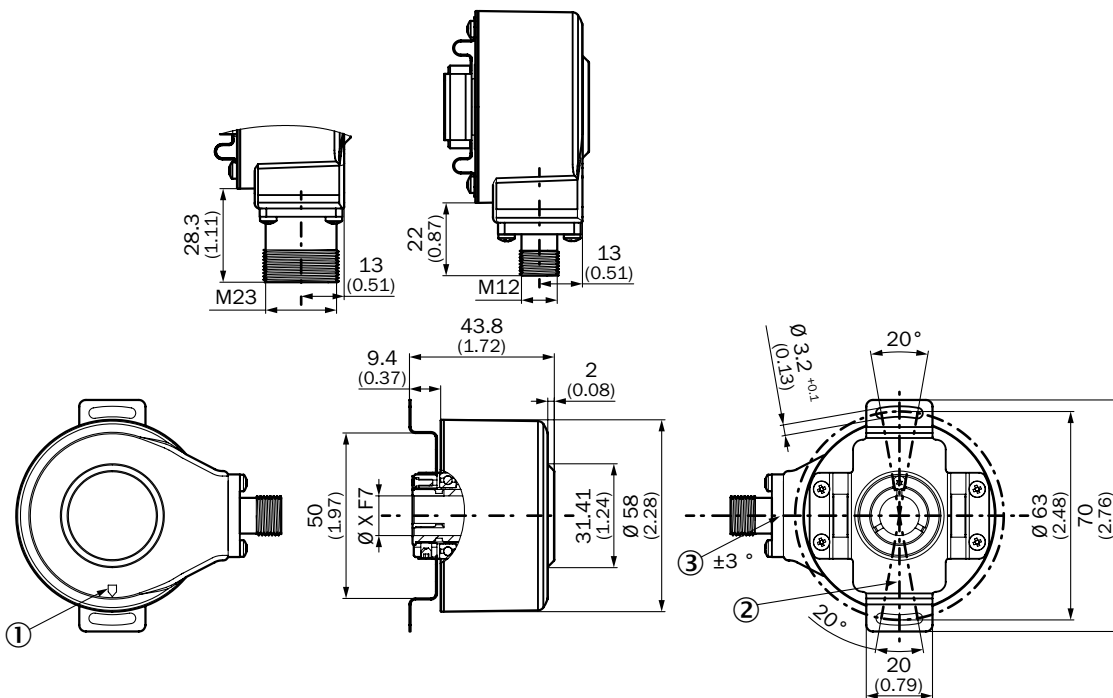
Blind hollow shaft, male connector connection, without stator coupling, flange with 4 x M2.5



XF7 values see shaft diameter table for blind hollow shaft

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange
- ③ Depth
- ④ Male connector tolerance in relation to hole pattern

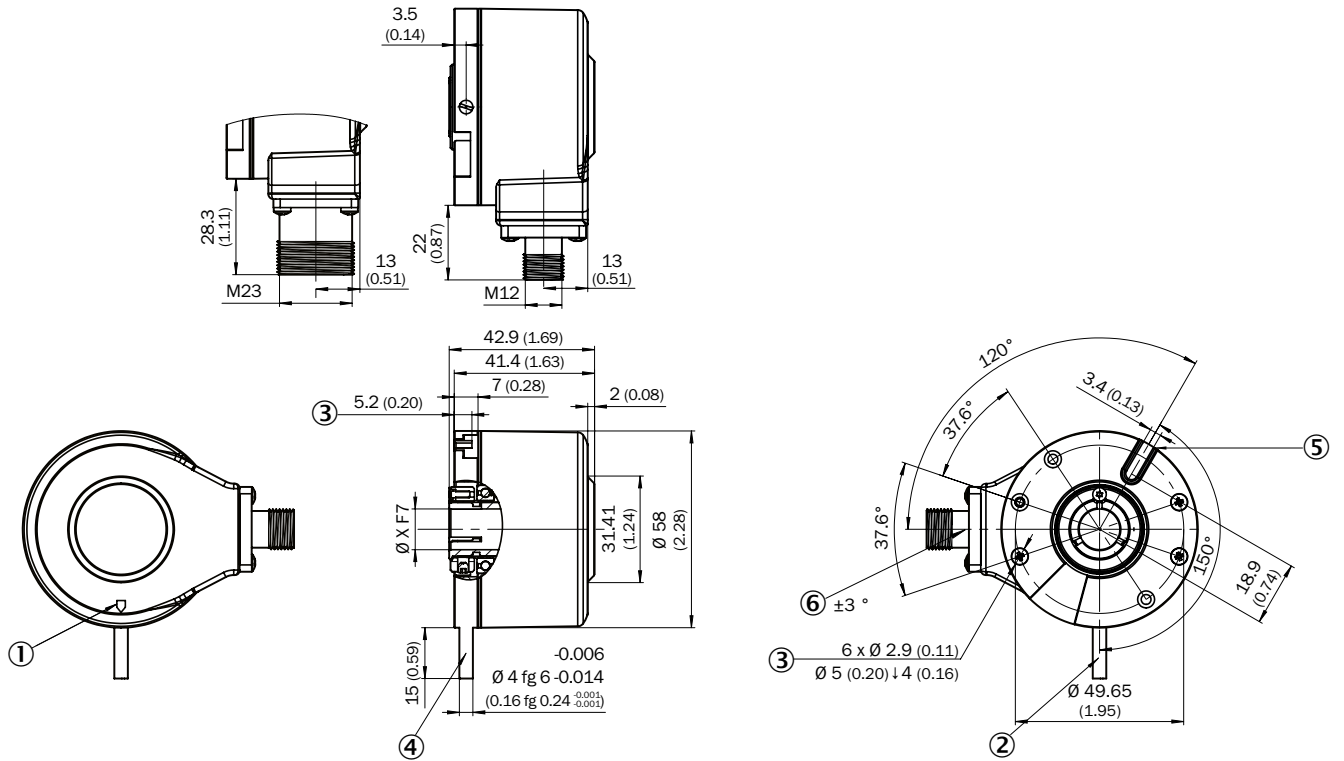
Blind hollow shaft, male connector connection, 2-sided stator coupling, screw hole circle 63 mm



XF7 values see shaft diameter table for blind hollow shaft

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange under stator coupling
- ③ Male connector tolerance in relation to hole pattern

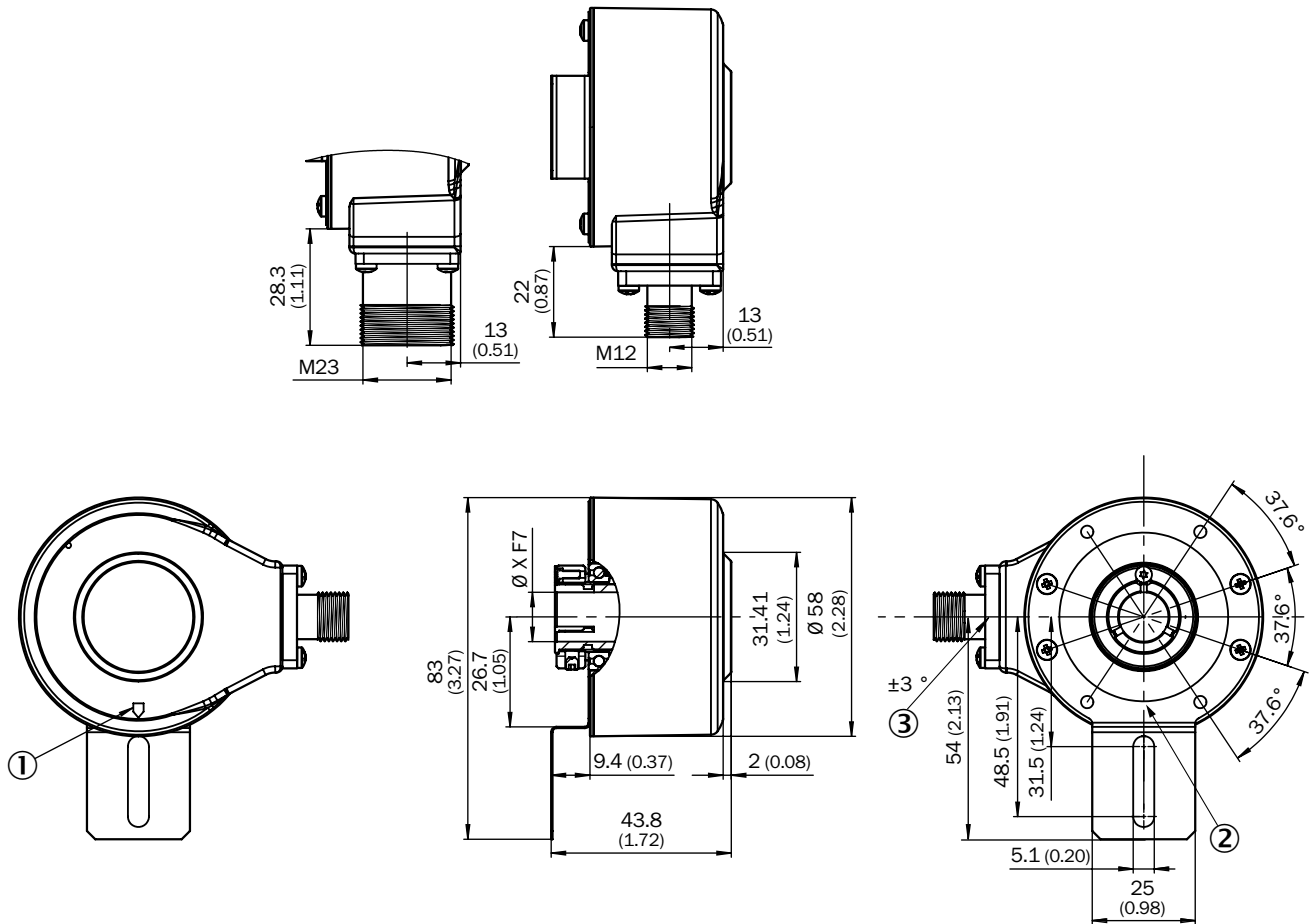
Blind hollow shaft, male connector connection, axial and radial register pin mounting, for 4 mm register pin



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
- ⑥ Male connector tolerance in relation to hole pattern

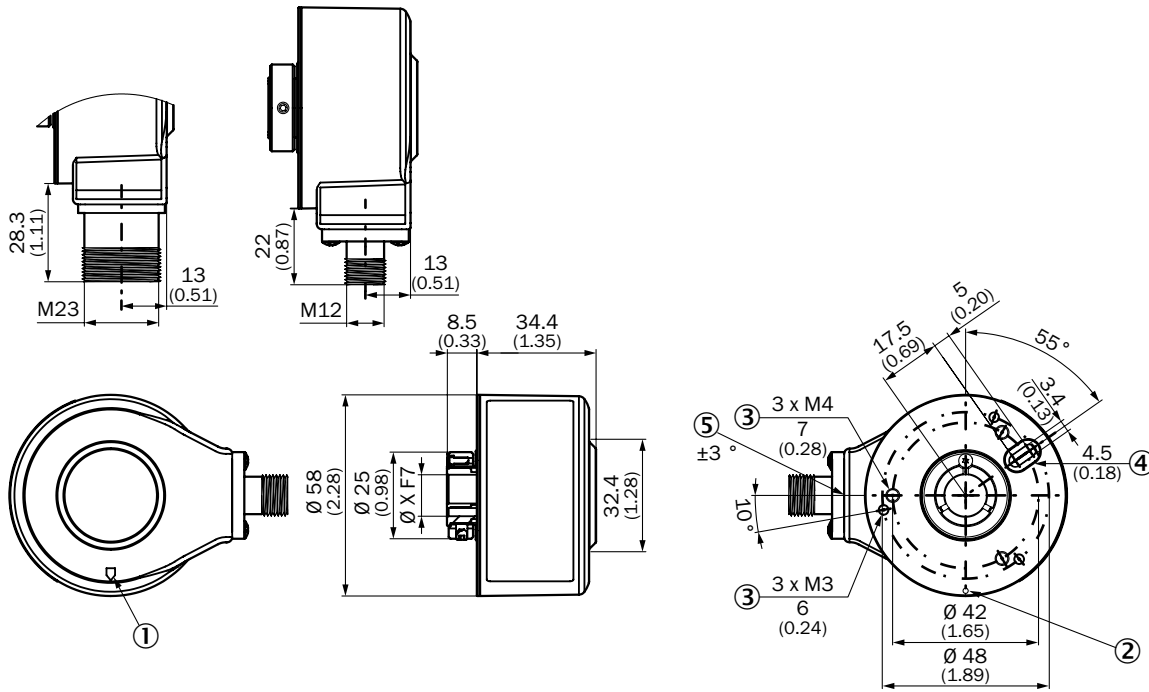
Blind hollow shaft, male connector connection, 1-sided stator coupling, slot, screw hole circle radius 31.5–48.5 mm



XF7 values see shaft diameter table for blind hollow shaft

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange under stator coupling
- ③ Male connector tolerance in relation to hole pattern

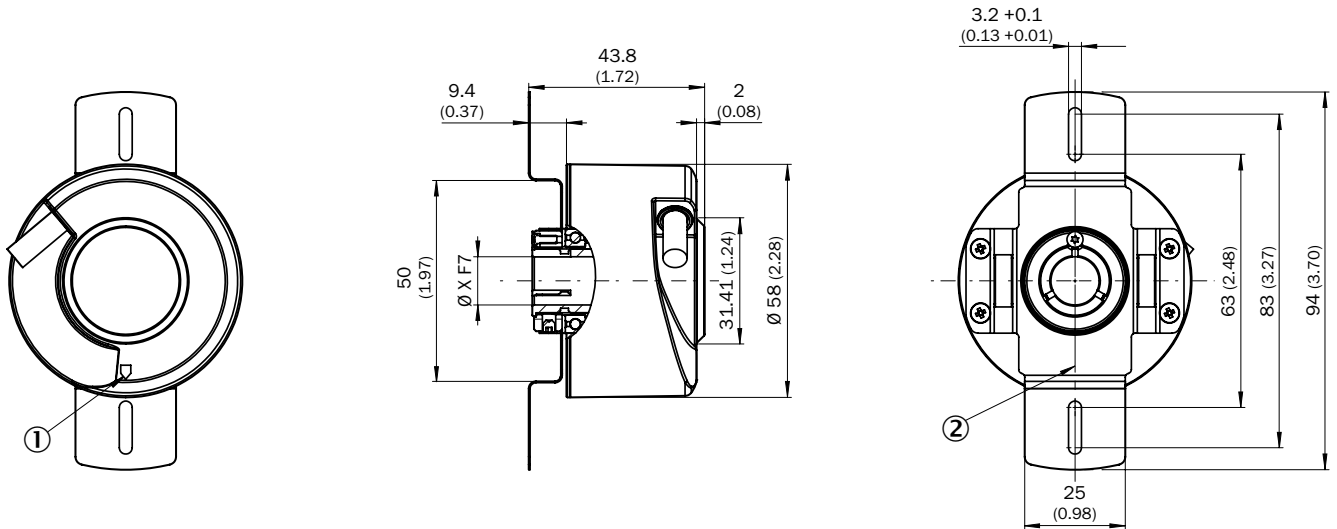
Blind hollow shaft, male connector connection, without stator coupling, flange with 3 x M3, 3 x M4, axial register pin mounting, for 4 mm register pin



XF7 values see shaft diameter table for blind hollow shaft

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange
- ③ Depth
- ④ Rubber insert, material: NBR
- ⑤ Male connector tolerance in relation to hole pattern

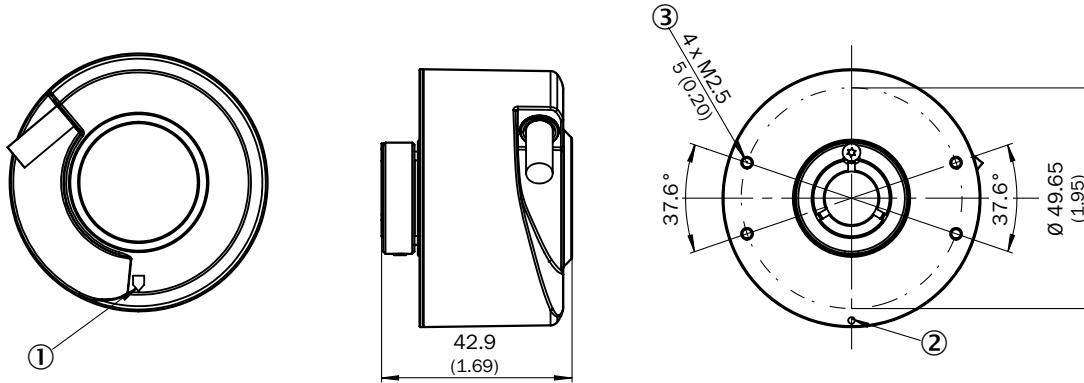
Blind hollow shaft, cable connection, 2-sided stator coupling, slot, screw hole circle 63–83 mm



XF7 values see shaft diameter table for blind hollow shaft

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange under stator coupling

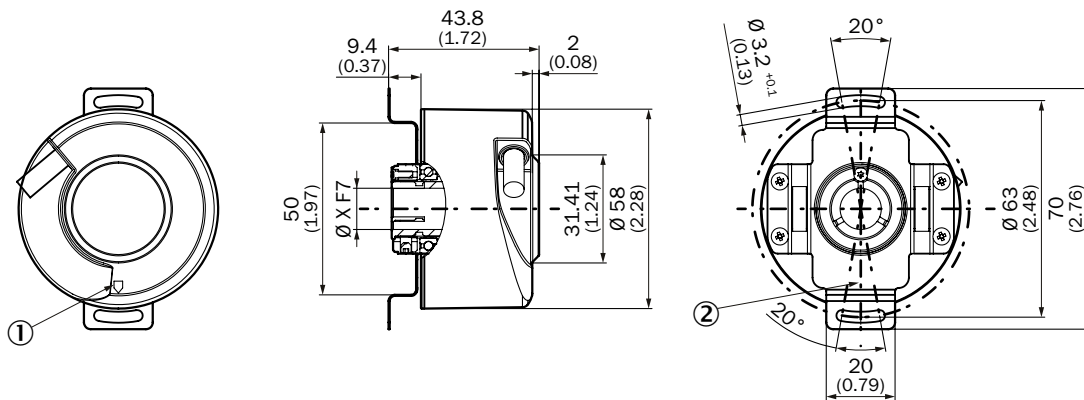
Blind hollow shaft, cable connection, without stator coupling, flange with 4 x M2.5



XF7 values see shaft diameter table for blind hollow shaft

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange
- ③ Depth

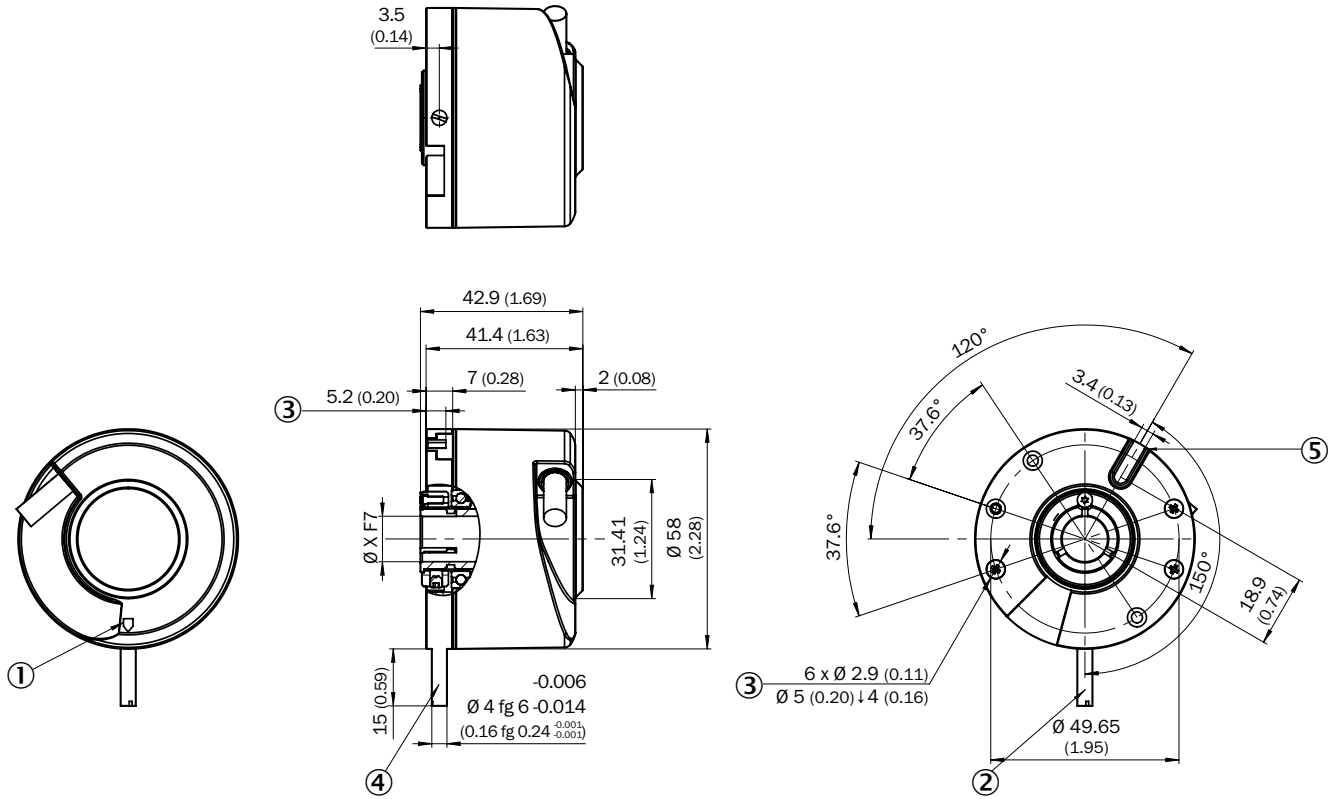
Blind hollow shaft, cable connection, 2-sided stator coupling, screw hole circle 63 mm



XF7 values see shaft diameter table for blind hollow shaft

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange under stator coupling

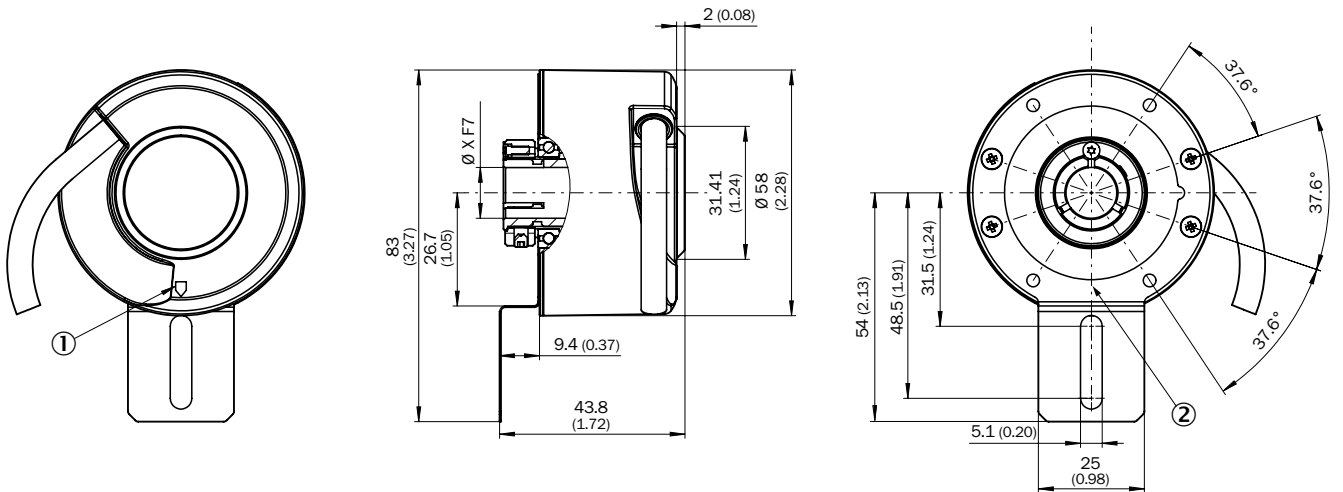
Blind hollow shaft, cable connection, axial and radial register pin mounting, for 4 mm register pin



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

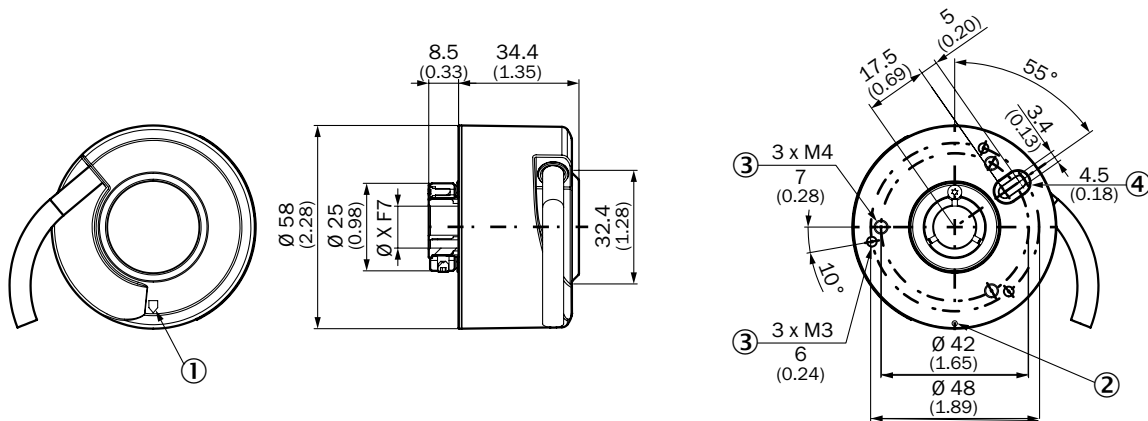
Blind hollow shaft, cable connection, 1-sided stator coupling, slot, screw hole circle radius 31.5–48.5 mm



XF7 values see shaft diameter table for blind hollow shaft

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange under stator coupling

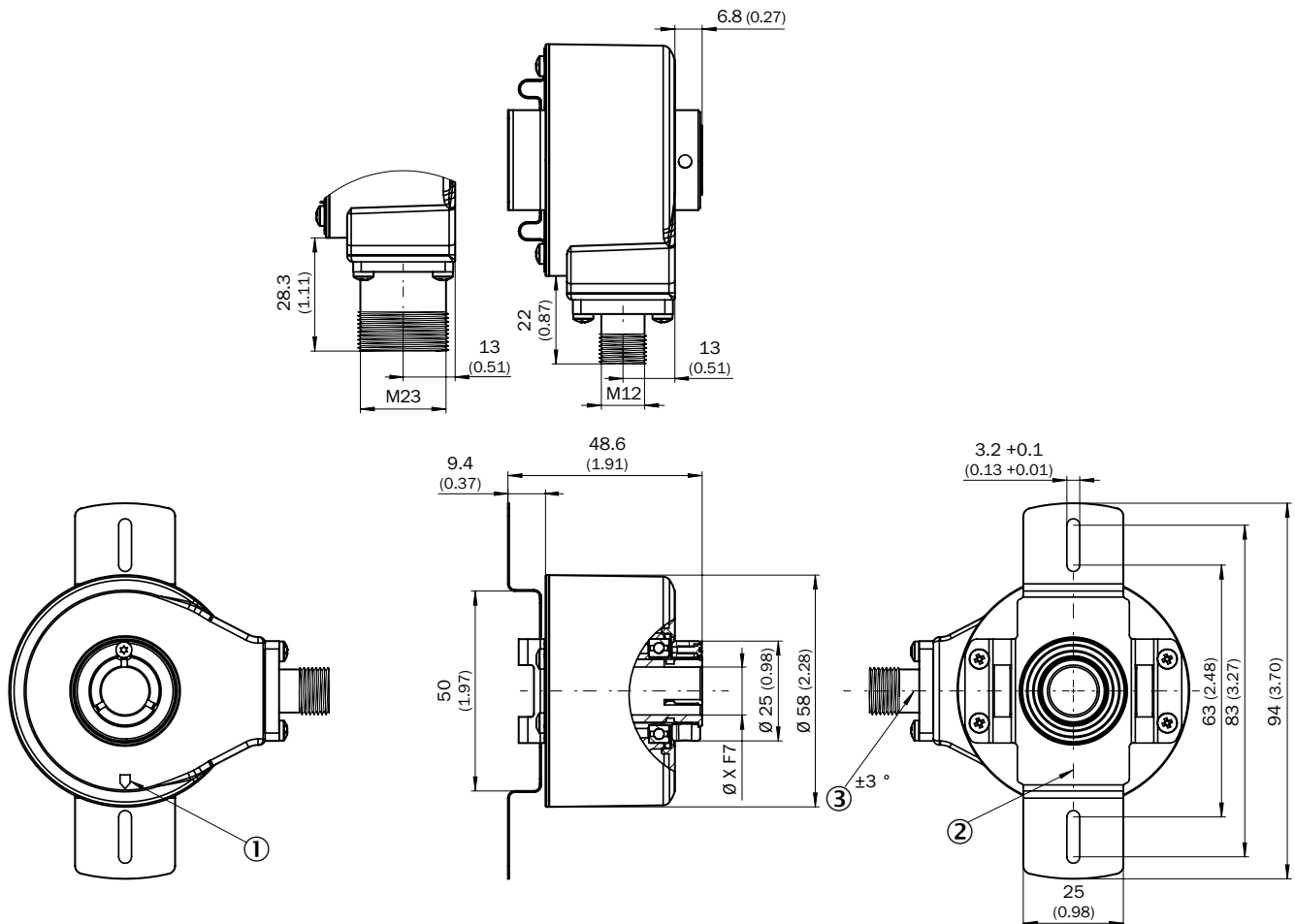
Blind hollow shaft, cable connection, without stator coupling, flange with 3 x M3, 3 x M4, axial register pin mounting, for 4 mm register pin



XF7 values see shaft diameter table for blind hollow shaft

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange
- ③ Depth
- ④ Rubber insert, material: NBR

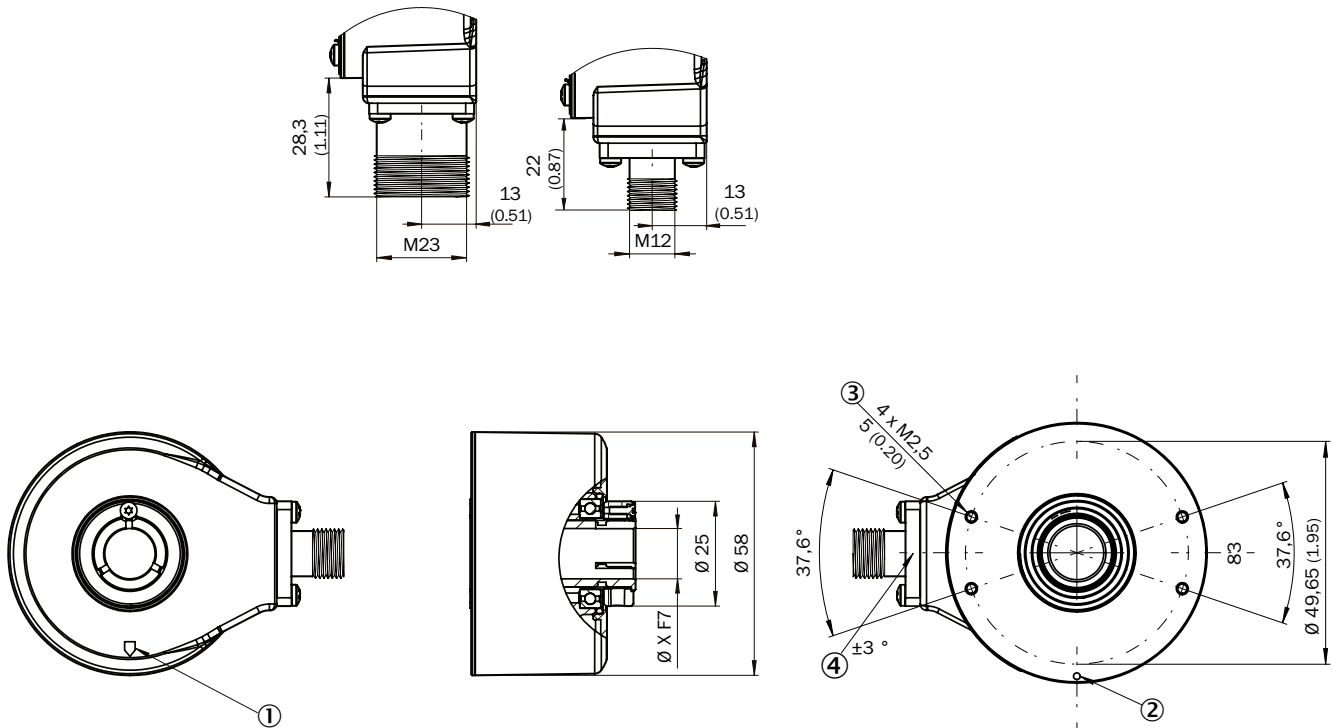
Through hollow shaft clamping at the back, male connector connection, 2-sided stator coupling, slot, screw hole circle 63–83 mm



- ① Zero pulse mark on housing
- ② Zero pulse mark on flange under stator coupling
- ③ Male connector tolerance in relation to hole pattern

Type Through hollow shaft, rear clamping	Shaft diameter XF7
DBS60x-RAxxxxxxx DBS60x-R1xxxxxxx	6 mm
DBS60x-RBxxxxxxx DBS60x-R2xxxxxxx	8 mm
DBS60x-RCxxxxxxx DBS60x-R3xxxxxxx	3/8 "
DBS60x-RDxxxxxxx DBS60x-R4xxxxxxx	10 mm
DBS60x-RExxxxxxx DBS60x-R5xxxxxxx	12 mm
DBS60x-RFxxxxxxx DBS60x-R6xxxxxxx	1/2 "
DBS60x-RGxxxxxxx DBS60x-R7xxxxxxx	14 mm
DBS60x-RHxxxxxxx DBS60x-R8xxxxxxx	15 mm
DBS60x-RJxxxxxxx	5/8 "
Shaft diameter 1,2,3,4,5,6,7,8 with isolated shaft	

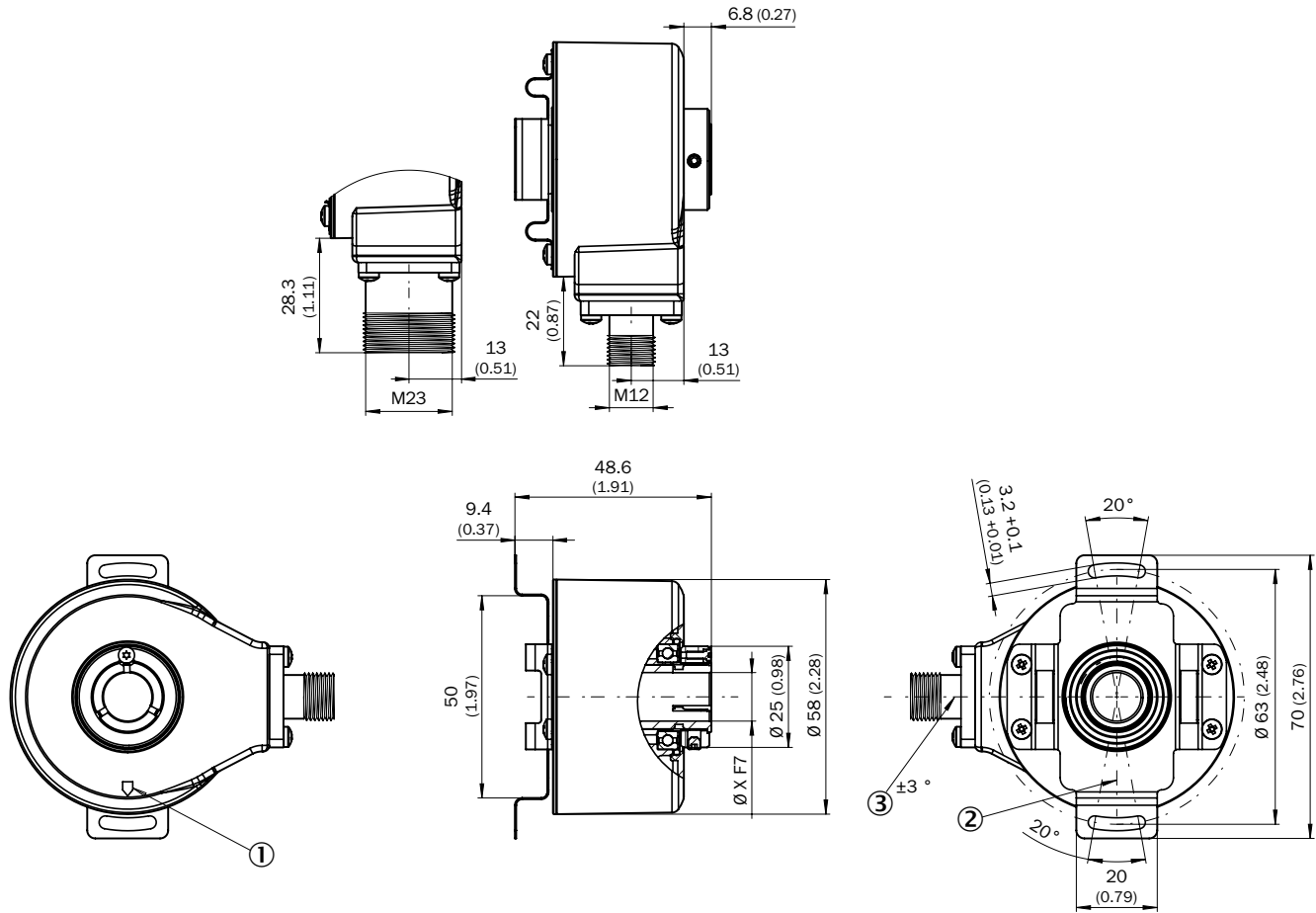
Through hollow shaft clamping at the back, male connector connection, without stator coupling, flange with 4 x M2.5



XF7 values see shaft diameter table for through hollow shaft, clamping at the back

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange
- ③ Depth
- ④ Male connector tolerance in relation to hole pattern

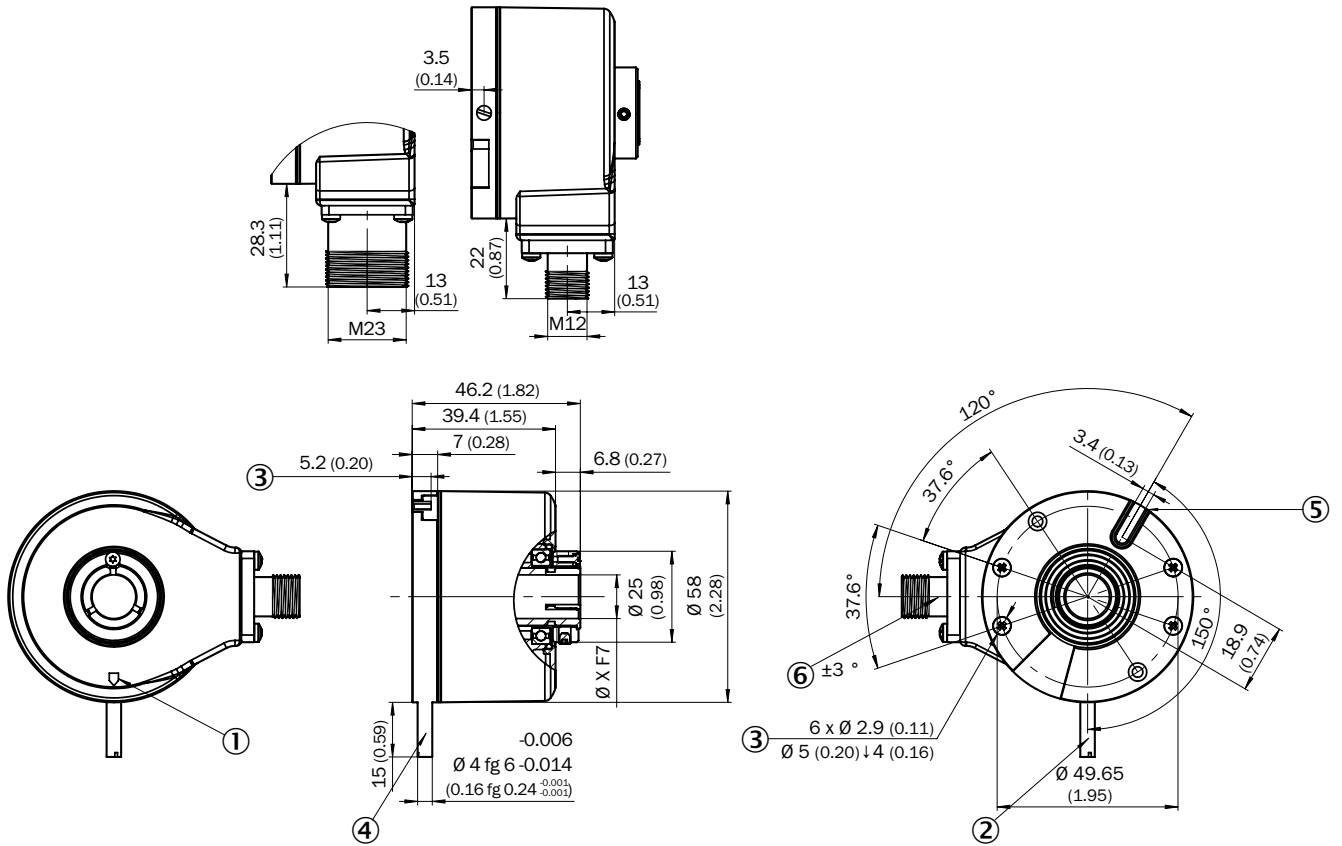
Through hollow shaft clamping at the back, male connector connection, 2-sided stator coupling, screw hole circle 63 mm



XF7 values see shaft diameter table for through hollow shaft, clamping at the back

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange under stator coupling
- ③ Male connector tolerance in relation to hole pattern

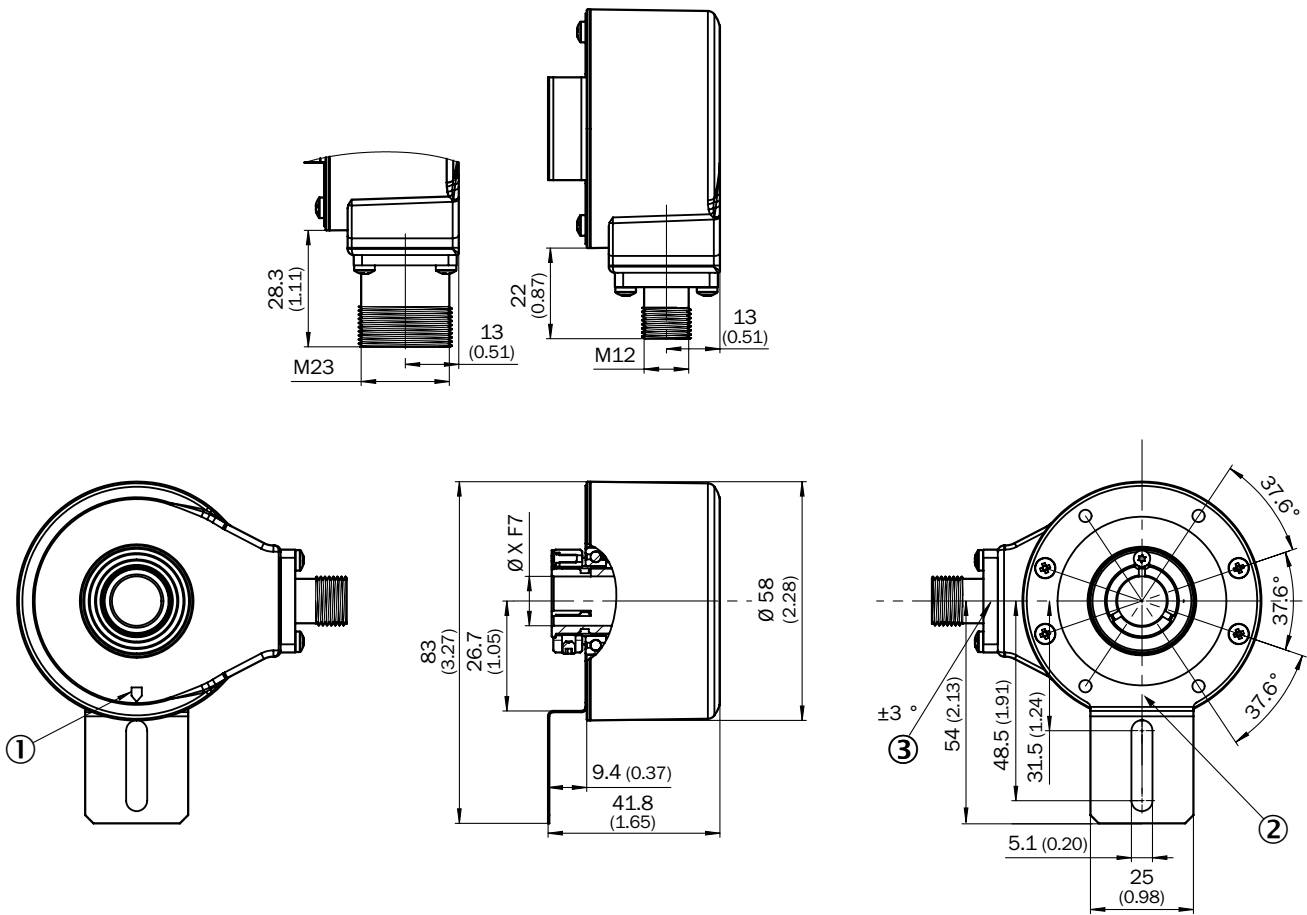
Through hollow shaft clamping at the back, male connector connection, axial and radial register pin mounting, for 4 mm register pin



XF7 values see shaft diameter table for through hollow shaft, clamping at the back

- 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
- ⑥ Male connector tolerance in relation to hole pattern

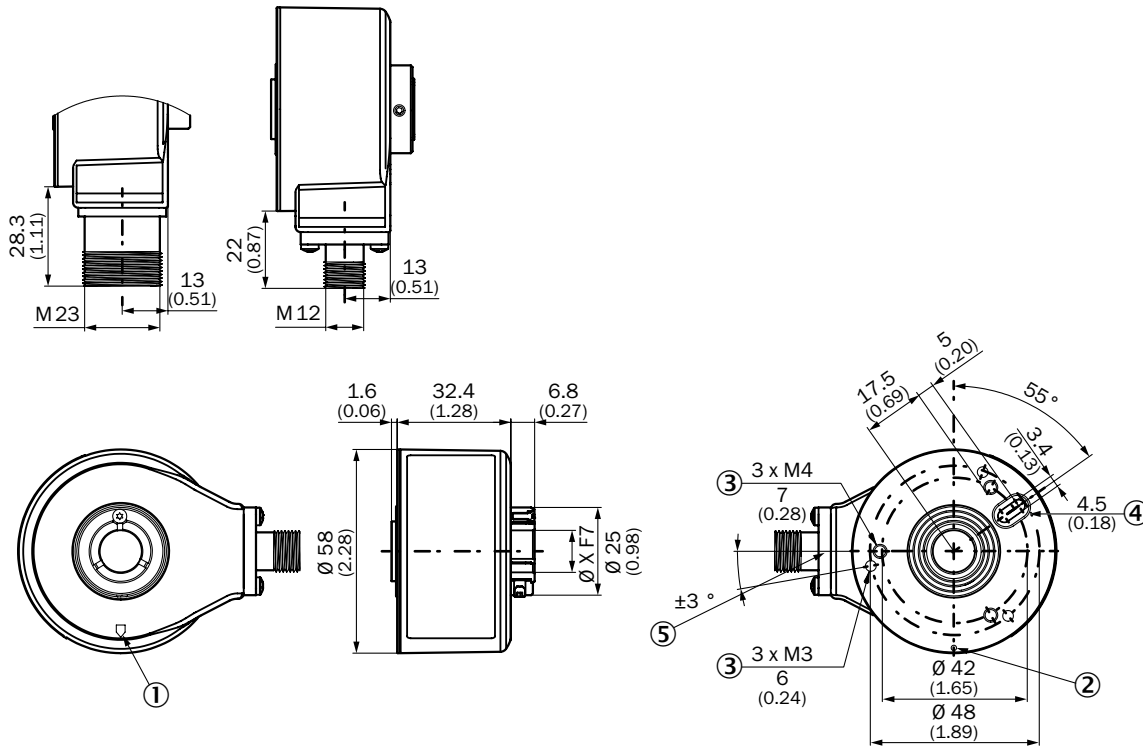
Through hollow shaft clamping at the back, male connector connection, 1-sided stator coupling, slot, screw hole circle radius 31.5–48.5 mm



XF7 values see shaft diameter table for through hollow shaft, clamping at the back

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange under stator coupling
- ③ Male connector tolerance in relation to hole pattern

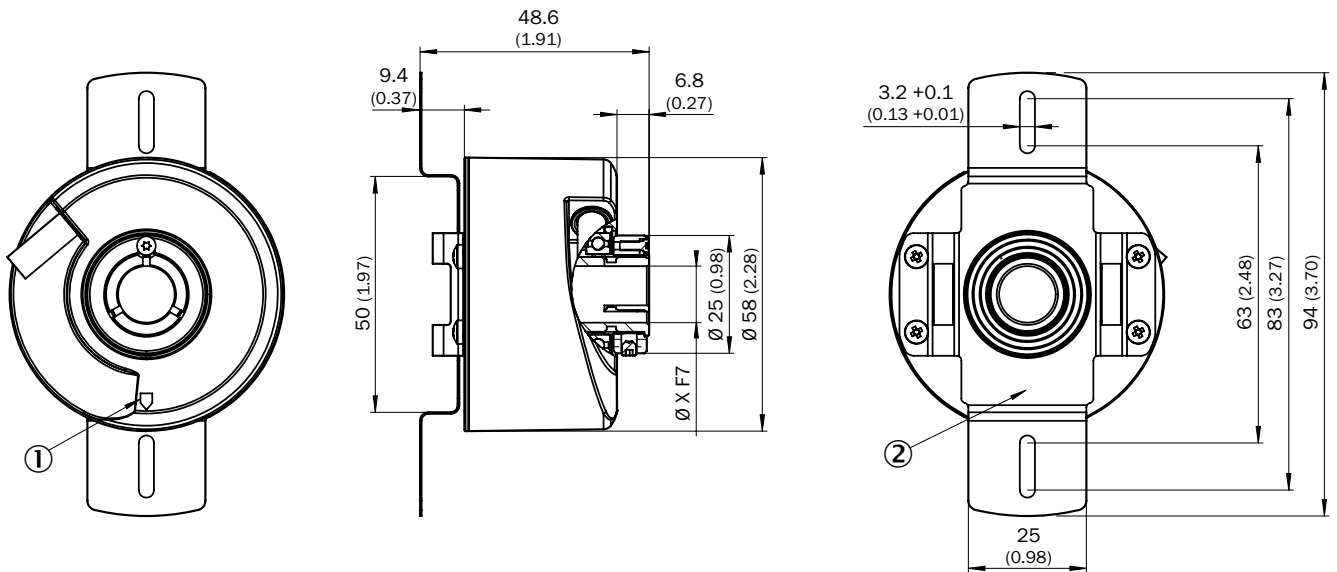
Through hollow shaft clamping at the back, male connector connection, without stator coupling, flange with 3 x M3, 3 x M4, axial register pin mounting, for 4 mm register pin



XF7 values see shaft diameter table for through hollow shaft, clamping at the back

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange
- ③ Depth
- ④ Rubber insert, material: NBR
- ⑤ Male connector tolerance in relation to hole pattern

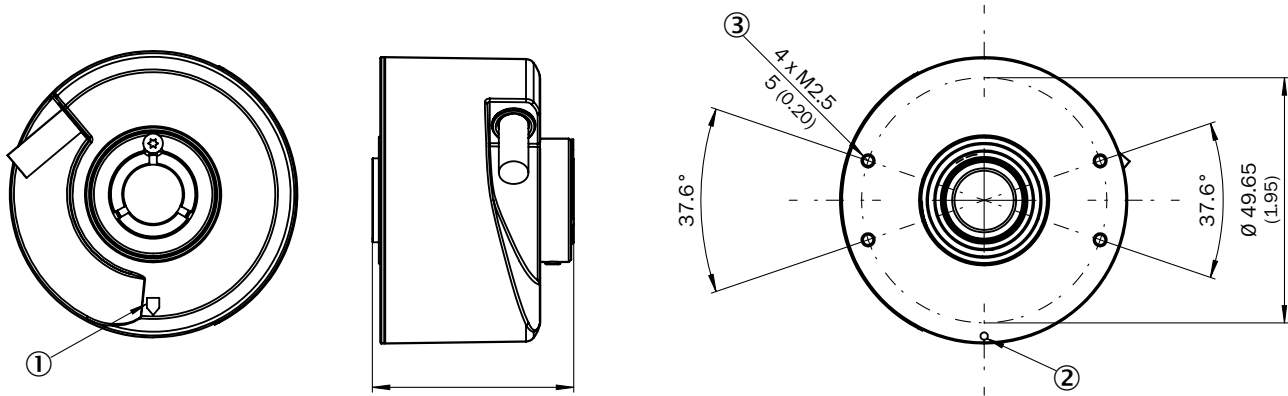
Through hollow shaft clamping at the back, cable connection, 2-sided stator coupling, slot, screw hole circle 63–83 mm



XF7 values see shaft diameter table for through hollow shaft, clamping at the back

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange under stator coupling

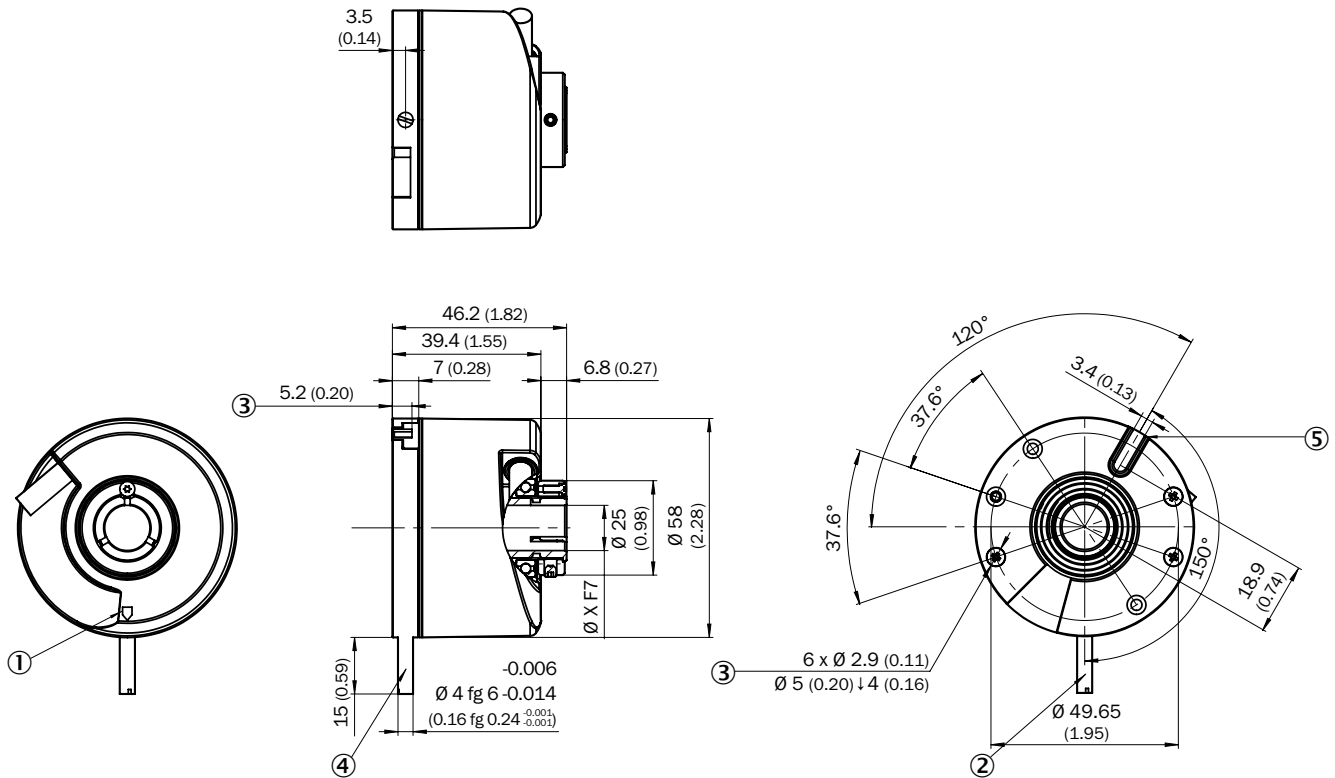
Through hollow shaft clamping at the back, cable connection, without stator coupling, flange with 4 x M2.5



XF7 values see shaft diameter table for through hollow shaft, clamping at the back

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange
- ③ Depth

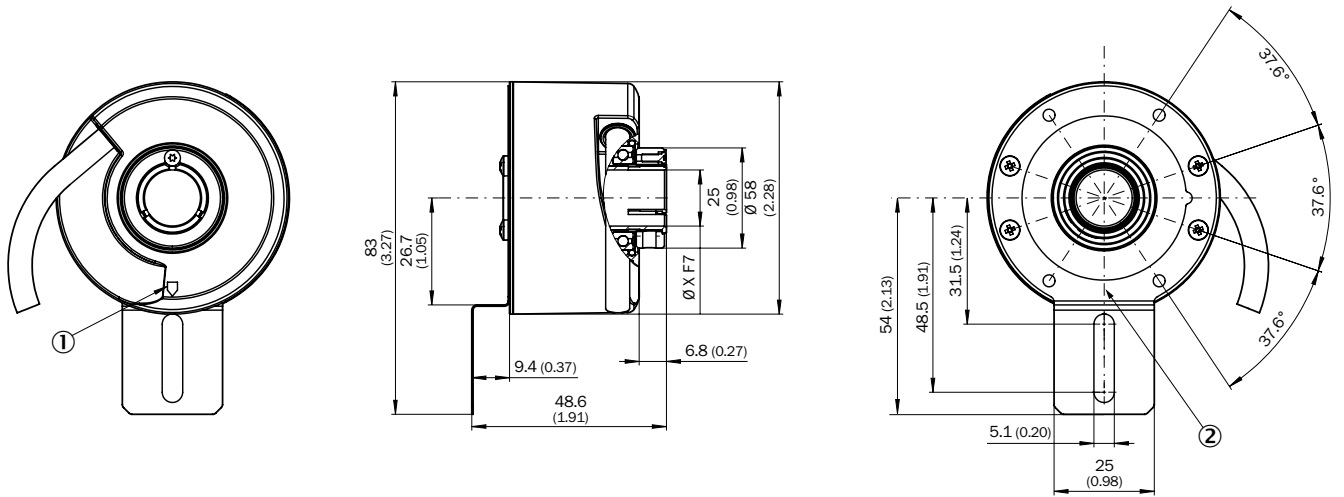
Through hollow shaft clamping at the back, cable connection, axial and radial register pin mounting, for 4 mm register pin



XF7 values see shaft diameter table for through hollow shaft, clamping at the back

- 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
- ⑥ Male connector tolerance in relation to hole pattern

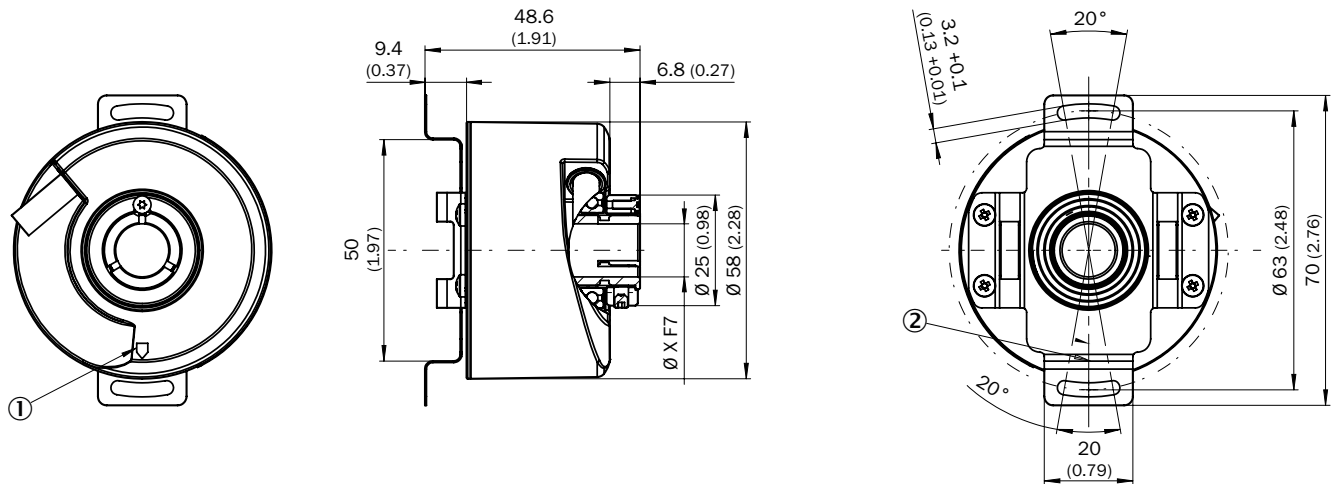
Through hollow shaft clamping at the back, cable connection, 1-sided stator coupling, slot, screw hole circle radius 31.5-48.5 mm



XF7 values see shaft diameter table for through hollow shaft, clamping at the back

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange under stator coupling

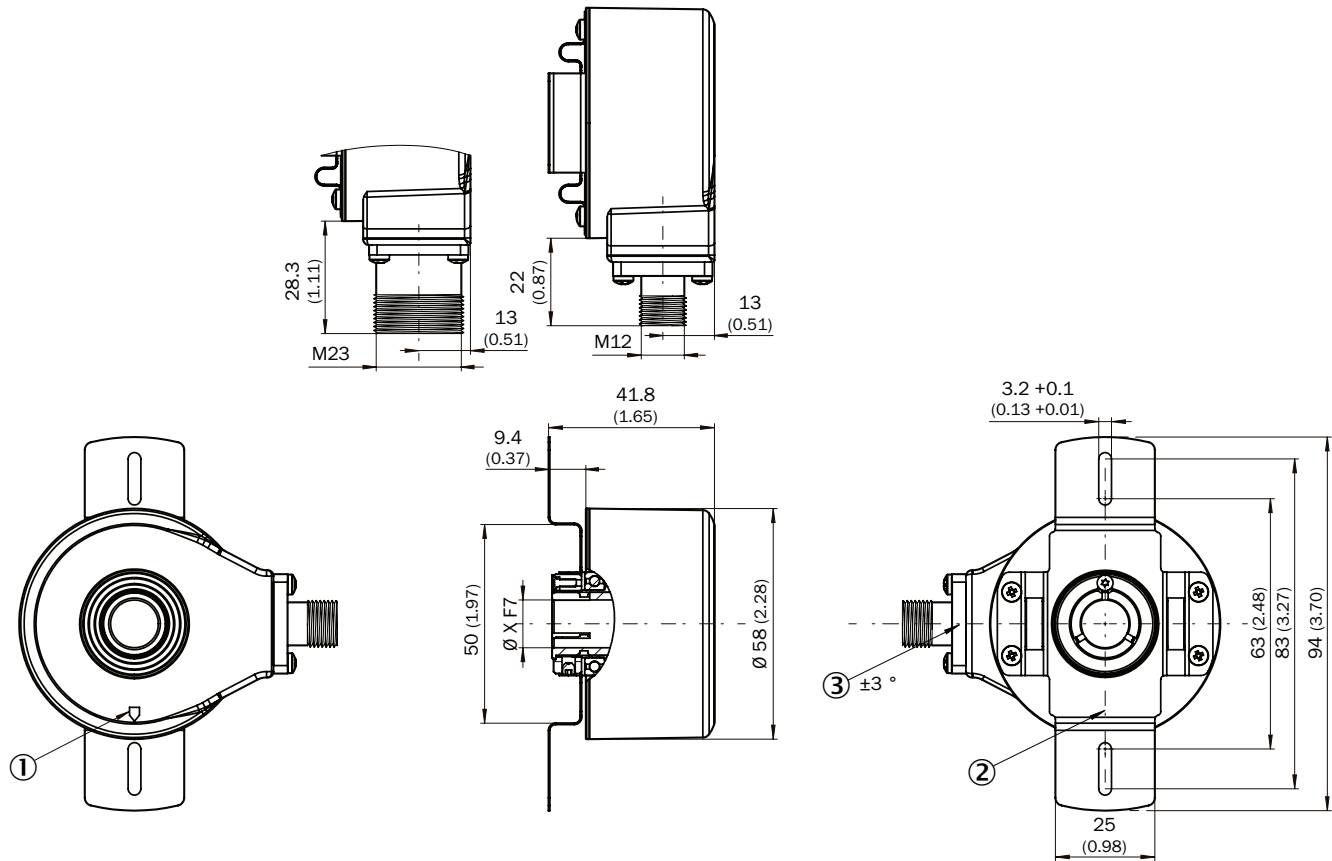
Through hollow shaft clamping at the back, cable connection, 2-sided stator coupling, screw hole circle 63 mm



XF7 values see shaft diameter table for through hollow shaft, clamping at the back

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange under stator coupling

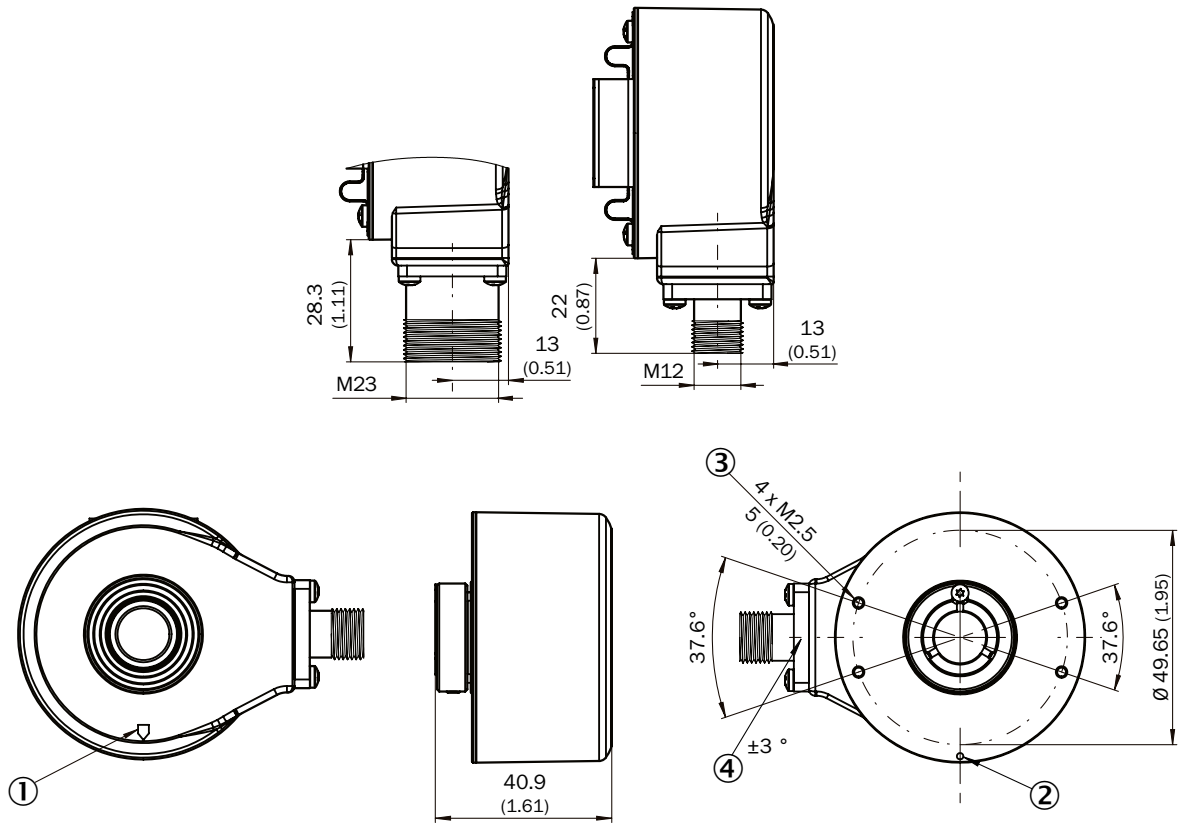
Through hollow shaft clamping at the front, male connector connection, 2-sided stator coupling, slot, screw hole circle 63–83 mm



- ① Zero pulse mark on housing
- ② Zero pulse mark on flange under stator coupling
- ③ Male connector tolerance in relation to hole pattern

Type Through hollow shaft, front clamping	Shaft diameter XF7
DBS60x-TAxxxxxxx DBS60x-T1xxxxxxx	6 mm
DBS60x-TBxxxxxxx DBS60x-T2xxxxxxx	8 mm
DBS60x-TCxxxxxxx DBS60x-T3xxxxxxx	3/8 "
DBS60x-TDxxxxxxx DBS60x-T4xxxxxxx	10 mm
DBS60x-TExxxxxxx DBS60x-T5xxxxxxx	12 mm
DBS60x-TFxxxxxxx DBS60x-T6xxxxxxx	1/2 "
DBS60x-TGxxxxxxx DBS60x-T7xxxxxxx	14 mm
DBS60x-THxxxxxxx DBS60x-T8xxxxxxx	15 mm
DBS60x-TJxxxxxxx	5/8 "
Shaft diameter 1,2,3,4,5,6,7,8 with isolated shaft	

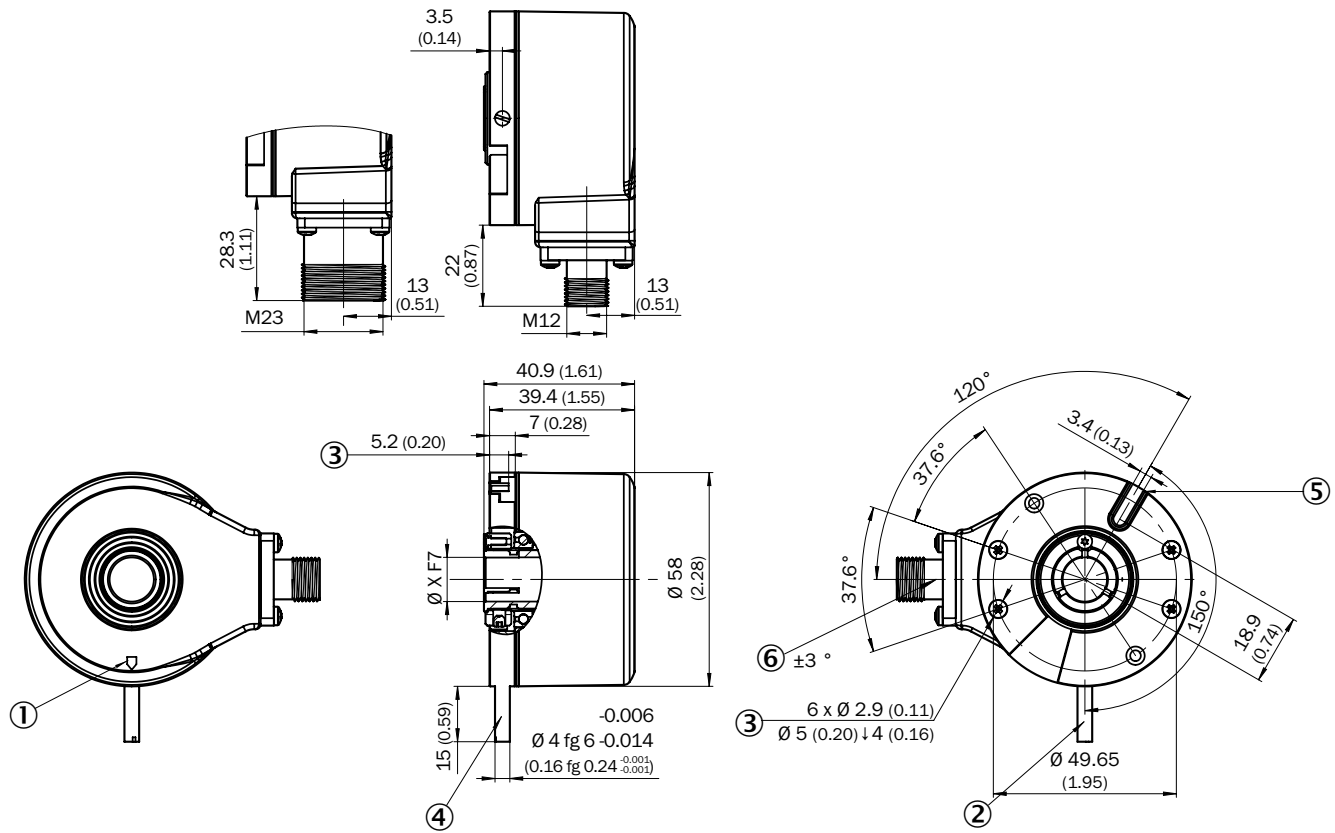
Through hollow shaft clamping at the front, male connector connection, without stator coupling, flange with 4 x M2.5



XF7 values see shaft diameter table for through hollow shaft, clamping at the front

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange
- ③ Depth
- ④ Male connector tolerance in relation to hole pattern

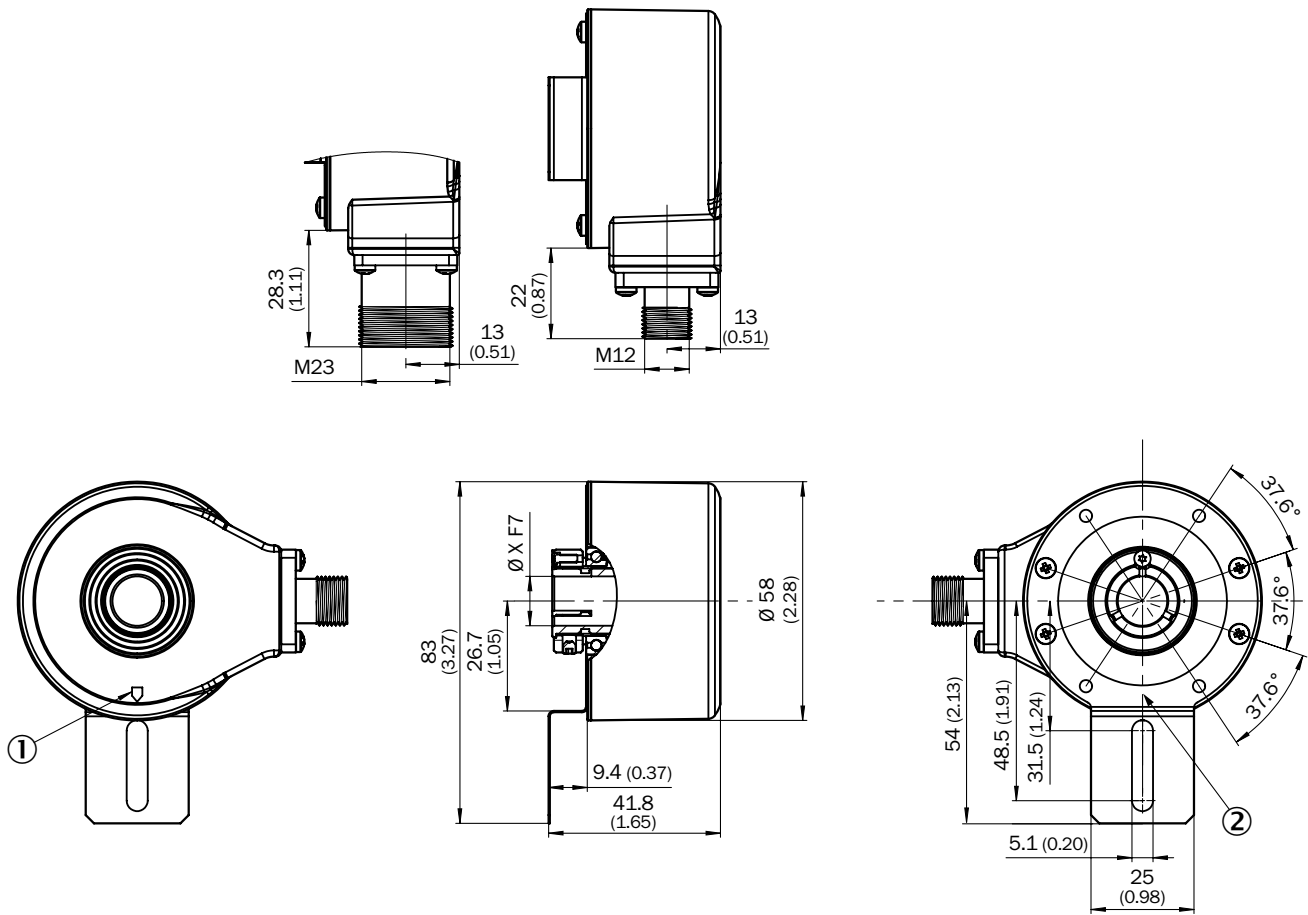
Through hollow shaft clamping at the front, male connector connection, axial and radial register pin mounting, for 4 mm register pin



XF7 values see shaft diameter table for through hollow shaft, clamping at the front

- 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
- ⑥ Male connector tolerance in relation to hole pattern

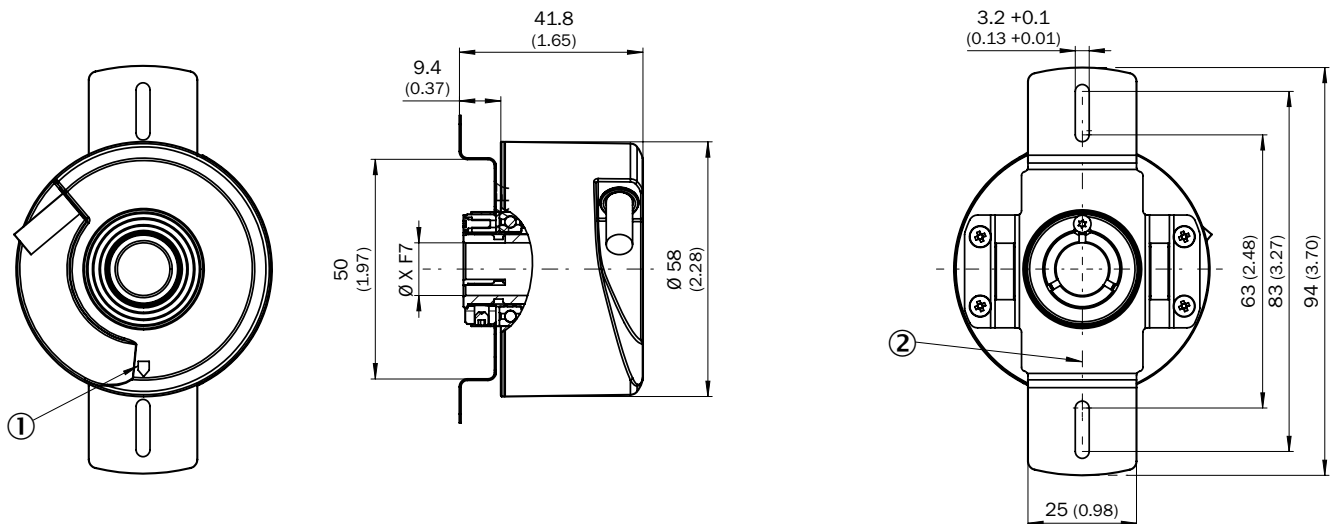
Through hollow shaft clamping at the front, male connector connection, 1-sided stator coupling, slot, screw hole circle radius 31.5–48.5 mm



XF7 values see shaft diameter table for through hollow shaft, clamping at the front

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange under stator coupling
- ③ Male connector tolerance in relation to hole pattern

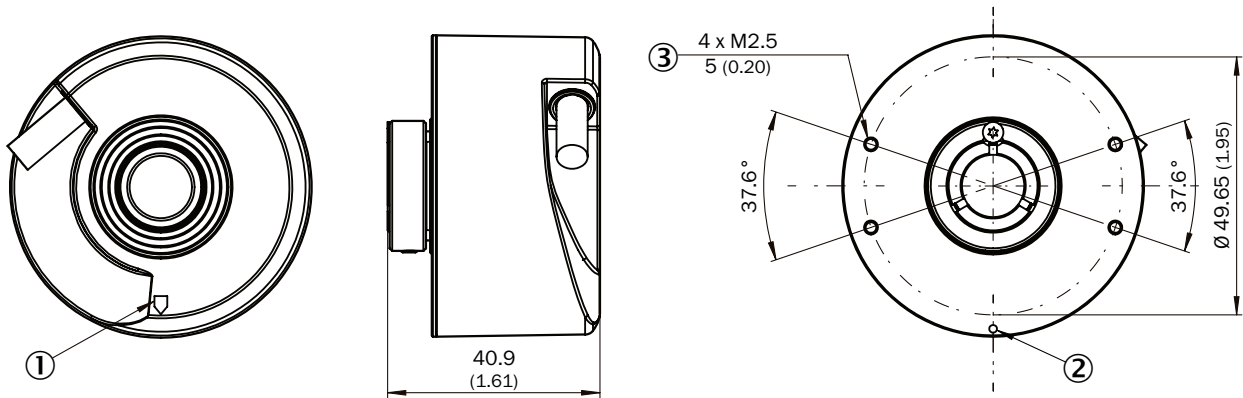
Through hollow shaft clamping at the front, cable connection, 2-sided stator coupling, slot, screw hole circle 63–83 mm



XF7 values see shaft diameter table for through hollow shaft, clamping at the front

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange under stator coupling

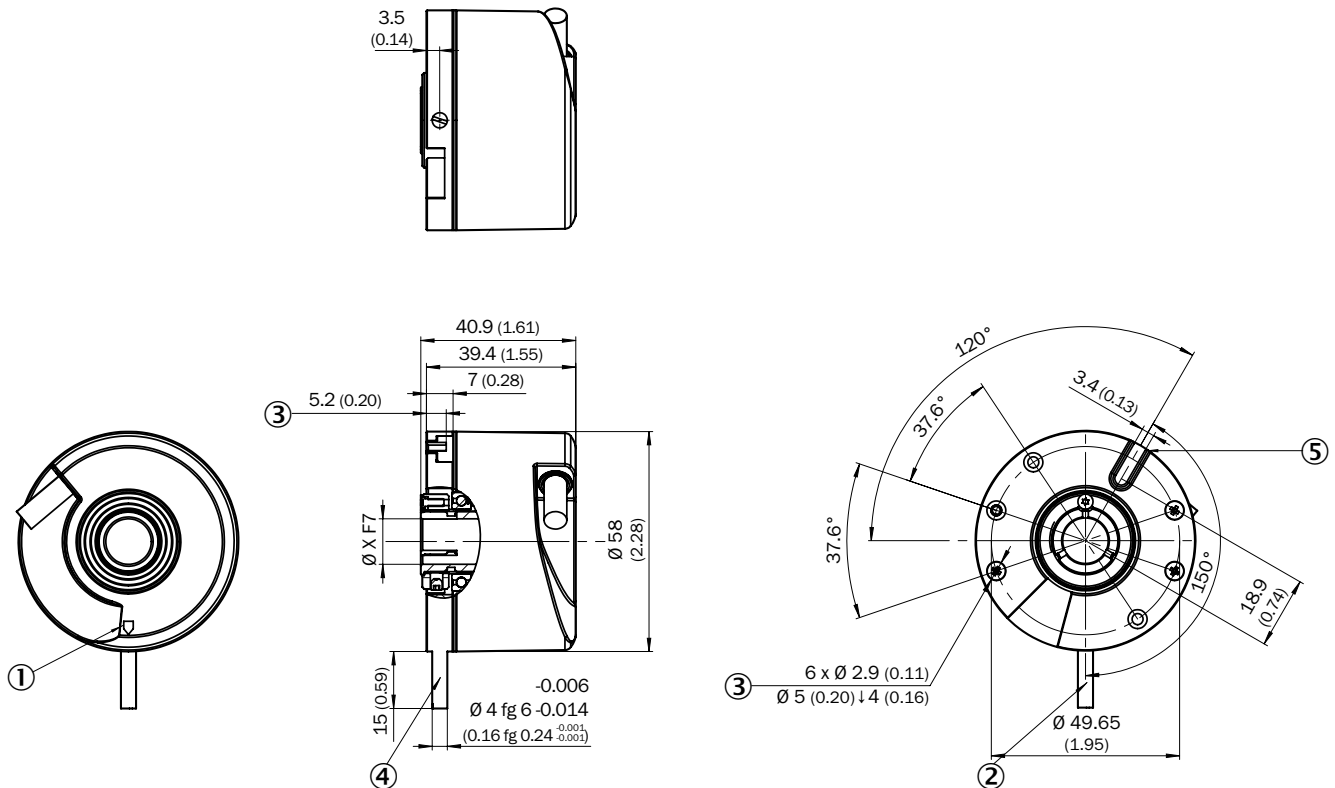
Through hollow shaft clamping at the front, cable connection, without stator coupling, flange with 4 x M2.5



XF7 values see shaft diameter table for through hollow shaft, clamping at the front

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange under stator coupling
- ③ Depth

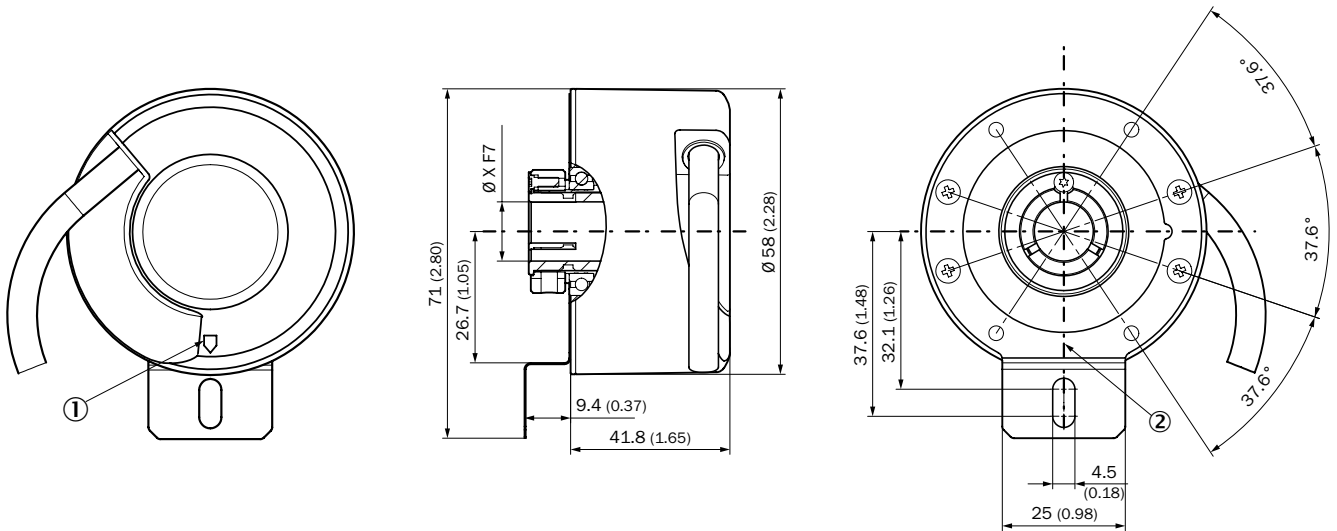
Through hollow shaft clamping at the front, cable connection, axial and radial register pin mounting, for 4 mm register pin



XF7 values see shaft diameter table for through hollow shaft, clamping at the front

- 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

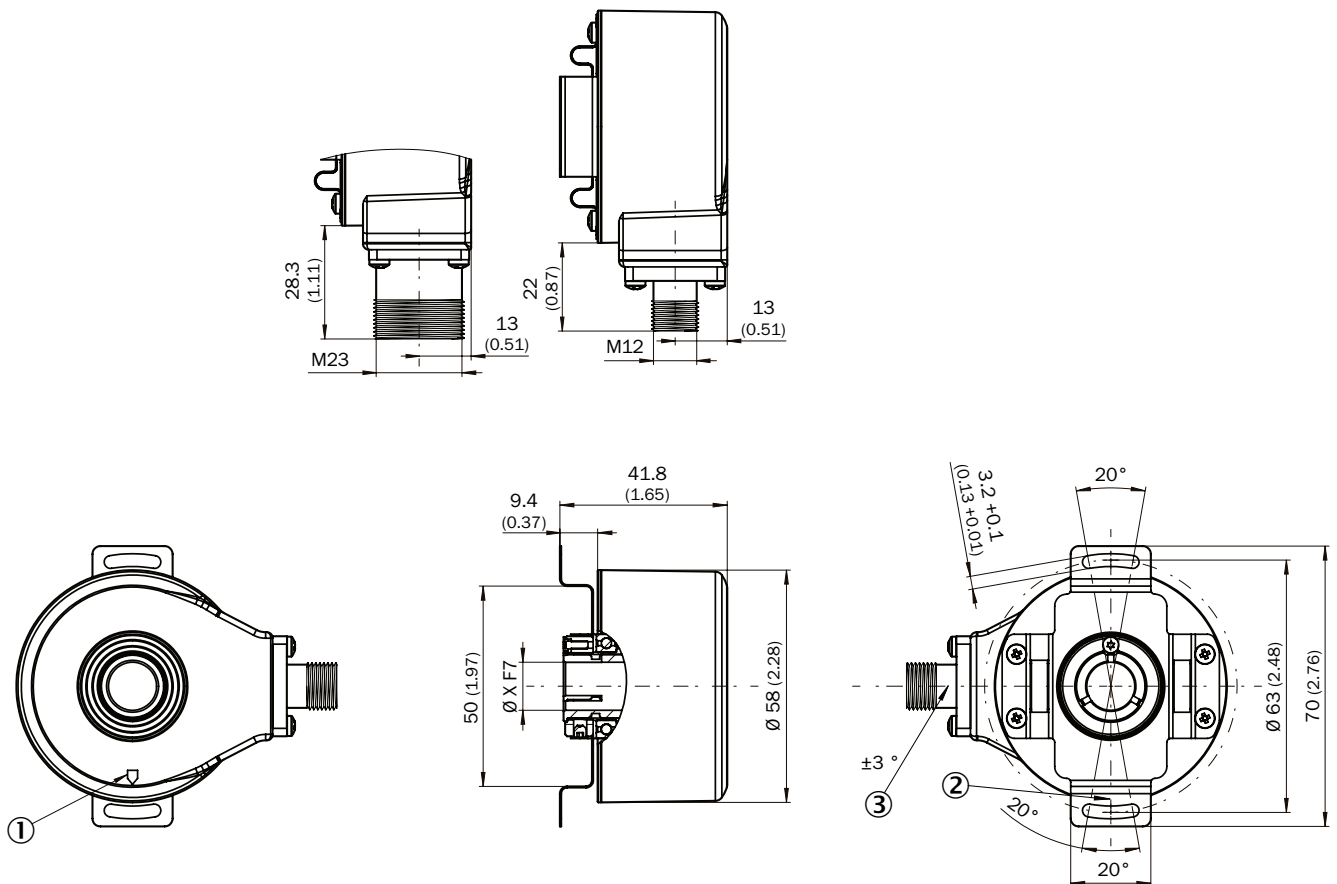
Through hollow shaft clamping at the front, cable connection, 1-sided stator coupling, slot, screw hole circle radius 31.5-48.5 mm



XF7 values see shaft diameter table for through hollow shaft, clamping at the front

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange under stator coupling

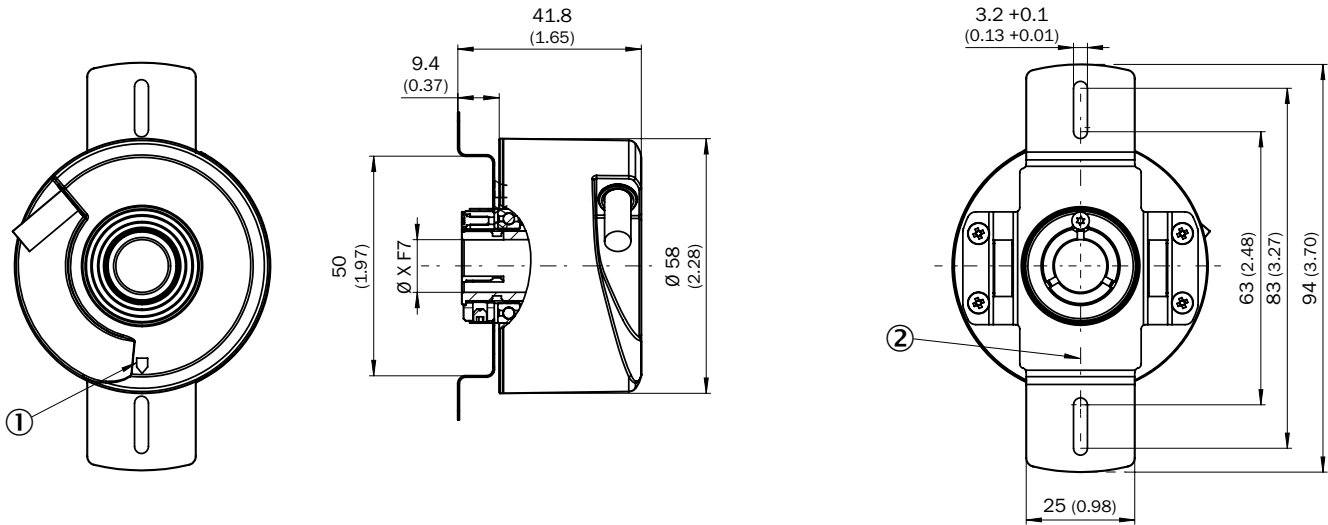
Through hollow shaft clamping at the front, male connector connection, 2-sided stator coupling, screw hole circle 63 mm



XF7 values see shaft diameter table for through hollow shaft, clamping at the front

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange under stator coupling
- ③ Male connector tolerance in relation to hole pattern

Through hollow shaft clamping at the front, cable connection, 2-sided stator coupling, screw hole circle 63 mm

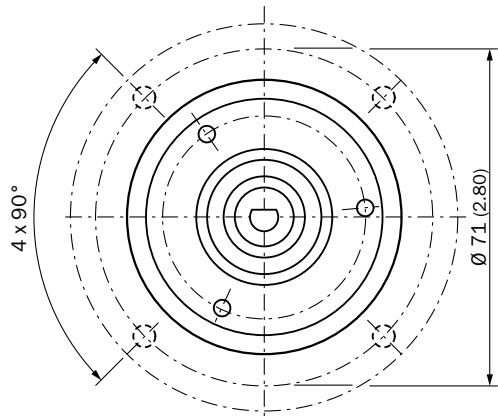


XF7 values see shaft diameter table for through hollow shaft, clamping at the front

- ① Zero pulse mark on housing
- ② Zero pulse mark on flange under stator coupling

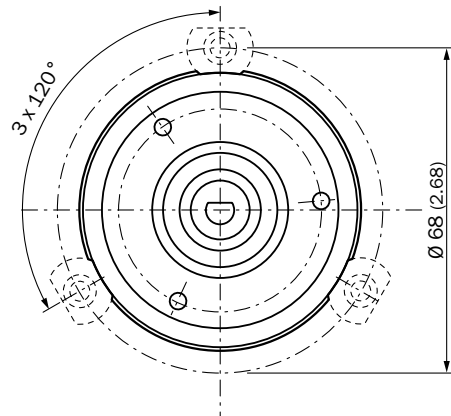
Proposed fitting

Proposed customer fitting for servo clamp half-shell (part no. 2029165)



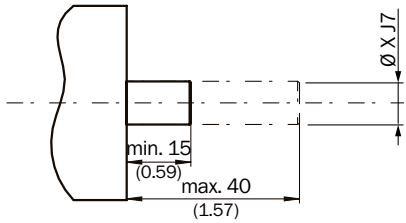
All dimensions in mm (inch)

Proposed customer fitting for servo clamp small (part no. 2029166)



All dimensions in mm (inch)

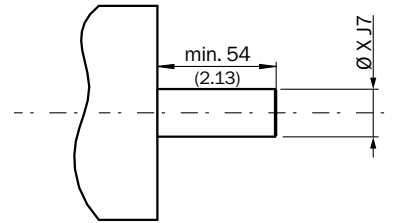
Blind hollow shaft



Customer side

Type	Shaft diameter xj7
Blind hollow shaft	
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 "
Shaft diameter 1,2,3,4,5,6,7,8 with isolated shaft	

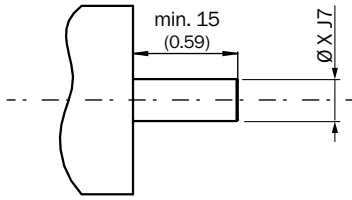
Through hollow shaft with rear clamping



Customer side

Type	Shaft diameter xj7
Through hollow shaft, rear clamping	
DBS60x-RAxxxxxxx DBS60x-R1xxxxxxx	6 mm
DBS60x-RBxxxxxxx DBS60x-R2xxxxxxx	8 mm
DBS60x-RCxxxxxxx DBS60x-R3xxxxxxx	3/8 "
DBS60x-RDxxxxxxx DBS60x-R4xxxxxxx	10 mm
DBS60x-RExxxxxxx DBS60x-R5xxxxxxx	12 mm
DBS60x-RFxxxxxxx DBS60x-R6xxxxxxx	1/2 "
DBS60x-RGxxxxxxx DBS60x-R7xxxxxxx	14 mm
DBS60x-RHxxxxxxx DBS60x-R8xxxxxxx	15 mm
DBS60x-RJxxxxxxx	5/8 "
Shaft diameter 1,2,3,4,5,6,7,8 with isolated shaft	

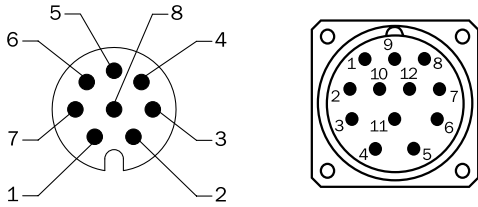
Through hollow shaft with front clamping



Customer side

Type Through hollow shaft, front clamping	Shaft diameter xj7
DBS60x-TAxxxxxxx DBS60x-T1xxxxxxx	6 mm
DBS60x-TBxxxxxxx DBS60x-T2xxxxxxx	8 mm
DBS60x-TCxxxxxxx DBS60x-T3xxxxxxx	3/8 "
DBS60x-TDxxxxxxx DBS60x-T4xxxxxxx	10 mm
DBS60x-TExxxxxxx DBS60x-T5xxxxxxx	12 mm
DBS60x-TFxxxxxxx DBS60x-T6xxxxxxx	1/2 "
DBS60x-TGxxxxxxx DBS60x-T7xxxxxxx	14 mm
DBS60x-THxxxxxxx DBS60x-T8xxxxxxx	15 mm
DBS60x-TJxxxxxxx	5/8 "
Shaft diameter 1,2,3,4,5,6,7,8 with isolated shaft	

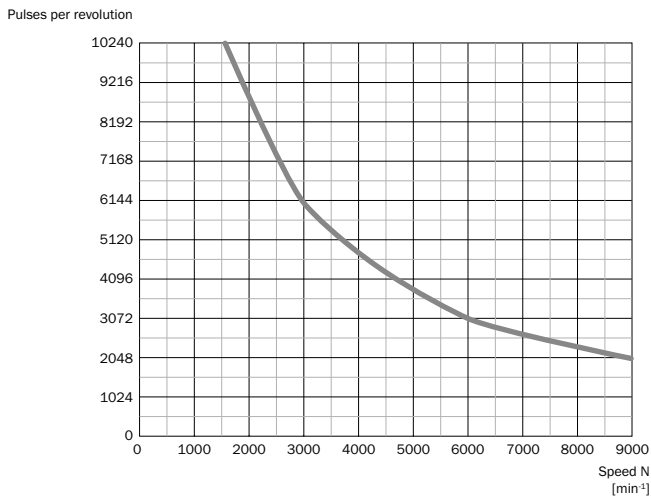
PIN assignment



View of M12 / M23 male device connector on cable / housing

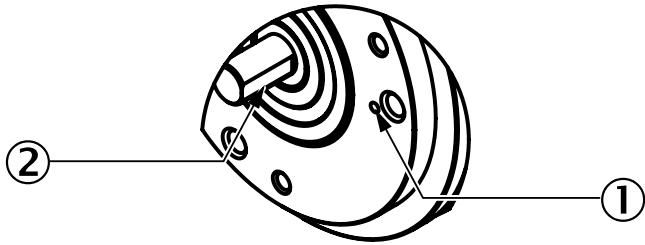
Colour of wires	M12, 8-pin	M23, 12-pin	Signal TTL/HTL	Explanation
Brown	1	6	A-	Signal line
White	2	5	A	Signal line
Black	3	1	B-	Signal line
Pink	4	8	B	Signal line
Yellow	5	4	Z-	Signal line
Purple	6	3	Z	Signal line
Blue	7	10	GND	Ground connection of the encoder
Red	8	12	+U _s	Supply voltage
-	-	9	Not connected	Not connected
-	-	2	Not connected	Not connected
-	-	11	Not connected	Not connected
-	-	7	Not connected	Not connected
Screen	Screen	Screen	Screen	Screen (screen connected to encoder housing)

Maximum revolution range



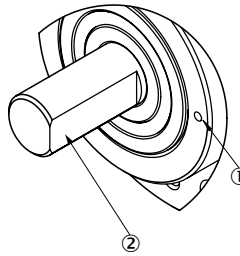
Zero pulse explanation

Solid shaft, servo flange



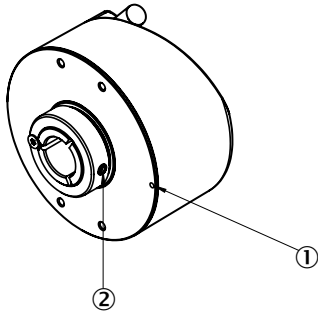
- ① Zero pulse mark on flange
- ② Zero pulse is active when shaft with flat is inline for zero mark alignment with zero mark on flange

Solid shaft, face mount flange



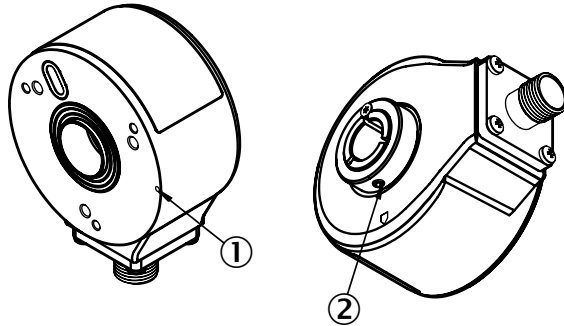
- ① Zero pulse mark on flange
- ② Zero pulse is active when shaft with flat is inline for zero mark alignment with zero mark on flange

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

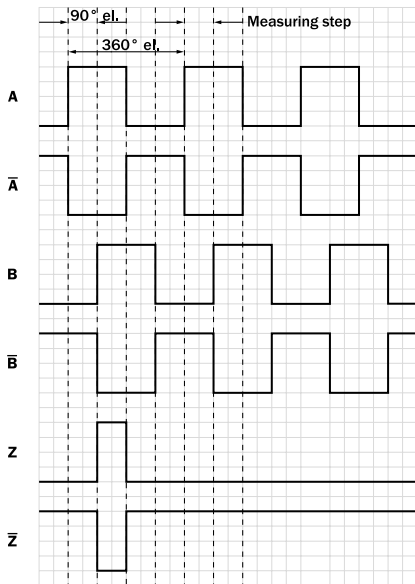
Through hollow shaft with rear clamping



- 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

Signal outputs

Signal outputs for electrical interfaces TTL and HTL



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

Supply voltage	Outlet
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






Accessories

Mounting systems

Flanges

Flange plates



Figure	Brief description	Type	Part no.
	Two-sided stator coupling, screw hole circle diameter 63 mm, slot width 3.2 mm	BEF-DS-09	2076214
	Two-sided stator coupling, slot, slot radius 63 mm – 83 mm, slot width 3.2 mm	BEF-DS-10	2076215
	One-sided stator coupling, slots, slot radius 32.75 mm – 142.65 mm, slot width 4.5 mm	BEF-DS-11	2076216
	Torque support, 1-sided, slotted hole, screw hole radius 33 mm - 48.5 mm, hole width 5.1 mm	BEF-DS-12	2076217
	Flange adapter (for hollow shaft) for register pin mounting (pin 4 mm)	BEF-DS-13	2076218
	One-sided stator coupling, slot, slot radius 32.1 mm – 37.6 mm, slot width 4.5 mm	BEF-DS-14	2076678

Figure	Brief description	Type	Part no.
	Flange adapter, adaptation of face mount flange with 36 mm centering hub to 50 mm servo flange, aluminum, including 3 flat head screws M4 x 10, Aluminum, including 3 countersunk screws M4 x 10	BEF-FA-036-050	2029160
	Flange adapter, adaptation of face mount flange with 36 mm centering hub to 60 mm square mounting plate, aluminum, including 3 flat head screws M4 x 8, Aluminum, including 3 countersunk screws M4 x 8	BEF-FA-036-060REC	2029162
	Flange adapter, adaptation of face mount flange with 36 mm centering hub to 58 mm square mounting plate with shock absorbers, aluminum, Aluminum	BEF-FA-036-060RSA	2029163
	Flange adapter, adaptation of face mount flange with 36 mm centering hub to 63 mm square mounting plate, aluminum, including 3 flat head screws M4 x 10, Aluminum, including 3 countersunk screws M4 x 10	BEF-FA-036-063REC	2034225
	Flange adapter, adaptation of face mount flange with 36 mm centering hub to 100 mm servo flange with 60 mm centering hub, aluminum, Aluminum	BEF-FA-036-100	2029161

Dimensional drawings → [page 49](#)

Mounting brackets and plates

Mounting brackets

Figure	Brief description	Type	Part no.
	Mounting bracket for encoder with spigot 36 mm for face mount flange, mounting kit included	BEF-WF-36	2029164
	Mounting angle spring-loaded, for flange with centerring collar 36 mm, working temperature range -40° ... +120°C, Aluminum	BEF-WF36F	4084775

Dimensional drawings → [page 51](#)

Other mounting accessories

Measuring wheels and measuring wheel systems


















Figure	Brief description	Type	Part no.
	Plastic measuring wheel with smooth plastic surface (Hytrel), for 10 mm solid shaft, circumference 200 mm	BEF-MR-010020	5312988
	Measuring wheel with ridged plastic surface (Hytrel) for 10 mm solid shaft, circumference 200 mm	BEF-MR-010020G	5318678
	Plastic measuring wheel with smooth plastic surface (Hytrel) for 10 mm solid shaft, circumference 500 mm	BEF-MR-010050	5312989
	Aluminium measuring wheel with O-ring (NBR70) for 6 mm solid shaft, circumference 200 mm	BEF-MR006020R	2055222
	Measuring wheel with O-ring (NBR70) for 6 mm solid shaft, circumference 300 mm	BEF-MR006030R	2055634
	Aluminium measuring wheel with O-ring (NBR70) for 6 mm solid shaft, circumference 500 mm	BEF-MR006050R	2055225
	Aluminium measuring wheel with O-ring (NBR70) for 10 mm solid shaft, circumference 200 mm	BEF-MR010020R	2055224
	Aluminium measuring wheel with O-ring (NBR70) for 10 mm solid shaft, circumference 300 mm	BEF-MR010030R	2049278
	Measuring wheel with O-ring (NBR70) for 10 mm solid shaft, circumference 500 mm	BEF-MR010050R	2055227
	Aluminum measuring wheel with cross-knurled surface for 6 mm solid shaft, circumference 200 mm	BEF-MR06200AK	4084745

Figure	Brief description	Type	Part no.
	Aluminum measuring wheel with smooth polyurethane surface for 6 mm solid shaft, circumference 200 mm	BEF-MR06200AP	4084746
	Aluminum measuring wheel with ridged polyurethane surface for 6 mm solid shaft, circumference 200 mm	BEF-MR06200APG	4084748
	Aluminum measuring wheel with studded polyurethane surface for 6 mm solid shaft, circumference 200 mm	BEF-MR06200APN	4084747
	Aluminum measuring wheel with cross-knurled surface for 10 mm solid shaft, circumference 200 mm	BEF-MR10200AK	4084737
	Aluminum measuring wheel with smooth polyurethane surface for 10 mm solid shaft, circumference 200 mm	BEF-MR10200AP	4084738
	Aluminum measuring wheel with ridged polyurethane surface for 10 mm solid shaft, circumference 200 mm	BEF-MR10200APG	4084740
	Aluminum measuring wheel with studded polyurethane surface for 10 mm solid shaft, circumference 200 mm	BEF-MR10200APN	4084739
	Aluminum measuring wheel with cross-knurled surface for 10 mm solid shaft, circumference 500 mm	BEF-MR10500AK	4084733
	Aluminum measuring wheel with smooth polyurethane surface for 10 mm solid shaft, circumference 500 mm	BEF-MR10500AP	4084734
	Aluminum measuring wheel with ridged polyurethane surface for 10 mm solid shaft, circumference 500 mm	BEF-MR10500APG	4084736
	Aluminum measuring wheel with studded polyurethane surface for 10 mm solid shaft, circumference 500 mm	BEF-MR10500APN	4084735
	O-ring for measuring wheels (circumference 200 mm)	BEF-OR-053-040	2064061
	O-ring for measuring wheels (circumference 300 mm)	BEF-OR-083-050	2064076
	O-ring for measuring wheels (circumference 500 mm)	BEF-OR-145-050	2064074


Dimensional drawings → [page 52](#)

Modular measuring wheel system

Figure	Brief description	Type	Part no.
	SICK modular measuring wheel system for face mount flange encoder with S4 mechanical design (10 x 19 mm solid shaft), e.g., DFS60-S4	BEF-MRS-10-U	2085714



Dimensional drawings → [page 52](#)

Mounting bells

Figure	Brief description	Type	Part no.
	Mounting bell for encoder with servo flange, 50 mm spigot, mounting kit included	BEF-MG-50	5312987



Dimensional drawings → [page 52](#)

Others

Figure	Brief description	Type	Part no.
	Flange adapter (adapts size 60 face mount flange encoder to bearing block with part. no. 2044591)	BEF-FA-036-050-019	2063378
	Bearing bracket for hollow shaft encoders, fastening screws included the Bearing Block is intended for very large radial and axial shaft loads. Particularly for application on: Belt pulleys, Chain pinions, Friction wheels. It is designed this way to enable fitting of encoder with blind hollow shaft with \varnothing 12 mm., fastening screws included	BEF-FA-B12-010	2042728
	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.	BEF-FA-LB1210	2044591
	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, 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	BEF-MK-LB	5320872

Dimensional drawings → [page 52](#)

Servo clamps

Figure	Brief description	Type	Part no.
	Half-shell servo clamps (2 pcs.) for servo flanges with a 50 mm centering hub	BEF-WG-SF050	2029165
	Servo clamps, large, for servo flanges (clamps, eccentric fastener), 3 pcs., without mounting material, without mounting hardware	BEF-WK-SF	2029166

Dimensional drawings → [page 52](#)

Shaft adaptation

Collets and clamping rings




















Figure	Brief description	Type	Part no.
	Collet plastic insulated for hollow shaft, shaft diameter 6 mm, outer diameter 5/8" (15.875 mm), plastic	SPZ-58Z-006-P	2076228
	Collet metal for hollow shaft, shaft diameter 8 mm, outer diameter 5/8" (15.875 mm), metal	SPZ-58Z-008-M	2076219
	Collet plastic insulated for hollow shaft, shaft diameter 8 mm, outer diameter 5/8" (15.875 mm), plastic	SPZ-58Z-008-P	2076229
	Collet metal for hollow shaft, shaft diameter 10 mm, outer diameter 5/8" (15.875 mm), metal	SPZ-58Z-010-M	2076220
	Collet plastic insulated for hollow shaft, shaft diameter 10 mm, outer diameter 5/8" (15.875 mm), plastic	SPZ-58Z-010-P	2076230
	Collet metal for hollow shaft, shaft diameter 11 mm, outer diameter 5/8" (15.875 mm), metal	SPZ-58Z-011-M	2094671
	Collet metal for hollow shaft, shaft diameter 12 mm, outer diameter 5/8" (15.875 mm), metal	SPZ-58Z-012-M	2076221
	Collet plastic insulated for hollow shaft, shaft diameter 12 mm, outer diameter 5/8" (15.875 mm), plastic	SPZ-58Z-012-P	2076231

Figure	Brief description	Type	Part no.
	Collet metal for hollow shaft, shaft diameter 14 mm, outer diameter 5/8" (15.875 mm), metal	SPZ-58Z-014-M	2076222
	Collet plastic insulated for hollow shaft, shaft diameter 14 mm, outer diameter 5/8" (15.875 mm), plastic	SPZ-58Z-014-P	2076232
	Collet metal for hollow shaft, shaft diameter 15 mm, outer diameter 5/8" (15.875 mm), metal	SPZ-58Z-015-M	2076223
	Collet plastic insulated for hollow shaft, shaft diameter 15 mm, outer diameter 5/8" (15.875 mm), plastic	SPZ-58Z-015-P	2076233
	Collet metal for hollow shaft, shaft diameter 1/2" (12.7 mm), outer diameter 5/8" (15.875 mm), metal	SPZ-58Z-12Z-M	2076225
	Collet plastic insulated for hollow shaft, shaft diameter 1/2" (12.7 mm), outer diameter 5/8" (15.875 mm), plastic	SPZ-58Z-12Z-P	2076227
	Collet metal for hollow shaft, shaft diameter 3/8" (9.525 mm), outer diameter 5/8" (15.875 mm), metal	SPZ-58Z-38Z-M	2076224
	Collet plastic insulated for hollow shaft, shaft diameter 3/8" (9.525 mm), outer diameter 5/8" (15.875 mm), plastic	SPZ-58Z-38Z-P	2076226

Dimensional drawings → page 55

Shaft couplings

Figure	Brief description	Type	Part no.
	Bellows coupling, shaft diameter 6 mm / 6 mm, maximum shaft offset: radial ± 0.25 mm, axial ± 0.4 mm, angular +/- 4°; max. speed 10,000 rpm, -30 °C to +120 °C, max. torque 80 Ncm; material: stainless steel bellows, aluminum hub	KUP-0606-B	5312981
	Bar coupling, shaft diameter 6 mm / 6 mm, maximum shaft offset: radial ± 0.3 mm, axial ± 0.2 mm, angle ± 3°; max. speed 10,000 rpm, -10° to +80 °C, max. torque 80 Ncm; material: fiber-glass reinforced polyamide, aluminum hub	KUP-0606-S	2056406
	Bar coupling, shaft diameter 6 mm / 8 mm, maximum shaft offset radial ± 0.3 mm, axial ± 0.2 mm, angle ± 3°, max. speed 10,000 rpm, torsion spring rigidity 38 Nm/wheel; material: fiber-glass reinforced polyamide, aluminum hub	KUP-0608-S	5314179
	Bellows coupling, shaft diameter 6 mm / 10 mm, maximum shaft offset: radial ± 0.25 mm, axial ± 0.4 mm, angular +/- 4°; max. speed 10,000 rpm, -30 °C to +120 °C, max. torque 80 Ncm; material: stainless steel bellows, aluminum hub	KUP-0610-B	5312982
	Double loop coupling, shaft diameter 6 mm / 10 mm, max. shaft offset: radially +/- 2,5 mm, axially +/- 3 mm, angle +/- 10 degrees; max. speed 3.000 rpm, -30 to +80 degrees Celsius, torsional spring stiffness of 25 Nm/rad	KUP-0610-D	5326697
	Spring washer coupling, shaft diameter 6 mm / 10 mm, Maximum shaft offset: radial +/- 0.3 mm, axial +/- 0.4 mm, angular +/- 2.5°; max. speed 12,000 rpm, -10° to +80 °C, max. torque 60 Ncm; material: aluminum flange, glass fiber-reinforced polyamide membrane and hardened steel coupling pin	KUP-0610-F	5312985
	Bar coupling, shaft diameter 6 mm / 10 mm, max. shaft offset: radial ± 0,3 mm, axial ± 0,3 mm, angular ± 3°; max. speed 10.000 rpm, -10° to +80 °C, max. torque: 80 Ncm, material: fiber-glass reinforced polyamide, aluminum hub	KUP-0610-S	2056407
	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
	Bar coupling, shaft diameter 8 mm / 10 mm, max. shaft offset: radial ± 0,3 mm, axial ± 0,3 mm, angular ± 3°; max. speed 10.000 rpm, -10° to +80 °C, max. torque: 80 Ncm, material: fiber-glass reinforced polyamide, aluminum hub	KUP-0810-S	5314178
	Bellows coupling, shaft diameter 10 mm/10 mm; maximum shaft offset: radial +/- 0.25 mm, axial +/- 0.4 mm, angular +/- 4°; max. revolutions 10,000 rpm, -30° to +120 °C, max. torque 80 Ncm; material: stainless steel bellows, aluminum clamping hubs	KUP-1010-B	5312983

Figure	Brief description	Type	Part no.
	Double loop coupling, shaft diameter 10 mm / 10 mm, Maximum shaft offset: radial +/- 2.5 mm, axial +/- 3 mm, angular +/- 10°; max. speed 3,000 rpm, -30° to +80 °C, max. torque 1.5 Nm; material: polyurethane, galvanized steel flange	KUP-1010-D	5326703
	Spring washer coupling, shaft diameter 10 mm / 10 mm, maximum shaft offset, radial ± 0.3 mm, axial ± 0.4 mm, angle ± 2.5°, torsion spring stiffness 30 Nm/rad; material: aluminum flange, glass-fiber reinforced polyamide membrane and hardened steel coupling pin	KUP-1010-F	5312986
	Bar coupling, shaft diameter 10 mm / 10 mm; maximum shaft offset: radial ± 0.3 mm, axial ± 0.2 mm, angular ± 3°; speed 10,000 rpm, -10° to +80° Celsius, max. torque 80 Ncm; material: glass fiber-reinforced polyamide, aluminum hub	KUP-1010-S	2056408
	Spring washer coupling, shaft diameter 10 mm / 10 mm, maximum shaft offset, radial ± 0.3 mm, axial ± 0.4 mm, angle ± 2.5°, torsion spring stiffness 30 Nm/rad; material: aluminum flange, glass-fiber reinforced polyamide membrane and hardened steel coupling pin	KUP-1010-W	5319914
	10 mm / 12 mm; maximum shaft offset: radial +/- 0.25 mm, axial +/- 0.4 mm, angular +/- 4°; max. revolutions 10,000 rpm, -30° to +120 °C, max. torque 80 Ncm; material: stainless steel bellows, aluminum clamping hubs	KUP-1012-B	5312984

Dimensional drawings → [page 55](#)

Connection systems

Plug connectors and cables

Cables (ready to assemble)

Figure	Brief description	Type	Part no.
	Head A: cable Head B: open cable ends Cable: SSI, PUR, halogen-free, shielded, 4 x 2 x 0.15 mm ² , 7.8 mm	LTG-2308-MWENC	6027529
	Head A: cable Head B: open cable ends Cable: SSI, PUR, shielded, 4 x 2 x 0.15 mm ² + 2 x 0.5mm ² + 1 x 0.14mm ² , 7.5 mm	LTG-2411-MW	6027530
	Head A: cable Head B: open cable ends Cable: SSI, PUR, halogen-free, shielded, 4 x 2 x 0.25 mm ² + 2 x 0.5 mm ² + 2 x 0.14 mm ² , 7.8 mm	LTG-2512-MW	6027531
	Head A: cable Head B: open cable ends Cable: SSI, PUR, halogen-free, shielded, 4 x 2 x 0.25 mm ² + 2 x 0.5 mm ² + 2 x 0.14 mm ² , 7.8 mm, UV and saltwater-resistant	LTG-2612-MW	6028516

Connecting cables with female connector





Figure	Brief description	Cable length	Type	Part no.
	Head A: female connector, M12, 8-pin, straight Head B: open cable ends Cable: PUR, halogen-free, shielded, 4 x 2 x 0.25 mm ² , 7 mm	2 m	DOL-1208-G02MAC1	6032866
		5 m	DOL-1208-G05MAC1	6032867
		10 m	DOL-1208-G10MAC1	6032868
		20 m	DOL-1208-G20MAC1	6032869
		25 m	DOL-1208-G25MAC1	6067859
	Head A: female connector, M23, 12-pin, straight Head B: open cable ends Cable: Incremental, PUR, shielded, 4 x 2 x 0.25 mm ² + 2 x 0.5 mm ² + 1 x 0.14 mm ² , 7.5 mm	2 m	DOL-2312-G02MLA3	2030682
		3 m	DOL-2312-G03M-MA3	2029213
	Head A: female connector, M23, 12-pin, straight Head B: open cable ends Cable: Incremental, PUR, shielded, 4 x 2 x 0.25 mm ² + 2 x 0,5 mm ² + 2 x 0.14 mm ² , 7.8 mm		5 m	DOL-2312-G05M-MA3

Figure	Brief description	Cable length	Type	Part no.
	Head A: female connector, M23, 12-pin, straight Head B: open cable ends Cable: Incremental, PUR, shielded, 4 x 2 x 0.25 mm ² + 2 x 0.5 mm ² + 1 x 0.14 mm ² , 7.5 mm	7 m	DOL-2312-G07MLA3	2030685
		10 m	DOL-2312-G10MLA3	2030688
	Head A: female connector, M23, 12-pin, straight Head B: open cable ends Cable: Incremental, PUR, shielded, 4 x 2 x 0.25 mm ² + 2 x 0.5 mm ² + 2 x 0.14 mm ² , 7.8 mm	10 m	DOL-2312-G10MMA3	2029215
	Head A: female connector, M23, 12-pin, straight Head B: open cable ends Cable: Incremental, PUR, shielded, 4 x 2 x 0.25 mm ² + 2 x 0.5 mm ² + 1 x 0.14 mm ² , 7.5 mm	15 m	DOL-2312-G15MLA3	2030692
	Head A: female connector, M23, 12-pin, straight Head B: open cable ends Cable: Incremental, PUR, shielded, 4 x 2 x 0.25 mm ² + 2 x 0.5 mm ² + 2 x 0.14 mm ² , 7.8 mm	1.5 m	DOL-2312-G1M5MA3	2029212
	Head A: female connector, M23, 12-pin, straight Head B: open cable ends Cable: Incremental, PUR, shielded, 4 x 2 x 0.25 mm ² + 2 x 0.5 mm ² + 1 x 0.14 mm ² , 7.5 mm	20 m	DOL-2312-G20MLA3	2030695
	Head A: female connector, M23, 12-pin, straight Head B: open cable ends Cable: Incremental, PUR, shielded, 4 x 2 x 0.25 mm ² + 2 x 0.5 mm ² + 2 x 0.14 mm ² , 7.8 mm	20 m	DOL-2312-G20M-MA3	2029216
	Head A: female connector, M23, 12-pin, straight Head B: open cable ends Cable: Incremental, PUR, shielded, 4 x 2 x 0.25 mm ² + 2 x 0.5 mm ² + 1 x 0.14 mm ² , 7.5 mm	25 m	DOL-2312-G25MLA3	2030699
		30 m	DOL-2312-G30MLA3	2030702
	Head A: female connector, M23, 12-pin, straight Head B: open cable ends Cable: Incremental, PUR, shielded, 4 x 2 x 0.25 mm ² + 2 x 0.5 mm ² + 2 x 0.14 mm ² , 7.8 mm	30 m	DOL-2312-G30M-MA3	2029217

Dimensional drawings → page 56

Connection cables with female connector and male connector

Figure	Brief description	Cable length	Type	Part no.
	Head A: female connector, M12, 8-pin, straight, A-coded Head B: male connector, M12, 8-pin, straight, A-coded Cable: PUR, halogen-free, shielded, 4 x 2 x 0.25 mm ² , 7 mm	2 m	YF2AA8-020S01M-KA18	2099207
		5 m	YF2AA8-050S01M-KA18	2099209
		10 m	YF2AA8-100S01M-KA18	2099210
		20 m	YF2AA8-200S01M-KA18	2099208





Dimensional drawings → page 56

Female connectors (ready to assemble)

Figure	Brief description	Type	Part no.
	Head A: female connector, M12, 8-pin, straight, A-coded Head B: - Cable: Incremental, SSI, shielded, CAT5, CAT5e	DOS-1208-GA01	6045001
	Head A: female connector, M23, 12-pin, straight Head B: - Cable: HIPERFACE®, SSI, Incremental, shielded	DOS-2312-G	6027538
	Head A: female connector, M23, 12-pin, straight Head B: - Cable: HIPERFACE®, SSI, Incremental, PBT UL 94-V0, shielded	DOS-2312-G02	2077057
	Head A: female connector, M23, 12-pin, angled Head B: - Cable: HIPERFACE®, SSI, Incremental, shielded	DOS-2312-W01	2072580

Dimensional drawings → [page 56](#)

Male connectors (ready to assemble)

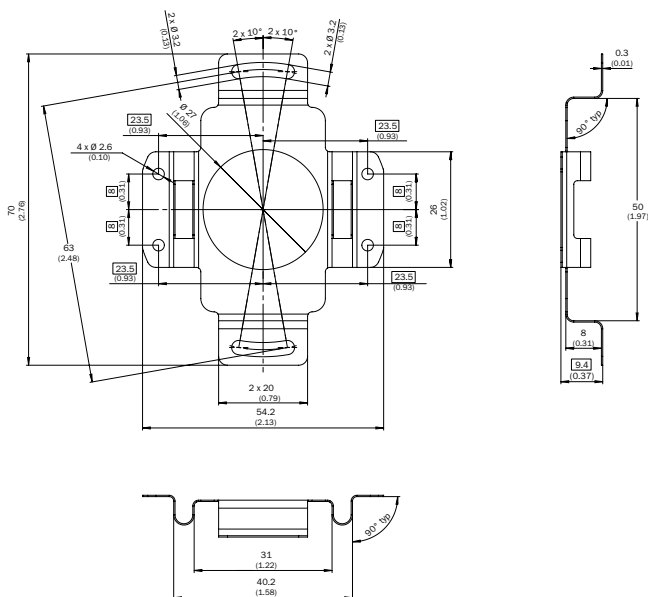
Figure	Brief description	Type	Part no.
	Head A: male connector, M12, 8-pin, straight, A-coded Head B: - Cable: Incremental, shielded, CAT5, CAT5e	STE-1208-GA01	6044892
	Head A: male connector, M23, 12-pin, straight Head B: - Cable: HIPERFACE®, SSI, Incremental, RS-422, shielded	STE-2312-G	6027537
	Head A: male connector, M23, 12-pin, straight Head B: - Cable: HIPERFACE®, SSI, Incremental, PBT UL 94-V0, shielded	STE-2312-G01	2077273
	Head A: male connector, M23, 12-pin, straight Head B: - Cable: HIPERFACE®, SSI, Incremental, shielded	STE-2312-GX	6028548

Dimensional drawings → [page 56](#)

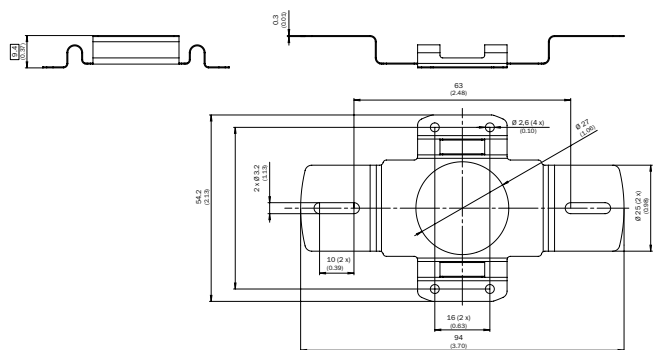
Dimensional drawings for accessories (Dimensions in mm (inch))

Flanges

BEF-DS-09

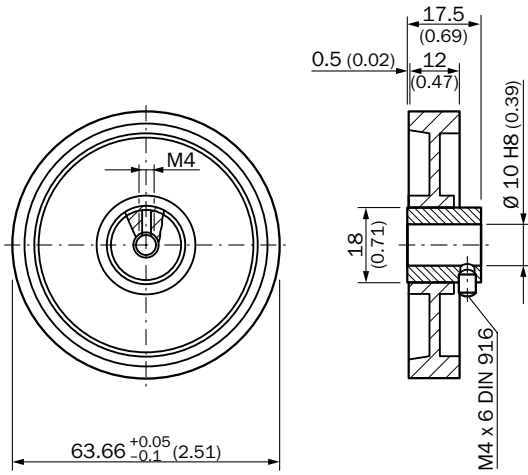


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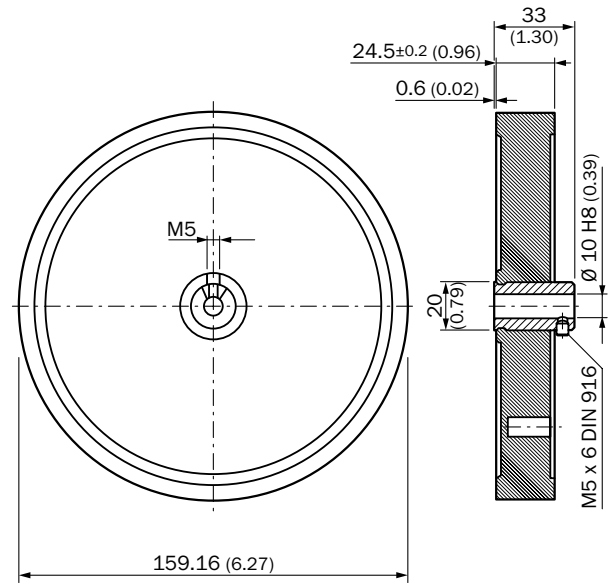


Other mounting accessories

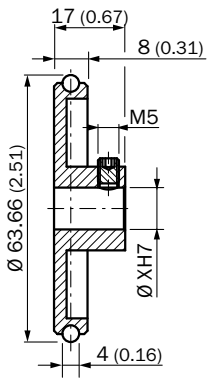
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BEF-MR-010020G



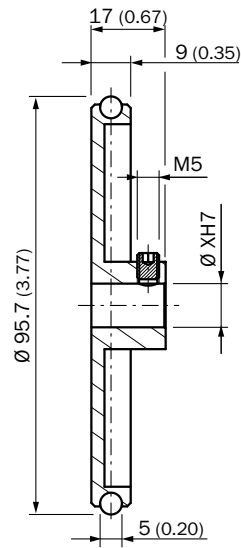
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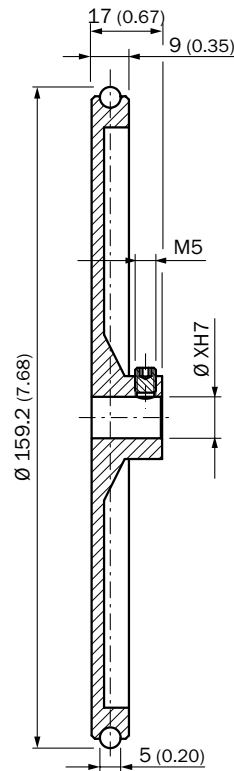
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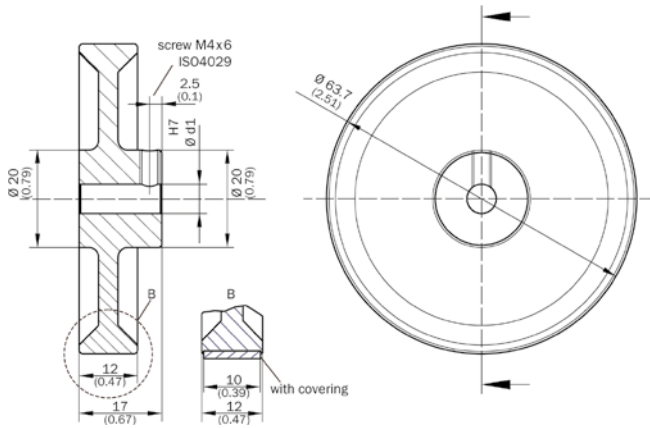
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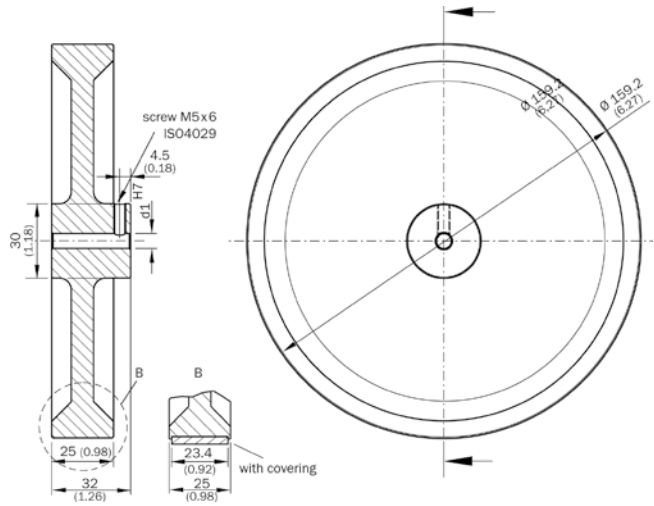
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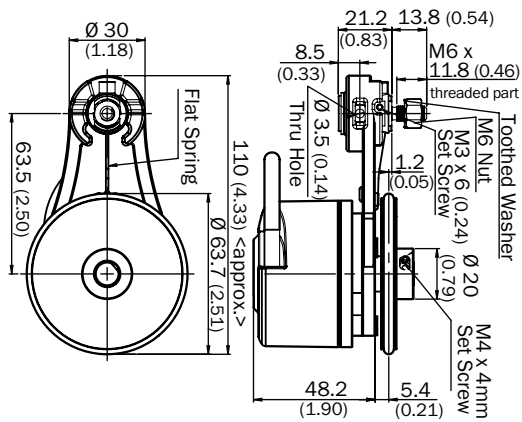
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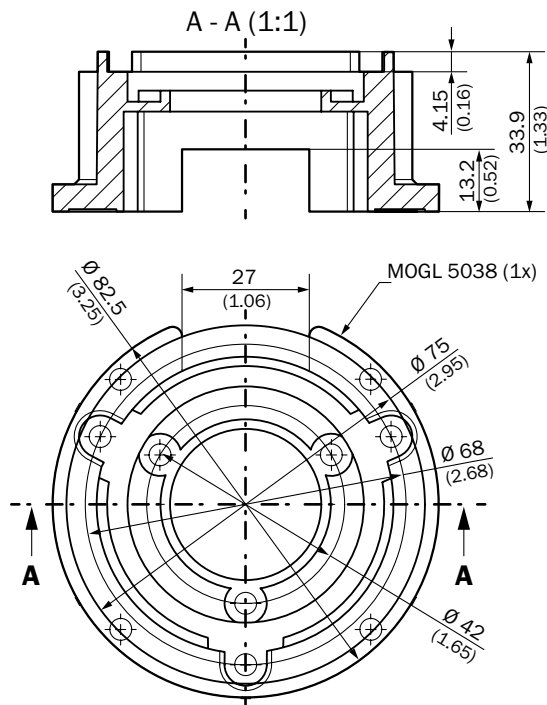
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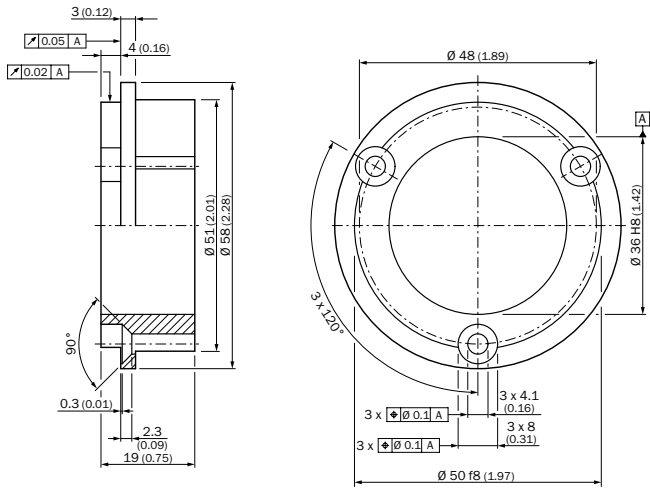
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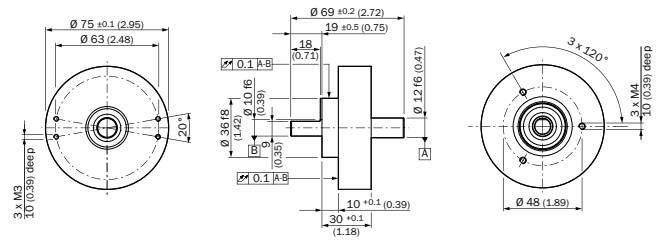
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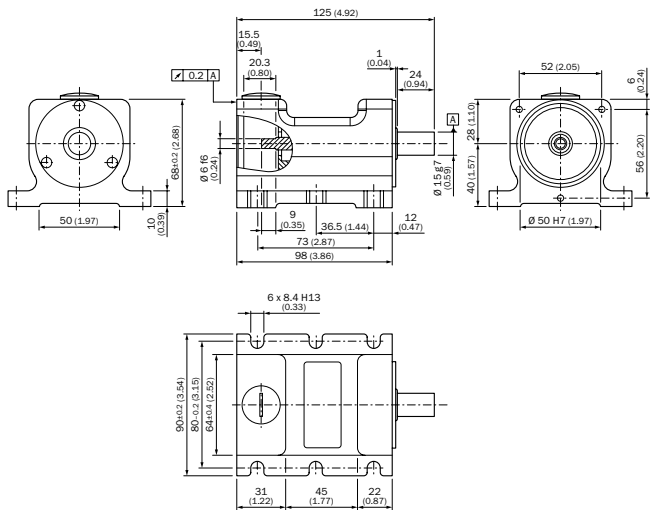
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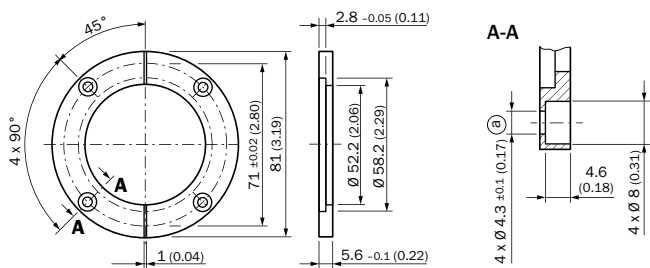
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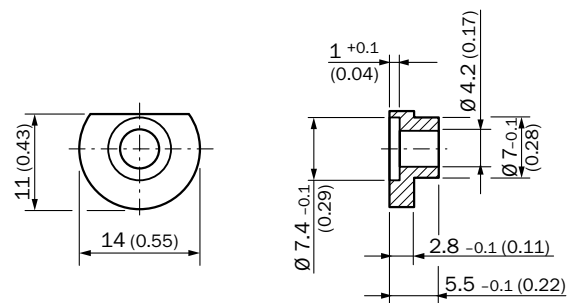
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BEF-WG-SF050

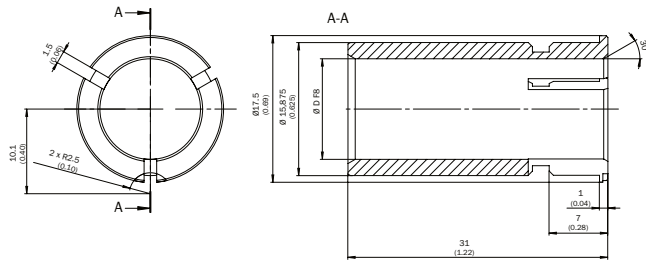


BEF-WK-SF



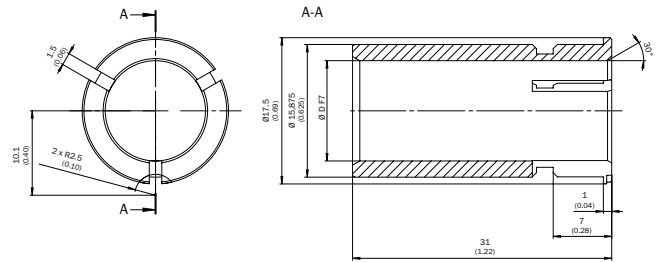
Shaft adaptation

SPZ-58Z-xxx-P



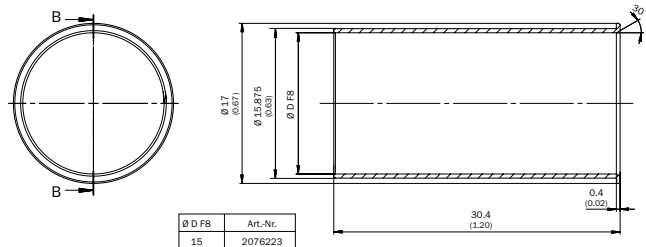
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12	2076231
1/2" (12.7)	2076227

SPZ-58Z-xxx-M



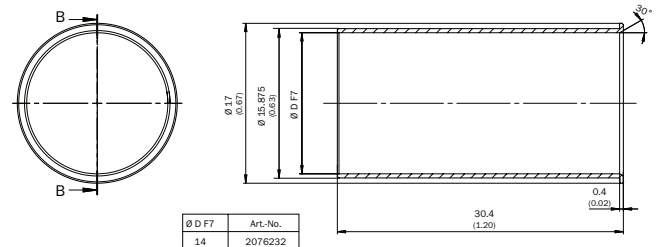
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SPZ-58Z-01x-P



Ø D F8	Art.-Nr.
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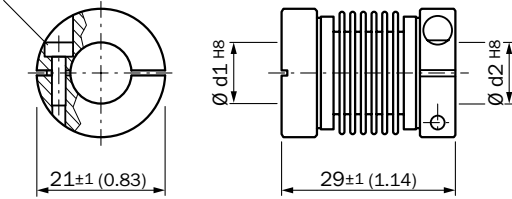
SPZ-58Z-015-M



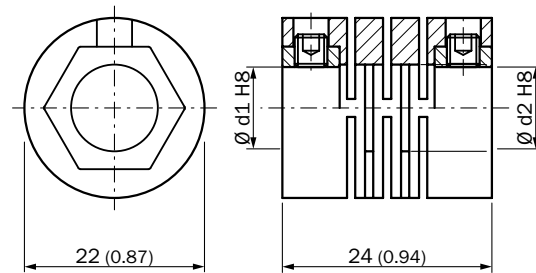
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KUP-xxxx-B

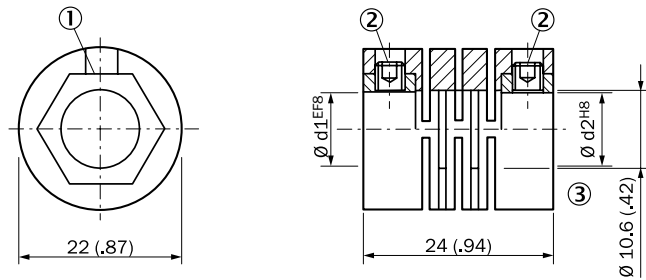
Cheese-head screw
M2.5 x 8, DIN 912 A2



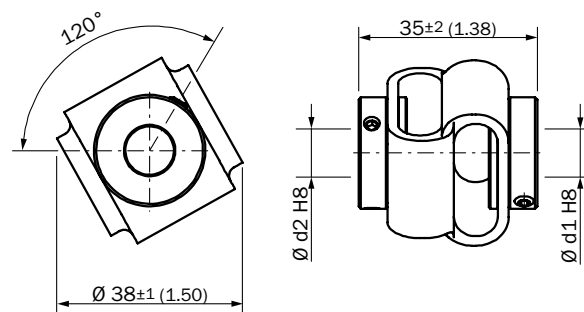
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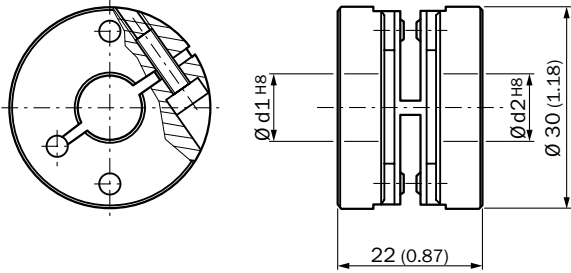
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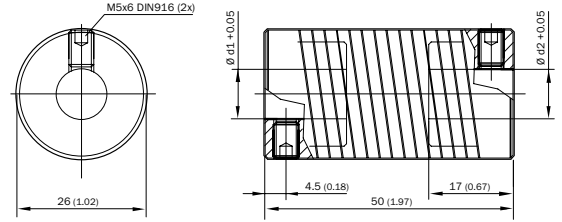
KUP-xx10-D



KUP-xx10-F

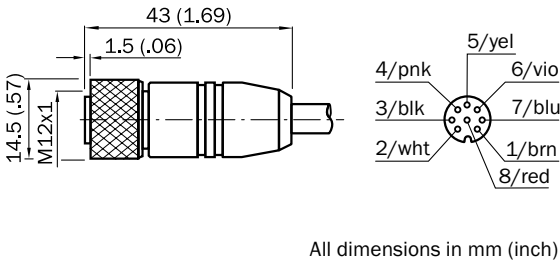


KUP-1010-W

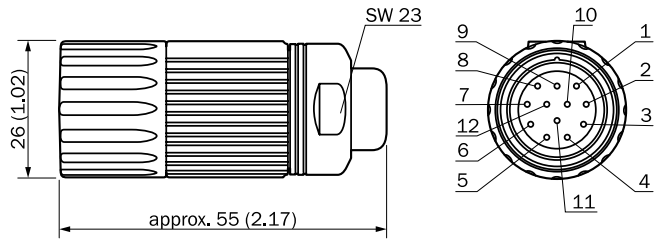


Plug connectors and cables

DOL-1208-GxxMAC1

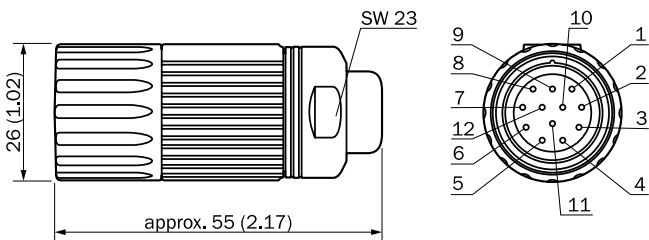


DOL-2312-G02MLA3



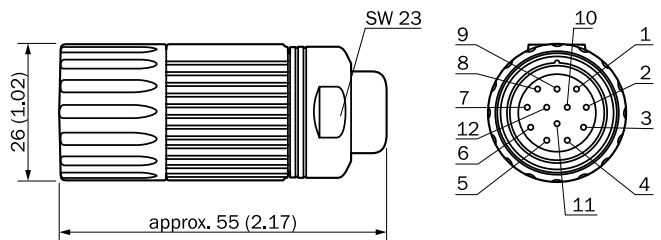
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- ⑩ Blue
- ⑪ Green
- ⑫ Red

DOL-2312-G03MMA3



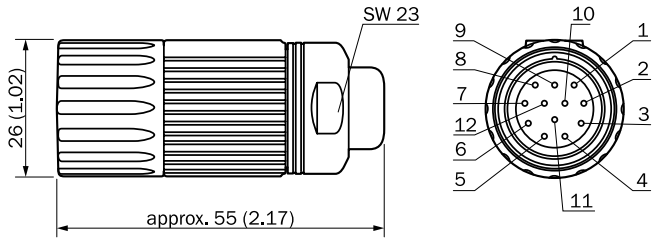
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- ⑫ Red

DOL-2312-G05MMA3



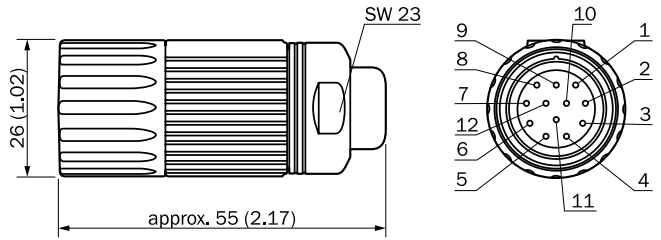
- ① Black
- ② Gray
- ③ Purple
- ④ Yellow
- ⑤ White
- ⑥ Brown
- ⑧ Pink
- ⑨ Screen
- ⑩ Blue
- ⑪ Green
- ⑫ Red

DOL-2312-G07MLA3



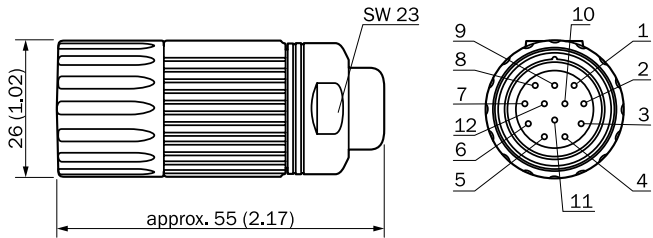
- ① Black
- ② Gray
- ③ Purple
- ④ Yellow
- ⑤ White
- ⑥ Brown
- ⑧ Pink
- ⑨ Screen
- ⑩ Blue
- ⑪ Green
- ⑫ Red

DOL-2312-G10MLA3



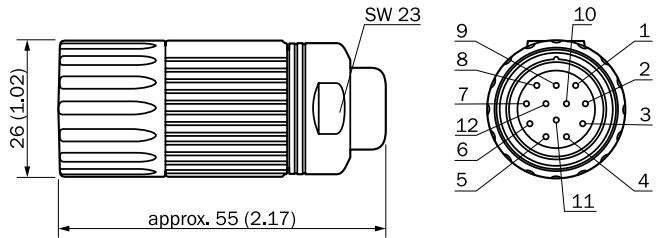
- ① Black
- ② Gray
- ③ Purple
- ④ Yellow
- ⑤ White
- ⑥ Brown
- ⑧ Pink
- ⑨ Screen
- ⑩ Blue
- ⑪ Green
- ⑫ Red

DOL-2312-G10MMA3



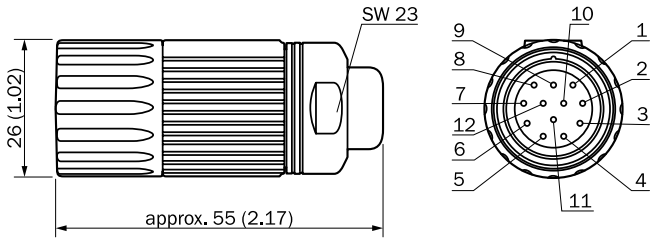
- ① Black
- ② Gray
- ③ Purple
- ④ Yellow
- ⑤ White
- ⑥ Brown
- ⑧ Pink
- ⑨ Screen
- ⑩ Blue
- ⑪ Green
- ⑫ Red

DOL-2312-G15MLA3



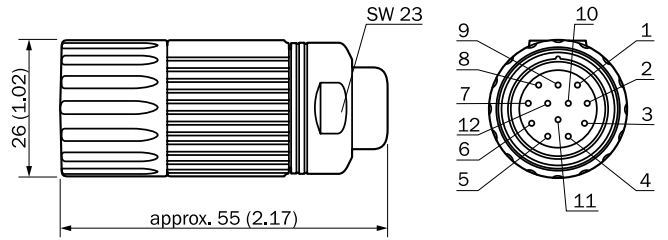
- ① Black
- ② Gray
- ③ Purple
- ④ Yellow
- ⑤ White
- ⑥ Brown
- ⑧ Pink
- ⑨ Screen
- ⑩ Blue
- ⑪ Green
- ⑫ Red

DOL-2312-G1M5MA3



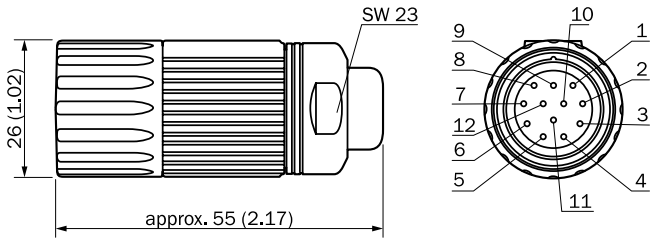
- ① Black
- ② Gray
- ③ Purple
- ④ Yellow
- ⑤ White
- ⑥ Brown
- ⑧ Pink
- ⑨ Screen
- ⑩ Blue
- ⑪ Green
- ⑫ Red

DOL-2312-G20MLA3



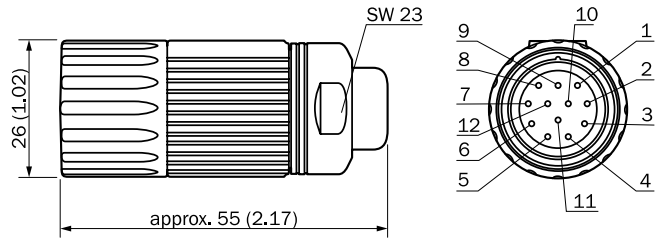
- ① Black
- ② Gray
- ③ Purple
- ④ Yellow
- ⑤ White
- ⑥ Brown
- ⑧ Pink
- ⑨ Screen
- ⑩ Blue
- ⑪ Green
- ⑫ Red

DOL-2312-G20MMA3



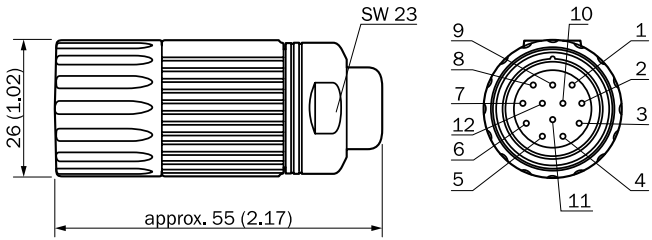
- ① Black
- ② Gray
- ③ Purple
- ④ Yellow
- ⑤ White
- ⑥ Brown
- ⑧ Pink
- ⑨ Screen
- ⑩ Blue
- ⑪ Green
- ⑫ Red

DOL-2312-G25MLA3



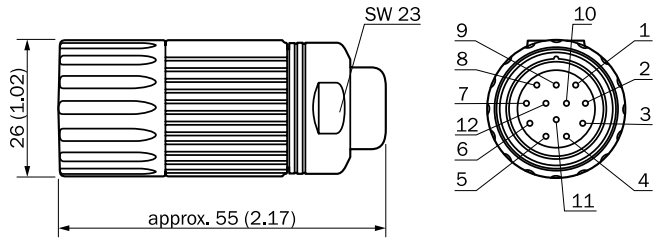
- ① Black
- ② Gray
- ③ Purple
- ④ Yellow
- ⑤ White
- ⑥ Brown
- ⑧ Pink
- ⑨ Screen
- ⑩ Blue
- ⑪ Green
- ⑫ Red

DOL-2312-G30MLA3



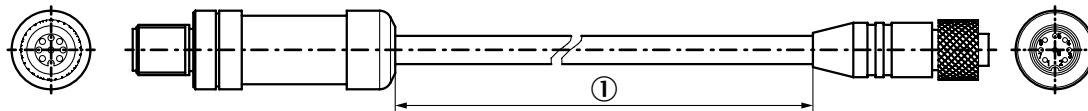
- ① Black
- ② Gray
- ③ Purple
- ④ Yellow
- ⑤ White
- ⑥ Brown
- ⑧ Pink
- ⑨ Screen
- ⑩ Blue
- ⑪ Green
- ⑫ Red

DOL-2312-G30MMA3



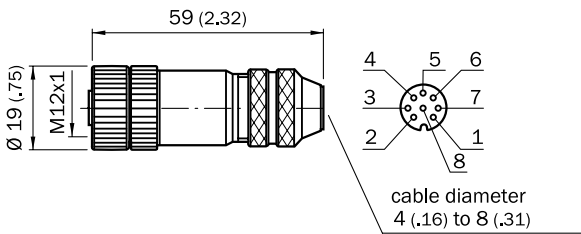
- ① Black
- ② Gray
- ③ Purple
- ④ Yellow
- ⑤ White
- ⑥ Brown
- ⑧ Pink
- ⑨ Screen
- ⑩ Blue
- ⑪ Green
- ⑫ Red

YF2AA8-xx0S01MKA18



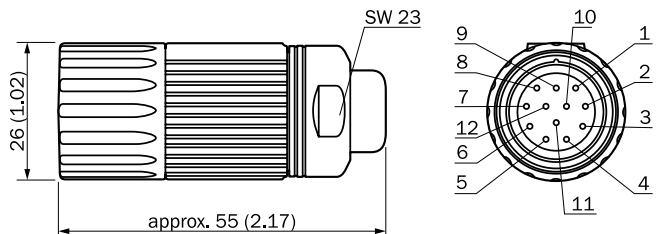
① See technical data for length of cable

DOS-1208-GA01



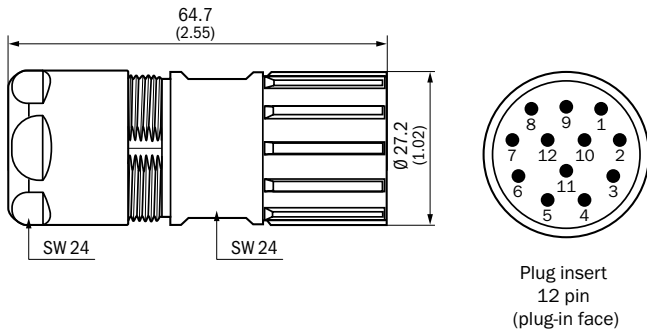
- ① Blue
- ② White
- ③ Yellow
- ④ Gray
- ⑤ Green
- ⑥ Pink
- ⑦ Black
- ⑧ Red
- ⑨ Orange
- ⑩ Brown
- ⑪ Purple
- ⑫ Orange/black

DOS-2312-G

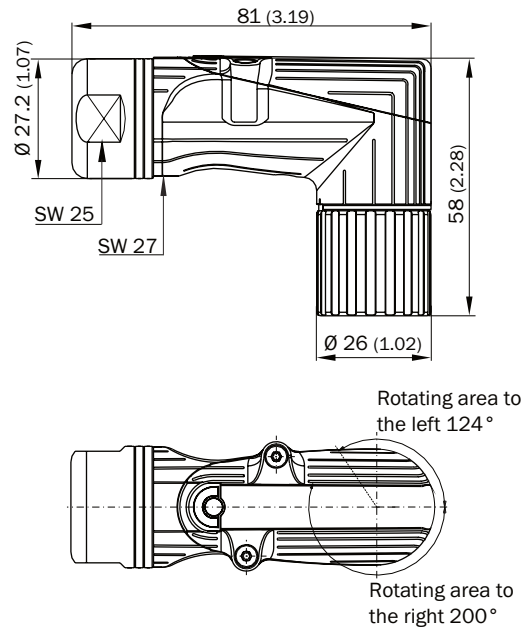


- ① Blue
- ② White
- ③ Yellow
- ④ Gray
- ⑤ Green
- ⑥ Pink
- ⑦ Black
- ⑧ Red
- ⑨ Orange
- ⑩ Brown
- ⑪ Purple
- ⑫ Orange/black

DOS-2312-G02

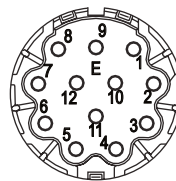


DOS-2312-W01



Main dimensions

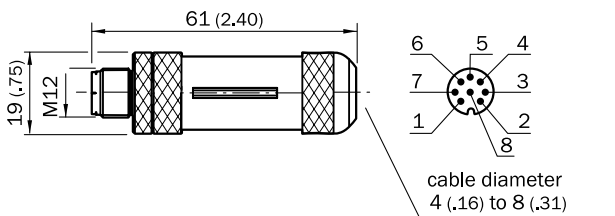
Plug



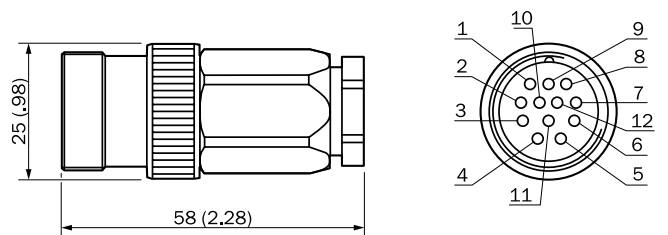
Contact arrangement

Mating view

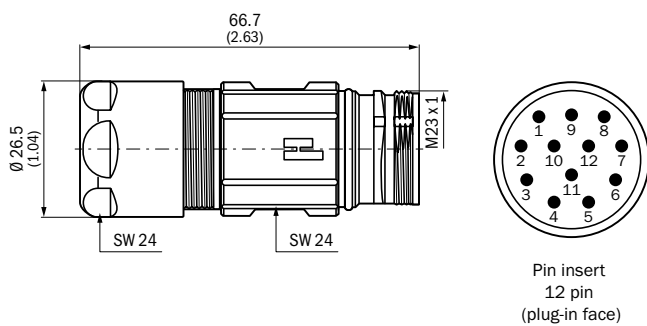
STE-1208-GA01



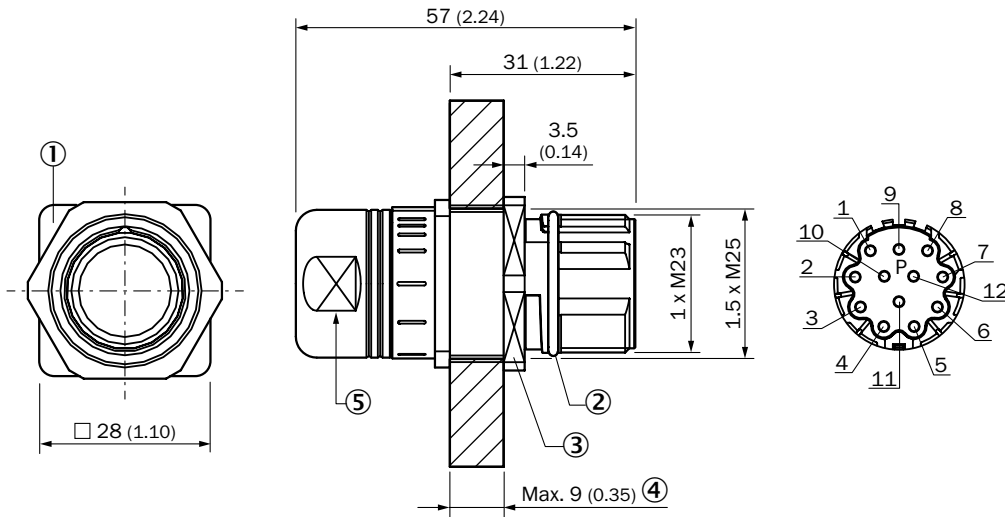
STE-2312-G



STE-2312-G01



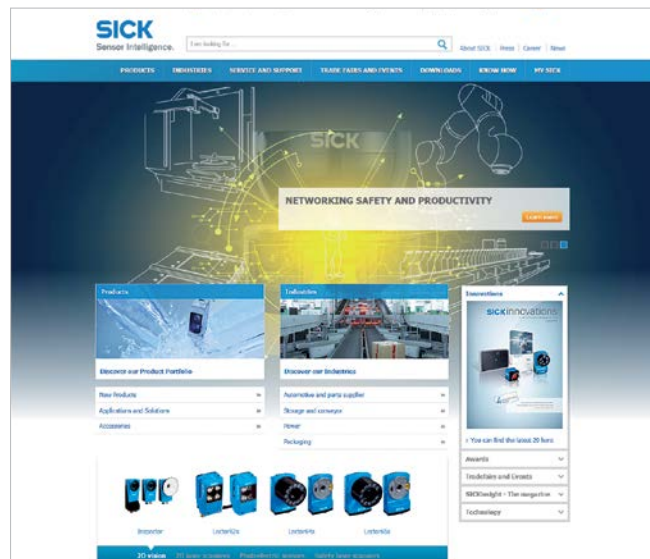
STE-2312-GX



- ① Fixed stop position
- ② Vibration protection
- ③ Fixing nut SW30
- ④ Max. wall thickness
- ⑤ SW23

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