

SICK Encoder Betriebsanleitung

SICK Encoder

DBS60 Core DBS60 Inox

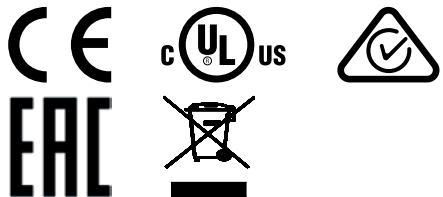
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Irrtümer und Änderungen vorbehalten.

UL-Zertifizierung nicht für alle Typen gültig. Siehe Typenschild auf dem Encoder.



For use in NFPA 79 applications only.

- ▶ Innensechskantschraube (1) am Klemmring (2) leicht anziehen (Anzugsmoment 0,2 Nm), danach festziehen. Anzugsdrehmoment = 1,5/1,1 Nm (Hülse: Metall/Kunststoff)
- ▶ Encoder auf die Antriebswelle schieben.
- ▶ Elektrische Verbindungen bei abgeschalteter Spannung herstellen.
- ▶ Spannung einschalten und Funktion des Encoders prüfen.

Anbau Klemm- bzw. Servoflansch über flanschseitige Gewindebohrungen (Abb. 9)

- ▶ **ACHTUNG!**
Da der Klemmansatz gleichzeitig auch Zentriersatz ist, muss die Klemmvorrichtung so ausgebildet sein, dass beim Festklemmen kein unzulässiger Winkel- bzw. Wellerversatz entsteht.
- ▶ Kundenseitige Antriebswelle blockieren.
- ▶ Kupplung (1) am Encoder montieren; darauf achten, dass diese nicht am Encoderflansch streift.
- ▶ Encoder mit montierter Kupplung (1) auf Antriebswelle und Zentrier-/Klemmsatz (2) aufschieben.
- ▶ Encoder so ausrichten, dass das Lochbild in der Anwendung mit dem entsprechenden Lochbild des Encoders übereinstimmt.
- ▶ Encoder mit 3 Schrauben M3 bzw. M4 (3) befestigen.
- ▶ Kupplung (1) auf der Antriebswelle montieren.
- ▶ Die Kupplung darf keinen mechanischen Spannungen ausgesetzt werden.
- ▶ Elektrische Verbindungen bei ausgeschalteter Spannung herstellen.
- ▶ Spannung einschalten und Funktion des Encoders prüfen.

Anbau Klemmflansch über den Klemmansatz (Abb. 10)

- ▶ **ACHTUNG!**
Da der Klemmansatz gleichzeitig auch Zentriersatz ist, muss die Klemmvorrichtung so ausgebildet sein, dass beim Festklemmen kein unzulässiger Winkel- bzw. Wellerversatz entsteht.
- ▶ Kundenseitige Antriebswelle blockieren.
- ▶ Kupplung (1) montieren.
- ▶ Darauf achten, dass die Kupplung (1) nicht am Encoderflansch streift.
- ▶ Encoder mit montierter Kupplung (1) auf Antriebswelle und Klemmansatz in Klemmvorrichtung (2) schieben.
- ▶ Encoder mit Schraube (3) festklemmen.
- ▶ Kupplung (1) auf der Antriebswelle befestigen.
- ▶ Die Kupplung darf keinen mechanischen Spannungen ausgesetzt werden.
- ▶ Elektrische Verbindungen bei ausgeschalteter Spannung herstellen.
- ▶ Spannung einschalten und Funktion des Encoders prüfen.

Anbau Klemm- bzw. Servoflansch über flanschseitige Gewindebohrungen (Abb. 11)

- ▶ Kundenseitige Antriebswelle blockieren.
- ▶ Kupplung (1) am Encoder montieren.
- ▶ Darauf achten, dass Kupplung (1) nicht am Encoderflansch streift.
- ▶ Encoder mit montierter Kupplung (1) auf Antriebswelle und Zentrier-/Klemmsatz (2) aufschieben.
- ▶ Encoder so ausrichten, dass das Lochbild in der Anwendung mit dem entsprechenden Lochbild des Encoders übereinstimmt.
- ▶ Encoder mit 3 Schrauben M3 bzw. M4 (3) befestigen.

- ▶ Kupplung (1) auf der Antriebswelle montieren.
- ▶ Die Kupplung darf keinen mechanischen Spannungen ausgesetzt werden.
- ▶ Elektrische Verbindungen bei ausgeschalteter Spannung herstellen.
- ▶ Spannung einschalten und Funktion des Encoders prüfen.

Anbau Servoflansch mit Servoklammern (Abb. 12)

- ▶ Kundenseitige Antriebswelle blockieren.
- ▶ Kupplung (1) am Encoder montieren.
- ▶ Darauf achten, dass die Kupplung (1) nicht am Encoder-Flansch streift.
- ▶ Servoklammern (2) mit Schrauben M3 (4) montieren.
- ▶ Schrauben noch nicht festziehen. Servoklammern (2) so verdrehen, dass der Encoder-Flansch in den Zentriersatz (3) geschoben werden kann.
- ▶ Encoder mit montierter Kupplung (1) auf Antriebswelle und Zentriersatz (3) aufschieben.
- ▶ Servoklammern (2) durch Drehen in die Nut einrücken und leicht festziehen. Kupplung (1) auf Antriebswelle befestigen. Die Kupplung darf keinen mechanischen Spannungen ausgesetzt werden.
- ▶ Alle 3 Schrauben (4) der Servoklammern (2) festziehen.
- ▶ Elektrische Verbindungen bei abgeschalteter Spannung herstellen.
- ▶ Spannung einschalten und Funktion des Encoders prüfen.

Anbau mit Quadratlansch (Abb. 13)

- ▶ Kundenseitige Antriebswelle blockieren.
- ▶ Kupplung (1) am Encoder montieren.
- ▶ Darauf achten, dass die Kupplung (1) nicht am Encoder-Flansch streift.
- ▶ Encoder mit montierter Kupplung (1) auf Antriebswelle und Klemmansatz in Klemmvorrichtung (2) schieben.
- ▶ Encoder mit 4 M5-Schrauben (3) sowie Unterlegscheiben (4) montieren.
- ▶ Kupplung (1) auf der Antriebswelle befestigen. Die Kupplung darf keinen mechanischen Spannungen ausgesetzt werden.
- ▶ Elektrische Verbindungen bei abgeschalteter Spannung herstellen. Spannung einschalten und Funktion des Encoders überprüfen.

Drehmomentstütze und Befestigung

Artikelbezeichnung	Var.	Schrauben
Drehmomentstütze		
2-seitig, Langloch, Lochkreis 63 – 83 mm	O	2x M3
ohne Drehmomentstütze	A	4x M2,5
2-seitig, Lochkreis 63 mm	B	4x M3
Passstiftmontage	C	siehe Abb. 7/ 8
1-seitig, Langloch, Lochkreisradius 33 – 48,5 mm	D	1x M5
1-seitig, Langlöcher, Lochkreisradius 32,25 – 142,65 mm	E	1x M4
1-seitig, Langloch, Lochkreisradius 32,1 mm – 37,6 mm	G	1x M4
Passstiftmontage	K	siehe Abb. 6

Bei Modellen ohne Drehmomentstütze (Variante A) ist auf eine ausreichende mechanische Entkopplung zwischen Encoder und Anwendung zu achten. Eine nicht ausreichende Entkopplung kann zur mechanischen Beschädigung des Encoders führen.

Leitungsverlegung (Abb. 14)

- ▶ Den Stecker bzw. Leitungsanschluss nach unten richten, um den Eintritt von Feuchtigkeit in den Stecker zu vermeiden.
- ▶ Die Leitung in einem Bogen wieder nach oben führen, damit die Feuchtigkeit abtropfen kann.
- ▶ Zulässigen Biegeradius der Leitung beachten.

Abb. 1: Montage Hülsen für Hohlwellenencoder

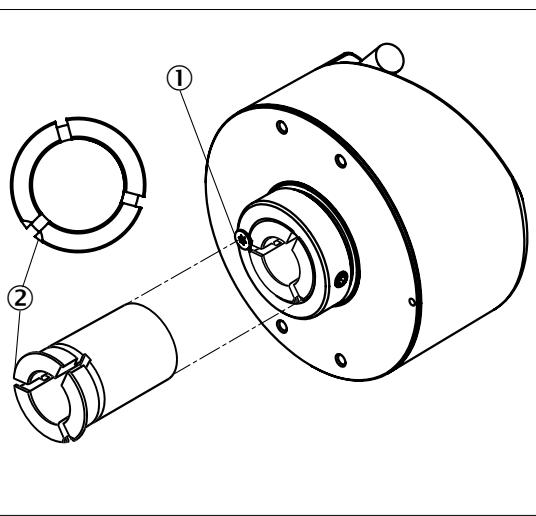


Abb. 2: Einstellungen des Nullimpulses

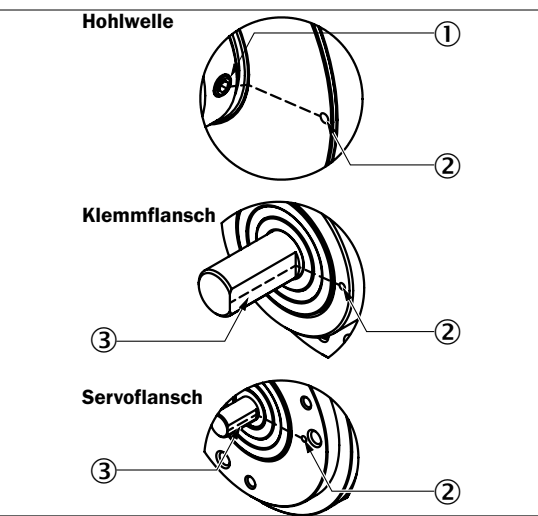


Abb. 3: Anbau Aufsteckhohlwelle mit Drehmomentstütze O, B, D, E, G

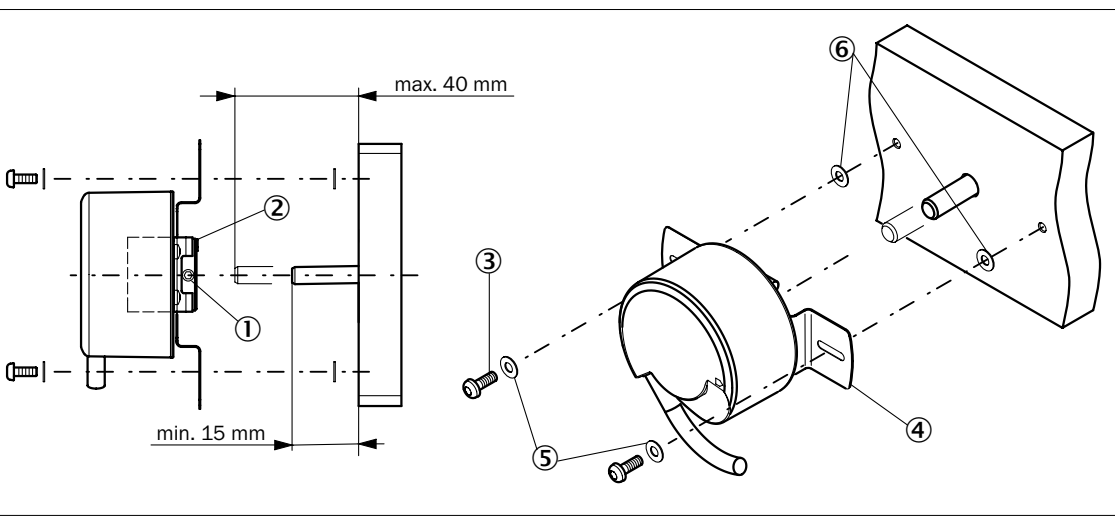


Abb. 5: Anbau Durchsteckhohlwelle mit Drehmomentstütze O, B, D, E, G (Klemmung hinten)

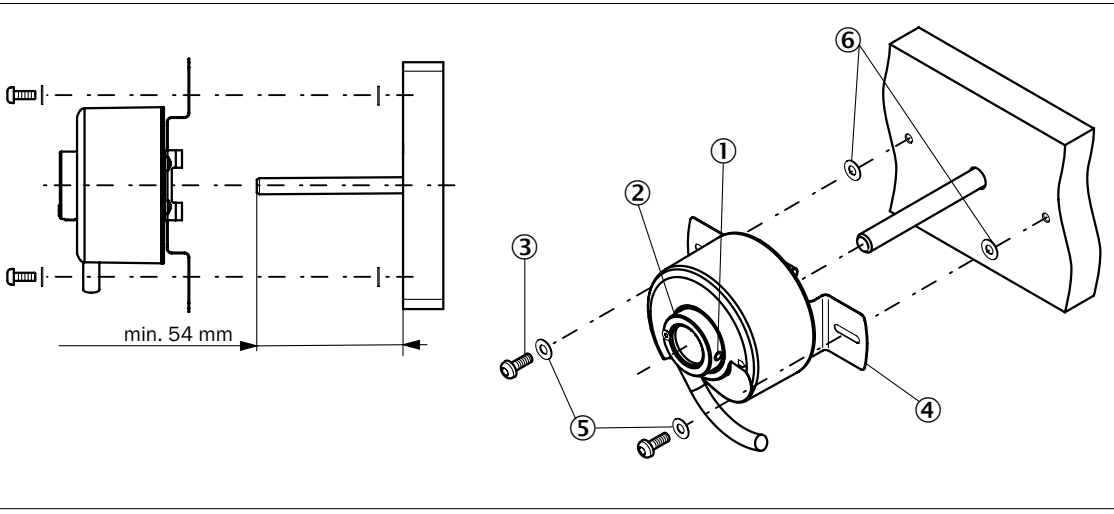


Abb. 6: Anbau mit axialer Passstiftmontage Variante K

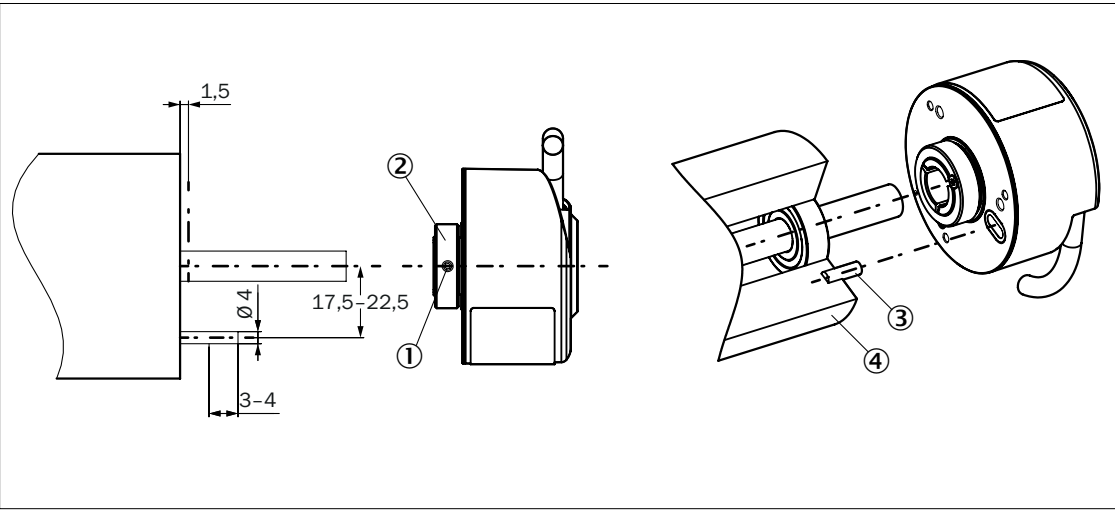


Abb. 4: Anbau Durchsteckhohlwelle mit Drehmomentstütze O, B, D, E, G (Klemmung vorne)

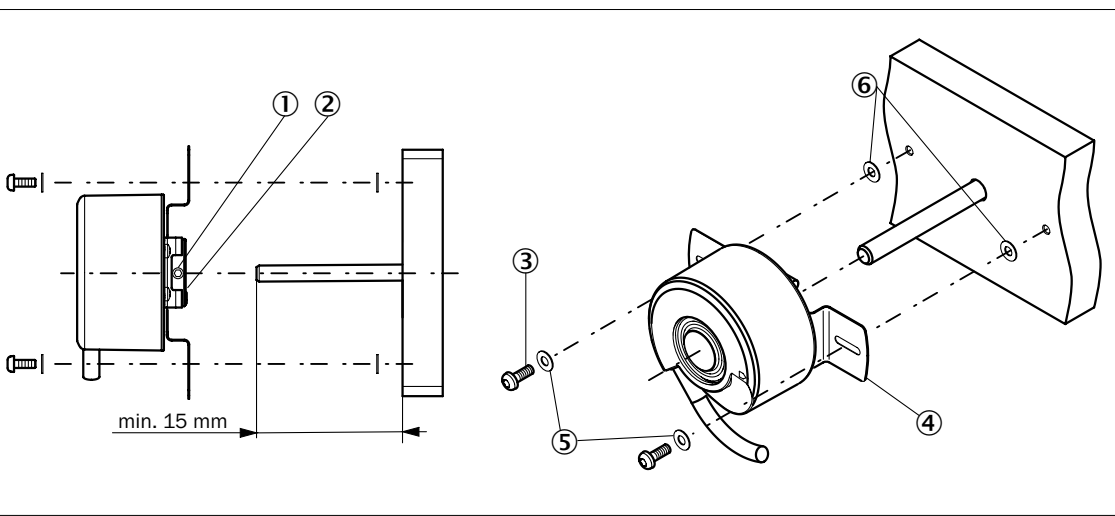


Abb. 7: Anbau mit axialer Passstiftmontage Variante C

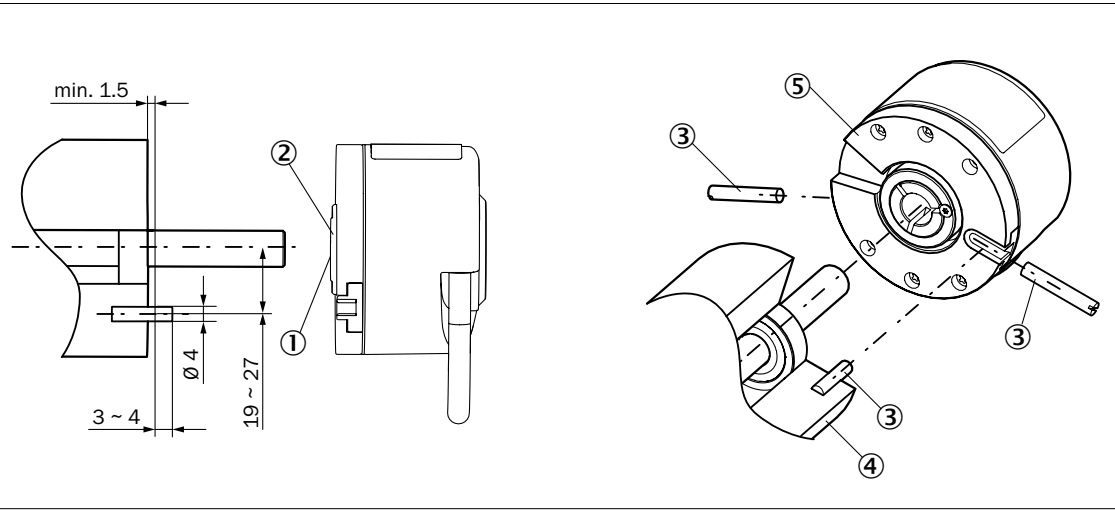


Abb. 8: Anbau mit radialer Passstiftmontage Variante C

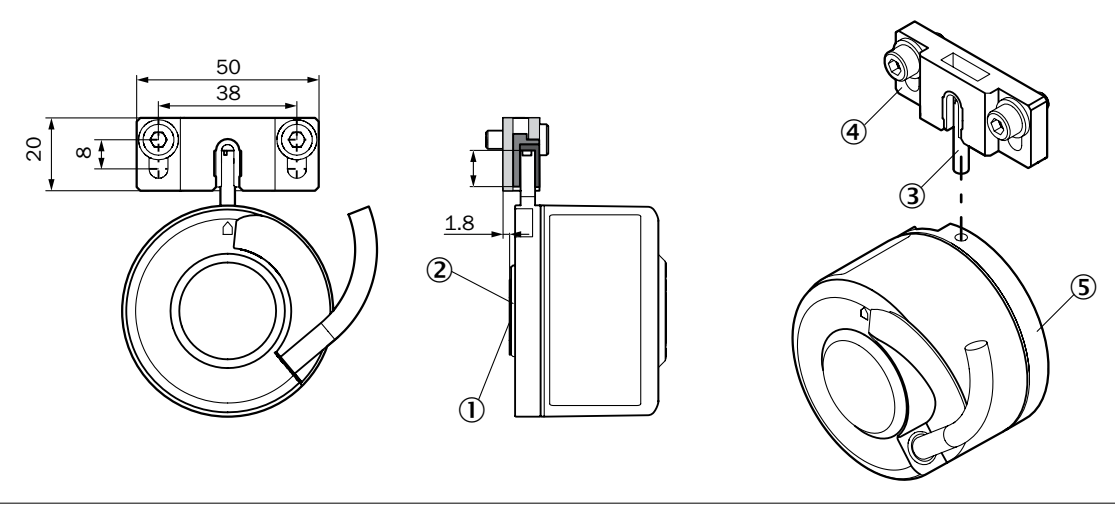


Abb. 9: Anbau Klemmflansch über flanschseitige Gewindebohrungen

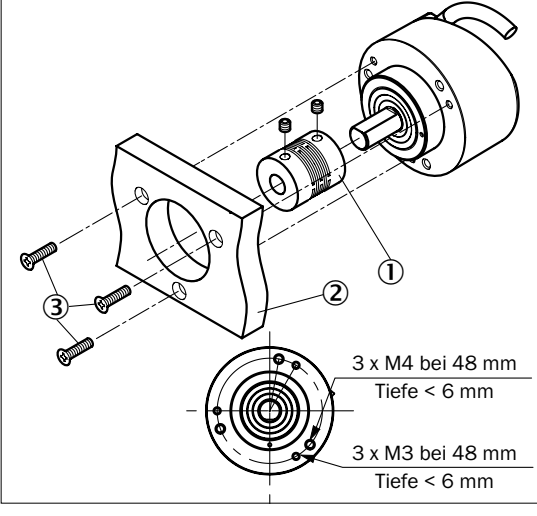


Abb. 10: Anbau Klemmflansch über den Klemmansatz

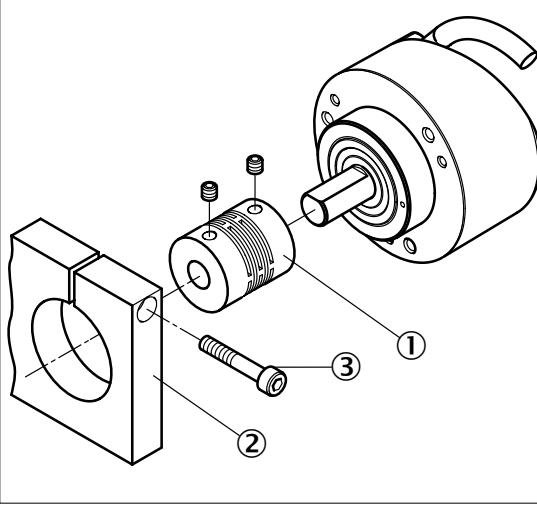


Abb. 11: Anbau Servoflansch über flanschseitige Gewindebohrungen

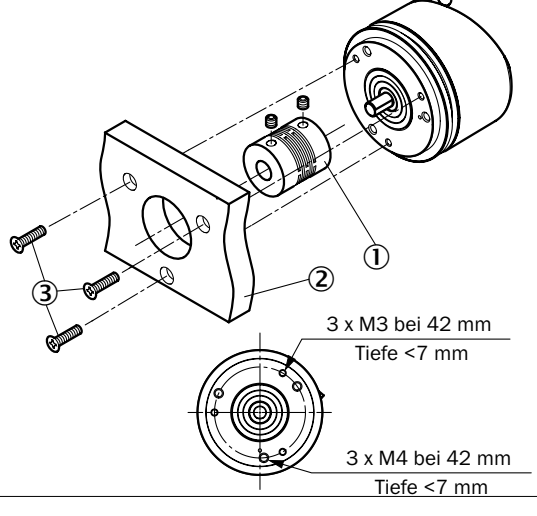


Abb. 12: Anbau Servoflansch mit Servoklammern

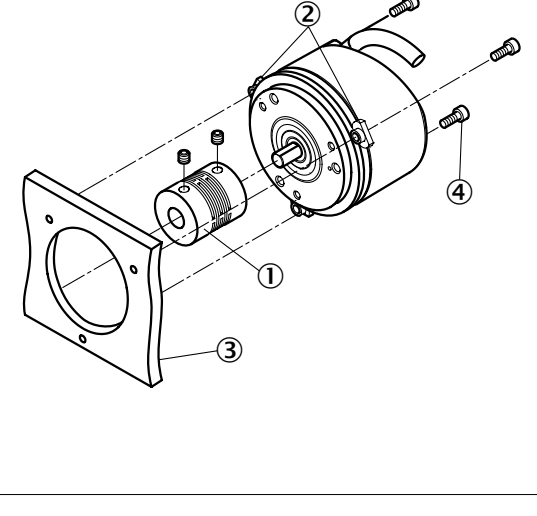


Abb. 13: Anbau mit Quadratlansch

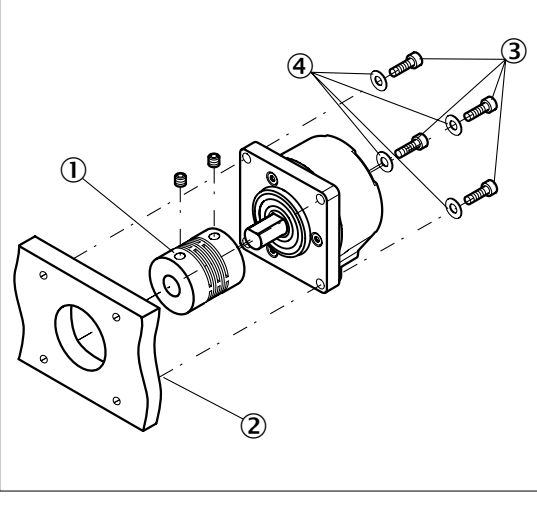
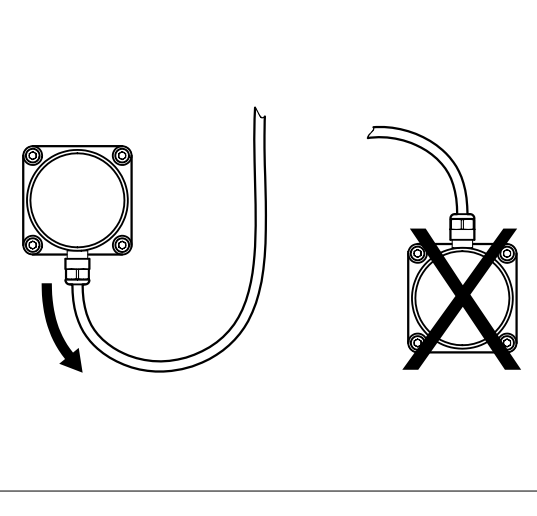


Abb. 14: Leitungsverlegung



SICK encoder Operating instructions

SICK encoders are measuring devices manufactured using state-of-the-art technology.

Safety notes

- The encoders should only be mounted by a specialist with electrical and precision engineering knowledge.
- The encoder may only be used for the purpose for which it was intended.
- Observe the relevant national work safety regulations as specified by trade associations.
- During mounting, disconnect all applicable devices/machinery and systems from the voltage.
- Never connect or disconnect electrical connections to or from the encoder when the voltage is switched on, as this may result in equipment damage.
- Make sure to avoid any blows or impact to the encoder shaft to prevent damage to the ball bearings.
- Provide cables with strain relief, otherwise the encoder can become damaged.
- Keep the path of the encoder clear. Collisions with objects can destroy the encoder.
- To ensure the encoders function properly, they must be connected to an EMC screen (fitted on both sides).

Generally applicable notes

Precise alignment and centering of the encoder during installation reduces shaft misalignment and side-loading which decreases the stress on the encoder bearings and stator coupling.

To avoid straining the stator coupling during assembly, always flange-mount the encoder first and then mount the clamping ring for the hollow-shaft clamp.

In the case of encoders with a cable outlet, the braided screen is connected to the housing.

EMC considerations make it mandatory to connect the device housing or cable screen to ground. This is achieved by connecting the cable braided screen. The braided screen should be connected over a large area.

Please obey the maximum ambient temperature in the application. The product has a maximum ambient temperature rating of +85 °C ... +100 °C (depending on type). The UL approved temperature range is max. +75 °C.

Encoder cleaning practices (pressure, distance, temperature) must not exceed the IP rating of the device.

Mounting

Mounting of the sleeve (Fig. 1)

- Unscrew torx screw (1) and if necessary insert sleeve.
- Align the slit sleeves such that the cutouts correspond to the recess of the hole (2) for the torx screw (not necessary for non-slit sleeves).
- Tighten the torx screw slightly (tightening torque 0.2 Nm).

Mechanical setting of the zero set (Fig. 2)

- Hollow shaft encoder: align the line on the hexagon socket screw (1) with the zero point mark (2) on the encoder.
- Face mount flange / servo flange encoder: align the flange side of the shaft (3) with the zero point mark (2) of the encoder housing.

Mounting of blind hollow shaft with stator coupling (Fig. 3)

- Block customer's drive shaft to prevent rotation.
- Release the hexagon socket screw (1) on the clamping ring (2) with a hexagon socket wrench; wrench width = 2.
- Observe the shaft length.
- Slide the encoder onto the drive shaft.
- Ensure that the encoder shaft does not touch the customer application.
- Mount stator couplings (4) with screws (3) (see Tab. 1) and washers (5) and (6). Ensure that the tightening torque is selected such that it is not possible for the encoder to rotate.
- Ensure that the stator coupling is not pre-stressed.
- Tighten the hexagon socket screw (1) slightly on the clamping ring (2) (tightening torque 0.2 Nm), then tighten fully. Tightening torque = 1.5 / 1.1 Nm (sleeve: metal / plastic)
- Establish an electrical connection with the power switched off.
- Switch on the power and check the function of the encoder.

Mounting of through hollow shaft with stator coupling (Fig. 4 and Fig. 5)

- Block customer's drive shaft to prevent rotation.
- Release the hexagon socket screw (1) on the clamping ring (2) with a hexagon socket wrench; wrench width = 2.
- Observe the shaft length.
- Slide the encoder onto the drive shaft.
- Ensure that the encoder shaft does not touch the customer application.
- Mount stator couplings (4) with screws (3) (see Tab. 1) and washers (5) and (6). Ensure that the tightening torque is selected such that it is not possible for the encoder to rotate.
- Ensure that the stator coupling is not pre-stressed.
- Tighten the hexagon socket screw (1) slightly on the clamping ring (2) (tightening torque 0.2 Nm), then tighten fully. Tightening torque = 1.5 / 1.1 Nm (sleeve: metal / plastic)
- Establish an electrical connection with the power switched off.
- Switch on the power and check the function of the encoder.

Mounting with flange version K (Fig. 6)

- Depending on the version, also note Figures 3, 4 and 5.
- Block the customer's drive shaft.
- Attach the locating pin (3) into the customer application axially (4).
- Tighten the hexagon socket screw (1) slightly on the clamping ring (2) (tightening torque 0.2 Nm), then tighten fully. Tightening torque = 1.5 / 1.1 Nm (sleeve: metal / plastic)
- Slide the encoder onto the drive shaft.
- Establish electrical connections with the voltage switched off.
- Switch on the voltage and check that the encoder is functioning.

Mounting with pin block mounting (Fig. 7 and 8)

- This version offers 3 different mounting options. Depending on the version, also note Figures 3, 4 and 5.
- Block the customer's drive shaft.
- Depending on the application, either attach the locating pin (3) into the customer application axially (4), into the customer application radially (see Fig. 7) or into the stator coupling radially (5) (see Fig. 8).
- Tighten the hexagon socket screw (1) slightly on the clamping ring (2) (tightening torque 0.2 Nm), then tighten fully. Tightening

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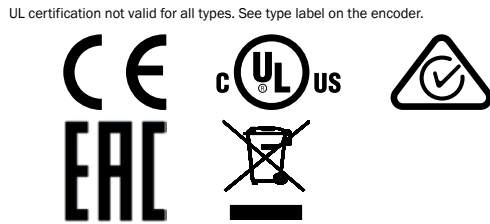
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torque = 1.5 / 1.1 Nm (sleeve: metal / plastic)

- Slide the encoder onto the drive shaft.
 - Establish electrical connections with the voltage switched off.
 - Switch on the voltage and check that the encoder is functioning.
- Mounting of face mount flange via the mounting spigot (Fig. 9)**
- WARNING!
- Since the mounting spigot is also a centering fixture, the clamping device must be designed such that there is no impermissible angle or shaft offset occurs during clamping.
- Block customer's drive shaft to prevent rotation.
 - Mount coupling (1); ensure that this does not touch the encoder flange.
 - Slide the encoder together with the mounted coupling (1) onto the drive shaft and mounting spigot in a clamping direction (2).
 - Clamp the encoder with a screw (3).
 - Mount the coupling (1) on the drive shaft.
 - The coupling must not be subjected to mechanical stress.
 - Establish electrical connections while the voltage is switched off.
 - Switch on the voltage and check that the encoder is functioning.

Mounting of face mount flange via the mounting spigot (Fig. 10)

- WARNING!
- Since the mounting spigot is also a centering fixture, the clamping device must be designed such that there is no impermissible angle or shaft offset occurs during clamping.
- Block customer's drive shaft to prevent rotation.
 - Mount coupling (1)
 - Ensure that this does not touch the encoder flange.
 - Slide the encoder together with the mounted coupling (1) onto the drive shaft and mounting spigot in a clamping direction (2).
 - Clamp the encoder with a screw (3).
 - Mount the coupling (1) on the drive shaft.
 - The coupling must not be subjected to mechanical stress.
 - Establish electrical connections while the voltage is switched off.
 - Switch on the voltage and check that the encoder is functioning.
- Mounting of face mount flange / servo flange via flange-side threaded holes (Fig. 11)**
- Block customer's drive shaft to prevent rotation.
 - Mount the coupling (1) on the encoder
 - Ensure that this does not touch the encoder flange.
 - Slide the encoder together with the mounted coupling (1) onto the drive shaft and the centering fixture / mounting spigot (2).
 - Align the encoder such that the hole pattern in the application corresponds to the relevant hole pattern of the encoder.
 - Fasten the encoder with 3 x M3 or M4 screws (3).
 - Mount the coupling (1) on the drive shaft.

- The coupling must not be subjected to mechanical stress.
- Establish electrical connections while the voltage is switched off.
- Switch on the voltage and check that the encoder is functioning.

Mounting of servo flange with servo-clamps (Fig. 12)

- Block customer's drive shaft to prevent rotation.
- Mount the coupling (1) on the encoder
- Ensure that it does not touch the encoder flange.
- Mount servo-clamps (2) with M3 screws (4).
- Do not fully tighten screws, turn the servo-clamps (2) such that the encoder flange can be slid into the centering fixture (3).
- Slide the encoder together with the mounted coupling (1) onto the drive shaft and centering fixture (3).
- Engage the servo-clamps (2) by rotating into the groove and tighten slightly. Mount the coupling (1) on the drive shaft. The coupling must not be subjected to mechanical stress.
- Tighten up all 3 screws (4) on the servo-clamps (2).
- Establish an electrical connection with the power switched off.
- Switch on the voltage and check that the encoder is functioning.

Mounting of with square flange (Fig. 13)

- Block the customer's drive shaft.
- Install the coupling (1) on the encoder.
- Ensure that the coupling (1) does not touch the encoder flange.
- Slide the encoder together with the mounted coupling (1) onto the drive shaft and mounting spigot in the clamping direction (2).
- Install the encoder with 4 M5 screws (3) and washers (4).
- Install the coupling (1) on the drive shaft. The coupling must not be subjected to any mechanical stress.
- Establish electrical connections with the voltage switched off. Switch on the power and check the function of the encoder.

Stator coupling and mounting

Tab. 1

Item description	Var.	Screws
Stator coupling		
2-sided, slot, bolt circle 63-83 mm	A	2x M3
without stator coupling	O	4x M2.5
2-sided, bolt circle 63 mm	B	4x M3
pin block mounting	C	see Fig. 7 / 8
1-sided, slot, bolt circle radius 33-48.5 mm	D	1x M5
1-sided, slots, bolt circle radius 32.25-142.65 mm	E	1x M4
1-sided, slot, bolt circle radius 32.1-37.6 mm	G	1x M4
pin block mounting	K	see Fig. 6

For models without stator coupling (Variant A), sufficient decoupling between encoder and application is mandatory. Insufficient decoupling can lead to mechanical damage of the encoder.

Cable laying (Fig. 14)

- Align cable outlet / connector downwards to avoid moisture ingress into connector.
- Loop the cable back upwards to create a drip loop to carry liquids away from the encoder connection.
- Mind the permissible bending radius of the cable.

Fig. 1: Mounting of sleeves for hollow shaft encoder

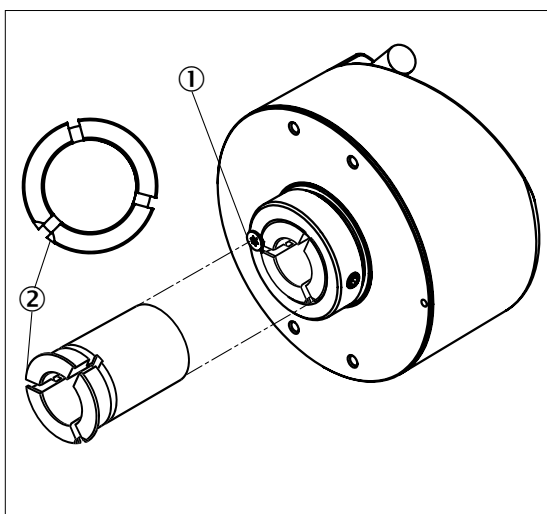


Fig. 2: Setting of the zero set

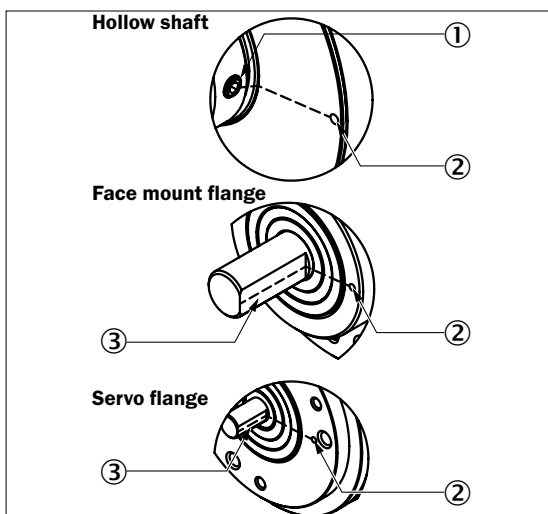


Fig. 3: Mounting blind hollow shaft with stator coupling O, B, D, E, G

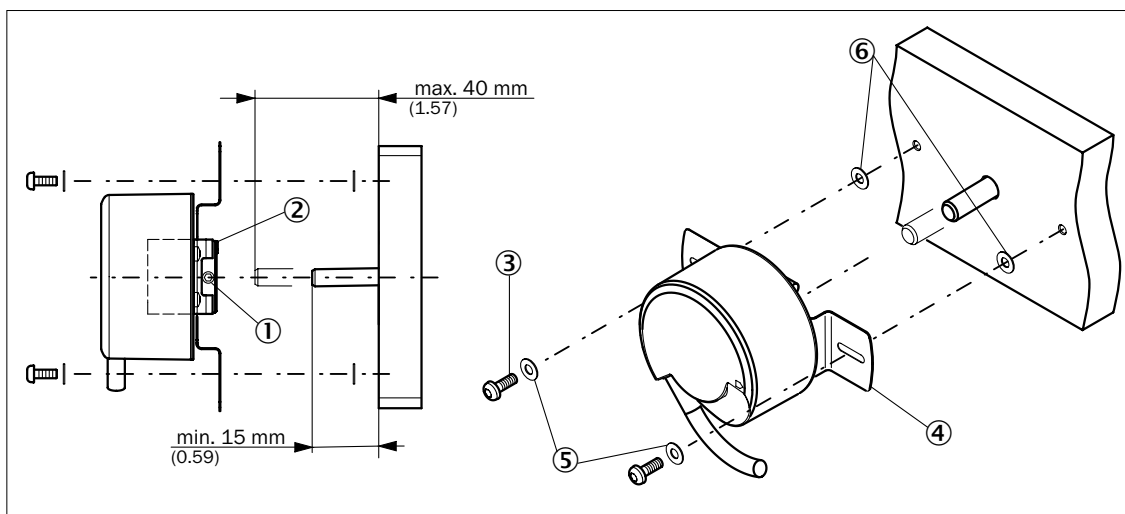


Fig. 5: Mounting through hollow shaft with stator coupling O, B, D, E, G (clamping at the rear)

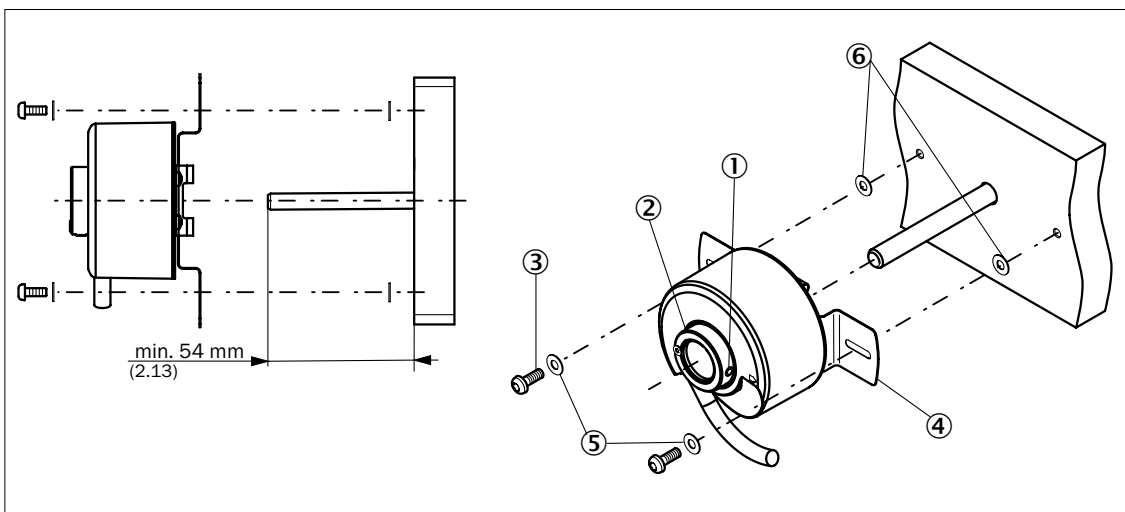


Fig. 6: Mounting with axial pin block mounting variant K

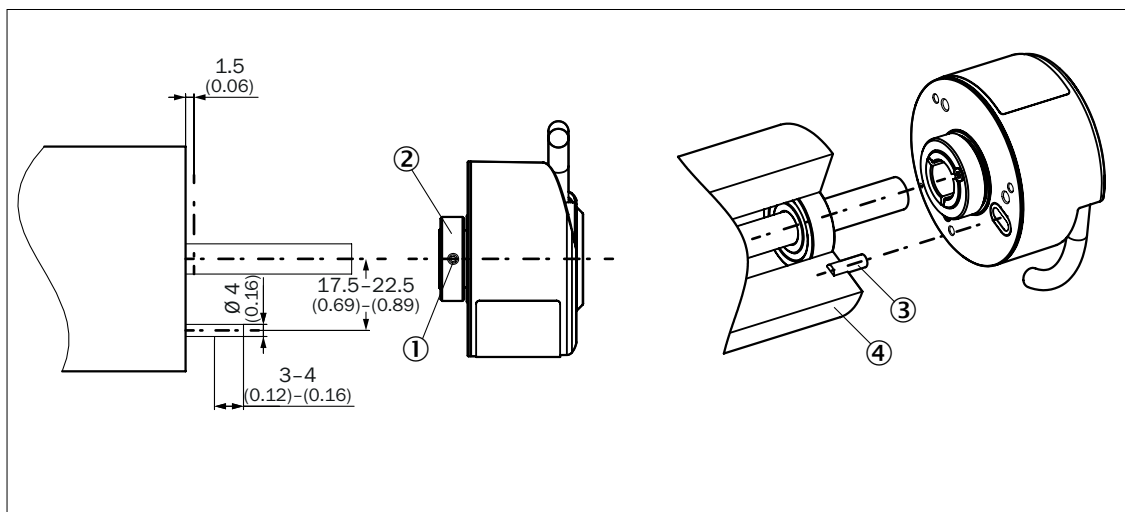


Fig. 4: Mounting through hollow shaft with stator coupling O, B, D, E, G (clamping at the front)

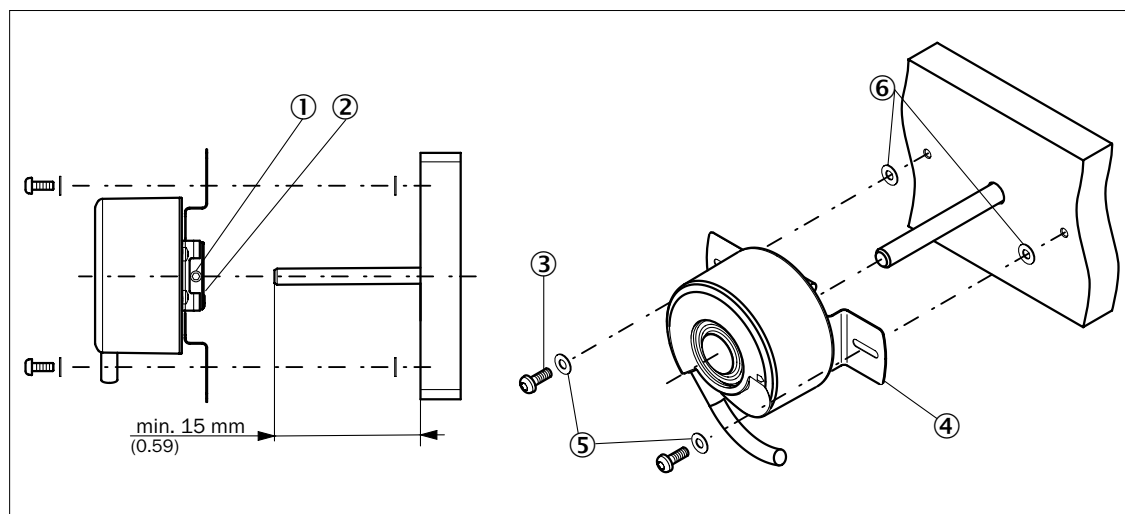
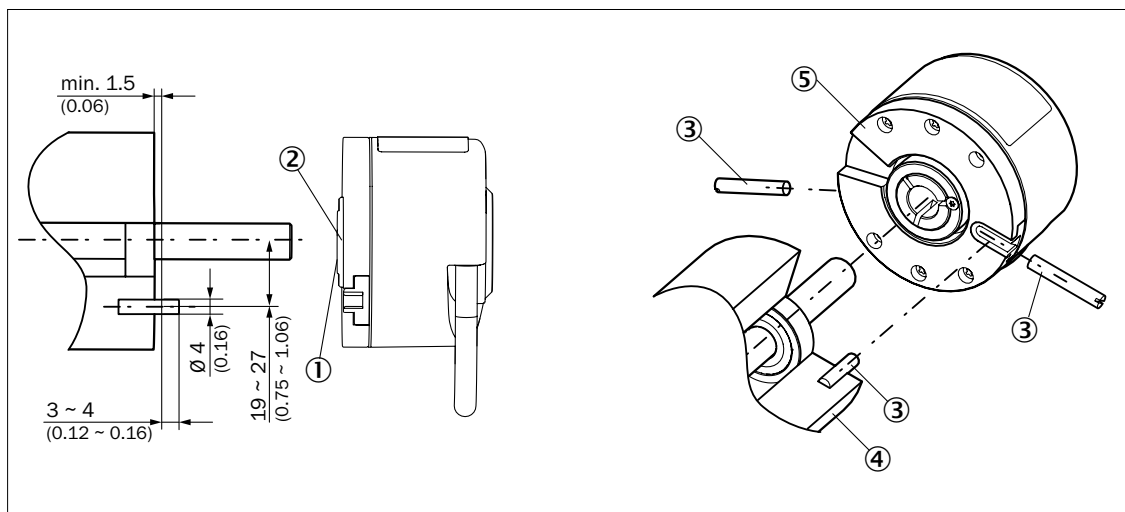
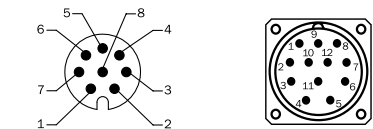


Fig. 7: Mounting with axial pin block mounting variant C



PIN assignment



View of M12 device plug

View of M23 device plug

Check whether the signal quality of the encoder is sufficient depending on the output frequency and supply voltage of the encoder as well as the input wiring of the operating concept.

Tab 2

Wire color	Pin 9-pole for M12	Pin 12-pole for M23	Signal TTL / HTL 6-channel	Explanation
brown	1	6	A-	Signal wire
white	2	5	A	Signal wire
black	3	1	B-	Signal wire
pink	4	8	B	Signal wire
Yellow	5	4	Z-	Signal wire
purple	6	3	Z	Signal wire
blue	7	10	GND	Ground connection of the encoder
Red	8	12	+Us	Supply voltage
-	-	9	Not connected	Not connected
-	-	2	Not connected	Not connected
-	-	11	Not connected	Not connected
-	-	7	Not connected	Not connected
Shield	Shield	Shield	Shield	Shield (connected with housing on the encoder side)

WARNING!

PIN assignment valid for standard encoders only Please use the appropriate data sheet for customer-specific encoders.

- In order to achieve a high signal quality, we recommend a differential evaluation of the encoder signals.
- Unused signal wires shall be connected differentially, i.e. a resistor needs to be connected between signal wire and inverted signal wire. The resulting current should be 12.5 mA ± 20 %.
- For encoders with connector, the unused signals must not be connected to the customer cabling.

Fig. 8: Mounting with radial pin block mounting variant C

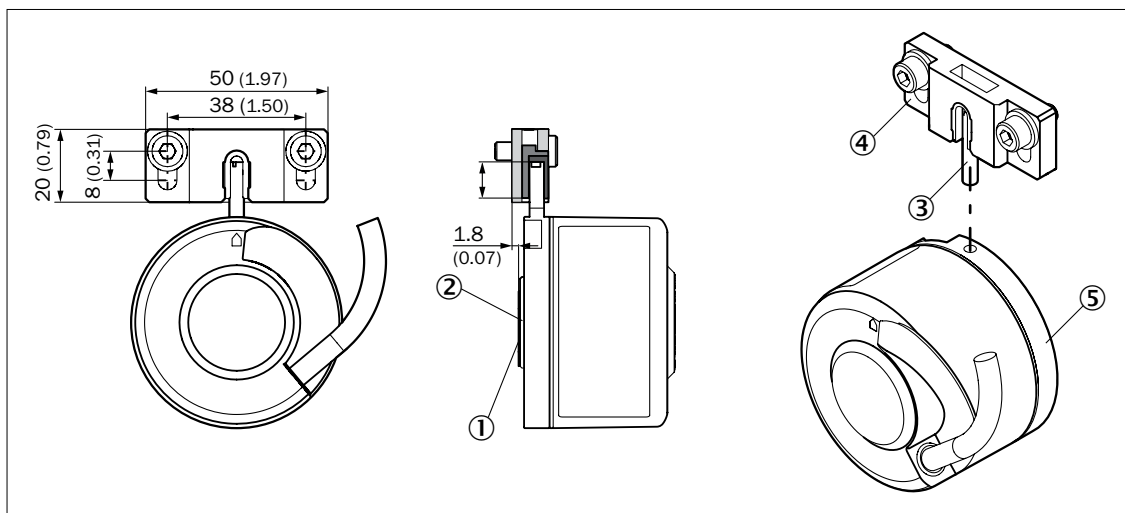


Fig. 11: Mounting servo flange via flange-side threaded holes

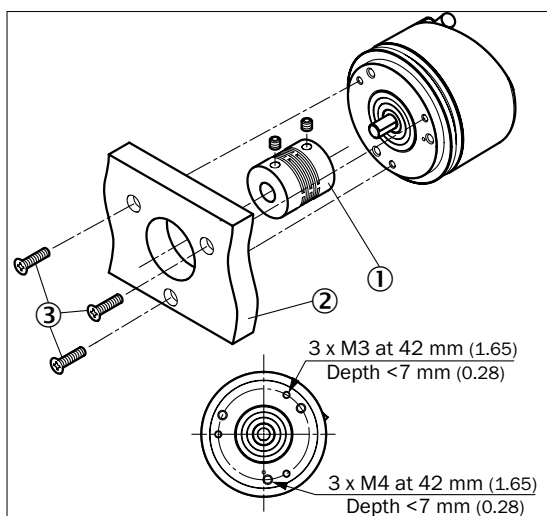


Fig. 12: Mounting servo flange with servo-clamps

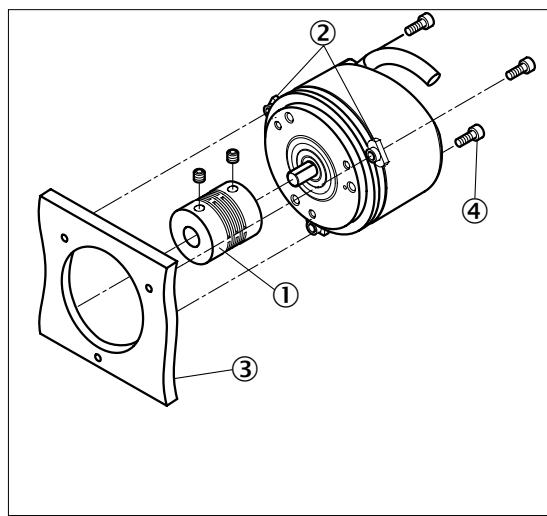


Fig. 9: Mounting face mount flange via flange-side threaded holes

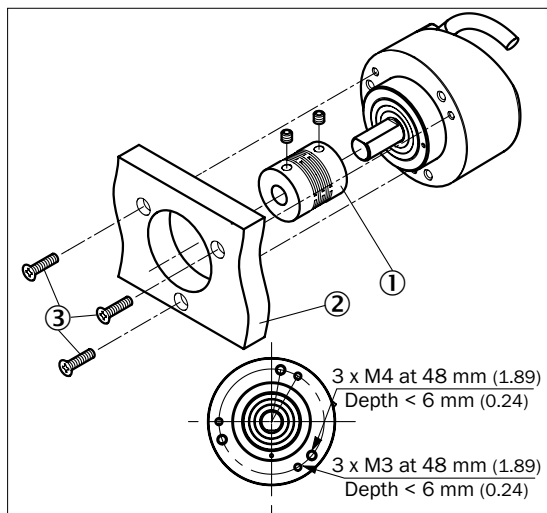


Fig. 10: Mounting face mount flange via the mounting spigot

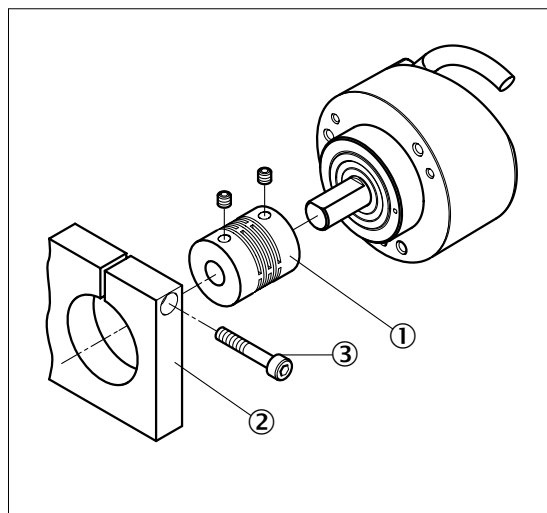


Fig. 13: Mounting with square flange

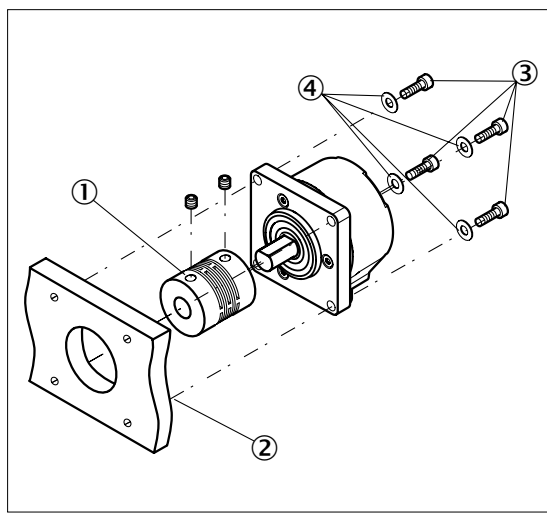


Fig. 14: Cable laying

