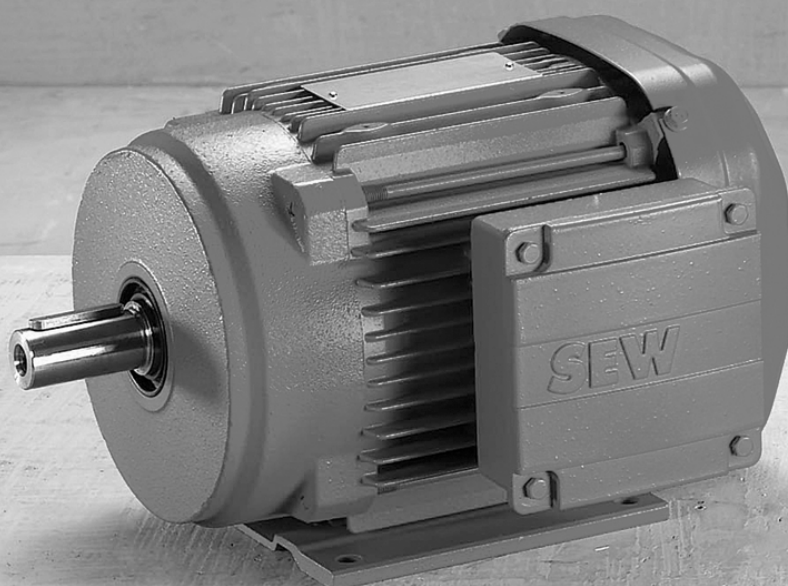




SEW
EURODRIVE

Revision



AC Motors

DR..71 – 315, DRN63 – 315, DR2..56 – 80



1 Revision



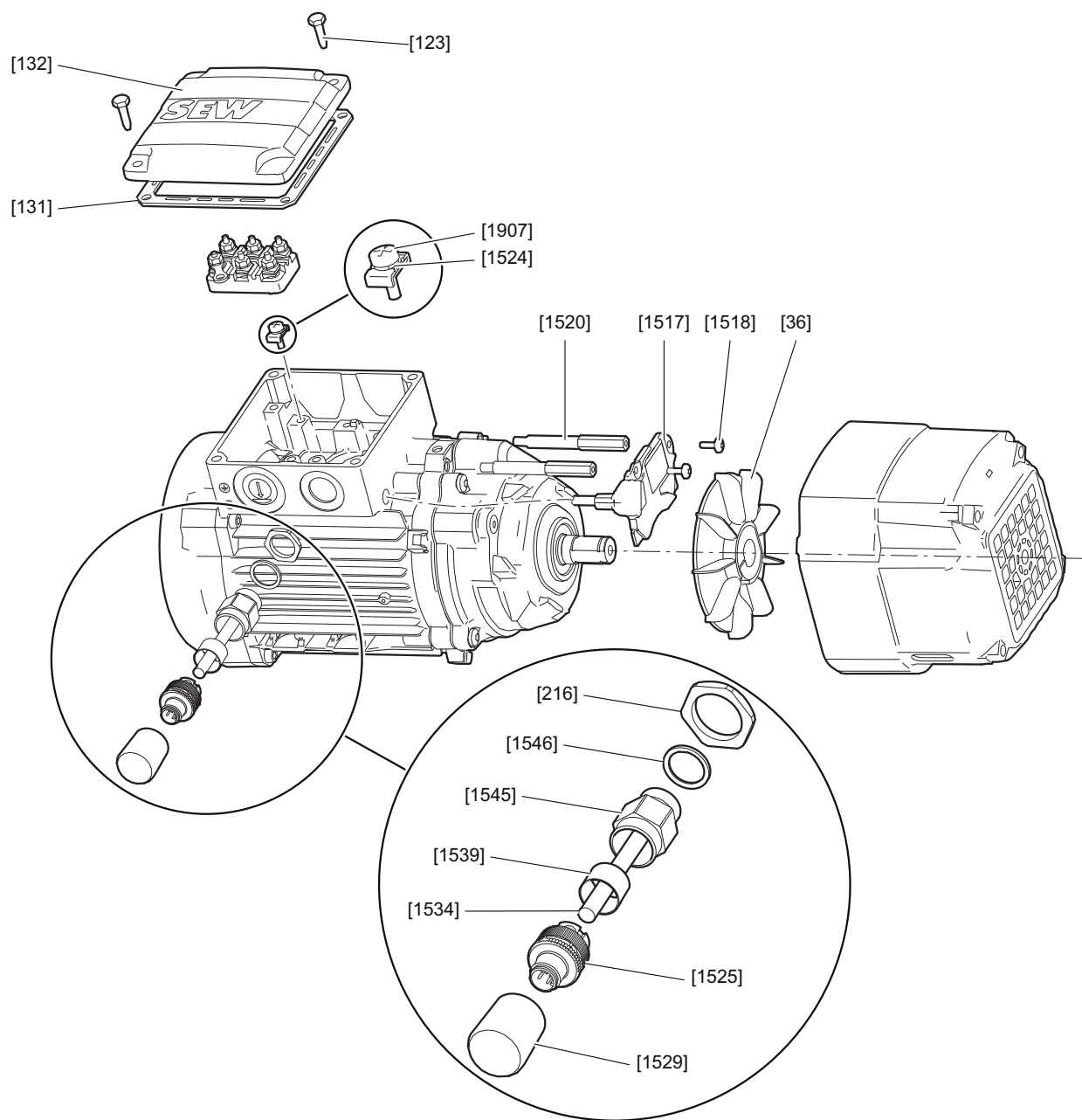
INFORMATION

This revision describes amendments made to the "DR..71 – 315, DR2..56 – 80 AC Motors" operating instructions. The following chapters are amended:

- Installation EI7 encoder
- Electrical connection of cosine encoders
- Temperature detection /KY
- Temperature detection /PT
- /PK temperature detection
- Wiring diagrams
- Installation notes

2 Installation EI7 encoder

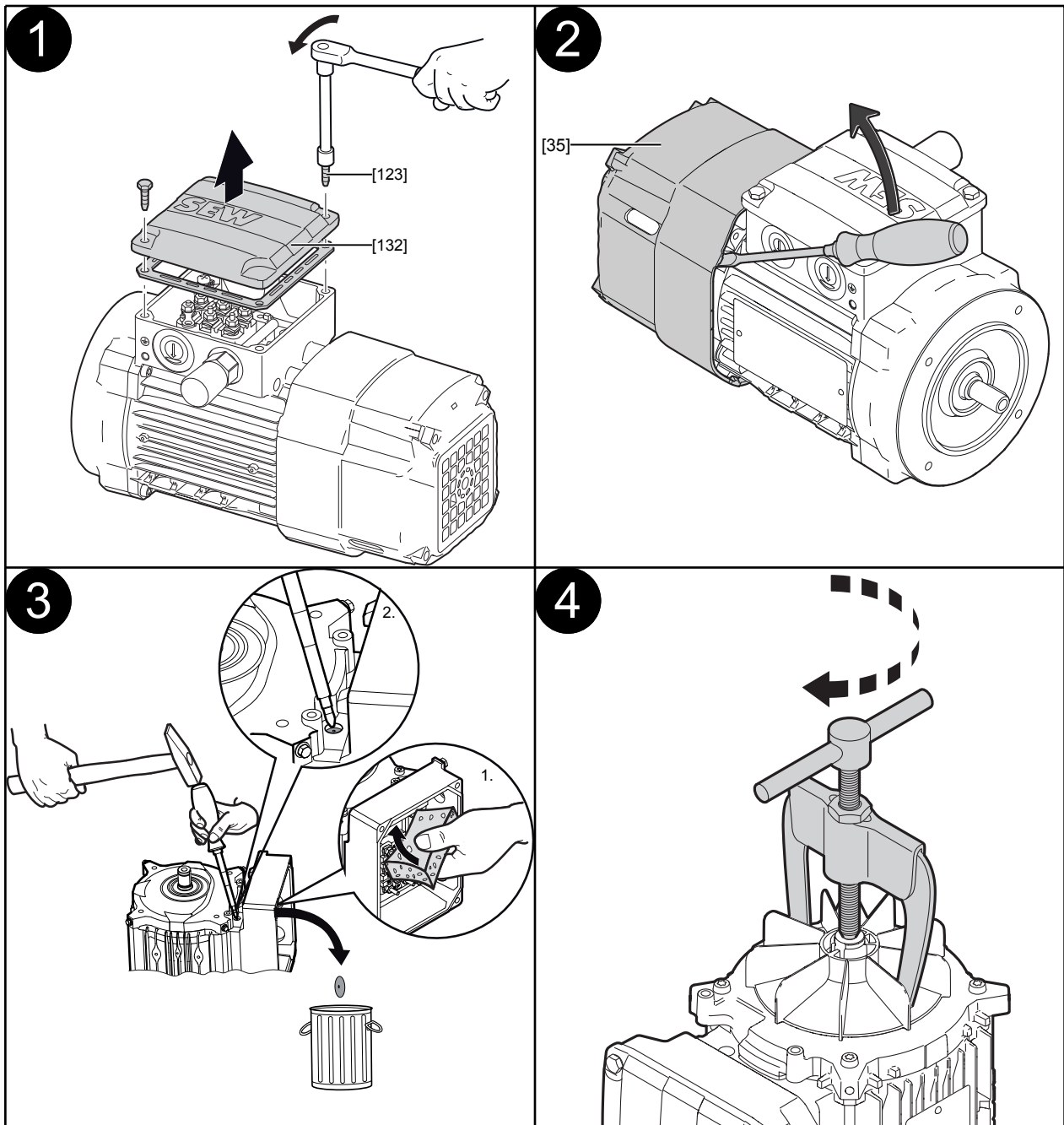
2.1 EI7C B DRN63



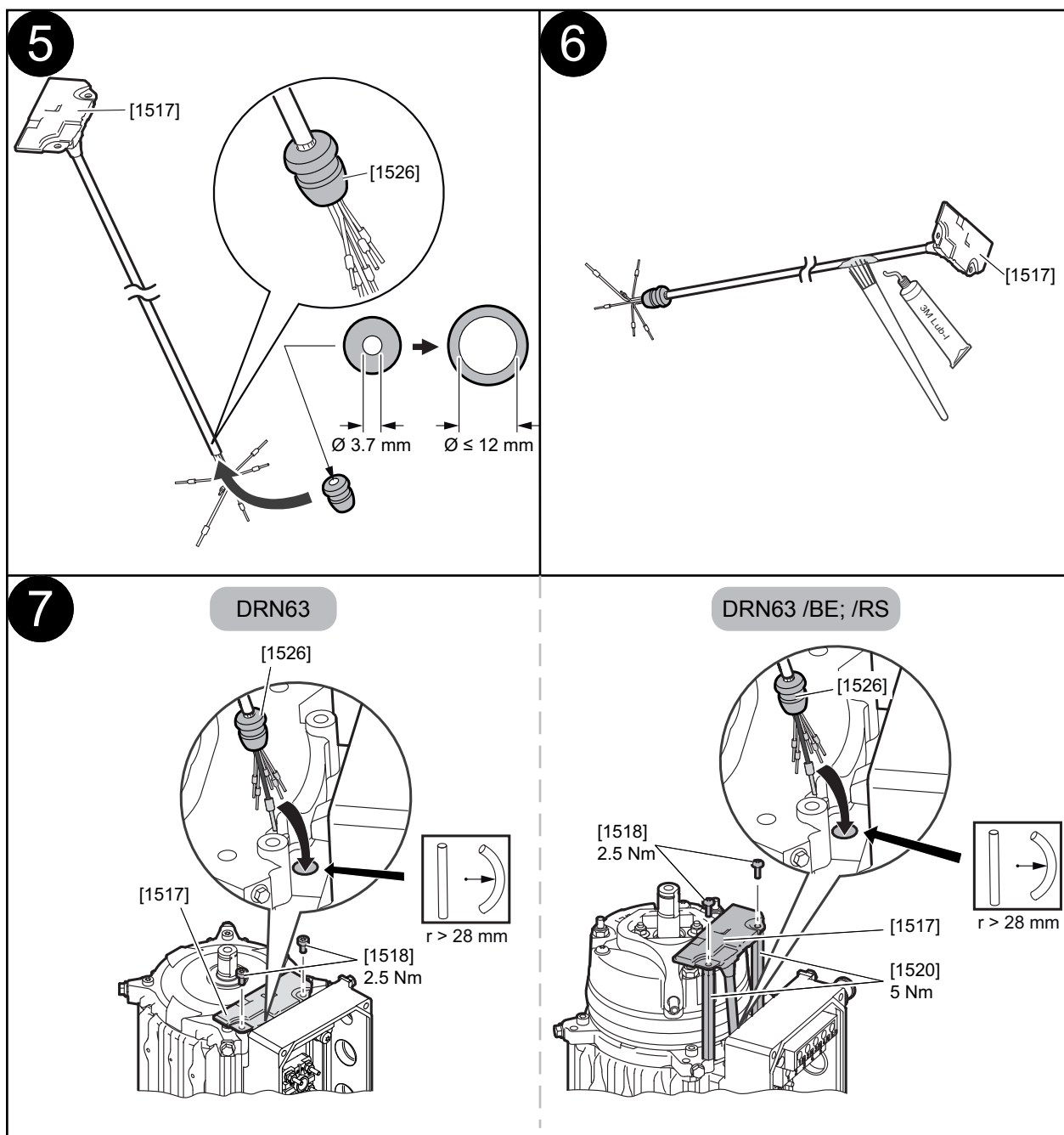
9007228725844107

[36]	1 × DRN63 (/BE, /RS)
[123]	2 × DRN63 (/BE, /RS)
[131]	1 × DRN63 (/BE, /RS)
[132]	1 × DRN63 (/BE, /RS)
[216]	1 × DRN63 (/BE, /RS)
[1517]	1 × DRN63 (/BE, /RS)
[1518]	2 × DRN63 (/BE, /RS)
[1520]	2 × DRN63 /BE, /RS

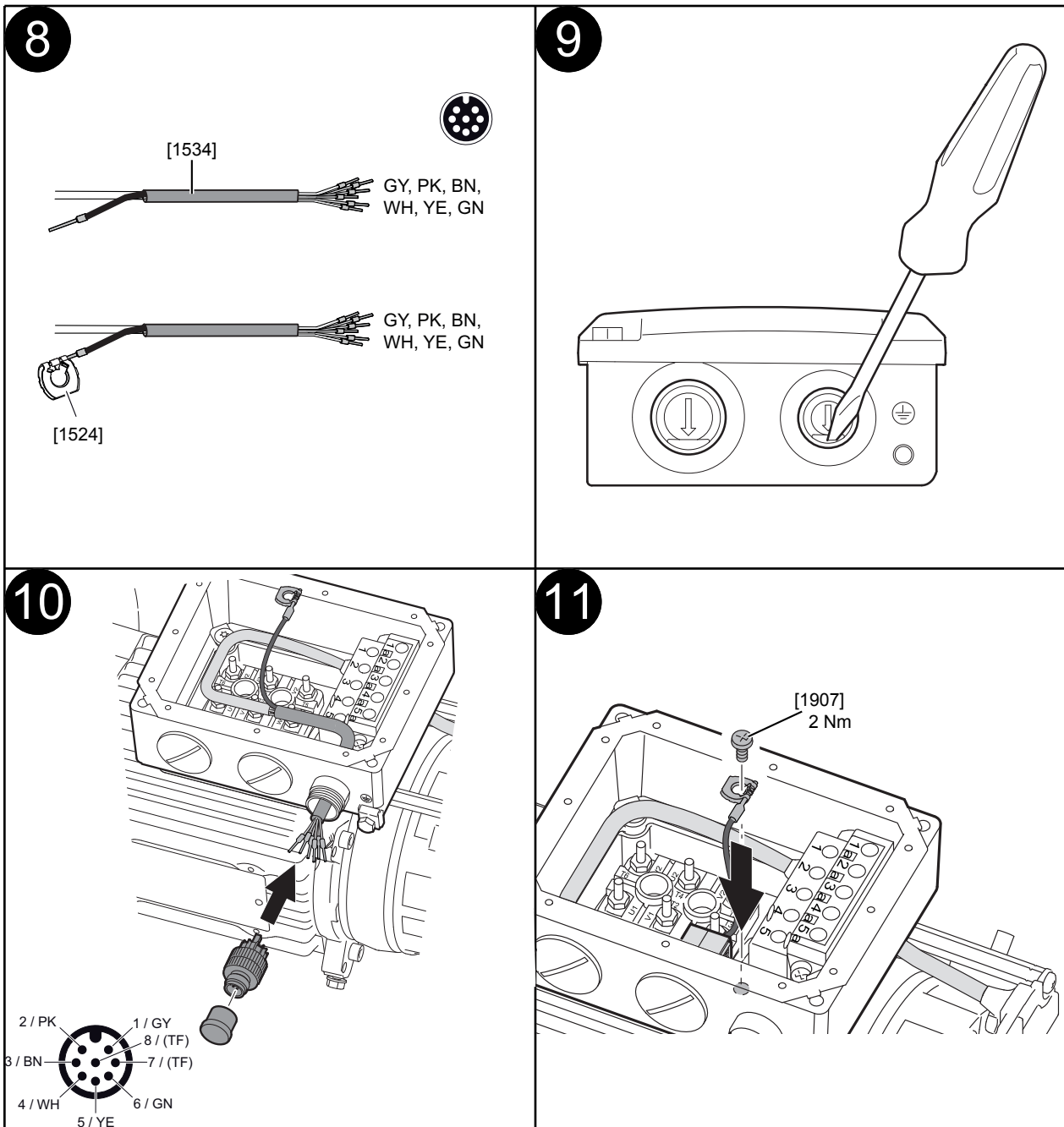
[1524]	1 × DRN63 (/BE, /RS)
[1525]	1 × DRN63 (/BE, /RS)
[1529]	1 × DRN63 (/BE, /RS)
[1534]	1 × DRN63 (/BE, /RS)
[1539]	1 × DRN63 (/BE, /RS)
[1545]	1 × DRN63 (/BE, /RS)
[1546]	1 × DRN63 (/BE, /RS)
[1907]	1 × DRN63 (/BE, /RS)



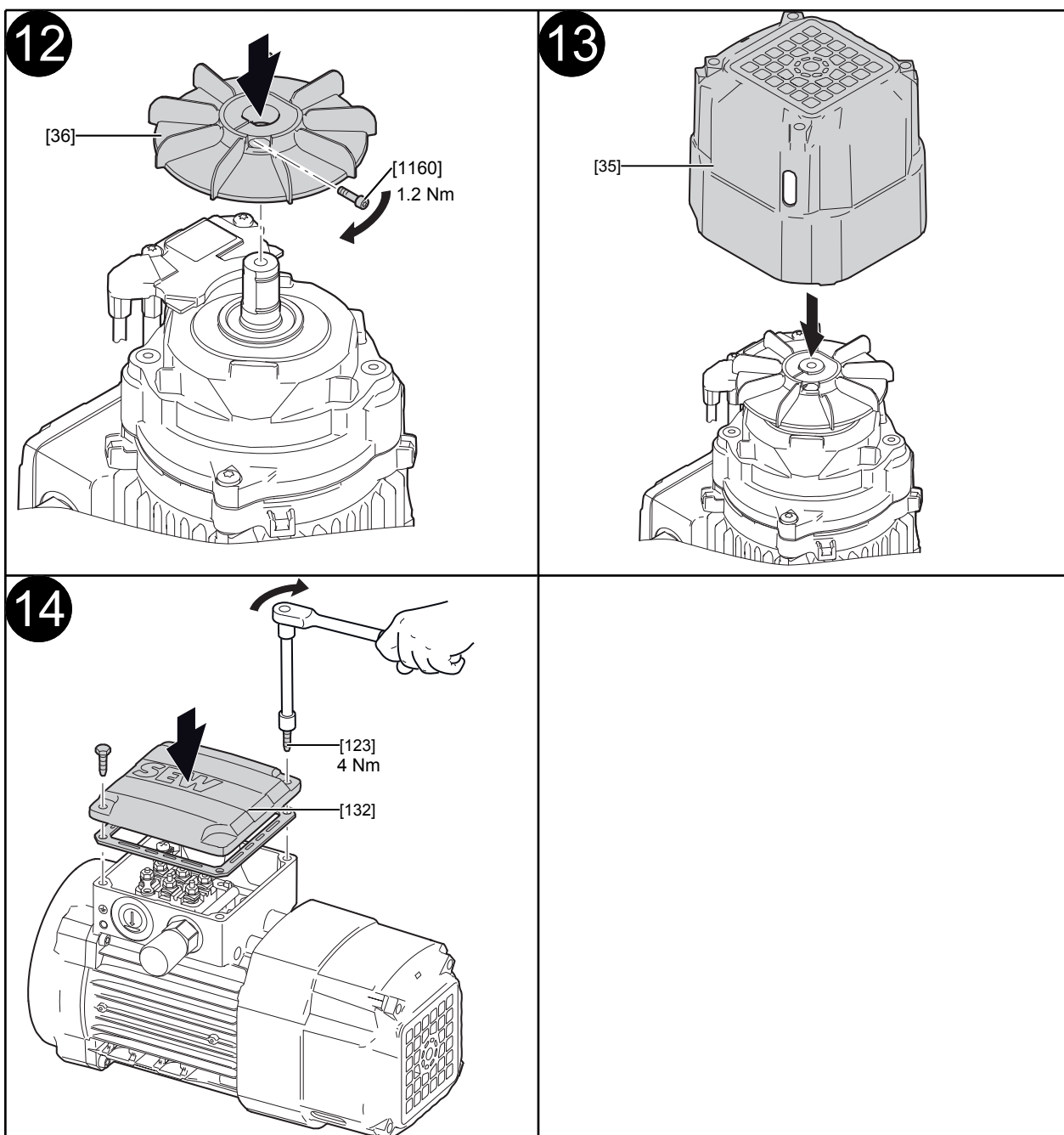
28906902027



28908086283

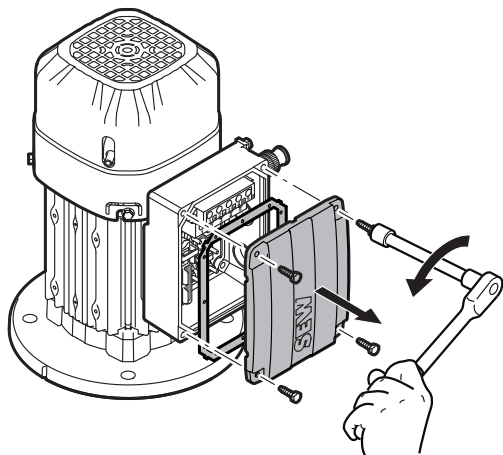


18014427418017547



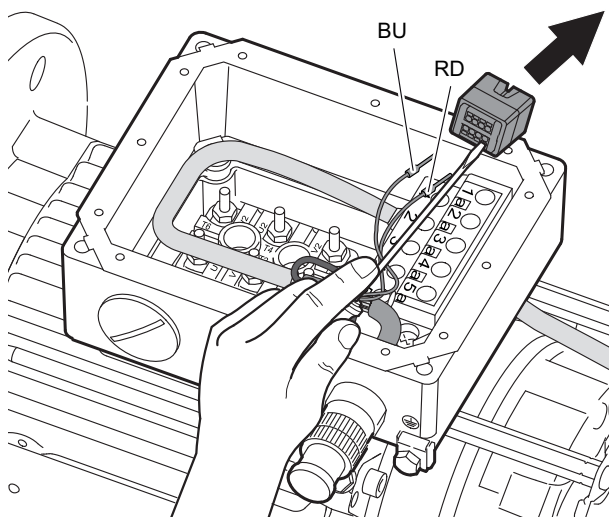
18014428631220363

2.2 Removal of the EI7.B encoder



9592975883

- Loosen the screws on the terminal box and remove the terminal box cover.

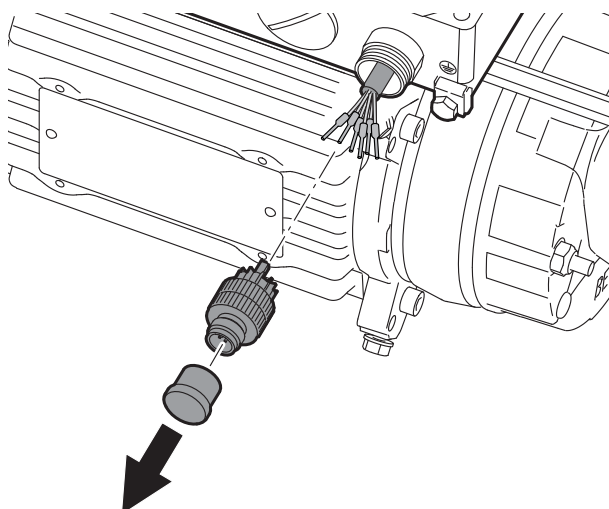


9592952843

If a connection unit with M12 connector is used:

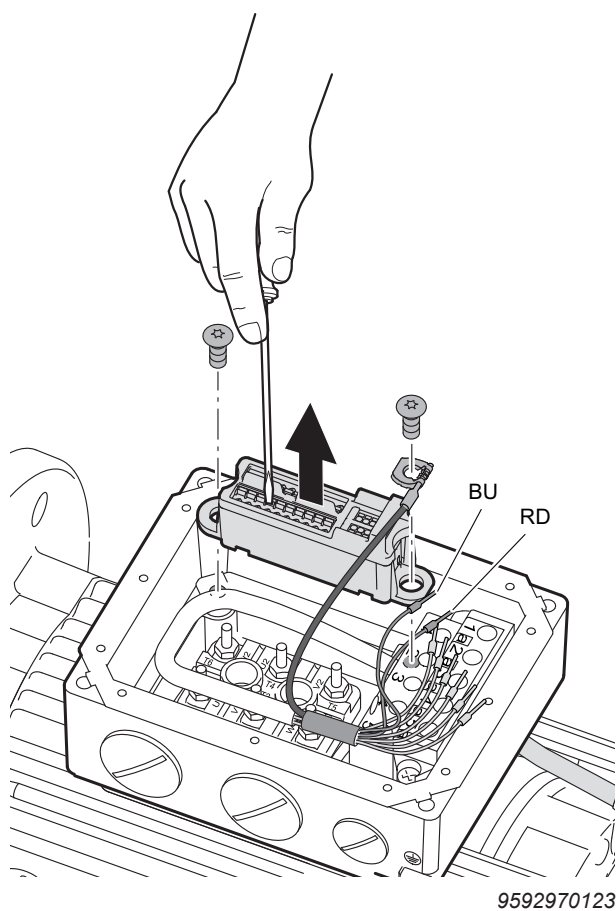
- Disconnect the conductors from the connection unit.

SEW-EURODRIVE recommends using the 1205202 screwdriver from Phoenix



9007208847705355

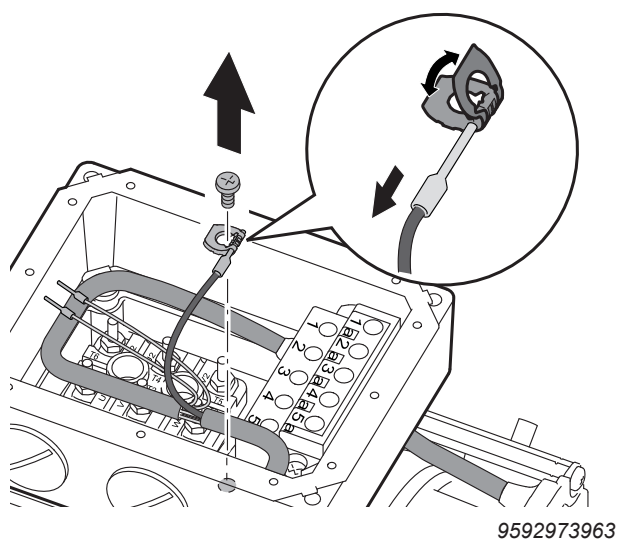
- Unscrew the M12 connector.
- Disconnect the conductors of the encoder cable from the M12 connector.



If a connection unit without M12 connector is used:

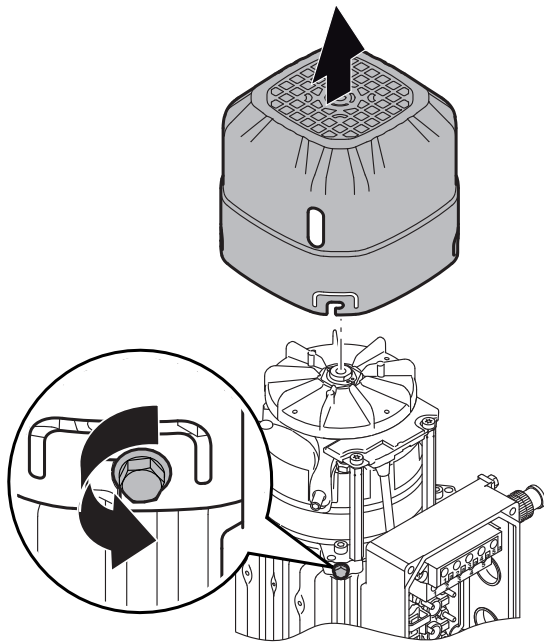
- Disconnect the conductors of the encoder cable from the connection unit.

SEW-EURODRIVE recommends using the 1205202 screwdriver from Phoenix



- Loosen the screw for fastening the shielding on the terminal box.
- Bend the terminal washer open and remove the encoder cable shielding together with the conductor end sleeve.
- Dispose of the terminal washer.

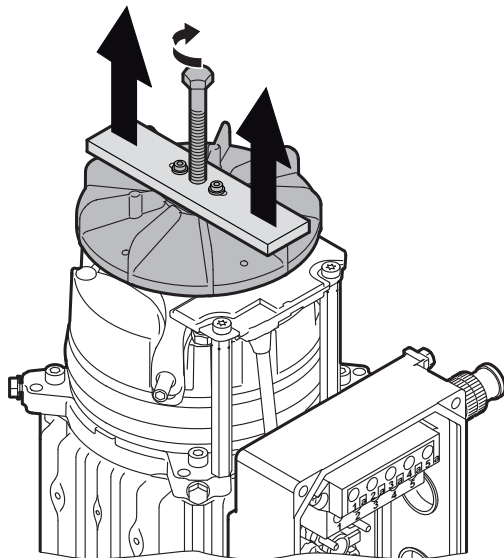
- Loosen the screws on the fan guard and remove the fan guard.



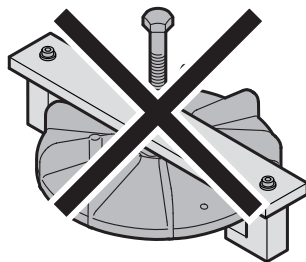
9683088139

- Apply a puller to the bushing of the plastic fan and remove the plastic fan.

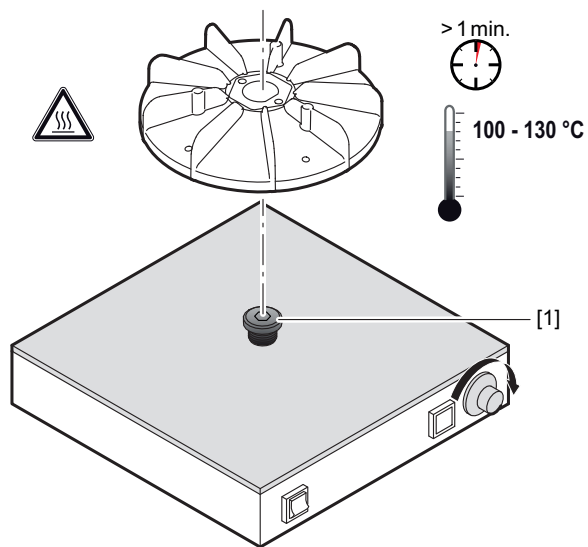
Notice: Applying direct force to the plastic fan can damage it.



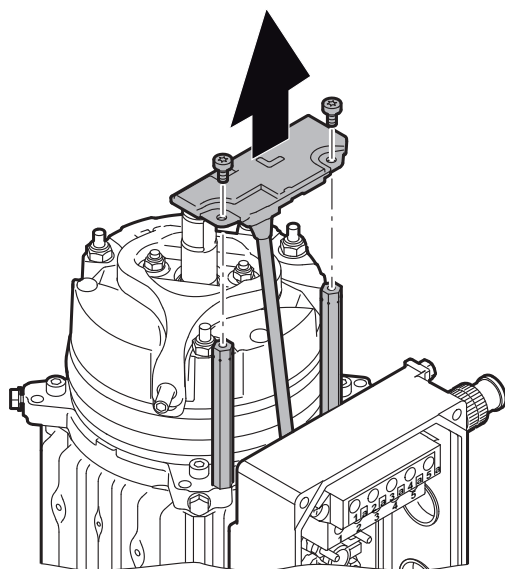
9656067723



9744815115



18014407955475723



9656069643

- Place the bushing of the plastic fan on a warming plate and heat it up to a temperature of 100 – 130 °C.

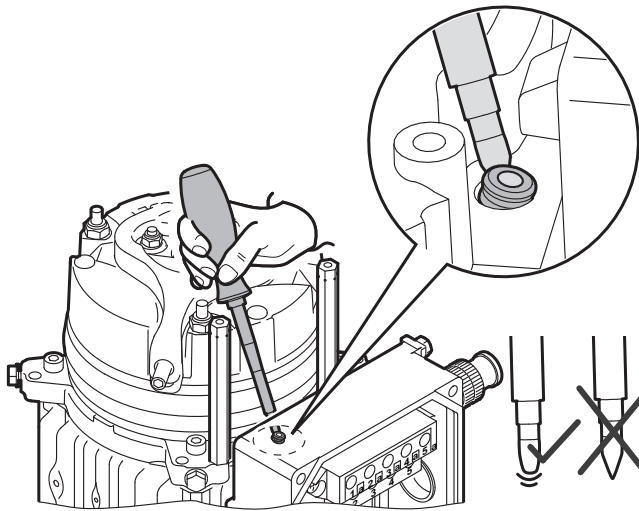
While doing so, ensure that the plastic fan does not come into direct contact with the warming plate.

Any thermally conductive component [1] (e.g. a metal ring) can be used as a contact surface.

Wet the fan seat with Molykote.

This step is necessary for reassembly.

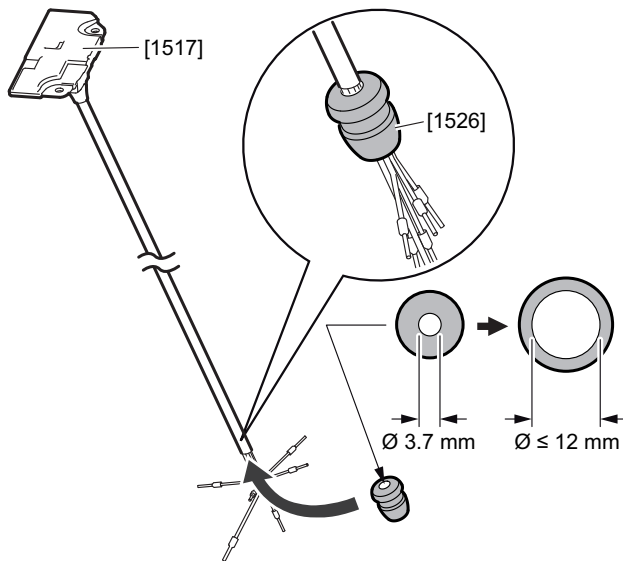
- Loosen the screws on the encoder and remove the encoder.
- Dispose of the screws.



9656065803

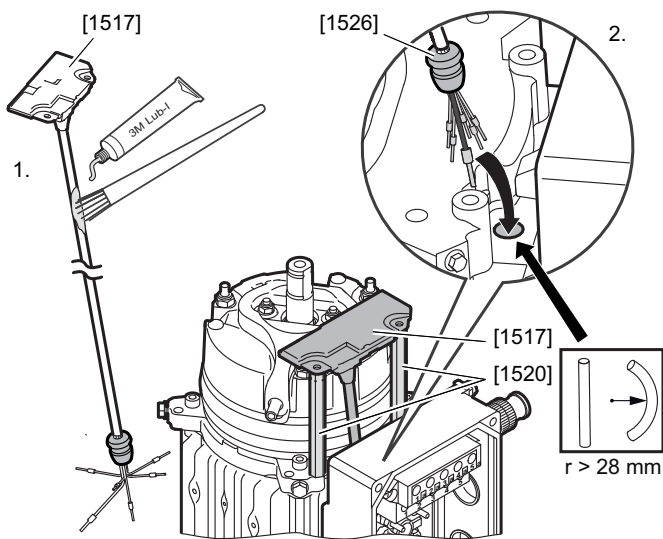
- Remove the old grommet from the cable bushing of the terminal box.
- Dispose of the old grommet.

2.3 Installation of the new EI7.B encoder



9446005259

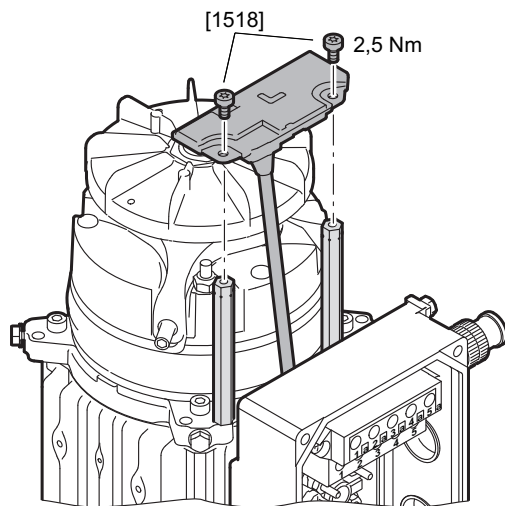
- Push the grommet [1526] onto the cable end of the encoder module [1517]. The inside diameter of the grommet may not exceed the maximum inside diameter of 12 mm.



9592966283

- Coat the cable jacket with wire lubricant. Using a rotating movement, carefully pull the cable through the grommet into the terminal box. While doing so, ensure that the grommet does not inadvertently slide through into the terminal box.

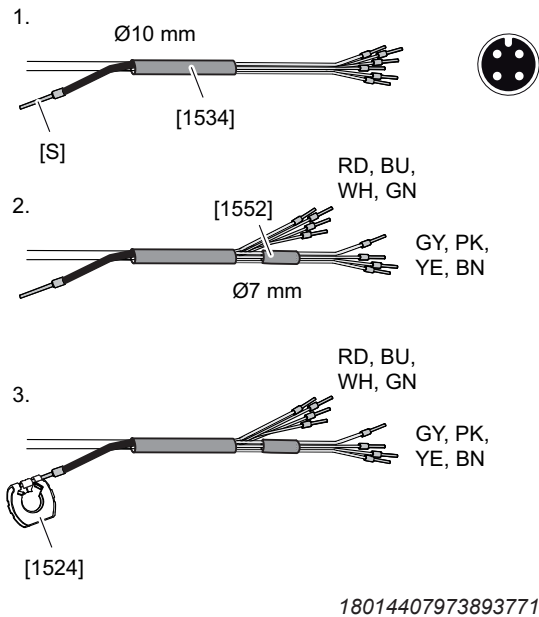
The minimum bending radius of 28 mm must be observed.



9592979723

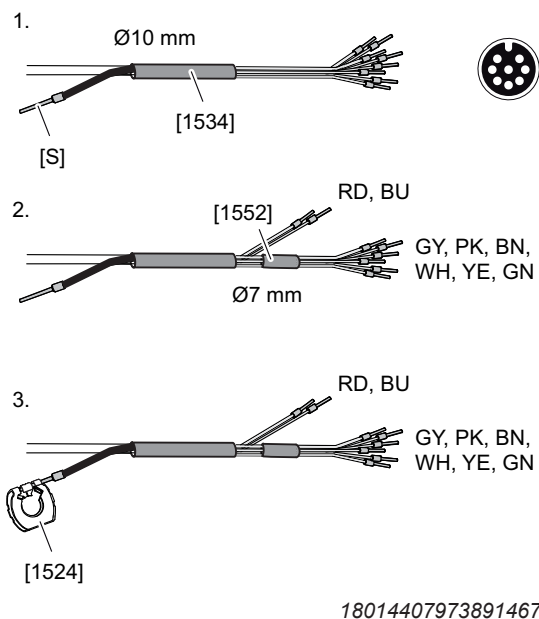
- Fasten the encoder board to the spacers using 2 screws [1518]. The tightening torque must be $2.5 \text{ Nm} \pm 10\%$.

2.4 Wiring the EI7.B encoder to the connection box



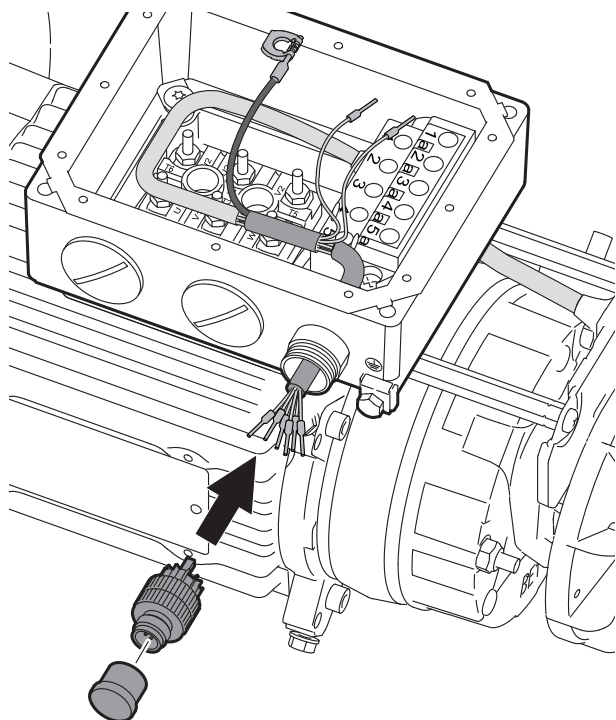
4-pole:

- Push the long glass fiber sheathing [1534] over the single conductors of the encoder cable. Lay the shielding [S] in the opposite direction.
- Push the short glass fiber sheathing [1552] over the single conductors.
- Install the terminal washer [1524].



8-pole:

- Push the long glass fiber sheathing [1534] over the single conductors of the encoder cable. Lay the shielding [S] in the opposite direction.
- Push the short glass fiber sheathing [1552] over the single conductors.
- Install the terminal washer [1524].

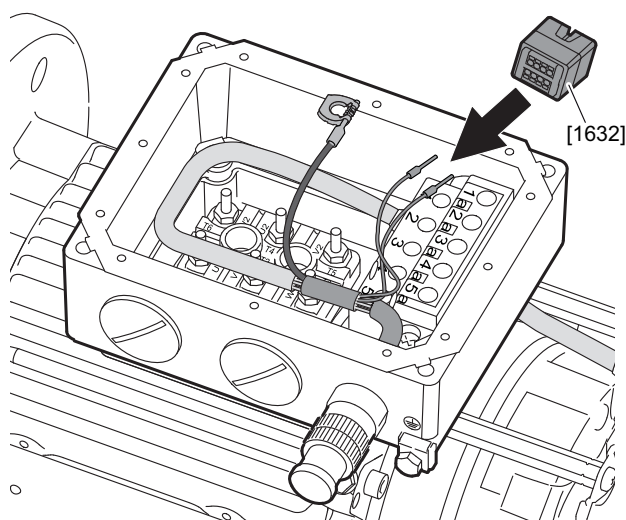


9007208847722635

- Route the conductors through the thread reduction out of the terminal box to the outside.
- Connect the M12 connector as shown in the wiring diagram.

The wiring diagrams for 4 and 8-pin connectors are included in the appendix.

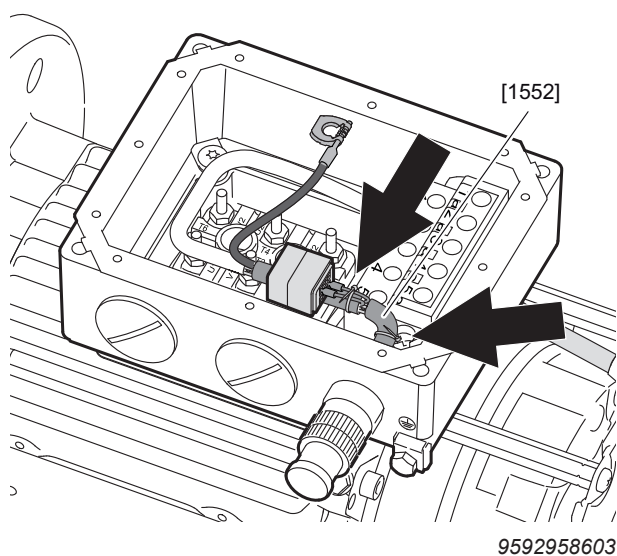
- Screw on and secure the conductors with the M12 connector. The tightening torque must be $0.8 \text{ Nm} \pm 10\%$.
- Fasten the connector.



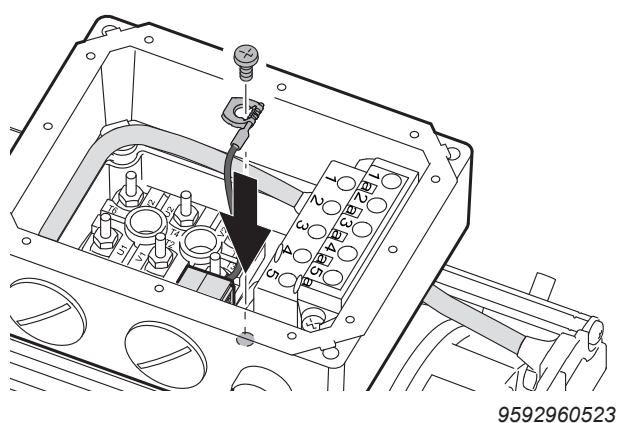
9007208847724555

- Wire the connection box [1632] (in accordance with the previously installed encoder type).

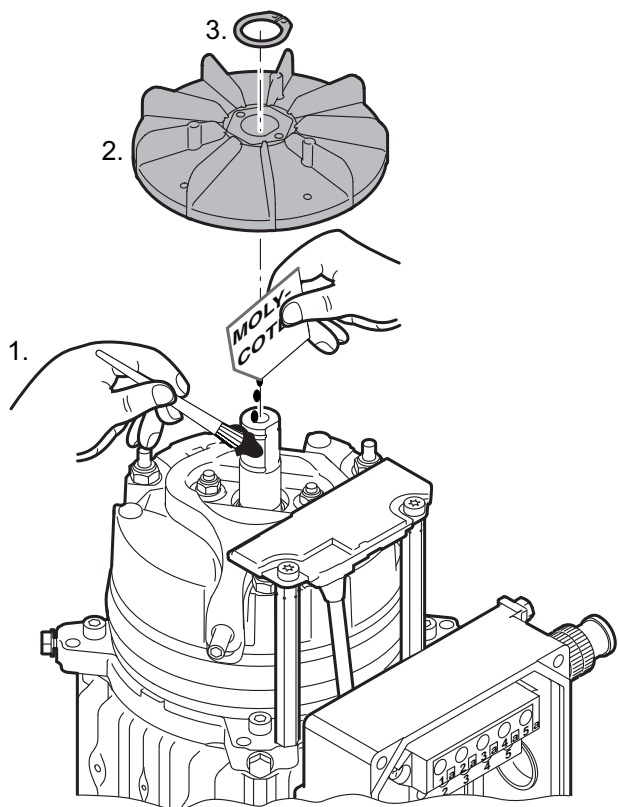
The wiring diagrams for 4 and 8-pin connectors are included in the appendix.



- Fasten the short glass fiber sheathing [1635] using a cable tie.
- Fasten the connection box using a cable tie as close to the conductor end sleeves on the glass fiber sheathing as possible.

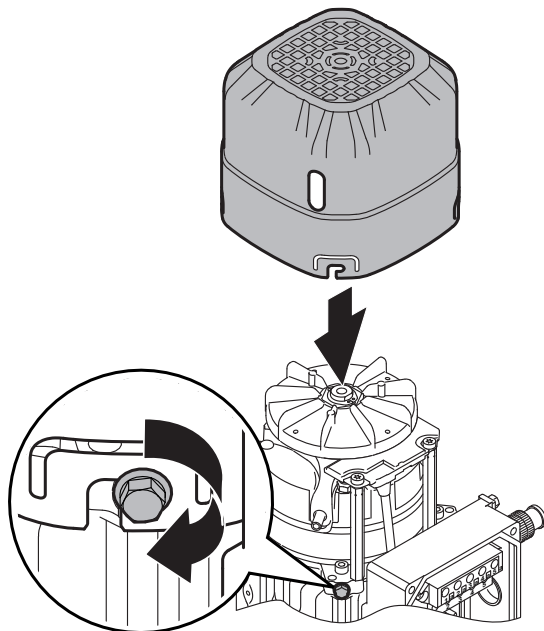


- Screw on and secure the shielding on the terminal box. The tightening torque must be $5 \text{ Nm} \pm 10\%$.



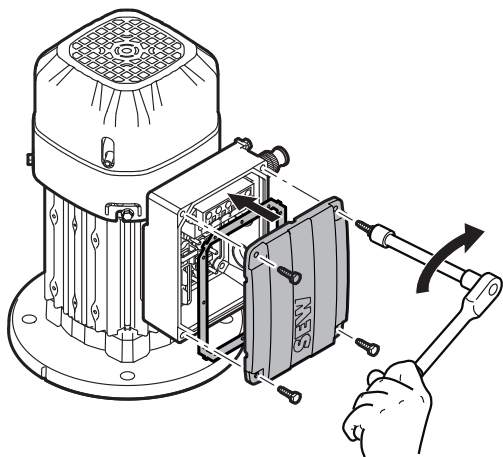
9656061707

- Apply assembly paste to the shaft.
- Install the plastic fan that has been heated.
- Fasten the plastic fan using a retaining ring.



9592956683

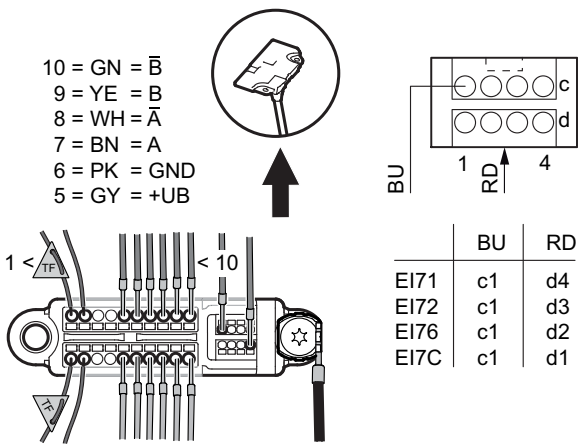
- Mount the fan guard and fasten it with screws. The tightening torque must be $3.3 \text{ Nm} \pm 10\%$.



9592987403

- Mount the terminal box cover and fasten it with screws. The tightening torque must be 3.5 – 4.0 Nm ± 10%.

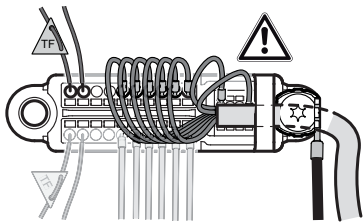
2.5 Wiring the EI7.B encoder to the connection unit



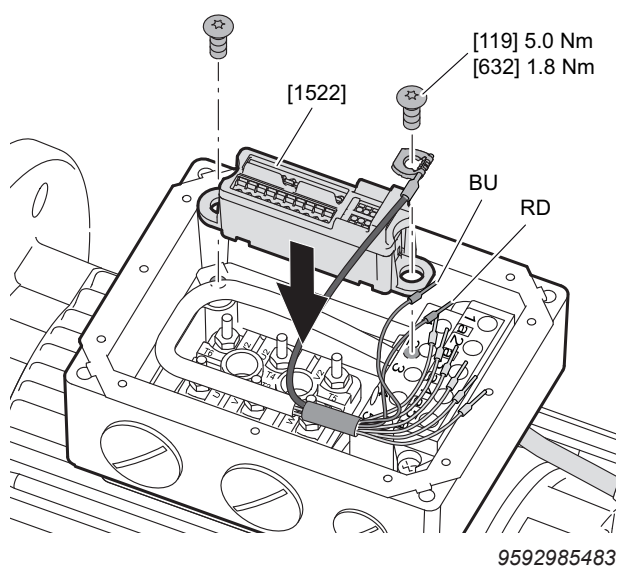
9591928587

- Wire the connection unit [1522] in accordance with the previously installed encoder type and the applicable wiring diagrams.

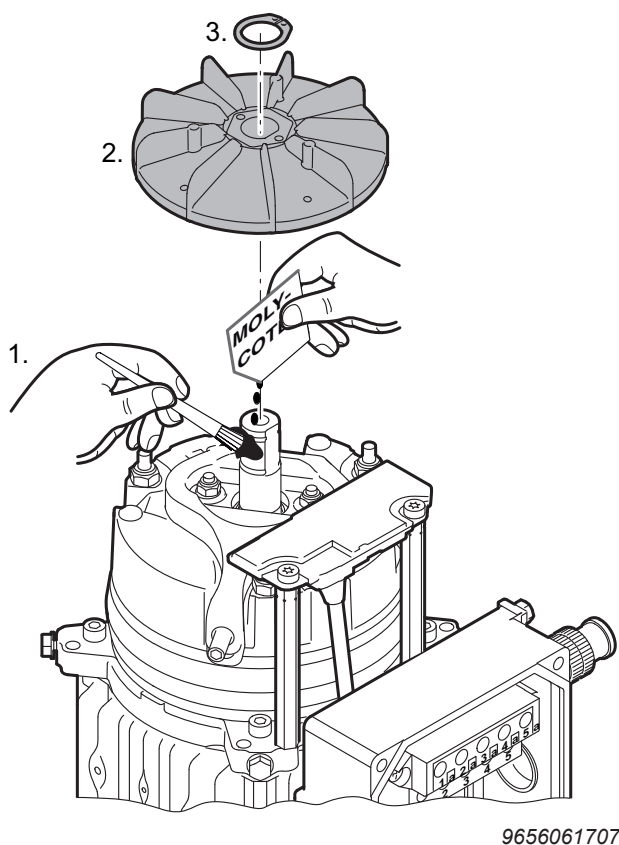
The wiring diagrams for connection without M12 connector are included in the appendix.



9656059787

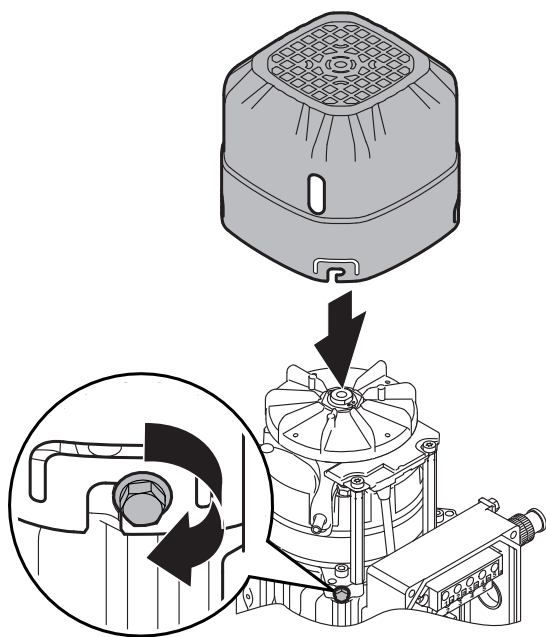


- Fasten the connection unit using screws [119] or [632] (dependent on the terminal box). The tightening torque must be 5.0 Nm $\pm$ 10% for [119] and 1.8 Nm $\pm$ 10% for [632].



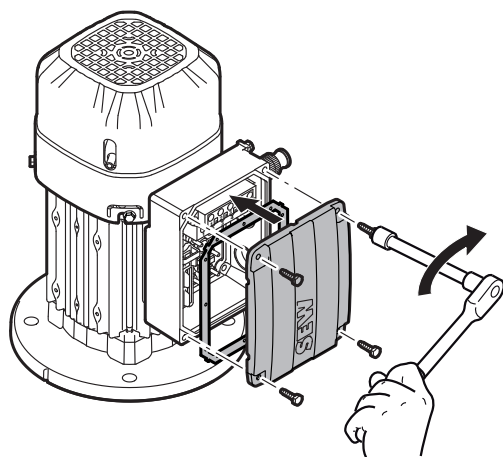
- Apply assembly paste to the shaft.
- Install the plastic fan that has been heated.
- Fasten the plastic fan using a retaining ring.

- Mount the fan guard and fasten it with screws. The tightening torque must be $3.3 \text{ Nm} \pm 10\%$.



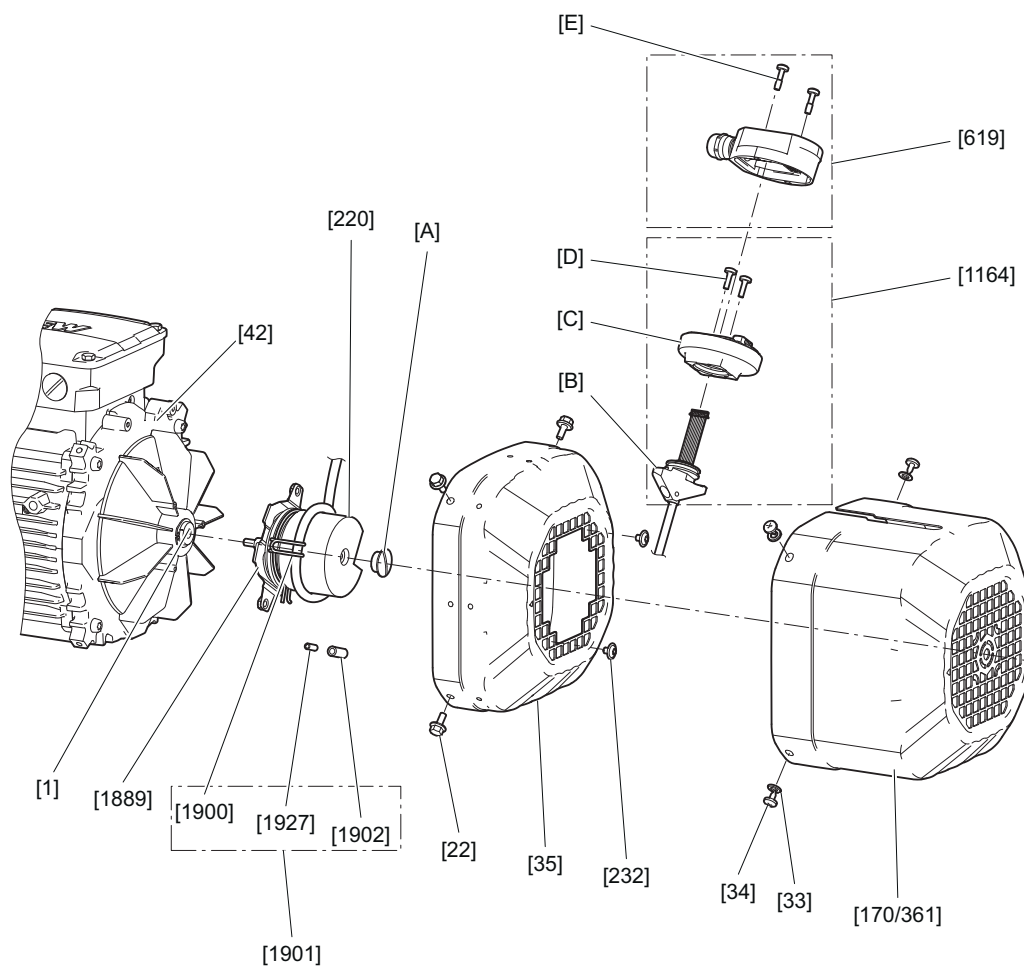
9592956683

- Mount the terminal box cover and fasten it with screws. The tightening torque must be $3.5 - 4.0 \text{ Nm} \pm 10\%$.

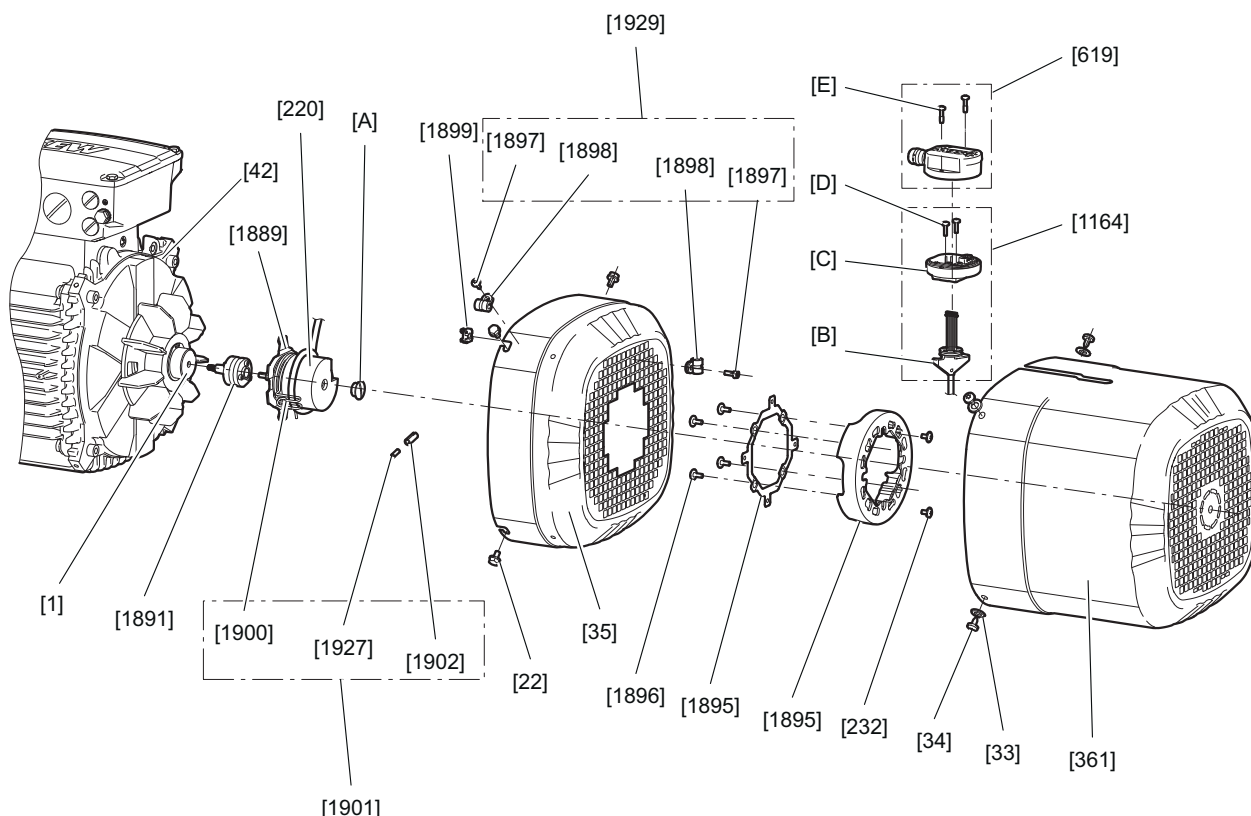


9592987403

3 Electrical connection of EK8., AK8., EV8., AV8. cosine encoders



9007227774284811



9007227788914699

The integrated encoder plug connector (parts 1164 and 619) can be turned in steps of 90° to allow for a variable cable outlet of the connection cover [619].

Part C can be turned ± 360 degrees in steps of 90° by loosening the screws D to allow for a variable cable outlet of the connection cover [619].

In addition, the encoder cover [361] can be turned ± 360 degrees in steps of 90° for many motor configurations to allow for a variable connection side of the integrated encoder plug connector (parts 1164 and 619). Loosen the screws 34 and the washers 33. The ability to turn parts can be restricted by the following design features of the motor:

- Size
- Position of the manual brake release
- Certain gear unit combinations
- Dimensions of the feet of the motor
- Connection technology of the motor (e.g. plug connectors)
- Combination with a forced cooling fan
- Applicative limits of the system

4 Temperature detection /KY (KTY84 – 130)

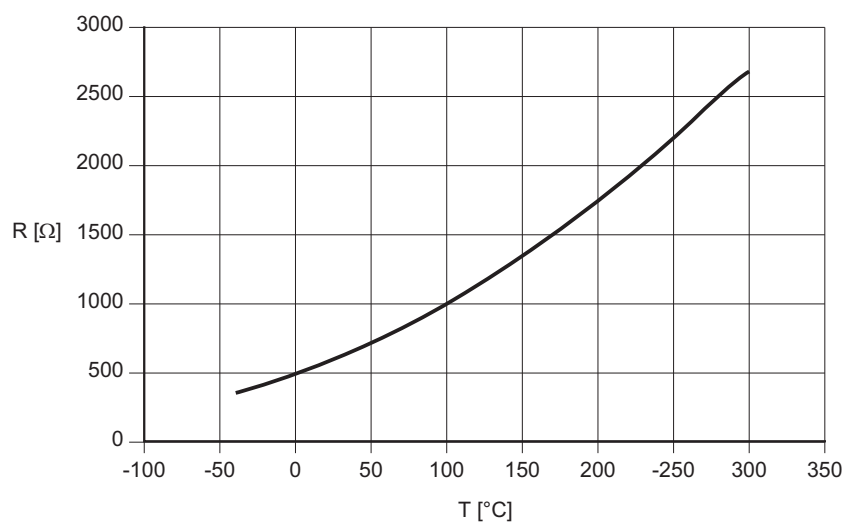
NOTICE

Excessive self-heating of the temperature sensor can damage the insulation of the temperature detection as well as the motor winding.

The drive system might be damaged.

- The current in the circuit must not exceed 3 mA.
- Observe the correct connection of the KTY to ensure correct evaluation of the temperature detection.
- Observe the polarity during connection.

The characteristic curve in the following figure shows the resistance curve subject to the motor temperature with a measuring current of 2 mA and correct pole connection:



1140975115

Technical data	KTY84 – 130
Connection	Red (+) Blue (-)
Total resistance at 20 – 25 °C	540 Ω < R < 640 Ω
Test current	< 3 mA

5 Temperature sensor /PT (PT100)

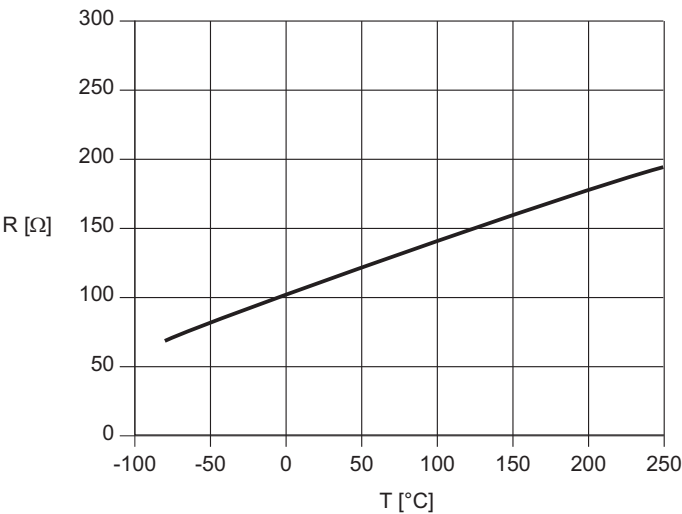
NOTICE

Excessive self-heating of the temperature detection can damage the insulation of the temperature detection as well as the motor winding.

The drive system might be damaged.

- The current in the circuit must not exceed 3 mA.
- Observe the correct connection of the PT100 to ensure correct evaluation of the temperature detection.

The characteristic curve in the following figure shows the resistance curve subject to the motor temperature.



1145838347

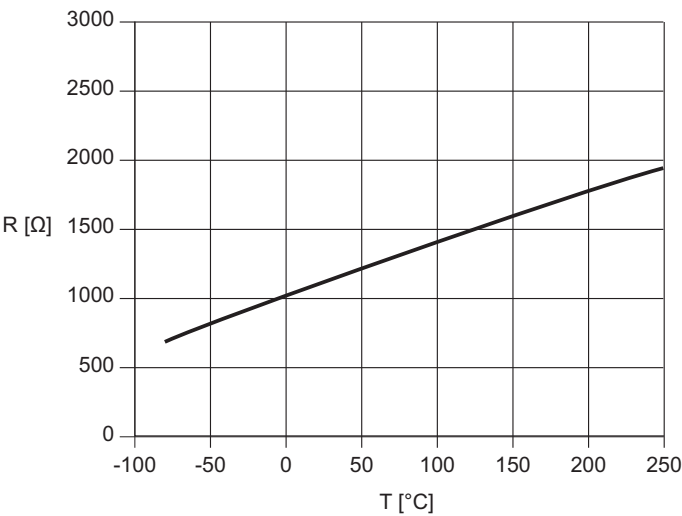
Technical data	PT100
Connection	Red/white
Resistance at 20 – 25 °C per PT100	107.8 Ω < R < 109.7 Ω
Test current	< 3 mA

6 Temperature detection /PK (PT1000)

NOTICE

- Excessive self-heating of the temperature sensor can damage the insulation of the temperature detection as well as the motor winding.
- The drive system might be damaged.
- The current in the circuit must not exceed 3 mA.
 - Observe the correct connection of the PT1000 to ensure correct evaluation of the temperature detection.

The characteristic curve in the following figure shows the resistance curve subject to the motor temperature.



17535480203

Technical data	PT1000
Connection	Black/red
Resistance at 20 – 25 °C per PT1000	1077 Ω < R < 1098 Ω
Test current	< 3 mA

7 Wiring diagrams

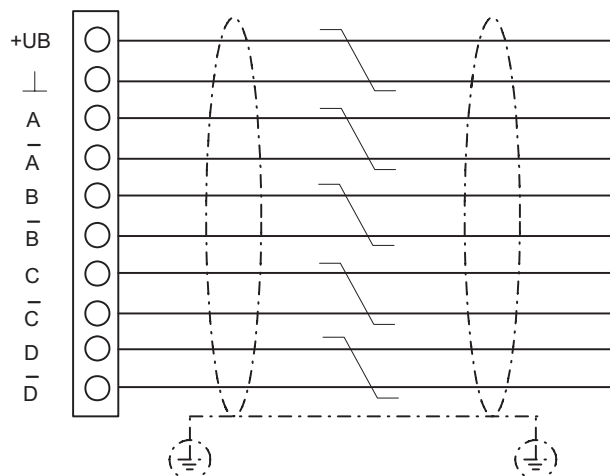
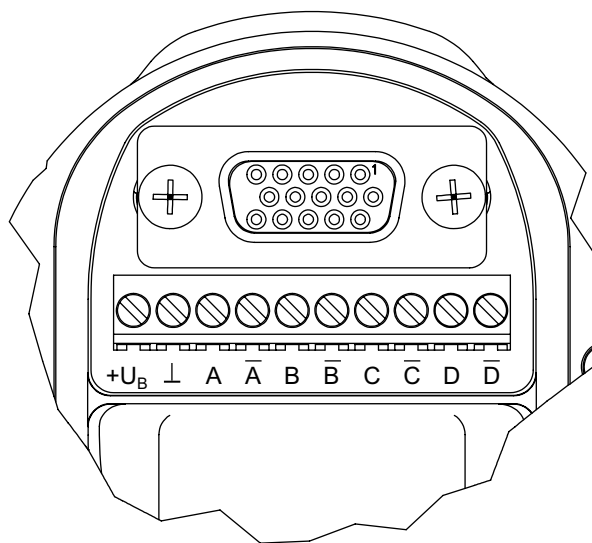
INFORMATION



The motor should be connected as shown in the connection wiring diagram or the terminal assignment diagram, which are supplied with the motor. The following section only shows a selection of the common types of connections. You can obtain the relevant wiring diagrams free of charge from SEW-EURODRIVE.

7.1 EK8., AK8., ES7., AS7., EG7., AG7. encoders

Observe the notes in chapter Connecting the encoder when connecting encoders:



AK8W, AS7W, AG7W, AV8W	AK8Y, AS7Y, AG7Y, AV8Y	AK8H AV8H	EK8C, EK8R, ES7C, EG7C, ES7R, EG7R, EV8C, EV8R	EK8S, ES7S, EG7S, EV8S
+U _B	+U _B	+U _B	+U _B	+U _B
DGND	DGND	DGND	DGND	DGND
Cos+	Cos+	Cos	A	Cos+
Cos-	Cos-	Cos Ref	$\bar{A}$	Cos-
Sin+	Sin+	Sin	B	Sin+
Sin-	Sin-	Sin Ref	$\bar{B}$	Sin-
–	Clock+	–	C	C
–	Clock-	–	$\bar{C}$	$\bar{C}$
Data+	Data+	Data+	–	Data+
Data-	Data-	Data-	–	Data-

7.2 Overview of add-on encoders

Refer to the wiring connection diagrams on information on how to connect incremental encoders:

En-coder	Motors	Encoder type	Mounting type	Supply	Signal	Wiring diagram
				DC V		
EK8S	EDRN71 – 315	Incremental	Shaft-centered	7 – 30	1 V _{PP} sin/cos	63083078
EK8C	EDRN71 – 315	Incremental	Shaft-centered	4.5 – 30	HTL/TTL (RS422)	63181649
EK8R	EDRN71 – 315	Incremental	Shaft-centered	7 – 30	TTL (RS422)	63181649
AK8W	EDRN71 – 315	Absolute value	Shaft-centered	7 – 30	1 V _{PP} sin/cos + RS485	63147378
AK8H	EDRN71 – 315	Absolute value	Shaft-centered	7 – 12	sin/cos + HIPERFACE®	63293706
AK8Y	EDRN71 – 315	Absolute value	Shaft-centered	7 – 30	1 V _{PP} sin/cos + SSI	63120291
EV8S	EDRN71 – 280	Incremental	Flange-centered	7 – 30	1 V _{PP} sin/cos	63083078
EV8C	EDRN71 – 280	Incremental	Flange-centered	4.5 – 30	HTL / TTL (RS422)	63181649
EV8R	EDRN71 – 280	Incremental	Flange-centered	7 – 30	TTL (RS422)	63181649
AV8W	EDRN71 – 280	Absolute value	Flange centered	7 – 30	1 V _{PP} sin/cos + RS485	63147378
AV8H	EDRN71 – 315	Absolute value	Shaft-centered	7 – 12	sin/cos + HIPERFACE®	63293706
AV8Y	EDRN71 – 280	Absolute value	Flange-centered	7 – 30	1 V _{PP} sin/cos + SSI	63120291
ES7S	EDR..71 – 132, EDRN80M – 132S	Incremental	Shaft-centered	7 – 30	1 V _{SS} sin/cos	68180xx08
ES7R	EDR..71 – 132, EDRN80M – 132S	Incremental	Shaft-centered	7 – 30	TTL (RS422)	68179xx08
ES7C	EDR..71 – 132, EDRN80M – 132S	Incremental	Shaft-centered	4.75 – 30	HTL/TTL (RS422)	68179xx08
AS7W	EDR..71 – 132, EDRN80M – 132S	Absolute value	Shaft-centered	7 – 30	1 V _{SS} sin/cos + RS485	68181xx08
AS7Y	EDR..71 – 132, EDRN80M – 132S	Absolute value	Shaft-centered	7 – 30	1 V _{SS} sin/cos + SSI	68182xx07
EG7S	EDR..160 – 280, EDRN132M – 280	Incremental	Shaft-centered	7 – 30	1 V _{SS} sin/cos	68180xx08
EG7R	EDR..160 – 280, EDRN132M – 280	Incremental	Shaft-centered	7 – 30	TTL (RS422)	68179xx08
EG7C	EDR..160 – 280, EDRN132M – 280	Incremental	Shaft-centered	4.75 – 30	HTL/TTL (RS422)	68179xx08
AG7W	EDR..160 – 280, EDRN132M – 280	Absolute value	Shaft-centered	7 – 30	1 V _{SS} sin/cos + RS485	68181xx08
AG7Y	EDR..160 – 280, EDRN132M – 280	Absolute value	Shaft-centered	7 – 30	1 V _{SS} sin/cos + SSI	68182xx07

En-coder	Motors	Encoder type	Mounting type	Supply	Signal	Wiring diagram
				DC V		
EH7C	EDR../EDRN315	Incremental	Shaft-centered	10 – 30	HTL	08511xx08
EH7R	EDR../EDRN315	Incremental	Shaft-centered	10 – 30	TTL (RS422)	08511xx08
EH7S	EDR../EDRN315	Incremental	Shaft-centered	10 – 30	1 V _{ss} sin/cos	08511xx08
EH7T	EDR../EDRN315	Incremental	Shaft-centered	5 (±5%)	TTL (RS422)	08511xx08
AH7Y	EDR../EDRN315	Incremental	Shaft-centered	9 – 30	TTL+SSI (RS422)	08259xx07
EV7C	EDR..71 – 280 EDRN80M – 280	Incremental	Flange-centered	4.75 – 30	HTL/TTL (RS422)	68179xx08
EV7R	EDR..71 – 280 EDRN80M – 280	Incremental	Flange-centered	7 – 30	TTL (RS422)	68179xx08
EV7S	EDR..71 – 280 EDRN80M – 280	Incremental	Flange-centered	7 – 30	1 V _{ss} sin/cos	68180xx08
AV7W	EDR..71 – 280 EDRN80M – 280	Absolute value	Flange-centered	7 – 30	1 V _{ss} sin/cos (RS485)	68181xx08
AV7Y	EDR..71 – 280 EDRN80M – 280	Absolute value	Flange-centered	7 – 30	1 V _{ss} sin/cos + SSI	68182xx08

8 Installation notes

For cable routing, use only cables and cable glands that meet the following criteria:

- The clamping range is suitable for the cables used.
- The IP degree of protection and operating temperature range of the encoder connection corresponds to at least the IP degree of protection and operating temperature range of the encoder.

If you use cables with a different diameter, replace the supplied cable gland with a suitable cable gland.

Depending on the encoder design, observe the following requirements for the cable gland:

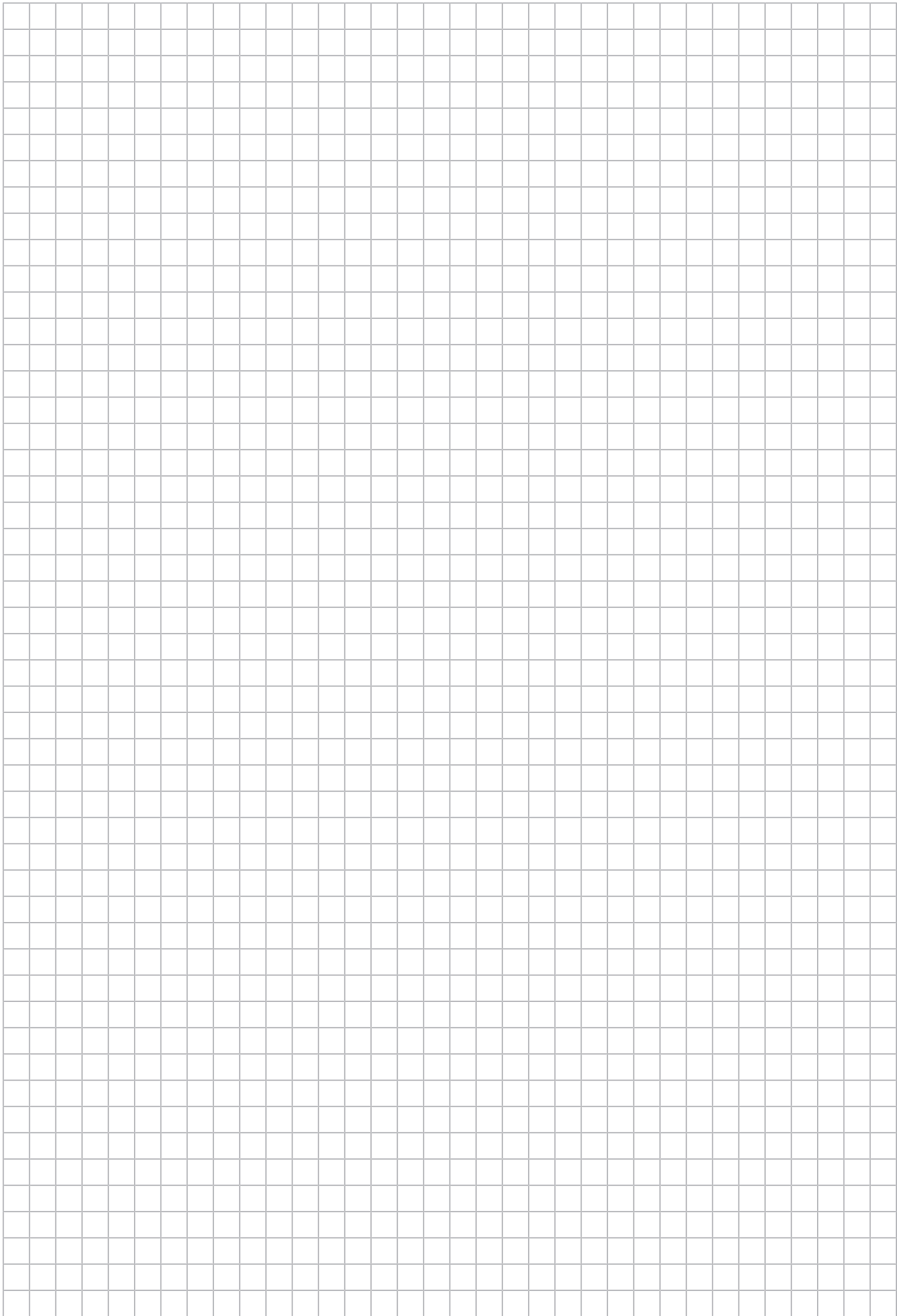
Encoder	Clamping range in mm	Tightening torque in Nm
.K8., .V8.	5 – 9.5	2 ¹⁾
.S7., .V7., .G7. with SW17	5 – 9	3
.S7., .V7., .G7. with SW20	5 – 10	3

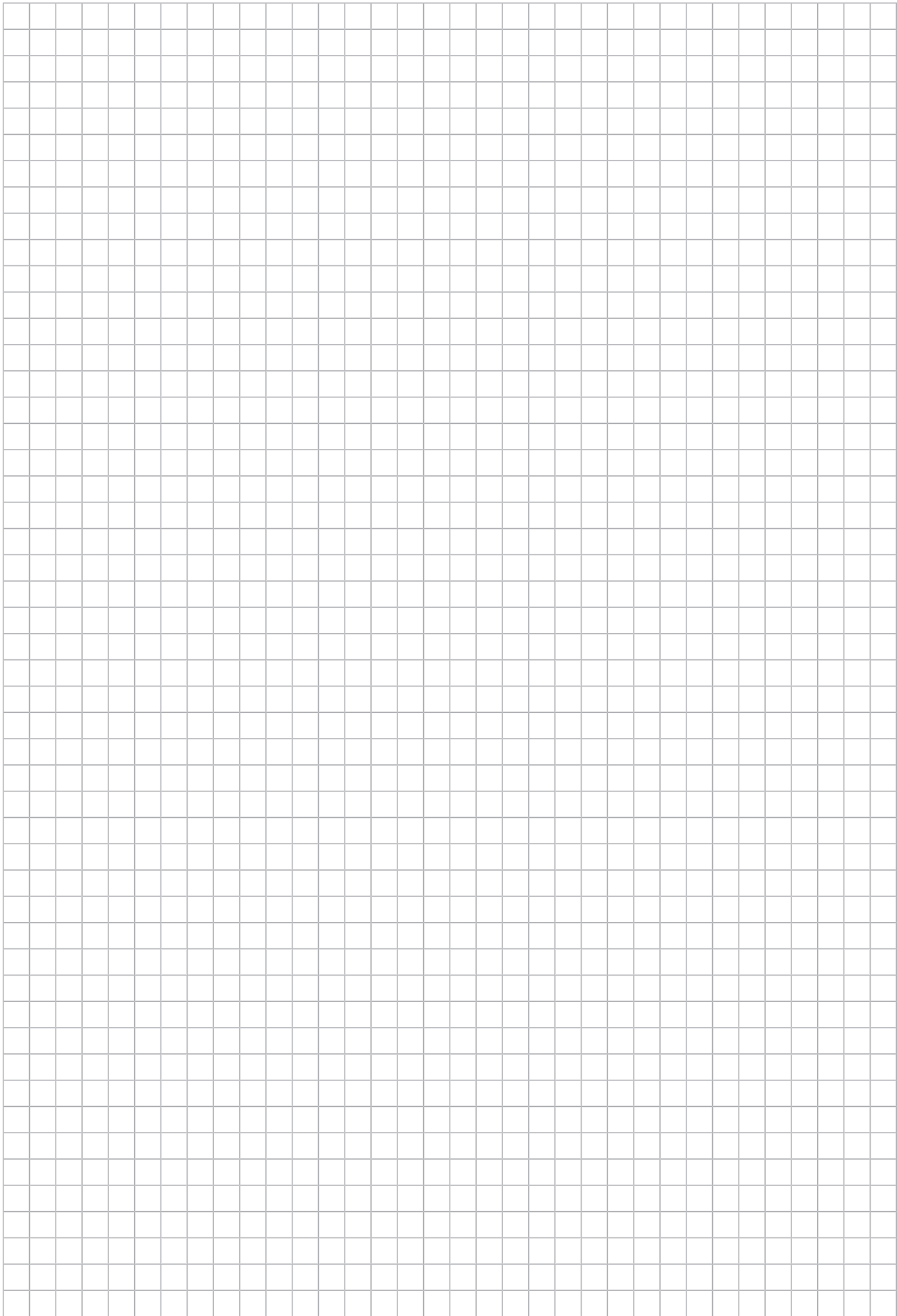
1) For cables from SEW-EURODRIVE with a diameter of 8.5 – 9 mm, 5 cable pairs, shielded, PU coated.
For other cables or operation subject to strong vibration, use adapted tightening torques.

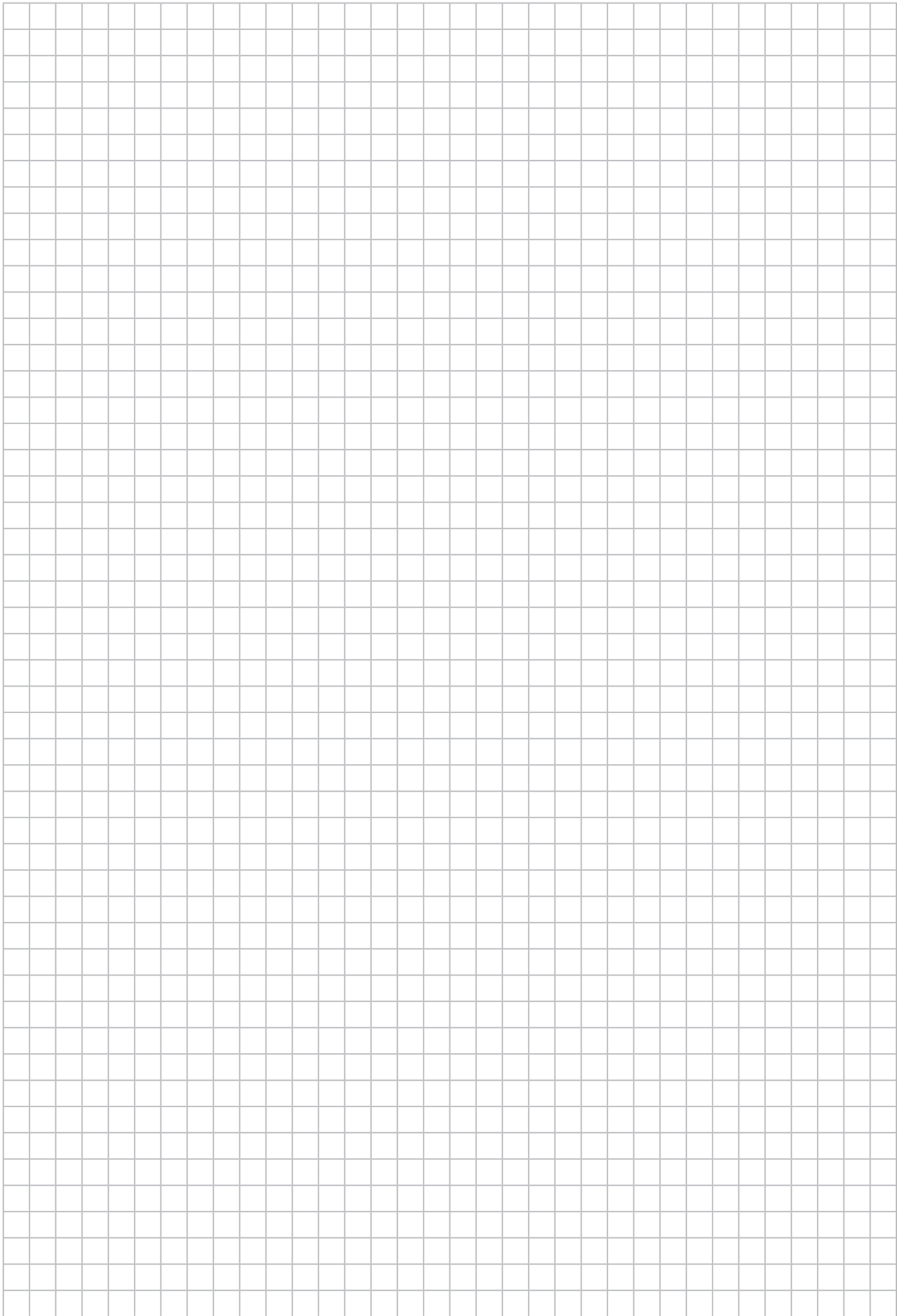
Encoders .K8./V8.

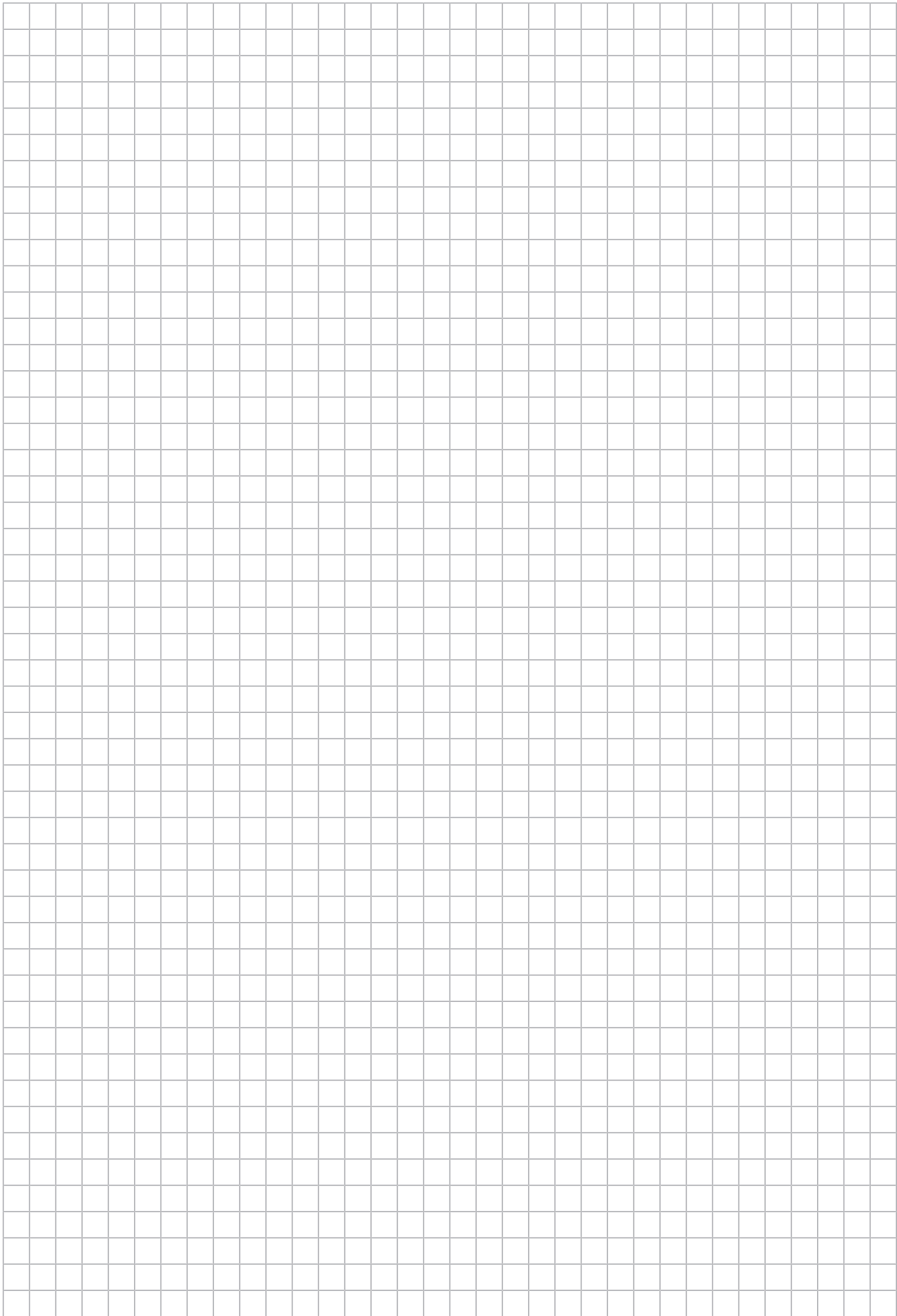
Specifications regarding the connection cover with prefabricated cable (provided by the customer):

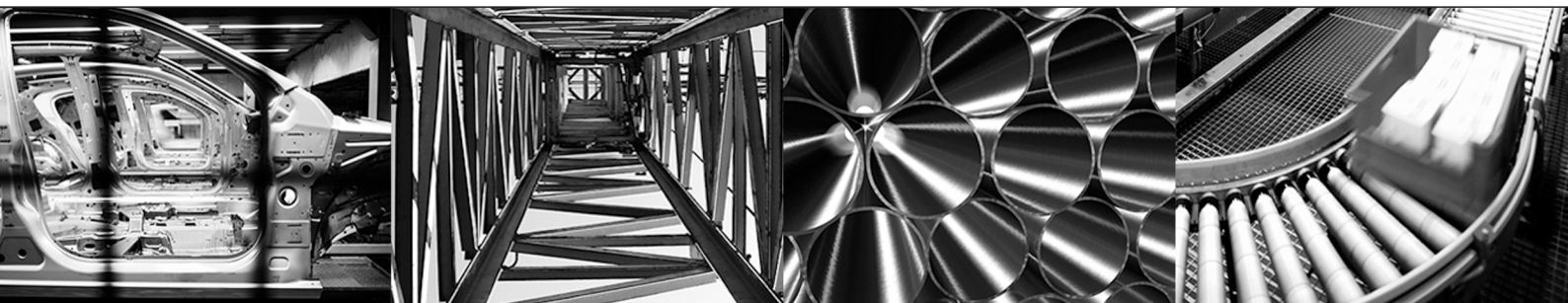
- Connect the M23 connector only outside of the explosion-protected area, or connect it to a device that meets explosion-protection requirements.
- Connect the D-sub connector only outside of the explosion-protected area, or connect it to a device that meets explosion-protection requirements.
- If you use a cable carrier installation, adhere to the minimum ambient temperature of -20 °C.













SEW-EURODRIVE
Driving the world

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