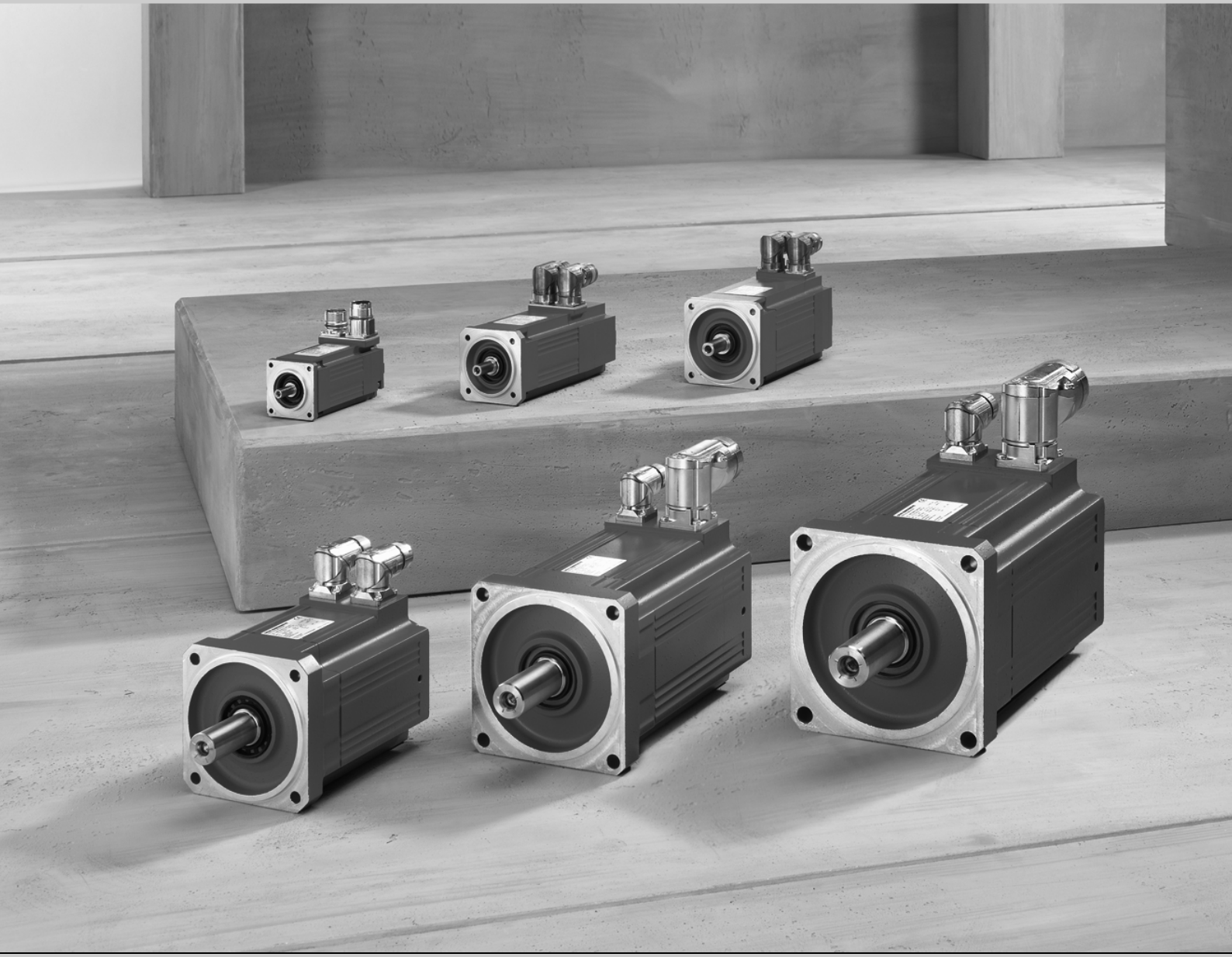
SEW EURODRIVE

Operating Instructions

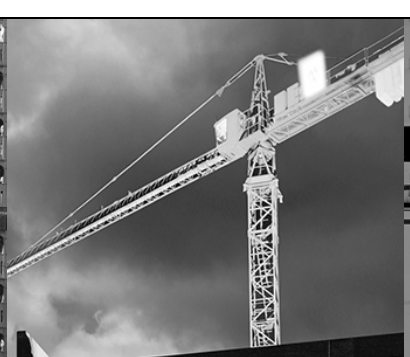


Synchronous Servomotors

CMP40 – CMP100
CMPZ71 – CMPZ100

Edition 07/2010

16907213 / EN

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Contents

1 General Information

1.1 How to use this documentation

The documentation is an integral part of the product and contains important information on operation and service. The documentation is written for all employees who assemble, install, startup, and service this product.

The documentation must be accessible and legible. Make sure that persons responsible for the system and its operation, as well as persons who work independently on the unit, have read through the documentation carefully and understood it. If you are unclear about any of the information in this documentation, or if you require further information, contact SEW-EURODRIVE.

1.2 Structure of the safety notes

1.2.1 Meaning of the signal words

The following table shows the grading and meaning of the signal words for safety notes, notes on potential risks of damage to property, and other notes.

Signal word	Meaning	Consequences if disregarded
⚠ **DANGER**	Imminent danger	Severe or fatal injuries
⚠ **WARNING**	Possible dangerous situation	Severe or fatal injuries
⚠ **CAUTION**	Possible dangerous situation	Minor injuries
NOTICE	Possible damage to property	Damage to the drive system or its environment
INFORMATION	Useful information or tip: Simplifies the handling of the drive system.	

1.2.2 Structure of the section-related safety notes

Section safety notes do not apply to a specific action, but to several actions pertaining to one subject. The used symbols indicate either a general or a specific hazard.

This is the formal structure of a section safety note:

⚠ SIGNAL WORD

Type and source of danger.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the danger.

1.2.3 Structure of the embedded safety notes

Embedded safety notes are directly integrated in the instructions just before the description of the dangerous action.

This is the formal structure of an embedded safety note:

- ⚠ **SIGNAL WORD** Nature and source of hazard.

  Possible consequence(s) if disregarded.

  – Measure(s) to prevent the danger.

1.3 Rights to claim under warranty

A requirement of fault-free operation and fulfillment of any rights to claim under limited warranty is that you adhere to the information in the documentation. Read the documentation before you start working with the unit!

1.4 Exclusion of liability

You must comply with the information contained in this documentation to ensure safe operation of the electric motors and to achieve the specified product characteristics and performance features. SEW-EURODRIVE assumes no liability for injury to persons or damage to equipment or property resulting from non-observance of the documentation. In such cases, any liability for defects is excluded.

1.5 Copyright

1.6 Motor type notation

These operating instructions cover the motor types CMP and CMPZ.

If information refers to both CMP and CMPZ motors, the notation CMP. motors is used.

If information refers to either CMP or CMPZ motors, the motor type is stated explicitly.

2 Safety Notes

The following basic safety notes must be read carefully to prevent injury to persons and damage to property. The operator must ensure that the basic safety notes are read and adhered to. Make sure that persons responsible for the system and its operation, as well as persons who work independently on the unit, have read through the operating instructions carefully and understood them. If you are unclear about any of the information in this documentation or if you require further information, please contact SEW-EURODRIVE.

2.1 Preliminary information

The following safety notes are primarily concerned with the use of CMP motors. If using gearmotors, please also refer to the safety notes for gear units in the corresponding operating instructions.

Also observe the supplementary safety notes in the individual sections of this documentation.

2.2 General information

⚠ DANGER

During operation, the motors and gearmotors can have live, bare (in the event of open connectors/terminal boxes) and movable or rotating parts as well as hot surfaces, depending on their enclosure.

Severe or fatal injuries.

- All work related to transportation, storage, installation, assembly, connection, startup, maintenance and repair may only be carried out by qualified personnel, in strict observance of:
  - The relevant detailed operating instructions
  - The warning and safety signs on the motor/gearmotor
  - All other project planning documents, operating instructions and wiring diagrams related to the drive
  - The specific regulations and requirements for the system
  - The national/regional regulations governing safety and the prevention of accidents
- Never install damaged products
- Immediately report any damage to the shipping company

Removing the required protection cover or the housing without authorization, improper use as well as incorrect installation or operation may result in severe injuries to persons or damage to property.

This documentation provides additional information.

2.3 Target group

Any mechanical work may only be performed by adequately qualified personnel. Qualified staff in the context of this documentation are persons familiar with the design, mechanical installation, troubleshooting and servicing of the product who possess the following qualifications:

- Training in mechanical engineering, e.g. as a mechanic or mechatronics technician (final examinations must have been passed).
- They are familiar with these operating instructions.

Any electronic work may only be performed by adequately qualified electricians. Qualified electricians in the context of this documentation are persons familiar with electrical installation, startup, troubleshooting and servicing of the product who possess the following qualifications:

- Training in electrical engineering, e.g. as an electrician or mechatronics technician (final examinations must have been passed).
- They are familiar with these operating instructions.

All work in further areas of transportation, storage, operation and waste disposal must only be carried out by persons who are trained appropriately.

All qualified personnel must wear appropriate protective clothing.

2.4 Functional safety technology (FS)

SEW-EURODRIVE drives can be supplied with safety-rated components.

MOVIMOT®, encoders or brakes, or other accessories, can be integrated in the AC motor as safety-relevant components either individually or in combination.

SEW-EURODRIVE indicates such an integration by the FS mark and a number on the nameplate.

The number is a code that indicates which components in the drive are safety-related. See the following code table for all products:

Functional safety	Inverter (e.g. MOVIMOT®)	Brake	Manual brake release monitoring	Brake monitoring	Motor protection	Encoder
01	x					
02		x				
03					x	
04						x
05	x	x				
06	x				x	
07	x					x
08		x	x			
09		x		x		
10		x			x	
11		x				x
12					x	x
13	x	x				x
14	x				x	x
15		x	x			x
16		x		x		x
17		x			x	x
18	x	x	x		x	
19	x	x	x			x
20	x	x		x	x	
21	x	x		x		x
22	x	x			x	x
23	x	x	x		x	x
24	x	x		x	x	x
25	x	x	x	x	x	x

If the drive bears the FS mark on the nameplate, you must adhere to the information in the following document:

- the addendum to the "Functional Safety for Synchronous Servomotors – Encoders" operating instructions.

You find the characteristic safety values of the following components in the technical data section so you can determine the security level for systems and machines yourself:

- Characteristic safety values for encoders: $MTTF_d$ values

The characteristic safety values of SEW components are also available on the SEW homepage on the internet and in the SEW library for the BGIA Sistema software.

2.5 Designated use

These motors are intended for industrial systems.

When installed in machines, startup of the motors (i.e. start of designated operation) is prohibited until it is determined that the machine meets the requirements stipulated in Directive 2006/42/EC (Machinery Directive).

Use in potentially explosive atmospheres is prohibited, unless measures are expressly taken to make it possible.

Air-cooled types are dimensioned for ambient temperatures of -20 °C to +40 °C and installation altitudes ≤ 1000 m above sea level. Note that information on the nameplate may differ. The ambient conditions must comply with all the specifications on the nameplate.

2.6 Other applicable documentation

The following publications and documents have to be observed as well:

- Wiring diagrams provided with the motor
- "Gear Unit Series R..7, F..7, K..7, S..7, SPIROPLAN® W" operating instructions for gearmotors
- Operating instructions "Gear Unit Series BS.F.., PS.F.. and PS.C.."
- Catalog "Synchronous Servomotors" and/or
- "Synchronous Servo Gearmotors" catalog
- If required, addendum to the operating instructions "Safety-Rated Encoders – Functional Safety for Synchronous Servomotors CMP"

2.7 Transport/storage

Inspect the shipment for any damage that may have occurred in transit as soon as you receive the delivery. Inform the shipping company immediately. It may be necessary to preclude startup.

Tighten the eyebolts securely. They are designed to only carry the weight of the motor/gearmotor; do not attach any additional loads.

The built-in lifting eyebolts comply with DIN 580. Always observe the loads and regulations listed in this standard. If the gearmotor is equipped with two eyebolts, then both of these should be used for transportation. In this case, the tension force vector of the slings must not exceed a 45° angle according to DIN 580.

Use suitable, sufficiently rated handling equipment if necessary. Reattach these in the case of further transportation.

Store the motor in a dry, dust-free environment if it is not to be installed straight away. The motor can be stored for one year without requiring any special measures before startup.

2.8 Installation

Make sure that the supports are even, the foot and flange mounting is correct and if there is direct coupling, align with precision. Resonances between the rotational frequency and the double network frequency caused by the structure are to be avoided. Turn the rotor manually and listen for unusual noises. Check the direction of rotation in decoupled status.

Only install or remove belt pulleys and couplings using suitable devices (heat up) and cover with a touch guard. Avoid improper belt tension.

Make the pipe connections that may eventually be required. Mounting positions with shaft ends pointing upwards should be equipped with a cover to prevent foreign objects from falling into the fan. Ensure that ventilation openings are not obstructed and that used air, including air from adjacent units, cannot be drawn in again straight away.

Observe the notes in section "Mechanical Installation" (page 21).

2.9 Electrical connection

All work may only be carried out by qualified personnel. During work, the low-voltage machine must be at standstill, de-energized and safeguarded against accidental restart. This also applies to auxiliary circuits (e.g. anti-condensation heating or forced cooling fan).

Check that the motor is de-energized!

Exceeding the tolerances in EN 60034-1 (VDE 0530, part 1) – voltage + 5%, frequency + 2%, curve shape, symmetry – increases the heating and influences electromagnetic compatibility. Also observe EN 50110 (and, if applicable, other national regulations, such as DIN VDE 0105 for Germany).

Observe the wiring information and differing data on the nameplate as well as the wiring diagram provided with the motor.

The connection should be a continuous secure electrical connection (no protruding wire ends); use the cable end equipment intended for this purpose. Establish a secure protective earth connection. When the motor is connected, the distances to non-insulated and live parts must not be shorter than the minimum values according to IEC 60664 and national regulations. With low voltage, the distances should be no shorter than the following values, in compliance with IEC 60664:

Nominal voltage V_N	Distance
≤ 500 V	3 mm
≤ 690 V	5.5 mm

The terminal box must be free of foreign objects, dirt and humidity. Unused cable entry openings and the box itself must be closed so that they are dust and water proof. Secure keys for test mode without output elements. When operating low-voltage machines with brakes, check that the brake is functioning correctly before startup.

Observe the notes in section "Electrical Installation" (page 26).

2.10 Startup/operation

Whenever changes to normal operation occur, such as increased temperatures, noise, vibrations, etc., you should determine the cause. Consult the manufacturer if required. Never deactivate protection devices, even in test mode. Switch off the motor if you are not sure.

Regularly clean air ducts in dusty or dirty environments.

2.10.1 Hot surfaces of servomotors

The CMP synchronous servomotors get very hot during operation.

Touching the synchronous servomotor when it has not cooled down can result in burns. The servomotor can have a surface temperature of more than 100 °C during operation.

Never touch the servomotor during operation or in the cool down phase once the it has been switched off.

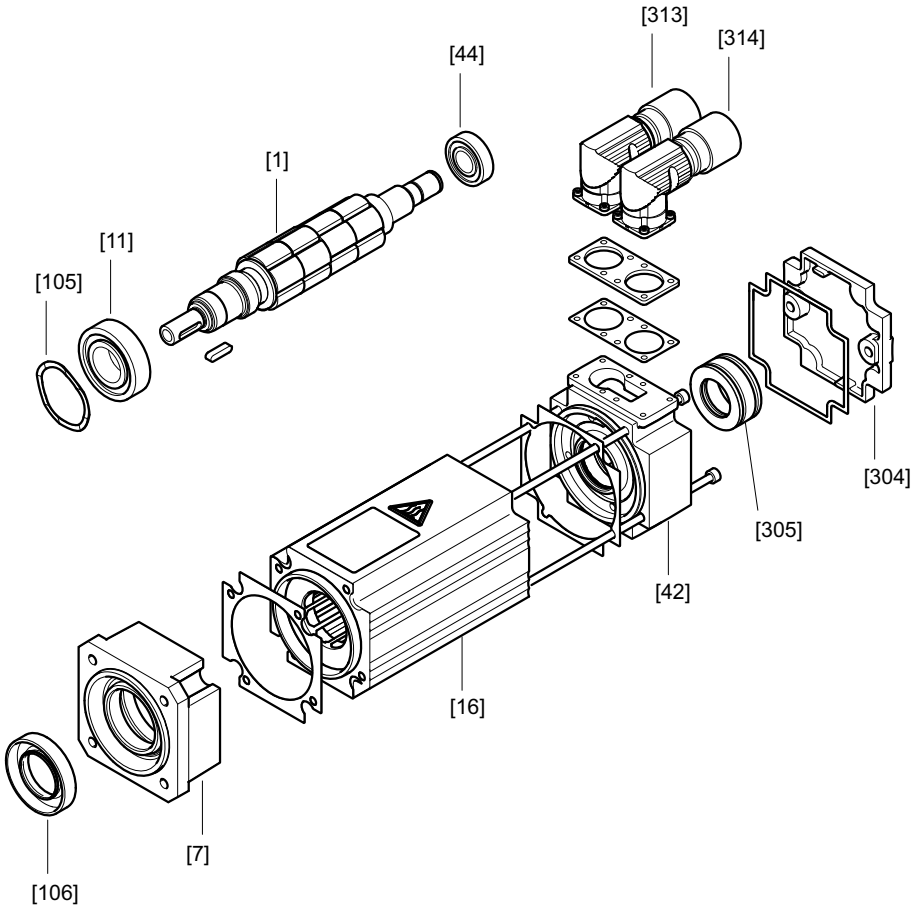
3 Motor Structure

3.1 Diagrams of the synchronous servomotors

INFORMATION

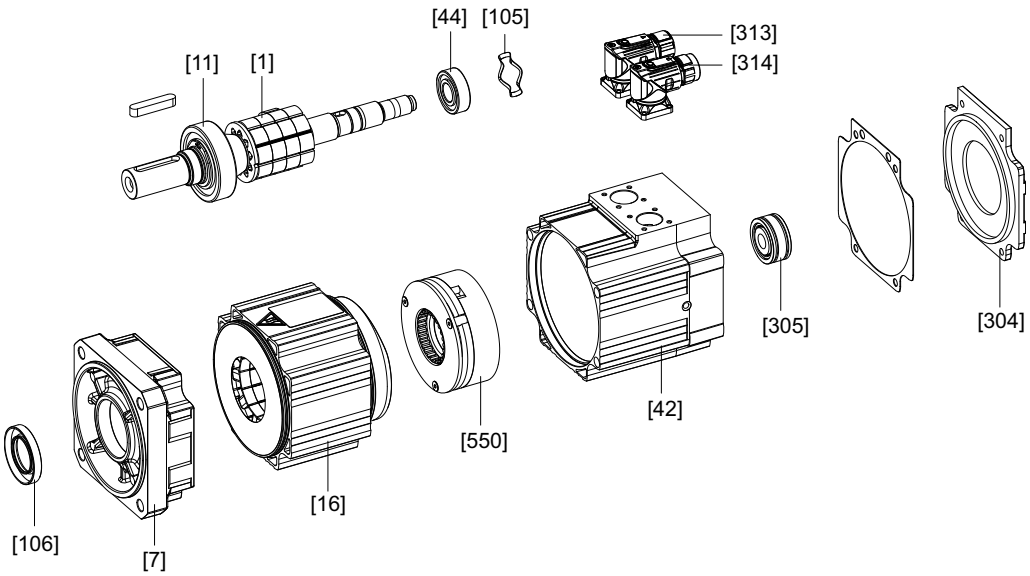
The following illustrations are intended to explain the general structure. Differences are possible depending on the motor size and variant.

3.1.1 CMP40 – CMP63



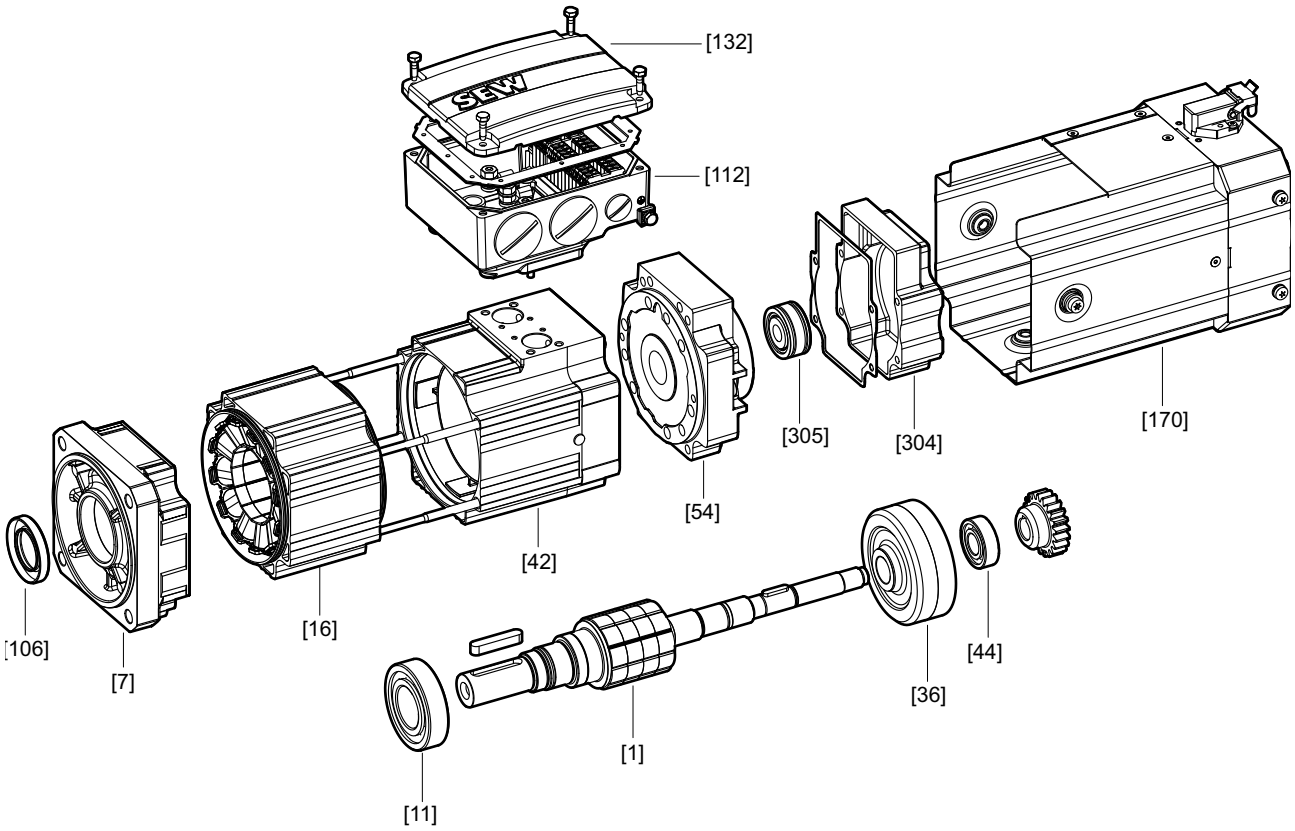
[1] Rotor (key optional)
[7] Flange
[11] Grooved ball bearing
[16] Stator
[42] Endshield
[44] Grooved ball bearing
[105] Shim washer
[106] Oil seal
[304] Cover
[305] Resolver
[313] SM/SB signal plug connector
[314] SM/SB power plug connector

3.1.2 CMP71 – CMP100/BP



[1] Rotor (key optional)
[7] Flange
[11] Grooved ball bearing
[16] Stator
[42] Brake endshield
[44] Grooved ball bearing
[105] Shim washer
[106] Oil seal
[304] Cover
[305] Resolver
[313] SB signal plug connector
[314] SB power plug connector
[550] BP holding brake

3.1.3 CMPZ71 – CMPZ100/BY/KK/VR



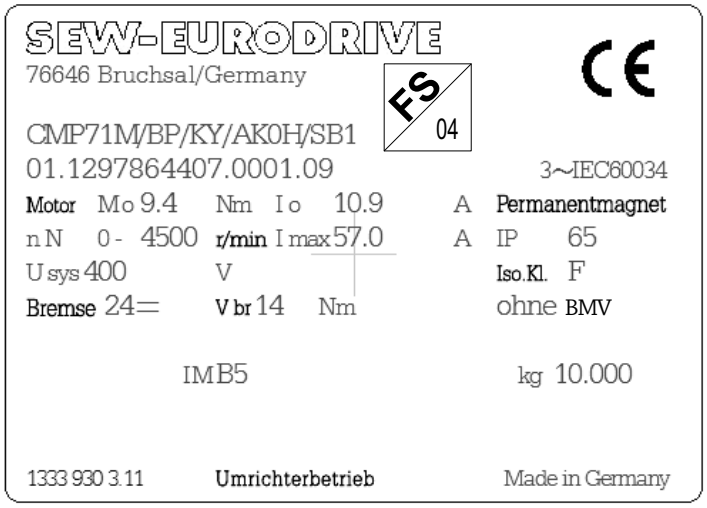
[1] Rotor (key optional)
[7] Flange
[11] Grooved ball bearing
[16] Stator
[36] Additional flywheel mass
[42] Brake endshield
[44] Grooved ball bearing
[54] Magnet cpl. (BY brake component)
[106] Oil seal
[112] Terminal box lower part
[132] Terminal box upper part
[170] Forced cooling fan, cpl.
[304] Cover
[305] Resolver

3.2 Nameplate and unit designation

3.2.1 Nameplate on the servomotor

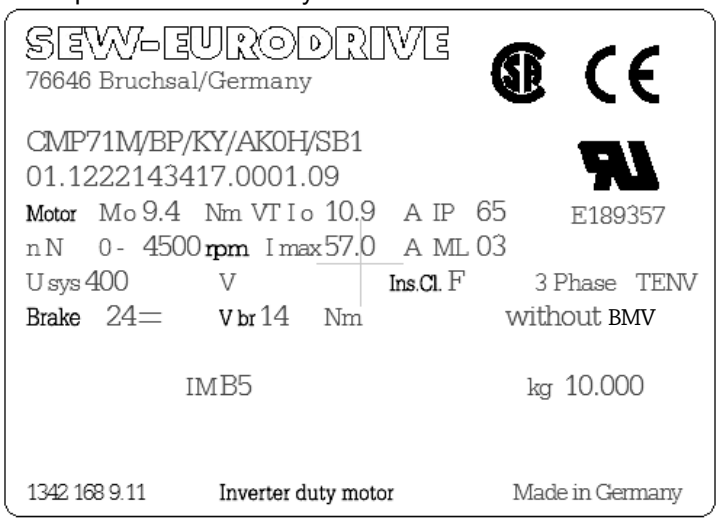
Example: CMP71M / BP / KY / AK0H / SB1 synchronous servo brakemotor – nameplate

Nameplate on the CMP synchronous servo brakemotor.



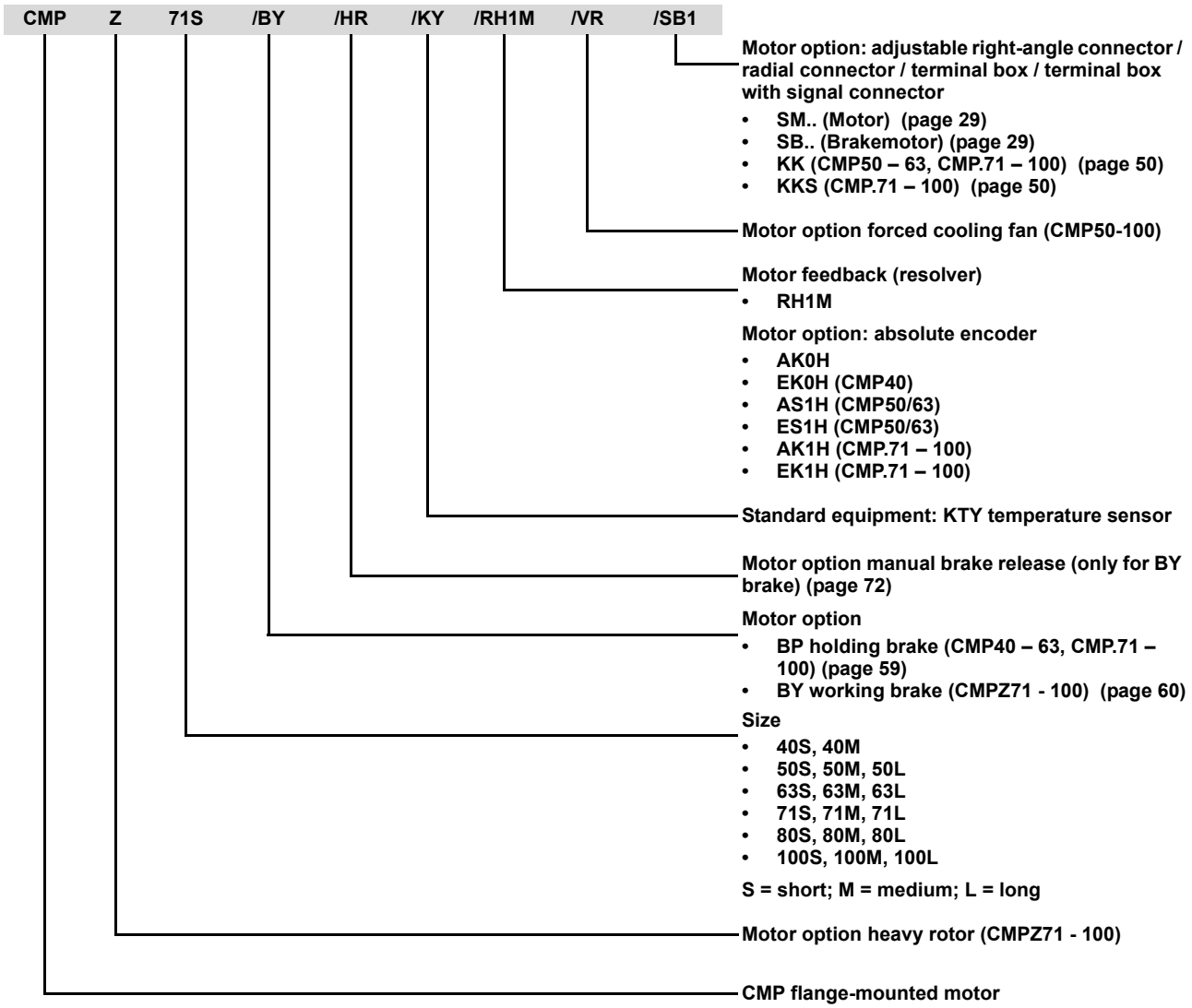
The nameplate only contains the FS logo if safety-rated components are used..

Nameplate on the CMP synchronous servo brakemotor with UL and CSA approvals

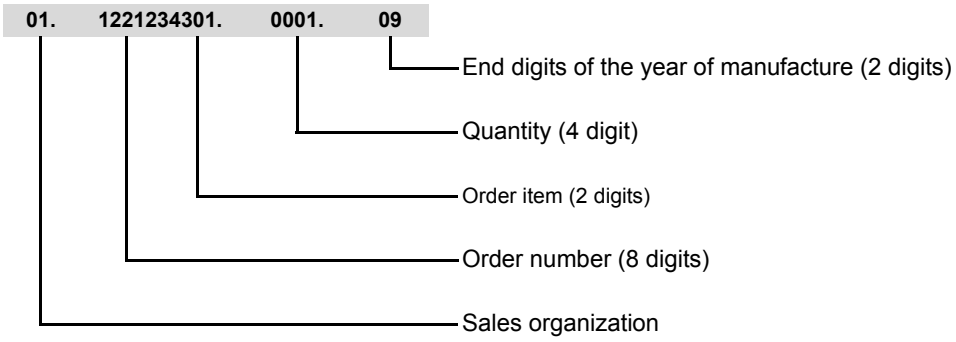


Location of the nameplate

3.2.2 Type designation of a servomotor



3.2.3 Serial number



3.3 Accessory equipment

3.3.1 Mechanical attachments

Designation	Option
/BP	Holding brake for CMP40 – 63, CMP.71 – 100
/BY	Working brake for CMPZ71 – 100
/HR	BY manual brake release for CMPZ71 – 100, automatic disengaging function

3.3.2 Temperature sensor / temperature detection

Designation	Option
/KY	Temperature sensor (standard)

3.3.3 Encoders

Designation	Option
/RH1M	Resolver (standard)
/ES1H	Single-turn Hiperface® encoder, spread shaft, high resolution for CMP50 and CMP63
/AS1H	Multi-turn Hiperface® encoder, spread shaft, high resolution for CMP50 and CMP63
/EK0H	Single-turn Hiperface® encoder, cone shaft, for CMP40
/AK0H	Multi-turn Hiperface® encoder, cone shaft, for CMP40 – 63, CMP.71 – 100
/EK1H	Single-turn Hiperface® encoder, cone shaft, high resolution for CMP.71 – 100
/AK1H	Multi-turn Hiperface® encoder, cone shaft, high resolution for CMP.71 – 100

3.3.4 Connection variants

Designation	Option
/SM1, /SMB	Motor plug connector, socket on motor end only, pluggable motor and encoder cables (standard)
/SB1, /SBB	Plug connector motor + brake, socket on motor end only, pluggable motor and encoder cables (standard)
/KK	Terminal box for CMP50, CMP63, CMP.71 – 100, pluggable motor and encoder cable
/KKS	Terminal box for CMP.71 – 100, clampable motor cable and pluggable encoder cable

3.3.5 VR forced-cooling fan

Designation	Option
/VR	Forced cooling fan

4 Mechanical Installation

4.1 Before you start

Install the drive only if the following conditions are met:

- The drive must be undamaged (no damage caused by shipping or storage).
- All securing devices must be removed.
- The information on the nameplate must indicate that the drive is suitable for operation on a servo inverter.
- The ambient temperature is between -20 °C and +40 °C.
- Motors for cold storage applications can be used down to -40 °C. The temperature range from -40 °C to +10 °C is listed on the nameplate.
- The installation altitude must be no higher than 1000 m above sea level, otherwise the drive must be designed to meet the special environmental conditions.
- The surrounding area is free from oils, acids, gases, vapors, radiation, etc.

4.2 Required tools and resources

- Standard tools
- For plug connectors assembled by the customer:
  - Crimping pliers up to 10 mm^2 cable cross section
  - Crimping pliers for cable cross sections larger than 16 mm^2
- For deliveries until 12/2008: Removal tool for insulator when changing the plug connector.
- For deliveries as of 01/2009: No tool required for right-angle plug connector.

4.3 Long-term storage of servomotors

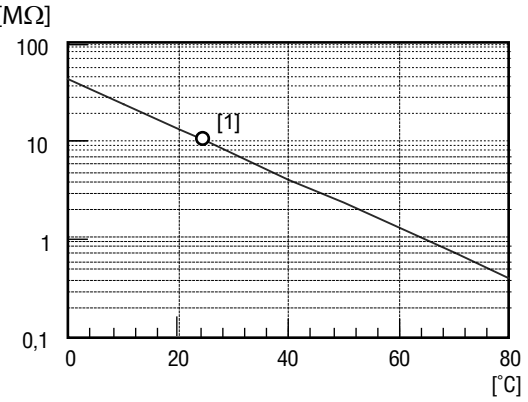
Observe the following notes when you take a stored motor into operation:

- The service life of the ball bearing grease is reduced after storage periods exceeding one year.
- SEW-EURODRIVE recommends to have the motor inspected by SEW Service after 4 years in storage to check the ball bearing grease for signs of ageing.
- Check whether the servomotor has absorbed moisture as a result of being stored for a long time. Measure the insulation resistance with a measurement voltage of DC 500 V.

  The insulation resistance varies greatly depending on the temperature. You can measure the insulation resistance between the connection pins and the motor housing using an insulation measuring device. The motor must be dried if the insulation resistance is not adequate.

The following figure shows the insulation resistance depending on the temperature.

Insulation resistance depending on the temperature



[1] Resistance/temperature point (RT point)

4.3.1 Insulation resistance too low

INFORMATION

Insulation resistance too low:

- Servomotor has absorbed moisture.

Measure: Send the servomotor to the SEW-EURODRIVE Service with a description of the error.

4.4 Motor installation notes

⚠ CAUTION

For shafts with key: Sharp edges due to open keyway.

Minor injuries.

- Insert key in keyway.
- Pull protective sleeve over shaft.

NOTICE

Improper assembly may damage the CMP motors.

Possible damage to property

- Note the following:

- Motor shaft ends must be thoroughly cleaned of anti-corrosion agents, contamination or similar. Use a commercially available solvent. Solvent may not get in contact with bearing or sealing rings because it may damage material.
- Make sure the customer's counter-bearing is unobstructed and can move freely.
- Make sure that the CMP motors is not subject to overhung loads and bending moments.
- Do not jolt or hammer the shaft or spindle end.

- Protect the components from mechanical damage.
- Only install the gearmotor in the specified mounting position on a level, vibration-free and torsionally rigid support structure.
- Align the motor and the driven machine carefully in order to prevent the output shaft from being exposed to unacceptable strain. Observe the permitted overhung and axial forces.
- Provide for sufficient clearance around the motor to allow for adequate cooling. The clearance between the wall and the housing must be at least 10 cm.
- Make sure that it does not reuse the air warmed by other devices.
- Protect vertical mounting positions with VR forced cooling fan by installing a cover.
- Balance components for subsequent mounting on the shaft with a half key (motor shafts are balanced with a half key).
- For brakemotors with manual brake release, screw in the manual lever (for HR self-reengaging manual brake release).

4.4.1 Installation in damp locations or in the open

- Try to arrange the motor and encoder connection so that the connector cables do not point upwards.
- Clean the sealing surfaces of the connector (motor or encoder connection) before re-assembly.
- Replace any brittle seals.
- If necessary, restore the anticorrosive paint coat.
- Check that the degree of protection is maintained.
- If necessary, attach covers (protection canopy).

4.5 Installation tolerances

Shaft end (CMP40 – 63, CMP.71 – 100)	Flanges (CMP40 – 63, CMP.71 – 100)
Diameter tolerance in accordance with DIN 748 • ISO k6 • Center bore to DIN 332	Centering shoulder tolerance in accordance with EN 50347 • ISO j6

4.6 Accessory equipment

4.6.1 VR forced cooling fan

The synchronous servomotors size CMP50 – 63 and CMP.71 – 100 can be equipped with a VR forced cooling fan as an option.

INFORMATION

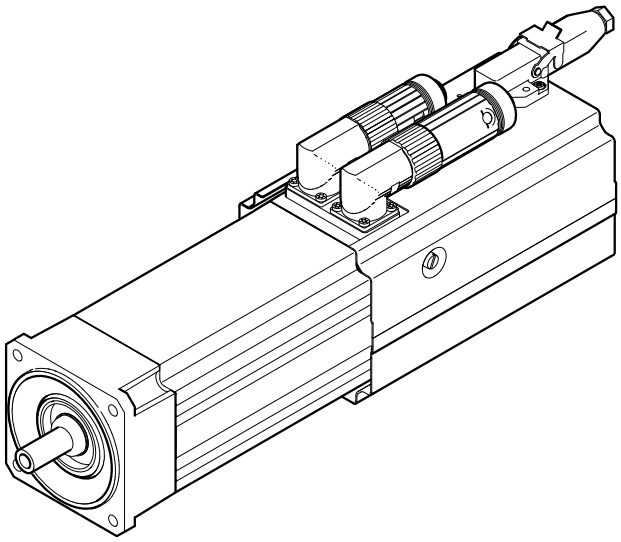
The forced cooling fan can only be used up to a maximum oscillation and shock load of 1 g.

Mechanical installation

Mounting the fan guard for the VR forced cooling fan:

Motor	Screws	Tightening torque
CMP50, CMP63	M4 × 8 self-tapping	4 Nm
CMP.71	M6 × 20	4 Nm [1)]
CMP.80, CMP.100	M8 × 20	10 Nm[1)]

1) Additional Loctite® thread lock fluid



Retrofit set for CMP50 – 63, CMP.71 – 100

Forced cooling fan retrofit sets are available for motors of sizes 50 – 100.

INFORMATION

The forced cooling fan retrofit set for the motors CMP50 and CMP63 may only be mounted by staff authorized by SEW-EURODRIVE.

For information on the retrofit set, refer to the "Synchronous Servomotors" catalog.

4.6.2 Retrofitting the manual brake release for BY brake

Manual brake release retrofit set

The following retrofit sets are required for retrofitting manual brake release to the BY brakes:

Retrofit set	Part number
BY2	**1750 8428**
BY4	**1750 8525**
BY8	**1750 8622**

Retrofitting the manual brake release

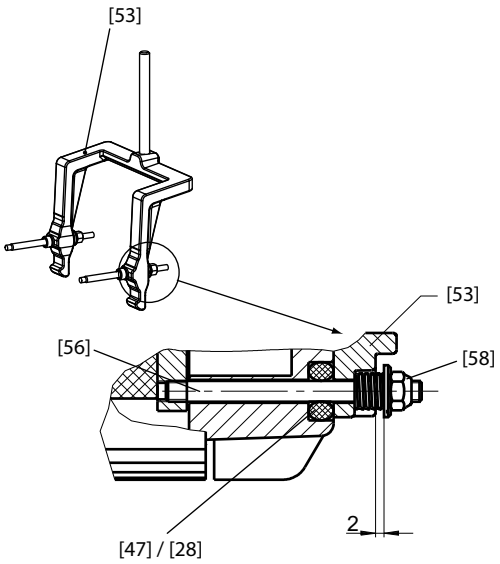
⚠ DANGER

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Disconnect the motor and brake from the power supply and safeguard the drive against unintentional power up before you begin!
- Carefully observe the following steps.

1. Remove forced cooling fan, if installed
2. Remove the closing caps [28]
3. Screw in studs [56]
4. Push in the sealing element [47]
5. Position the release lever [53]
6. Insert tension spring [57]
7. Tighten hex nut [58], observe 2 mm backlash between shim (nut [58]) and release lever [53] to ensure the proper function of the brake
8. Install forced cooling fan, if required



5 Electrical Installation

⚠ WARNING

Danger of electric shock.

Severe or fatal injuries!

- Note the following:

- It is essential to comply with the safety notes in Sec. 2 during installation!
- Use switch contacts in utilization category AC-3 according to EN 60947-4-1 for switching the motor and the brake.
- Use switch contacts in utilization category DC-3 according to EN 60947-4-1 for switching the brake with DC 24 V.
- When motors are powered by inverters, you must adhere to the wiring instructions issued by the inverter manufacturer.
- Observe the operating instructions of the inverter.

5.1 Additional regulations

The generally applicable installation regulations for low-voltage electric equipment (such as DIN IEC 60364, DIN EN 50110) must be complied with when setting up electrical machinery.

5.2 Compulsory use of the wiring diagrams

Connect the motor only as shown in the wiring diagram(s) included with the motor. **You must not connect or start up the motor if the wiring diagram is missing.** You can obtain the valid wiring diagrams from SEW-EURODRIVE free of charge.

5.3 Wiring information

5.3.1 Brake control protection

To protect the brake control system against interference, do not route unshielded brake cables together with switched-mode power cables.

Switched-mode power cables include in particular:

- Output cables from servo inverters, converters, soft start units and brake units
- Supply cables for braking resistors and similar options

5.3.2 Thermal motor protection

NOTICE

Electromagnetic interference of the drives.

Possible damage to property.

- Install the connecting lead of the KTY separately from other power cables, maintaining a distance of at least 200 mm. The cables can only be routed together if either the KTY cable or the power cable is shielded.

5.4 Power/signal cable connection via the plug connector system – notes

The cable entry of the power and signal cable is installed using an adjustable right-angle connector. Once the mating connector has been plugged in, the right-angle connector can be adjusted as required without using additional tools. A torque of > 8 Nm is required to adjust the connector.

NOTICE

Damage of the right-angle connector in case of rotation without mating connector.

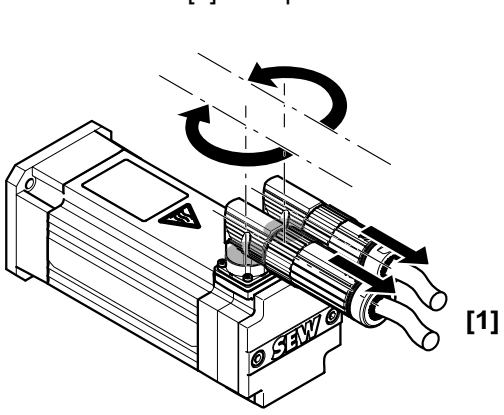
Possible damage to property.

- Do not use pliers to adjust the right-angle connector before connecting it. This might damage the thread and the sealing surface.

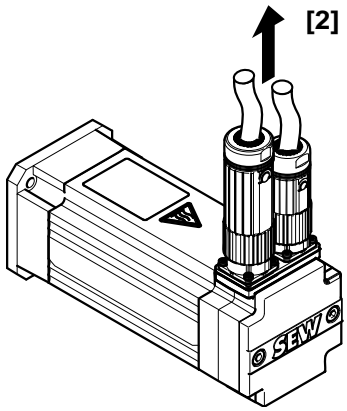
5.4.1 Connector positions

An adjustable position has been defined for right-angle, adjustable connectors [1]. This is the standard connector position. It corresponds to connector position "3".

A "radial" position has been defined for the straight plug connectors (radial output). Radial connectors [2] are optional.



[1] "Adjustable" connector position



[2] "Radial" connector position

INFORMATION

- Comply with the permitted bending radii of the cables.
- When using low-capacity trailing cables, the bending radii are larger than for the previously used standard cables.
- SEW-EURODRIVE recommends the use of low-capacity cables.

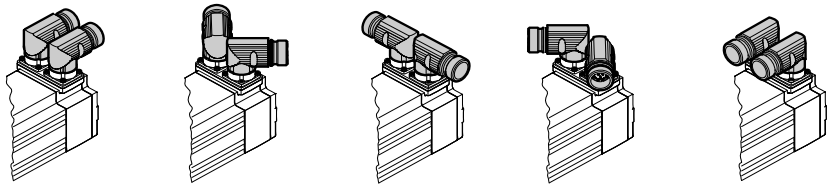
The right-angle plug connectors can be rotated to achieve the required position.

INFORMATION

The connector should only be rotated to install and connect the motor.

Do not turn the plug connector regularly once it has been installed.

Positions of the adjustable connectors (examples)

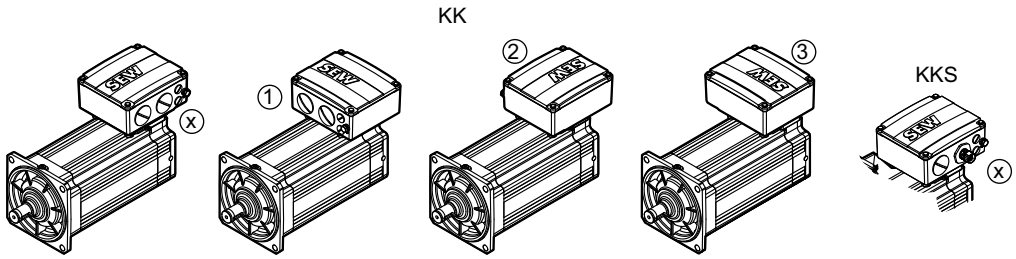


5.5 Power/signal cable connection via the terminal box – notes

Optionally, you can connect the power and signal cables via a terminal box.

- Option /KK: Connection of the power and signal cable via conductor end sleeves in the terminal box.
- Option /KKS: Connection of the power cable via conductor end sleeves, and the signal cable via a plug connector.

The cable entry position is specified with x, 1, 2, 3.



For motor sizes CMP50 and 63 in a fixed mounting position "x", the cable entry is possible from three directions.

5.6 Connecting the motor and the encoder system via SM./SB. plug connectors

Electric cylinders are supplied with the SM. / SB. plug connector system.

In the basic version, SEW-EURODRIVE delivers electric cylinders with right-angle connector on the motor end and without mating connector. The encoder system is connected using a separate 12-pin round plug connector.

The mating connectors can be ordered separately or together with the motor.

NOTICE

Potential damage to the right-angle connector.

Possible damage to property.

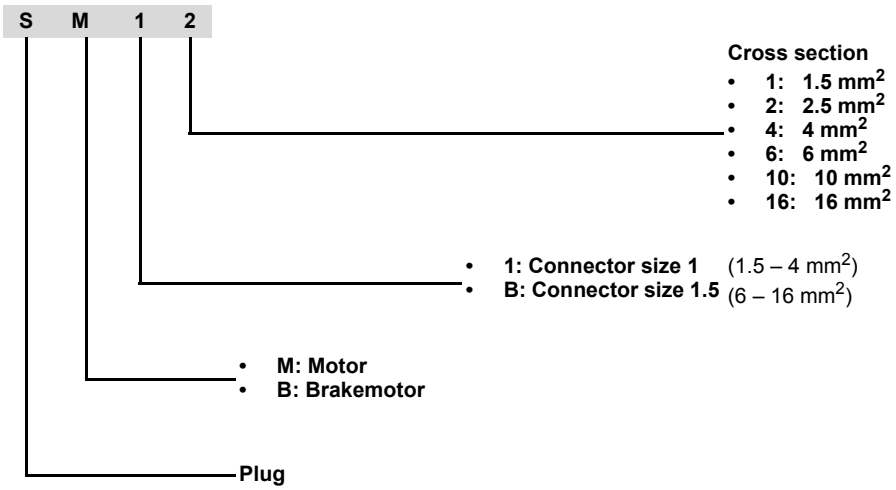
- Do not align the right-angle connector frequently.

All servomotors are equipped with quick-lock right-angle connectors (SpeedTec). If you use connectors without quick lock, the O-ring serves as vibration protector. The connector can only be screwed on until it reaches the O-ring. The connector is always sealed at the bottom.

If you use self-assembled cables with quick lock, you must remove the O-ring.

5.6.1 Plug connectors on cable side

Unit designation of the plug connectors



Power cables and plug connectors for CMP motors

Cable type		Connector type	Thread size	Cable cross section	Part number	
					Prefabricated cables	Spare power plug*
Fixed installation	Motor cable	SM11	M23	4 x 1.5 mm^2	0590 4544	0198 6740
		SM12		4 x 2.5 mm^2	0590 4552	0198 6740
		SM14		4 x 4 mm^2	0590 4560	0199 1639
		SMB6	M40	4 x 6 mm^2	1335 0269	1334 9856
		SMB10		4 x 10 mm^2	1335 0277	1334 9864
		SMB16		4 x 16 mm^2	1335 0285	1334 9872
	BP brakemotor cable[1] BP brake	SB11	M23	4 x 1.5 mm^2 + 2 x 1 mm^2	1335 4345	0198 6740
		SB12		4 x 2.5 mm^2 + 2 x 1 mm^2	1335 4353	0198 6740
		SB14		4 x 4 mm^2 + 2 x 1 mm^2	1335 4361	0199 1639
		SBB6	M40	4 x 6 mm^2 + 2 x 1.5 mm^2	1335 0196	1334 9856
		SBB10		4 x 10 mm^2 + 2 x 1.5 mm^2	1335 0218	1334 9864
		SBB16		4 x 16 mm^2 + 2 x 1.5 mm^2	1335 0226	1334 9872
Cable carrier installation	Motor cable	SM11	M23	4 x 1.5 mm^2	0590 6245	0198 6740
		SM12		4 x 2.5 mm^2	0590 6253	0198 9197
		SM14		4 x 4 mm^2	0590 4803	0199 1639
		SMB6	M40	4 x 6 mm^2	1335 0293	1334 9856
		SMB10		4 x 10 mm^2	1335 0307	1334 9864
		SMB16		4 x 16 mm^2	1335 0315	1334 9872
	Brake motor cable[1] BP brake	SB11	M23	4 x 1.5 mm^2 + 2 x 1 mm^2	1335 4388	0198 9197
		SB12		4 x 2.5 mm^2 + 2 x 1 mm^2	1335 4396	0198 9197
		SB14		4 x 4 mm^2 + 2 x 1 mm^2	1342 1603	0199 1639
		SBB6	M40	4 x 6 mm^2 + 2 x 1.5 mm^2	1335 0234	1334 9856
		SBB10		4 x 10 mm^2 + 2 x 1.5 mm^2	1335 0242	1334 9864
		SBB16		4 x 16 mm^2 + 2 x 1.5 mm^2	1335 0250	1334 9872

1) BP brake: 3-core cable, only 2 cores are used

* The complete connector service pack always includes the following parts:

- Power connector,
- Insulation inserts,
- Socket contacts.

Extension cables for power cables are listed in the "Synchronous Servomotors" catalog.

Replaced brakemotor cables

The brake cores of the replaced brakemotor cables are labeled differently from today's standard. This applies to the following cables:

Cable type		Connector type	Cable cross section	Part number	
				Prefabricated cables	Spare power plug*
Fixed installation	BP brakemotor cable[1] BP brake	SB11	4 x 1.5 mm^2 + 2 x 1 mm^2	1332 4853	0198 6740
		SB12	4 x 2.5 mm^2 + 2 x 1 mm^2	1333 2139	0198 6740
		SB14	4 x 4 mm^2 + 2 x 1 mm^2	1333 2147	0199 1639
Cable carrier installation	Brake motor cable[1] BP brake	SB11	4 x 1.5 mm^2 + 2 x 1 mm^2	1333 1221	0198 9197
		SB12	4 x 2.5 mm^2 + 2 x 1 mm^2	1333 2155	0198 9197
		SB14	4 x 4 mm^2 + 2 x 1 mm^2	1333 2163	0199 1639

1) BP brake: 3-core cable, only 2 cores are used

The polarity is not relevant when connecting the BP brake, i.e. the replaced cables can still be used.

Power cables and plug connectors for CMPZ motors

Cable type		Connector type	Thread size	Cable cross section	Part number	
					Prefabricated cables	Spare power plug*
Fixed installation	Motor cable	SM11	M23	4 x 1.5 mm^2	0590 4544	0198 6740
		SM12		4 x 2.5 mm^2	0590 4552	0198 6740
		SM14		4 x 4 mm^2	0590 4560	0199 1639
		SMB6	M40	4 x 6 mm^2	1335 0269	1334 9856
		SMB10		4 x 10 mm^2	1335 0277	1334 9864
		SMB16		4 x 16 mm^2	1335 0285	1334 9872
	Brakemotor cable for BY brake	SB11	M23	4 x 1.5 mm^2 + 3 x 1 mm^2	1335 4272	0198 6740
		SB12		4 x 2.5 mm^2 + 3 x 1 mm^2	1335 4280	0198 6740
		SB14		4 x 4 mm^2 + 3 x 1 mm^2	1335 4299	0199 1639
		SBB6	M40	4 x 6 mm^2 + 3 x 1.5 mm^2	1335 0129	1334 9856
		SBB10		4 x 10 mm^2 + 3 x 1.5 mm^2	1335 0137	1334 9864
		SBB16		4 x 16 mm^2 + 3 x 1.5 mm^2	1335 0145	1334 9872

Table continued on next page

Cable type		Connector type	Thread size	Cable cross section	Part number	
					Prefabricated cables	Spare power plug*
Cable carrier installation	Motor cable	SM11	M23	4 x 1.5 mm^2	0590 6245	0198 6740
		SM12		4 x 2.5 mm^2	0590 6253	0198 9197
		SM14		4 x 4 mm^2	0590 4803	0199 1639
		SMB6	M40	4 x 6 mm^2	1335 0293	1334 9856
		SMB10		4 x 10 mm^2	1335 0307	1334 9864
		SMB16		4 x 16 mm^2	1335 0315	1334 9872
	Brakemotor cable for BY brake	SB11	M23	4 x 1.5 mm^2 + 3 x 1 mm^2	1335 4302	0198 9197
		SB12		4 x 2.5 mm^2 + 3 x 1 mm^2	1335 4310	0198 9197
		SB14		4 x 4 mm^2 + 3 x 1 mm^2	1335 4329	0199 1639
		SBB6	M40	4 x 6 mm^2 + 3 x 1.5 mm^2	1335 0153	1334 9856
		SBB10		4 x 10 mm^2 + 3 x 1.5 mm^2	1335 0161	1334 9864
		SBB16		4 x 16 mm^2 + 3 x 1.5 mm^2	1335 0188	1334 9872

* The complete connector service pack always includes the following parts:

- Power connector,
- Insulation inserts,
- Socket contacts.

Extension cables for power cables are listed in the "Synchronous Servomotors" catalog.

Dependence of mating connector on cable diameter and crimping area

SM1/SB1 connector type	Crimping area U, V, W, PE mm^2	Cable crimping diameter mm
01986740	0.35 – 2.5	9 – 14
01989197	0.35 – 2.5	14 – 17
01991639	2.5 – 4	14 – 17

SMB/SBB connector type	Crimping area U, V, W, PE mm^2	Cable crimping diameter mm
13349856	1.5 – 10	9 – 16
13349864	1.5 – 10	16.5 – 25
13349872	6 – 16	16.5 – 25

The connector service packs also contain the brake pins, so that no difference needs to be made between motor and brakemotor.

5.6.2 Encoder cables

Cable type		Cable cross section	FI type	Part number	
				Prefabricated cables	Signal connector*
Fixed installation	Resolver cable	5 x 2 x 0.25 mm^2	MOVIDRIVE®	0199 4875	0198 6732
			MOVIAXIS®	1332 7429	
Cable carrier installation			MOVIDRIVE®	0199 3194	
			MOVIAXIS®	1332 7437	
Fixed installation	Hiperface® cable	6 x 2 x 0.25 mm^2	MOVIDRIVE®/ MOVIAXIS®	1332 4535	0198 6732
Cable carrier installation			MOVIDRIVE®/ MOVIAXIS®	1332 4551	

* The complete connector service pack always includes the following parts:

- Feedback connector,
- Insulation inserts,
- Socket contacts.

Extension cables for power and feedback cables are listed in the "Synchronous Servomotors" catalog.

5.6.3 Forced cooling fan cables

Cable type		Cable cross section	Part number
Fixed installation	Forced cooling fan cables	3 x 1 mm^2	0198 6341
Cable carrier installation		3 x 1 mm^2	0199 560X

Extension cables for forced cooling fan cables are listed in the "Synchronous Servomotors" catalog.

5.6.4 Prefabricated cables

Prefabricated cables are available from SEW-EURODRIVE to connect the SM./SB. plug connector system. For information on the prefabricated cables, refer to the "Synchronous Servomotors" catalog.

The plug connectors are depicted with the connector assignment on the cable at the connection side (back).

Note the following points if you want to assemble the cables yourself:

- Section "Assembling the plug connectors for resolvers and Hiperface®" (page 42) illustrates the assembly of the signal plug connectors and section "Assembling the power plug connectors" (page 45) illustrates the assembly of the SM. / SB. plug connectors.
- The socket contacts for the motor connection are designed as crimp contacts. Only use suitable tools for crimping.

- Strip the leads according to sections "Assembling the plug connectors for resolvers and Hiperface®" (page 42) and "Assembling the power plug connectors" (page 45). Apply shrink tubing to the connectors.
- Incorrectly installed socket contacts can be removed without removal tools.

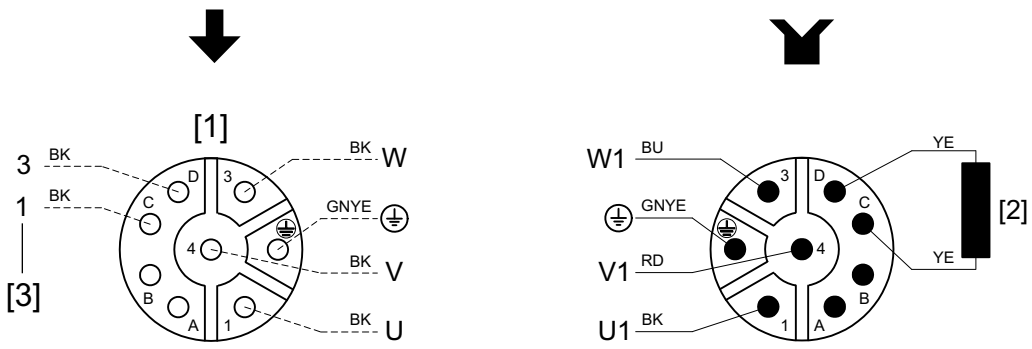
5.6.5 Wiring diagrams – plug connectors for CMP. motors

Symbols

	Plug connector upper part (top view on flange socket), To be connected by the customer
	Plug connector lower part, Connected at the factory

SM1 / SB1 power plug connectors (M23) BP brake

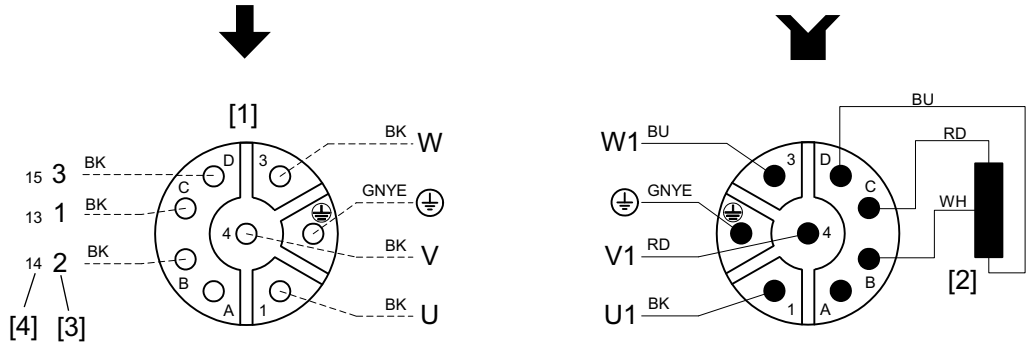
Wiring diagram with/without BP brake



[1] BP brake (optional)
[2] Brake coil
[3] Motor cable labeling

SM1 / SB1 power plug connectors (M23) BY brake

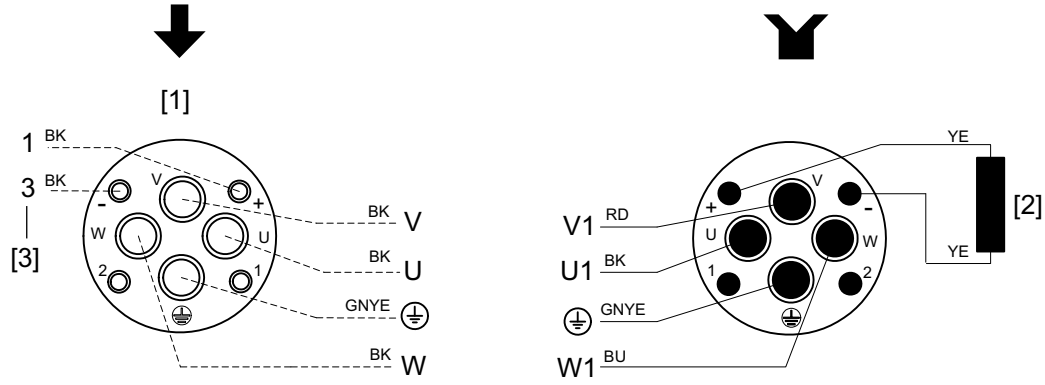
Wiring diagram with/without BY brake



[1] BY brake (optional)
[2] Brake coil
[3] Motor cable labeling
[4] Brake rectifier labeling

SMB / SBB power plug connectors (M40)

Wiring diagram with/without BP brake



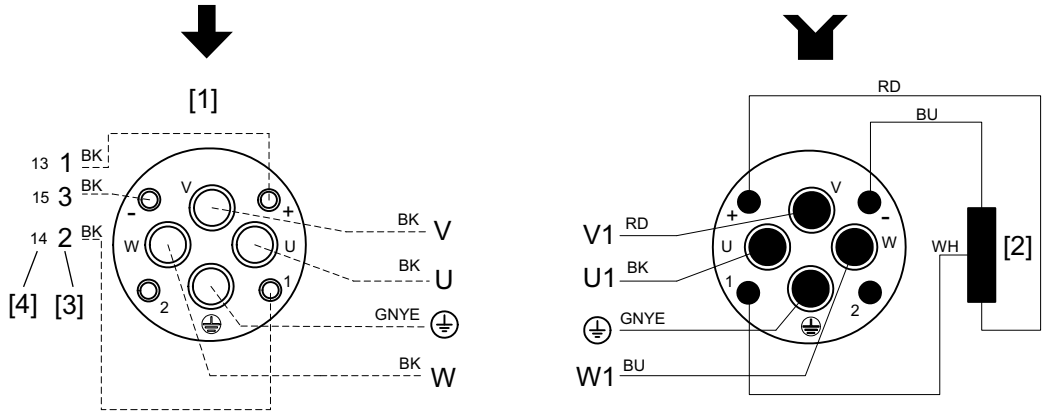
[1] BP brake (optional)

[2] Brake coil

[3] Motor cable labeling

SMB / SBB power plug connectors (M40)

Wiring diagram with/without BY brake



[1] BY brake (optional)

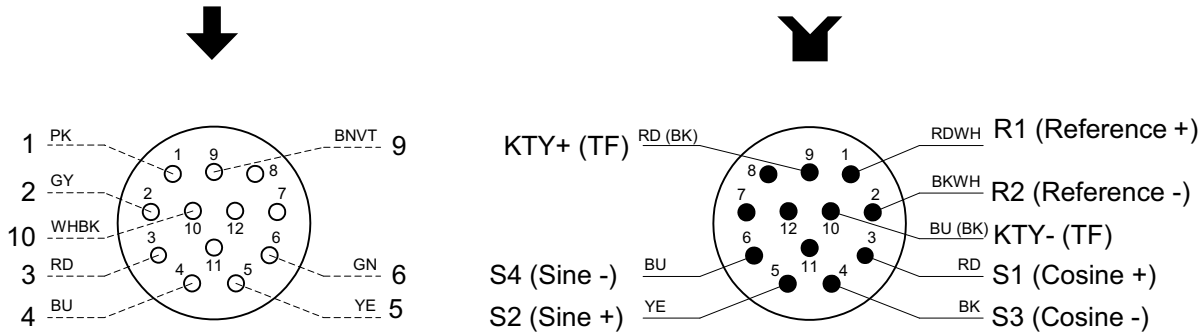
[2] Brake coil

[3] Motor cable labeling

[4] Brake rectifier labeling

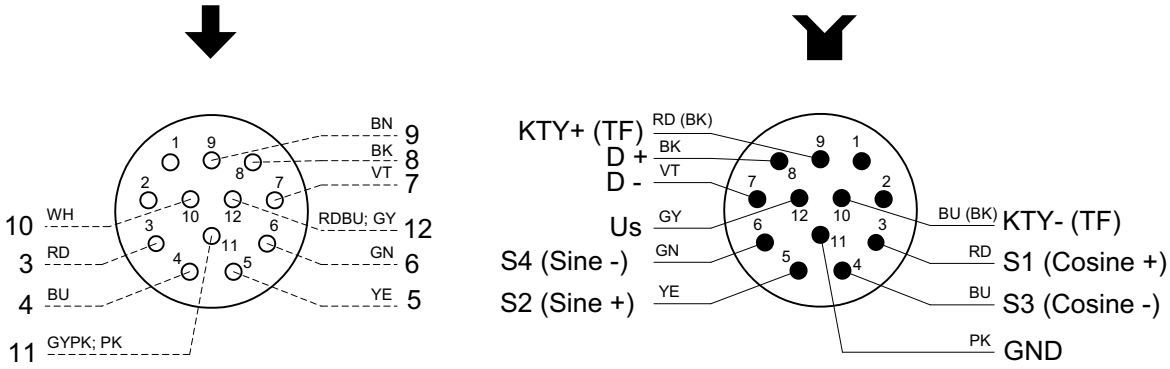
RH1M resolver signal plug connector

Wiring diagram



Signal plug connectors for ES1H, AS1H, AK0H, EK0H, AK1H, EK1H encoders

Wiring diagram



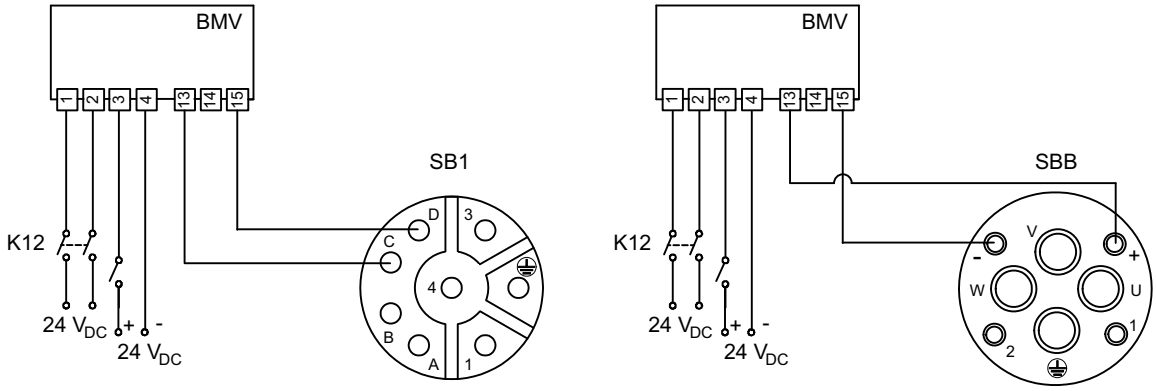
5.6.6 Wiring diagrams of the BP brake control

In every application, the BP holding brake can be controlled via the BMV brake relay or a customer relay with varistor overvoltage protection.

If the system complies with the specifications for direct brake control, a BP brake can also be controlled directly via the brake output of a MOVIAXIS® servo inverter.

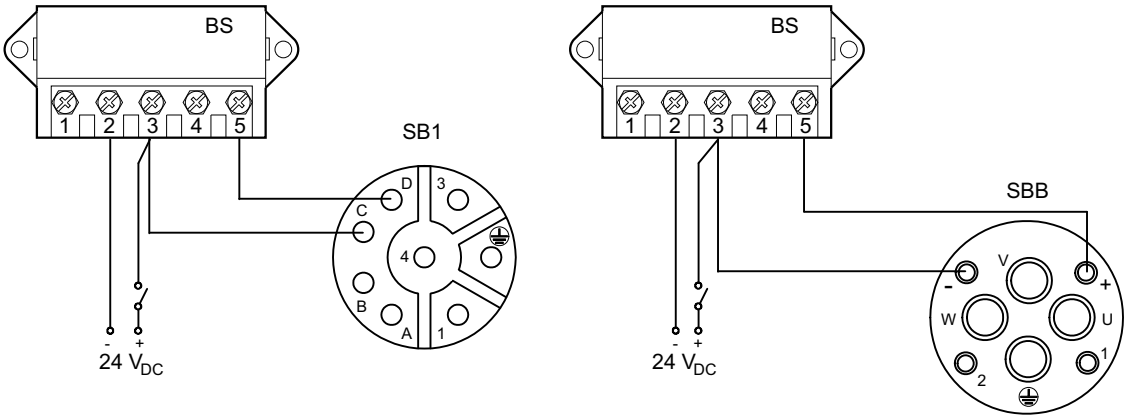
However, the brakes of motors CMP.80 and CMP.100 can never be directly connected to MOVIAXIS®. For detailed information, refer to the "MOVIAXIS® Multi-Axis Servo Inverter" system manual.

BMV brake rectifier

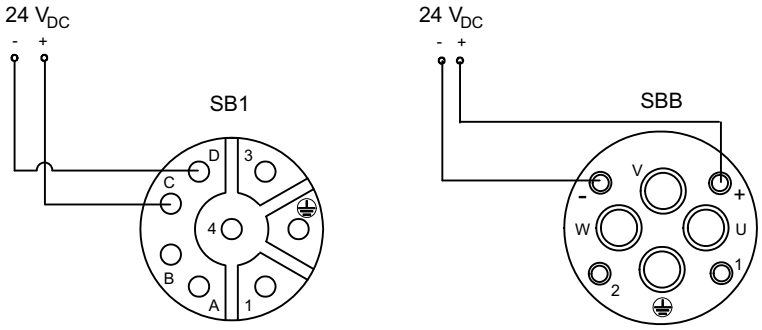


Connection 1, 2	Energy supply
Connection 3, 4	Signal (inverter)

BS brake rectifier



Direct 24 V brake supply



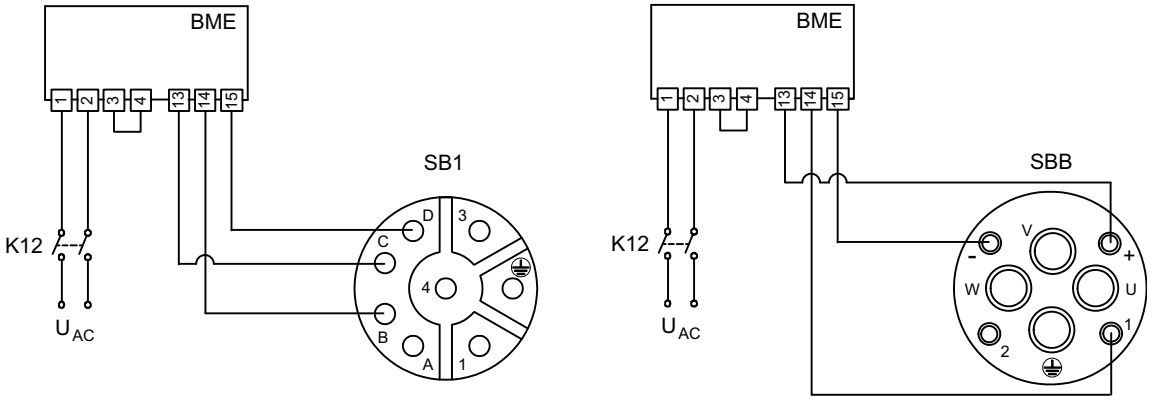
The brake must be protected from overvoltage, e.g. by a varistor protection circuit, in the following cases:

- Operation on non-SEW inverters,
- If the brake is not directly supplied from the SEW inverter.

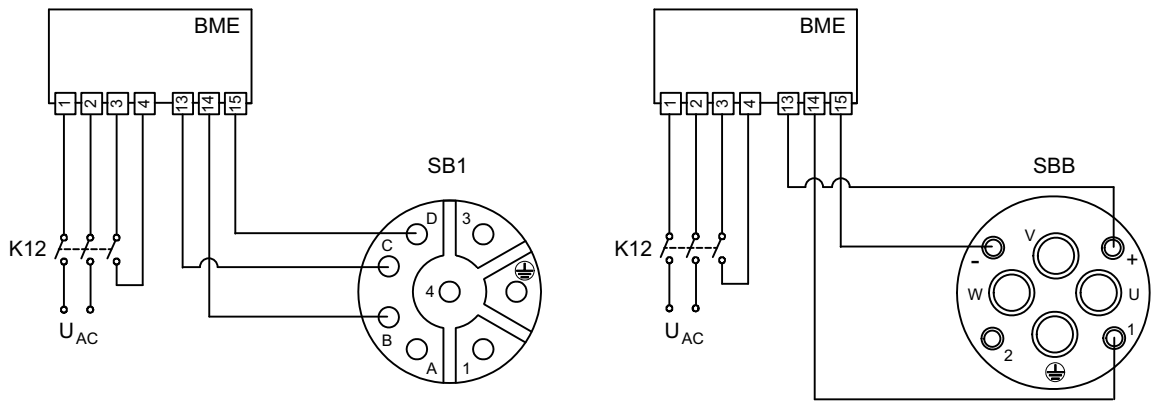
5.6.7 Wiring diagrams of the BY brake control

BME brake rectifier

Cut-off in the AC circuit / standard application of the brake

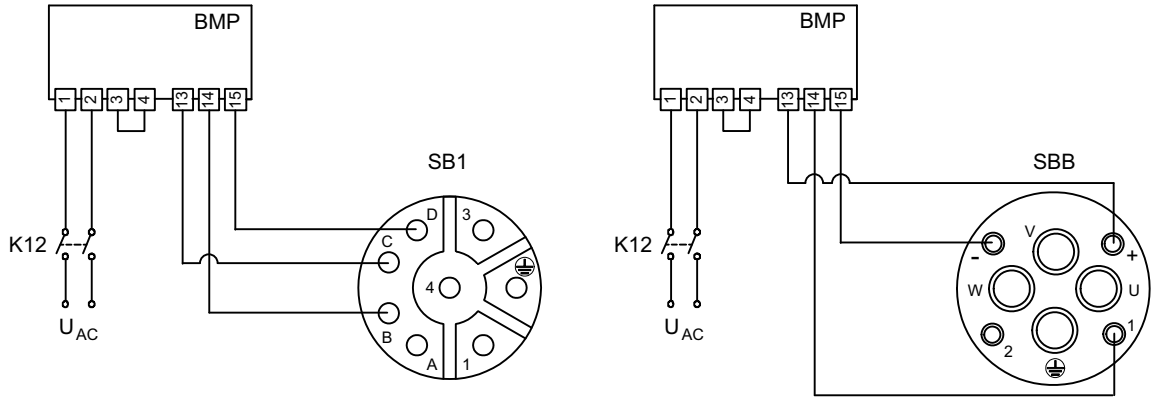


Cut-off in the DC and AC circuit / quick application of the brake



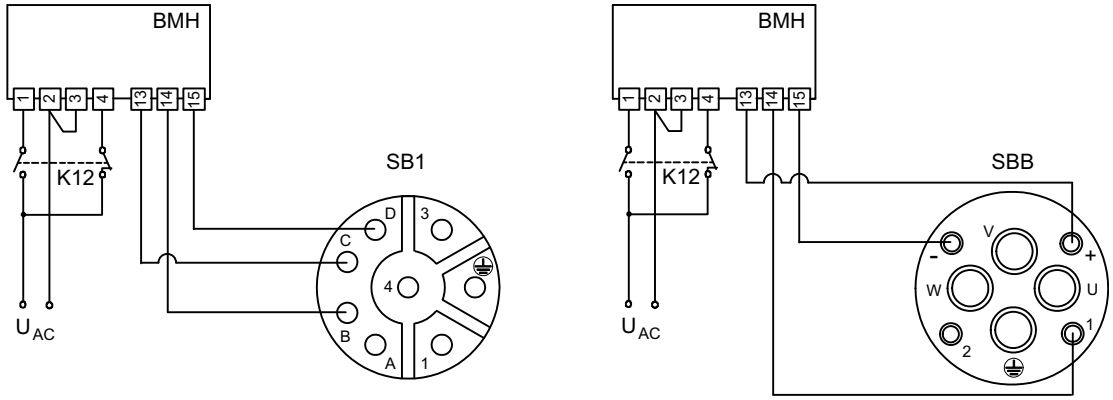
BMP brake rectifier

Cut-off in the DC and AC circuits / rapid application of the brake / integrated voltage relay

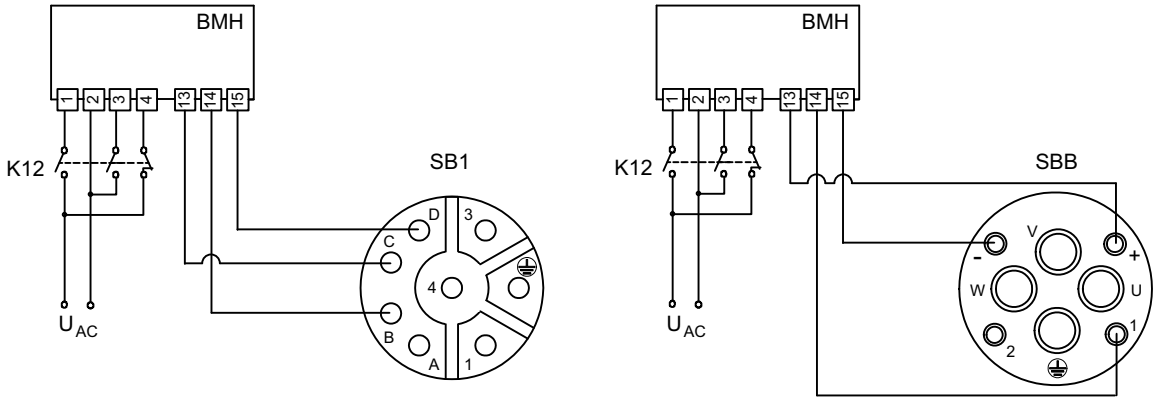


BMH brake rectifier

Cut-off in the AC circuit / standard application of the brake

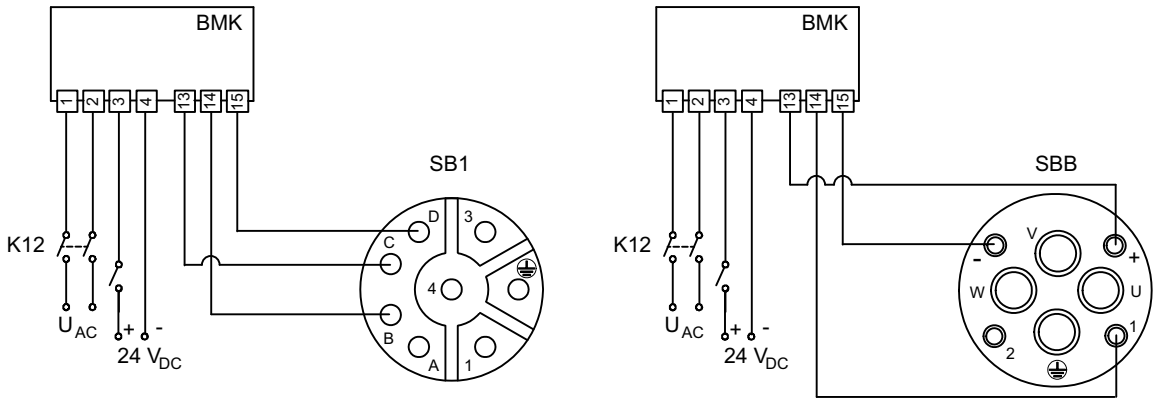


Cut-off in the DC and AC circuit / quick application of the brake



BMK brake rectifier

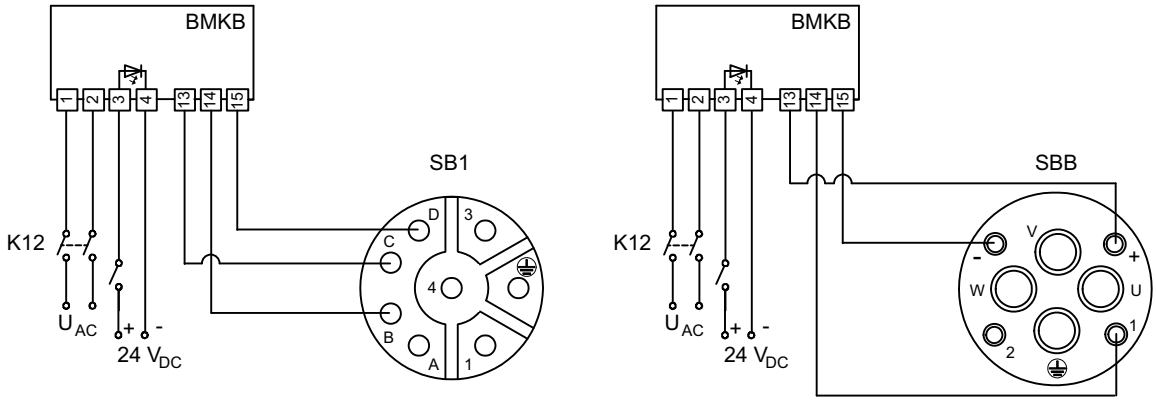
Cut-off in the DC and AC circuits / rapid application of the brake / integrated voltage relay / integrated DC 24 V control input.



Connection 1, 2	Energy supply
Connection 3, 4	Signal (inverter)

BMKB brake rectifier

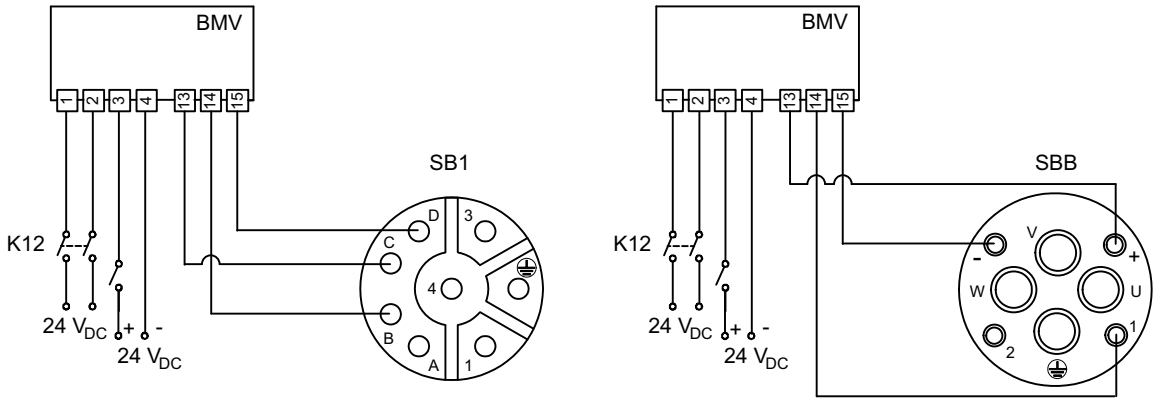
Cut-off in the DC and AC circuits / rapid application of the brake / integrated voltage relay / integrated DC 24 V control input / diode displays readiness for operation.



Connection 1, 2	Energy supply
Connection 3, 4	Signal (inverter)

BMV brake rectifier

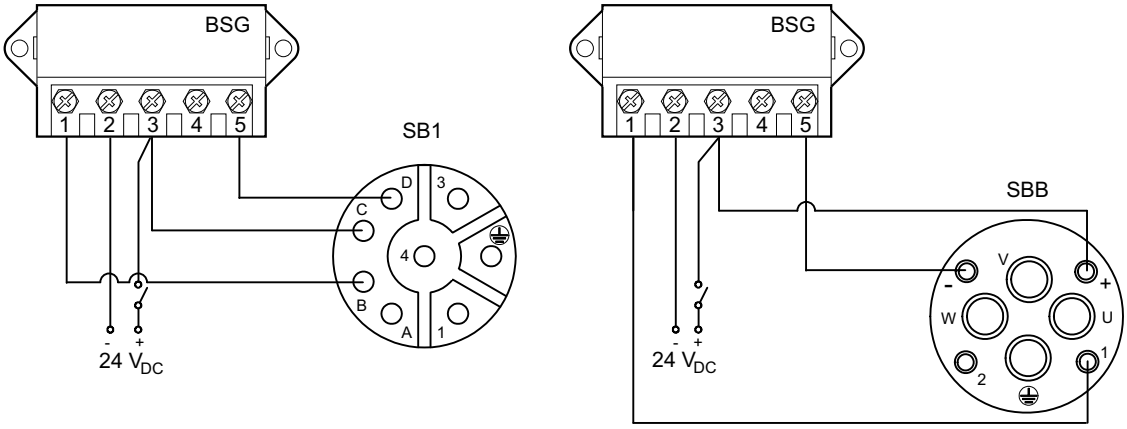
Cut-off in the DC and AC circuits rapid application of the brake / integrated DC 24 V control input.



Connection 1, 2	Energy supply
Connection 3, 4	Signal (inverter)

BSG brake rectifier

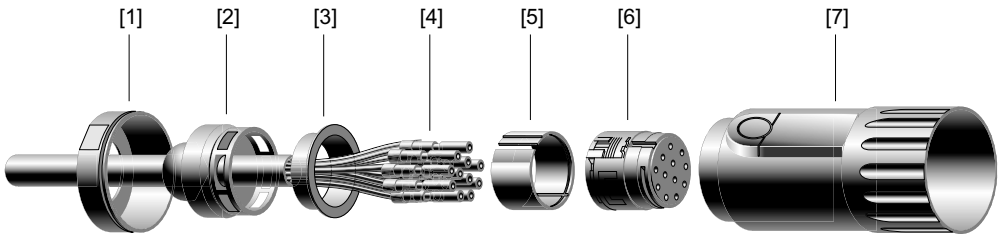
For DC voltage supply with DC 24 V.



5.6.8 Assembling the plug connectors for resolvers and Hiperface®

Scope of delivery for plug connectors

The following parts are supplied for assembling resolver/Hiperface® plug connectors. The SEW part number is 198 673 2.

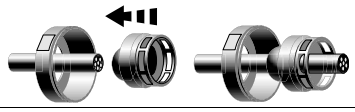
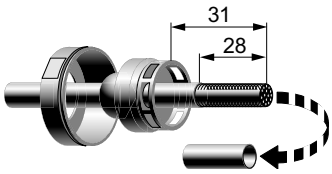
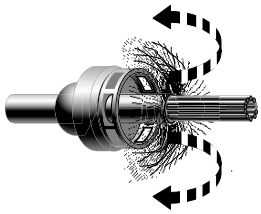
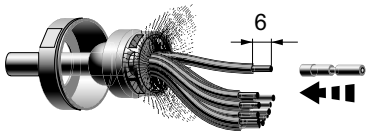
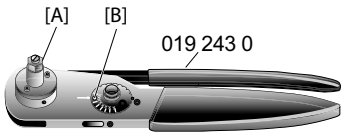
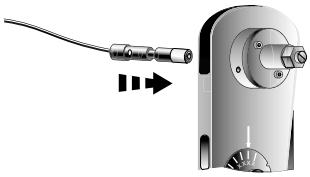
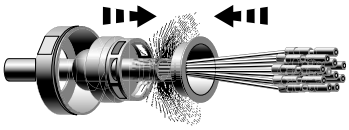
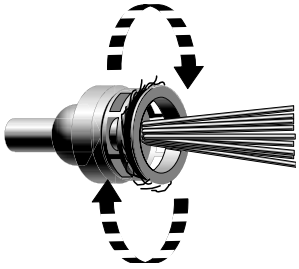


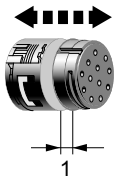
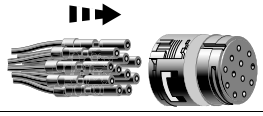
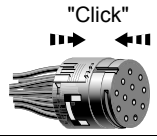
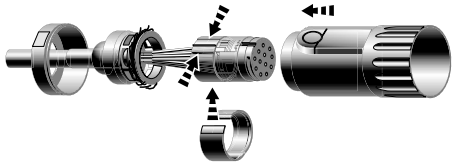
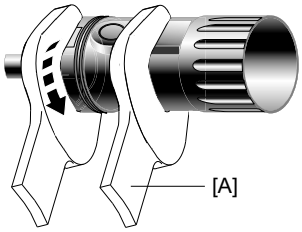
[1] Screw fitting
[2] Seal with strain relief
[3] Shield ring
[4] Socket contacts
[5] Insulating sleeve
[6] Insulator
[7] Connector housing

INFORMATION

Hold the cable firmly in place when tightening the cable and connector.

Assembly instructions for plug connectors

1		• Pull the screw fitting and seal with strain relief 31 mm over the cable.
2		• Strip 28 mm of cable insulation off the end of the cable
3		• Fold back the braided shield and fan it out
4		• Strip 6 mm insulation off the leads • Push the socket contacts onto the ends of the leads
5		• Insert the small-diameter positioning tool (SEW part number 019 244 9) into the crimping tool until the green mark appears in the view window [A]. • Set the pressing force [B] to 24 on the crimping tool.
6		• Insert a lead with socket contact in the crimping tool and press the tool fully together. The tool then opens automatically. • Repeat this procedure for each lead.
7		• Pull the shield ring over the leads and press the shield against the seal
8		• Turn the shield ring until the braided shield is flush with the shield ring.

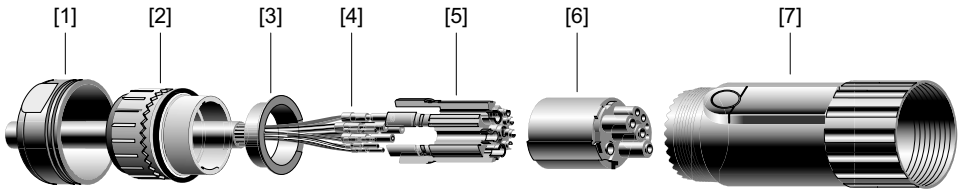
9		• Pull the insulator apart evenly by about 1 mm.
10		• Insert the socket contacts into the insulator.
11		• Press the insulator together until you hear a click.
12		• Fold open the insulating sleeve. • Position the side of the insulating sleeve with the recess against the groove in the insulator so that the opening of the insulating sleeve is pointing in the same direction as the double-headed arrow on the insulator. • Press the insulating sleeve together until it engages. • Insert the insulator into the connector housing in the middle position
13		• Use a wrench to hold the connector housing in place and use a second wrench to tighten the screw fitting • [A] = Hold in place

5.6.9 Power plug connector assembly

The following assembly figure and description are exemplary for the SM/SB power plug connectors. This description can be used analogously for assembling the SMB and SMC power plug connectors.

Scope of delivery of SM./SB. power plug connectors

The following parts are supplied for assembling the power plug connectors. The SEW part number is 198 674 0.

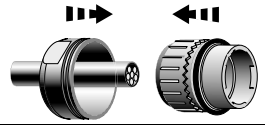
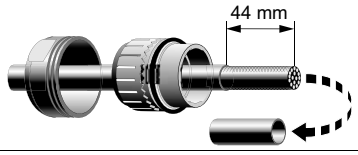
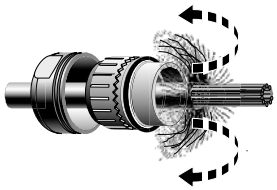
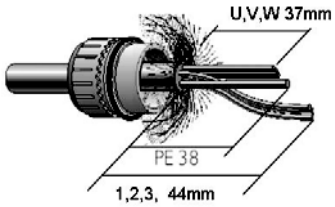
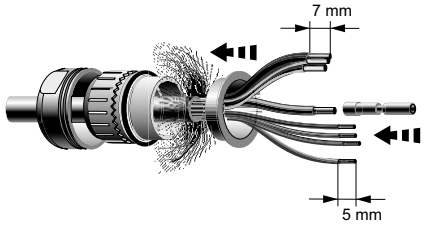
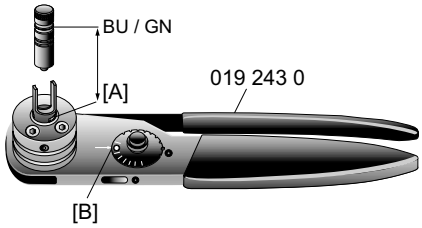
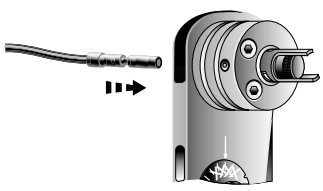


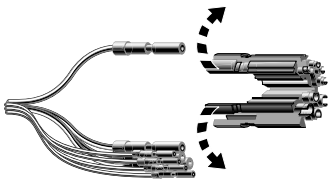
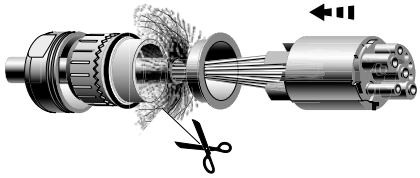
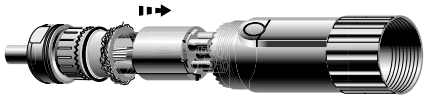
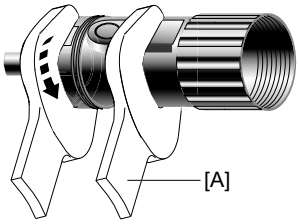
[1] Screw fitting
[2] Seal with strain relief
[3] Shield ring
[4] Socket contacts
[5] Insulating sleeve
[6] Insulator
[7] Connector housing

INFORMATION

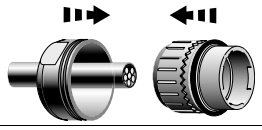
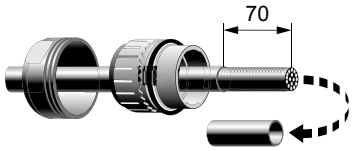
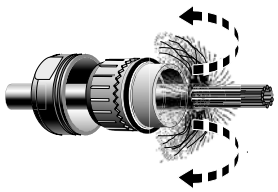
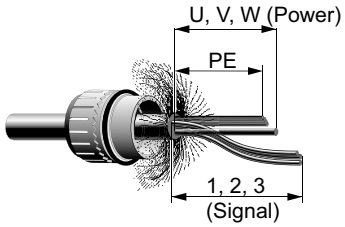
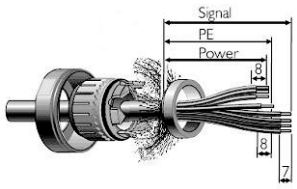
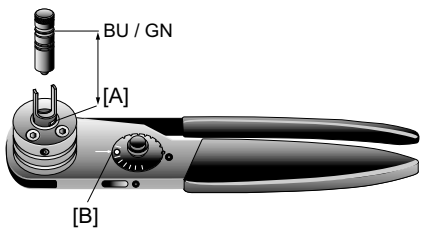
Hold the cable firmly in place when tightening the cable and connector.

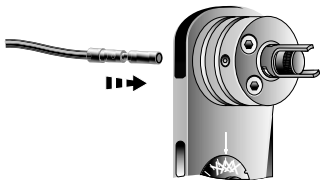
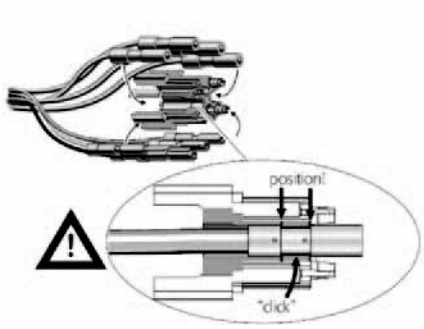
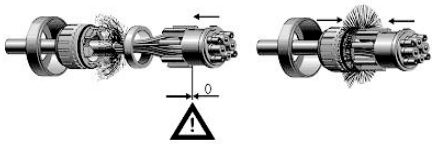
SM1/SB1 power connectors – assembly notes

<table>
<tr><td>1</td><td>  </td><td>• Pull the screw fitting and the seal with strain relief over the cable.</td></tr>
<tr><td>2</td><td> 
</td><td>• Strip 44 mm of cable insulation off the end of the cable.</td></tr>
<tr><td>3</td><td>  </td><td>• Fold back the braided shield and fan it out.</td></tr>
<tr><td>4</td><td> 
</td><td>• Shorten the power leads (U, V, W) to 37 mm.
• Shorten the PE lead (GN/YE) to 38 mm.
• Do not shorten leads 1, 2, 3.</td></tr>
<tr><td>5</td><td> 
</td><td>• Pull the shield over the leads.
• Strip 7 mm of insulation off leads U, V, P and PE.
• Strip 5 mm of insulation off the leads 1, 2, 3.</td></tr>
<tr><td>6</td><td> 
</td><td>• Insert the positioning tool in the crimping tool until the marking (color) appears in the view window [A] appears (see table below).
• Set the pressing force [B] on the crimping tool according to the table.
<table>
<tr><th>Litz wire</th><th>a in mm²</th><th>Positioning tool Part number</th><th>Marking (color)</th><th>Press force</th></tr>
<tr><td>1, 2, 3</td><td>0.14 – 1.0</td><td>019 244 9</td><td>Green (GN)</td><td>24</td></tr>
<tr><td>U, V, W and PE</td><td>0.35 – 4.0</td><td>019 245 7</td><td>Blue (BU)</td><td>6</td></tr>
</table></td></tr>
<tr><td>7</td><td>  </td><td>• Insert a lead with socket contact in the crimping tool and press the tool fully together. The tool then opens automatically.
• Repeat this procedure for each lead in accordance with the table in step 6.</td></tr>
</table>

8		• Open the insulating sleeve.
9		• Insert the middle socket contact into the insulator according to the wiring diagram (page 34). • Close the insulating sleeve until it clicks shut. • Insert the remaining socket contacts into the insulator according to the wiring diagram (page 34).
10		• Shorten the braided shield as shown. • Insert the shield ring into the seal so that the shield and end of the cable are flush. Make sure that the braided shield is routed cleanly between the shield ring and the seal.
11		• Insert the insulator into the connector housing until the seal rests against its stop in the connector housing.
12		• Use a wrench to hold the connector housing in place and use a second wrench to tighten the screw fitting. • [A] = Hold in place

Assembly notes for SMB/SBB power connectors

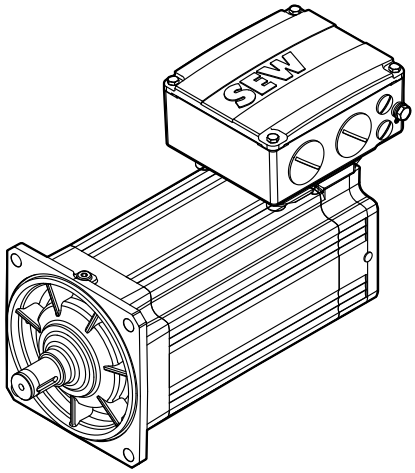
<table>
<tr><td>1</td><td>  </td><td>• Pull the screw fitting and the seal with strain relief over the cable.</td></tr>
<tr><td>2</td><td> 
</td><td>• Strip 70 mm of cable insulation off the end of the cable.</td></tr>
<tr><td>3</td><td>  </td><td>• Fold back the braided shield and fan it out.</td></tr>
<tr><td>4</td><td> 
</td><td>• Shorten the power leads (U, V, W).
• Shorten the PE lead (GN/YE).
• Do not shorten leads 1, 2, 3.
<table>
<tr><th colspan="3">Crimping tools</th></tr>
<tr><th></th><th>a in mm²</th><th>l in mm</th></tr>
<tr><td>Signal</td><td>0.36 – 2.6</td><td>70</td></tr>
<tr><td rowspan="3">PE</td><td>1.5 – 4</td><td>59</td></tr>
<tr><td>6 – 10</td><td>51</td></tr>
<tr><td>16</td><td>51</td></tr>
<tr><td rowspan="3">Power rating</td><td>1.5 – 4</td><td>68</td></tr>
<tr><td>6 – 10</td><td>50</td></tr>
<tr><td>16</td><td>50</td></tr>
</table></td></tr>
<tr><td>5</td><td> 
</td><td>• Pull the shield ring over the leads with the opening facing the cables.
• Strip insulation of leads U, V, W and PE.
• Strip insulation off the leads 1, 2, 3.</td></tr>
<tr><td>6</td><td> 
</td><td>• Insert the positioning tool in the crimping tool until the marking (color) appears in the view window [A] appears (see table below).
• Set the press thickness [B] on the crimping tool.
<table>
<tr><th>Litz wire</th><th>Crimping tool part number</th><th>a in mm²</th><th>Positioning tool Part number</th><th>Marking (color)</th></tr>
<tr><td>1, 2, 3</td><td>016 243 0</td><td>0.35 – 4</td><td>019 245 7</td><td>Blue (BU)</td></tr>
<tr><td>U, V, W and PE</td><td>029 461 65</td><td>1.5 – 4</td><td>032 560 65</td><td>Blue (BU)</td></tr>
<tr><td>U, V, W and PE</td><td>029 461 65</td><td>6 – 10</td><td>032 560 65</td><td>Green (GN)</td></tr>
</table></td></tr>
</table>

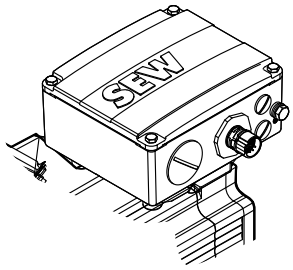
7		• Insert a lead with socket contact in the crimping tool and press the tool fully together. The tool then opens automatically. • Repeat this procedure for each lead in accordance with the table in step 6.
8		• Open the insulating sleeve. • Insert the socket contacts into the insulator as shown in the wiring diagram in section 5.3.4. • Close the insulating sleeve until it clicks shut.
9		• Place outer insulating sleeve flush on the inner insulating sleeve. • Let the braided shield protrude to the outside between the cable clamping and the shield ring.
10		• Braided shield must be turned in completely, do not shorten it. • Insert the insulator into the connector housing until the seal rests against its stop in the connector housing.
11		• Use a wrench to hold the connector housing in place and use a second wrench to tighten the screw fitting. • [A] = Hold in place

5.7 Connecting the motor and encoder system via KK / KKS terminal box

- Check the cable cross sections.
- Screw on the connections and PE conductors.
- Check the winding connections in the terminal box and tighten them, if necessary.
- You have to use an EMC cable gland for the signal cable entry in order to ensure a flawless shielding.

5.7.1 Connection option via terminal box

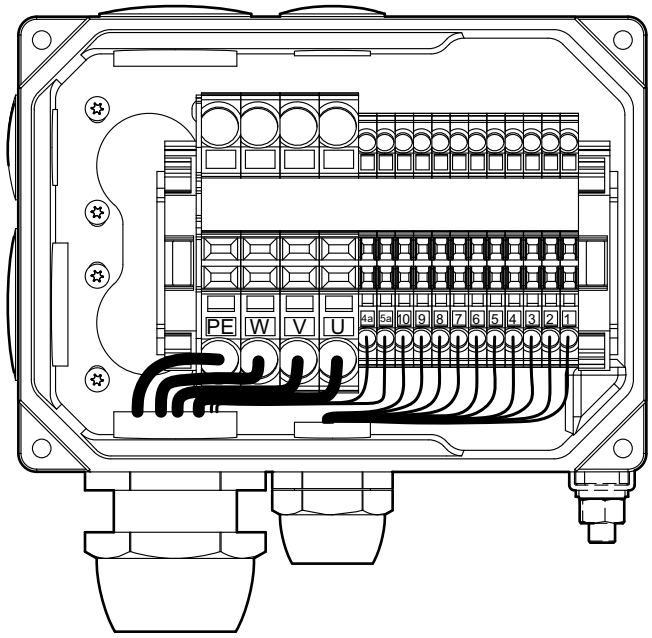




Connection cross section

Motor type	Power connection			Encoder/resolver/thermal motor protection	
	Connection	Maximum connection cross section	Cable entry	Connection	Cable entry
CMP50, CMP63	Spring terminals	6 mm^2	M25	Spring terminals	M20
CMP.71, CMP.80	M6 stud	10 mm^2	M32		M16
CMP.100	M8 stud	25 mm^2	M40		

5.7.2 CMP50 and CMP63 – connection



Power rating

Pin	Core identification	Connection
U	(BK/WH) Black with white lettering U, V, W	U
V		V
W		W
PE	(GN/YE) Green/Yellow	Protective earth

BP brake

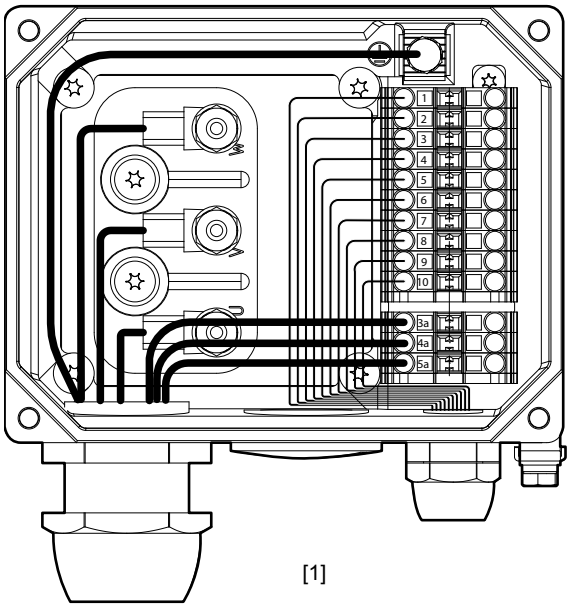
Auxiliary terminal contacts	Core identification	BMV brake rectifier connection	BS brake controller connection
4a	(BK/WH) Black with white lettering 1, 2, 3	13	3
5a		15	5

The brake has a standard supply voltage of DC 24 V.

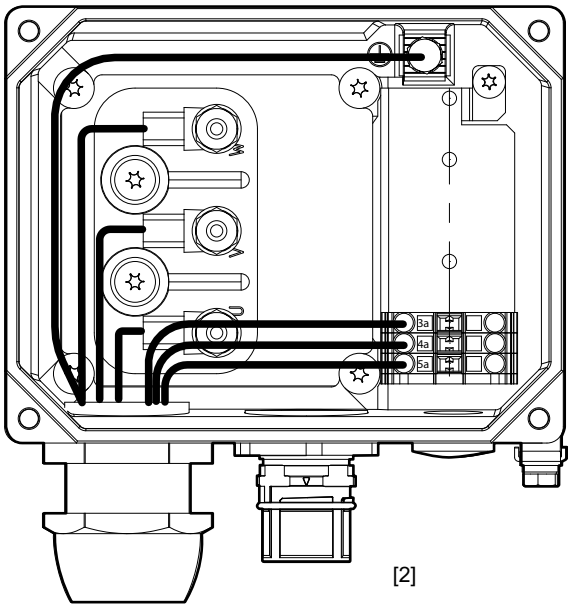
Signal

Resolver				Encoder			
1	RD/WH	ref +	Reference	1	RD	cos +	Cosine
2	BK/WH	ref -		2	BU	ref cos	Reference
3	RD	cos +	Cosine	3	YE	sin+	Sine
4	BK	cos-		4	GN	ref sin	Reference
5	YE	sin+	Sine	5	VT	D -	DATA
6	BU	sin-		6	BK	D +	DATA
7		-	-	7	PK	GND	Ground
8		-	-	8	GY	Us	Supply voltage
9	RD(BK)	KTY + / (TF)	Motor protection	9	RD(BK)	KTY + / (TF)	Motor protection
10	BU(BK)	KTY - / (TF)		10	BU(BK)	KTY - / (TF)	

5.7.3 CMP71- CMP100 – connection



[1]



[2]

[1] KK terminal box

[2] KKS terminal box

Power rating

Pin	Core identification	Connection
U	(BK/WH) Black with white lettering U, V, W	U
V		V
W		W
PE	(GN/YE) Green/Yellow	Protective earth

BP brake

Auxiliary terminal contacts	Core identification	BMV brake rectifier connection	BS brake controller connection
4a	(BK/WH) Black with white lettering 1, 2, 3	13	3
5a		15	5

The brake has a standard supply voltage of DC 24 V.

BY brake

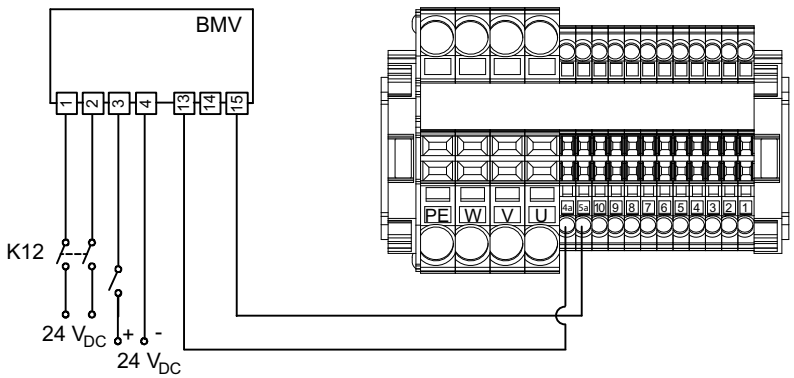
Auxiliary terminal contacts	Core identification	Connection of BME, BMP, BMH, BMK brake rectifiers	Connecting the BSG brake control unit
3a	(BK/WH) Black with white lettering 1, 2, 3	14	1
4a		13	3
5a		15	5

Signal

Resolver				Encoder			
1	RD/WH	ref +	Reference	1	RD	cos +	Cosine
2	BK/WH	ref -		2	BU	ref cos	Reference
3	RD	cos +	Cosine	3	YE	sin+	Sine
4	BK	cos-		4	GN	ref sin	Reference
5	YE	sin+	Sine	5	VT	D -	DATA
6	BU	sin-		6	BK	D +	DATA
7		-	-	7	PK	GND	Ground
8		-	-	8	GY	Us	Supply voltage
9	RD(BK)	KTY + / (TF)	Motor protection	9	RD(BK)	KTY + / (TF)	Motor protection
10	BU(BK)	KTY - / (TF)		10	BU(BK)	KTY - / (TF)	

5.7.4 Wiring diagrams of the BP brake control

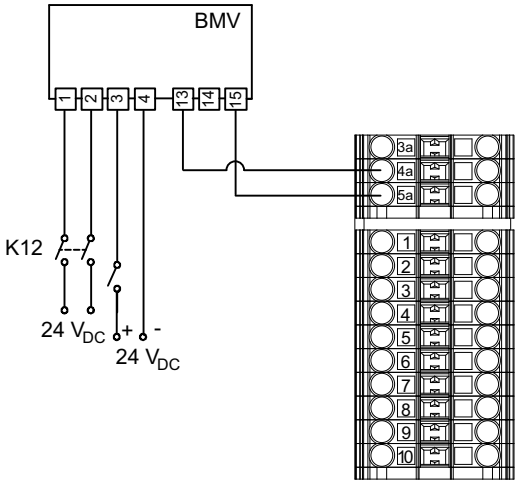
BMV brake rectifier – CMP50, CMP63



Connection 1, 2 Energy supply

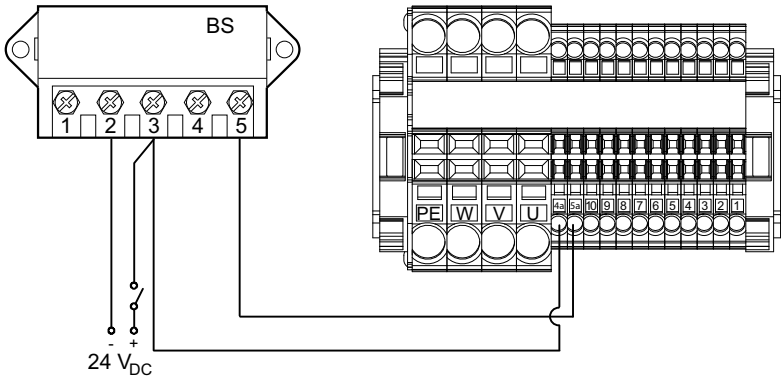
Connection 3, 4 Signal (inverter)

BMV brake rectifier – CMP.71 – CMP.100

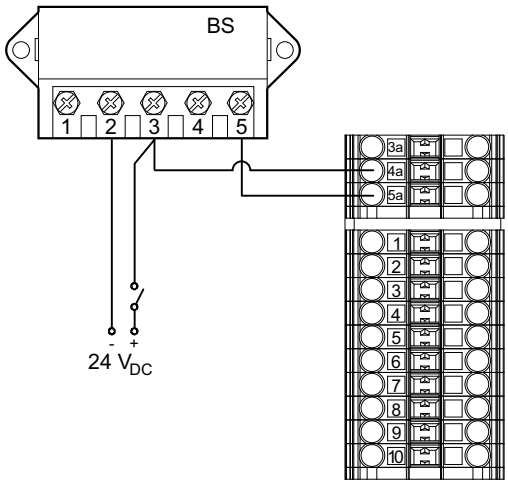


Connection 1, 2	Energy supply
Connection 3, 4	Signal (inverter)

BS brake rectifier – CMP50, CMP63



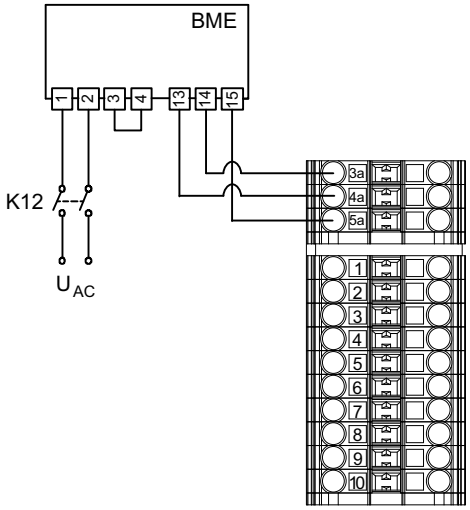
BS brake rectifier – CMP.71 – CMP.100



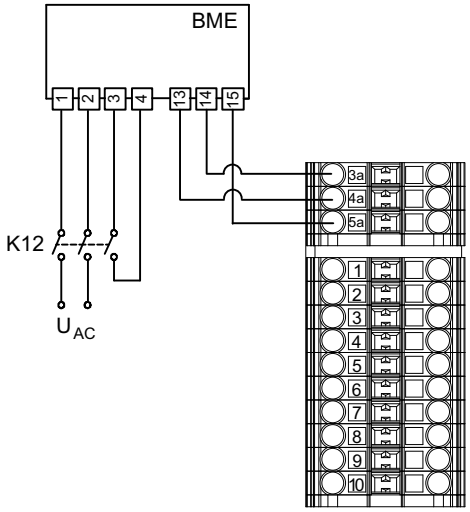
5.7.5 Wiring diagrams of the BY brake control

BME brake rectifier

Cut-off in the AC circuit / standard application of the brake

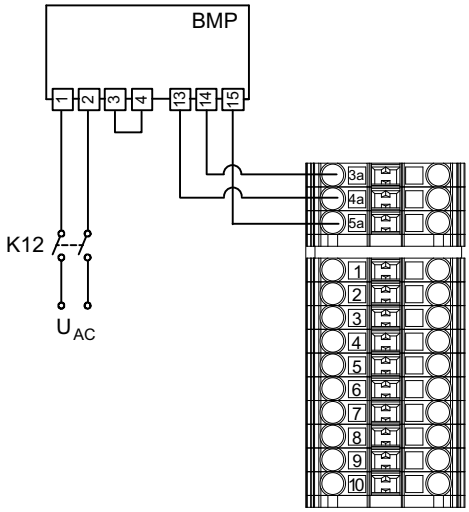


Cut-off in the DC and AC circuit / quick application of the brake



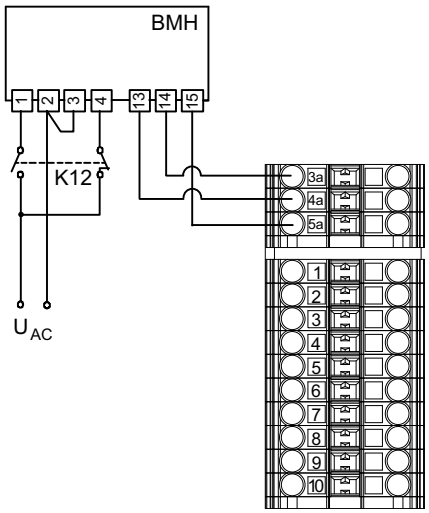
BMP brake rectifier

Cut-off in the DC and AC circuits / rapid application of the brake / integrated voltage relay

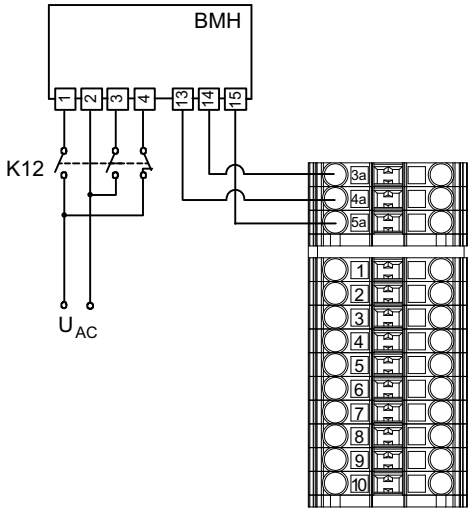


BMH brake rectifier

Cut-off in the AC circuit / standard application of the brake

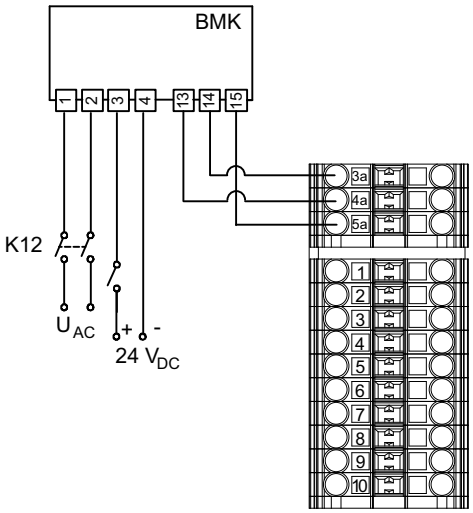


Cut-off in the DC and AC circuit / quick application of the brake



BMK brake rectifier

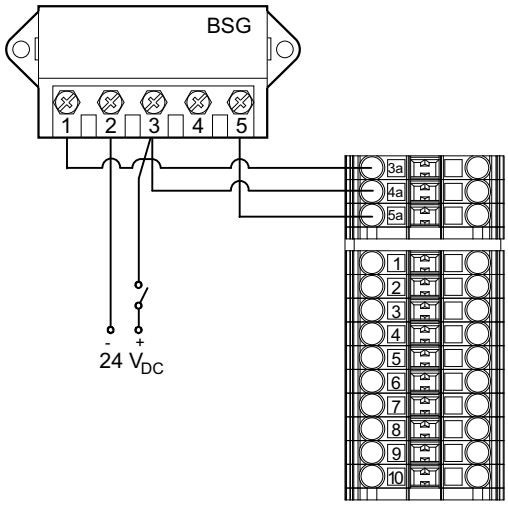
Cut-off in the DC and AC circuits / rapid application of the brake / integrated voltage relay



Connection 1, 2	Energy supply
Connection 3, 4	Signal (inverter)

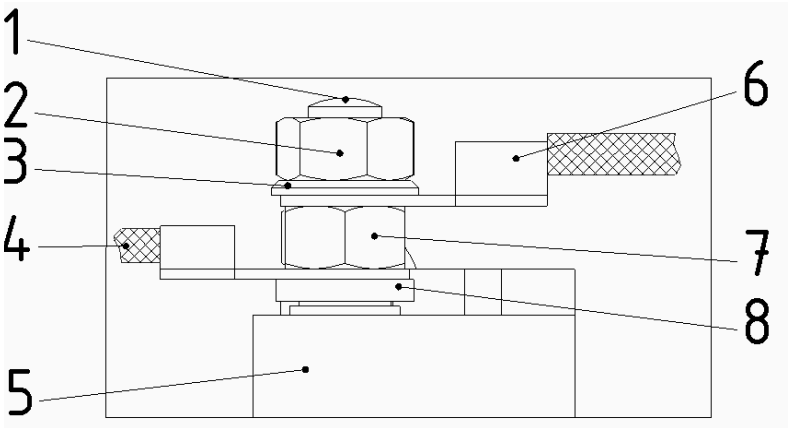
BSG brake rectifier

For DC voltage supply with DC 24 V.



5.7.6 Power connection on terminal box

The following figure shows the power connection in the terminal box.



[1]	Terminal stud	[5]	Terminal board
[2]	Upper nut	[6]	Customer's cable
[3]	Washer	[7]	Lower nut
[4]	Motor cable	[8]	Lock washer

For designing the terminal box, positions 4, 6 and 7 are regarded as current-carrying.

5.8 Accessory equipment

5.8.1 BP brake

BP holding brake – description

The mechanical brake is a holding brake implemented as a spring-loaded brake.

The brake has a standard supply voltage of DC 24 V and operates with one or two braking torque ratings for each motor size. See the table below.

The brake can not be retrofitted.

If the servomotors are operated on the MOVIAXIS® servo inverter, overvoltage protection is provided.

In every application, the BP holding brake can be controlled via the BMV brake relay or a customer relay with varistor overvoltage protection.

If the system complies with the specifications for direct brake control, a BP brake can also be controlled directly via the brake output of a MOVIAXIS® servo inverter.

However, the brakes of motors CMP.80 and CMP.100 can never be directly connected to MOVIAXIS®. For detailed information, refer to the "MOVIAXIS® Multi-Axis Servo Inverter" system manual.

If the servomotors are operated on MOVIDRIVE® or inverters from other manufacturers, overvoltage protection must be implemented by the customers themselves using, for example, varistors.

Observe the notes in the relevant operating instructions for the inverters concerning the switching sequence of motor enable and brake control during standard operation.

For the wiring diagrams of the brake controller, refer to section "Wiring diagrams of the BP brake control" (page 37) and (page 53).

5.8.2 BY brake

BY working brake – description

On request, SEW-EURODRIVE motors can be supplied with an integrated mechanical brake. The BY brake is a DC-operated electromagnetic disk brake with a high working capacity that is released electrically and applied using spring force. The brake is applied in case of a power failure. It meets the basic safety requirements.

The brake can also be released mechanically if equipped with manual brake release. The manual brake release function is self-reengaging (..HR). A hand lever is supplied.

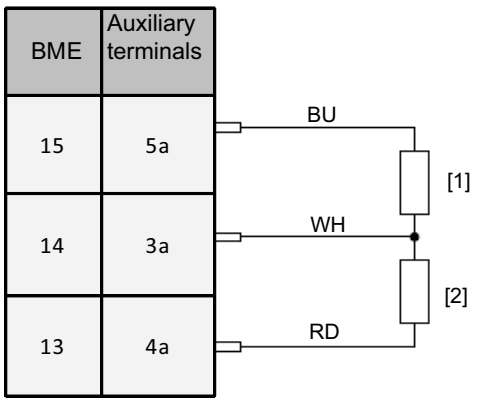
The brake is controlled by a brake controller that is either installed in the control cabinet or in the terminal box.

A main advantage of brakes from SEW-EURODRIVE is their very short design. The integrated construction of the brakemotor permits particularly compact and sturdy solutions.

Observe the notes in the relevant operating instructions concerning the switching sequence of motor enable and brake control during standard operation.

For the wiring diagrams of the brake controller, refer to section "Wiring diagrams of the BY brake control" (page 38) and (page 55).

Connecting the resistance coils



[1] R_T: Resistance of coil section

[2] R_B: Resistance of accelerator coil

5.8.3 Thermal motor protection

NOTICE

Due to the low thermal time constants of the winding, thermal motor protection for CMP40 – CMP.71S motors is only possible when, in addition to a temperature sensor, a current monitoring device (I^2t, rms current monitoring) or a motor model for thermal protection, as installed in SEW servo systems, is activated.

Complete motor protection at full motor utilization is only ensured if the signals are evaluated by SEW-EURODRIVE inverters.

KTY84 - 130 temperature sensor

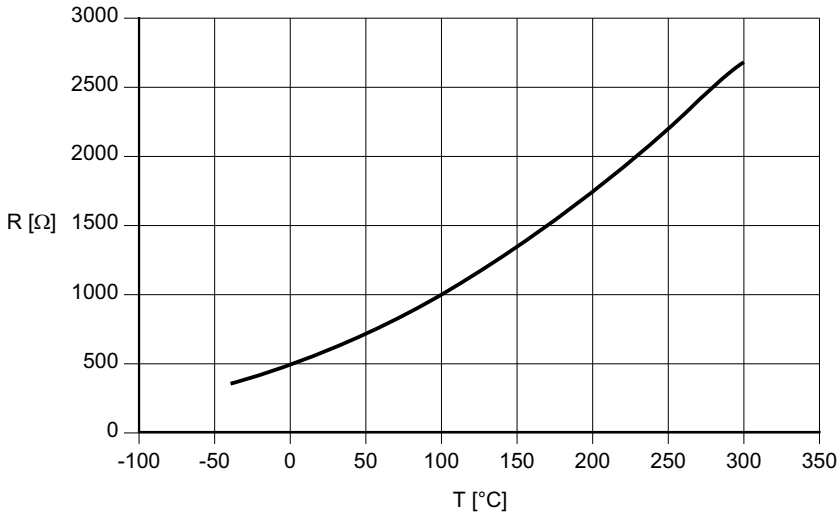
NOTICE

Possible damage to the temperature sensor and the motor winding.

Use test currents < 3 mA in the circuit of the KTY since high self-heating of the temperature sensor can damage its insulation and the motor winding.

Correct connection of the KTY is essential to ensure correct evaluation of the temperature sensor.

Typical characteristic curve of KTY:



For detailed information on connecting the KTY sensor, refer to the contact assignments of resolver/encoder cables. Observe the correct polarity.

5.8.4 VR forced cooling fan

The synchronous servomotors size CMP50 – 63 and CMP.71 – 100 can be equipped with a VR forced cooling fan as an option.

Electrical connection

⚠ CAUTION

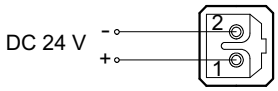
Starting up the fan before it is installed.

Risk of injury due to rotating parts.

- The fan may only be started up once it is installed.

The VR forced cooling fan is only available for DC 24 V voltage.

- DC 24 V ± 20 %
- Plug connector connection
- Maximum connection cross section 2 x 1 mm^2
- Pg7 cable gland with 7 mm inside diameter



Connector contact	Connection
1	24 V +
2	0 V

6 Startup

⚠ WARNING

Danger of electric shock.

Severe or fatal injuries!

Note the following:

- It is essential to comply with the safety notes in section 2 (page 8) during installation.
- Use switch contacts in utilization category AC-3 according to EN 60947-4-1 for switching the motor and the brake.
- When motors are powered by inverters, you must adhere to the wiring instructions issued by the inverter manufacturer.
- Observe the operating instructions of the inverter.

⚠ CAUTION

The surface temperatures on the drive can be very high during operation.

Danger of burns.

- Let the motor cool down before you start your work.

NOTICE

The rated speed (n_N) of the motor can be higher than the mechanically permitted input speed (n_{epk}) of the gear unit.

Limit the maximum speed at the inverter. For information on the procedure, refer to the documentation of the inverter.

NOTICE

With the CMP motors, the maximum limit torque (M_{pk}) and the maximum current (I_{max}) may not be exceeded, not even for acceleration.

Limit the maximum current on the inverter.

6.1 Before startup

- The drive must be undamaged and not blocked.
- The measures stipulated in section "Preliminary work" (page 21) are performed after extended storage periods.
- All connections have to be made correctly.
- All protective covers have to be fitted correctly.
- All motor protection devices must be active.
- There must not be any other sources of danger.
- No heat-sensitive or insulating materials are covering the motor surface.
- If the manual brake release option /HR has been selected for motor with BY brake, the brake can be released manually.

6.2 During startup

- The servomotor must run correctly (e.g. no overload, no unwanted speed fluctuations, no loud noises, correct direction of rotation).
- In case of problems, refer to section "Malfunctions" (page 87) first.

7 Inspection/Maintenance

⚠ DANGER

Risk of crushing if the hoist falls or in the event of uncontrolled unit behavior.

Severe or fatal injuries.

- Secure or lower hoist drives (danger of falling)
- Safeguard and/or protect the driven machine against touching
- Isolate the motor, brake, and forced cooling fan, if installed, from the power supply before starting work, safeguarding them against unintentional re-start.
- Only use genuine spare parts in accordance with the valid parts list.
- Always install a new brake controller at the same time as replacing the brake coil.

⚠ DANGER

Disabling functional safety devices.

Severe or fatal injuries.

- Only qualified personnel is allowed to carry out work on functional safety components.
- Any work on functional safety components must be carried out by strictly observing the specifications in the operating instructions at hand and the respective addendum to the operating instructions. Else, the right to claim under warranty will become invalid.

⚠ CAUTION

The surface temperatures on the drive can be very high during operation.

Danger of burns.

- Let the motor cool down before you start your work.

NOTICE

For assembly, the ambient temperature and the oil seals themselves may not be colder than 0 °C, else the oil seals might be damaged.

NOTICE

The motor must be disassembled when replacing the brake which cannot be adjusted.

Possible damage to motor and brake

- Only SEW-EURODRIVE may perform maintenance on the brake because the encoder or resolver has to be reset each time the system is disassembled.

7.1 General information

The amount of wear depends on many factors and may be high. The required inspection intervals must be calculated individually in line with project planning documents from the system manufacturer.

INFORMATION

Observe the data of the machine and system manufacturer in the machine maintenance schedule.

7.1.1 Cleaning

Excessive dirt, dust or shavings can have a negative impact on the function of servomotors; in extreme cases these factors can cause the servomotor to break down.

Therefore, you must clean the servomotors at regular intervals (after one year at the latest) to ensure a sufficiently large area for heat emission.

Insufficient heat emission can have unwanted consequences. The bearing service life is reduced through operation at impermissibly high temperatures (bearing grease degrades).

7.1.2 Connection cable

Check the connection cable for damage at regular intervals and replace if necessary.

7.2 BY brake – notes

7.2.1 Replacing the brake disks

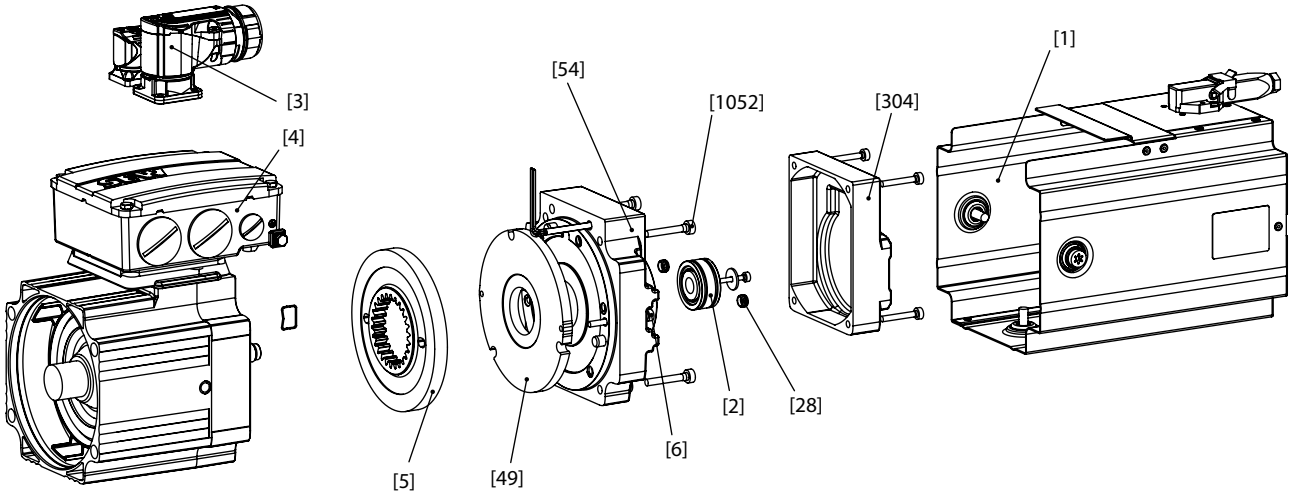
When replacing the brake disk, check the other removed parts as well, and replace them if necessary.

⚠ DANGER

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Disconnect the motor and brake from the power supply and safeguard the drive against unintentional power up before you begin!
- Carefully observe the following steps.



[1]	Forced cooling fan	[28]	Closing caps
[2]	Encoder/resolver	[49]	Pressure plate
[3]	Plug connector	[54]	Magnet
[4]	Terminal box	[304]	Cover
[5]	Brake disk	[1052]	Machine screws
[6]	Locking screws for pressure plate		

1. Remove forced cooling fan [1], if applicable
2. Remove cover [304]
3. Remove encoder or resolver [2]
4. Plug connector [3]:
   - Drive out the brake pins of the plug connector
5. Terminal box [4]:
   - Disconnect the brake cable
6. Not necessary for manual brake release:
   - Remove the closing caps [28]
   - Secure pressure plate with screws [6]
7. Loosen pan head screws [1052]

8. Carefully remove the magnet [54] together with the pressure plate [45] – mind the brake cable
9. Remove the brake disk [5]
10. Check the clasp [69]
11. Clean the brake components
12. Install the new brake disk [5]
13. Re-install the brake components
14. Not necessary for manual brake release:
    - Remove the screws [6] that secure the pressure plate
    - Install the closing cap [28]
15. Calibrate the encoder or resolver [2]
16. Install the cover [304]
17. Install the forced-cooling fan [1], if applicable

INFORMATION

Important: After replacing the brake disk, the maximum braking torque is reached only after several cycles.

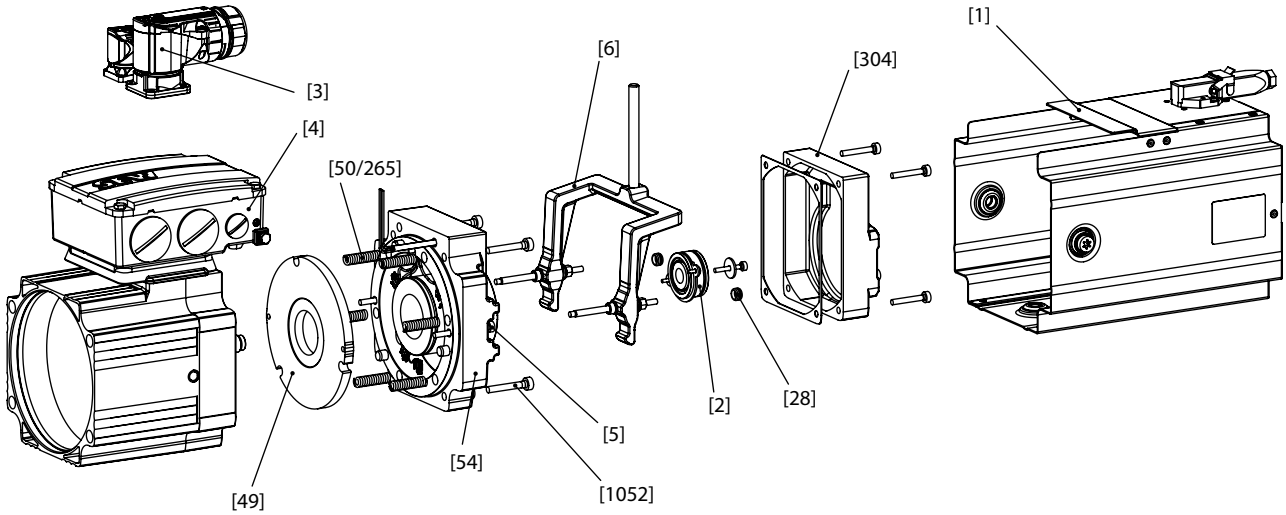
7.2.2 Changing the braking torque

⚠ DANGER

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Disconnect the motor and brake from the power supply and safeguard the drive against unintentional power up before you begin!
- Carefully observe the following steps.



[1]	Forced cooling fan	[28]	Closing caps
[2]	Encoder/resolver	[49]	Pressure plate
[3]	Plug connector	[50/265]	brake springs
[4]	Terminal box	[54]	Magnet
[5]	Locking screws for pressure plate	[304]	Cover
[6]	Manual brake release	[1052]	Machine screws

1. Remove forced cooling fan [1], if applicable
2. Remove cover [304]
3. Remove encoder or resolver [2]
4. Plug connector [3]:
   - Drive out the brake pins of the plug connector
5. Terminal box [4]:
   - Disconnect the brake cable
6. If a manual brake release [6] is provided:
   - Remove it
7. No manual brake release installed:
   - Remove the closing caps [28]
8. Loosen pan head screws [1052]
9. Carefully remove the magnet [54] – mind the brake cable.

10. Remove the pressure plate [49]
11. Replace or add brake springs [50/265], see the following table
12. Arrange brake springs symmetrically
13. Replace the pressure plate [49] if required, see the following table
14. Re-install the brake components
15. If a manual brake release [6] is provided:
    - install according to the figure in section "Retrofitting the manual brake release" (page 25)
16. No manual brake release installed:
    - Install the closing caps [28]
17. Calibrate the encoder or resolver [2]
18. Install the cover [304]
19. Install the forced-cooling fan [1], if applicable

Brake type	Braking work until Maintenance	Pressure plate order number	Braking torque settings				
			Braking torque	Type and number of brake springs		Order number of brake springs	
	10^6 J		Nm	standard	Red	standard	Red
BY2	60	1644 3632	20	6	-	0186 6621	0183 7427
			14	4	2		
		1644 7824	10	3	-		
			7	2	2		
BY4	90	1644 5856	40	6	-	0186 663X	0184 0037
			28	4	2		
		1644 7840	20	3	-		
			14	2	2		
BY8	120	1644 4876	80	6	-	1644 6011	1644 6038
			55	4	2		
		1644 7859	40	3	-		
			28	2	2		

7.2.3 Replacing the magnet

⚠ DANGER

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

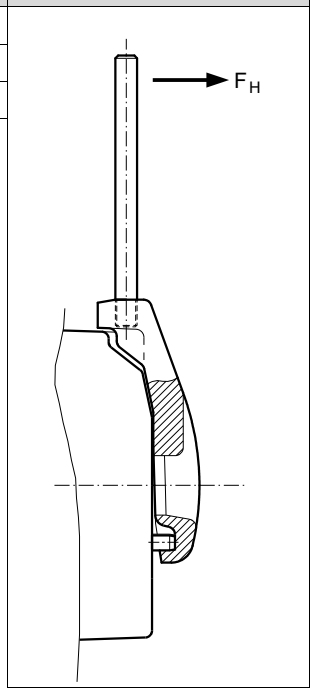
- Disconnect the motor and brake from the power supply and safeguard the drive against unintentional power up before you begin!
- Carefully observe the following steps.

See figure on

1. Remove forced cooling fan [1], if applicable
2. Remove cover [304]
3. Remove encoder or resolver [2]
4. Plug connector [3]:
   - Drive out the brake pins of the plug connector
5. Terminal box [4]:
   - Disconnect the brake cable
6. If a manual brake release [6] is provided:
   - Remove it
7. No manual brake release installed:
   - Remove the closing caps [28]
8. Loosen pan head screws [1052]
9. Carefully remove the magnet [54] – mind the brake cable.
10. Install the magnet [54]; for plug connector: After threading the leads through the brake endshield, crimp the pins onto the leads
11. Re-install the brake components
12. If a manual brake release [6] is provided:
    - install according to the figure in section "Retrofitting the manual brake release" (page 25)
13. No manual brake release installed:
    - Install the closing caps [28]
14. Calibrate the encoder or resolver [2]
15. Install the cover [304]
16. Install the forced-cooling fan [1], if applicable

7.2.4 Manual brake release

In brakemotors with the ../HR option "Manual brake release with automatic reengaging function", you can release the brake manually using the provided lever. The following table specifies the actuation force required at maximum braking torque to release the brake manually. The values are based on the assumption that you operate the lever at the upper end.

Brake type	Motor size	Actuation force F_H in N	
BY2	**CMPZ71**	50	
BY4	**CMPZ80**	70	
BY8	**CMPZ100**	90	

8 CMP/CMPZ Servomotors – Technical Data

8.1 Key to the technical data

n_N	Rated speed
M_0	Standstill torque (thermal continuous torque at low speeds)
I_0	Standstill current
M_{pk}	Dynamic limit torque
I_{max}	Maximum permitted motor current
M_{0VR}	Standstill torque with forced cooling fan
I_{0VR}	Standstill current with forced cooling fan
J_{mot}	Mass moment of inertia of the motor
J_{bmot}	Mass moment of inertia of the brakemotor
M_{B1}	Standard braking torque
M_{B2}	Optional braking torque
W_{max1}	Maximum permitted braking work per braking operation
W_{max2}	Maximum permitted braking work per braking operation with optional braking torque
L_1	Inductance between connection phase and star point
R_1	Resistance between connection phase and star point
U_{p0} cold	Internal voltage at 1000 rpm
m_{mot}	Weight of the motor
m_{bmot}	Weight of the brakemotor

8.2 CMP motors – technical data

Synchronous servomotors with 400 V system voltage

n_N rpm	Motor	M_0 Nm	I_0 A	M_{pk} Nm	I_{max} A	M_{0VR} Nm	I_{0VR} A	m kg	J_{mot} 10^{-4} kgm^2
	CMP71S	6.4	3.4	19.2	17	8.7	4.6	7	3.04
	CMP71M	9.4	5	30.8	26	13.7	7.3	8.4	4.08
	CMP71L	13.1	6.3	46.9	39	21	10.1	11.4	6.18
	CMP80S	13.4	6.9	42.1	33	18.7	9.5	12.8	8.78
2000	**CMP80M**	18.7	9.3	62.6	48	27	13.4	16.5	11.9
	CMP80L	27.5	12.5	107	72	44	20	21.4	18.1
	CMP100S	25.5	13.3	68.3	49	36	18.8	19.8	19.59
	CMP100M	31	14.7	108	69	47	22.3	24.8	26.49
	CMP100L	47	21.8	178.8	113	70	32.5	34.6	40.24
	CMP40S	0.5	1.2	1.9	6.1	–	–	1.3	0.1
	CMP40M	0.8	0.95	3.8	6.0	–	–	1.6	0.15
	CMP50S	1.3	0.96	5.2	5.1	1.7	1.25	2.3	0.42
	CMP50M	2.4	1.68	10.3	9.6	3.5	2.45	3.3	0.67
	CMP50L	3.3	2.2	15.4	13.6	4.8	3.2	4.1	0.92
	CMP63S	2.9	2.15	11.1	12.9	4	3	4.0	1.15
	CMP63M	5.3	3.6	21.4	21.6	7.5	5.1	5.7	1.92
	CMP63L	7.1	4.95	30.4	29.7	10.3	7.2	7.5	2.69
3000	**CMP71S**	6.4	4.9	19.2	25	8.7	6.7	7	3.04
	CMP71M	9.4	7.5	30.8	39	13.7	10.9	8.4	4.08
	CMP71L	13.1	9.4	46.9	58	21	15.1	11.4	6.18
	CMP80S	13.4	10	42.1	47	18.5	13.8	12.8	8.78
	CMP80M	18.7	13.4	62.6	69	27	19.3	16.5	11.9
	CMP80L	27.5	18.7	107	107	44	30	21.4	18.1
	CMP100S	25.5	19.6	68.3	73	36	27.5	19.8	19.34
	CMP100M	31	21.8	108	102	47	33	24.8	26.25
	CMP100L	47	32.3	178.8	167	70	48	34.6	40
	CMP40S	0.5	1.2	1.9	6.1	–	–	1.3	0.1
	CMP40M	0.8	0.95	3.8	6.0	–	–	1.6	0.15
	CMP50S	1.3	1.32	5.2	7.0	1.7	1.7	2.3	0.42
	CMP50M	2.4	2.3	10.3	13.1	3.5	3.35	3.3	0.67
	CMP50L	3.3	3.15	15.4	19.5	4.8	4.6	4.1	0.92
	CMP63S	2.9	3.05	11.1	18.3	4	4.2	4.0	1.15
	CMP63M	5.3	5.4	21.4	32.4	7.5	7.6	5.7	1.92
	CMP63L	7.1	6.9	30.4	41.4	10.3	10	7.5	2.69
4500	**CMP71S**	6.4	7.3	19.2	38	8.7	9.9	7	3.04
	CMP71M	9.4	10.9	30.8	57	13.7	15.9	8.4	4.08
	CMP71L	13.1	14.1	46.9	87	21	22.5	11.4	6.18
	CMP80S	13.4	15.3	42.1	73	18.5	21	12.8	8.78
	CMP80M	18.7	20.1	62.6	103	27	29	16.5	11.9
	CMP80L	27.5	27.8	107	159	44	44.5	21.4	18.1
	CMP100S	25.5	30	68.3	111	36	42.5	19.8	19.34
	CMP100M	31	33.1	108	154	47	50	24.8	26.25
	CMP100L	47	48.4	178.8	251	70	72	34.6	40

n_N rpm	Motor	M_0 Nm	I_0 A	M_{pk} Nm	I_{max} A	M_{0VR} Nm	I_{0VR} A	m kg	J_{mot} 10^{-4} kgm^2
6000	**CMP40S**	0.5	1.2	1.9	6.1	–	–	1.3	0.1
	CMP40M	0.8	1.1	3.8	6.9	–	–	1.6	0.15
	CMP50S	1.3	1.7	5.2	9.0	1.7	2.2	2.3	0.42
	CMP50M	2.4	3	10.3	17.1	3.5	4.4	3.3	0.67
	CMP50L	3.3	4.2	15.4	26	4.8	6.1	4.1	0.92
	CMP63S	2.9	3.9	11.1	23.4	4	5.4	4.0	1.15
	CMP63M	5.3	6.9	21.4	41.4	7.5	9.8	5.7	1.92
	CMP63L	7.1	9.3	30.4	55.8	10.3	13.5	7.5	2.69
	CMP71S	6.4	9.6	19.2	50	8.7	13.1	7	3.04
	CMP71M	9.4	14.7	30.8	76	13.7	21.5	8.4	4.08
	CMP71L	13.1	18.8	46.9	115	21	30	11.4	6.18
	CMP80S	13.4	20	42.1	95	18.5	27.5	12.8	8.78
	CMP80M	18.7	26.4	62.6	135	27	38	16.5	11.9
	CMP80L	27.5	37.6	107	215	–	–	21.4	18.1

n_N rpm	Motor	L_1 mH	R_1 Ω	U_{p0} cold V	m_{bmot} kg	J_{bmot} 10^{-4} kgm^2	M_{B1} Nm	M_{B2} Nm
2000	**CMP71S**	33.5	3.48	128	9	3.44	7	14
	CMP71M	21.5	1.87	127	10.4	4.5	14	7
	CMP71L	16.2	1.2	142	13.4	6.6	14	7
	CMP80S	15.3	1.1	133	16.8	10.04	16	31
	CMP80M	10.5	0.69	136	20.5	13.16	31	16
	CMP80L	7.6	0.44	149	24.4	19.36	31	16
	CMP100S	8.5	0.44	130	22.8	21.34	24	47
	CMP100M	6.6	0.3	141	27.8	28.25	47	24
	CMP100L	4.15	0.169	145	37.6	42.82	47	24
3000	**CMP40S**	23	11.94	27.5	1.7	0.13	0.95	–
	CMP40M	46	19.93	56	2.0	0.18	0.95	–
	CMP50S	71	22.49	86	2.9	0.48	3.1	4.3
	CMP50M	38.5	9.96	90	3.9	0.73	4.3	3.1
	CMP50L	30.5	7.42	98	4.7	0.98	4.3	3.1
	CMP63S	36.5	6.79	90	5.0	1.49	7	9.3
	CMP63M	22	3.56	100	6.7	2.26	9.3	7
	CMP63L	14.2	2.07	100	8.5	3.03	9.3	7
	CMP71S	15.7	1.48	87.5	9	3.44	7	14
	CMP71M	9.7	0.81	85	10.4	4.5	14	7
	CMP71L	7.3	0.56	96	13.4	6.6	14	7
	CMP80S	7.2	0.54	91	16.8	10.04	16	31
	CMP80M	5	0.345	94	20.5	13.16	31	16
	CMP80L	3.35	0.21	99	24.4	19.36	31	16
	CMP100S	3.9	0.215	88	22.8	21.34	24	47
	CMP100M	3.05	0.142	95.5	27.8	28.25	47	24
	CMP100L	1.9	0.081	98	37.6	42	47	24
4500	**CMP40S**	23	11.94	27.5	1.7	0.13	0.95	–
	CMP40M	46	19.93	56	2.0	0.18	0.95	–
	CMP50S	37	11.61	62	2.9	0.48	3.1	4.3
	CMP50M	20.5	5.28	66	3.9	0.73	4.3	3.1
	CMP50L	14.6	3.57	68	4.7	0.98	4.3	3.1
	CMP63S	18.3	3.34	64	5.0	1.49	7	9.3
	CMP63M	9.8	1.48	67	6.7	2.26	9.3	7
	CMP63L	7.2	1.07	71	8.5	3.03	9.3	7
	CMP71S	7.1	0.72	59	9	3.44	7	14
	CMP71M	4.55	0.385	58	10.4	4.5	14	7
	CMP71L	3.25	0.24	64	13.4	6.6	14	7
	CMP80S	3.05	0.22	59	16.8	10.04	16	31
	CMP80M	2.25	0.148	63	20.5	13.16	31	16
	CMP80L	1.54	0.085	67	24.4	19.36	31	16
	CMP100S	1.68	0.086	58	22.8	21.34	24	47
	CMP100M	1.32	0.058	63	27.8	28.25	47	24
	CMP100L	0.84	0.038	65	37.6	42.82	47	24

n_N rpm	Motor	L_1 mH	R_1 Ω	U_{p0} cold V	m_{bmot} kg	J_{bmot} 10^{-4} kgm^2	M_{B1} Nm	M_{B2} Nm
6000	**CMP40S**	23	11.94	27.5	1.7	0.13	0.95	–
	CMP40M	34	14.95	48.5	2.0	0.18	0.95	–
	CMP50S	22.5	7.11	48.5	2.9	0.48	3.1	4.3
	CMP50M	12	3.21	50.5	3.9	0.73	4.3	3.1
	CMP50L	8.2	1.91	51	4.7	0.98	4.3	3.1
	CMP63S	11.2	2.1	50	5.0	1.49	7	9.3
	CMP63M	5.9	0.92	52	6.7	2.26	9.3	7
	CMP63L	4	0.62	53	8.5	3.03	9.3	7
	CMP71S	4.15	0.395	45	9	3.44	7	14
	CMP71M	2.55	0.205	43.5	10.4	4.5	14	7
	CMP71L	1.84	0.145	48	13.4	6.6	14	7
	CMP80S	1.8	0.136	46	–	–	–	–
	CMP80M	1.3	0.087	48	–	–	–	–
	CMP80L	0.84	0.051	50	–	–	–	–

Synchronous servomotors with 230 V system voltage

n_N rpm	Motor	M_0 Nm	I_0 A	M_{pk} Nm	I_{max} A	M_{0VR} Nm	I_{0VR} A	m kg	J_{mot} 10^{-4} kgm^2
3000	**CMP40S**	0.5	1.2	1.9	6.1	–	–	1.3	0.1
	CMP40M	0.8	1.1	3.8	6.89	–	–	1.6	0.15
	CMP50S	1.3	1.64	5.2	9.8	–	–	2.3	0.42
	CMP50M	2.4	2.84	10.3	17.05	–	–	3.3	0.67
	CMP50L	3.3	3.84	15.4	23.1	–	–	4.1	0.92
	CMP63S	2.9	3.61	11.1	21.65	–	–	4.0	1.15
	CMP63M	5.3	6.35	21.4	38.1	–	–	5.7	1.92
	CMP63L	7.1	8.76	30.4	52.59	–	–	7.5	2.69
	CMP71S	6.4	8.7	19.2	44	8.7	11.8	7	3.04
	CMP71M	9.4	13.1	30.8	68	13.7	19.1	8.4	4.08
	CMP71L	13.1	16.8	46.9	103	21	27	11.4	6.18
	CMP80S	13.4	17.7	42.1	83	18.5	24.5	12.8	8.78
	CMP80M	18.7	23.5	62.6	121	27	34	16.5	11.9
	CMP80L	27.5	32.5	107	186	44	52	21.4	18.1
	CMP100S	25.5	34.2	68.3	127	–	–	19.8	19.59
	CMP100M	31	40	108	187	–	–	24.8	26.49
4500	**CMP40S**	0.5	1.2	1.9	6.1	–	–	1.3	0.1
	CMP40M	0.8	1.5	3.8	9	–	–	1.6	0.15
	CMP50S	1.3	2.26	5.2	13.75	–	–	2.3	0.42
	CMP50M	2.4	4.025	10.3	24.2	–	–	3.3	0.67
	CMP50L	3.3	5.53	15.4	33.2	–	–	4.1	0.92
	CMP63S	2.9	5.25	11.1	31.5	–	–	4.0	1.15
	CMP63M	5.3	9.78	21.4	58.7	–	–	5.7	1.92
	CMP63L	7.1	12.01	30.4	72.07	–	–	7.5	2.69
	CMP71S	6.4	12.8	19.2	67	8.7	17.4	7	3.04
	CMP71M	9.4	19.2	30.8	101	13.7	28	8.4	4.08
	CMP80S	13.4	27	42.1	129	18.5	37	12.8	8.78
	CMP80M	18.7	35	62.6	180	27	51	16.5	11.9
	CMP100S	25.5	54.5	68.3	200	–	–	19.8	19.59
6000	**CMP40S**	0.5	1.36	1.9	6.8	–	–	1.3	0.1
	CMP40M	0.8	1.91	3.8	11.5	–	–	1.6	0.15
	CMP50S	1.3	3.07	5.2	18.45	–	–	2.3	0.42
	CMP50M	2.4	5.25	10.3	31.5	–	–	3.3	0.67
	CMP50L	3.3	7.6	15.4	45.4	–	–	4.1	0.92
	CMP63S	2.9	6.78	11.1	40.7	–	–	4.0	1.15
	CMP63M	5.3	12.06	21.4	72.36	–	–	5.7	1.92
	CMP71S	6.4	17	19.2	89	8.7	23	7	3.04
	CMP80S	13.4	35.5	42.1	168	18.5	48.5	12.8	8.78

n_N rpm	Motor	L_1 mH	R_1 Ω	U_{p0} cold V	m_{bmot} kg	J_{bmot} 10^{-4} kgm^2	M_{B1} Nm	M_{B2} Nm
3000	**CMP40S**	23	11.94	27.5	1.7	0.13	0.95	–
	CMP40M	34	14.95	48.5	2.0	0.18	0.95	–
	CMP50S	24.5	7.39	50.4	2.9	0.48	3.1	4.3
	CMP50M	13.5	3.41	53.7	3.9	0.73	4.3	3.1
	CMP50L	9.8	2.34	55.7	4.7	0.98	4.3	3.1
	CMP63S	13	2.56	54	5.0	1.49	7	9.3
	CMP63M	7.1	1.12	57	6.7	2.26	9.3	7
	CMP63L	4.45	0.66	56	8.5	3.03	9.3	7
	CMP71S	5	0.485	49.5	9	3.44	7	14
	CMP71M	3.15	0.26	48.7	10.4	4.5	14	7
	CMP71L	2.3	0.162	53.7	13.4	6.6	14	7
	CMP80S	2.3	0.166	51.5	16.8	10.04	16	31
	CMP80M	1.64	0.113	53.3	20.5	13.16	31	16
	CMP80L	1.11	0.073	57	24.4	19.36	31	16
	CMP100S	1.29	0.066	50.5	22.8	21.34	24	47
	CMP100M	0.9	0.0445	52.1	27.8	28.25	47	24
4500	**CMP40S**	23	11.94	27.5	1.7	0.13	0.95	–
	CMP40M	18.4	7.85	35.7	2.0	0.18	0.95	–
	CMP50S	12.3	3.73	35.9	2.9	0.48	3.1	4.3
	CMP50M	6.8	1.68	37.9	3.9	0.73	4.3	3.1
	CMP50L	4.75	1.14	38.7	4.7	0.98	4.3	3.1
	CMP63S	6.2	1.09	37.1	5.0	1.49	7	9.3
	CMP63M	3	0.46	37	6.7	2.26	9.3	7
	CMP63L	2.4	0.34	40.9	8.5	3.03	9.3	7
	CMP71S	2.3	0.225	33.4	9	3.44	7	14
	CMP71M	1.46	0.127	33.1	10.4	4.5	14	7
	CMP80S	0.98	0.07	33.7	16.8	10.04	16	31
	CMP80M	0.73	0.051	35.9	20.5	13.16	31	16
	CMP100S	0.51	0.027	31.7	22.8	21.34	24	47
6000	**CMP40S**	17.9	9.19	24.3	1.7	0.13	0.95	–
	CMP40M	11.2	4.83	27.8	2.0	0.18	0.95	–
	CMP50S	6.9	2	26.8	2.9	0.48	3.1	4.3
	CMP50M	3.95	1.03	29	3.9	0.73	4.3	3.1
	CMP50L	2.55	0.6	28.3	4.7	0.98	4.3	3.1
	CMP63S	3.7	0.67	28.7	5.0	1.49	7	9.3
	CMP63M	1.96	0.295	30	6.7	2.26	9.3	7
	CMP71S	1.32	0.124	25.3	9	3.44	7	14
	CMP80S	0.58	0.0415	25.7	16.8	10.04	–	–

8.3 CMPZ motors – technical data

Synchronous servomotors with 400 V system voltage

n_N rpm	Motor	M_0 Nm	I_0 A	M_{pk} Nm	I_{max} A	M_{0VR} Nm	I_{0VR} A	m kg	J_{mot} 10^{-4} kgm^2
2000	**CMPZ71S**	6.4	3.4	19.2	17	8.7	4.6	8.6	9.32
	CMPZ71M	9.4	5	30.8	26	13.7	7.3	10	10.37
	CMPZ71L	13.1	6.3	46.9	39	21	10.1	13	12.47
	CMPZ80S	13.4	6.9	42.1	33	18.7	9.5	15.8	27.18
	CMPZ80M	18.7	9.3	62.6	48	27	13.4	19.5	30.3
	CMPZ80L	27.5	12.5	107	72	44	20	24.4	36.51
	CMPZ100S	25.5	13.3	68.3	49	36	18.8	24.2	79.76
	CMPZ100M	31	14.7	108	69	47	22.3	29.2	86.66
	CMPZ100L	47	21.8	178.8	113	70	32.5	39	100.41
3000	**CMPZ71S**	6.4	4.9	19.2	25	8.7	6.7	8.6	9.32
	CMPZ71M	9.4	7.5	30.8	39	13.7	10.9	10	10.37
	CMPZ71L	13.1	9.4	46.9	58	21	15.1	13	12.47
	CMPZ80S	13.4	10	42.1	47	18.5	13.8	15.8	27.18
	CMPZ80M	18.7	13.4	62.6	69	27	19.3	19.5	30.3
	CMPZ80L	27.5	18.7	107	107	44	30	24.4	36.51
	CMPZ100S	25.5	19.6	68.3	73	36	27.5	24.2	79.76
	CMPZ100M	31	21.8	108	102	47	33	29.2	86.66
	CMPZ100L	47	32.3	178.8	167	70	48	39	100.41
4500	**CMPZ71S**	6.4	7.3	19.2	38	8.7	9.9	8.6	9.32
	CMPZ71M	9.4	10.9	30.8	57	13.7	15.9	10	10.37
	CMPZ71L	13.1	14.1	46.9	87	21	22.5	13	12.47
	CMPZ80S	13.4	15.3	42.1	73	18.5	21	15.8	27.18
	CMPZ80M	18.7	20.1	62.6	103	27	29	19.5	30.3
	CMPZ80L	27.5	27.8	107	159	44	44.5	24.4	36.51
	CMPZ100S	25.5	30	68.3	111	36	42.5	24.2	79.76
	CMPZ100M	31	33.1	108	154	47	50	29.2	86.66
	CMPZ100L	47	48.4	178.8	251	70	72	39	100.41
6000	**CMPZ71S**	6.4	9.6	19.2	50	8.7	13.1	8.6	9.32
	CMPZ71M	9.4	14.7	30.8	76	13.7	21.5	10	10.37
	CMPZ71L	13.1	18.8	46.9	115	21	30	13	12.47
	CMPZ80S	13.4	20	42.1	95	18.5	27.5	15.8	27.18
	CMPZ80M	18.7	26.4	62.6	135	27	38	19.5	30.3
	CMPZ80L	27.5	37.6	107	215	–	–	24.4	36.51

n_N rpm	Motor	L_1 mH	R_1 Ω	U_{p0} cold V	ΔLB[1] mm	m_{bmot} kg	J_{bmot} 10^{-4} kgm^2	M_{B1} Nm	M_{B2} Nm	ΔLBS[2] mm
2000	**CMPZ71S**	33.5	3.48	128	62.6	11.2	11.04	14	10	58.5
	CMPZ71M	21.5	1.87	127	62.6	12.6	12.09	20	14	58.5
	CMPZ71L	16.2	1.2	142	62.6	15.6	14.19	20	14	58.5
	CMPZ80S	15.3	1.1	133	75.3	20.8	30.95	28	20	62.4
	CMPZ80M	10.5	0.69	136	75.3	24.5	34.07	40	28	62.4
	CMPZ80L	7.6	0.44	149	75.3	29.4	40.28	40	28	62.4
	CMPZ100S	8.5	0.44	130	96.2	34.7	84.19	55	40	61.1
	CMPZ100M	6.6	0.3	141	96.2	39.7	91.1	80	55	61.1
	CMPZ100L	4.15	0.169	145	96.2	49.5	104.85	80	55	61.1
3000	**CMPZ71S**	15.7	1.48	87.5	62.6	11.2	11.04	14	10	58.5
	CMPZ71M	9.7	0.81	85	62.6	12.6	12.09	20	14	58.5
	CMPZ71L	7.3	0.56	96	62.6	15.6	14.19	20	14	58.5
	CMPZ80S	7.2	0.54	91	75.3	20.8	30.95	28	20	62.4
	CMPZ80M	5	0.345	94	75.3	24.5	34.07	40	28	62.4
	CMPZ80L	3.35	0.21	99	75.3	29.4	40.28	40	28	62.4
	CMPZ100S	3.9	0.215	88	96.2	34.7	84.19	55	40	61.1
	CMPZ100M	3.05	0.142	95.5	96.2	39.7	91.1	80	55	61.1
	CMPZ100L	1.9	0.081	98	96.2	49.5	104.85	80	55	61.1
4500	**CMPZ71S**	7.1	0.72	59	62.6	11.2	11.04	14	10	58.5
	CMPZ71M	4.55	0.385	58	62.6	12.6	12.09	20	14	58.5
	CMPZ71L	3.25	0.24	64	62.6	15.6	14.19	20	14	58.5
	CMPZ80S	3.05	0.22	59	75.3	20.8	30.95	28	20	62.4
	CMPZ80M	2.25	0.148	63	75.3	24.5	34.07	40	28	62.4
	CMPZ80L	1.54	0.085	67	75.3	29.4	40.28	40	28	62.4
	CMPZ100S	1.68	0.086	58	96.2	34.7	84.19	55	40	61.1
	CMPZ100M	1.32	0.058	63	96.2	39.7	91.1	80	55	61.1
	CMPZ100L	0.84	0.038	65	96.2	49.5	104.85	80	55	61.1
6000	**CMPZ71S**	4.15	0.395	45	62.6	11.2	11.04	14	10	58.5
	CMPZ71M	2.55	0.205	43.5	62.6	12.6	12.09	20	14	58.5
	CMPZ71L	1.84	0.145	48	62.6	15.6	14.19	20	14	58.5
	CMPZ80S	1.8	0.136	46	75.3	–	–	–	–	62.4
	CMPZ80M	1.3	0.087	48	75.3	–	–	–	–	62.4
	CMPZ80L	0.84	0.051	50	75.3	–	–	–	–	62.4

1) Length difference between CMPZ.. motor and the corresponding CMP.. motor

2) Length difference between the CMPZ../BY brakemotor and the corresponding CMP../BP brakemotor

8.4 Accessories – technical data

8.4.1 BP brake

Brake assignment

The BP brake can be used for the following rated speeds and braking torques depending on the motor size:

Motor type	Brake type	M_{B1} Nm	M_{B2} Nm	Speed class
CMP40	BP01	0.95	–	3000, 4500, 6000
CMP50S	BP04	3.1	4.3	
CMP50M/L		4.3	3.1	
CMP63S	BP09	7	9.3	
CMP63M/L		9.3	7	
CMP.71S	BP1	7	14	2000, 3000, 4500, 6000
CMP.71M/L		14	7	
CMP.80S	BP3	15	31	2000, 3000, 4500
CMP.80M/L		31	15	
CMP.100S	BP5	24	47	
CMP.100M/L		47	24	

M_{B1} Preferred braking torque

M_{B2} Optional braking torque

Response and application times

Brake type	t_1 ms	t_2 ms
BP01	25	15
BP04	60	15
BP09	60	15
BP1	50	15
BP3	70	15
BP5	110	15

t_1 = Response time

t_2 = Application time

INFORMATION

The response and application times are recommended values in relation to the maximum braking torque.

BP brake coils – resistance

	BP01	BP04	BP09	BP1	BP3	BP5
maximum braking torque in Nm	0.95	4.3	9.3	14	31	47
Braking power in W	7	10.2	16	19.5	28	33

Nominal voltage V_N	V_{DC}	R Ω	R Ω	R Ω	R Ω	R Ω	R Ω
	24	84	56.5	35	29.4	20.5	17.3

R Coil resistance at 20 °C

V_N Rated voltage (rated voltage range)

8.4.2 BY brake

Switching frequency

The following no-load starting frequency Z_0 must not be exceeded in order to prevent the BY brake from heating up.

Brake	No-load starting frequency
BY2	7200 per hour
BY4	5400 per hour
BY8	3600 per hour

Brake assignment

The BY brake can be used for the following rated speeds and braking torques depending on the motor size:

Motor type	Brake type	M_{B1} Nm	M_{B2} Nm	Speed class
CMPZ71S	BY2	14	10	2000, 3000, 4500, 6000
CMPZ71M/L		20	14	
CMPZ80S	BY4	28	20	2000, 3000, 4500
CMPZ80M/L		40	28	
CMPZ100S	BY8	55	40	2000, 3000, 4500
CMPZ100M/L		80	55	

M_{B1} Preferred braking torque

M_{B2} Optional braking torque

Response and application times

Brake type	t_1 ms	t_2 ms	t_3 ms
BY2	40	15	90
BY4	40	15	110
BY8	60	30	140

t_1 Response time

t_2 AC/DC application time

t_3 Application time AC

INFORMATION

The response and application times are recommended values in relation to the maximum braking torque.

BY brake – operating currents

The following tables list the operating currents of the brakes at different voltages. The following values are specified:

- Inrush current ratio $I_B I_H$; I_B = accelerator current, I_H = holding current
- Holding current I_H
- Nominal voltage V_N

The accelerator current I_B (= inrush current) only flows for a short time (ca. 120 ms) when the brake is released or during voltage dips below 70 % of rated voltage.

The values for the holding currents I_H are rms values (with DC 24 V arithmetic mean value). Use suitable measuring instruments for current measurements.

	BY2	BY4	BY8
maximum braking torque in Nm	20	40	80
Braking power in W	30	40	50
Inrush current ratio I_B/I_H	6	6.5	7

Nominal voltage V_N		I_H	I_G	I_H	I_G	I_H	I_G
V_{AC}	V_{DC}	A_{AC}	A_{DC}	A_{AC}	A_{DC}	A_{AC}	A_{DC}
	24	–	1.4	–	1.6	–	2.1
110 (99 – 121)		0.47	–	0.63	–	0.8	–
230 (218 – 243)		0.21	–	0.28	–	0.355	–
400 (380 – 431)		0.12	–	0.16	–	0.2	–
460 (432 – 484)		0.11	–	0.14	–	0.18	–

I_H Holding current, r.m.s. value in the supply cable to the SEW brake rectifier
I_G Direct current with direct DC voltage supply
V_N Rated voltage (rated voltage range)

BY brake coil resistance

	BY2	BY4	BY8
maximum braking torque in Nm	20	40	80
Braking power in W	30	40	50

Nominal voltage V_N		R_B	R_T	R_B	R_T	R_B	R_T
V_{AC}	V_{DC}	Ω	Ω	Ω	Ω	Ω	Ω
	24	3.9	18.85	2.6	13.91	1.9	11.05
110 (99 – 121)		12.3	59.6	8.1	43.98	6	34.94
230 (218 – 243)		61.6	298.7	40.6	220.4	30.1	175.1
400 (380 – 431)		194.8	944.6	128.4	697	95.2	553.7
460 (432 – 484)		245.2	1189.1	161.6	877.4	119.8	697.1

R_B Resistance of accelerator coil at 20 °C
R_T Coil section resistance at 20°C
V_N Rated voltage (rated voltage range)

8.5 Functional safety – characteristic values

8.5.1 Characteristic safety values

Characteristic safety values of AK0H	
Safety class / standard	• SIL 2 according to IEC 61508 • Performance level d according to EN ISO 13849-1
System structure	2 channels (corresponds to category 3 according to EN ISO 13849-1)
Probability of a dangerous failure per hour ($(PFH_d$ value)[1)]	1.3×10^{-8} 1/h
Mean time to dangerous failure ($MTTF_d$ value)[2)]	100 years
Service life or proof test interval according to IEC 61508	20 years Then the component must be replaced with a new one.
Safety function	SLS, SDI, SLA, SS1, SS2, SOS, SLI
Motor/encoder connection	With exclusion of errors according to EN ISO 13849-1

1) The specified value refers to a diagnostics coverage of 90% that must be achieved by an encoder evaluation unit. For corresponding error presumptions, refer to the EN 61800-5-2 standard. The encoder evaluation unit must at least meet the requirements for SIL2.

2) Ambient temperature 40 °C

8.5.2 Encoder

Designation	Value
Ambient temperature of motor	-20 °C to +60 °C
Operating temperature of encoder	-20 °C to +110 °C
Storage temperature of encoder	-40 °C to +125 °C
Maximum speed	9000 rpm
Vibration resistance to EN 60068-2-6	≤ 50 m/s^2 ≈ 5 g (10 Hz to 2 kHz)
Maximum angular acceleration	5×10^5
Degree of protection according to EN 60529	IP50
Operating voltage	DC +7 to +12 V
Current consumption without load	60 mA
Resolution of the incremental section	sin/cos interface
	128 periods / revolution
Accuracy of the incremental section	0.0222° (80 angular seconds)
Resolution of the absolute section	RS485 interface (Hiperface®)
	7 bit = 128 increments/revolution (single-turn)
	12 bit = 4096 increments (multi-turn)
Accuracy of the absolute section	0.0888° (320 angular seconds)
Shock resistance to EN 60068-2-27	≤ 1000 m/s^2 ≈ 100 g (6 ms)

8.5.3 Encoder evaluation unit

Designation	Value
Safety requirements	≥ SIL 2 (IEC 61508)
Error detection rate	DC ≥ 90 %
Error presumptions	according to EN 61800-5-2
Signal amplitude monitoring[1)]	DC 0.5 V to 1.5 V (peak-peak)

1) In the encoder evaluation unit, signals A, $\overline{A}$, B and $\overline{B}$ must be high-resistance (> 1 kΩ) to the supply voltage and 0 V.

9 Malfunctions

⚠ CAUTION

During operation, sevomotors can get reach a surface temperature of more than 100 °C

Danger of burns.

- Never touch the servomotor during operation or in the cool down phase once the it has been switched off.

NOTICE

Improper troubleshooting measures may damage the servomotor.

Possible damage to property.

- Note the following information.

- Components may be subject to mechanical loads. Support and secure the customer structure before removing the servomotor.
- Disconnect the servomotor and the brake from the power supply before you start working on the unit. Secure the servomotor against unintended power-up.
- Use only genuine spare parts in accordance with the valid parts list.
- Strictly observe the safety notes in the individual chapters.

9.1 Customer service

Please have the following information to hand if you require the assistance of our customer service:

- Complete nameplate data.
- Type and extent of the problem.
- Time the problem occurred and any accompanying circumstances.
- Assumed cause

9.2 Servomotor malfunctions

Malfunction	Possible cause	Remedy
Motor does not start up	Supply cable interrupted	Check connections, correct if necessary
	Fuse has blown	Replace fuse
	Motor protection has triggered	Check motor protection for correct setting, correct fault if necessary
	Inverter faulty, overloaded, incorrectly wired or incorrectly set	Check inverter, check wiring
Incorrect direction of rotation	Incorrect setpoint polarity	Check inverter, check setpoints
Motor hums and has high current consumption	Drive is blocked	Check drive
	Brake does not release	See section "Brake malfunctions" (page 89)
	Encoder cable malfunction	Check encoder cable
	Wrong inverter setting	Check the inverter
Motor heats up excessively (measure temperature, significantly higher than 100 °C)	Overload	Measure power, use larger motor or reduce load if necessary, check travel profile
	Ambient temperature too high	Comply with permitted temperature range
	Insufficient cooling	Correct cooling air supply or clear cooling air passages, retrofit forced cooling fan if necessary
	Forced cooling fan does not run	Check connection, correct if necessary
	Rated operating mode (S1 to S10, EN 60034) exceeded, e.g. caused by excessive effective torque	Adjust the rated operating mode of the motor to the required operating conditions; consult a professional to determine the correct drive if necessary
	Inverter not optimized	Check the inverter
Running noise on motor	Bearing damage	• Contact SEW-EURODRIVE customer service • Replace the motor
	Vibration of rotating parts	Rectify cause, possible imbalance
	Forced cooling fan: Foreign bodies in cooling air passages	Clean the cooling air passages

9.3 Servo inverter malfunctions

INFORMATION

The malfunctions described in sections "Servomotor malfunctions" and "Brake malfunctions" may also occur when the servomotor is operated with a servo inverter. For the meaning of the individual inverter issues and troubleshooting information, refer to the operating instructions of the servo inverter.

9.4 Brake malfunctions

9.4.1 BP brake

Malfunction	Possible cause	Remedy
Brake does not release	Brake connected incorrectly	Check brake connection
	Max. permitted working air gap exceeded because brake lining worn down	• Consult SEW-EURODRIVE • Replace the motor
	Incorrect voltage at brake control unit, e.g. voltage drop in the supply cable > 10%	Check voltage at motor connection: Ensure correct connection voltage; check cable cross section
	Brake coil has interturn short circuit or a short circuit to frame	Consult SEW-EURODRIVE
Motor does not brake	Brake lining worn	• Consult SEW-EURODRIVE • Replace the motor
	Incorrect braking torque.	• Consult SEW-EURODRIVE • Replace the motor
Noise/squeaking near the brake	Brake parameters set incorrectly in the inverter	Check brake release and application times

9.4.2 BY brake

Malfunction	Possible cause	Remedy
Brake does not release	Brake control unit failed	Install a new brake control system, check internal resistance and insulation of brake coil, check switchgear
	Brake connected incorrectly	Check brake connection
	Max. permitted working air gap exceeded because brake lining worn down	• Consult SEW-EURODRIVE • Brake disk replacement by SEW-trained staff
	Brake coil has interturn short circuit or a short circuit to frame	• Check switchgear • Replace the entire brake and brake control system (consult SEW-EURODRIVE)
Motor does not brake	Brake lining worn	• Consult SEW-EURODRIVE • Brake disk replacement by SEW-trained staff
	Incorrect braking torque.	• Consult SEW-EURODRIVE • Brake disk replacement by SEW-trained staff
	Manual brake release device not set correctly	Set the setting nuts correctly
Brake is applied with time lag	Brake is switched on AC voltage side	Switch both, the DC and AC voltage sides; observe wiring diagram
Noise/squeaking near the brake	Brake parameters set incorrectly in the inverter	Check brake release and application times

9.5 Disposal

This product consists of:

- Iron
- Aluminum
- Copper
- Plastics
- Electronic components

Dispose of all components in accordance with applicable regulations.

10 Declaration of Conformity

EC Declaration of Conformity

SEW EURODRIVE

900270110

SEW-EURODRIVE GmbH & Co KG
Ernst-Blickle-Straße 42, D-76646 Bruchsal

declares under sole responsibility that the following products

motors of the series	**CM...** **CFM..** **DS..** **DFS.. / DFY..**
possibly in connection with gear units of the series	**R..; RES** **F..** **K..; KES** **W..** **S..** **H..** **BS.F..** **PS.F..** **PS.C..**
are in conformity with	
Low Voltage Directive	**2006/95/EC**
Applied harmonized standards	**EN 12100-1:2003** **EN 12100-2:2003** **EN 13857: 2008** **EN 60034-1:2004** **EN 60034-5: 2007** **EN 60664-1:2003**

Bruchsal	26.04.10	Johann Soder	
Place	Date	Managing Director Technology	a) b)

a) Authorized representative for issuing this declaration on behalf of the manufacturer
b) Authorized representative for compiling the technical documents

EC Declaration of Conformity

900220010

SEW-EURODRIVE GmbH & Co KG
Ernst-Blickle-Straße 42, D-76646 Bruchsal

declares under sole responsibility that the

forced cooling fans of the series	**CM...VR** **CMP...VR**	
are in conformity with		
EMC Directive	**2004/108/EC**	**4)**
applied harmonized standards	**EN 61800-3:2007**	

4) According to the EMC Directive, the listed products are not independently operable products. EMC assessment is only possible after these products have been integrated in an overall system. The assessment was verified for a typical system constellation, but not for the individual product.

Bruchsal	11.12.09	Johann Soder	
Place	Date	Managing Director Technology	a) b)

a) Authorized representative for issuing this declaration on behalf of the manufacturer
b) Authorized representative for compiling the technical documents

11 Address List

Germany			
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Production / Industrial Gears	**Bruchsal**	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Str.10 D-76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-2970
Service Competence Center	**Central**	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 D-76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 sc-mitte@sew-eurodrive.de
	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 40-42 D-30823 Garbsen (near Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 sc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg 1 D-08393 Meerane (near Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 sc-ost@sew-eurodrive.de
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	Electronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 sc-elektronik@sew-eurodrive.de
	Drive Service Hotline / 24 Hour Service		+49 180 5 SEWHELP +49 180 5 7394357
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France			
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Production	**Forbach**	SEW-USOCOME Zone industrielle Technopôle Forbach Sud B. P. 30269 F-57604 Forbach Cedex	Tel. +33 3 87 29 38 00
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	Lyon	SEW-USOCOME Parc d'affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 00 Fax +33 4 72 15 37 15
	Nantes	SEW-USOCOME Parc d'activités de la forêt 4 rue des Fontenelles F-44140 Le Bignon	Tel. +33 2 40 78 42 00 Fax +33 2 40 78 42 20

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	Paris	SEW-USOCOME Zone industrielle 2 rue Denis Papin F-77390 Verneuil l'Etang	Tel. +33 1 64 42 40 80 Fax +33 1 64 42 40 88
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Australia			
Assembly **Sales** **Service**	**Melbourne**	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 3 9933-1000 Fax +61 3 9933-1003 http://www.sew-eurodrive.com.au enquires@sew-eurodrive.com.au
	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au

Austria			
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Belarus			
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Belgium			
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Service Competence Center	**Industrial Gears**	**SEW Caron-Vector** Rue de Parc Industriel, 31 BE-6900 Marche-en-Famenne	Tel. +32 84 219-878 Fax +32 84 219-879 http://www.sew-eurodrive.be service-wallonie@sew-eurodrive.be
	Antwerp	**SEW Caron-Vector** Glasstraat, 19 BE-2170 Merksem	Tel. +32 3 64 19 333 Fax +32 3 64 19 336 http://www.sew-eurodrive.be service-antwerpen@sew-eurodrive.be

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	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. Tilbury Industrial Park 7188 Honeyman Street Delta, BC V4G 1G1	Tel. +1 604 946-5535 Fax +1 604 946-2513 b.wake@sew-eurodrive.ca
	Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2555 Rue Leger Lasalle, PQ H8N 2V9	Tel. +1 514 367-1124 Fax +1 514 367-3677 a.peluso@sew-eurodrive.ca
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Denmark			
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Estonia			
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Gabon			
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Great Britain			
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Ireland			
Sales **Service**	**Dublin**	Alperton Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458 info@alperton.ie http://www.alperton.ie

Israel			
Sales	**Tel-Aviv**	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 http://www.liraz-handasa.co.il office@liraz-handasa.co.il

Italy			
Assembly **Sales** **Service**	**Solaro**	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Bernini,14 I-20020 Solaro (Milano)	Tel. +39 02 96 9801 Fax +39 02 96 799781 http://www.sew-eurodrive.it sewit@sew-eurodrive.it

Ivory Coast			
Sales	**Abidjan**	SICA Société industrielle & commerciale pour l'Afrique 165, Boulevard de Marseille 26 BP 1115 Abidjan 26	Tel. +225 21 25 79 44 Fax +225 21 25 88 28 sicamot@aviso.ci

Japan			
Assembly **Sales** **Service**	**Iwata**	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373855 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp

Kazakhstan			
Sales	**Almaty**	ТОО "СЕВ-ЕВРОДРАЙВ" пр.Райымбека, 348 050061 г. Алматы Республика Казахстан	Тел. +7 (727) 334 1880 Факс +7 (727) 334 1881 http://www.sew-eurodrive.kz sew@sew-eurodrive.kz

Latvia			
Sales	**Riga**	SIA Alas-Kuul Katlakalna 11C LV-1073 Riga	Tel. +371 6 7139253 Fax +371 6 7139386 http://www.alas-kuul.com info@alas-kuul.com

Lebanon			
Sales	**Beirut**	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 510 532 Fax +961 1 494 971 ssacar@inco.com.lb
Jordan Kuwait Saudi Arabia Syria	**Beirut**	Middle East Drives S.A.L. (offshore) Sin El Fil. B. P. 55-378 Beirut	Tel. +961 1 494 786 Fax +961 1 494 971 info@medrives.com http://www.medrives.com

Lithuania			
Sales	**Alytus**	UAB Irseva Statybininku 106C LT-63431 Alytus	Tel. +370 315 79204 Fax +370 315 56175 info@irseva.lt http://www.sew-eurodrive.lt

Luxembourg			
Assembly **Sales** **Service**	**Brussels**	**SEW Caron-Vector** Research park Haasrode Evenementenlaan 7 BE-3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.be info@sew-eurodrive.be

Malaysia			
Assembly **Sales** **Service**	**Johore**	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my

Mexico			
Assembly **Sales** **Service**	**Quéretaro**	SEW-EURODRIVE MEXICO SA DE CV SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial Quéretaro C.P. 76220 Quéretaro, México	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx

Morocco			
Sales	**Casablanca**	Afit Route D'El Jadida KM 14 RP8 Province de Nouaceur Commune Rurale de Bouskoura MA 20300 Casablanca	Tel. +212 522633700 Fax +212 522621588 fatima.haquiq@premium.net.ma http://www.groupe-premium.com

Netherlands			
Assembly **Sales** **Service**	**Rotterdam**	VECTOR Aandrijftechniek B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 http://www.vector.nu info@vector.nu

New Zealand			
Assembly **Sales** **Service**	**Auckland**	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 10 Settlers Crescent, Ferrymead Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz

Norway			
Assembly **Sales** **Service**	**Moss**	SEW-EURODRIVE A/S Solgaard skog 71 N-1599 Moss	Tel. +47 69 24 10 20 Fax +47 69 24 10 40 http://www.sew-eurodrive.no sew@sew-eurodrive.no

Pakistan			
Sales	**Karachi**	Industrial Power Drives Al-Fatah Chamber A/3, 1st Floor Central Commercial Area, Sultan Ahmed Shah Road, Block 7/8, Karachi	Tel. +92 21 452 9369 Fax +92-21-454 7365 seweurodrive@cyber.net.pk

Peru			
Assembly **Sales** **Service**	**Lima**	SEW DEL PERU MOTORES REDUCTORES S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe

Poland			
Assembly **Sales** **Service**	**Lodz**	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 PL-92-518 Łódź	Tel. +48 42 676 53 00 Fax +48 42 676 53 45 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
	24 Hour Service		Tel. +48 602 739 739 (+48 602 SEW SEW) serwis@sew-eurodrive.pl

Portugal			
Assembly **Sales** **Service**	**Coimbra**	SEW-EURODRIVE, LDA. Apartado 15 P-3050-901 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt

Romania			
Sales **Service**	**Bucharest**	Sialco Trading SRL str. Madrid nr.4 011785 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro

Russia			
Assembly **Sales** **Service**	**St. Petersburg**	ZAO SEW-EURODRIVE P.O. Box 36 195220 St. Petersburg Russia	Tel. +7 812 3332522 +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru

Senegal			
Sales	**Dakar**	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 338 494 770 Fax +221 338 494 771 senemeca@sentoo.sn http://www.senemeca.com

Serbia			
Sales	**Beograd**	DIPAR d.o.o. Ustanicka 128a PC Košum, IV floor SCG-11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 office@dipar.rs

Singapore			
Assembly **Sales** **Service**	**Singapore**	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com

Slovakia			
Sales	**Bratislava**	SEW-Eurodrive SK s.r.o. Rybničná 40 SK-831 06 Bratislava	Tel. +421 2 33595 202 Fax +421 2 33595 200 sew@sew-eurodrive.sk http://www.sew-eurodrive.sk
	Žilina	SEW-Eurodrive SK s.r.o. Industry Park - PChZ ulica M.R.Štefánika 71 SK-010 01 Žilina	Tel. +421 41 700 2513 Fax +421 41 700 2514 sew@sew-eurodrive.sk
	Banská Bystrica	SEW-Eurodrive SK s.r.o. Rudlovská cesta 85 SK-974 11 Banská Bystrica	Tel. +421 48 414 6564 Fax +421 48 414 6566 sew@sew-eurodrive.sk
	Košice	SEW-Eurodrive SK s.r.o. Slovenská ulica 26 SK-040 01 Košice	Tel. +421 55 671 2245 Fax +421 55 671 2254 sew@sew-eurodrive.sk

Slovenia			
Sales **Service**	**Celje**	Pakman - Pogonska Tehnika d.o.o. UI. XIV. divizije 14 SLO - 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net

South Africa			
Assembly **Sales** **Service**	**Johannesburg**	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 494-3104 http://www.sew.co.za info@sew.co.za

South Africa			
	Cape Town	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442 Cape Town	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 cfoster@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaco Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 700-3451 Fax +27 31 700-3847 cdejager@sew.co.za
	Nelspruit	SEW-EURODRIVE (PTY) LTD. 7 Christie Crescent Vintonia P.O.Box 1942 Nelspruit 1200	Tel. +27 13 752-8007 Fax +27 13 752-8008 robermeyer@sew.co.za

South Korea			
Assembly **Sales** **Service**	**Ansan-City**	SEW-EURODRIVE KOREA CO., LTD. B 601-4, Banweol Industrial Estate 1048-4, Shingil-Dong Ansan 425-120	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-korea.co.kr master.korea@sew-eurodrive.com
	Busan	SEW-EURODRIVE KOREA Co., Ltd. No. 1720 - 11, Songjeong - dong Gangseo-ku Busan 618-270	Tel. +82 51 832-0204 Fax +82 51 832-0230 master@sew-korea.co.kr

Spain			
Assembly **Sales** **Service**	**Bilbao**	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. +34 94 43184-70 Fax +34 94 43184-71 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es

Sweden			
Assembly **Sales** **Service**	**Jönköping**	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping Box 3100 S-55003 Jönköping	Tel. +46 36 3442 00 Fax +46 36 3442 80 http://www.sew-eurodrive.se jonkoping@sew.se

Switzerland			
Assembly **Sales** **Service**	**Basel**	Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch

Thailand			
Assembly **Sales** **Service**	**Chonburi**	SEW-EURODRIVE (Thailand) Ltd. 700/456, Moo.7, Donhuaroh Muang Chonburi 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com

Tunisia			
Sales	**Tunis**	T. M.S. Technic Marketing Service Zone Industrielle Mghira 2 Lot No. 39 2082 Fouchana	Tel. +216 79 40 88 77 Fax +216 79 40 88 66 http://www.tms.com.tn tms@tms.com.tn

Turkey			
Assembly **Sales** **Service**	**Istanbul**	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. Bagdat Cad. Koruma Cikmazi No. 3 TR-34846 Maltepe ISTANBUL	Tel. +90 216 4419163 / 4419164 Fax +90 216 3055867 http://www.sew-eurodrive.com.tr sew@sew-eurodrive.com.tr

Ukraine			
Sales **Service**	**Dnepropetrovsk**	SEW-EURODRIVE Str. Rabochaja 23-B, Office 409 49008 Dnepropetrovsk	Tel. +380 56 370 3211 Fax +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua

United Arab Emirates			
Sales **Service**	**Sharjah**	Copam Middle East (FZC) Sharjah Airport International Free Zone P.O. Box 120709 Sharjah	Tel. +971 6 5578-488 Fax +971 6 5578-499 copam_me@eim.ae

USA			
Production **Assembly** **Sales** **Service** **Corporate Offices**	**Southeast Region**	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Manufacturing +1 864 439-9948 Fax Assembly +1 864 439-0566 Fax Confidential/HR +1 864 949-5557 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly **Sales** **Service**	**Northeast Region**	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com
	Midwest Region	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 332-0038 cstroy@seweurodrive.com
	Southwest Region	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	Western Region	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, CA 94544	Tel. +1 510 487-3560 Fax +1 510 487-6433 cshayward@seweurodrive.com
	Additional addresses for service in the USA provided on request!		

Venezuela			
Assembly **Sales** **Service**	**Valencia**	SEW-EURODRIVE Venezuela S.A. Av. Norte Sur No. 3, Galpon 84-319 Zona Industrial Municipal Norte Valencia, Estado Carabobo	Tel. +58 241 832-9804 Fax +58 241 838-6275 http://www.sew-eurodrive.com.ve ventas@sew-eurodrive.com.ve sewfinanzas@cantv.net

Vietnam			
Sales	**Ho Chi Minh City**	Nam Trung Co., Ltd 91 - 93 Tran Minh Quyen Street, District 10, HCMC	Tel. +84 8 8301026 Fax +84 8 8392223 namtrungco@hcm.vnn.vn

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