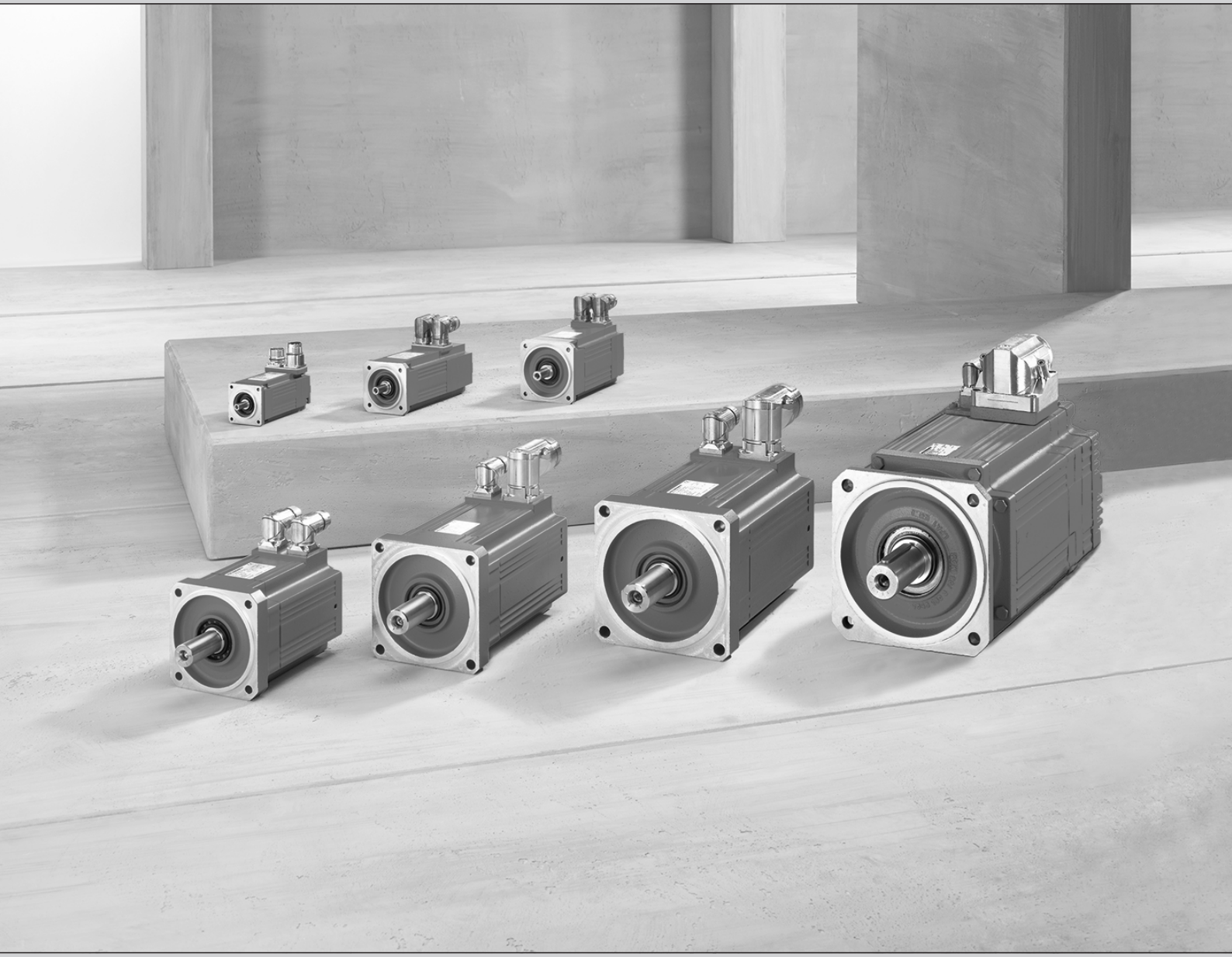
SEW EURODRIVE

Operating Instructions



Synchronous Servomotors

CMP40 – CMP112, CMPZ71 – CMPZ100

Edition 07/2015

21923582/EN

Contents

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1 General information

1.1 About this documentation

This documentation is an integral part of the product. The documentation is intended for all employees who perform assembly, installation, startup, and service work on the product.

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

1.2 Structure of the safety notes

1.2.1 Meaning of signal words

The following table shows the grading and meaning of the signal words for safety notes.

Signal word	Meaning	Consequences if disregarded
⚠ **DANGER**	Imminent hazard	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 handling of the drive system.	

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1.2.2 Structure of section-related safety notes

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

This is the formal structure of a safety note for a specific section:

SIGNAL WORD

Type and source of hazard.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the hazard.

Meaning of the hazard symbols

The hazard symbols in the safety notes have the following meaning:

Hazard symbol	Meaning
	General hazard
	Warning of dangerous electrical voltage
	Warning of hot surfaces
	Warning of risk of crushing
	Warning of suspended load
	Warning of automatic restart

1.2.3 Structure of embedded safety notes

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

This is the formal structure of an embedded safety note:

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

  Possible consequence(s) if disregarded.

  – Measure(s) to prevent the hazard.

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1.3 Rights to claim under limited warranty

Read the information in this documentation. This is essential for fault-free operation and fulfillment of any rights to claim under limited warranty. Read the documentation before you start working with the unit!

1.4 Exclusion of liability

Read the information in this documentation, otherwise safe operation is impossible. You must comply with the information contained in this documentation 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 these operating instructions. In such cases, SEW-EURODRIVE assumes no liability for defects.

1.5 Product names and trademarks

The brands and product names in this documentation are trademarks or registered trademarks of their respective titleholders.

1.6 Copyright notice

1.7 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.

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2 Safety notes

The following basic safety notes must be read carefully to prevent injury to persons and damage to property. The user must ensure that the basic safety notes are read and observed. Ensure that persons responsible for the machinery and its operation as well as persons who work on the unit independently 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.

2.1 Preliminary information

The following safety notes mainly apply to 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 and
  - The national/regional regulations governing safety and the prevention of accidents.
- Never install damaged products
- Report any damage to the shipping company immediately.

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.

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2.3 Target group

Any mechanical work may only be performed by adequately qualified personnel. Qualified personnel 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 this documentation.

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 this documentation.

In addition to that, they must be familiar with the relevant safety regulations and laws, especially with the requirements of the performance levels according to DIN EN ISO 13849-1 and all other standards, directives and laws specified in this documentation. The above-mentioned persons must have the express authorization of the company to operate, program, parameterize, label and ground units, systems and circuits in accordance with the standards of safety technology.

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

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2.4 Functional safety technology (FS)

INFORMATION

For the "Synchronous Servomotors" operating instructions, addendums are available for the documentation "Functional Safety for CMP Synchronous Servomotors" at www.sew-eurodrive.com.

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

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 motor are safety-related. See the following excerpt from the code table for all products:

Functional safety	Inverters	Motor monitoring (e.g. motor protection)	Encoder	Brake	Brake monitoring (e.g. function)	Manual brake release
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		

If the FS logo on the nameplate contains the code "FS 04", for example, the motor is equipped with a safe encoder.

You can determine the safety level of machines and plants using the characteristic safety values provided in chapter "Technical Data" of the relevant documentation.

The characteristic safety values of components by SEW-EURODRIVE are also available on www.sew-eurodrive.de and in the SEW-EURODRIVE library for the Sistema software of the Institute for Occupational Safety and Health of the German Social Accident Insurance (IFA, formerly BGIA).

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2.5 Designated use

These motors are intended for industrial systems.

Observe the applicable standards and directives in your country for assembly, installation, and operation of the motor.

For the installation and operation of the motor as well as for startup and recurring technical checks, national and international regulations apply, especially:

- Machinery Directive 2006/42/EC
- EMC Directive 2004/108/EC
- Low Voltage Directive 2006/95/EC
- Accident prevention regulations and safety rules

Using these products in potentially explosive atmospheres is prohibited, unless specifically designated otherwise.

Air-cooled versions are designed for ambient temperatures of -20 °C to +40 °C and installation altitudes ≤ 1000 m above sea level. Any differing specifications on the nameplate must be observed. 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, K..9, S..7, SPIROPLAN® W" operating instructions for gearmotors
- Operating instructions "Gear Unit Series BS.F.., PS.F.. and PS.C.."
- Catalog "Synchronous Servomotors"
- Catalog for "Synchronous Servo Gearmotors"
- If required, addendum to the operating instructions "Safety-Rated Encoders – Functional Safety for Synchronous Servomotors CMP"
- "Cable Prefabrication" manual
- Safe brake system "Synchronous Servomotors"
- Addendum to the operating instructions "Safety-Rated Brakes – Functional Safety for CMP71 – CMP100, CMPZ71 – CMPZ100Z"

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2.7 Transport/storage

Inspect the shipment for damage as soon as you receive the delivery. Inform the shipping company immediately about any damage. It may be necessary to suspend startup.

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

The installed eyebolts are in accordance with DIN 580. The loads and regulations specified in that document must always be observed. 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 in accordance with 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/assembly

Ensure that the unit is installed and cooled according to the regulations in this documentation.

Protect the unit from excessive strain. Ensure that components are not deformed and that insulation spaces are maintained, particularly during transportation. Electric components must not be mechanically damaged or destroyed.

The following applications are prohibited unless explicitly permitted:

- Use in potentially explosive atmospheres.
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc.
- Use in applications that are subject to mechanical vibration and shock loads in excess of the requirements in EN 61800-5-1.

Observe the notes in the chapter "Mechanical installation".

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2.9 Electrical connection

⚠ WARNING

Risk of injury due to electric shock.

Severe or fatal injuries.

- Wire the motor according to the regulations.

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 re-start. This also applies to auxiliary circuits (e.g. anti-condensation heating or forced cooling fan).

Perform electrical installation according to the pertinent regulations (e.g. cable cross sections, fusing, protective conductor connection). For any additional information, refer to the applicable documentation.

Comply with the regulations of the following standards and directives:

- EN 60034-1, rotating electrical machines
- EN 50110, operation of electrical installations
- IEC 60664, insulation coordination for equipment within low-voltage systems
- EN 60204-1, safety of machinery - electrical equipment of machines
- EN 61800-5-1, adjustable speed electrical power drive systems

The connection must be a permanently secure electrical connection (no protruding wire ends); use the cable end equipment intended for this purpose. Establish a safe PE 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

Observe the notes in the "Electrical installation" chapter.

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2.10 Safety notes on the motor

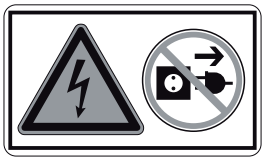
⚠ CAUTION

Safety notes or signs can become dirty or illegible over time.

Risk of injury due to illegible symbols.

- Always make sure that safety, warning, and operating notes are legible.
- Replace damaged safety notes and signs.

The safety notes on the motor must be observed. They have the following meaning:

Safety note	Meaning
	Do not unplug the signal plug connector while it is energized!
	For motors with BK brake: It is essential that you observe the correct polarity of the BK brake supply. Check the polarity when replacing the brake.

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2.11 Startup

⚠ WARNING

Risk of injury due to missing or defective protection covers.

Severe or fatal injuries.

- Install the protective covers of the system according to the instructions.
- Never start up the motor if the protective covers are not installed.

2.11.1 Regenerative operation

Moving the output element generates a voltage at the pin contacts of the plug connectors.

⚠ CAUTION

Electric shock due to regenerative operation.

Minor injuries.

- Do not touch the pin contacts in the plug connector.
- If the mating connector is not plugged in, attach a touch guard to the plug connector.

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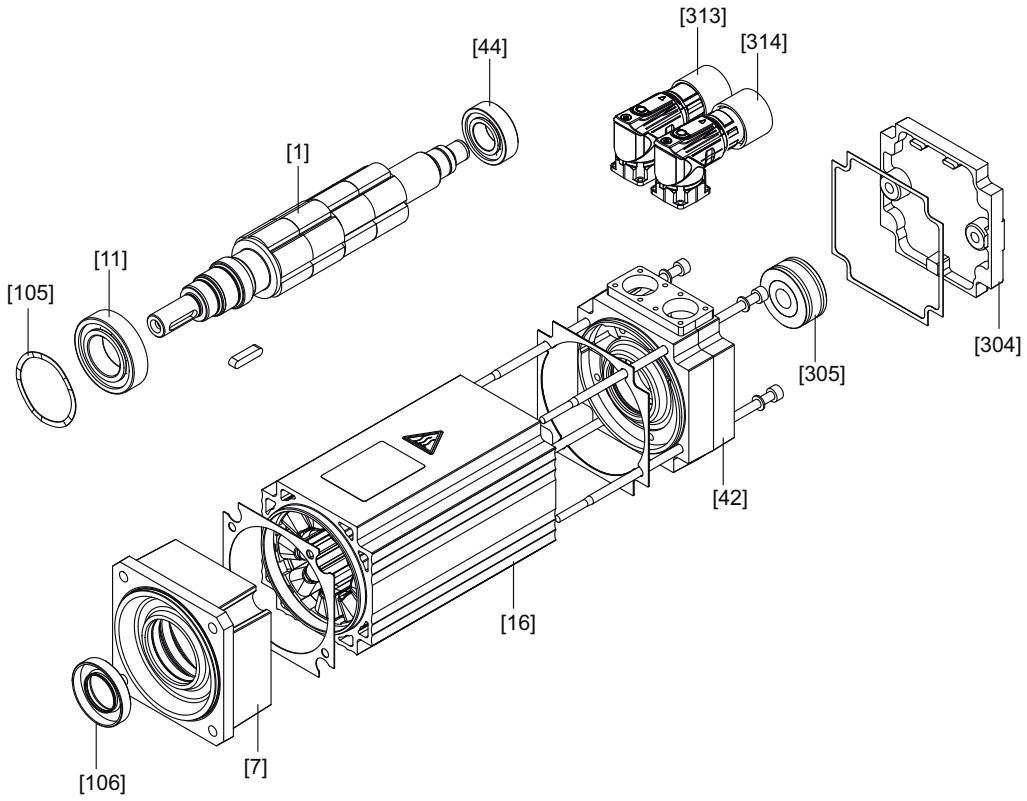
3 Motor structure

INFORMATION

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

3.1 Basic structure of CMP40 – CMP63



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[1]	Rotor	[105]	Shim
[7]	Flange	[106]	Oil seal
[11]	Deep groove ball bearing	[304]	Housing cover
[16]	Stator	[305]	Resolver
[42]	Endshield	[313]	SM/SB signal plug connector
[44]	Deep groove ball bearing	[314]	SM/SB power plug connector

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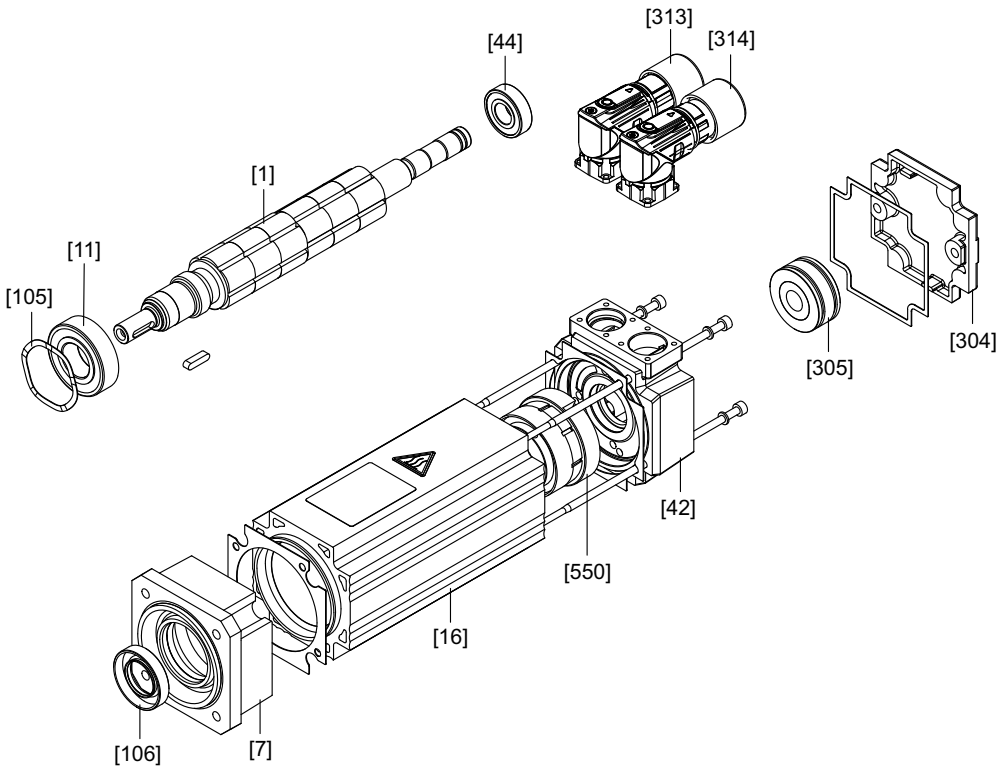
3.2 Basic structure of CMP40 – CMP63/BK



9092601867

[1]	Rotor	[106]	Oil seal
[7]	Flange	[304]	Housing cover
[11]	Deep groove ball bearing	[305]	Resolver
[16]	Stator	[313]	SM/SB signal plug connector
[42]	Brake endshield	[314]	SM/SB power plug connector
[44]	Deep groove ball bearing	[550]	BK permanent magnet brake
[105]	Shim		

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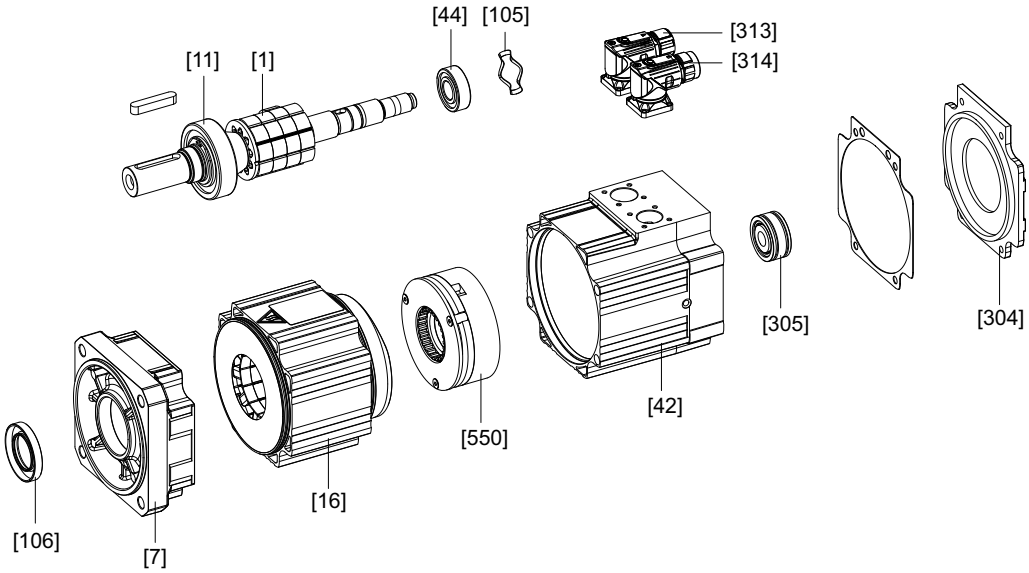
3.3 Basic structure of CMP71 – CMP100/BP



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

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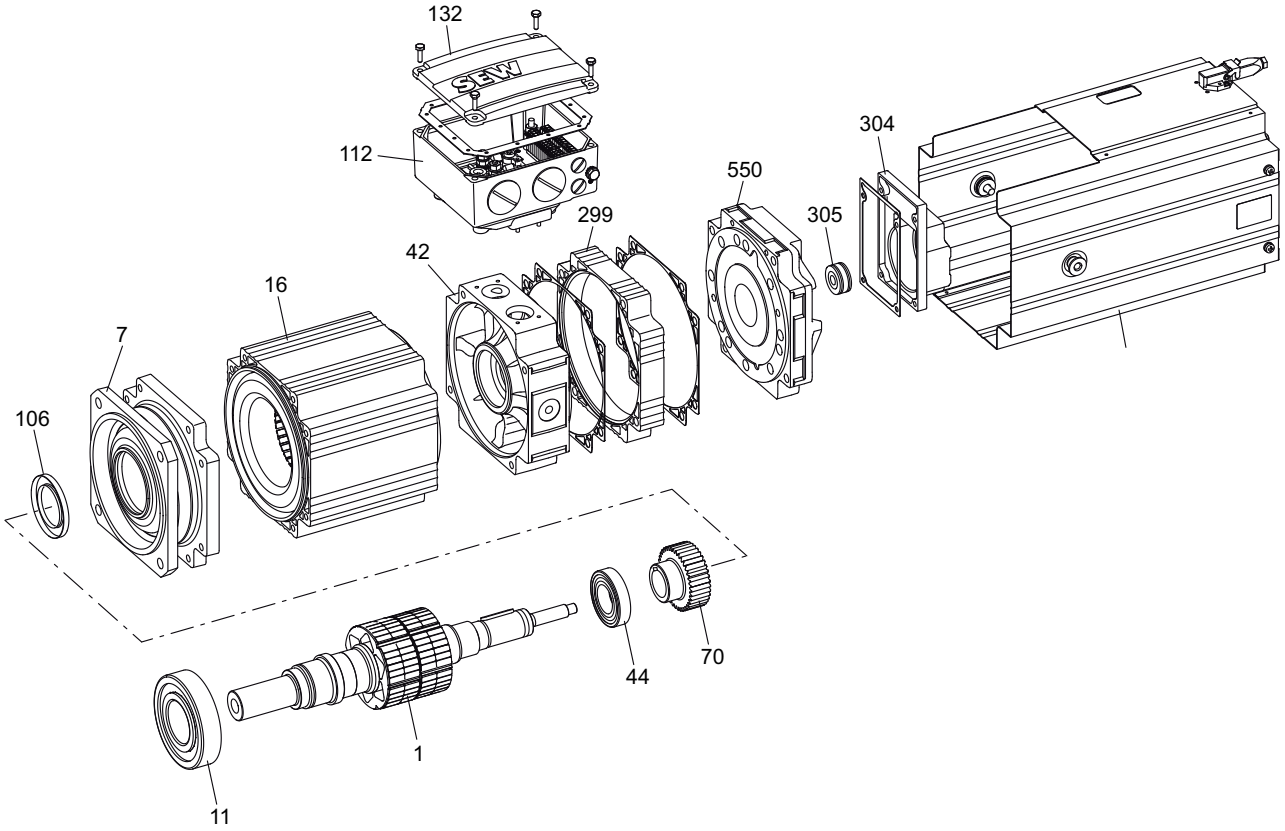
3.4 Basic structure of CMP112 – CMP112/BY/KK/VR



6351863435

[1]	Rotor (key optional)	[106]	Oil seal
[7]	Flange	[112]	Terminal box lower part
[11]	Deep groove ball bearing	[132]	Terminal box cover
[16]	Stator	[299]	Spacer ring
[42]	Rear endshield	[304]	Cover
[44]	Deep groove ball bearing	[305]	Resolver
[70]	Driver	[550]	Disk brake

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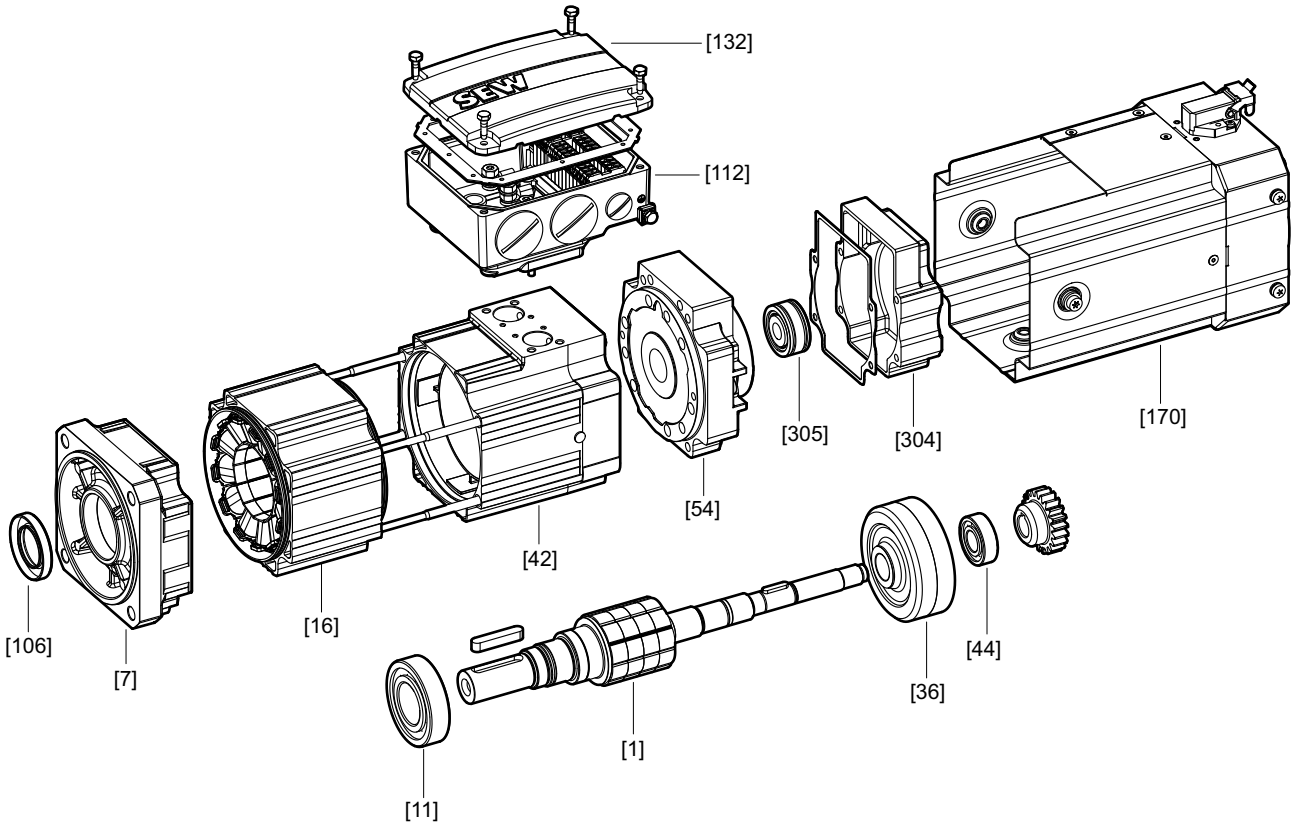
3.5 Basic structure of CMPZ71 – CMPZ100/BY/KK/VR



2892166283

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

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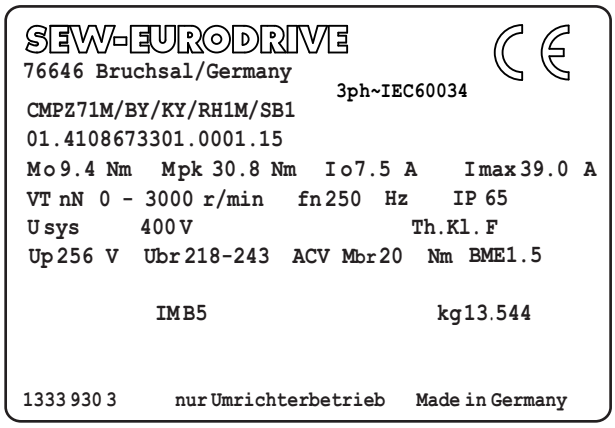
3.6 Nameplate and unit designation

3.6.1 Nameplate on the servomotor

CMP motor nameplate

The following figure shows the nameplate of a CMP motor:



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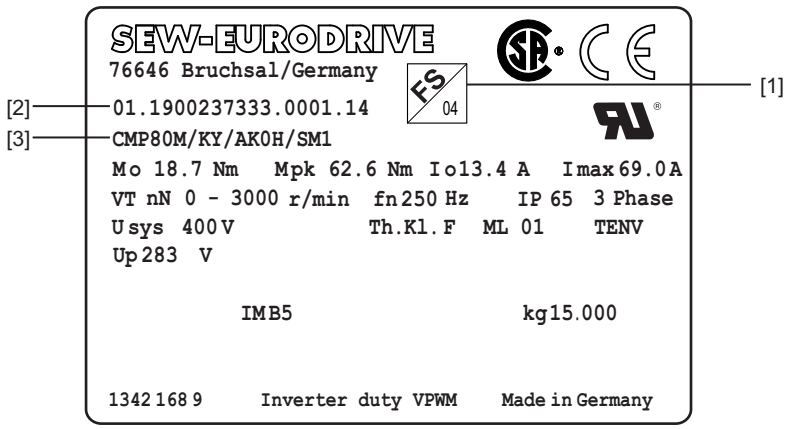
The nameplate only contains the FS logo if safety-rated components are used.

The following figure shows a nameplate of a motor with UL and CSA approvals and safety-rated components:



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[1] FS logo including number
[2] Motor identification number
[3] Type designation

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3.6.2 Markings

The following table lists all marks that can occur on a nameplate or on the motor and an explanation of what they mean.

Mark	Meaning
	CE mark to state compliance with European guidelines, such as the Low Voltage Directive
	ATEX mark to state compliance with the European Directive 94/9/EC
	UR logo to confirm that UL (Underwriters Laboratory) is informed about the registered components; register number by UL: E337323
	CSA mark to confirm the Canadian Standard Association (CSA) and the market conformity of AC motors
	EAC mark (EurAsian Conformity) Confirms compliance with the regulations of the economic and customs union of Russia, Belarus and Kazakhstan.
	UkrSEPRO mark (Ukrainian Certification of Products) Confirms compliance with the technical regulations of the country Ukraine.
	FS mark with code number to identify functional safety relevant components

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3.6.3 Sample type designation of a servomotor

The following figure shows an example of a type designation:

Example: CMP112M /BY/HR/KY/RH1M/VR/KK		
Synchronous servomotor	CMP112	Flange motor size 112
Length	M	Medium
Mechanical attachments	/BY	BY working brake
Motor option	/HR	Manual brake release (only for BY brake)
Standard equipment: temperature sensor TF	/KY	KY temperature sensor
Encoder motor option	/RH1M	Resolver (standard)
Fan motor option	/VR	Forced cooling fan
Connection motor option	/KK	Terminal box

3.6.4 Example of a serial number for a servomotor

The following figure shows an example of a serial number:

Example: 01. 12212343 01. 0001. 14	
01.	Sales organization
12212343	Order number (8 digits)
01.	Order item (2 digits)
0001	Quantity (4 digits)
14	End digits of the year of manufacture (2 digits)

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3.7 Variants and options of the CMP. motor series

3.7.1 Synchronous servomotors

Designation	
CMP...	Flange motor size 40 / 50 / 63 / 71 / 80 / 100 / 112
CMPZ...	Flange motor size 71 / 80 / 100 with additional inertia/increased mass moment of inertia
S – E	S = Small / M = Medium / L = Long / H = Huge / E = Extra long

3.7.2 Mechanical attachments

Designation	Option
/BP	Holding brake for CMP71 – 100
/BK	Holding brake for CMP40 – 63
/BY	Working brake for CMPZ71 – 100, CMP112 Optionally available as safety-rated brake for CMPZ71 – 100.
/HR	BY manual brake release for CMP.71 – 100, CMP112 with automatic disengaging function

3.7.3 Temperature sensor / temperature detection

Designation	Option
/KY	Temperature sensor (standard)
/TF	Temperature sensor for CMP.71 – CMP112

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3.7.4 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, CMP112, optionally available as safety-rated encoder
/EK1H	Single-turn Hiperface® encoder, cone shaft, high resolution, for CMP50 – 63, CMP.71 – 100, CMP112
/AK1H	Multi-turn Hiperface® encoder, cone shaft, high resolution, for CMP50 – 63, CMP.71 – 100, CMP112, optionally available as safety-rated encoder

3.7.5 Connection options

Designation	Option
/SM1	M23 motor plug connector, socket on motor end only, pluggable motor and encoder cables (standard)
/SMB	M40 motor plug connector, socket on motor end only, pluggable motor and encoder cables (standard)
/SMC	M58 motor plug connector, socket on motor end only, pluggable motor and encoder cables (standard)
/SB1	M23 brakemotor plug connector, socket on motor end only, pluggable motor and encoder cables (standard)
/SBB	M40 brakemotor plug connector, socket on motor end only, pluggable motor and encoder cables (standard)
/SBC	M58 brakemotor plug connector, socket on motor end only, pluggable motor and encoder cables (standard)
/KK	Terminal box for CMP50, CMP63, CMP.71 to 100, clampable motor and encoder cable
/KKS	Terminal box for CMP.71 to 100, CMP112, clampable motor cable and pluggable encoder cable

3.7.6 Ventilation

Designation	Option
/VR	Forced cooling fan (from size 50)

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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 ambient conditions.
- The surrounding area is free from oils, acids, gases, vapors, radiation, etc.

4.2 Required tools/resources

- Standard tools

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-EURODRIVE 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.

INFORMATION

If the insulation resistance is too low, the servomotor has absorbed moisture.

SEW-EURODRIVE recommends to send the motor back to SEW-EURODRIVE service, together with a description of the fault.

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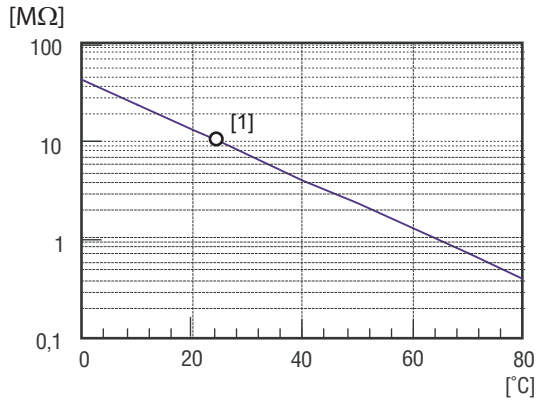
The following figure shows the insulation resistance depending on the temperature.



2892305291

[1] Resistance temperature point (RT point)

4.4 Motor installation notes

Observe the following notes when installing the motor:

⚠ CAUTION

For shafts with key: Cuts caused by sharp edges due to open keyway.

Cuts.

- Insert the key into the keyway.
- Pull a protective hose over the shaft.

NOTICE

Damage to the motor due to improper installation.

Unit may get damaged or destroyed.

- 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.
- Make sure that the CMP motors are not subjected to overhung loads and bending moments.
- Do not jolt or hammer the shaft or spindle end.
- Only install or remove belt pulleys and couplings using suitable devices (heat up) and cover them with a touch guard. Avoid unacceptable belt tension.
- Motor shaft ends must be thoroughly cleaned of anti-corrosion agents, contamination or similar. Use a commercially available solvent. Make sure that the solvent does not come into contact with the bearing or sealing rings as it may damage the material.
- Make sure the customer's counter-bearing is unobstructed and can move freely.
- 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 the warm exhaust air of other devices is not sucked in.
- Use a cover to protect motors in vertical mounting position with VR forced cooling fan from objects falling into the fan.
- Balance components for subsequent mounting on the shaft only with a half key (motor shafts are balanced with a half key).
- For brakemotors with manual brake release, screw in the hand lever (for HR self-reengaging manual brake release).
- Avoid resonance between the rotational frequency and the double supply system frequency.
- Turn the rotor by hand and listen for unusual grinding noise.
- Check the direction of rotation in decoupled state.
- Establish the necessary pipe connections.

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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 reassembly.
- Replace any brittle seals.
- If necessary, restore the anticorrosive paint coat.
- Check that the degree of protection is maintained.
- If necessary, attach covers (canopy).

4.5 Installation tolerances

Shaft end	Flanges
Diameter tolerance according to EN 50347 • ISO k6 • Centering bore in accordance with DIN 332, shape DR	Centering shoulder tolerance in accordance with EN 50347 • ISO j6

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4.6 Options

4.6.1 VR forced cooling fan

The synchronous servomotors of size CMP50 – 63, CMP.71 – 100 and CMP112 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.

INFORMATION

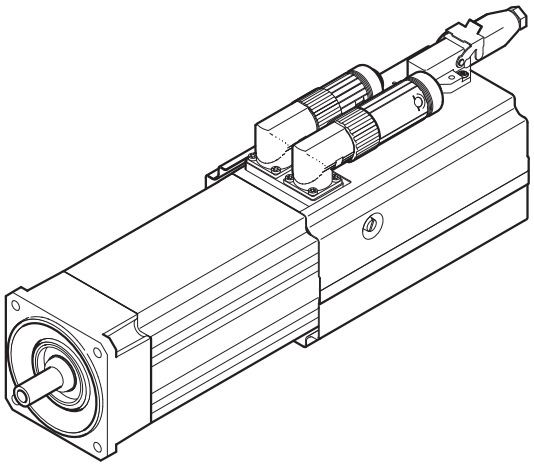
Before the forced cooling fan is retrofitted, make sure that the previously used motor plug connector/cables also are approved for the higher current consumption after the retrofit.

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[2)]
CMP112	M10 x 25	15 Nm[1)]

1) Additional Loctite® thread locking compound
2) Additional Loctite® thread locking compound



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Retrofit set for CMP50 – 63, CMP.71 – 100, CMP112

Forced cooling fan retrofit sets are available for motors of sizes 50 – 112.

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 HR manual brake release

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	17508428
BY4	17508525
BY8	17508622
BY14	17573300

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Retrofitting the manual brake release for BY brake

For designs with forced cooling fan /VR, a manual brake release may only be retrofitted at CMP112 motors.

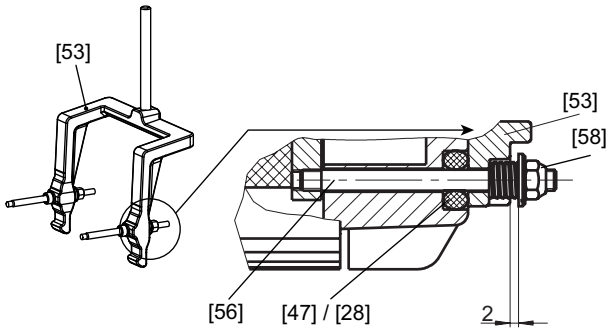
⚠ DANGER

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. **CMP112:** 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 releasing lever [53]
6. Insert tension spring [57]
7. Tighten hex nut [58], observe 2 mm clearance between shim (nut [58]) and releasing lever [53] to ensure the proper function of the brake
8. **CMP112**: Install forced cooling fan, if required



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5 Electrical installation

⚠ WARNING

Risk of injury due to electric shock.

Severe or fatal injuries.

- Wire the motor according to the regulations.
- De-energize the unit.
- Check whether the unit is de-energized.

- It is essential to comply with the notes in chapter 2 during installation.
- Observe the information on the motor nameplate.
- Observe the information on the wiring diagram that is supplied with the motor.
- Switch contacts in utilization category AC-3 to EN 60947-4-1 must be used for switching motor and brake.
- Use switch contacts in utilization category DC-3 according to EN 60947-4-1 for switching the brake with DC 24 V.
- 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).
- The connection box must be free from foreign objects, dirt and humidity. Unused cable entry openings and the connection box itself must be sealed so that they are dust- and water-proof.
- Secure the key for test mode without output elements.
- Before starting up the motor with brake, check whether the brake works correctly.
- 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. **Do not connect or start up the motor if the wiring diagram is missing.** The applicable wiring diagrams are available from SEW-EURODRIVE free of charge.

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5.3 Wiring notes

5.3.1 Protecting the brake control system against interference

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.

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5.4 Notes regarding the connection of the power and signal cables via the connector system

The cable entry of the power and signal cable is installed using an adjustable right-angle connector. SEW-EURODRIVE recommends to adjust the adjustable right-angle connector while the mating connector is plugged in. A torque of > 8 Nm is required to screw the right-angle connector to the motor.

NOTICE

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

Damage to the plug connector and the sealing surface.

- Adjust the right-angle connector only while the mating connector is plugged in.
- If you do not have a mating connector at hand, do NOT use pliers to adjust the right-angle connector.

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.

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.

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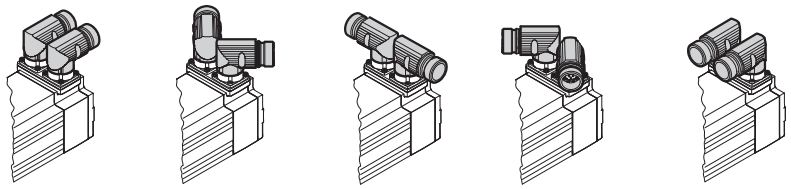
5.4.1 SM1/SB1, SMB/SBB connector positions

The right-angle plug connectors SM1/SB1 and SMB/SBB can be rotated to achieve any required position.

The following figure shows examples of the differently adjusted plug connectors SM1/SB1, SMB/SBB:



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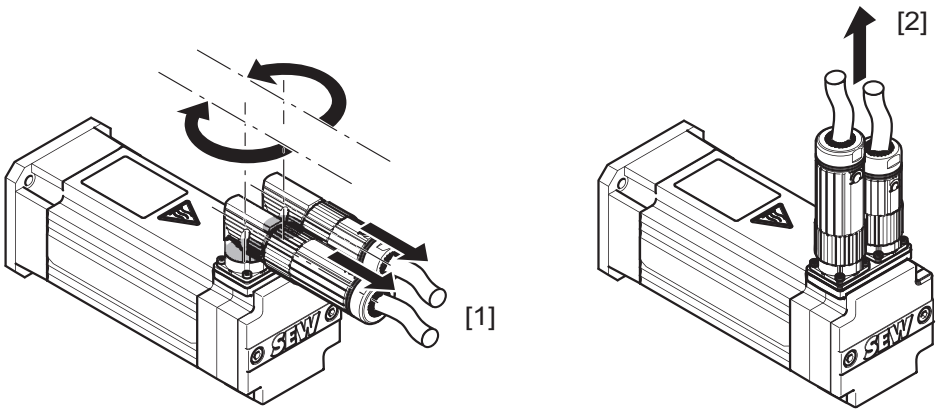
A "radial" position has been defined for the straight plug connectors (radial output). Radial plug connectors [2] are optional:



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[1] "Adjustable" connector position [2] "Radial" connector position

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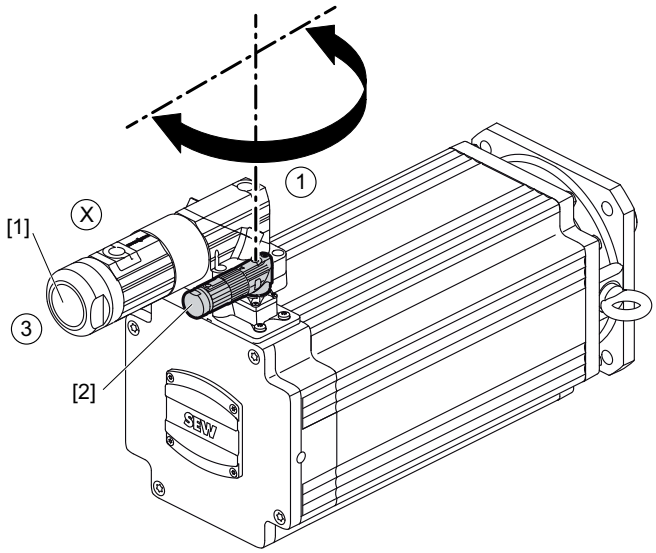
5.4.2 SMC/SBC connector positions

The power connector [1] can be ordered in three connector positions ("1", "3", and "x").



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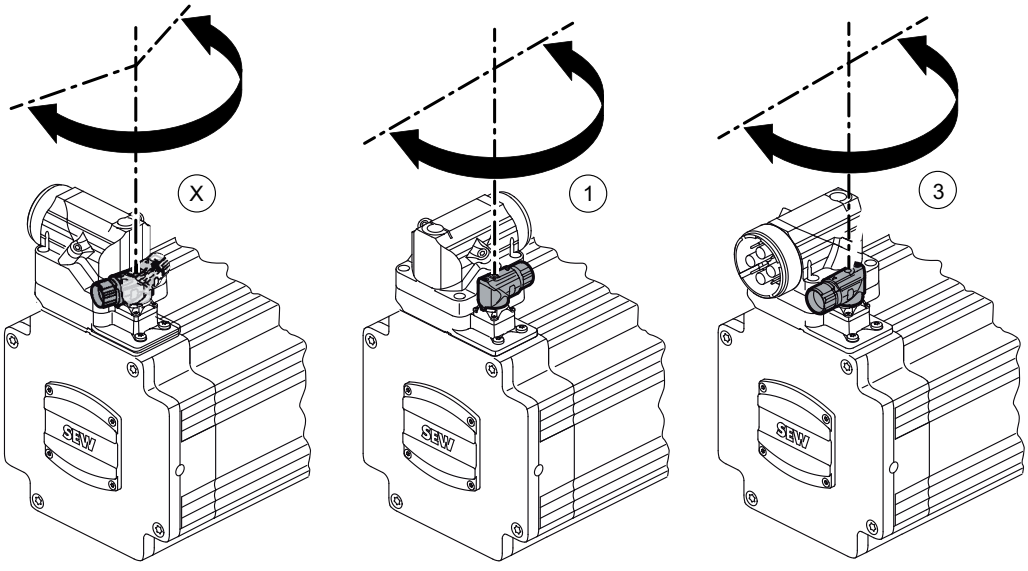
[1] SMC/SBC power plug connectors [2] Signal plug connector

The following figure shows the SMC/SBC power connector with all possible connector positions. The signal plug connector next to it can be turned by 180°:



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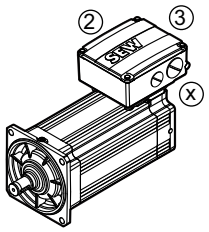
5.5 Notes regarding the connection of the power and signal cables via the terminal box

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

- /KK option: 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.

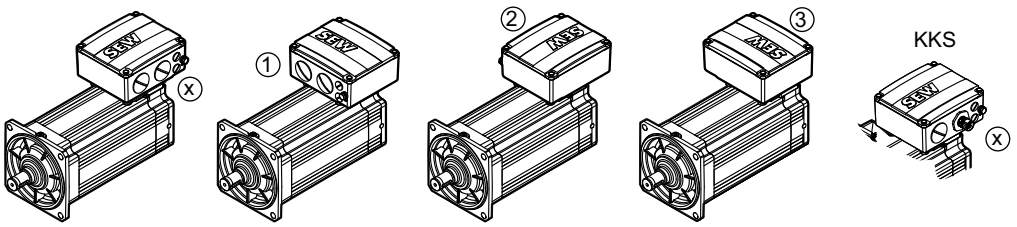
CMP50 – CMP63

KK



CMP.71 – CMP.100, CMP112

KK



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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.

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

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

In the basic version, SEW-EURODRIVE delivers electric motors with a connector on the motor end and without mating connector. The encoder system is connected using a separate 12-pin round plug connector (M23).

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 or radial connectors (speedtec ®). As an exception, the SMC plug connectors are not suitable for 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 are using self-assembled cables with quick lock, you have to remove the O-ring.

5.6.1 Plug connectors on cable side

Unit designation of the plug connectors

The following diagram shows a type designation:

S M 1 2	
S	**S:** Connector
M	**M**: Motor, **B**: Brakemotor
1	**1**: Connector size 1 (1.5 – 4 mm^2), **B**: Connector size 1.5 (6 – 16 mm^2), **C**: Connector size 3 (16 – 35 mm^2)
2	Cross section **1**: 1.5 mm^2, **2**: 2.5 mm^2, **4**: 4 mm^2, **6**: 6 mm^2, **10**: 10 mm^2, **16**: 16 mm^2, **25**: 25 mm^2, **35**: 35 mm^2

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Power cables and plug connectors for CMP motors

Cable type		Connector type	Thread size	Cable cross section	Part number	
					Prefabricated cables	Replacement mating connector
Fixed installation	Motor cable	SM11	M23	4 x 1.5 mm²	05904544	01986740
		SM12		4 x 2.5 mm²	05904552	01986740
		SM14		4 x 4 mm²	05904560	01991639
		SMB6	M40	4 x 6 mm²	13350269	13349856
		SMB10		4 x 10 mm²	13350277	13349864
		SMB16		4 x 16 mm²	13350285	13349872
		SMC16	M58	4 x 16 mm²	18148476	18150349
	Brakemotor cable[1] BP/ BK brake	SB11	M23	4 x 1.5 mm² + 2 x 1 mm²	13354345	01986740
		SB12		4 x 2.5 mm² + 2 x 1 mm²	13354353	01986740
		SB14		4 x 4 mm² + 2 x 1 mm²	13354361	01991639
		SBB6	M40	4 x 6 mm² + 2 x 1.5 mm²	13350196	13349856
		SBB10		4 x 10 mm² + 2 x 1.5 mm²	13350218	13349864
		SBB16		4 x 16 mm² + 2 x 1.5 mm²	13350226	13349872
	Brakemotor cable BY brake	SBC16	M58	4 x 16 mm² + 3 x 1.5 mm²	18148514	18150349
Cable carrier installation	Motor cable	SM11	M23	4 x 1.5 mm²	05906245	01986740
		SM12		4 x 2.5 mm²	05906253	01989197
		SM14		4 x 4 mm²	05904803	01991639
		SMB6	M40	4 x 6 mm²	13350293	13349856
		SMB10		4 x 10 mm²	13350307	13349864
		SMB16		4 x 16 mm²	13350315	13349872
		SMC16	M58	4 x 16 mm²	18148484	18150349
		SMC25		4 x 25 mm²	18148581	18150160
		SMC35		4 x 35 mm²	18148697	18150179
	Brakemotor cable[1]	SB11	M23	4 x 1.5 mm² + 2 x 1 mm²	13354388	01989197
		SB12		4 x 2.5 mm² + 2 x 1 mm²	13354396	01989197
		SB14		4 x 4 mm² + 2 x 1 mm²	13421603	01991639
		SBB6	M40	4 x 6 mm² + 2 x 1.5 mm²	13350234	13349856
		SBB10		4 x 10 mm² + 2 x 1.5 mm²	13350242	13349864
		SBB16		4 x 16 mm² + 2 x 1.5 mm²	13350250	13349872
	Brakemotor cable BY brake	SBC16	M58	4 x 16 mm² + 3 x 1.5 mm²	18148522	18150349

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

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

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

Prefabricated brakemotor cables with a core cross section > 16 mm^2 are currently not available.

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	Signal connector*
Fixed installation	Brakemotor cable[1] BP/ BK brake	SB11	4 x 1.5 mm^2 + 2 x 1 mm^2	13324853	01986740
		SB12	4 x 2.5 mm^2 + 2 x 1 mm^2	13332139	01986740
		SB14	4 x 4 mm^2 + 2 x 1 mm^2	13332147	01991639
Cable carrier installation	Brakemotor cable[1]	SB11	4 x 1.5 mm^2 + 2 x 1 mm^2	13331221	01989197
		SB12	4 x 2.5 mm^2 + 2 x 1 mm^2	13332155	01989197
		SB14	4 x 4 mm^2 + 2 x 1 mm^2	13332163	01991639

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

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Power cables and plug connectors for CMPZ motors

Cable type		Connector type	Thread size	Cable cross section	Part number	
					Prefabricated cables	Signal connector*
Fixed installation	Motor cable	SM11	M23	4 x 1.5 mm²	05904544	01986740
		SM12		4 x 2.5 mm²	05904552	01986740
		SM14		4 x 4 mm²	05904560	01991639
		SMB6	M40	4 x 6 mm²	13350269	13349856
		SMB10		4 x 10 mm²	13350277	13349864
		SMB16		4 x 16 mm²	13350285	13349872
	Brakemotor cable BY brake	SB11	M23	4 x 1.5 mm² + 3 x 1 mm²	13354272	01986740
		SB12		4 x 2.5 mm² + 3 x 1 mm²	13354280	01986740
		SB14		4 x 4 mm² + 3 x 1 mm²	13354299	01991639
		SBB6	M40	4 x 6 mm² + 3 x 1.5 mm²	13350129	13349856
		SBB10		4 x 10 mm² + 3 x 1.5 mm²	13350137	13349864
		SBB16		4 x 16 mm² + 3 x 1.5 mm²	13350145	13349872
Cable carrier installation	Motor cable	SM11	M23	4 x 1.5 mm²	05906245	01986740
		SM12		4 x 2.5 mm²	05906253	01989197
		SM14		4 x 4 mm²	05904803	01991639
		SMB6	M40	4 x 6 mm²	13350293	13349856
		SMB10		4 x 10 mm²	13350307	13349864
		SMB16		4 x 16 mm²	13350315	13349872
	Brakemotor cable BY brake	SB11	M23	4 x 1.5 mm² + 3 x 1 mm²	13354302	01989197
		SB12		4 x 2.5 mm² + 3 x 1 mm²	13354310	01989197
		SB14		4 x 4 mm² + 3 x 1 mm²	13354329	01991639
		SBB6	M40	4 x 6 mm² + 3 x 1.5 mm²	13350153	13349856
		SBB10		4 x 10 mm² + 3 x 1.5 mm²	13350161	13349864
		SBB16		4 x 16 mm² + 3 x 1.5 mm²	13350188	13349872

* 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.

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Dependence of mating connector on cable diameter and crimping area

Mating connector type SM1/SB1	Crimping area U, V, W, PE mm²	Cable crimping diameter mm
01986740	0.35 – 2.5	9 – 14
01989197	0.35 – 2.5	14 – 17
01991639	2.5 – 4	14 – 17

Mating connector type SMB/SBB	Crimping area U, V, W, PE mm²	Cable crimping diameter mm
13349856	1.5 – 10	9 – 16
13349864	1.5 – 10	16.5 – 25
13349872	6 – 16	16.5 – 25

Mating connector type SMC/SBC	Crimping area U, V, W, PE mm²	Cable crimping diameter mm
18150349	16	17 – 36
18150160[1)]	25	17 – 36
18150179[2)]	35	17 – 36

1) Connector service pack does not contain any brake pins
2) Connector service pack does not contain any brake pins

The connector service packs also contain the brake pins (except for mating connector type SMC/SBC: 18150160, 18150179), hence it is not necessary to distinguish between motor and brakemotor.

5.6.2 Encoder cables

Cable type		Cable cross section	Frequency inverter type	Part number	
				Prefabricated cables	Signal connector*
Fixed installation	Resolver cable	5 x 2 x 0.25 mm²	MOVIDRIVE®	01994875	01986732
			MOVIAXIS®	13327429	
Cable carrier installation			MOVIDRIVE®	01993194	
			MOVIAXIS®	13327437	
Fixed installation	HIPERFACE® cable	6 x 2 x 0.25 mm²	MOVIDRIVE® / MOVIAXIS®	13324535	01986732
Cable carrier installation			MOVIDRIVE® / MOVIAXIS®	13324551	

* 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 mm²	01986341
Cable carrier installation		3 x 1 mm²	0199560X

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

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5.6.4 Prefabricated cables

Prefabricated cables are available from SEW-EURODRIVE for connection with the SM./SB. plug connector system.

For information on the prefabricated cables and part numbers, refer to the "Synchronous Servomotors" catalog.

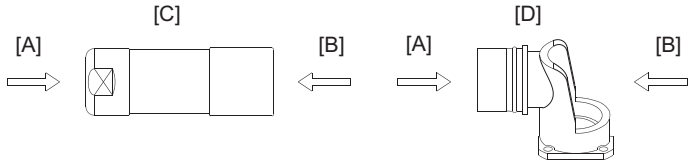
If you assemble cables yourself, observe the manual "Cable assembly".

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

- The socket contacts for the motor connection are implemented as crimping contacts. Only use suitable tools for crimping.
- Strip the insulation off the connection leads. Apply heat 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

Key



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[A] View A
[B] View B
[C] Customer connector with socket contacts
[D] Flange socket with pin contacts installed at the factory

SM1/SB1 power connector (M23)

Wiring diagram with/without BP/BK brake

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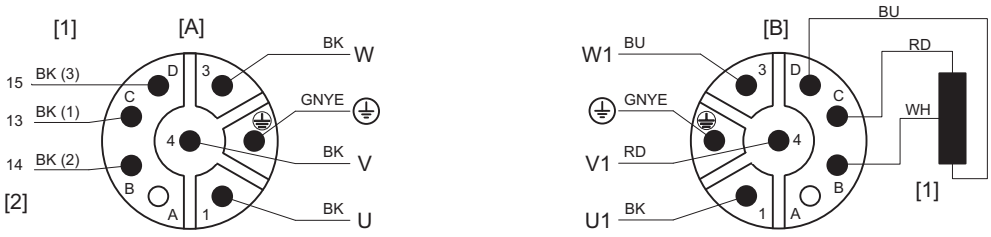
[1] BP/BK brake (optional)

Connection of power plug connector SM1 / SB1 (M23)

Wiring diagram with/without BY brake



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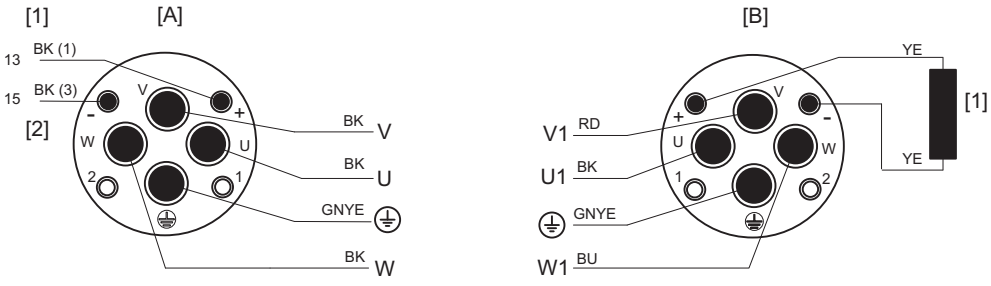
[1] BY brake (optional)
[2] Connection to SEW rectifier according to operating instructions

Connection of SMB/SBB power plug connector (M40)

Wiring diagram with/without BP brake



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[1] BP brake (optional)
[2] Connection to SEW rectifier according to operating instructions

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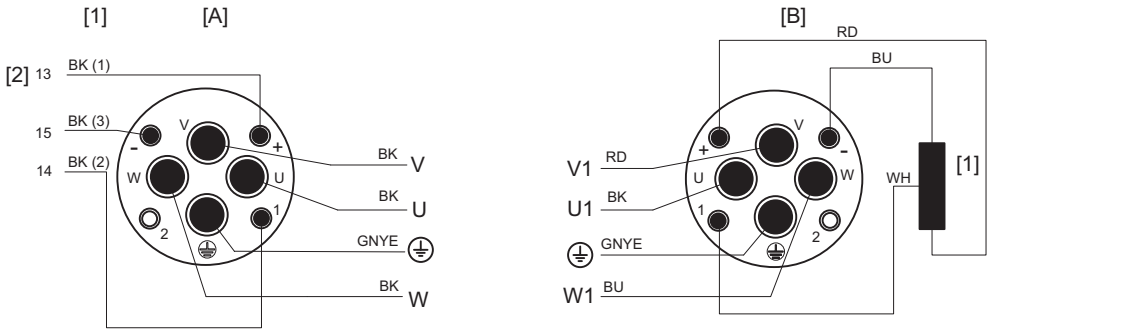
Connection of SMB/SBB power plug connector (M40)

Wiring diagram with/without BY brake

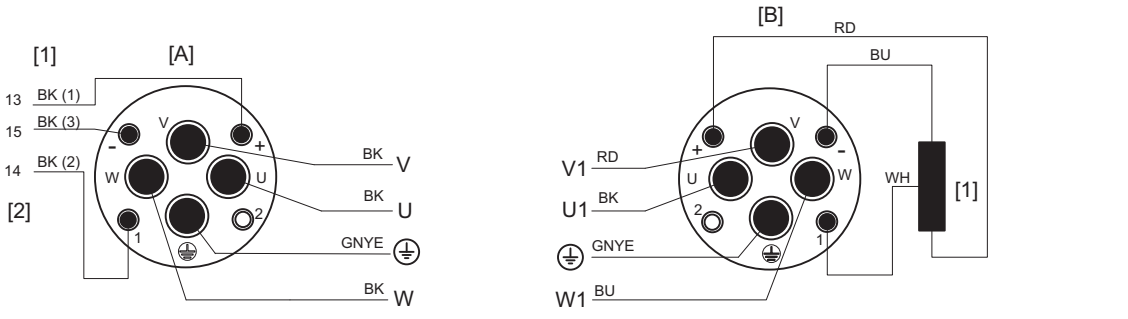


8791078027

[1] BY brake (optional)
[2] Connection to SEW rectifier according to operating instructions. For BY.D, connection 14 is omitted.

Connection of SMC/SBC power plug connector (M58)

Wiring diagram with/without BY brake



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[1] BY brake (optional)
[2] Brake coil

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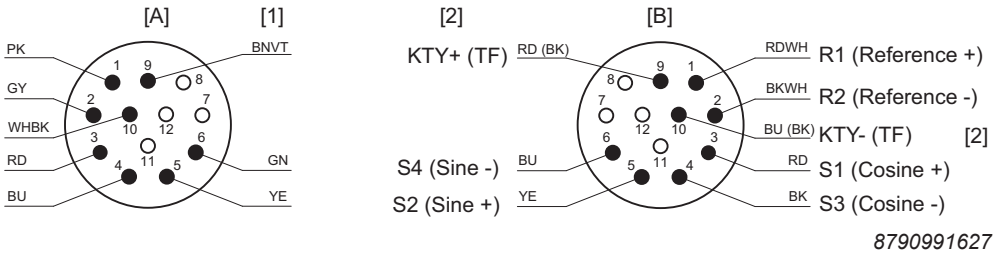
Wiring diagram for RH1M resolver signal plug connectors

Wiring diagram



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[1] Shield connected to the metal housing of the connector. Colors according to SEW-EURODRIVE cables
[2] KTY+ (RD), KTY-(BU), optional TF (BK)

Pin assignment of plug connector lower part

Pin	Color code	Connection
1	RD/WH	R1 (reference +)
2	BK/WH	R2 (reference -)
3	RD	S1 (cosine +)
4	BK	S3 (cosine –)
5	YE	S2 (sine +)
6	BU	S4 (sine –)
7	–	–
8	–	–
9	RD	KTY +
10	BU	KTY –
11	–	–
12	–	–

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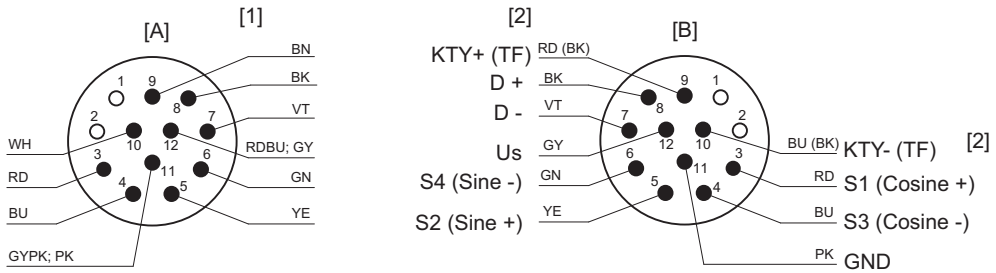
Connection of signal plug connector encoder AK0H, EK0H, AK1H, EK1H, AS1H, ES1H

Wiring diagram



8790993547

[1] Shield connected to the metal housing of the connector. Colors according to SEW-EURODRIVE cables
[2] KTY+ (RD), KTY-(BU), optional TF (BK)

Pin assignment of plug connector lower part

Pin	Color code	Connection
1	–	–
2	–	–
3	RD	S1 (cosine +)
4	BU	S3 (cosine –)
5	YE	S2 (sine +)
6	GN	S4 (sine –)
7	VT	D –
8	BK	D +
9	RD	KTY +
10	BU	KTY –
11	PK	Voltage reference (GND)
12	GY	Supply voltage Vs

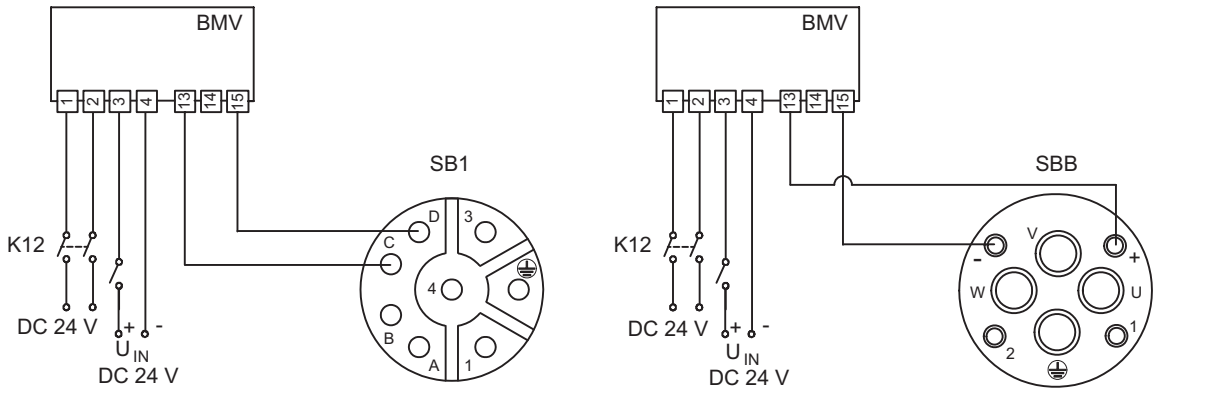
5.6.6 Wiring diagrams of the brake control – BP brake

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, then 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.

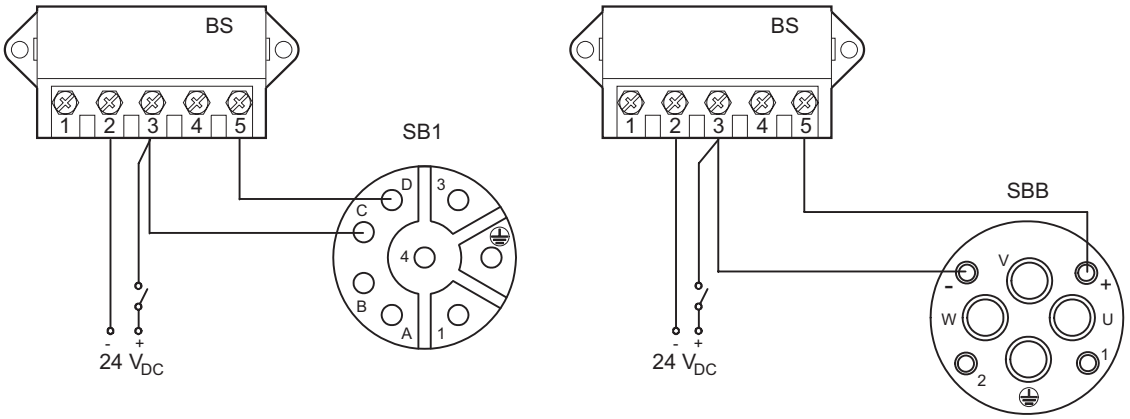
BMV brake controller



9007202156330251

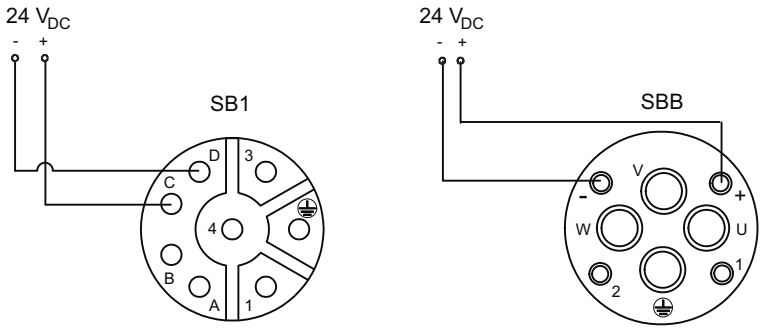
Connection 1, 2	Power supply
Connection 3, 4	Signal (inverter)

BS brake contactor



2901591947

Direct 24 V brake supply



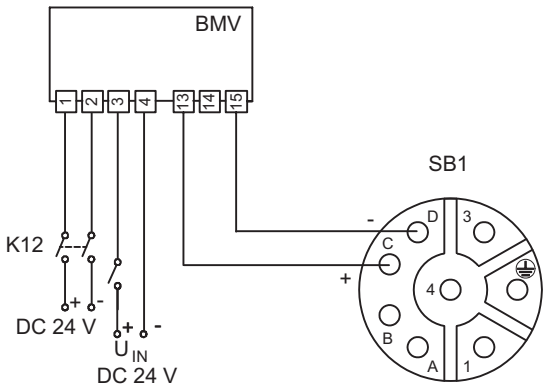
9007202156335627

In the following cases, the brake must be protected from overvoltage, for example by means of a varistor protection circuit:

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

5.6.7 Wiring diagrams of the brake control – BK brake

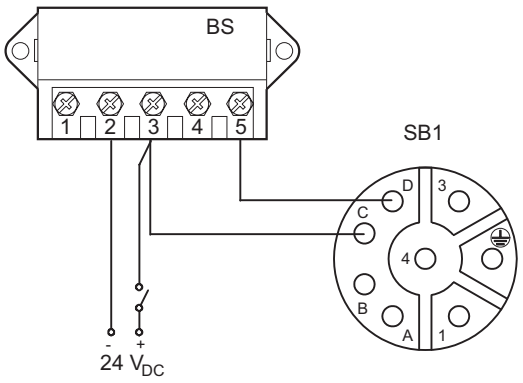
BMV brake controller



9007212241295115

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

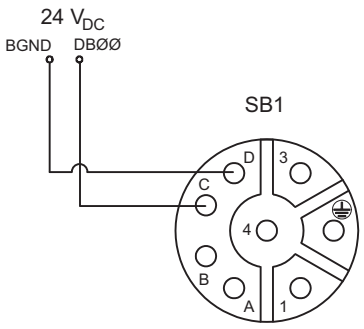
BS brake contactor



12986690059

Direct 24 V brake supply

Via MOVIAXIS®



9007207071783051

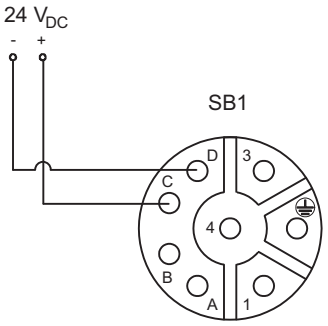
NOTICE

Damage to the BK brake.

Possible damage to property.

- It is essential that you observe the correct polarity of BK brake supply. Check the polarity when replacing the brake.

With non-SEW inverters



12986696203

In the following cases, the brake must be protected from overvoltage, e.g. via a varistor protection circuit:

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

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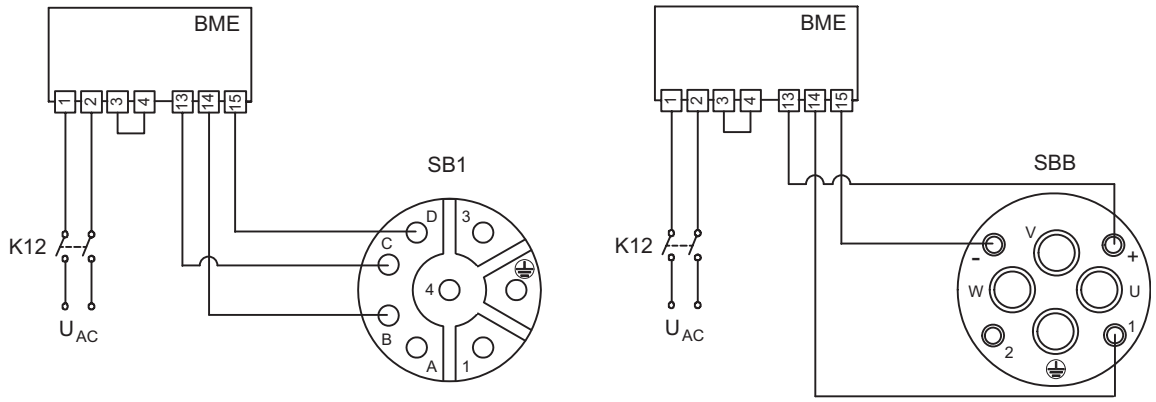
5.6.8 Wiring diagrams of the brake control – BY brake

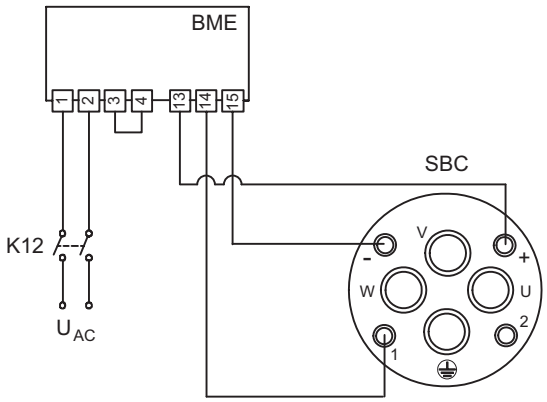
BME brake rectifier

Cut-off in the AC circuit / standard application of the brake with SB1, SBB.



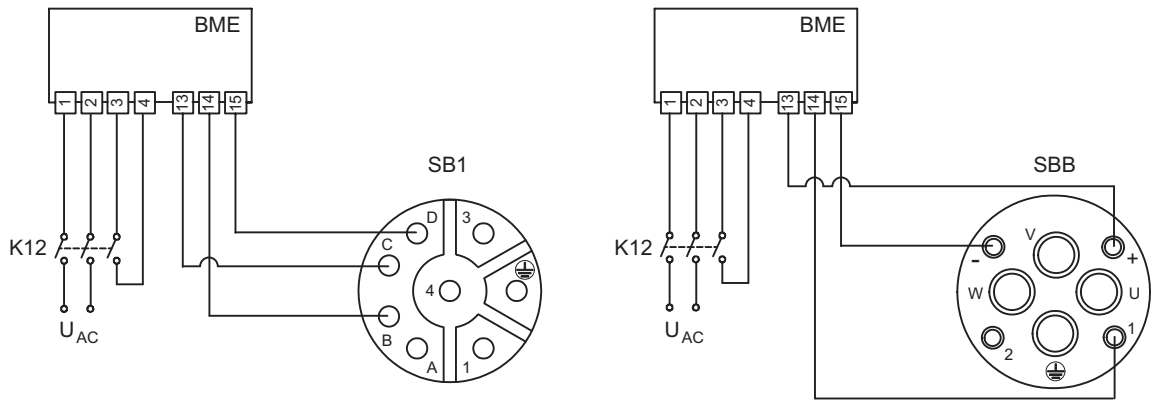
2901967755

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



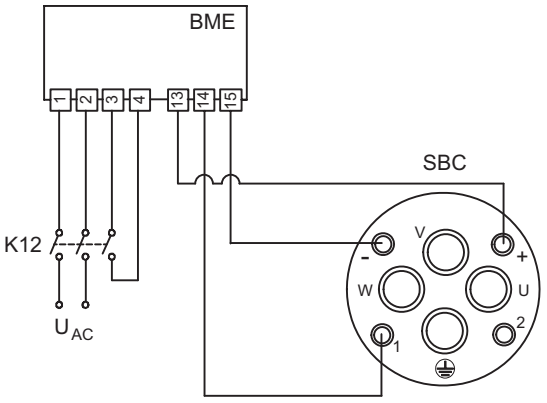
9007206235835659

Cut-off in the DC and AC circuits / rapid application of the brake with SB1, SBB.



2901969419

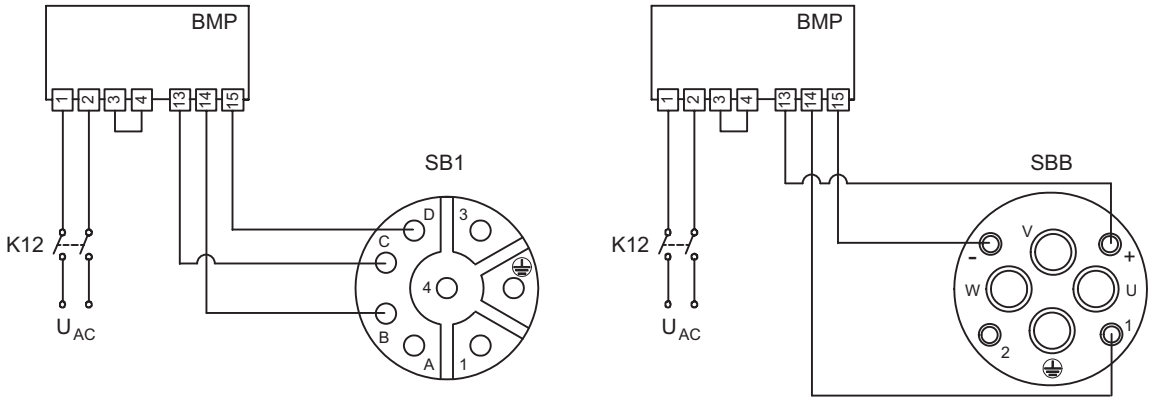
Cut-off in the DC and AC circuits / rapid application of the brake with SBC.



9007206235910283

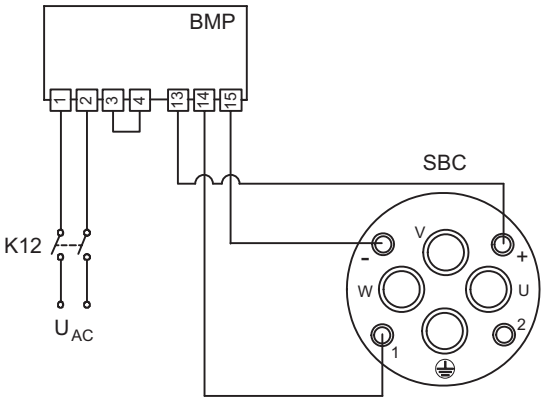
BMP brake rectifier

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



2901972107

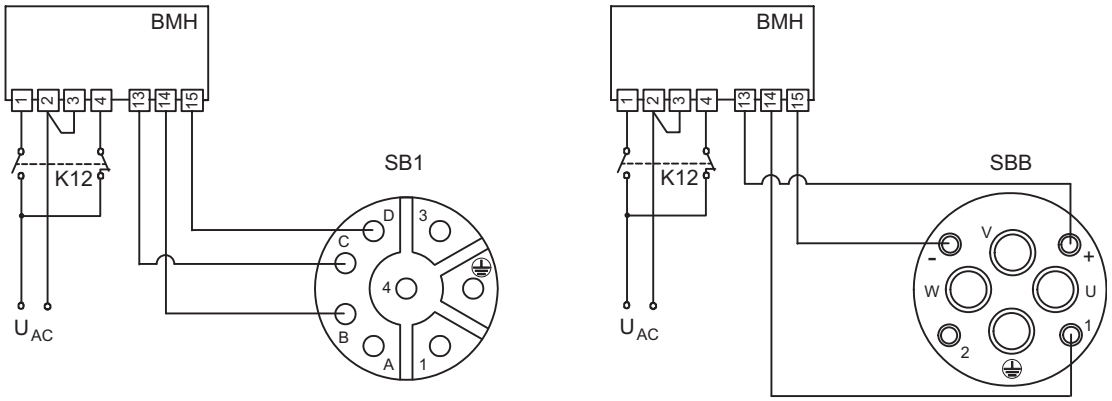
Cut-off in the DC and AC circuits / rapid application of the brake / integrated voltage relay with SBC.



9007206235946507

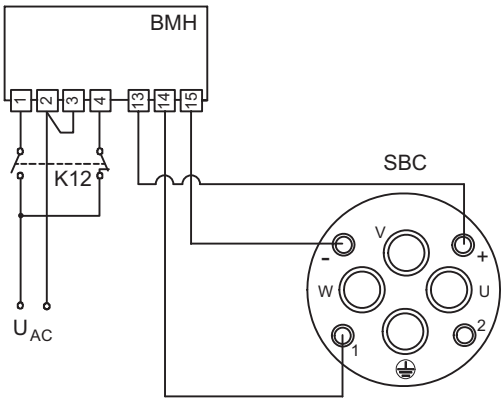
BMH brake rectifier

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



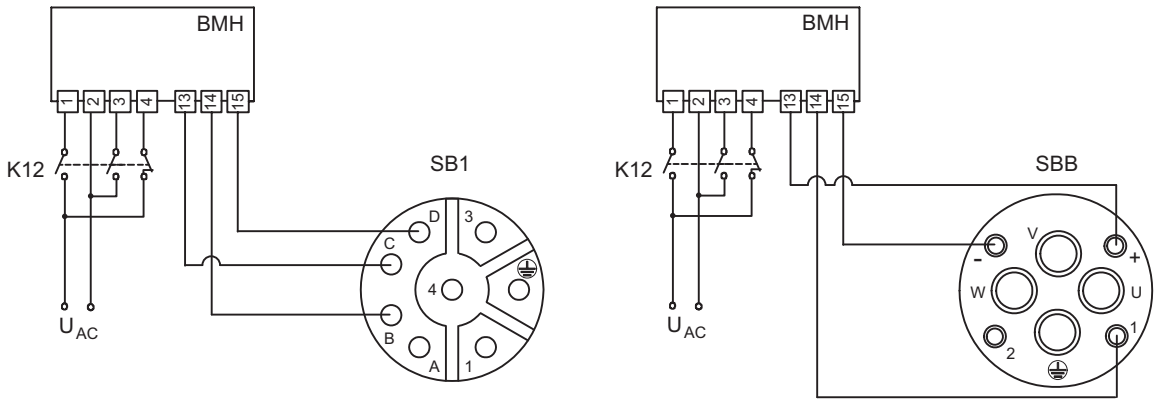
2901974795

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



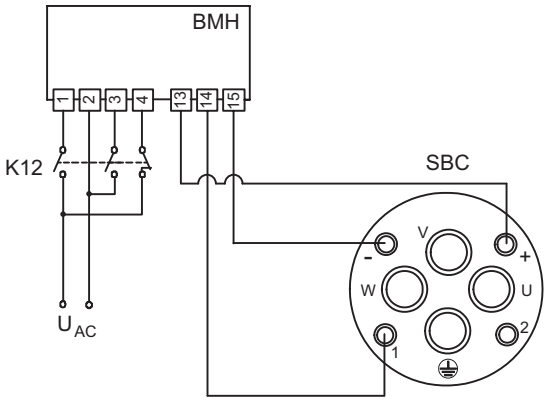
9007206235982731

Cut-off in the DC and AC circuits / rapid application of the brake with SBB.



2901976459

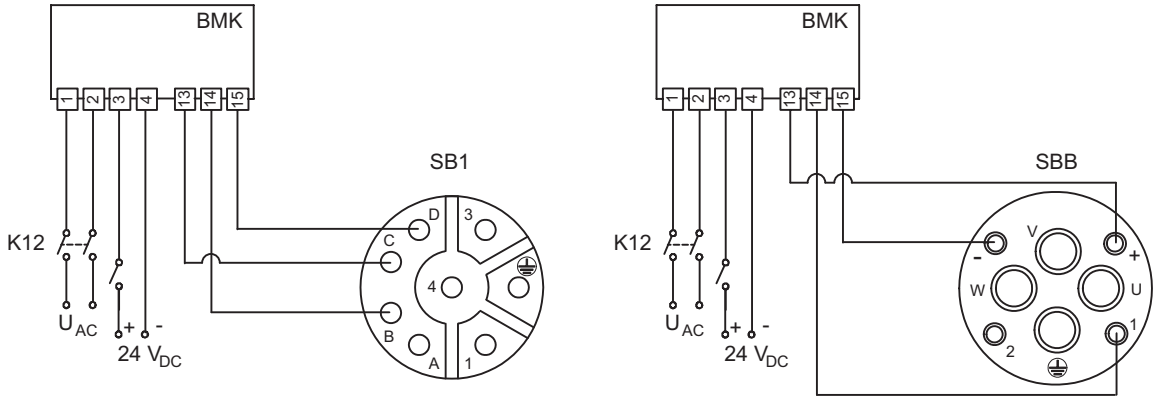
Cut-off in the DC and AC circuits / rapid application of the brake with SBC.



9007206236018571

BMK brake controller

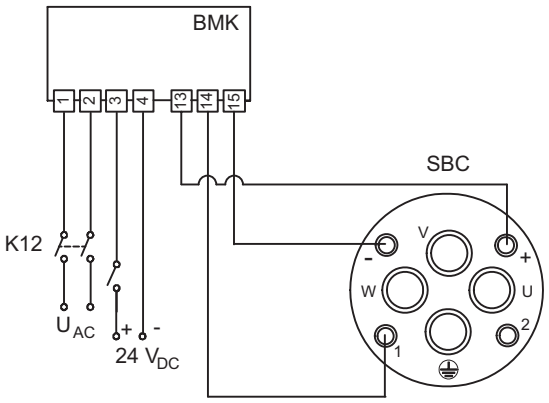
Cut-off in the DC and AC circuits / rapid application of the brake / integrated voltage relay / DC 24 V control input integrated with SBB.



2901979147

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

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

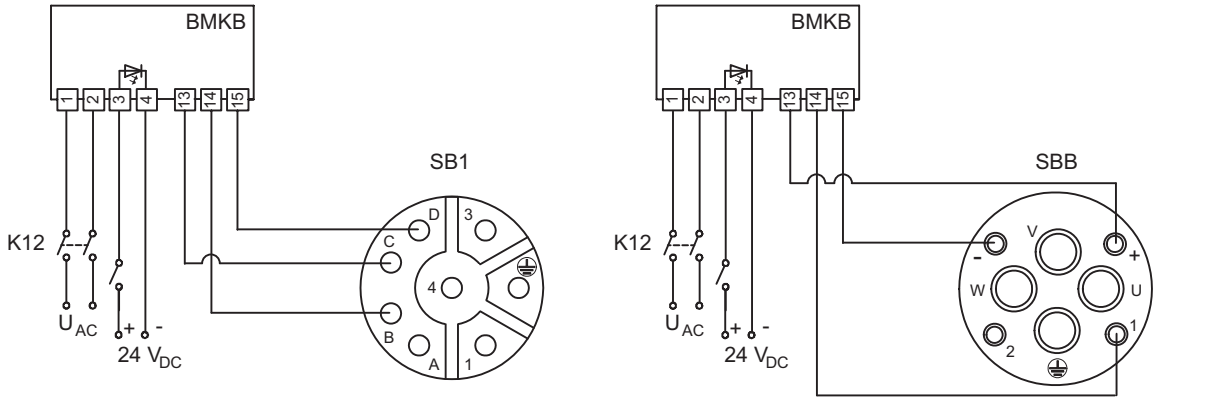


9007206236054795

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

BMKB brake controller

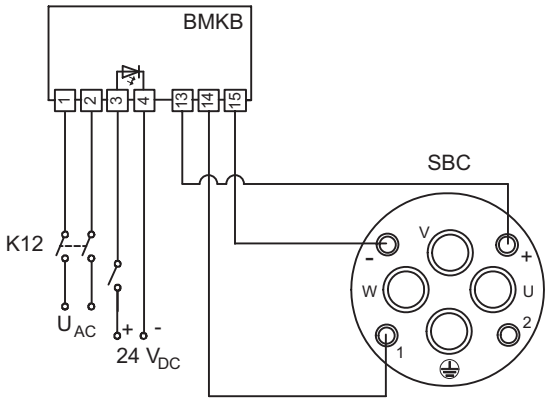
Cut-off in the DC and AC circuits / rapid application of the brake / integrated voltage relay / DC 24 V control input integrated / indication of readiness for operation with diode with SBB.



2901981835

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

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

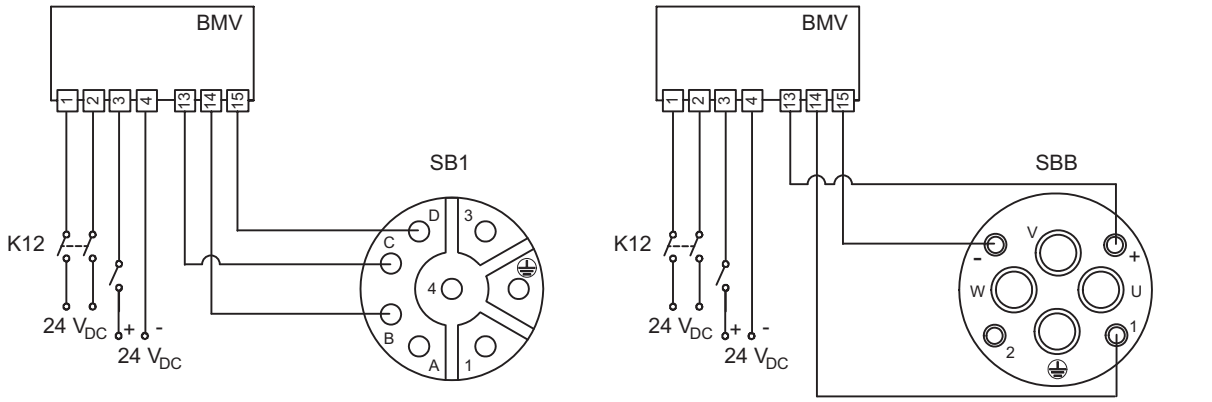


9007206236091019

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

BMV brake controller

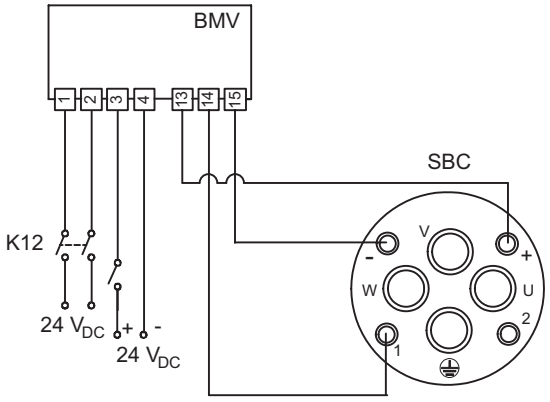
Cut-off in the DC and AC circuits / rapid application of the brake / DC 24 V control input integrated with SBB.



2901984523

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

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



9007206236127243

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

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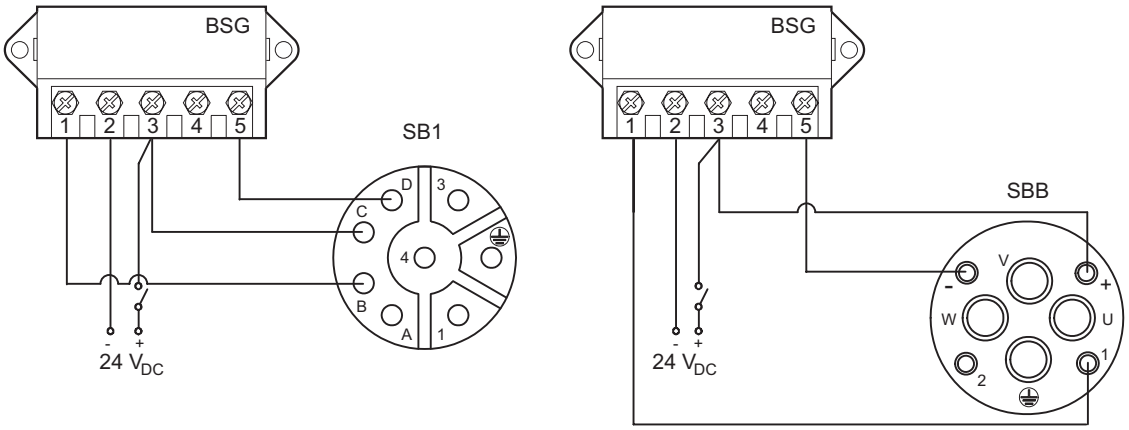
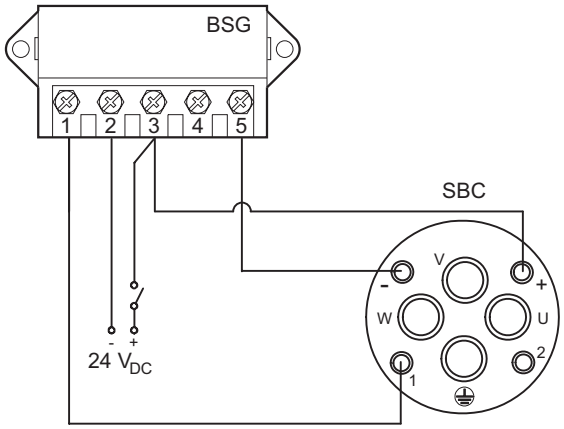
BSG brake control unit

For DC 24 V supply with SBB.



2901987211

For DC 24 V supply with SBC.



9007206236163467

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

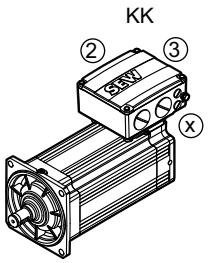
- Check the cable cross sections.
- Screw on the connections and PE conductors.
- Check the winding connections in the terminal box and tighten them, if necessary.
- You have to use an EMC screw fitting for the signal cable entry in order to ensure a flawless shielding.

5.7.1 Connection option via terminal box

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

- /KK option: Connection of the power and signal cable via conductor end sleeves in the terminal box.

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



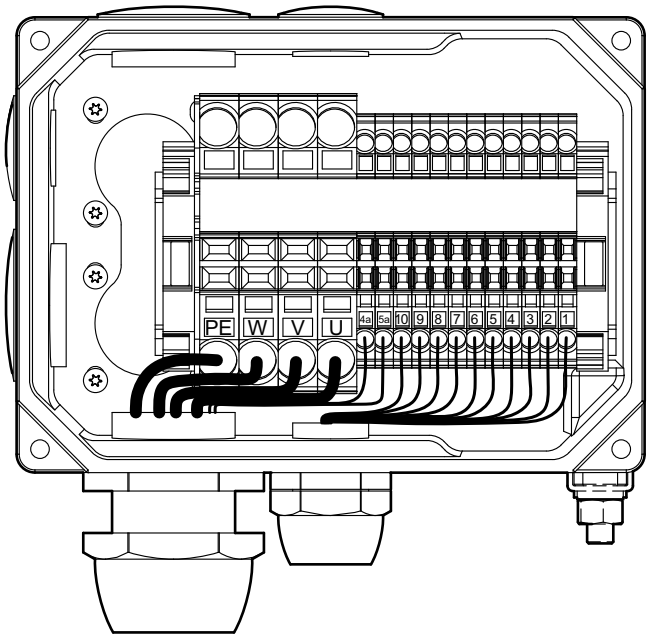
6015540491

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

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 mm²	M25	Spring terminals	M20
CMP71, CMP80	M6 stud	10 mm²	M32		M16
CMP100	M8 stud	25 mm²	M40		
CMP112S/M/L	M8 stud	35 mm²	M50		
CMP112H/E	M10 stud	50 mm²	M50		

5.7.2 Connection of CMP50 and CMP63



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Power

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

BP brake, BK brake

Auxiliary terminal contacts	Core identification		BMV brake rectifier connection	BS brake controller connection
	BP	BK		
4 a (RD)	+ (YE) Yellow	+ (RD) Red	13	3
5a (BU)	– (YE) Yellow	– (BU) Blue	15	5

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

NOTICE

Damage to the BK brake.

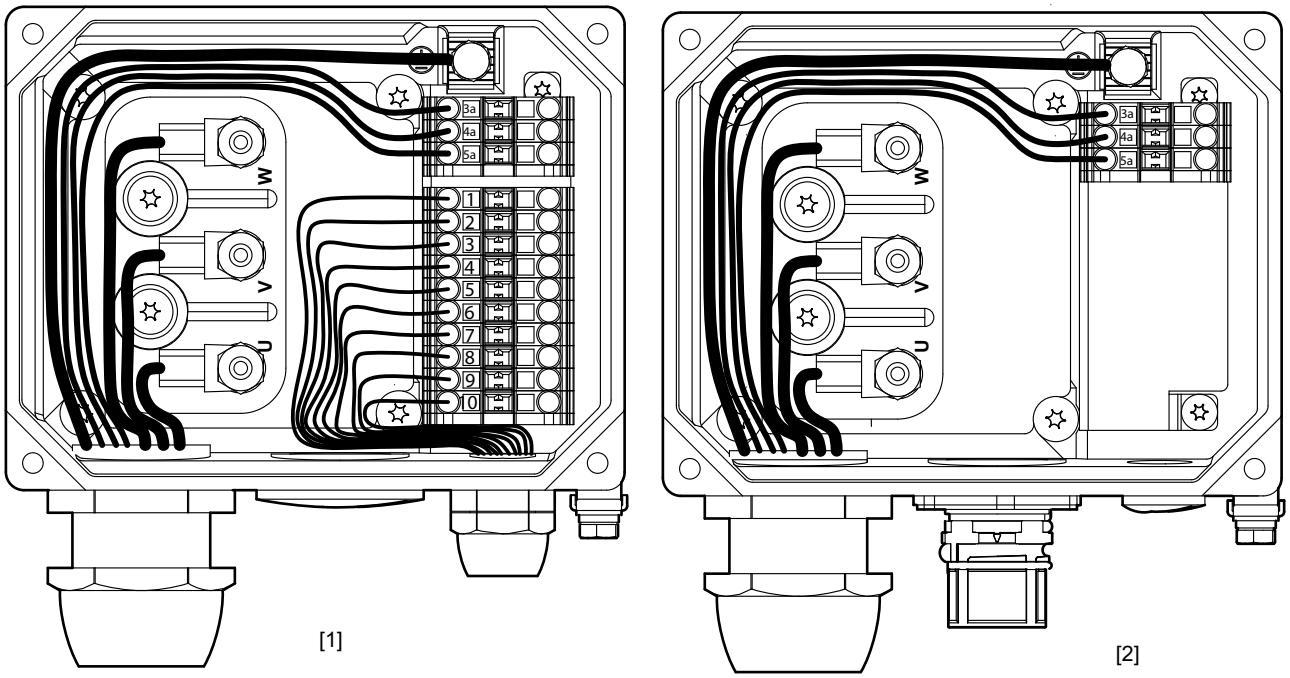
Possible damage to property.

- It is essential that you observe the correct polarity of BK brake supply. Check the polarity when replacing the brake.

Signal

Resolver			Encoder		
1	ref +	Reference	1	cos +	Cosine
2	ref -		2	ref cos	Reference
3	cos +	Cosine	3	sin +	Sine
4	cos -		4	ref sin	Reference
5	sin +	Sine	5	D -	DATA
6	sin -		6	D +	DATA
7	-	–	7	GND	Ground
8	-	–	8	Us	Supply voltage
9	KTY + / (TF)	Motor protection	9	KTY + / (TF)	Motor protection
10	KTY - / (TF)		10	KTY - / (TF)	

5.7.3 CMP71 – CMP112 connection



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[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	PE conductor

BP brake

Auxiliary terminal contacts	Core identification	BMV brake rectifier connection	BS brake controller connection
4 a	(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.

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BY brake

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

Signal

Resolver			Encoder		
1	ref +	Reference	1	cos +	Cosine
2	ref –		2	ref cos	Reference
3	cos +	Cosine	3	sin +	Sine
4	cos –		4	ref sin	Reference
5	sin +	Sine	5	D –	DATA
6	sin –		6	D +	DATA
7	–	–	7	GND	Ground
8	–	–	8	Us	Supply voltage
9	KTY + / (TF)	Motor protection	9	KTY + / (TF)	Motor protection
10	KTY – / (TF)		10	KTY – / (TF)	

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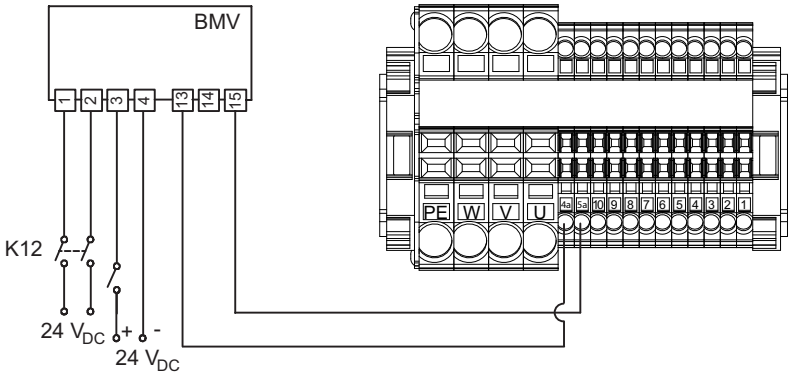
5.7.4 Wiring diagrams of the brake control – BP brake

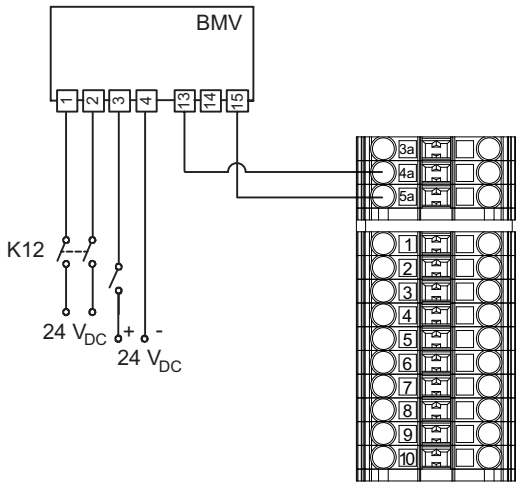
BMV brake controller – CMP50, CMP63



9007202156696971

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

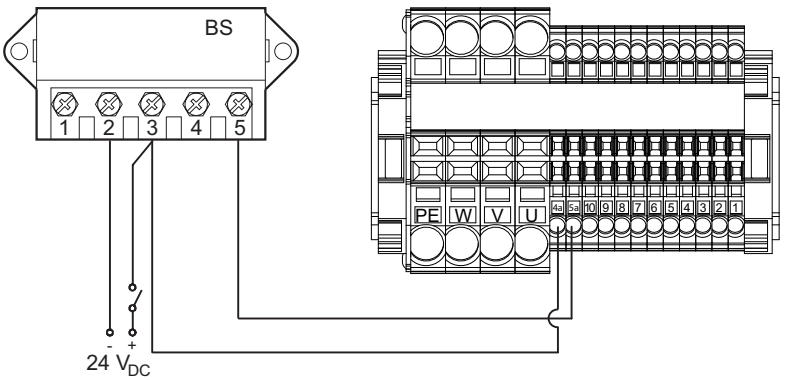
BMV brake controller – CMP.71 – CMP.100



2901958667

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

BS brake contactor – CMP50, CMP63



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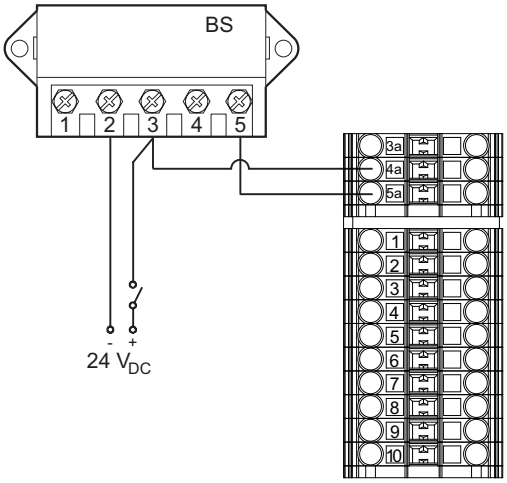
21923582/EN – 07/2015

BS brake contactor – CMP.71 – CMP.100



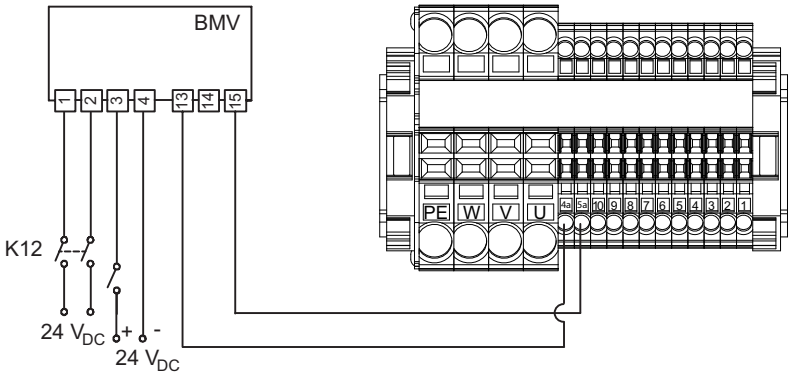
2901964043

5.7.5 Wiring diagrams of the brake control – BK brake

In every application, the BK 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, then a BK brake can also be controlled directly via the brake output of a MOVIAXIS® servo inverter.

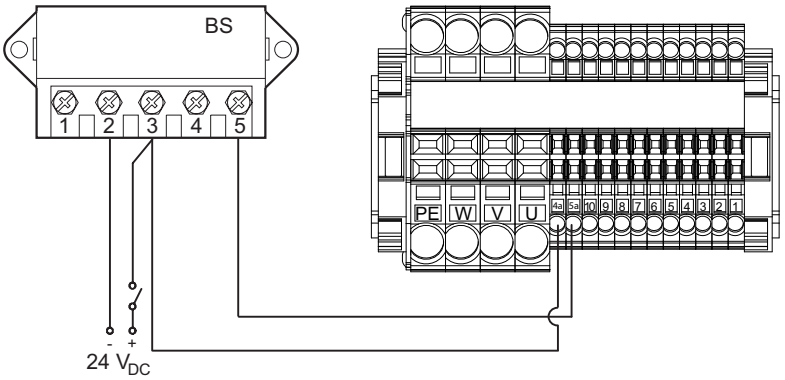
BMV brake controller – CMP50, CMP63



9007202156696971

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

BS brake contactor – CMP50, CMP63



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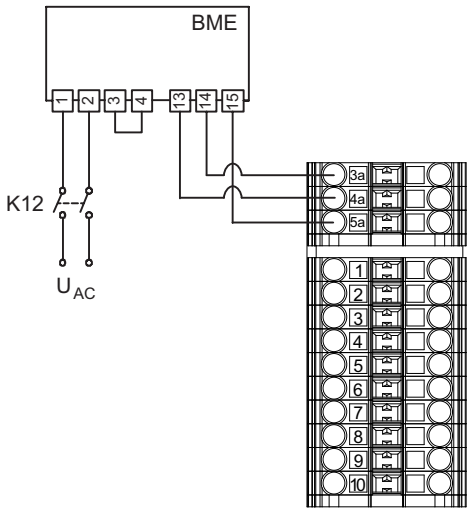
21923582/EN – 07/2015

5.7.6 Wiring diagrams of the brake control – BY brake

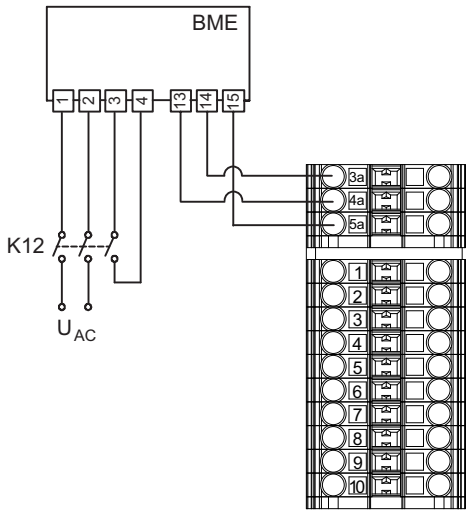
BME brake rectifier

Cut-off in the AC circuit / normal application of the brake.



2901990923

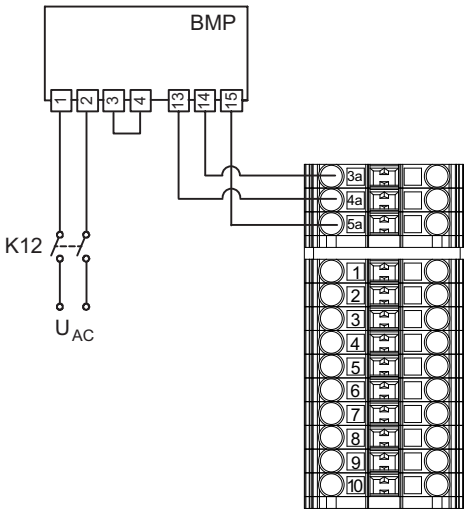
Cut-off in the DC and AC circuit / rapid application of the brake.



2901992587

BMP brake rectifier

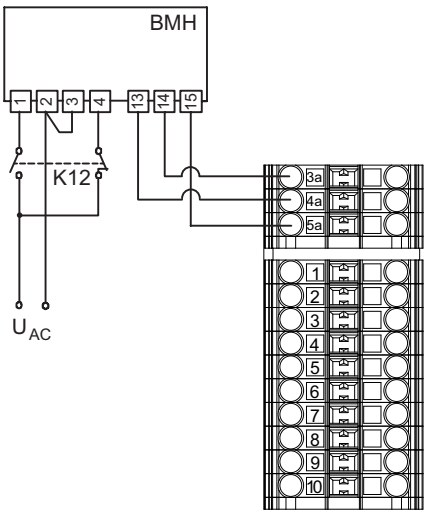
Cut-off in the DC and AC circuits / rapid application of the brake / integrated voltage relay.



2901995275

BMH brake rectifier

Cut-off in the AC circuit / normal application of the brake.



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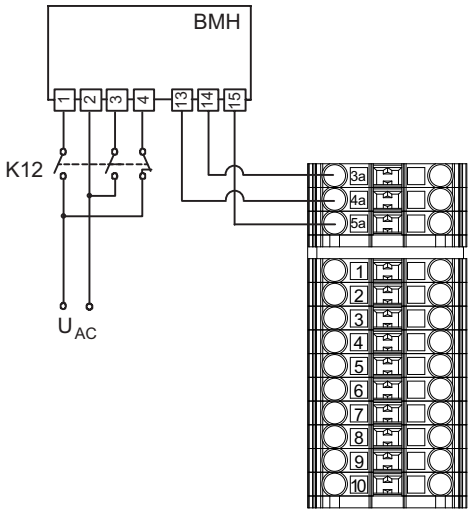
Cut-off in the DC and AC circuit / rapid application of the brake.



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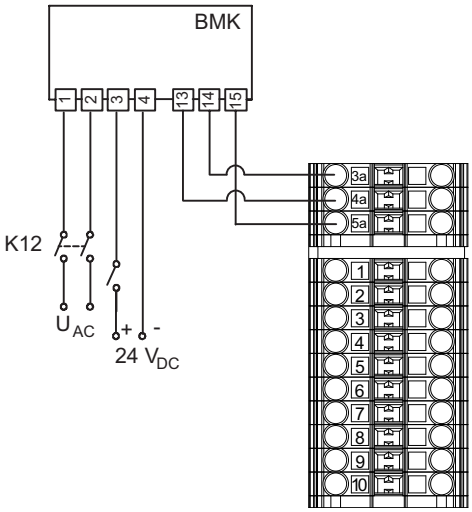
BMK brake controller

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



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

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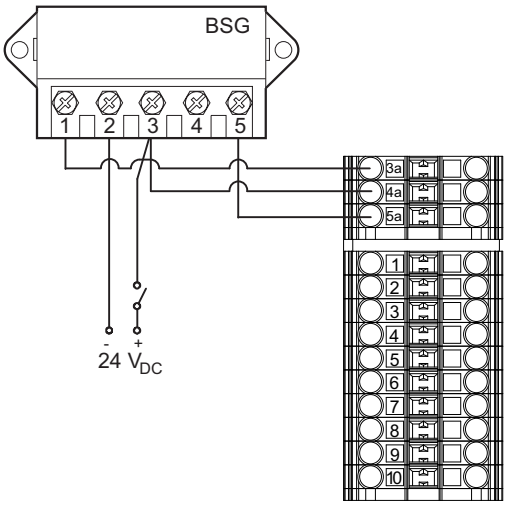
BSG brake control unit

For DC voltage supply with DC 24 V.



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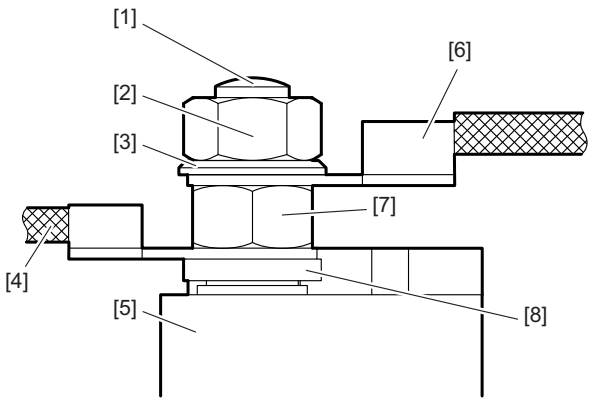
5.7.7 Power connection on terminal box

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



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

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

Terminal stud diameter	Tightening torque of hex nut	Customer connection Cross section	Execution	Connection type	Scope of delivery
M4	1.6 Nm	≤ 6 mm²	Design 1b	Ring cable lug	Pre-assembled terminal links
		≤ 6 mm²	Design 2	Ring cable lug	Small connection accessories enclosed in bag
M5	2.0 Nm	≤ 10 mm²	Design 2	Ring cable lug	Small connection accessories enclosed in bag
M6	3.0 Nm	≤ 16 mm²	Design 3	Ring cable lug	Small connection accessories enclosed in bag
M8	6.0 Nm	≤ 25 mm²	Design 3	Ring cable lug	Premounted connection pieces
M10	10.0 Nm	≤ 50 mm²	Design 3	Ring cable lug	Premounted connection pieces

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5.8 Options

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 connection voltage of DC 24 V and operates with one or two braking torque ratings for each motor size. For further information, refer to chapter "Accessories – technical data".

The brake cannot 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, then 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 of other manufacturers, overvoltage protection must be implemented by the customers themselves, for example by using 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 control, refer to chapter "Wiring diagrams of the BP brake control" (→ 🗎 50) (→ 🗎 64).

5.8.2 BK brake

BK holding brake – description

The BK brake is a permanent magnet holding brake with emergency stop function. It is different from the BP brakes through its fixed coil polarity.

For further information, refer to chapter "Accessories – technical data".

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5.8.3 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 control that is either installed in the control cabinet or in the terminal box.

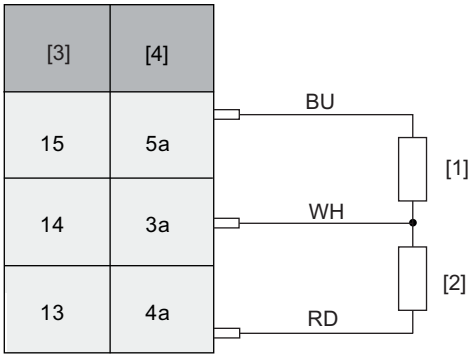
A main advantage of brakes from SEW-EURODRIVE is their very short design. The integrated construction of the brakemotor permits particularly compact and sturdy solutions.

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 control, refer to chapter "Wiring diagrams of the BY brake control" (→ 🗎 53) (→ 🗎 67).

For further information, refer to chapter "Accessories – technical data".

Connection of resistance coils



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[1] R_T: Resistance of coil section
[2] R_B: Resistance of accelerator coil
[3] BME, BMP, BMH, BMV, BMK, BMKB
[4] Auxiliary terminals

5.8.4 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.

TF temperature sensor

NOTICE

Too high input voltage at the temperature sensor input can damage the motor winding and the insulation of the sensor as well as the semiconductor.

Possible damage to property.

- Make sure that the TF evaluation unit is connected correctly.
- Do not connect a voltage > 10 V.

The PTC thermistors comply with DIN 44082.

Resistance measurement (measuring instrument with V ≤ 2.5 V or I < 1 mA)

- Standard measured values: 20 ... 500 Ω, hot resistance > 4000 Ω

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Temperature sensor KTY84 – 130

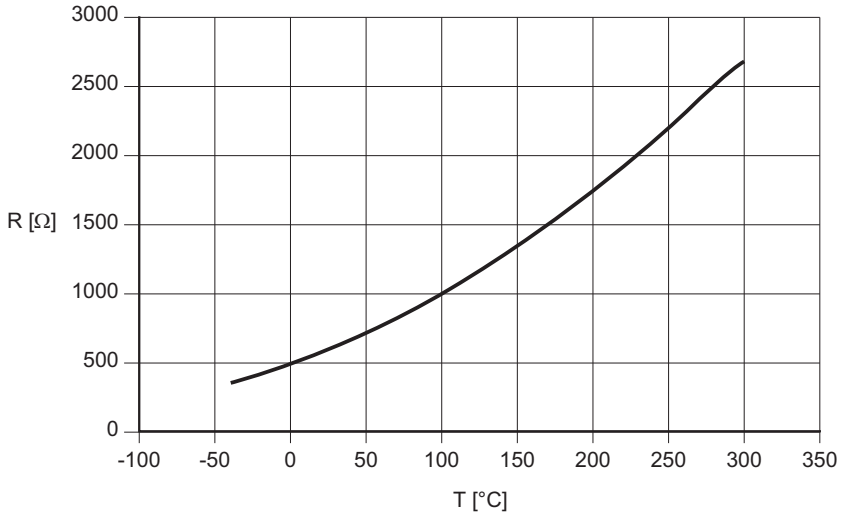
The KTY temperature sensor is the standard temperature sensor for CMP. motors.

NOTICE

Possible damage to the temperature sensor and the motor winding

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

Typical characteristic curve of KTY:



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

5.8.5 VR forced cooling fan

The synchronous servomotors size CMP50 – 63, CMP112, and CMP.71 – 100 can be equipped with a VR forced cooling fan as an option.

Electrical connection

⚠ CAUTION

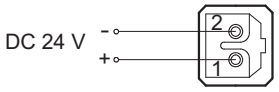
Starting up the fan before it is installed.

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



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Connector contact	Connection
1	24 V +
2	0 V

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6 Startup

⚠ WARNING

Risk of injury due to electric shock.

Severe or fatal injuries.

- Adhere to the safety notes in chapter 2 (→ 🗎 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

Electric shock due to regenerative operation, because turning the output element generates a voltage at the pin contacts of the plug connectors.

Minor injuries.

- Do not touch the pin contacts in the plug connector.
- If the mating connector is not plugged in, attach a touch guard to the plug connector.

⚠ CAUTION

The surfaces of the drive can be very hot during operation.

Risk of burns.

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

NOTICE

Destruction of the motor due to multiple acknowledgements of a motor protection fault.

Damage to property, damage to the motor

- Do not acknowledge a motor protection fault more than once. If an acknowledged motor protection fault occurs again shortly after the acknowledgement, you must first determine the cause for the fault and remedy it.

NOTICE

The mechanical maximum speed of a brakemotor can be greater than the rated speed (n_N) of the motor.

Possible damage to property, damage to brake.

- Limit the maximum speed at the inverter so that the brake is applied maximally at the rated speed.

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NOTICE

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

Possible damage to property, damage to gear unit.

- Limit the maximum speed at the inverter, so that the mechanically permitted input speed n_{epk} of the gear unit is not exceeded.

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.

Possible damage to property, damage to the motor.

- Limit the maximum current on the inverter.

NOTICE

The brakemotor can be damaged if you do not remove the hand lever after startup.

Possible damage to property.

- Remove the hand lever after startup of brakemotors with self-reengaging manual brake release.

6.1 Before startup

- The motors may only be operated in combination with frequency inverters.
- Before initial startup, frequency inverters must be configured using the MotionStudio software.
- A suitable frequency inverter is chosen during project planning. For further information on project planning, refer to the "Synchronous Servomotors" catalog.
- The drive must be undamaged and not blocked.
- The measures stipulated in chapter "Preliminary work" (→ 🗎 26) 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.
- The motor surface must not be covered by heat-sensitive or insulating materials.
- When motors with BK brake are stored for more than 6 months, the function of the BK brake must be checked. We recommend a running-in routine (3 minutes running at 300 1/min, brake application 1-2 times per second).
- If the manual brake release option /HR has been selected for a motor with BY brake, the brake can be released manually.

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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 chapter "Malfunctions" (→ 🗎 107) first.

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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 spare parts list.
- Whenever replacing the brake coil, always install a new brake control.

⚠ 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 surfaces of the drive can be very hot during operation.

Risk of burns.

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

NOTICE

The motor must be disassembled when replacing the BP or BK 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.

NOTICE

Working air gap at BY brake too large.

Possible damage to property.

- When a BY brake is used, the working air gap must be measured at regular intervals, which are specified in chapter "Inspection/Maintenance". A working air gap that exceeds the permitted maximum value can cause encoder errors or destroy the encoder.

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NOTICE

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

Possible damage to property

- Only mount the oil seals at an ambient temperature > 0°C.
- Before the assembly, heat the oil seals to a temperature of > 0°C.

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 chips can have a negative impact on the function of servomotors; in extreme cases these factors can cause the servomotor to break down.

Therefore 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.

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7.2 Maintenance intervals

INFORMATION

The amount of wear depends on many factors and may be high. The system manufacturer must calculate the required inspection/maintenance intervals individually in accordance with the project planning documents.

Factors that can shorten the inspection and maintenance intervals include:

- Number of real emergency switching off braking operations
- Use of frequency inverters
- Particularly high number of cycles with high motor acceleration
- Especially high cyclic duration factor at high speed
- Changing direction of rotation (reversing operation)
- Vertical mounting positions and pivoted mounting positions
- High mass moments of inertia due to the motion of the drive, e.g. in mobile drives or drives subject to high impact and vibration load
- Application-related generative torques or torsional vibrations
- External environmental influences, such as moisture, high degree of UV exposure, low ambient temperatures, etc.

Unit / part of unit	Time interval	What to do?
Servomotor	• Every 10 000 operating hours[1)]	Inspect the servomotor: • Check ball bearing and change if necessary • Replacing the oil seal • Clean cooling air ducts
Drive	• Varies (depending on external factors)	• Touch up or renew the surfaces/anticorrosion coating
BP/BK brake	• Every 0.5 to 2 years, depending on operating conditions	Inspect the brake: • Connect the brake to a regulated power supply unit. Determine the opening voltage (clicking of the brake) by increasing the voltage from 10 to 24 V. Contact SEW-EURODRIVE for further information. • Contact SEW-EURODRIVE when maintenance is required.
BY brake	• Every 0.5 to 2 years, depending on operating conditions	Inspect the brake: • Measuring the working air gap.
Servomotor surfaces	• Varies (depending on external factors)	• Clean surfaces

1) The periods of wear are affected by many factors and may be shorter than the recommendation above.

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7.3 Notes on the BP brake

- The BP brake does not require any maintenance.
- The working air gap cannot be measured directly, as the brake is integrated in the motor.
- Check the releasing voltage of the brake every 0.5 to 2 years, depending on the load conditions:
  - Connect the brake contacts to an adjustable power supply unit.
  - Increase the voltage gradually from 0 V to 24 V.
  - The releasing voltage is reached when the brake clicks.
- The brake must be replaced when the permitted total work W_{insp}, determined during project planning, is reached. Contact SEW-EURODRIVE.

7.4 Notes on the BK brake

- The BK brake does not require any maintenance.
- The working air gap cannot be measured directly, as the brake is integrated in the motor.
- The brake must be replaced when the permitted total work W_{insp}, determined during project planning, is reached. Contact SEW-EURODRIVE.
- The brake may only be replaced by SEW-EURODRIVE.
- The BK brake is a permanent magnet holding brake with emergency stop function. It differs from the BP brakes by its fixed coil polarity.

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7.5 Notes on the BY brake

The BY brake, which is designed as a working brake, must be inspected and serviced **every 0.5 to 2 years**, depending on the load conditions.

Inspection and maintenance work includes:

- Measuring the working air gap. See also chapter "Measuring the working air gap of the BY brake".

NOTICE

A lack of maintenance may result in damage to the encoder.

Destruction of the encoder.

- The BY brake, which is designed as a working brake, must be inspected and serviced every 0.5 to 2 years, depending on the load conditions.

7.5.1 Changing the brake disks

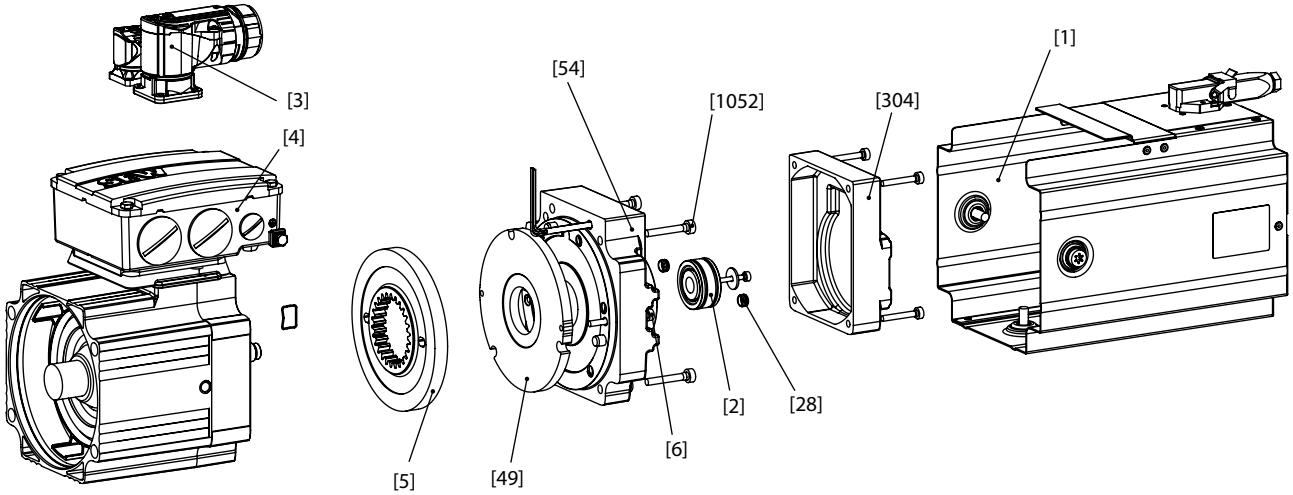
When replacing the brake disk, check the other removed parts as well, and replace them if necessary.

⚠ 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.



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

1. Remove forced cooling fan [1], if installed
2. Remove cover [304]

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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 cap screws [1052]
8. Carefully remove the magnet body [54] together with the pressure plate [49] – 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 required

INFORMATION

After replacing the brake disk, the maximum braking torque will be reached after several cycles.

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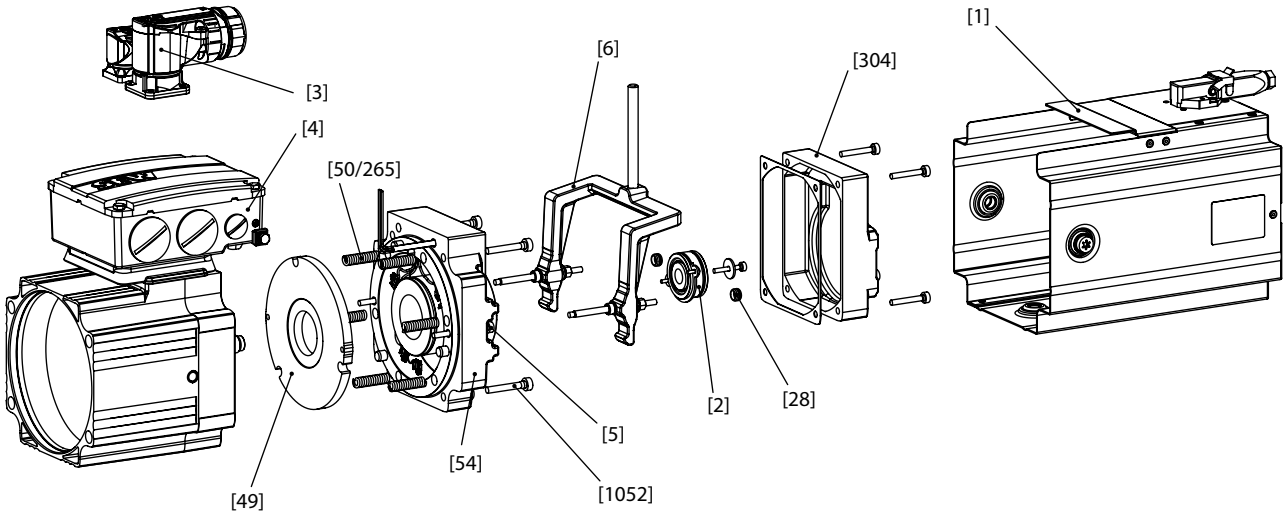
7.5.2 Changing the braking torque

⚠ 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.



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

1. Remove forced cooling fan [1], if installed
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 manual brake release [6] is installed:
   - Disassemble
7. No manual brake release installed:
   - Remove the closing caps [28]
8. Loosen cap screws [1052]
9. Carefully remove the magnet body [54] – mind the brake cable.
10. Remove the pressure plate [49]
11. Replace or add brake springs [50/265], see the following table

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12. Arrange brake springs symmetrically
13. Replace the pressure plate [49] if required, see chapter "Braking work and braking torques (→ 🗎 103)".
14. Re-install the brake components
15. If manual brake release [6] is installed:
    - install according to the figure in chapter "Retrofitting the manual brake release" (→ 🗎 31)
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 required.

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7.5.3 Change 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 (→ 🗎 86).

1. Remove forced cooling fan [1], if installed
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 manual brake release [6] is installed:
   - Disassemble
7. No manual brake release installed:
   - Remove the closing caps [28]
8. Loosen cap screws [1052]
9. Carefully remove the magnet body [54] – mind the brake cable.
10. Install the magnet body [54]; for plug connectors: After threading the leads through the brake endshield, crimp the pins onto the leads
11. Re-install the brake components
12. If manual brake release [6] is installed:
    - install according to the figure in chapter "Retrofitting the manual brake release" (→ 🗎 31)
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 required

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7.5.4 Measuring the working air gap of the BY brake

NOTICE

A lack of maintenance may result in damage to the encoder.

Possible damage to property.

- The air gap of the brake must not exceed a maximum value. The maximum values for the different brake sizes are listed in the following table.
- Replace the damping plate after maximally 1 million braking cycles.

INFORMATION

Customers can check the working air gap of the brake for inspection purposes.

The working air gap can be measured via the stroke of the pressure plate when the brake is released.

The permitted dimensions of the working air gap is listed in the following table:

Brake size	BY2	BY4	BY8	BY14
Permitted dimensions of working air gap	0.2 – 0.6 mm			0.4 – 0.8 mm.

If the working air gap exceeds the specified maximum value, the brake has to be replaced.

The working air gap cannot be adjusted.

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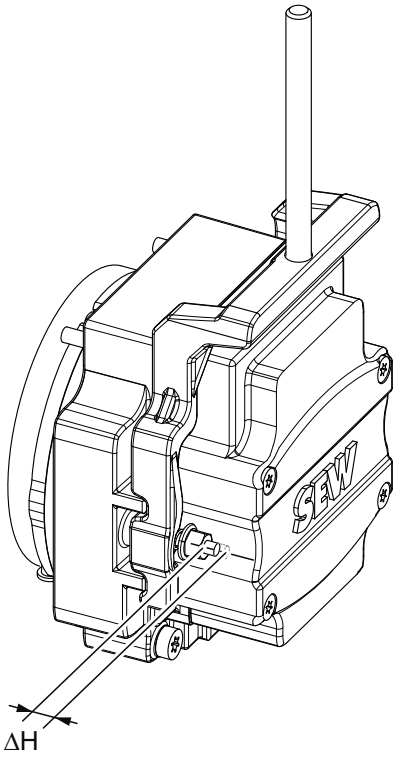
Measuring the working air gap for brakes with manual brake release

1. De-energize the motor and brake, safeguarding them against unintentional power-up.
2. Remove forced cooling fan, if installed
3. Connect the brake to the voltage supply
4. Release and apply the brake electrically. Measure the stroke ΔH of the pressure plate at the studs. This stroke ΔH corresponds to the working air gap.



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Measuring the working air gap for brakes without manual brake release

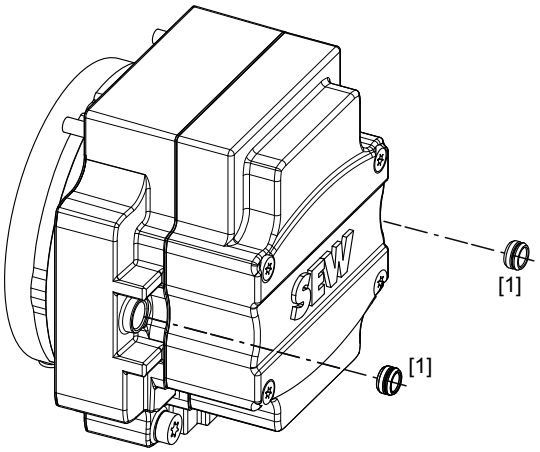
1. De-energize the motor and brake, safeguarding them against unintentional power-up.
2. Remove forced cooling fan, if installed
3. Remove the closing caps [1] from the two boreholes
4. Insert one stud each into the boreholes

   SEW-EURODRIVE recommends the following studs:

Brake sizes	Screw size	Part number
BY2, BY4	M5 x 75	13281453
BY8	M6 x 70	00118346
BY14	M8 x 75	19074557

5. Connect the brake to the voltage supply
6. Release and apply the brake electrically. Measure the stroke ΔH of the pressure plate at the studs. This stroke ΔH corresponds to the working air gap.
7. Remove the two screws when you have finished measuring the working air gap.
8. Close the two boreholes with new closing caps [1].

   The following table shows the part numbers for the replacement closing caps:



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8 Technical data

8.1 Technical data of BK brakes

The following table shows the technical data of BK brakes. They operate with a fixed braking torque per brake size.

Brake type	$M_{4,\ 100\ °C}$ Nm	$M_{1m,\ 100\ °C}$ Nm	M_{1max} Nm	W_1 kJ	W_2 kJ	W_{insp} 10^3 kJ	P W	t_1 ms	t_2 ms
BK01	1.9	1.4	3.4	0.056	1.12	0.112	8.8	35	20
BK02	2.4	1.9	5.3	0.175	3.50	0.350	6.7	80	20
BK03	3.8	2.0	7.9	0.371	7.42	0.742	13.4	50	30
BK04	3.9	2.4	7.0	0.288	5.76	0.576	13.4	50	30
BK07	7.1	3.9	12.8	0.740	14.8	1.48	15.0	70	30

$M_{4,\ 100\ °C}$ Minimum static braking torque (holding torque) at 100 °C
$M_{1m,\ 100\ °C}$ Minimum averaged dynamic braking torque in case of emergency switching off at 100 °C
M_{1max} Maximum dynamic braking torque in case of emergency switching off
W_1 Permitted braking work per braking operation
W_2 Permitted braking work per hour
W_{insp} Permitted total braking work (braking work until maintenance)
P Power consumption of the coil
t_1 Brake response time
t_2 Brake application time

INFORMATION

The response and application times are guide values that were determined at maximum braking torque.

Possible response times of switching elements or controllers were not taken into account.

8.1.1 Motor assignment

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

Motor type	Brake type	$M_{4,\ 100\ °C}$ Nm	Speed class
CMP40S/M	BK01	1.9	3000 / 4500 / 6000
CMP50S/M	BK02	2.4	
CMP63S	BK03	3.8	
CMP50L	BK04	3.9	
CMP63M/L	BK07	7.1	

$M_{4,\ 100\ °C}$ Minimum static braking torque (holding torque) at 100 °C

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8.1.2 Operating currents for BK brakes

	BK01	BK02	BK03	BK04	BK07
Braking torque $M_{4,\ 100\ °C}$ in Nm	1.9	2.4	3.8	3.9	7.1
Braking power in W	8.8	6.7	13.4	13.4	15

Nominal voltage U_N V_{DC}	I A_{DC}	I A_{DC}	I A_{DC}	I A_{DC}	I A_{DC}
24 (21.6 – 26.4)	0.365	0.280	0.557	0.557	0.623

$M_{4,\ 100\ °C}$ Minimum static braking torque (holding torque) at 100 °C
I Operating current
U_N Nominal voltage (nominal voltage range)

When dimensioning the 24 V supply, it is not necessary to consider a current reserve for releasing the brake, i.e. the ratio of inrush current to operating current is 1.

8.1.3 Resistance values of BK brake coils

	BK01	BK02	BK03	BK04	BK07
Braking torque $M_{4,\ 100\ °C}$ in Nm	1.9	2.4	3.8	3.9	7.1
Braking power in W	8.8	6.7	13.4	13.4	15

Nominal voltage U_N V_{DC}	R Ω	R Ω	R Ω	R Ω	R Ω
24 (21.6 – 26.4)	65.7	85.5	43.1	43.1	38.6

$M_{4,\ 100\ °C}$ Minimum static braking torque (holding torque) at 100 °C
R Coil resistance at 20 °C
V_N Nominal voltage (nominal voltage range)

8.1.4 Working capacity

INFORMATION

If the permitted braking work per braking W_1 is exceed during braking from speed, or if the permitted total braking work W_{insp} is reached, it can no longer be guaranteed that the brake applies. In this case, no braking will occur.

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8.2 Technical data of the BP brake

Motor type	Brake type	$M_{2,\ 20\ °C}$ Nm	$M_{4,\ 100\ °C}$ Nm	$M_{1m,\ 100\ °C}$ Nm	W_1 kJ	W_2 kJ	W_{insp} 10^3 kJ	P W	t_1 ms	t_2 ms
CMP40S/M	BP01	0.95	0.6	0.4	0.4	4.8	0.2	7	200	75
CMP50S	BP04	3.1	1.9	1.2	0.6	7.2	1.0	10.2	200	75
		4.3	2.6	1.7						
CMP50M/L	BP04	3.1	1.9	1.2	0.6	7.2	1.0	10.2	200	75
		4.3	2.6	1.7						
CMP63S	BP09	7.0	4.2	2.8	1.0	10.0	1.8	16	200	75
		9.3	5.6	3.7						
CMP63M/L	BP09	7.0	4.2	2.8	1.0	10.0	1.8	16	200	75
		9.3	5.6	3.7						
CMP71S	BP1	7	4.2	2.8	1.4	16.8	2.6	19.5	200	75
		14	8.4	5.6						
CMP71M/L	BP1	7	4.2	2.8	1.4	16.8	2.6	19.5	200	75
		14	8.4	5.6						
CMP80S	BP3	16	9.6	6.4	2.2	26.4	4.1	28	200	75
		31	18.6	12.4						
CMP80M/L	BP3	16	9.6	6.4	2.2	26.4	4.1	28	200	75
		31	18.6	12.4						
CMP100S	BP5	24	14.4	9.6	3.6	43.2	6.7	33	200	75
		47	28.2	18.8						
CMP100M/L	BP5	24	14.4	9.6	3.6	43.2	6.7	33	200	75
		47	28.2	18.8						

Standard braking torque
Optional braking torque

$M_{2,\ 20\ °C}$ Nominal torque for slipping brake disk (relative speed between brake disk and friction surface: 1 m/s) at 20 °C
$M_{4,\ 100\ °C}$ Minimum static braking torque (holding torque) at 100 °C
$M_{1m,\ 100\ °C}$ Minimal averaged dynamic braking torque in case of emergency switching off at 100 °C
W_1 Permitted braking work per braking operation
W_2 Permitted braking work per hour
W_{insp} Permitted total braking work (braking work until maintenance)
P Power consumption of the coil
t_1 Brake response time
t_2 Brake application time

INFORMATION

The response and application times are guide values that were determined at maximum braking torque.

Possible response times of switching elements or controllers were not taken into account.

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8.2.1 Motor assignment

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

Motor type	Brake type	$M_{2,\ 20\ °C}$ Nm	Speed class
CMP40S/M	BP01	0.95	3000/4500/6000
CMP50S	BP04	3.1	
		4.3	
CMP50M/L	BP04	3.1	
		4.3	
CMP63S	BP09	7.0	
		9.3	
CMP63M/L	BP09	7.0	
		9.3	
CMP71S	BP1	7	2000/3000/4500/6000
		14	
CMP71M/L	BP1	7	
		14	
CMP80S	BP3	16	2000/3000/4500
		31	
CMP80M/L	BP3	16	
		31	
CMP100S	BP5	24	2000/3000/4500
		47	
CMP100M/L	BP5	24	
		47	

$M_{2,\ 20\ °C}$ Nominal torque for slipping brake disk (relative speed between brake disk and friction surface: 1 m/s) at 20 °C

Standard braking torque

Optional braking torque

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8.2.2 Operating currents for BP brakes

	BP01	BP04	BP09	BP1	BP3	BP5
Braking torque $M_{2,\ 20\ °C}$ 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}**	**I** **A_{DC}**	**I** **A_{DC}**	**I** **A_{DC}**	**I** **A_{DC}**	**I** **A_{DC}**	**I** **A_{DC}**
24 (21.6 – 26.4)	0.29	0.42	0.67	0.81	1.17	1.38

$M_{2,\ 20\ °C}$ Nominal torque for slipping brake disk (relative speed between brake disk and friction surface: 1 m/s) at 20 °C
I Operating current
V_N Nominal voltage (nominal voltage range)

When dimensioning the 24 V supply, it is not necessary to consider a current reserve for releasing the brake, i.e. the ratio of inrush current to operating current is 1.

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8.2.3 Resistance values of BP brake coils

	BP01	BP04	BP09	BP1	BP3	BP5
Braking torque $M_{2,\ 20\ °C}$ 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 (21.6 – 26.4)	84	56.5	35	29.4	20.5	17.3

$M_{2,\ 20\ °C}$ Nominal torque for slipping brake disk (relative speed between brake disk and friction surface: 1 m/s) at 20 °C
R Coil resistance at 20 °C
V_N Nominal voltage (nominal voltage range)

8.2.4 Permitted switching work (emergency switching off operation)

The maximum number of cycles per hour is 10.

The minimum idle time between two cycles is 6 min.

8.2.5 BP brake switching cycles

The following table shows the number of permitted switching cycles of the BP brake until end of service life when used exclusively as holding brake.

Motor type	Brake type	Approved switching cycles
CMP71	BP1	4,000,000
CMP80	BP3	2,500,000
CMP100	BP5	1,500,000

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8.3 Technical data of the BY brake

The following tables list the technical data of the brakes. The type and number of brake springs determines the level of the braking torque. Unless specified otherwise in the order, the brakemotors are delivered with the braking torques marked in gray.

Motor type	Brake type	$M_{2,\ 20\ °C}$ Nm	$M_{4,\ 100\ °C}$ Nm	$M_{1m,\ 100\ °C}$ Nm	P W	t_1 ms	t_2 ms	t_3 ms
CMPZ71S	BY2	7	4.2	4.9	27	25	23	130
		10	6	7				
		14	8.4	9.8				
		20	12	14				
CMPZ71M/L	BY2	7	4.2	4.9	27	25	23	130
		10	6	7				
		14	8.4	9.8				
		20	12	14				
CMPZ80S	BY4	14	8.4	9.8	38	30	17	110
		20	12	14				
		28	16.8	19.6				
		40	24	28				
CMPZ80M/L	BY4	14	8.4	9.8	38	30	17	110
		20	12	14				
		28	16.8	19.6				
		40	24	28				
CMPZ100S	BY8	28	16.8	19.6	45	55	25	210
		40	24	28				
		55	33	38.5				
		80	48	56				
CMPZ100M/L	BY8	28	16.8	19.6	45	55	25	210
		40	24	28				
		55	33	38.5				
		80	48	56				
CMP112S	BY14	50	30	35	76	60	20	100
		70	42	49				
		100	60	70				
		140	84	98				
CMP112M/L	BY14	50	30	35	76	60	20	100
		70	42	49				
		100	60	70				
		140	84	98				

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Motor type	Brake type	$M_{2,\ 20\ °C}$ Nm	$M_{4,\ 100\ °C}$ Nm	$M_{1m,\ 100\ °C}$ Nm	P W	t_1 ms	t_2 ms	t_3 ms
CMP112L/H/E	BY14	50	30	35	76	60	20	100
		70	42	49				
		100	60	70				
		140	84	98				

Standard braking torque
Optional braking torque

$M_{2,\ 20\ °C}$ Nominal torque for slipping brake disk (relative speed between brake disk and friction surface: 1 m/s) at 20 °C

$M_{4,\ 100\ °C}$ Minimum static braking torque (holding torque) at 100 °C

$M_{1m,\ 100\ °C}$ Minimal averaged dynamic braking torque in case of emergency switching off at 100 °C

P Power consumption of the coil

t_1 Brake response time

t_2 Brake application time AC / DC

t_3 Brake application time AC

INFORMATION

The response and application times are guide values that were determined at maximum braking torque.

Possible response times of switching elements or controllers were not taken into account.

The following table shows the permitted friction work depending on the application speed at which the braking process is triggered. The lower the speed, the higher the permitted braking work.

INFORMATION

If you do not stop the motor in an inverter-controlled manner but use the brake for mechanical deceleration, you must check whether the brake can supply the braking work required for the brake application speed in an EMERGENCY STOP situation.

INFORMATION

If the braking work W_1 (all applications) is exceeded, the enhanced braking work W_1 (only travel drive applications) are applied in case of travel drive applications. Emergency switching off features.

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8.3.1 Motor assignment

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

Motor type	Brake type	$M_{2,\ 20\ °C}$ Nm				Speed class
CMPZ71S	BY2	7	10	14	20	2000 / 3000 / 4500 / 6000
CMP71ZM/L		7	10	14	20	
CMPZ80S	BY4	14	20	28	40	2000 / 3000 / 4500
CMP80ZM/L		14	20	28	40	
CMPZ100S	BY8	28	40	55	80	2000 / 3000 / 4500
CMPZ100M/L		28	40	55	80	
CMP112S	BY14	50	70	100	140	2000 / 3000 / 4500
CMP112M/L		50	70	100	140	
CMP112L/H/E		50	70	100	140	

$M_{2,\ 20\ °C}$ Nominal torque for slipping brake disk (relative speed between brake disk and friction surface: 1 m/s) at 20 °C
Standard braking torque
Optional braking torque

8.3.2 No-load starting frequency

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

Brake type	No-load starting frequency
BY2	7200 1/h
BY4	5400 1/h
BY8	3600 1/h
BY14	2400 1/h

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8.3.3 Operating currents of BY brakes

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 U_N

The acceleration current I_B (= inrush current) only flows for a short time (about 150 ms) when the brake is released or during voltage dips below 70% of nominal 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	BY14
Braking torque $M_{2,\ 20\ °C}$ in Nm	20	40	80	140
Braking power in W	27	38	45	76
Inrush current ratio I_B/I_H or I_B/I_G	5	4	4	5.2

Nominal voltage U_N		I_H	I_G	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}	A_{AC}	A_{DC}
	24 (21.6 – 26.4)	–	1.05	–	1.4	–	1.6	–	2.8
110 (99 – 121)		0,425	–	0.58	–	0.69	–	1.542	–
230 (218 – 243)		0.19	–	0.26	–	0.305	–	0.689	–
400 (380 – 431)		0.107	–	0.147	–	0.172	–	0.387	–
460 (432 – 484)		0.095	–	0.131	–	0.154	–	0.345	–

$M_{2,\ 20\ °C}$ Nominal torque for slipping brake disk (relative speed between brake disk and friction surface: 1 m/s) at 20 °C
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 Nominal voltage (nominal voltage range)

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8.3.4 Resistance values of BY brake coils

	BY2	BY4	BY8	BY14
Braking torque $M_{2,\ 20\ °C}$ in Nm	20	40	80	140
Braking power in W	27	38	45	76

Nominal voltage U_N		R_B	R_T	R_B	R_T	R_B	R_T	R_B	R_T
V_{AC}	V_{DC}	Ω	Ω	Ω	Ω	Ω	Ω	Ω	Ω
	24 (21.6 – 26.4)	5.2	20	4.3	13.3	3.8	11.2	1.6	6.5
110 (99 – 121)		16.3	64	13.7	42	12	35.5	4.9	20.5
230 (218 – 243)		82	320	69	210	60	177	24.6	102.8
400 (380 – 431)		260	1010	215	670	191	560	77.8	325.1
460 (432 – 484)		325	1270	275	840	240	700	97.9	409.3

$M_{2,\ 20\ °C}$ Nominal torque for slipping brake disk (relative speed between brake disk and friction surface: 1 m/s) at 20 °C
R_B Accelerator coil resistance at 20 °C
R_T Coil section resistance at 20 °C
U_N Nominal voltage (nominal voltage range)

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8.3.5 Braking work and braking torques

Brake type	Braking work until maintenance W_{insp}		Braking torque settings					
		Pressure plate order number	Braking torque $M_{2,\ 20\ °C}$	Type and number of			Order numbers for brake springs	
	10^6 J		Nm	Normal	Red	Blue	Normal	Red/blue
BY2	35	16450450	20	6	–	–	01866621	01837427
			14	4	2	–		
		16450965	10	3	–	–		
			7	2	2	–		
BY4	50	16445856	40	6	–	–	0186663X	01840037
			28	4	2	–		
		16447840	20	3	–	–		
			14	2	2	–		
BY8	60	16444876	80	6	–	–	16446011	16446038
			55	4	2	–		
		16447859	40	3	–	–		
			28	2	2	–		
BY14	200	16451422	140	4	–	4	13741837	13741845
			100	3	–	3		
		16451961	70	2	–	2		
			50	-	–	4		

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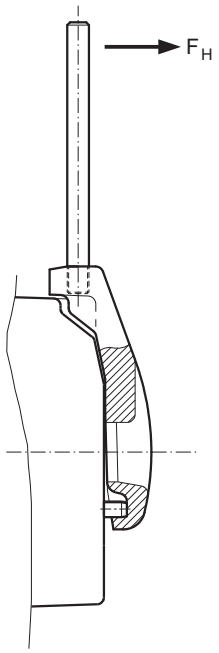
8.3.6 Manual brake release

In brakemotors with /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.



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Brake type	Motor type	Actuation force F_H in N
BY2	CMPZ71	50
BY4	CMPZ80	70
BY8	CMPZ100	90
BY14	CMP112	300

For BY2, BY4, and BY8, the manual brake release option /HR can no longer be combined with the forced cooling fan option /VR.

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8.3.7 B_{10d} values

Definition of the characteristic safety value B_{10d}:

The value B_{10d} specifies the number of cycles at which 10% of components have failed dangerously (definition according to standard EN ISO 13849). Failed dangerously means in this context that the brake is not applied when required. This means the brake does not deliver the necessary braking torque.

Size BY..	B_{10d} Switching cycles
BY2	8 000 000
BY4	6 000 000
BY8	3 000 000
BY14	2 000 000

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8.4 Safety categories of standard design

INFORMATION

Usage in safety-related applications:

The system/machine manufacturer is responsible for compliance of the system/machine with applicable safety regulations.

If a brake is used to fulfill a safety function, then the brake is to be regarded as component (element) and not as safety-related subsystem. The brake alone is usually not sufficient to execute a safety function in compliance with the standard.

Definition of the categories:

The categories classify safety-related components regarding their resistance to errors and their response in the event of an error based on the reliability and/or the structural arrangement of the parts. A higher resistance to errors means a higher potential to reduce risk.

Brake type	Category (according to EN ISO 13849)
BK.. brake	Category B
BP.. brake	Category B
BY.. brake[1)]	Category B

1) The safety-rated design of BY brakes has higher B10d values.

For further information on characteristic safety value of the brake, refer to the respective data sheets on the SEW-EURODRIVE homepage www.sew-eurodrive.de.

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9 Malfunctions

⚠ CAUTION

During operation, servomotors can reach a surface temperature of more than 100 °C.

Risk of burns.

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

NOTICE

Destruction of the motor due to multiple acknowledgements of a motor protection fault.

Damage to property, damage to the motor.

- Do not acknowledge a motor protection fault more than once. If an acknowledged motor protection fault occurs again shortly after the acknowledgement, you must first determine the cause for the fault and remedy it.

NOTICE

Improper troubleshooting measures may damage the servomotor.

Possible damage to property.

- 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 spare 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 interference.
- Time the interference occurred and any accompanying circumstances.
- Assumed cause.

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9.2 Encoder malfunctions

When a BY brake is used, the working air gap of the brake must be measured at regular intervals, which are specified in chapter "Inspection/Maintenance" (→ 🗎 89).

A working air gap that exceeds the permitted maximum value can cause encoder errors or destroy the encoder.

Encoder malfunctions are displayed at the inverter with a corresponding error message.

9.3 Malfunctions of the servo inverter

INFORMATION

The malfunctions described in sections "Malfunctions of the servomotor" and "Malfunctions of the brake" 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 Disposal

This product consists of:

- Iron
- Aluminum
- Copper
- Plastics
- Electronic components

Dispose of all components in accordance with applicable regulations.

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10 Address list

Algeria			
Sales	Algiers	REDUCOM Sarl 16, rue des Frères Zaghnoune Bellevue 16200 El Harrach Alger	Tel. +213 21 8214-91 Fax +213 21 8222-84 http://www.reducom-dz.com info@reducom-dz.com
Argentina			
Assembly Sales	Buenos Aires	SEW EURODRIVE ARGENTINA S.A. Ruta Panamericana Km 37.5, Lote 35 (B1619IEA) Centro Industrial Garín Prov. de Buenos Aires	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 http://www.sew-eurodrive.com.ar sewar@sew-eurodrive.com.ar
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			
Assembly Sales Service	Vienna	SEW-EURODRIVE Ges.m.b.H. Richard-Strauss-Strasse 24 A-1230 Wien	Tel. +43 1 617 55 00-0 Fax +43 1 617 55 00-30 http://www.sew-eurodrive.at sew@sew-eurodrive.at
Bangladesh			
Sales	Bangladesh	SEW-EURODRIVE INDIA PRIVATE LIMITED 345 DIT Road East Rampura Dhaka-1219, Bangladesh	Tel. +88 01729 097309 salesdhaka@seweurodrivebangladesh.com
Belarus			
Sales	Minsk	Foreign Enterprise Industrial Components RybalkoStr. 26 BY-220033 Minsk	Tel. +375 17 298 47 56 / 298 47 58 Fax +375 17 298 47 54 http://www.sew.by sales@sew.by
Belgium			
Assembly Sales Service	Brussels	SEW-EURODRIVE n.v./s.a. Researchpark Haasrode 1060 Evenementenlaan 7 BE-3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.be info@sew-eurodrive.be
Service Competence Center	Industrial Gears	SEW-EURODRIVE n.v./s.a. 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
Brazil			
Production Sales Service	São Paulo	SEW-EURODRIVE Brasil Ltda. Estrada Municipal José Rubim, 205 – Rodovia Santos Dumont Km 49 Indaiatuba – 13347-510 – SP	Tel. +55 19 3835-8000 sew@sew.com.br
Assembly Sales Service	Rio Claro	SEW-EURODRIVE Brasil Ltda. Rodovia Washington Luiz, Km 172 Condomínio Industrial Conpark Caixa Postal: 327 13501-600 – Rio Claro / SP	Tel. +55 19 3522-3100 Fax +55 19 3524-6653 montadora.rc@sew.com.br
	Joinville	SEW-EURODRIVE Brasil Ltda. Rua Dona Francisca, 12.346 – Pirabeiraba 89239-270 – Joinville / SC	Tel. +55 47 3027-6886 Fax +55 47 3027-6888 filial.sc@sew.com.br
Bulgaria			
Sales	Sofia	BEVER-DRIVE GmbH Bogdanovetz Str.1 BG-1606 Sofia	Tel. +359 2 9151160 Fax +359 2 9151166 bever@bever.bg

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Cameroon			
is supported by Germany			
Canada			
Assembly Sales Service	Toronto	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, ON L6T 3W1	Tel. +1 905 791-1553 Fax +1 905 791-2999 http://www.sew-eurodrive.ca l.watson@sew-eurodrive.ca
	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
Chile			
Assembly Sales Service	Santiago de Chile	SEW-EURODRIVE CHILE LTDA Las Encinas 1295 Parque Industrial Valle Grande LAMPA RCH-Santiago de Chile P.O. Box Casilla 23 Correo Quilicura - Santiago - Chile	Tel. +56 2 2757 7000 Fax +56 2 2757 7001 http://www.sew-eurodrive.cl ventas@sew-eurodrive.cl
China			
Production Assembly Sales Service	Tianjin	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 78, 13th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25323273 http://www.sew-eurodrive.cn info@sew-eurodrive.cn
Assembly Sales Service	Suzhou	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew-eurodrive.cn
	Guangzhou	SEW-EURODRIVE (Guangzhou) Co., Ltd. No. 9, JunDa Road East Section of GETDD Guangzhou 510530	Tel. +86 20 82267890 Fax +86 20 82267922 guangzhou@sew-eurodrive.cn
	Shenyang	SEW-EURODRIVE (Shenyang) Co., Ltd. 10A-2, 6th Road Shenyang Economic Technological Development Area Shenyang, 110141	Tel. +86 24 25382538 Fax +86 24 25382580 shenyang@sew-eurodrive.cn
	Taiyuan	SEW-EURODRIVE (Taiyuan) Co,. Ltd. No.3, HuaZhang Street, TaiYuan Economic & Technical Development Zone ShanXi, 030032	Tel. +86-351-7117520 Fax +86-351-7117522 taiyuan@sew-eurodrive.cn
	Wuhan	SEW-EURODRIVE (Wuhan) Co., Ltd. 10A-2, 6th Road No. 59, the 4th Quanli Road, WEDA 430056 Wuhan	Tel. +86 27 84478388 Fax +86 27 84478389 wuhan@sew-eurodrive.cn
	Xi'An	SEW-EURODRIVE (Xi'An) Co., Ltd. No. 12 Jinye 2nd Road Xi'An High-Technology Industrial Development Zone Xi'An 710065	Tel. +86 29 68686262 Fax +86 29 68686311 xian@sew-eurodrive.cn
Sales Service	Hong Kong	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. +852 36902200 Fax +852 36902211 contact@sew-eurodrive.hk
Colombia			
Assembly Sales Service	Bogota	SEW-EURODRIVE COLOMBIA LTDA. Calle 22 No. 132-60 Bodega 6, Manzana B Santafé de Bogotá	Tel. +57 1 54750-50 Fax +57 1 54750-44 http://www.sew-eurodrive.com.co sew@sew-eurodrive.com.co

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Croatia			
Sales Service	Zagreb	KOMPEKS d. o. o. Zeleni dol 10 HR 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@inet.hr
Czech Republic			
Assembly Sales Service	Hostivice	SEW-EURODRIVE CZ s.r.o. Floriánova 2459 253 01 Hostivice	Tel. +420 255 709 601 Fax +420 235 350 613 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz
	Drive Service Hotline / 24 Hour Service	+420 800 739 739 (800 SEW SEW)	Service Tel. +420 255 709 632 Fax +420 235 358 218 servis@sew-eurodrive.cz
Denmark			
Assembly Sales Service	Copenhagen	SEW-EURODRIVEA/S Geminivej 28-30 DK-2670 Greve	Tel. +45 43 95 8500 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk
Egypt			
Sales Service	Cairo	Copam Egypt for Engineering & Agencies 33 EI Hegaz ST Heliopolis, Cairo	Tel. +20 222566299 Fax +20 2 22594-757 http://www.copam-egypt.com copam@copam-egypt.com
Estonia			
Sales	Tallin	ALAS-KUUL AS Reti tee 4 EE-75301 Peetri küla, Rae vald, Harjumaa	Tel. +372 6593230 Fax +372 6593231 http://www.alas-kuul.ee veiko.soots@alas-kuul.ee
Finland			
Assembly Sales Service	Hollola	SEW-EURODRIVE OY Vesimäentie 4 FIN-15860 Hollola 2	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
Service	Hollola	SEW-EURODRIVE OY Keskikankaantie 21 FIN-15860 Hollola	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
Production Assembly	Karkkila	SEW Industrial Gears Oy Santasalonkatu 6, PL 8 FI-03620 Karkkila, 03601 Karkkila	Tel. +358 201 589-300 Fax +358 201 589-310 http://www.sew-eurodrive.fi sew@sew.fi
France			
Production Sales Service	Hagenau	SEW-USOCOME 48-54 route de Soufflenheim B. P. 20185 F-67506 Haguenau Cedex	Tel. +33 3 88 73 67 00 Fax +33 3 88 73 66 00 http://www.usocome.com sew@usocome.com
Production	Forbach	SEW-USOCOME Zone industrielle Technopôle Forbach Sud B. P. 30269 F-57604 Forbach Cedex	Tel. +33 3 87 29 38 00
	Brumath	SEW-USOCOME 1 rue de Bruxelles F-67670 Mommenheim	Tel. +33 3 88 37 48 48
Assembly Sales Service	Bordeaux	SEW-USOCOME Parc d'activités de Magellan 62 avenue de Magellan – B. P. 182 F-33607 Pessac Cedex	Tel. +33 5 57 26 39 00 Fax +33 5 57 26 39 09
	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

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France			
	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
	Paris	SEW-USOCOME Zone industrielle 2 rue Denis Papin F-77390 Verneuil l'Étang	Tel. +33 1 64 42 40 80 Fax +33 1 64 42 40 88
Gabon			
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Germany			
Headquarters Production Sales	Bruchsal	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal P.O. Box Postfach 3023 – D-76642 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
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
Production	Graben	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 D-76676 Graben-Neudorf P.O. Box Postfach 1220 – D-76671 Graben-Neudorf	Tel. +49 7251 75-0 Fax +49 7251-2970
	Östringen	SEW-EURODRIVE GmbH & Co KG, Werk Östringen Franz-Gurk-Straße 2 D-76684 Östringen	Tel. +49 7253 9254-0 Fax +49 7253 9254-90 oestringen@sew-eurodrive.de
Service Competence Center	Mechanics / Mechatronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 D-76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 scc-mechanik@sew-eurodrive.de
	Electronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 scc-elektronik@sew-eurodrive.de
Drive Technology Center	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 40-42 D-30823 Garbsen (Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 dtc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg 1 D-08393 Meerane (Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 dtc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 D-85551 Kirchheim (München)	Tel. +49 89 909552-10 Fax +49 89 909552-50 dtc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 D-40764 Langenfeld (Düsseldorf)	Tel. +49 2173 8507-30 Fax +49 2173 8507-55 dtc-west@sew-eurodrive.de
Drive Center	Berlin	SEW-EURODRIVE GmbH & Co KG Alexander-Meißner-Straße 44 D-12526 Berlin	Tel. +49 306331131-30 Fax +49 306331131-36 dc-berlin@sew-eurodrive.de
	Ludwigshafen	SEW-EURODRIVE GmbH & Co KG c/o BASF SE Gebäude W130 Raum 101 D-67056 Ludwigshafen	Tel. +49 7251 75 3759 Fax +49 7251 75 503759 dc-ludwigshafen@sew-eurodrive.de
	Saarland	SEW-EURODRIVE GmbH & Co KG Gottlieb-Daimler-Straße 4 D-66773 Schwalbach Saar – Hülzweiler	Tel. +49 6831 48946 10 Fax +49 6831 48946 13 dc-saarland@sew-eurodrive.de
	Ulm	SEW-EURODRIVE GmbH & Co KG Dieselstraße 18 D-89160 Dornstadt	Tel. +49 7348 9885-0 Fax +49 7348 9885-90 dc-ulm@sew-eurodrive.de
	Würzburg	SEW-EURODRIVE GmbH & Co KG Nürnbergerstraße 118 D-97076 Würzburg-Lengfeld	Tel. +49 931 27886-60 Fax +49 931 27886-66 dc-wuerzburg@sew-eurodrive.de
Drive Service Hotline / 24 Hour Service			+49 800 SEWHELP +49 800 7394357

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Great Britain			
Assembly Sales Service	Normanton	SEW-EURODRIVE Ltd. DeVilliers Way Trident Park Normanton West Yorkshire WF6 1GX	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk
	Drive Service Hotline / 24 Hour Service		Tel. 01924 896911
Greece			
Sales	Athens	Christ. Boznos & Son S.A. 12, K. Mavromichali Street P.O. Box 80136 GR-18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr
Hungary			
Sales Service	Budapest	SEW-EURODRIVE Kft. Csillaghegyí út 13. H-1037 Budapest	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 http://www.sew-eurodrive.hu office@sew-eurodrive.hu
Iceland			
Sales	Reykjavik	Varma & Vélaverk ehf. Knarrarvogi 4 IS-104 Reykjavík	Tel. +354 585 1070 Fax +354 585)1071 http://www.varmaverk.is vov@vov.is
India			
Registered Office Assembly Sales Service	Vadodara	SEW-EURODRIVE India Private Limited Plot No. 4, GIDC POR Ramangamdi • Vadodara - 391 243 Gujarat	Tel. +91 265 3045200 Fax +91 265 3045300 http://www.seweurodriveindia.com salesvadodara@seweurodriveindia.com
Assembly Sales Service	Chennai	SEW-EURODRIVE India Private Limited Plot No. K3/1, Sipcot Industrial Park Phase II Mambakkam Village Sriperumbudur - 602105 Kancheepuram Dist, Tamil Nadu	Tel. +91 44 37188888 Fax +91 44 37188811 saleschennai@seweurodriveindia.com
	Pune	SEW-EURODRIVE India Private Limited Plant: Plot No. D236/1, Chakan Industrial Area Phase- II, Warale, Tal- Khed, Pune-410501, Maharashtra	Tel. +91 21 35301400 salespune@seweurodriveindia.com
Indonesia			
Sales	Jakarta	PT. Cahaya Sukses Abadi Komplek Rukan Puri Mutiara Blok A no 99, Sunter Jakarta 14350	Tel. +62 21 65310599 Fax +62 21 65310600 csajkt@cbn.net.id
	Jakarta	PT. Agrindo Putra Lestari JL.Pantai Indah Selatan, Komplek Sentra Industri Terpadu, Pantai indah Kapuk Tahap III, Blok E No. 27 Jakarta 14470	Tel. +62 21 2921-8899 Fax +62 21 2921-8988 aplindo@indosat.net.id http://www.aplindo.com
	Medan	PT. Serumpun Indah Lestari Jl.Pulau Solor no. 8, Kawasan Industri Medan II Medan 20252	Tel. +62 61 687 1221 Fax +62 61 6871429 / +62 61 6871458 / +62 61 30008041 sil@serumpunindah.com serumpunindah@yahoo.com http://www.serumpunindah.com
	Surabaya	PT. TRIAGRI JAYA ABADI Jl. Sukosemolo No. 63, Galaxi Bumi Permai G6 No. 11 Surabaya 60111	Tel. +62 31 5990128 Fax +62 31 5962666 sales@triagri.co.id http://www.triagri.co.id
	Surabaya	CV. Multi Mas Jl. Raden Saleh 43A Kav. 18 Surabaya 60174	Tel. +62 31 5458589 Fax +62 31 5317220 sianhwa@sby.centrin.net.id http://www.cvmultimas.com

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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 http://www.alperton.ie info@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 79 97 81 http://www.sew-eurodrive.it sewit@sew-eurodrive.it
Ivory Coast			
Sales	Abidjan	SEW-EURODRIVE SARL Ivory Coast Rue des Pècheurs, Zone 3 26 BP 916 Abidjan 26	Tel. +225 21 21 81 05 Fax +225 21 25 30 47 info@sew-eurodrive.ci http://www.sew-eurodrive.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 373814 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp hamamatsu@sew-eurodrive.co.jp
Kazakhstan			
Sales	Almaty	SEW-EURODRIVE LLP 291-291A, Tole bi street 050031, Almaty	Tel. +7 (727) 350 5156 Fax +7 (727) 350 5156 http://www.sew-eurodrive.kz sew@sew-eurodrive.kz
	Tashkent	SEW-EURODRIVE LLP Representative office in Uzbekistan 96A, Sharaf Rashidov street, Tashkent, 100084	Tel. +998 71 2359411 Fax +998 71 2359412 http://www.sew-eurodrive.uz sew@sew-eurodrive.uz
	Ulaanbaatar	SEW-EURODRIVE LLP Representative office in Mongolia Suite 407, Tushig Centre Seoul street 23, Sukhbaatar district, Ulaanbaatar 14250	Tel. +976-77109997 Fax +976-77109997 http://www.sew-eurodrive.mn sew@sew-eurodrive.mn
Kenya			
is supported by Tanzania			
Latvia			
Sales	Riga	SIA Alas-Kuul Katlakalna 11C LV-1073 Riga	Tel. +371 6 7139253 Fax +371 6 7139386 http://www.alas-kuul.lv info@alas-kuul.com
Lebanon			
Sales (Lebanon)	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
Sales (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 http://www.medrives.com info@medrives.com

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Lithuania			
Sales	Alytus	UAB Irseva Statybininku 106C LT-63431 Alytus	Tel. +370 315 79204 Fax +370 315 56175 http://www.irseva.lt irmantas@irseva.lt
Luxembourg			
Assembly Sales Service	Brussels	SEW-EURODRIVE n.v./s.a. Researchpark Haasrode 1060 Evenementenlaan 7 BE-3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.lu info@sew-eurodrive.be
Macedonia			
Sales	Skopje	Boznos DOOEL Dime Anicin 2A/7A 1000 Skopje	Tel. +389 23256553 Fax +389 23256554 http://www.boznos.mk
Madagascar			
Sales	Antananarivo	Ocean Trade BP21bis. Andraharo Antananarivo 101 Madagascar	Tel. +261 20 2330303 Fax +261 20 2330330 oceantrabp@moov.mg
Malaysia			
Assembly Sales Service	Johor	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
Mexiko			
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
Mongolia			
Technical Office	Ulaanbaatar	SEW-EURODRIVE LLP Representative office in Mongolia Suite 407, Tushig Centre Seoul street 23, Sukhbaatar district, Ulaanbaatar 14250	Tel. +976-77109997 Fax +976-77109997 http://www.sew-eurodrive.mn sew@sew-eurodrive.mn
Morocco			
Sales Service	Mohammedia	SEW-EURODRIVE SARL 2 bis, Rue Al Jahid 28810 Mohammedia	Tel. +212 523 32 27 80/81 Fax +212 523 32 27 89 http://www.sew-eurodrive.ma sew@sew-eurodrive.ma
Namibia			
Sales	Swakopmund	DB Mining & Industrial Services Einstein Street Strauss Industrial Park Unit1 Swakopmund	Tel. +264 64 462 738 Fax +264 64 462 734 anton@dbminingnam.com
Netherlands			
Assembly Sales Service	Rotterdam	SEW-EURODRIVE B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 Service: 0800-SEWHELP http://www.sew-eurodrive.nl info@sew-eurodrive.nl
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

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New Zealand			
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 30 Lodestar Avenue, Wigram Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz
Nigeria			
Sales	Lagos	EISNL Engineering Solutions and Drives Ltd Plot 9, Block A, Ikeja Industrial Estate (Ogba Scheme) Adeniyi Jones St. End Off ACME Road, Ogba, Ikeja, Lagos	Tel. +234 1 217 4332 http://www.eisnl.com team.sew@eisnl.com
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
Paraguay			
Sales	Fernando de la Mora	SEW-EURODRIVE PARAGUAY S.R.L De la Victoria 112, Esquina nueva Asunción Departamento Central Fernando de la Mora, Barrio Bernardino	Tel. +595 991 519695 Fax +595 21 3285539 sewpy@sew-eurodrive.com.py
Peru			
Assembly Sales Service	Lima	SEW EURODRIVE DEL PERU 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
Philippines			
Sales	Makati	P.T. Cerna Corporation 4137 Ponte St., Brgy. Sta. Cruz Makati City 1205	Tel. +63 2 519 6214 Fax +63 2 890 2802 mech_drive_sys@ptcerna.com http://www.ptcerna.com
Poland			
Assembly Sales Service	Łódź	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 PL-92-518 Łódź	Tel. +48 42 293 00 00 Fax +48 42 293 00 49 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
	Service	Tel. +48 42 293 0030 Fax +48 42 293 0043	24 Hour Service Tel. +48 602 739 739 (+48 602 SEW SEW) serwis@sew-eurodrive.pl
Portugal			
Assembly Sales Service	Coimbra	SEW-EURODRIVE, LDA. Av. da Fonte Nova, n.º 86 P-3050-379 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. Brazilia nr. 36 011783 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro
Russia			
Assembly Sales Service	St. Petersburg	ЗАО «СЕВ-ЕВРОДРАЙФ» а. я. 36 195220 Санкт-Петербург	Tel. +7 812 3332522 / +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru

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Sambia			
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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 http://www.senemeca.com senemeca@senemeca.sn
Serbia			
Sales	Belgrade	DIPAR d.o.o. Ustanicka 128a PC Košum, IV floor SRB-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, 217, 201 Fax +421 2 33595 200 http://www.sew-eurodrive.sk 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 Mobile +421 907 671 976 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 11 248-7289 http://www.sew.co.za info@sew.co.za
	Cape Town	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 bgriffiths@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 48 Prospecton Road Isipingo Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 902 3815 Fax +27 31 902 3826 cdejager@sew.co.za
	Nelspruit	SEW-EURODRIVE (PROPRIETARY) LIMITED 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	SEW-EURODRIVE KOREA CO., LTD. 7, Dangjaengi-ro, Danwon-gu, Ansan-si, Gyeonggi-do, Zip 425-839	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-eurodrive.kr master.korea@sew-eurodrive.com

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South Korea			
	Busan	SEW-EURODRIVE KOREA CO., LTD. 28, Noksansandan 262-ro 50beon-gil, Gangseo-gu, Busan, Zip 618-820	Tel. +82 51 832-0204 Fax +82 51 832-0230
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
Sri Lanka			
Sales	Colombo	SM International (Pte) Ltd 254, Galle Raod Colombo 4, Sri Lanka	Tel. +94 1 2584887 Fax +94 1 2582981
Swaziland			
Sales	Manzini	C G Trading Co. (Pty) Ltd PO Box 2960 Manzini M200	Tel. +268 2 518 6343 Fax +268 2 518 5033 engineering@cgtrading.co.sz
Sweden			
Assembly Sales Service	Jönköping	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55 303 Jönköping Box 3100 S-55 003 Jönköping	Tel. +46 36 34 42 00 Fax +46 36 34 42 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
Taiwan			
Sales	Taipei	Ting Shou Trading Co., Ltd. 6F-3, No. 267, Sec. 2 Tung Huw S. Road Taipei	Tel. +886 2 27383535 Fax +886 2 27368268 Telex 27 245 sewtwn@ms63.hinet.net http://www.tingshou.com.tw
	Nan Tou	Ting Shou Trading Co., Ltd. No. 55 Kung Yeh N. Road Industrial District Nan Tou 540	Tel. +886 49 255353 Fax +886 49 257878 sewtwn@ms63.hinet.net http://www.tingshou.com.tw
Tanzania			
Sales	Daressalam	SEW-EURODRIVE PTY LIMITED TANZANIA Plot 52, Regent Estate PO Box 106274 Dar Es Salaam	Tel. +255 0 22 277 5780 Fax +255 0 22 277 5788 http://www.sew-eurodrive.co.tz central.mailbox@sew.co.tz
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	Kocaeli-Gebze	SEW-EURODRİVE Hareket Sistemleri San. Ve TIC. Ltd. Sti Gebze Organize Sanayi Böl. 400 Sok No. 401 41480 Gebze Kocaeli	Tel. +90 262 9991000 04 Fax +90 262 9991009 http://www.sew-eurodrive.com.tr sew@sew-eurodrive.com.tr

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Ukraine			
Assembly Sales Service	Dnipropetrovsk	ООО «СЕВ-Евродрайв» ул. Рабочая, 23-В, офис 409 49008 Днепропетровск	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
Uruguay			
Assembly Sales	Montevideo	SEW-EURODRIVE Uruguay, S. A. Jose Serrato 3569 Esqina Corumbe CP 12000 Montevideo	Tel. +598 2 21181-89 Fax +598 2 21181-90 sewuy@sew-eurodrive.com.uy
USA			
Production Assembly Sales Service	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 Production +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 USA provided on request!		
Uzbekistan			
Technical Office	Tashkent	SEW-EURODRIVE LLP Representative office in Uzbekistan 96A, Sharaf Rashidov street, Tashkent, 100084	Tel. +998 71 2359411 Fax +998 71 2359412 http://www.sew-eurodrive.uz sew@sew-eurodrive.uz
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 Huế - South Vietnam / Construction Materials 250 Binh Duong Avenue, Thu Dau Mot Town, Binh Duong Province HCM office: 91 Tran Minh Quyen Street District 10, Ho Chi Minh City	Tel. +84 8 8301026 Fax +84 8 8392223 khanh-nguyen@namtrung.com.vn http://www.namtrung.com.vn
	Hanoi	MICO LTD Quảng Trị - North Vietnam / All sectors except Construction Materials 8th Floor, Ocean Park Building, 01 Dao Duy Anh St, Ha Noi, Viet Nam	Tel. +84 4 39386666 Fax +84 4 3938 6888 nam_ph@micogroup.com.vn http://www.micogroup.com.vn

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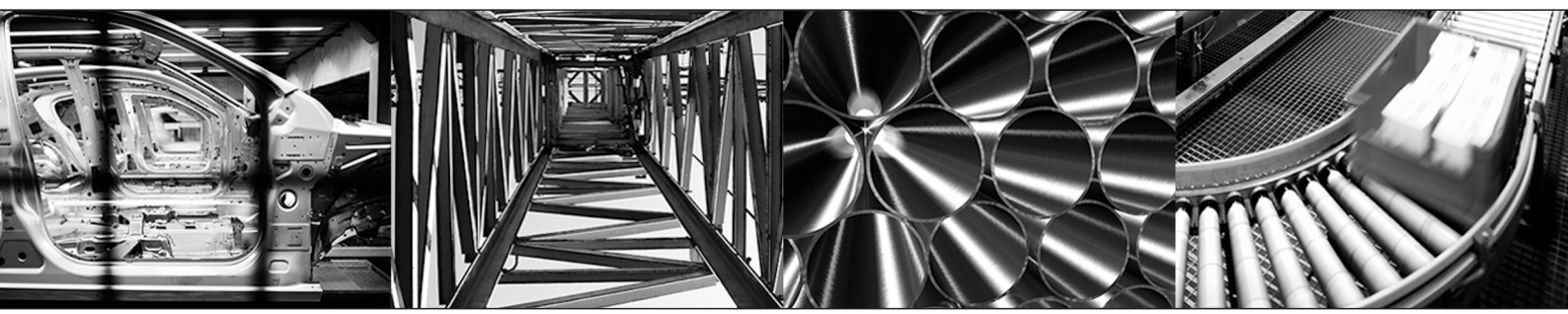

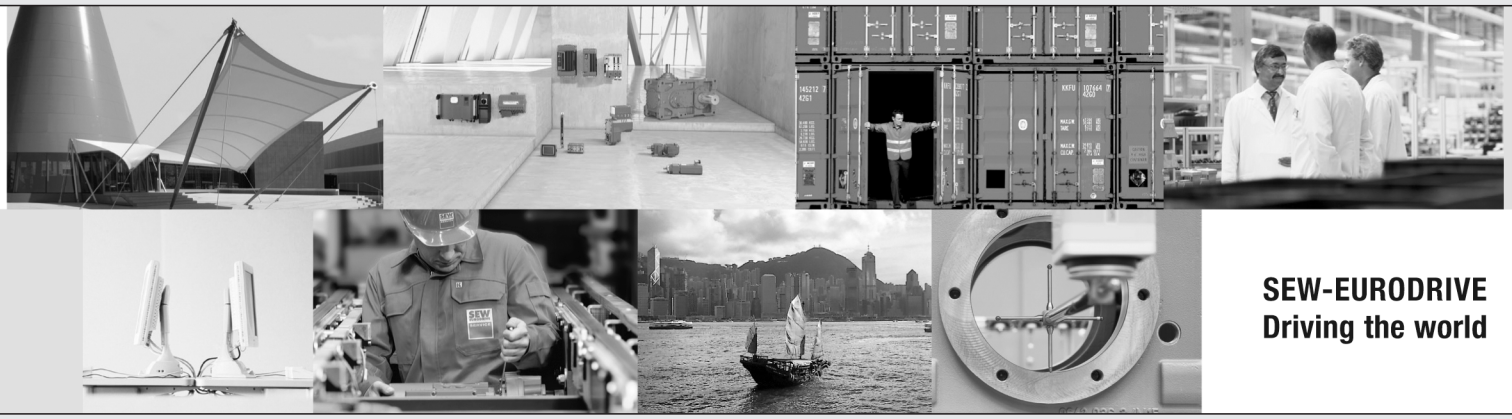

SEW-EURODRIVE
Driving the world

SEW-EURODRIVE GmbH & Co KG
P.O. Box 3023
76642 BRUCHSAL
GERMANY
Phone +49 7251 75-0
Fax +49 7251 75-1970
sew@sew-eurodrive.com
➞ **www.sew-eurodrive.com**