



SEW
EURODRIVE

Operating Instructions



Synchronous Servomotors

CMP40 – CMP100

CMPZ71 – CMPZ100





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1 General Information

1.1 How to use the operating instructions

Operating instructions are an integral part of the product and contain important information for operation and service. They are intended for staff responsible for the assembly, installation, startup and maintenance of the product.

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

1.2 Structure of the safety notes

The safety notes in these operating instructions are designed as follows:

Pictogram	! SIGNAL WORD
	Type and source of danger. Possible consequence(s) if disregarded. • Measure(s) to prevent the danger.

Pictogram	Signal word	Meaning	Consequences if disregarded
Example:  General danger  Specific danger, e.g. electric shock	! DANGER ! WARNING ! CAUTION	Imminent danger Possible dangerous situation Possible dangerous situation	Severe or fatal injuries Severe or fatal injuries Minor injuries
	STOP	Possible damage to property	Damage to the drive system or its environment
	INFORMATION	Useful information or tip. Simplifies the handling of the drive system.	

**1.3 Rights to claim under limited warranty**

A requirement of fault-free operation and fulfillment of any rights to claim under limited warranty is that you adhere to the information in the operating instructions. Therefore, read the operating instructions before you start working with the unit.

1.4 Exclusion of liability

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

1.5 Motor type notation

These operating instructions cover the motor types CMP and CMPZ.

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

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



2 Safety Notes

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

2.1 General information

	! DANGER
	Servomotors, gearmotors and gear units may have live, uninsulated (in case of open connector/terminal boxes), and sometimes moving or rotating parts as well as hot surfaces during operation. Severe or fatal injuries. • All work related to transportation, storage, setup/mounting, connection, startup, maintenance and repair may only be carried out by qualified personnel, in strict observation 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 – National / regional regulations governing safety and the prevention of accidents • Never install damaged products • Immediately report any damages to the shipping company

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

Refer to the documentation for additional information.



2.2 Target group

Any mechanical work may only be performed by adequately qualified personnel. Qualified personnel in this context are persons who are familiar with the setup, mechanical installation, trouble shooting and maintenance for this product. Further, they are qualified as follows:

- Completed apprenticeship in the field of mechanical engineering (e.g. mechanic or mechatronic technician).
- They are familiar with these operating instructions.

Any electric work may only be performed by adequately qualified personnel. Qualified electricians in this context are persons who are familiar with the electronic installation, startup, trouble shooting and maintenance for this product. Further, they are qualified as follows:

- Completed apprenticeship in the field of electrical engineering (e.g. electric or mechatronic technician).
- They are familiar with these operating instructions.

All persons involved in any other work, such as transportation, storage, operation and disposal, must be trained appropriately.

2.3 Designated use

The designated use refers to the procedure specified in the operating instructions.

CMP and CMPZ synchronous servomotors are drive motors designed for use in industrial and commercial systems. Motor loads other than those specified and areas of application other than industrial and commercial systems should only be used after consultation with SEW-EURODRIVE.

The CMP and CMPZ synchronous servomotors meet the requirements of the low voltage directive 2006/95/EC. Do not take the unit into operation until you have established that the end product complies with the EC Machinery Directive 98/37/EC.

You must observe the technical data and information on the connection requirements as provided on the nameplate and in the documentation.



2.4 Transportation/storage

Follow the instructions on transportation, storage and proper handling.

Inspect the shipment for any damage that may have occurred in transit as soon as you receive the delivery. Inform the shipping company immediately. If you notice any transport damage, do not startup the motor, but contact the SEW-EURODRIVE Service.

Remove securing devices used for transportation prior to startup.

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

The installed lifting eyebolts comply with DIN 580. The loads and regulations specified in this standard must always be observed. If the gearmotor has 2 suspension eye lugs or lifting eyebolts, then you should also use both suspension eye lugs for attaching transport ropes. In this case, the tension force vector of the slings must not exceed a 45° angle according to DIN 580.

	INFORMATION
	• Screw in the lifting eyes all the way. • Make sure that the lifting eyes carry only a reduced load, as the angle of the load exceeds 45°. • Due to the angle of the load, the lifting eyes are oversized. Note that the lifting eyes are not designed to hold the entire load of the gear unit.

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

2.5 Mounting/installation

Observe the instructions in section 4, "Mechanical Installation", and section 5, "Electrical Installation".

The units must be installed and cooled according to the regulations and specifications in the corresponding documentation.

Protect the synchronous servomotors from excessive strain. Ensure that components are not deformed, particularly during transportation and handling.

The following applications are prohibited unless the unit is explicitly designed for such use:

- Use in potentially explosive atmospheres
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc.

**2.6 Electrical connection**

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.

Observe the wiring information and differing data on the nameplate.

Observe the instructions in section 5, "Electrical Installation".

2.7 Startup/operation

Whenever changes to normal operation occur, such as increased temperatures, noise, vibrations, determine the cause and consult the manufacturer.

Refer to the information in section 6, "Startup."

2.8 Inspection/maintenance

Comply with the instructions in section 8, "Inspection/Maintenance".

2.9 Disposal

This product consists of:

- Iron
- Aluminum
- Copper
- Plastic
- Electronic components

Dispose of all components in accordance with applicable regulations.



3 Scope of Delivery and Unit Design



For information on the delivery scope and project planning, refer to the "Synchronous Servomotors" catalog as well as the relevant gear unit operating instructions.

3.1 Nameplate and unit designation

3.1.1 Nameplate on the servomotor

Example: Nameplate of synchronous servo brakemotor CMP71M / BP / KY / AK0H / SB1

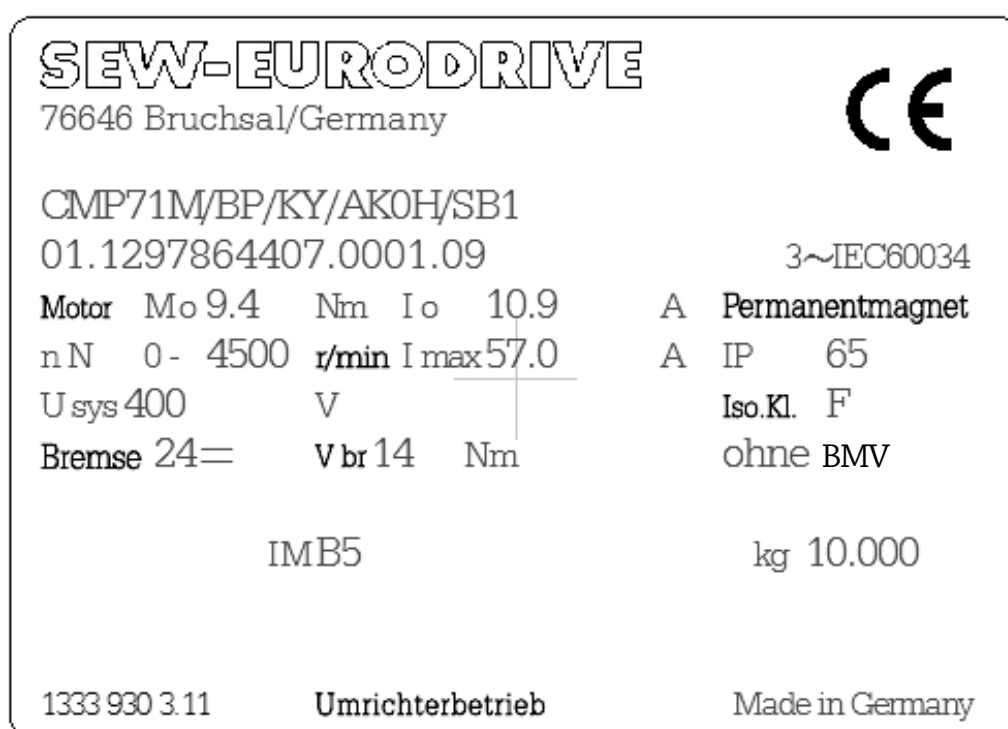
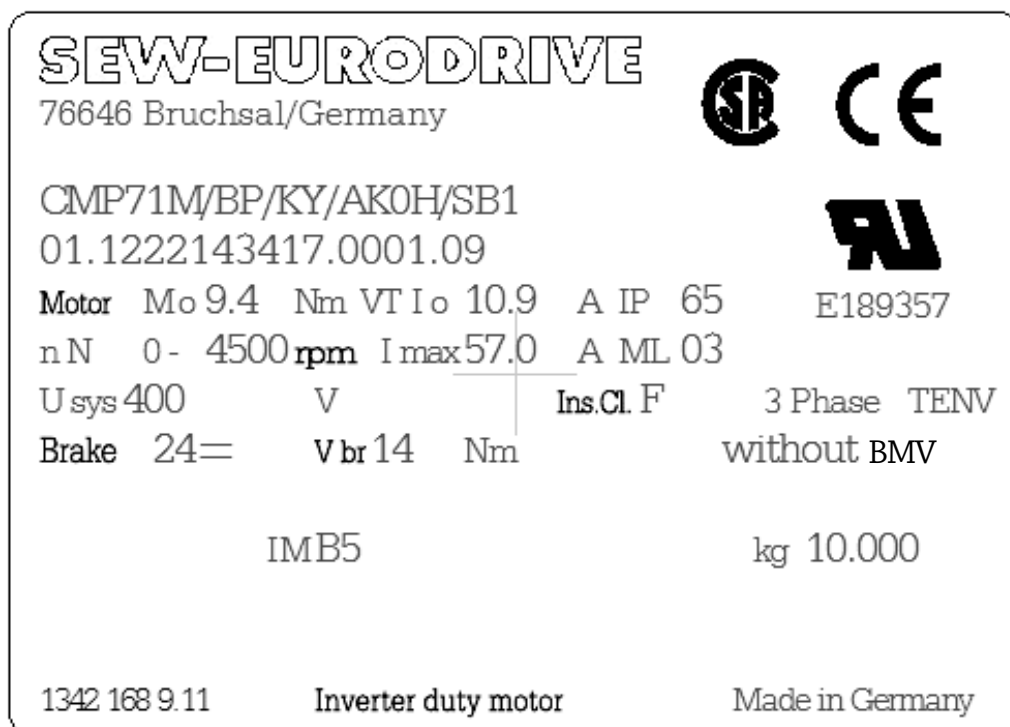


Figure 1: Nameplate on the CMP synchronous servo brake motor

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65852aen

Figure 2: Nameplate on the CMP synchronous servo brakemotor with UL and CSA approvals

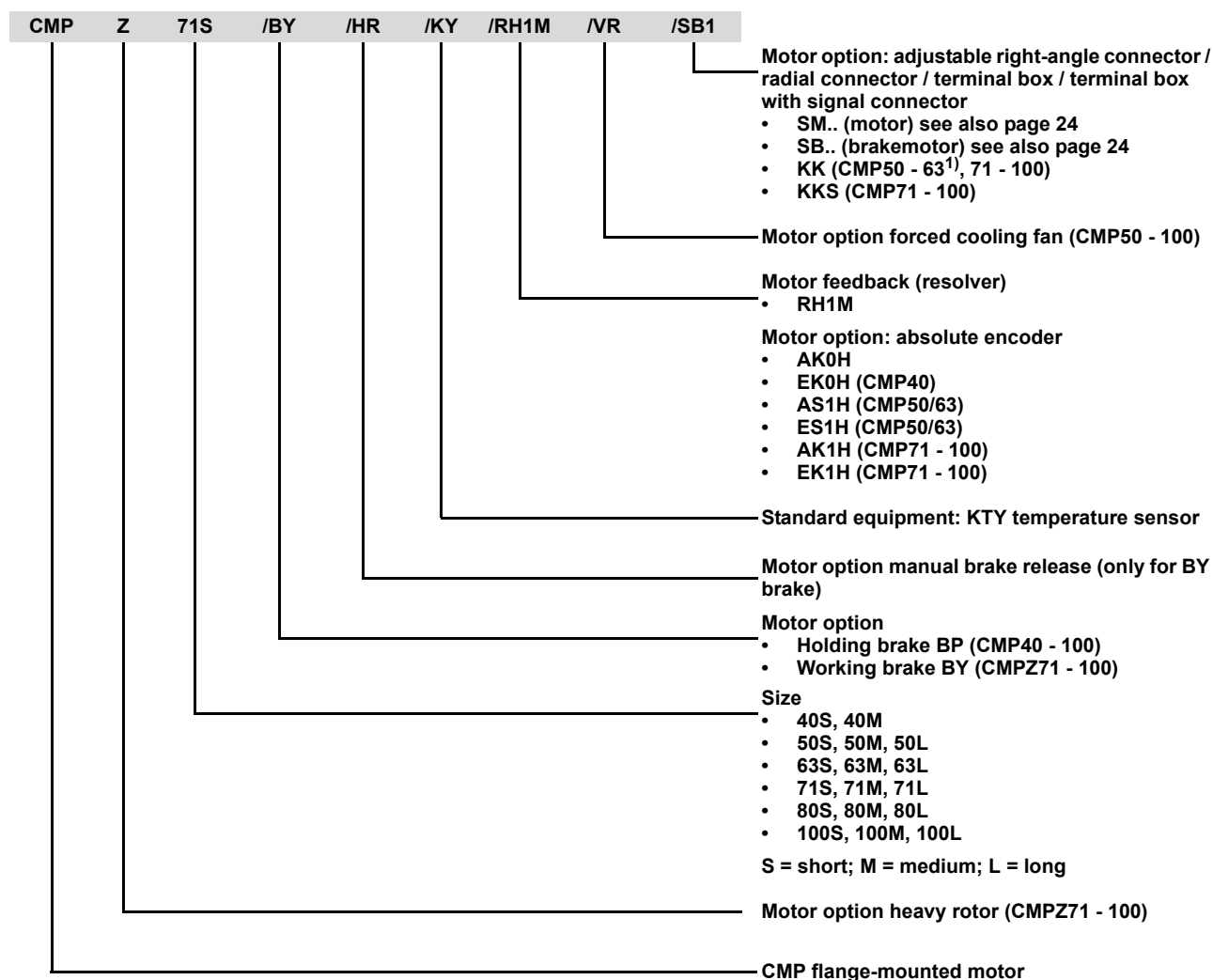


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Figure 3: Location of the nameplate

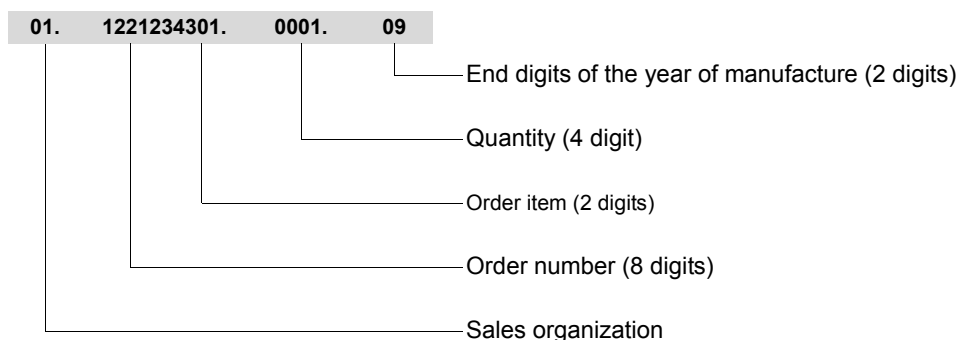


3.1.2 Unit designation of a servomotor



1) In preparation

3.1.3 Serial number

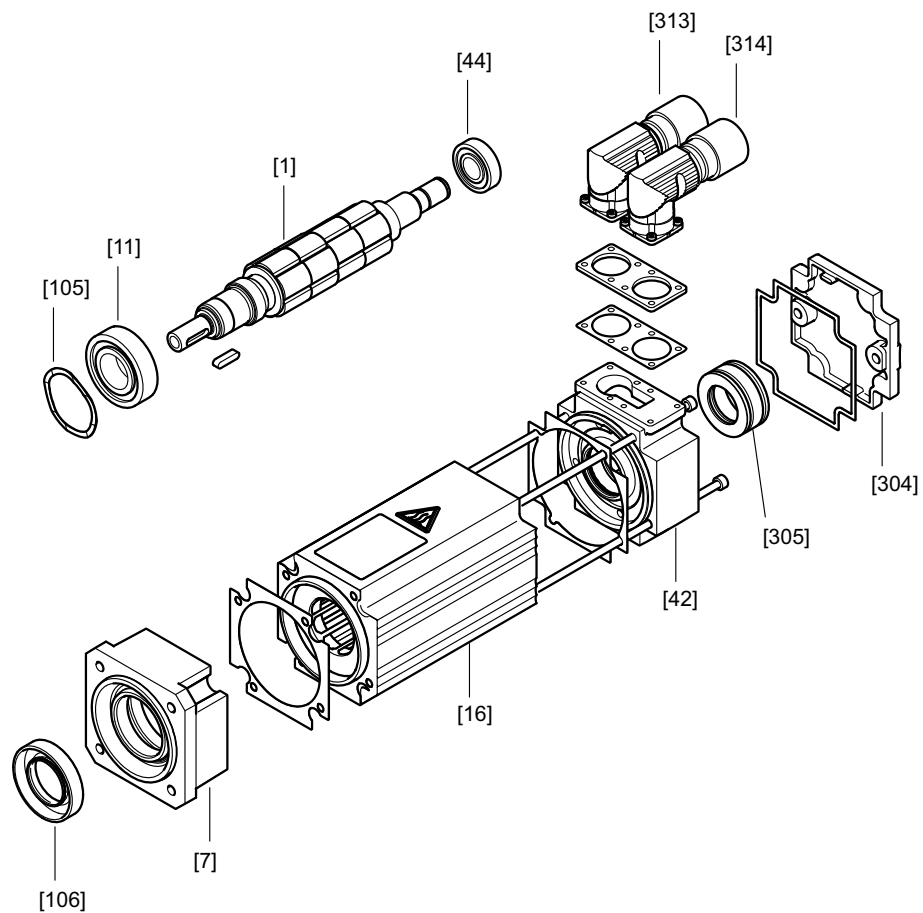




3.2 Structure of the synchronous CMP servomotor

	INFORMATION The following illustrations are intended to explain the general structure of the unit. Differences are possible depending on the motor size and variant.
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CMP40 - CMP63



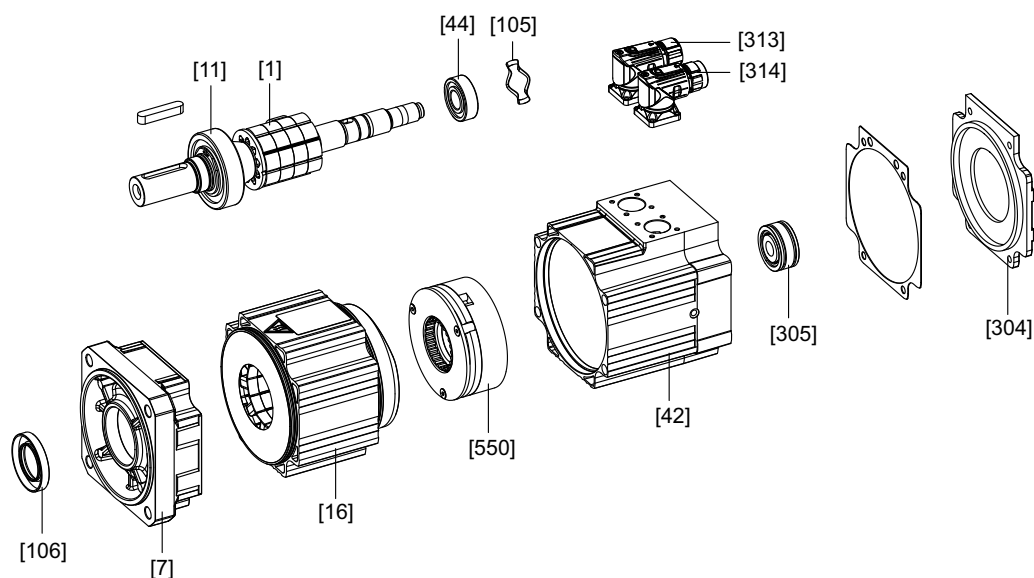
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Figure 4: General structure of the synchronous servomotor CMP40 - 63

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



CMP71 - CMP100 /BP



64024axx

Figure 5: General structure of the synchronous servomotor with brake CMP71 - 100

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



CMPZ71 - CMPZ100 /BY /KK/VR

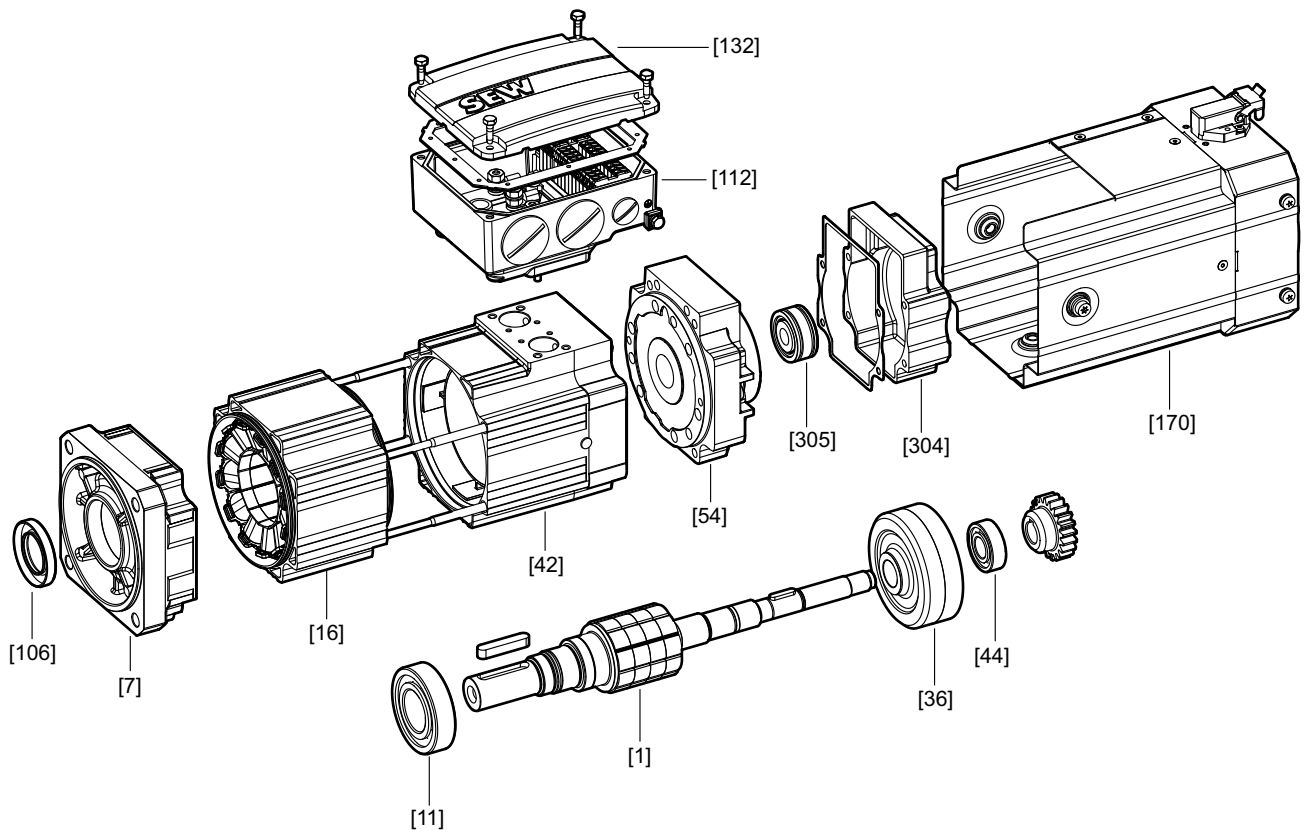


Figure 6: General structure of the synchronous servo brakemotor CMPZ71 - 100

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



4 Mechanical Installation

4.1 Required tools / resources

- Standard tools
- For plug connectors assembled by the customer:
 - Crimping pliers up to 10 mm² cable cross section
 - Crimping pliers for cable cross sections larger than 16 mm²
- For delivery until 12/2008: Removal tool for insulator when changing the plug connector.
- For delivery as of 01/2009: No tool required for right-angle plug connector.

4.2 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).
- 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 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 MSL, otherwise the drive must be designed to meet the special environmental conditions.
- The surrounding area is free from oils, acids, gases, vapors, radiation, etc.

4.3 Preliminary work

Motor shaft ends must be thoroughly cleaned of anti-corrosion agents, contamination or similar. Use a commercially available solvent. Solvent may not get in contact with bearing or sealing rings because it may damage material.

	 CAUTION
	The bearing and the sealing rings can be damaged if exposed to solvents. Potential damage to property. • Protect the bearing and sealing rings from exposure to solvents.



4.3.1 Long-term storage of servomotors

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

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

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

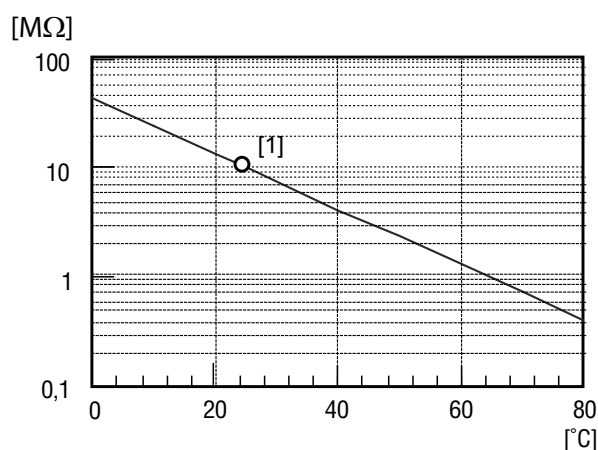


Figure 7: Insulation resistance depending on the temperature

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[1] Resistance/temperature point (RT point)

4.3.2 Insulation resistance too low



INFORMATION

Insulation resistance too low:

- Servomotor has absorbed moisture.

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



4.4 Installing the motor

	CAUTION
	Improper mounting may result in damages to the motor. Possible damage to property • Do only install the motor in the specified mounting position on a level, vibration-free and torsionally rigid support structure. • Align the motor and the driven machine carefully to avoid placing any unacceptable strain on the output shafts. • Observe the permitted overhung and axial loads, see the "Synchronous Servomotors" catalog. • Do not jolt or hammer the shaft end.

	WARNING
	The servomotor can have a surface temperature of more than 100 °C during operation. Risk of burns and fire. • Never touch the CMP synchronous servomotor during operation or in the cool down phase once it has been switched off.

Aligning the motor shaft

Align the servomotor and the driven machine carefully to avoid placing any unacceptable strain on the output shaft. Observe the permitted overhung and axial loads, see the "Synchronous Servomotors" catalog.

Do not jolt or hammer the shaft end.

Supply of cooling air

	CAUTION
	Vertical designs with VR forced-cooling fan can get damaged by foreign objects or moisture. Possible damage to property • Protect vertical mounting positions with VR forced cooling fan by installing a cover.

If a forced cooling fan is used, ensure there is sufficient clearance around the unit to allow for adequate cooling. Make sure that it does not reuse the air warmed by other devices. Position the unit housing **at least 10 cm** away from the wall.



Installation in damp locations or in the open

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

4.5 Installation tolerances

Shaft end (CMP.40 - 100)	Flanges (CMP.40 - 100)
Diameter tolerance in accordance with DIN 748 • ISO k6 • Center bore to DIN 332	Centering shoulder tolerance in accordance with EN 50347 • ISO j6



5 Electrical Installation

	! DANGER Danger of electric shock. Severe or fatal injuries! • It is essential to comply with the safety notes in chapter 2 during installation. • Switch contacts in utilization category AC-3 to EN 60947-4-1 must be used for switching the motor and the brake. • Use switch contacts in utilization category DC-3 to EN 60947-4-1 for connecting the brake to DC 24 V. • When motors are powered by inverters, you must adhere to the wiring instructions issued by the inverter manufacturer. • It is essential to observe the operating instructions supplied with the servo inverter.
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The wiring diagram for motor and brake is supplied in a bag attached to the motor.

	INFORMATION A bag containing the following information is attached to the motor: • Safety notes • Wiring diagram You must comply with this information.
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5.1 Connector installation

In motor variants with plug connectors, the power and signal cables are routed into the motor via adjustable right-angle connectors. Once the mating connector has been plugged in, the right-angle connector can be adjusted as required (about 16 notches) without using additional tools. A torque of > 8 Nm is required to adjust the connector.

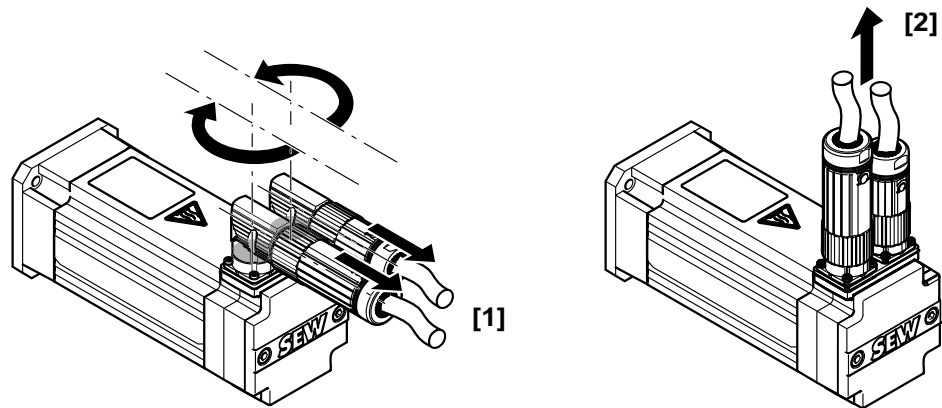
	STOP Possible damage of the right-angle connector in case of rotation without mating connector. Do not use pliers to adjust the right-angle connector before connecting it. Result: • Destruction of the thread. • Leakage due to damaged sealing surface.
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Connector positions

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

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



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Figure 8: Connector positions

[1] Connector position "adjustable"

[2] Connector position "radial"



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.

Exemplary positions of the adjustable connectors



63406axx

Figure 9: Positions of the adjustable connectors (examples)



5.2 Wiring information

5.2.1 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 to braking resistors and similar.

5.2.2 Thermal motor protection

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



5.3 Connecting motor and encoders system via SM./SB. plug connectors

The CMP. synchronous servomotors are supplied with an SM./SB. plug connector system.

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

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

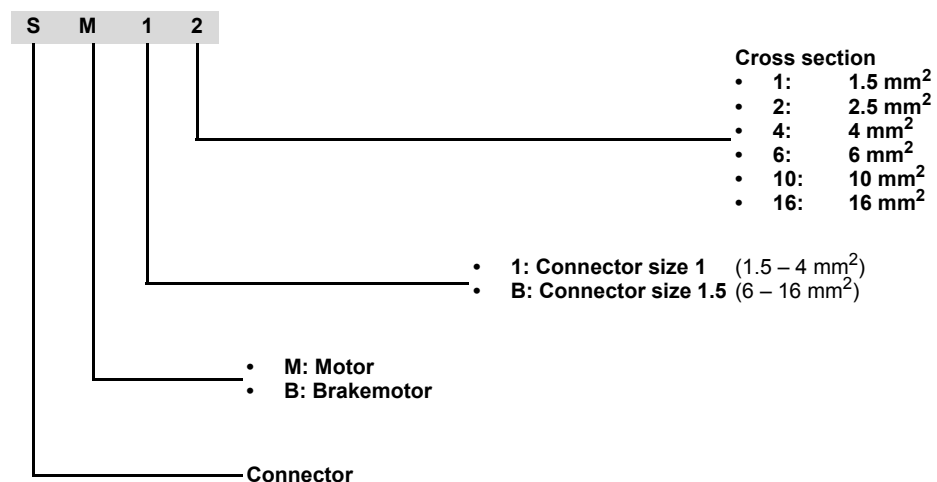
	STOP
	Adjusting the right-angle connector regularly can cause irreparable damage. Do not align the right-angle connector frequently.

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

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

5.3.1 Plug connector on the cable end

Unit designation of the plug connectors





5.3.2 Power cables and plug connectors for CMP motors

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

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

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

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

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



Electrical Installation

Connecting motor and encoders system via SM./SB. plug connectors

Replaced brakemotor cables

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

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

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

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

5.3.3 Power cables and plug connectors for CMPZ motors

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

Table continued on next page



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

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

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

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



Electrical Installation

Connecting motor and encoders system via SM./SB. plug connectors

5.3.4 Dependence of mating connector on cable diameter and crimping area

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

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

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

5.3.5 Feedback and forced cooling fan cable

Feedback cable

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

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

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

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



Forced cooling fan cable

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

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

5.3.6 Prefabricated cables

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

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

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

- Chapter 5.4 describes the assembly of the signal plug connectors, and chapter 5.5 the assembly of SM. / SB. power plug connectors.
- The socket contacts for the motor connection are designed as crimp contacts. Only use suitable tools for crimping.
- Strip the insulation off the leads as described in chapters 5.4 and 5.5. Apply shrink tubing to the connectors.
- Incorrectly installed socket contacts can be removed without removal tools.



Electrical Installation

Connecting motor and encoders system via SM./SB. plug connectors

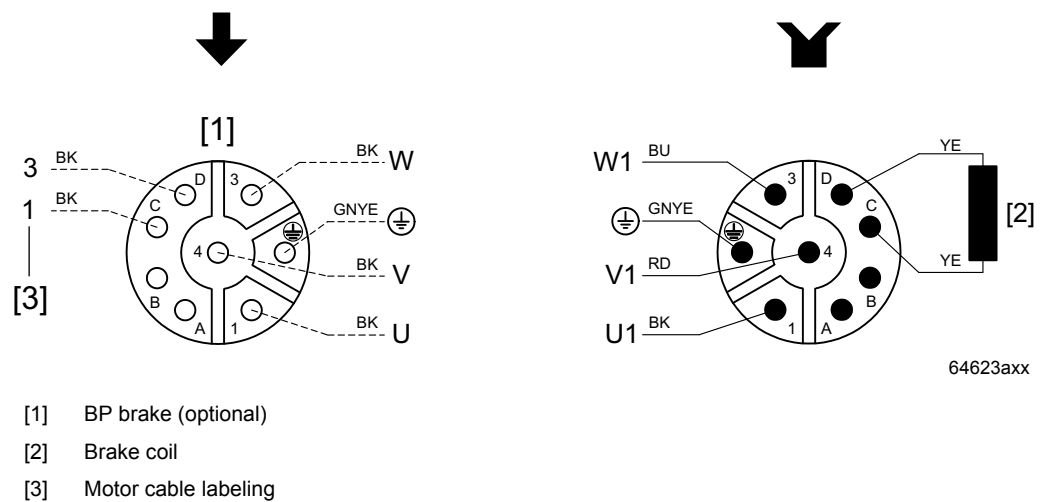
5.3.7 Wiring diagrams for synchronous CMP servomotors

Symbols used

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

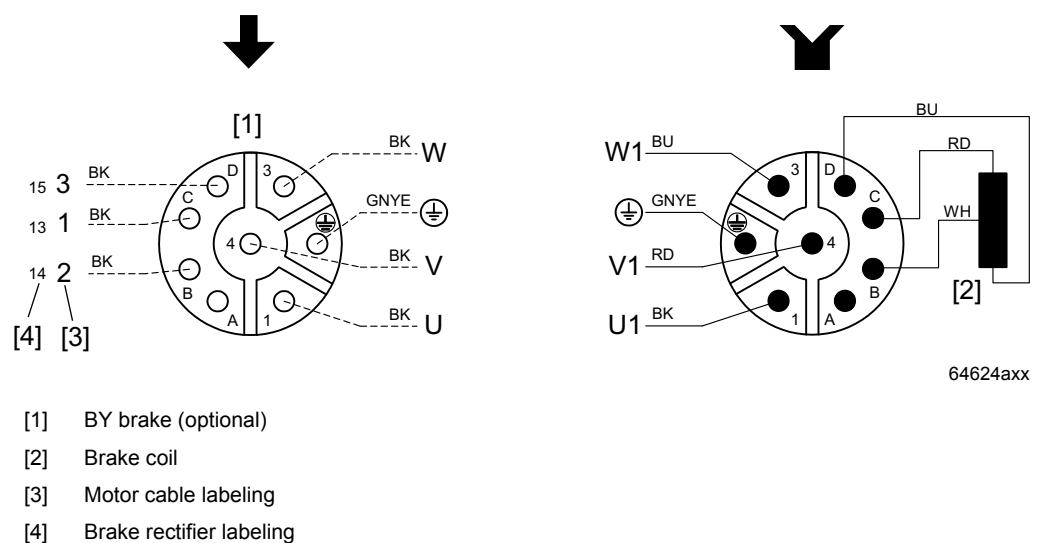
Connecting SM1 / SB1 (M23) power plug connectors

Wiring diagram
with/without BP
brake



Connecting SM1 / SB1 (M23) power plug connectors

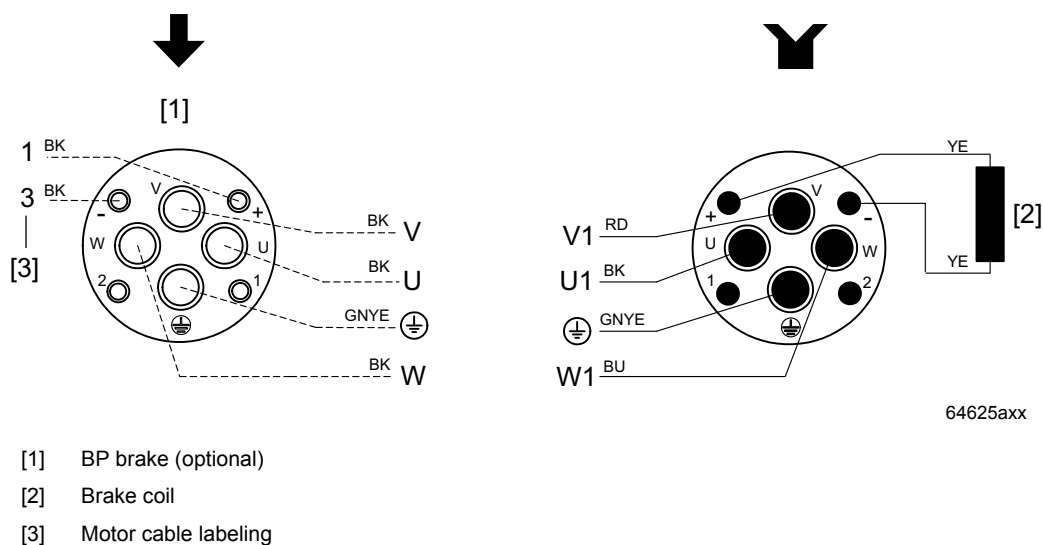
Wiring diagram
with/without BY
brake





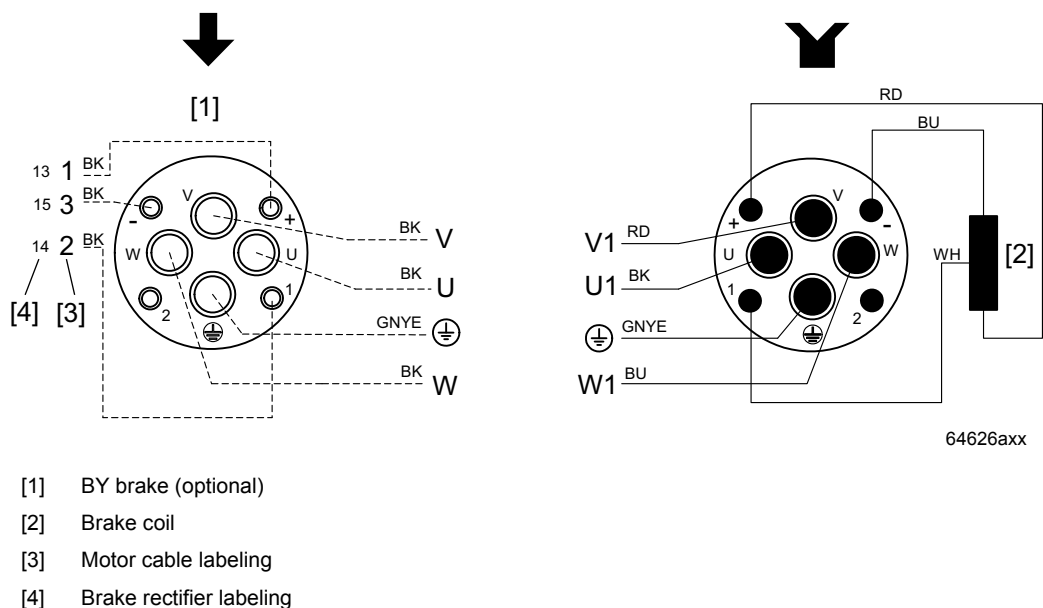
Connecting SMB / SBB power plug connectors (M40)

Wiring diagram
with/without BP
brake



Connecting SMB / SBB power plug connectors (M40)

Wiring diagram
with/without BY
brake



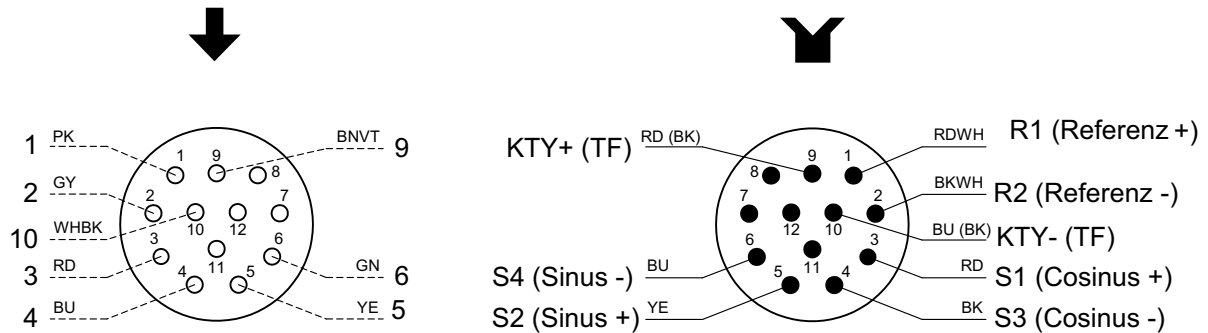


Electrical Installation

Connecting motor and encoders system via SM./SB. plug connectors

RH1M resolver signal plug connector

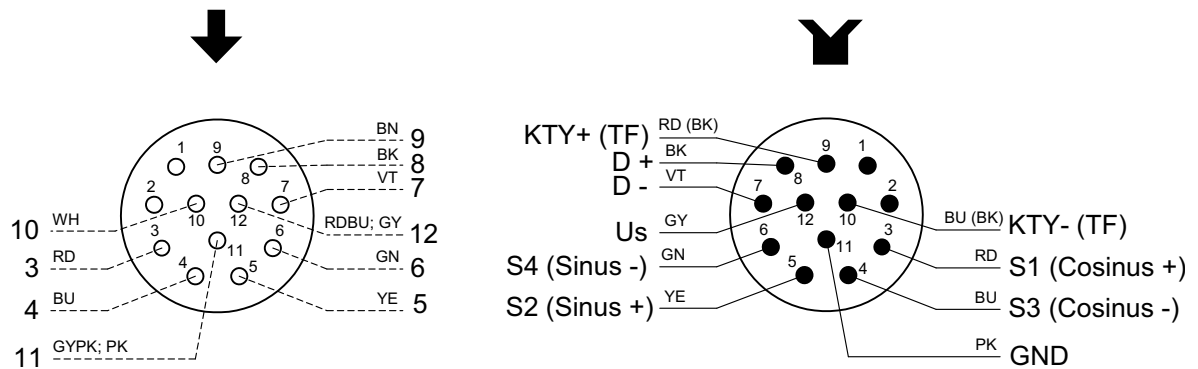
Wiring diagram



64627axx

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

Wiring diagram



64628axx



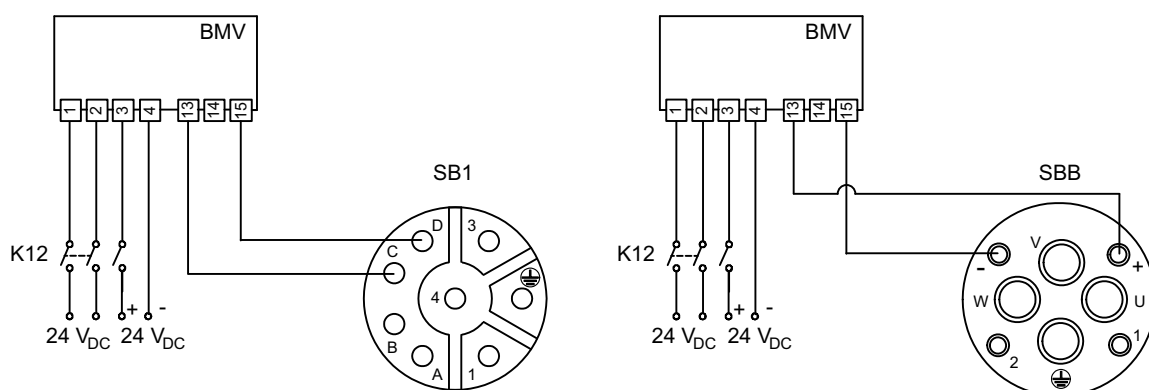
5.3.8 Block diagram of brake controller for BP brake plug connectors

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

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

However, the brakes of motors CMP80 and CMP100 can never be directly connected to MOVIAXIS®. For detailed information, refer to the "MOVIAXIS® Multi-Axis Servo Inverter" project planning manual.

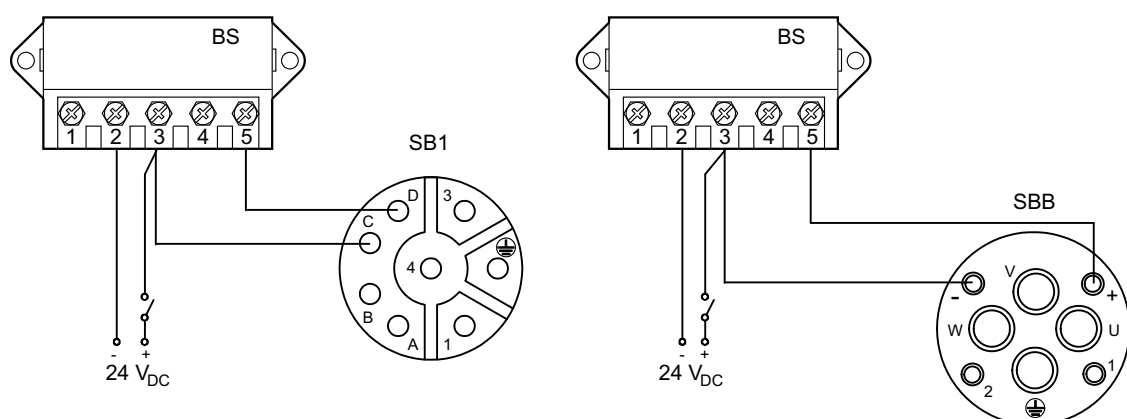
BMV brake rectifier



64842axx

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

BS brake controller



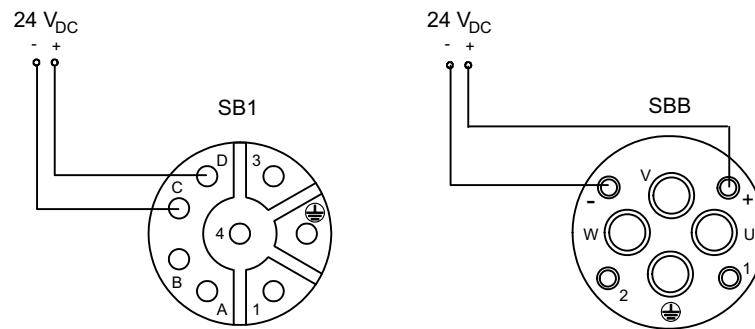
64858axx



Electrical Installation

Connecting motor and encoders system via SM./SB. plug connectors

Direct 24 V brake supply



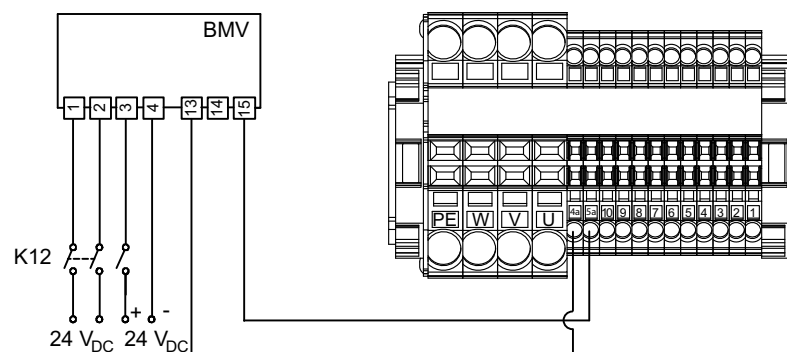
64859axx

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

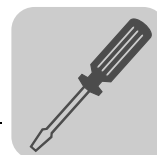
- Operation on non-SEW inverters,
- If the brake is not directly supplied from the SEW inverter.

5.3.9 Block diagram of brake controller for BP brake – terminal box

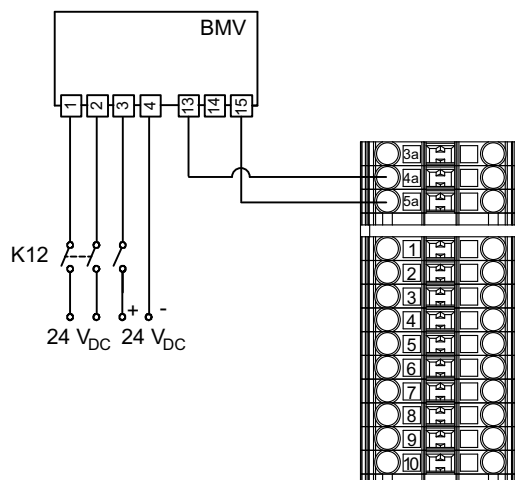
BMV brake rectifier – CMP50, CMP63



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

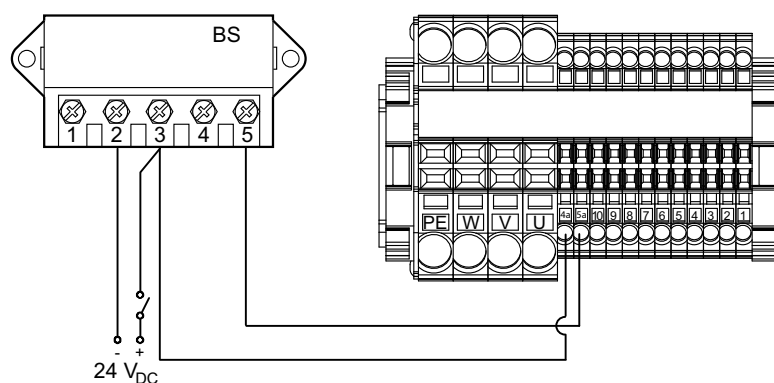


BMV brake rectifier – CMP71, CMP100

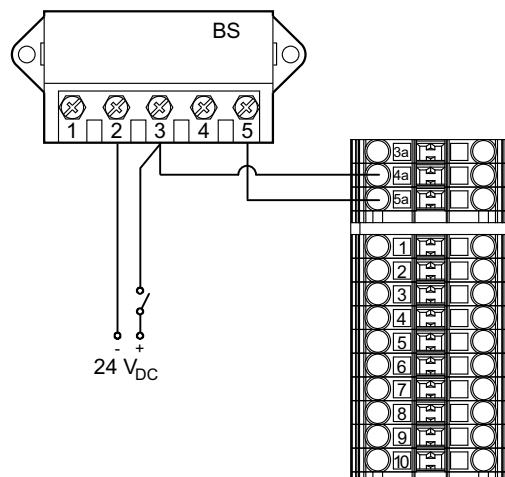


Connection 1, 2 Energy supply
Connection 3, 4 Signal (inverter)

BS brake rectifier – CMP50, CMP63



BS brake controller – CMP71, CMP100





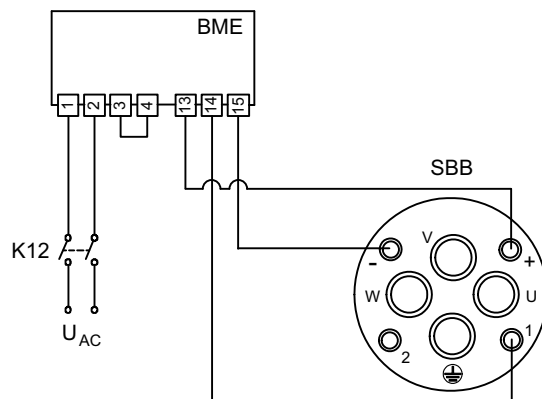
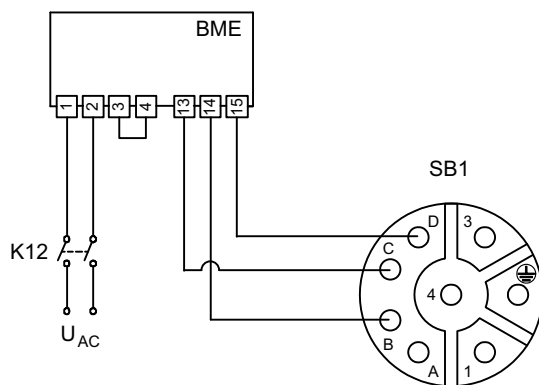
Electrical Installation

Connecting motor and encoders system via SM./SB. plug connectors

5.3.10 Block diagram of brake controller for BY brake – plug connectors

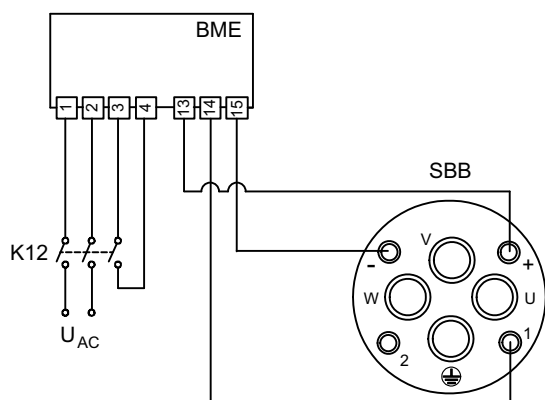
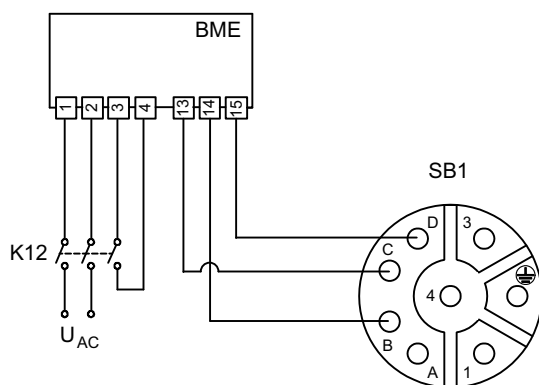
BME brake rectifier

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



64818axx

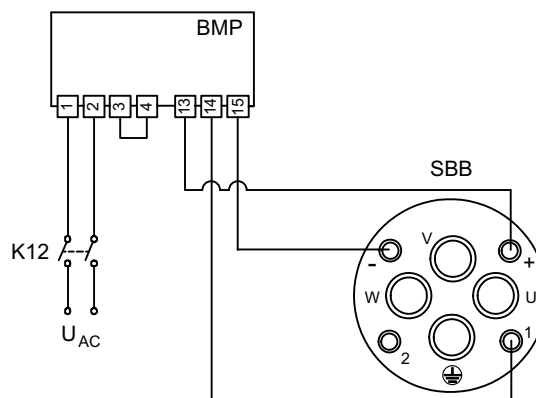
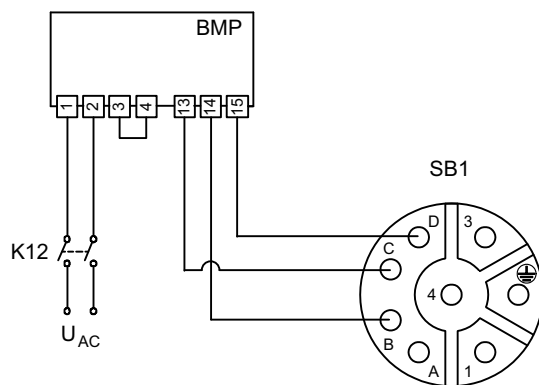
Cut-off in the DC and AC circuits / rapid application of the brake.



64824axx

BMP brake rectifier

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

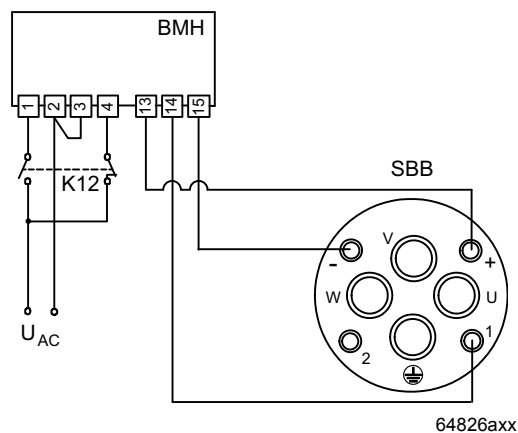
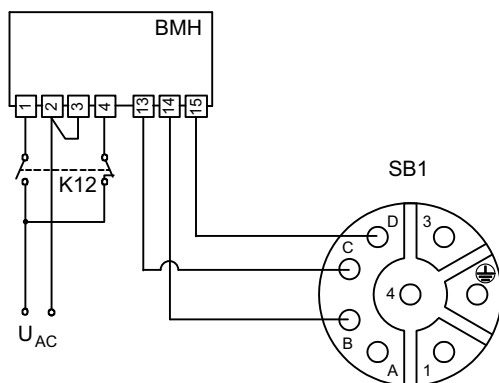


64825axx

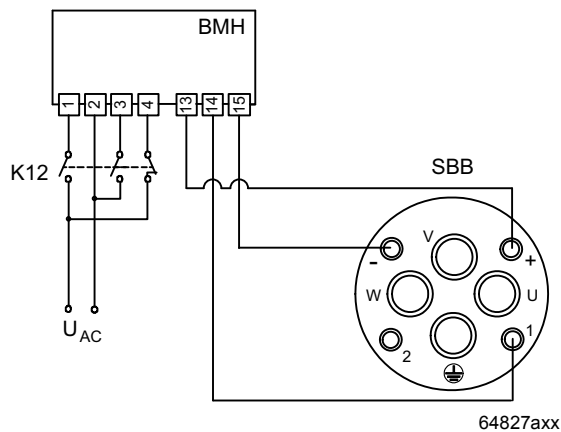
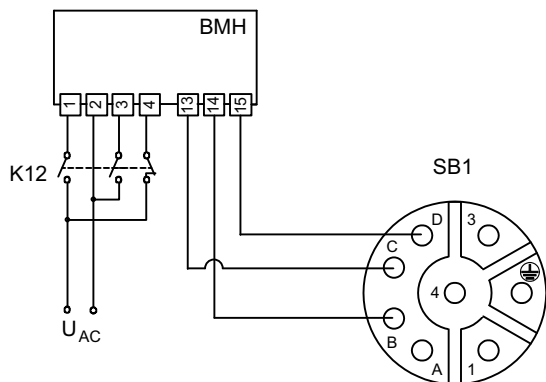


BMH brake rectifier

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

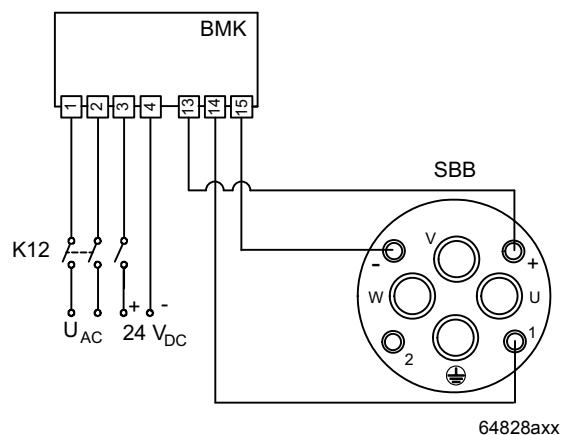
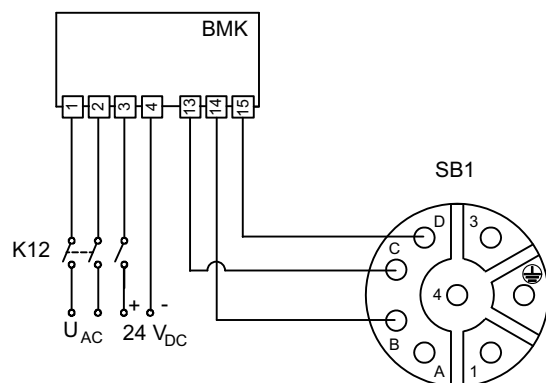


Cut-off in the DC and AC circuits / rapid application of the brake.



BMK brake rectifier

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



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

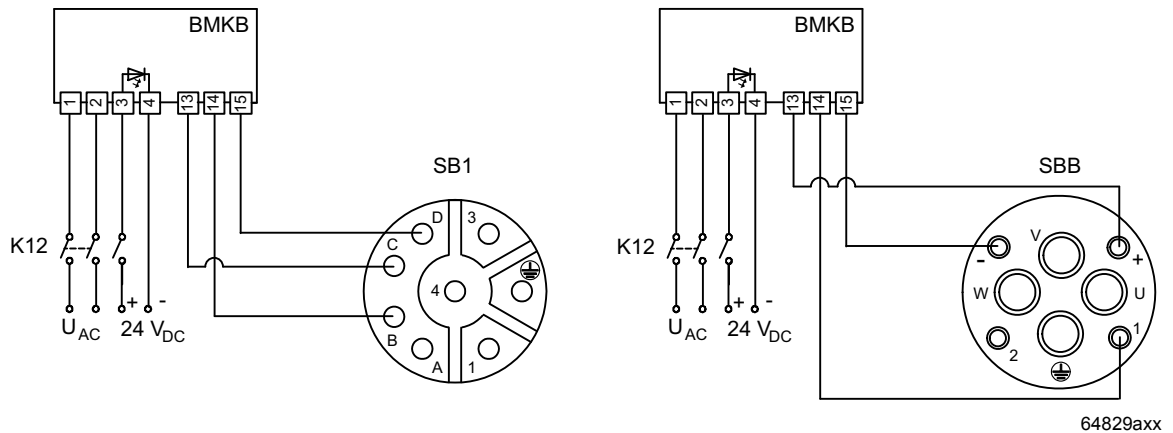


Electrical Installation

Connecting motor and encoders system via SM./SB. plug connectors

BMKB brake rectifier

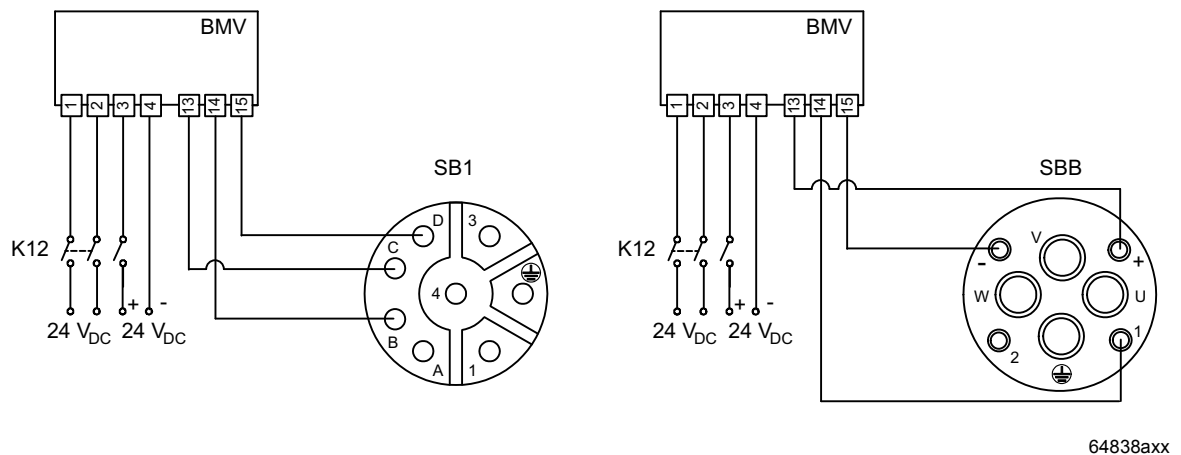
Cut-off in the DC and AC circuits / rapid application of the brake / integrated voltage relay / integrated DC 24 V control input / diode displays readiness for operation.



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

BMV brake rectifier

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

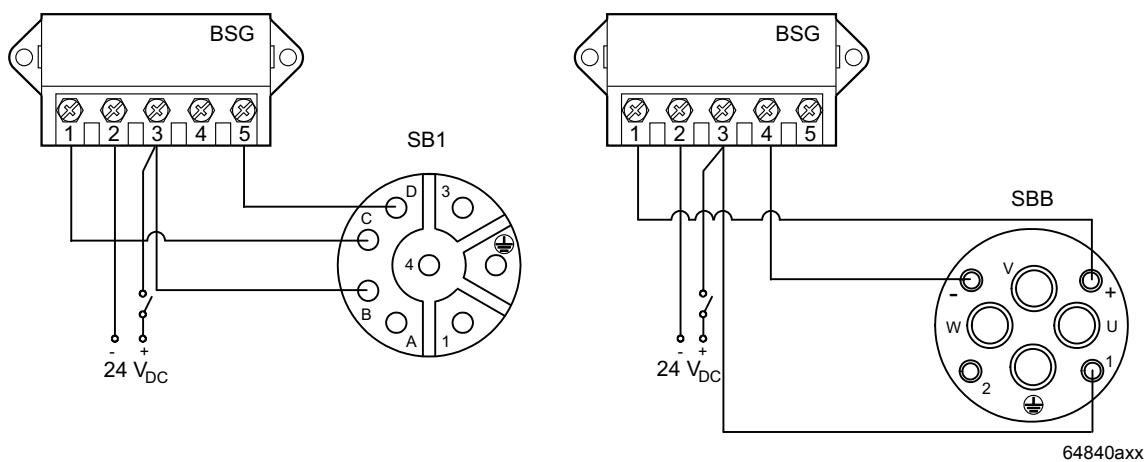


Connection 1, 2 Energy supply
Connection 3, 4 Signal (inverter)



BSG brake control unit

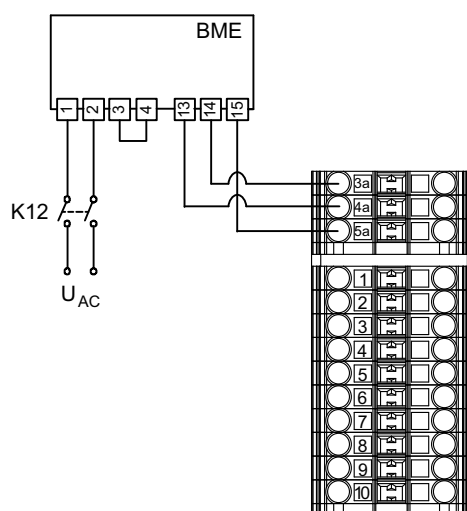
For DC voltage supply with DC 24 V.



5.3.11 Block diagram of brake controller for BY brake – terminal box

BME brake rectifier

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

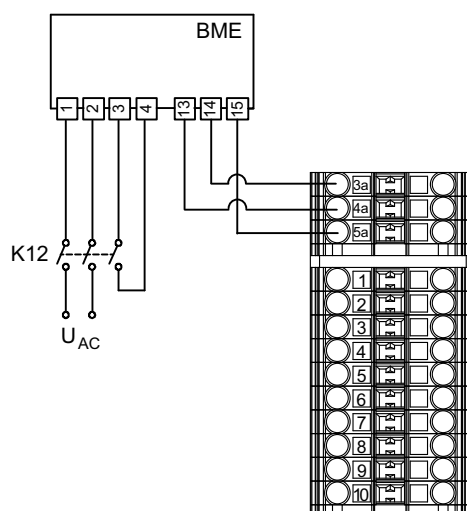




Electrical Installation

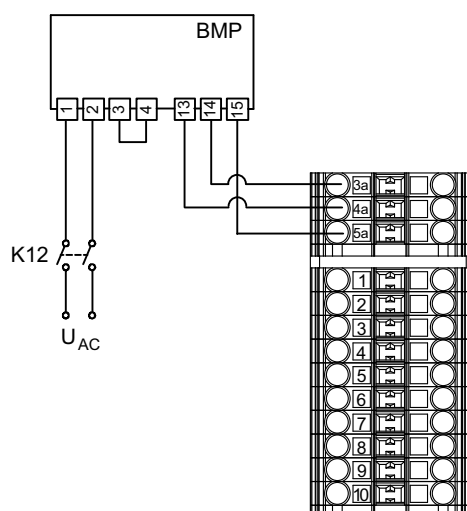
Connecting motor and encoders system via SM./SB. plug connectors

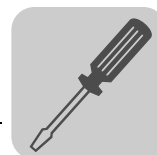
Cut-off in the DC and AC circuits / rapid application of the brake.



BMP brake rectifier

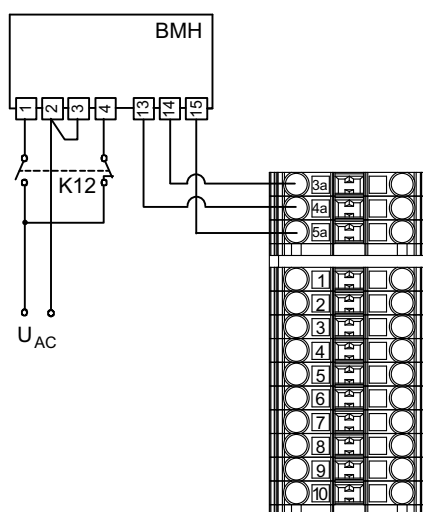
Cut-off in the DC and AC circuits / rapid application of the brake / integrated voltage relay.



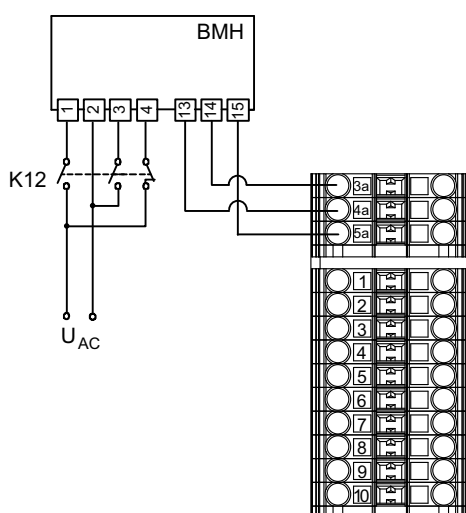


BMH brake rectifier

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



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



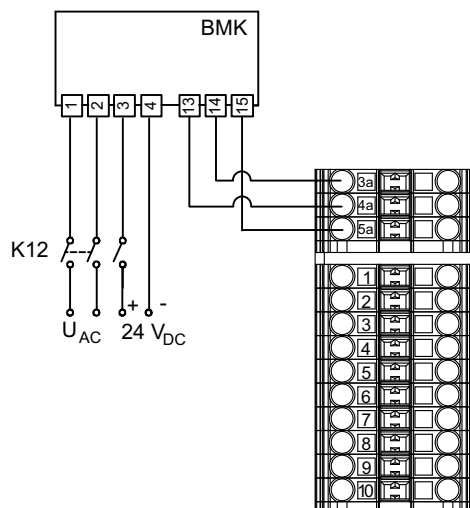


Electrical Installation

Connecting motor and encoders system via SM./SB. plug connectors

BMK brake rectifier

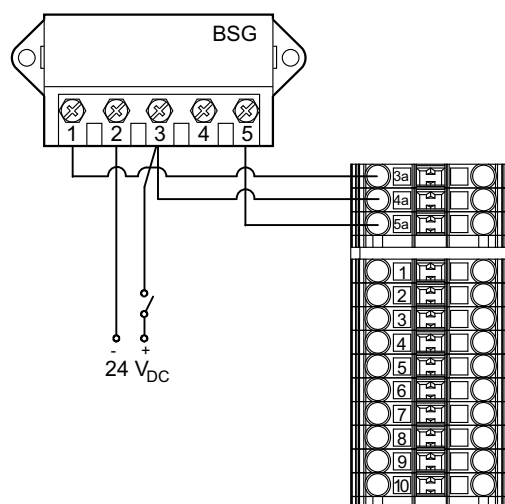
Cut-off in the DC and AC circuits / rapid application of the brake / integrated voltage relay.



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

BSG brake control unit

For DC voltage supply with DC 24 V.

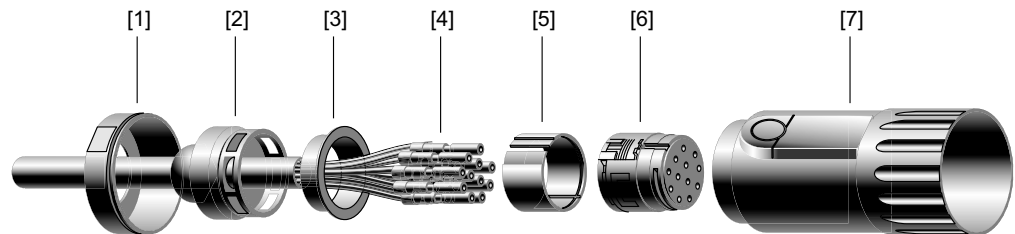




5.4 Assembly of plug connectors for resolver/HIPERFACE®

5.4.1 Scope of delivery signal plug connectors

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



54715AXX

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

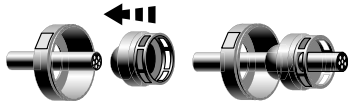
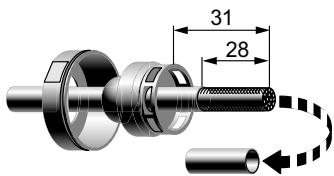
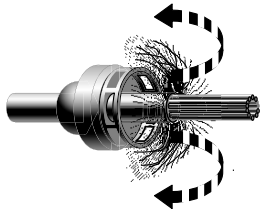
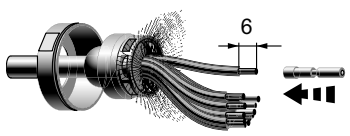
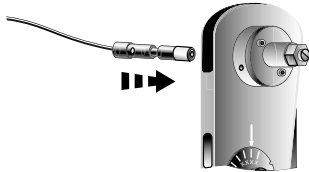
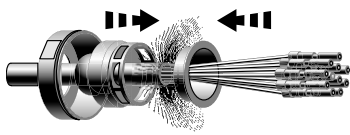


INFORMATION

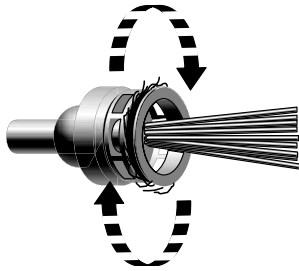
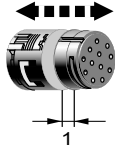
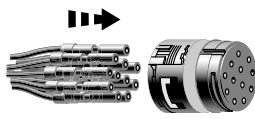
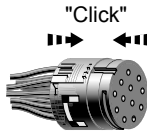
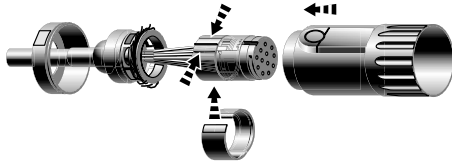
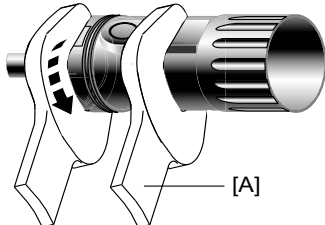
Hold the cable firmly in place when tightening the cable and the connector.



5.4.2 Assembly notes for signal plug connectors

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



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

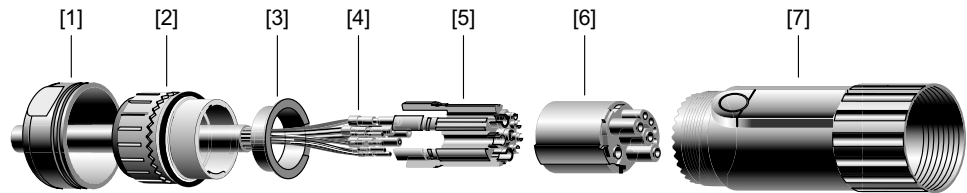


5.5 Power connector assembly

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

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

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



56252AXX

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

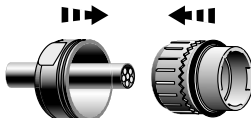
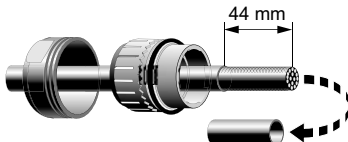
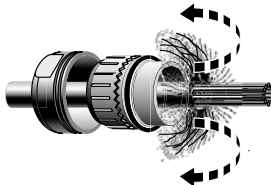
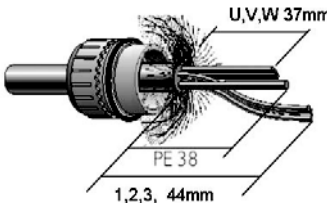
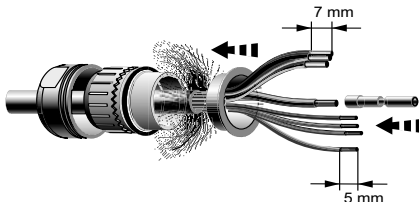
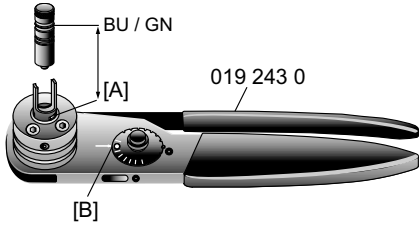
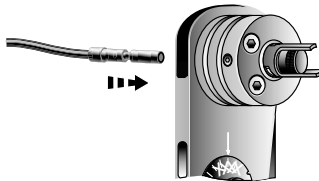


INFORMATION

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



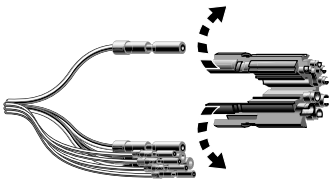
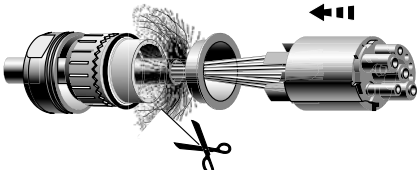
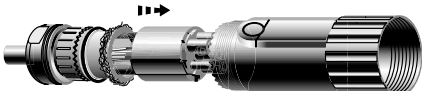
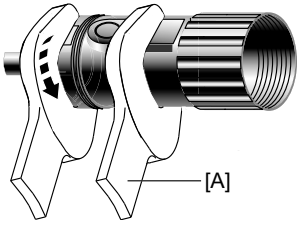
5.5.2 Assembly notes for SM1/SB1 power connectors

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



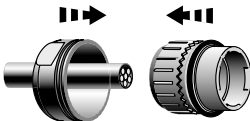
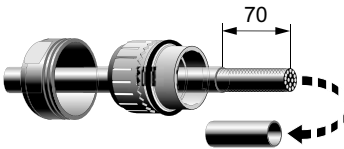
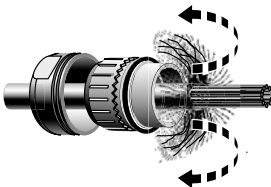
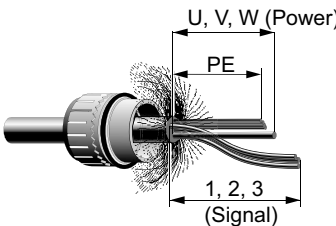
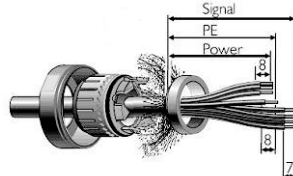
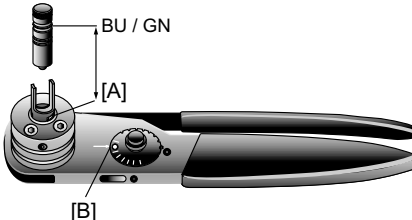
Electrical Installation

Power connector assembly

8		Open the insulating sleeve.
9		- Insert the middle socket contact into the insulator as shown in the wiring diagram in section 5.3.4. - Close the insulating sleeve until it clicks shut. - Insert the remaining socket contacts into the insulator as shown in the wiring diagram in section 5.3.4.
10		- Shorten the braided shield as shown. - Insert the shield ring into the seal so that the shield and end of the cable are flush. Make sure that the braid shield is routed cleanly between the shield ring and the seal.
11		Insert the insulator into the connector housing until the seal rests against its stop in the connector housing.
12		- Use a wrench to hold the connector housing in place and use a second wrench to tighten the screw fitting. [A] = Fix in place



5.5.3 Assembly notes for SMB./SBB. power connectors

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



Electrical Installation

Power connector assembly

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



5.6 Connecting the motor and encoders system via 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.

i	INFORMATION	
	The core colors listed in the following tables correspond to the color code for SEW-EURODRIVE cables.	

5.6.1 Terminal box connections

Motor type	Power connection			Encoder / resolver / thermal motor protection	
	Connection	Maximum connection cross section	Cable entry	Connection	Cable entry
CMP50, CMP63	Spring terminals	0.5 - 6 mm ² (10 mm ²) ¹⁾	M25	Spring terminals	M16
CMP71, CMP80	M6 stud	10 mm ²	M32		
CMP100	M8 stud	25 mm ²	M40		

1) Connection without conductor end sleeve

5.6.2 Connection of CMP50 and CMP63

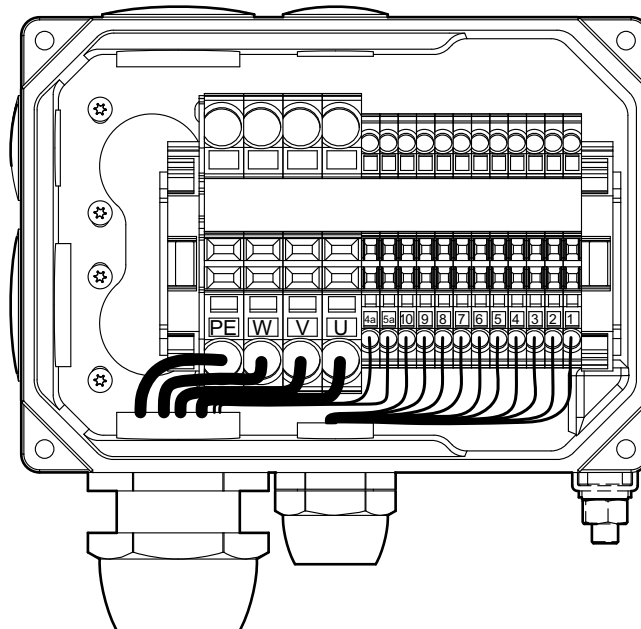


Figure 10: KK terminal box

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Electrical Installation

Connecting the motor and encoders system via terminal box

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	Protective earth

BP brake

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

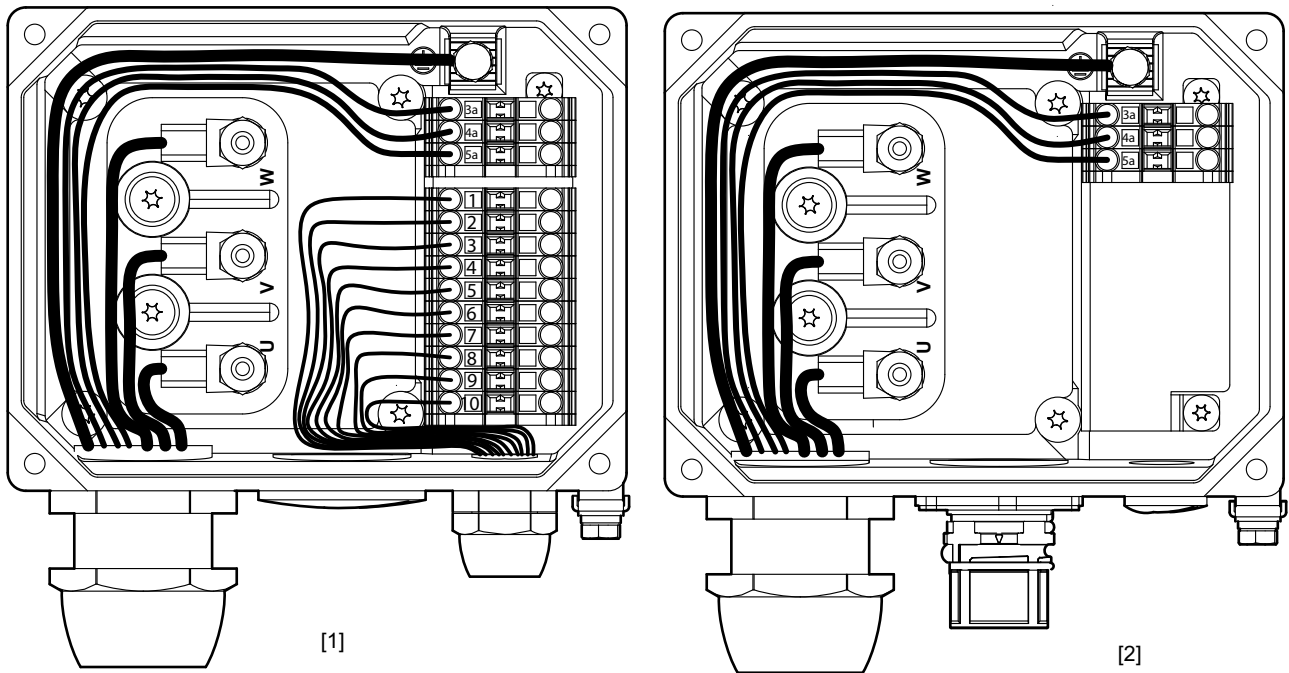
The brake has a standard supply voltage of DC 24 V.

Signal

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



5.6.3 CMP71 - CMP100 connection



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Figure 11: KK and KKS terminal boxes

[1] KK terminal box

[2] KKS terminal box

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	Protective earth

BP brake

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

1) Of the three cores, only cores 1 and 3 are used

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



Electrical Installation

Connecting the motor and encoders system via terminal box

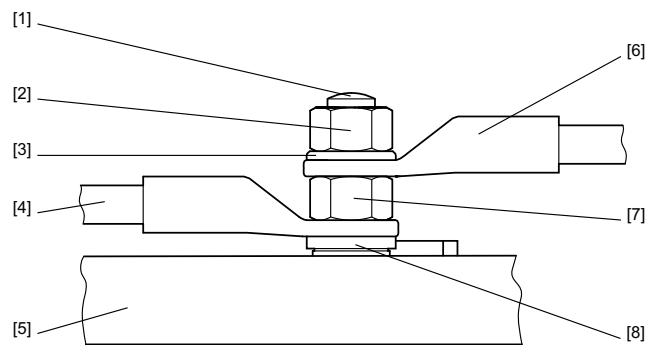
BY brake

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

Signal

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

5.6.4 Power connection in the terminal box of CMP71 - 100



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Figure 12: Power connection in the terminal box

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

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



5.7 Thermal motor protection

	STOP
	Due to the low thermal time constants of the winding, thermal motor protection for CMP40 - CMP71S motors is only possible when, in addition to a temperature sensor, a current monitoring device (I^2t, effective current monitoring) or a motor model for thermal protection, as installed in SEW servo systems, is activated. Complete motor protection at full motor utilization is only ensured if the signals are evaluated by SEW-EURODRIVE inverters.

KTY84 - 130 temperature sensor

	STOP
	Possible damage to the temperature sensor and the motor winding. Use test currents $< 3 \text{ mA}$ in the circuit of the KTY since high self-heating of the temperature sensor can damage its insulation and the motor winding. It is essential to observe the correct connection of the KTY to ensure correct evaluation of the temperature sensor.

Typical characteristic curve of KTY:

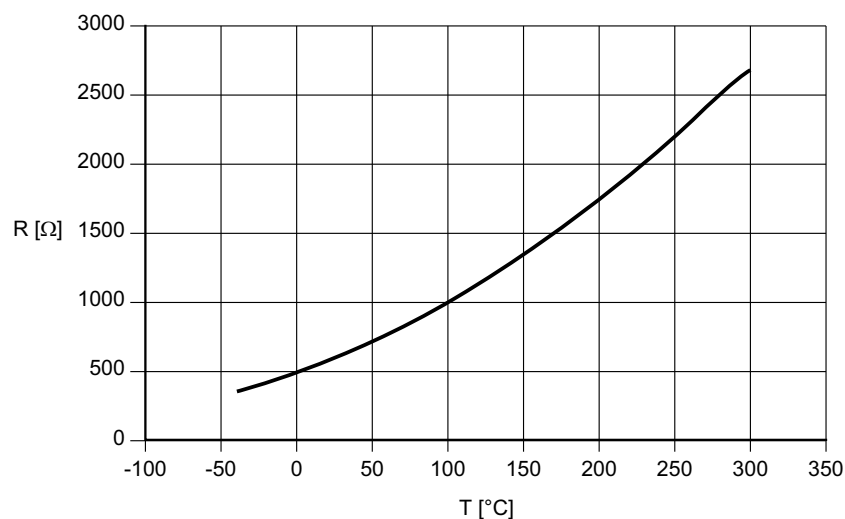


Figure 13: Resistance of the KTY sensor depending on the motor temperature

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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 VR forced cooling fan

The synchronous servomotors size CMP50 - CMP100 can be equipped with a VR forced cooling fan as an option.



INFORMATION

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

Mechanical installation

Mounting the fan guard for the VR forced cooling fan:

Motor	Screws	Tightening torque
CMP50, CMP63	M4 × 8, self-tapping	4 Nm
CMP71	M6 × 20	4 Nm ¹⁾
CMP80, CMP100	M8 × 20	10 Nm ¹⁾

1) Additional Loctite® thread lock fluid

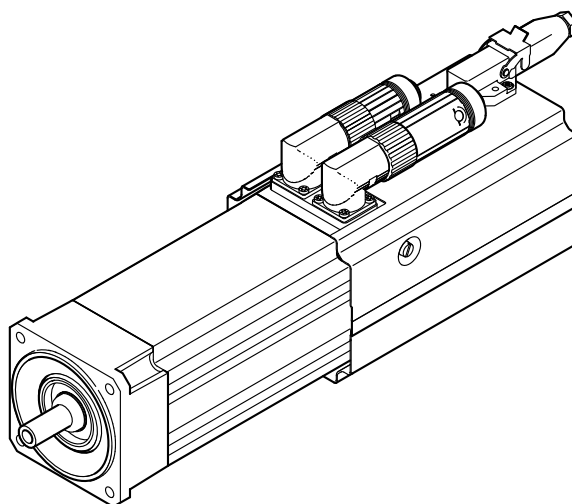


Figure 14: CMP63 synchronous servomotor with forced cooling fan

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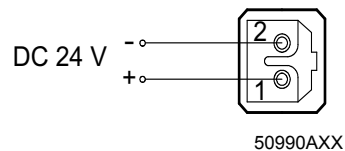


Electrical connection

	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 24 V DC voltage.

- DC 24 V $\pm$ 20 %
- Plug connector connection
- Maximum connection cross section 2 x 1 mm²
- Cable gland Pg7 with inside diameter 7 mm



Connector contact	Connection
1	24 V +
2	0 V

Retrofit set for CMP50 - CMP100

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

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

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



5.9 Connecting the BP brake

BP holding brake

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

The brake has a standard supply voltage of DC 24 V and operates with one or two braking torque ratings for each motor size. For assignment, see following table.

The brake can not be retrofitted.

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

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

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

However, the brakes of motors CMP80 and CMP100 can never be directly connected to MOVIAXIS[®]. For detailed information, refer to the "MOVIAXIS[®] Multi-Axis Servo Inverter" project planning manual.

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

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

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

Motor type	Brake type	M _{B1} [Nm]	M _{B2} [Nm]	Speed class
CMP40	BP01	0.95	-	3000 / 4500 / 6000
CMP50S	BP04	3.1	4.3	
CMP50M/L		4.3	3.1	
CMP63S	BP09	7	9.3	
CMP63M/L		9.3	7	
CMP71S	BP1	7	14	
CMP71M/L		14	7	
CMP80S	BP3	15	31	3000 / 4500
CMP80M/L		31	15	
CMP100S	BP5	24	47	
CMP100M/L		47	24	

M_{B1} Preferred braking torque

M_{B2} Optional braking torque



Response and application times

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

t_1 = Response time

t_2 = Application time



INFORMATION

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

Resistance values of BP brake coils

	BP01	BP04	BP09	BP1	BP3	BP5
Max. braking torque [Nm]	0.95	4.3	9.3	14	31	47
Braking power [W]	7	10.2	16	19.5	28	33
Rated voltage V_N						
	V_{DC}	R [Ω]	R [Ω]	R [Ω]	R [Ω]	R [Ω]
	24	84	56.5	35	29.4	20.5

R Coil resistance at 20 °C

V_N Rated voltage (rated voltage range)



5.10 Connecting the BY brake

Working brake BY

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

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

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

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

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

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

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

M_{B1} Preferred braking torque

M_{B2} Optional braking torque

Response and application times

Brake type	t ₁ [ms]	t ₂ [ms]	t ₃ [ms]
BY2	40	15	90
BY4	40	15	110
BY8	60	30	140

t₁ Response time

t₂ Application time AC/DC

t₃ Application time AC



INFORMATION

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



Operating currents for 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
- Rated voltage V_N

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

The values for the holding currents I_H are r.m.s. values (arithmetic mean value at DC 24 V). Use suitable measuring instruments for current measurements.

	BY2	BY4	BY8
Max. braking torque [Nm]	20	40	80
Braking power [W]	30	40	50
Inrush current ratio I_B/I_H	6	6.5	7

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

I_H Holding current, r.m.s. value in the supply cable to the SEW brake rectifier

I_G Direct current with direct DC voltage supply

V_N Rated voltage (rated voltage range)

Resistance values of BY brake coils

	BY2	BY4	BY8
Max. braking torque [Nm]	20	40	80
Braking power [W]	30	40	50

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

R_B Resistance of accelerator coil at 20 °C

R_T Coil section resistance at 20 °C

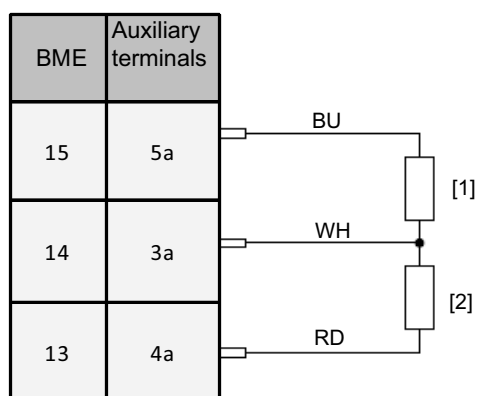
V_N Rated voltage (rated voltage range)



Electrical Installation

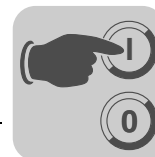
Connecting the BY brake

Connection of resistance coils



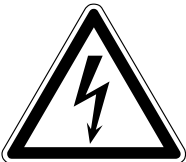
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- [1] R_T : Resistance of coil section
 [2] R_B : Resistance of accelerator coil



6 Startup

6.1 Prerequisites for startup

	 DANGER Danger of electric shock. Severe or fatal injuries! • Observe the safety notes in chapter 2 during installation. • Switch contacts in utilization category AC-3 to EN 60947-4-1 must be used 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. • It is essential to observe the operating instructions supplied with the servo inverter.
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	INFORMATION The rated speed of the motor in a gearmotor can be higher than the permitted, input speed of the gear unit. Limit the maximum speed at the servo inverter. For information on the procedure, refer to the documentation of the servo inverter.
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Before startup

- The drive must be undamaged and not blocked.
- After a longer storage period, you must perform the measures described in chapter 4.3 "Preliminary work".
- All connections must be established correctly.
- All protective covers have to be fitted correctly.
- All motor protection devices must be active.
- There must be no other sources of danger present.
- No heat-sensitive or insulating materials are allowed to cover the motor surface.
- If the manual brake release option /HR has been selected for motor with BY brake, the brake can be released manually.

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 initially to section 7, "Malfunctions".



7 Malfunctions

7.1 Malfunctions of the servomotor

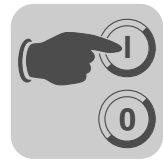
Malfunction	Possible cause	Remedy
Motor does not start up	Supply cable interrupted	Check connections, correct if necessary
	Fuse has blown	Replace fuse
	Motor protection has triggered	Check motor protection for correct setting, correct fault if necessary
	Inverter faulty, overloaded, incorrectly wired or incorrectly set	Check inverter, check wiring
Incorrect direction of rotation	Incorrect setpoint polarity	Check inverter, check setpoints
Motor hums and has high current consumption	Drive is blocked	Check drive
	Brake does not release	See section 7.3, "Brake faults"
	Encoder cable malfunction	Check encoder cable
	Wrong inverter setting	Check the inverter
Motor heats up excessively (measure temperature, significantly higher than 100 °C)	Overload	Measure power, use larger motor or reduce load if necessary, check travel profile
	Ambient temperature is too high	Comply with permitted temperature range
	Insufficient cooling	Correct cooling air supply or clear cooling air passages, retrofit forced cooling fan if necessary
	Forced cooling fan does not run	Check connection, correct if necessary
	Rated operating mode (S1 to S10, EN 60034) exceeded, e.g. caused by excessive torque	Adjust the rated operating mode of the motor to the required operating conditions; consult a professional to determine the correct drive if necessary
	Inverter not optimized	Check the inverter
Running noise on motor	Bearing damage	- Contact SEW-EURODRIVE customer service - Replace the motor
	Vibration of rotating parts	Rectify cause, possible imbalance
	Forced cooling fan: Foreign bodies in cooling air passages	Clean the cooling air passages

7.2 Malfunctions of the servo inverter

	INFORMATION
	The symptoms described in chapter 7.1 may also occur when the servomotor is operated with a servo inverter. Refer to the servo inverter operating instructions for the meaning of the problems that occur and to find information about rectifying the problems.

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

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



7.3 Malfunctions of the brake

Brake BP

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

BY brake

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



8 Inspection/Maintenance



CAUTION

Only use original spare parts, otherwise the motor can be damaged.

Possible damage to property

- Use only genuine spare parts in accordance with the valid parts list.



CAUTION

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

Possible damage to motor and brake

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



DANGER

The servomotor has live parts during and after operation.

Severe or fatal injuries from electric shock.

- De-energize all power, brake and signal cables before unplugging the power or signal plug connector.
- Secure the motors against unintended power-up.
- The motor can generate power when the shaft is rotated. Do not touch the connector pins.



WARNING

The servomotor can have a surface temperature of more than 100 °C during operation.

Risk of burns and fire.

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



8.1 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.

Cleaning

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

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

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

Connection cables

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

	DANGER
	The servomotor has live parts during and after operation. Severe or fatal injuries from electric shock. • De-energize all power, brake and signal cables before unplugging the power or signal plug connector. • Secure the motors against unintended power-up. • The motor can generate power when the shaft is rotated. Do not touch the connector pins. • Do not perform temporary repairs on the connection cables. When the cable jacket is defective, no matter how small the fault, shut down the system immediately and replace the cables.



8.2 Notes on the BY brake

8.2.1 Changing the brake disks

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

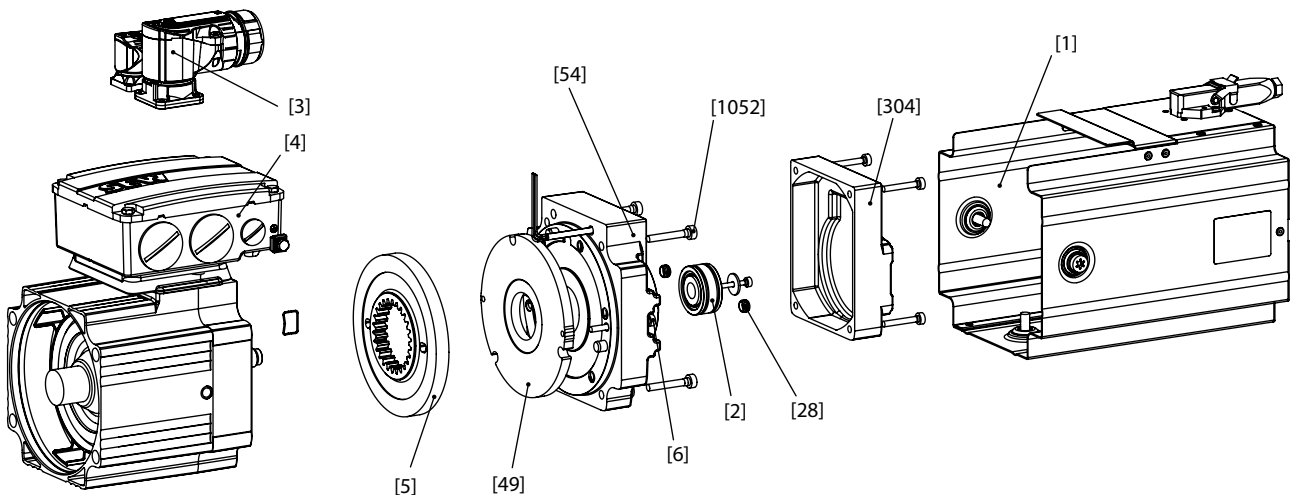


! DANGER

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

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



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

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



8. Carefully remove the complete magnet [54] together with the pressure plate [49] – look out for 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 screws [6] for fixing the pressure plate in position
 - Install the closing cap [28]
15. Calibrate the encoder or resolver [2]
16. Install the cover [304]
17. Install forced cooling fan [1], if required

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



8.2.2 Changing the braking torque

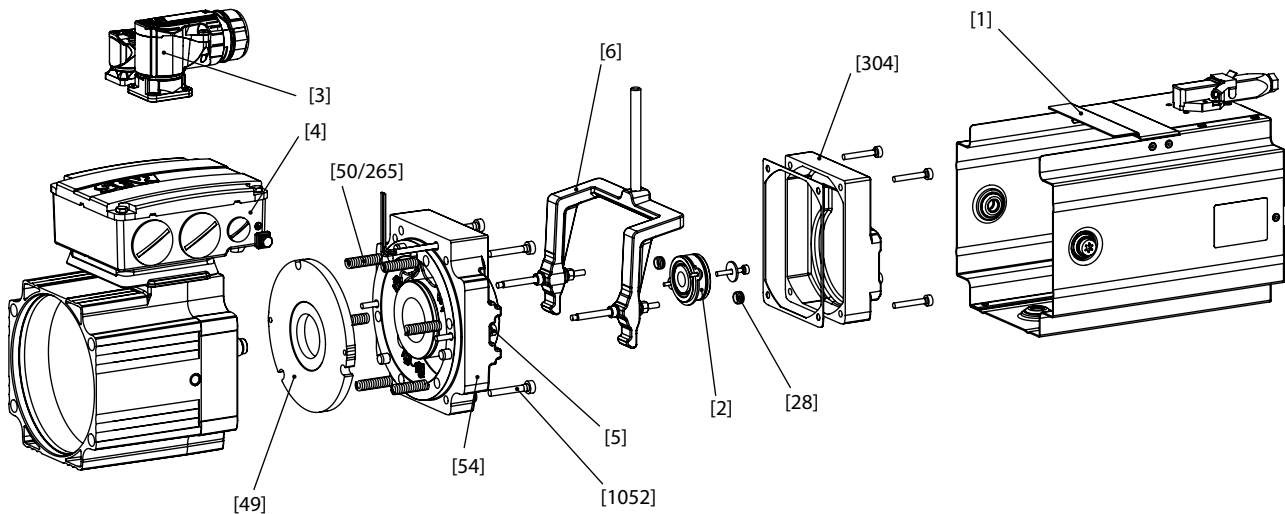


! DANGER

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

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



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

1. Remove forced cooling fan [1], if installed
2. Remove the cover [304]
3. Remove encoder or resolver [2]
4. Plug connector [3]:
 - Drive out the brake pins in the plug connector
5. Terminal box [4]:
 - Disconnect the brake cable
6. If manual brake release [6] is installed:
 - Remove it
7. No manual brake release installed:
 - Remove closing caps [28]
8. Loosen machine screws [1052]
9. Carefully remove the complete magnet [54] look out for the brake cable.
10. Remove the pressure plate [49]



11. Change or add brake springs [50/265], see following table
12. Arrange brake springs symmetrically
13. Change pressure plate [49], if necessary, see following table
14. Re-install the brake components
15. If manual brake release [6] is required:
 - Install it, see illustration in chapter "Retrofitting the manual brake release" on page 74
16. No manual brake release installed:
 - Install closing caps [28]
17. Calibrate the encoder or resolver [2]
18. Install the cover [304]
19. Install forced cooling fan [1], if required

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



8.2.3 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 system against unintentional power up before you begin!
- Carefully observe the following steps.

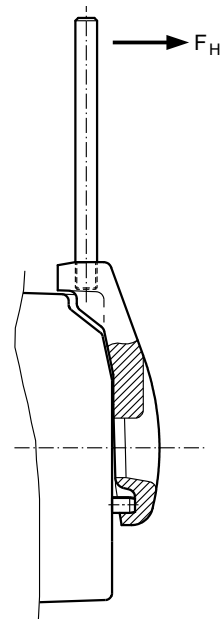
See figure on page 70.

1. Remove forced cooling fan [1], if installed
2. Remove the 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:
 - Remove it
7. No manual brake release installed:
 - Remove closing caps [28]
8. Loosen machine screws [1052]
9. Carefully remove the complete magnet [54] look out for the brake cable.
10. Install magnet [54]; for plug connector: After threading the leads through the brake endshield, crimp the pins onto the leads
11. Re-install the brake components
12. If manual brake release [6] is required:
 - Install it, see illustration in chapter "Retrofitting the manual brake release" on page 74
13. No manual brake release installed:
 - Install closing caps [28]
14. Calibrate the encoder or resolver [2]
15. Install the cover [304]
16. Install forced cooling fan [1], if required



8.2.4 Manual brake release

In brakemotors with ..HR option "Brake with self-reengaging manual brake release", 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 by hand. The values are based on the assumption that you operate the lever at the upper end.

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

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Retrofit set for manual brake release

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

Retrofit set	Part number
BY2	1750 842 8
BY4	1750 852 5
BY8	1750 862 2

8.2.5 Retrofitting the manual brake release



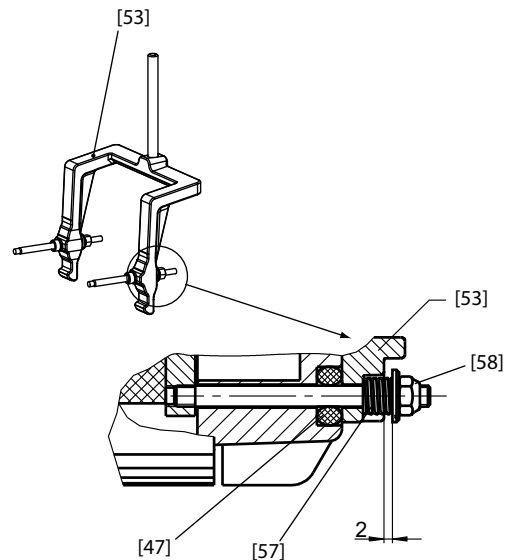
! DANGER

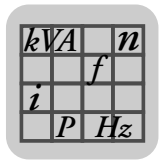
Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

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

1. Remove forced cooling fan, if installed
2. Remove closing caps [28]
3. Screw in studs [56]
4. Press in sealing element [47]
5. Position release lever [53]
6. Insert tension spring [57]
7. Tighten hex head screw [58] – Keep 2 mm clearance between disk (nut [58]) and releasing lever [53], to ensure proper functioning of the brake
8. Install forced cooling fan, if required



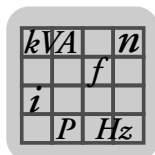


9 Technical Data of CMP and CMPZ Servomotors

9.1 Key to the data tables

The following table lists the short symbols used in the "Technical Data" table.

n_N	Rated speed
M_0	Standstill torque (thermal continuous torque at low speeds)
I_0	Standstill current
M_{pk}	Maximum limit torque of the servomotors
I_{max}	Maximum permitted motor current
M_{0VR}	Standstill torque with forced cooling fan
I_{0VR}	Standstill current with forced cooling fan
J_{mot}	Mass moment of inertia of the motor
J_{bmot}	Mass moment of inertia of the brakemotor
M_{B1}	Standard braking torque
M_{B2}	Optional braking torque
L_1	Inductivity between connection phase and star point
R_1	Resistance between connection phase and star point
$U_{p0 \text{ cold}}$	Internal voltage at 1000 rpm



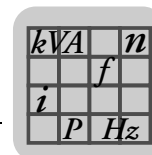
Technical Data of CMP and CMPZ Servomotors

Technical data – Synchronous CMP/BP servomotors

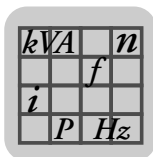
9.2 Technical data – Synchronous CMP/BP servomotors

System voltage: 400 V

n_N [min ⁻¹]	Motor	M_0 [Nm]	I_0 [A]	M_{pk} [Nm]	I_{max} [A]	M_{ovR} [Nm]	I_{ovR} [A]	m [kg]	J_{mot} [10 ⁻⁴ kgm ²]
3000	CMP40S	0.5	1.2	1.9	6.1	-	-	1.3	0.1
	CMP40M	0.8	0.95	3.8	6.0	-	-	1.6	0.15
	CMP50S	1.3	0.96	5.2	5.1	1.7	1.25	2.3	0.42
	CMP50M	2.4	1.68	10.3	9.6	3.5	2.45	3.3	0.67
	CMP50L	3.3	2.2	15.4	13.6	4.8	3.2	4.1	0.92
	CMP63S	2.9	2.15	11.1	12.9	4	3	4.0	1.15
	CMP63M	5.3	3.6	21.4	21.6	7.5	5.1	5.7	1.92
	CMP63L	7.1	4.95	30.4	29.7	10.3	7.2	7.5	2.69
	CMP71S	6.4	4.9	19.2	25	8.7	6.7	7	3.04
	CMP71M	9.4	7.5	30.8	39	13.7	10.9	8.4	4.08
	CMP71L	13.1	9.4	46.9	58	21	15.1	11.4	6.18
	CMP80S	13.4	10	42.1	47	18.5	13.8	12.8	8.78
	CMP80M	18.7	13.4	62.6	69	27	19.3	16.5	11.9
	CMP80L	27.5	18.7	107	107	44	30	21.4	18.1
	CMP100S	25.5	19.6	68.3	73	36	27.5	19.8	19.34
	CMP100M	31	21.8	108	102	47	33	24.8	26.25
	CMP100L	47	32.3	178.8	167	70	48	34.6	40
4500	CMP40S	0.5	1.2	1.9	6.1	-	-	1.3	0.1
	CMP40M	0.8	0.95	3.8	6.0	-	-	1.6	0.15
	CMP50S	1.3	1.32	5.2	7.0	1.7	1.7	2.3	0.42
	CMP50M	2.4	2.3	10.3	13.1	3.5	3.35	3.3	0.67
	CMP50L	3.3	3.15	15.4	19.5	4.8	4.6	4.1	0.92
	CMP63S	2.9	3.05	11.1	18.3	4	4.2	4.0	1.15
	CMP63M	5.3	5.4	21.4	32.4	7.5	7.6	5.7	1.92
	CMP63L	7.1	6.9	30.4	41.4	10.3	10	7.5	2.69
	CMP71S	6.4	7.3	19.2	38	8.7	9.9	7	3.04
	CMP71M	9.4	10.9	30.8	57	13.7	15.9	8.4	4.08
	CMP71L	13.1	14.1	46.9	87	21	22.5	11.4	6.18
	CMP80S	13.4	15.3	42.1	73	18.5	21	12.8	8.78
	CMP80M	18.7	20.1	62.6	103	27	29	16.5	11.9
	CMP80L	27.5	27.8	107	159	44	44.5	21.4	18.1
	CMP100S	25.5	30	68.3	111	36	42.5	19.8	19.34
	CMP100M	31	33.1	108	154	-	-	24.8	26.25
	CMP100L	47	48.4	178.8	251	-	-	34.6	40
6000	CMP40S	0.5	1.2	1.9	6.1	-	-	1.3	0.1
	CMP40M	0.8	1.1	3.8	6.9	-	-	1.6	0.15
	CMP50S	1.3	1.7	5.2	9.0	1.7	2.2	2.3	0.42
	CMP50M	2.4	3	10.3	17.1	3.5	4.4	3.3	0.67
	CMP50L	3.3	4.2	15.4	26	4.8	6.1	4.1	0.92
	CMP63S	2.9	3.9	11.1	23.4	4	5.4	4.0	1.15
	CMP63M	5.3	6.9	21.4	41.4	7.5	9.8	5.7	1.92
	CMP63L	7.1	9.3	30.4	55.8	10.3	13.5	7.5	2.69
	CMP71S	6.4	9.6	19.2	50	8.7	13.1	7	3.04
	CMP71M	9.4	14.7	30.8	76	13.7	21.5	8.4	4.08
	CMP71L	13.1	18.8	46.9	115	21	30	11.4	6.18
	CMP80S	13.4	20	42.1	95	18.5	27.5	12.8	8.78
	CMP80M	18.7	26.4	62.6	135	27	38	16.5	11.9
	CMP80L	27.5	37.6	107	215	-	-	21.4	18.1



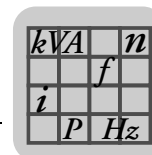
n_N [min ⁻¹]	Motor	L_1 [mH]	R_1 Ω	U_{p0} cold [V]	m_{bmot} [kg]	J_{bmot} [10 ⁻⁴ kgm ²]	M_{B1} [Nm]	M_{B2} [Nm]
3000	CMP40S	23	11.94	27.5	1.7	0.13	0.95	-
	CMP40M	46	19.93	56	2.0	0.18	0.95	-
	CMP50S	71	22.49	86	2.9	0.48	3.1	4.3
	CMP50M	38.5	9.96	90	3.9	0.73	4.3	3.1
	CMP50L	30.5	7.42	98	4.7	0.98	4.3	3.1
	CMP63S	36.5	6.79	90	5.0	1.49	7	9.3
	CMP63M	22	3.56	100	6.7	2.26	9.3	7
	CMP63L	14.2	2.07	100	8.5	3.03	9.3	7
	CMP71S	15.7	1.48	87.5	9	3.44	7	14
	CMP71M	9.7	0.81	85	10.4	4.5	14	7
	CMP71L	7.3	0.56	96	13.4	6.6	14	7
	CMP80S	7.2	0.54	91	16.8	10.04	16	31
	CMP80M	5	0.345	94	20.5	13.16	31	16
	CMP80L	3.35	0.21	99	24.4	19.36	31	16
	CMP100S	3.9	0.215	88	22.8	21.34	24	47
	CMP100M	3.05	0.142	95.5	27.8	28.25	47	24
	CMP100L	1.9	0.081	98	37.6	42	47	24
4500	CMP40S	23	11.94	27.5	1.7	0.13	0.95	-
	CMP40M	46	19.93	56	2.0	0.18	0.95	-
	CMP50S	37	11.61	62	2.9	0.48	3.1	4.3
	CMP50M	20.5	5.28	66	3.9	0.73	4.3	3.1
	CMP50L	14.6	3.57	68	4.7	0.98	4.3	3.1
	CMP63S	18.3	3.34	64	5.0	1.49	7	9.3
	CMP63M	9.8	1.48	67	6.7	2.26	9.3	7
	CMP63L	7.2	1.07	71	8.5	3.03	9.3	7
	CMP71S	7.1	0.72	59	9	3.44	7	14
	CMP71M	4.55	0.385	58	10.4	4.5	14	7
	CMP71L	3.25	0.24	64	13.4	6.6	14	7
	CMP80S	3.05	0.22	59	16.8	10.04	16	31
	CMP80M	2.25	0.148	63	20.5	13.16	31	16
	CMP80L	1.54	0.085	67	24.4	19.36	31	16
	CMP100S	1.68	0.086	58	22.8	21.34	24	47
	CMP100M	1.32	0.058	63	27.8	28.25	47	24
	CMP100L	0.84	0.038	65	37.6	42.82	47	24
6000	CMP40S	23	11.94	27.5	1.7	0.13	0.95	-
	CMP40M	34	14.95	48.5	2.0	0.18	0.95	-
	CMP50S	22.5	7.11	48.5	2.9	0.48	3.1	4.3
	CMP50M	12	3.21	50.5	3.9	0.73	4.3	3.1
	CMP50L	8.2	1.91	51	4.7	0.98	4.3	3.1
	CMP63S	11.2	2.1	50	5.0	1.49	7	9.3
	CMP63M	5.9	0.92	52	6.7	2.26	9.3	7
	CMP63L	4	0.62	53	8.5	3.03	9.3	7
	CMP71S	4.15	0.395	45	9	3.44	7	14
	CMP71M	2.55	0.205	43.5	10.4	4.5	14	7
	CMP71L	1.84	0.145	48	13.4	6.6	14	7
	CMP80S	1.8	0.136	46	-	-	-	-
	CMP80M	1.3	0.087	48	-	-	-	-
	CMP80L	0.84	0.051	50	-	-	-	-



9.3 Technical data – Synchronous CMPZ/BY servomotors

System voltage: 400 V

n_N [min ⁻¹]	Motor	M_0 [Nm]	I_0 [A]	M_{pk} [Nm]	I_{max} [A]	M_{0VR} [Nm]	I_{0VR} [A]	m [kg]	J_{mot} [10 ⁻⁴ kgm ²]
3000	CMPZ71S	6.4	4.9	19.2	25	8.7	6.7	8.6	11.02
	CMPZ71M	9.4	7.5	30.8	39	13.7	10.9	10	12.07
	CMPZ71L	13.1	9.4	46.9	58	21	15.1	13	14.17
	CMPZ80S	13.4	10	42.1	47	18.5	13.8	15.8	30.88
	CMPZ80M	18.7	13.4	62.6	69	27	19.3	19.5	34
	CMPZ80L	27.5	18.7	107	107	44	30	24.4	40.21
	CMPZ100S	25.5	19.6	68.3	73	36	27.5	24.2	84.99
	CMPZ100M	31	21.8	108	102	47	33	29.2	91.9
	CMPZ100L	47	32.3	178.8	167	70	48	39	105.65
4500	CMPZ71S	6.4	7.3	19.2	38	8.7	9.9	8.6	11.02
	CMPZ71M	9.4	10.9	30.8	57	13.7	15.9	10	12.07
	CMPZ71L	13.1	14.1	46.9	87	21	22.9	13	14.17
	CMPZ80S	13.4	15.3	42.1	73	18.5	21	15.8	30.88
	CMPZ80M	18.7	20.1	62.6	103	27	29	19.5	34
	CMPZ80L	27.5	27.8	107	159	44	44.5	24.4	40.21
	CMPZ100S	25.5	30	68.3	111	36	42.5	24.2	84.99
	CMPZ100M	31	33.1	108	154	-	-	29.2	91.9
	CMPZ100L	47	48.4	178.8	251	-	-	39	105.65
6000	CMPZ71S	6.4	9.6	19.2	50	8.7	13.1	8.6	11.02
	CMPZ71M	9.4	14.7	30.8	76	13.7	21.5	10	12.07
	CMPZ71L	13.1	18.8	46.9	115	21	30	13	14.17
	CMPZ80S	13.4	20	42.1	95	18.5	27.5	15.8	30.88
	CMPZ80M	18.7	26.4	62.6	135	27	38	19.5	34
	CMPZ80L	27.5	37.6	107	215	-	-	24.4	40.21



n_N [min ⁻¹]	Motor	L_1 [mH]	R_1 Ω	U_{p0} cold [V]	m_{bmot} [kg]	J_{bmot} [10 ⁻⁴ kgm ²]	M_{B1} [Nm]	M_{B2} [Nm]
3000	CMPZ71S	15.7	1.48	87.5	11.2	12.74	14	10
	CMPZ71M	9.7	0.81	85	12.6	13.79	20	14
	CMPZ71L	7.3	0.56	96	15.6	15.89	20	14
	CMPZ80S	7.2	0.54	91	20.8	34.65	28	20
	CMPZ80M	5	0.345	94	24.5	37.33	40	28
	CMPZ80L	3.35	0.21	99	29.4	43.98	40	28
	CMPZ100S	3.9	0.215	88	34.7	89.43	55	40
	CMPZ100M	3.05	0.142	95.5	39.7	96.34	80	55
	CMPZ100L	1.9	0.081	98	49.5	110.09	80	55
4500	CMPZ71S	7.1	0.72	59	11.2	12.74	14	10
	CMPZ71M	4.55	0.385	58	12.6	13.79	20	14
	CMPZ71L	3.25	0.24	64	15.6	15.89	20	14
	CMPZ80S	3.05	0.22	59	20.8	34.65	28	20
	CMPZ80M	2.25	0.148	63	24.5	37.33	40	28
	CMPZ80L	1.54	0.085	67	29.4	43.98	40	28
	CMPZ100S	1.68	0.086	58	34.7	89.43	55	40
	CMPZ100M	1.32	0.058	63	39.7	96.34	80	55
	CMPZ100L	0.84	0.038	65	49.5	110.09	80	55
6000	CMPZ71S	4.15	0.395	45	11.2	12.74	14	10
	CMPZ71M	2.55	0.205	43.5	12.6	13.79	20	14
	CMPZ71L	1.84	0.145	48	15.6	15.89	20	14
	CMPZ80S	1.8	0.136	46	-	-	-	-
	CMPZ80M	1.3	0.087	48	-	-	-	-
	CMPZ80L	0.84	0.051	50	-	-	-	-



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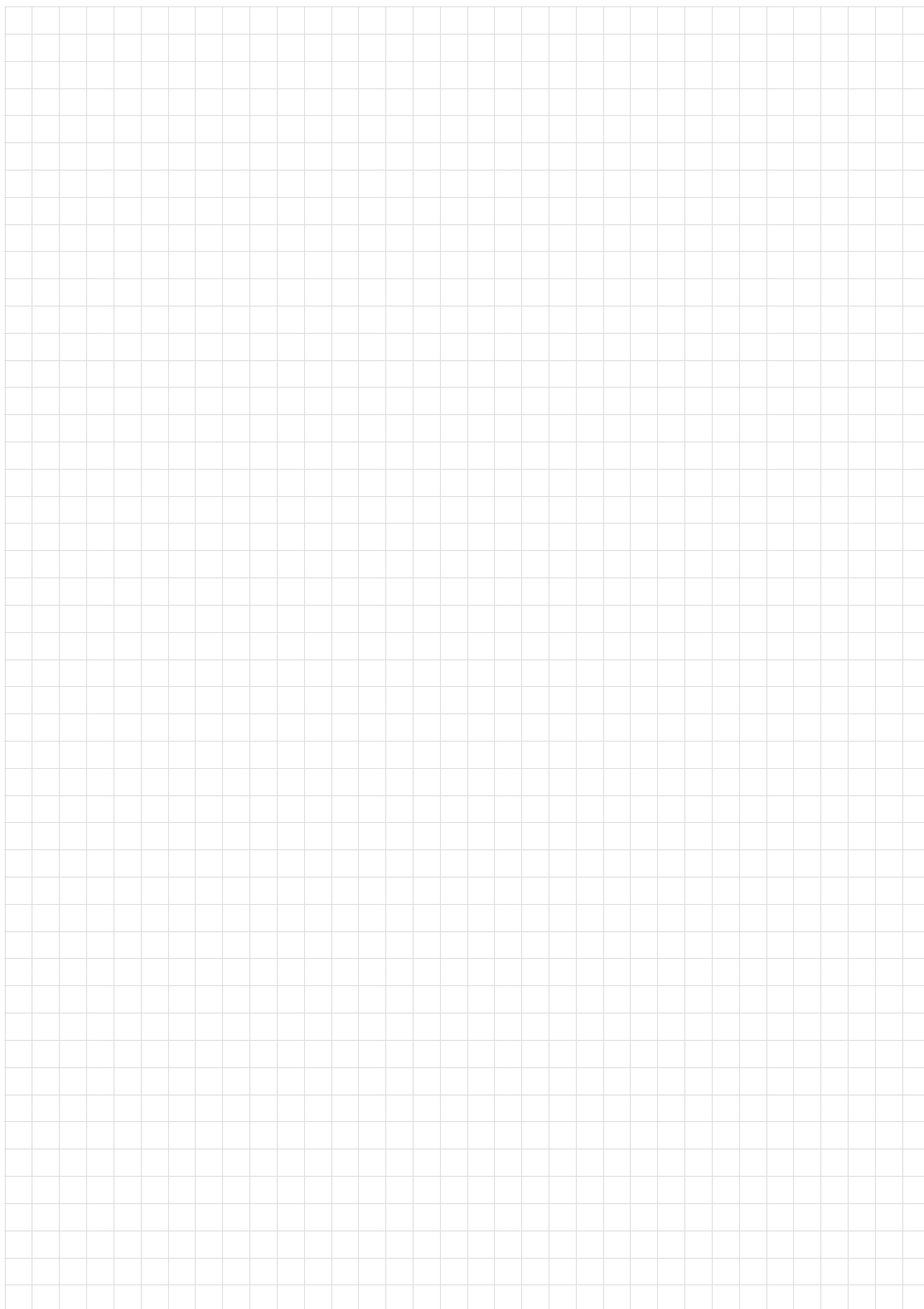
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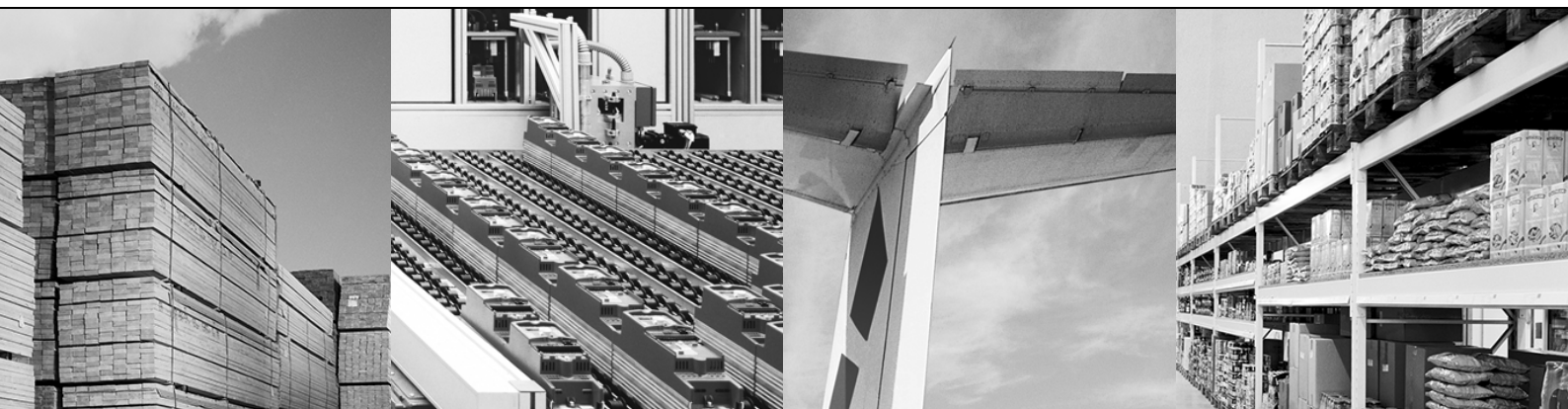
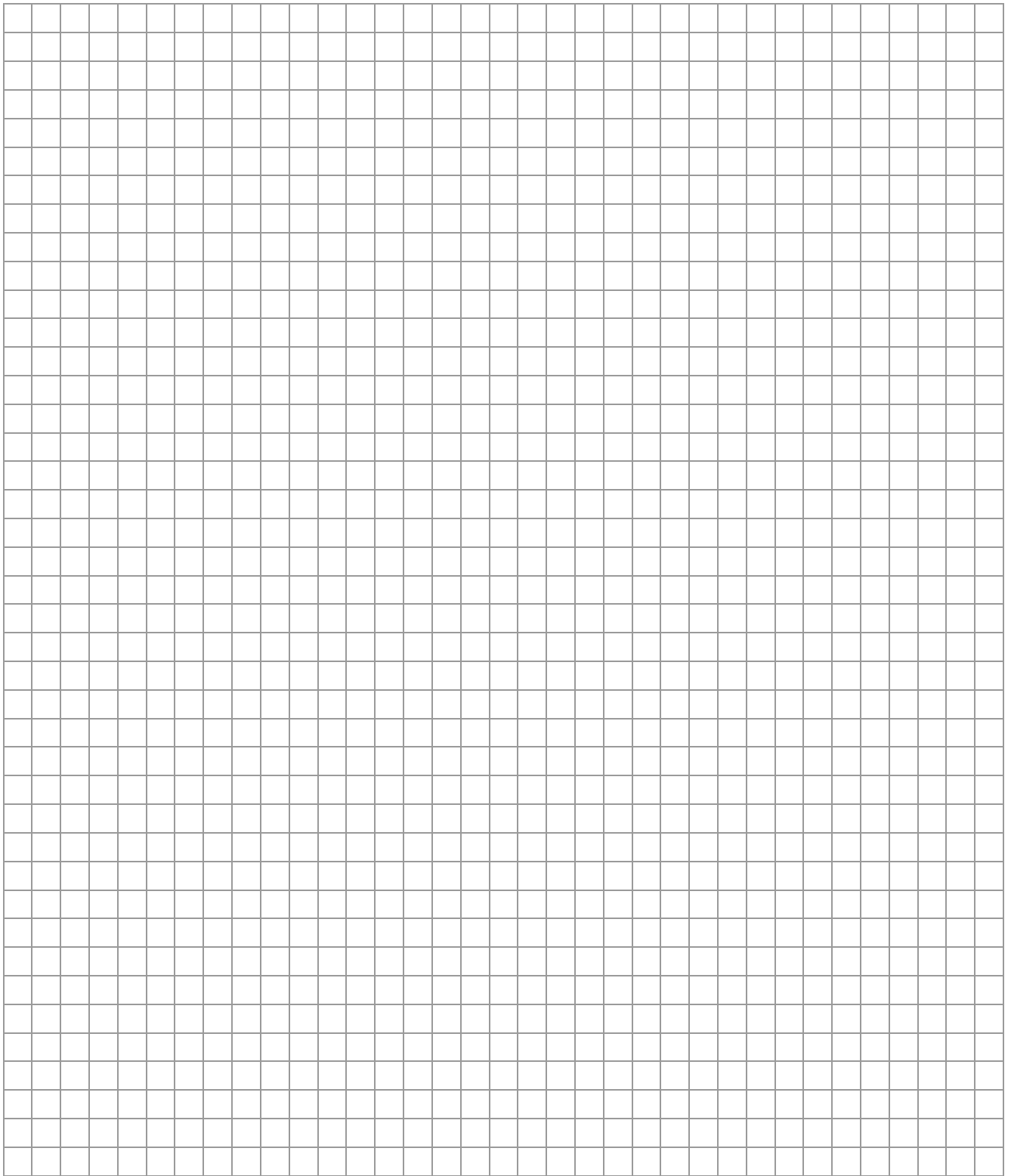
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