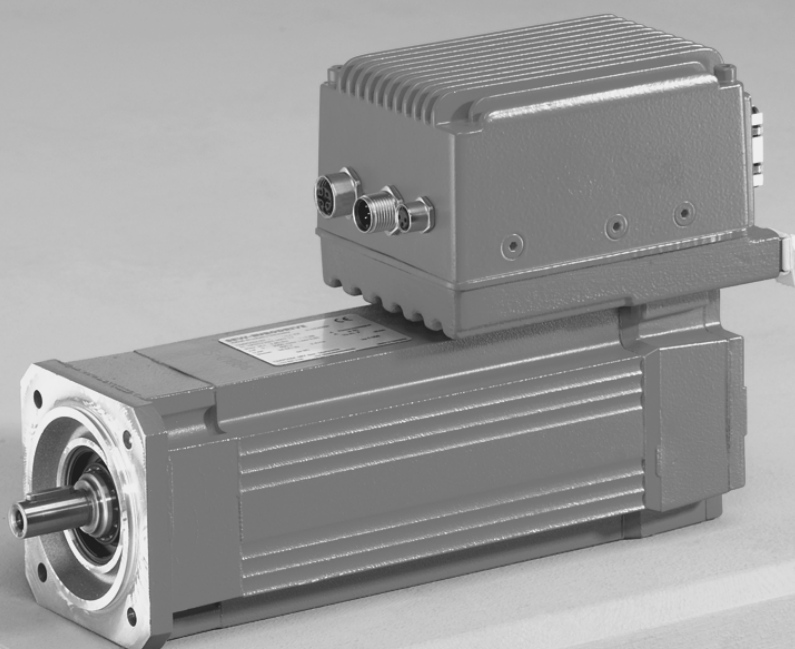




SEW
EURODRIVE

Operating Instructions



Decentralized Extra-Low Voltage Servo Drive
CMP ELVCD



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1 General information

1.1 About this documentation

The current version of the documentation is the original.

This documentation is an integral part of the product. The documentation is written for all employees who assemble, install, start up, and service this product.

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

1.2 Other applicable documentation

Observe the manual "Decentralized extra-low voltage servo drive CMP ELVCD – Functional safety".

Always use the latest edition of documentations and software.

The SEW-EURODRIVE website (www.sew-eurodrive.com) provides a wide selection of documents for download in various languages. If required, you can also order printed and bound copies of the documentation from SEW-EURODRIVE.

1.3 Structure of the safety notes

1.3.1 Meaning of signal words

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

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

1.3.2 Structure of section-related safety notes

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

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



SIGNAL WORD

Type and source of hazard.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the hazard.

Meaning of the hazard symbols

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

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

1.3.3 Structure of embedded safety notes

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

This is the formal structure of an embedded safety note:

▲ SIGNAL WORD Type and source of hazard. Possible consequence(s) if disregarded. Measure(s) to prevent the hazard.

1.4 Structure of the instructions

This documentation contains instructions whose constituents are marked with various icons.

Here you can see the formal structure of instructions and their meaning:

✓ *Prerequisite which must be fulfilled before starting instructions.*

1. *Step*

⇒ *Intermediate result of one or more previous steps.*

⇒ *Final result of all instructions.*

1.5 Rights to claim under limited warranty

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

1.6 Exclusion of liability

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

1.7 Product names and trademarks

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

1.8 Copyright notice

© 2017 SEW-EURODRIVE. All rights reserved. Unauthorized reproduction, modification, distribution or any other use of the whole or any part of this documentation is strictly prohibited.

2 Safety notes

2.1 Preliminary information

The following general safety notes have the purpose to avoid injury and damage to property. They primarily apply to the use of products described in this documentation. If you use additional components also observe the relevant warning and safety notes.

2.2 User duties

As the user, you must ensure that the basic safety notes are observed and complied with. Make sure that persons responsible for the machinery and its operation as well as persons who work on the device independently have read through the documentation carefully and understood it.

As the user, you must ensure that all of the work listed in the following is carried out only by qualified specialists:

- Setup and installation
- Installation and connection
- Startup
- Maintenance and repairs
- Shutdown
- Disassembly

Ensure that the persons who work on the product pay attention to the following regulations, conditions, documentation, and information:

- National and regional safety and accident prevention regulations
- Warning and safety signs on the product
- All other relevant project planning documents, installation and startup instructions, and wiring diagrams
- Do not assemble, install or operate damaged products
- All system-specific specifications and conditions

Ensure that systems in which the product is installed are equipped with additional monitoring and protection devices. Observe the applicable safety regulations and legislation governing technical work equipment and accident prevention regulations.

2.3 Target group

Specialist for
mechanical work

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

- Qualification in the field of mechanics according to applicable national regulation.
- They are familiar with this documentation

Specialist for electrotechnical work

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

- Qualification in the field of electrical engineering according to applicable national regulation.
- They are familiar with this documentation

In addition to that, these persons must be familiar with the valid safety regulations and laws, as well as with the requirements of the standards, directives and laws specified in this documentation. The above mentioned persons must have the authorization expressly issued by the company to operate, program, configure, label and ground devices, systems and circuits in accordance with the standards of safety technology.

Instructed persons

All work in the areas of transportation, storage, operation and waste disposal must be carried out by persons who are trained appropriately. The purpose of the instruction is that the persons are capable of performing the required tasks and work steps in a safe and correct manner.

2.4 Designated use

The product is intended for installation in electrical plants or machines.

In case of installation in electrical systems or machines, startup of the product is prohibited until it is determined that the machine meets the requirements stipulated in the local laws and directives. For Europe, Machinery Directive 2006/42/EC as well as the EMC Directive 2014/30/EU apply. Observe EN 60204-1 (Safety of machinery - electrical equipment of machines). The product meets the requirements stipulated in the Low Voltage Directive 2014/35/EU.

The standards given in the declaration of conformity apply to the product.

The product is designed for stationary use.

Technical data and information on the connection conditions are provided on the nameplate and in chapter "Technical data" in the documentation. Always comply with the data and conditions.

Unintended or improper use of the product may result in severe injury to persons and damage to property.

2.5 Functional safety technology

The product must not perform any safety functions without a higher-level safety system, unless explicitly allowed by the documentation.

2.6 Transport

Inspect the shipment for damage as soon as you receive the delivery. Inform the shipping company immediately about any damage. If the product is damaged, it must not be assembled, installed or started up.

Observe the following notes when transporting the device:

- Ensure that the product is not subject to mechanical impact during transportation.

If necessary, use suitable, sufficiently dimensioned handling equipment.

Observe the information on climatic conditions in chapter "Technical data" of the documentation.

2.7 Installation/assembly

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

Protect the product from excessive mechanical strain. The product and its mounted components must not protrude into the path of persons or vehicles. Ensure that components are not deformed and that insulation spaces are maintained, particularly during transportation. Electric components must not be mechanically damaged or destroyed.

Observe the notes in the chapter "Mechanical installation" of the documentation.

2.7.1 Restrictions of use

The following applications are prohibited unless explicitly permitted:

- Use in potentially explosive areas
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, and radiation
- Operation in applications with impermissibly high mechanical vibration and shock loads in excess of the regulations stipulated in EN 61800-5-1
- Operation at installation altitudes above 4000 m above sea level

The product can be used at altitudes above 1000 m asl up to 4000 m asl under the following conditions:

- Taking the reduced continuous rated current into consideration, see chapter "Technical data" of the documentation.
- Above 2000 m asl, the air and creeping distances are only sufficient for overvoltage class II according to EN 60664. If the installation requires overvoltage category III according to EN 60664 you have to reduce the overvoltages on the system side from category III to II using additional external overvoltage protection.
- If a protective electrical separation is required, then implement this outside the product at altitudes of more than 2000 m above sea level (protective separation in accordance with EN 61800-5-1 and EN 60204-1)

2.8 Electrical connection

Make yourself familiar with the applicable national accident prevention guidelines before you work on the product.

Perform electrical installation according to the pertinent regulations (e.g. cable cross sections, fusing, protective conductor connection). The documentation at hand contains additional information.

Make sure that all required covers are installed correctly after electrical installation.

Make sure that preventive measures and protection devices comply with the applicable regulations (e.g. EN 60204-1 or EN 61800-5-1).

2.8.1 Required preventive measure

Make sure that the product is correctly attached to the ground connection.

2.9 Protective separation

The product meets all requirements for protective separation of power and electronics connections in accordance with EN 61800-5-1. To ensure protective separation, all connected circuits must also meet the requirements for protective separation.

2.10 Startup/operation

Observe the safety notes in the chapters "Startup" and "Operation" in the documentation.

Make sure that the present transport protection is removed.

Do not deactivate monitoring and protection devices of the machine or system even for a test run.

Make sure the connection boxes are closed and screwed before connecting the supply voltage.

Depending on the degree of protection, products may have live, uninsulated, and sometimes moving or rotating parts, as well as hot surfaces during operation.

Additional preventive measures may be required for applications with increased hazard potential. You have to check the protection devices after each modification.

When in doubt, switch off the product whenever changes occur in relation to normal operation. Possible changes are e.g. increased temperatures, noise, or oscillation. Determine the cause. Contact SEW-EURODRIVE if necessary.

Mechanical blocking or internal safety functions of the product can cause a motor standstill. Eliminating the cause of the problem or performing a reset may result in the drive re-starting automatically. If, for safety reasons, this is not permitted for the drive-controlled machine, first disconnect the product from the supply system and then start troubleshooting.

Risk of burns: The surface temperature of the product can exceed 60 °C during operation.

Do not touch the product during operation.

Let the product cool down before touching it.

3 Device structure

3.1 Overview

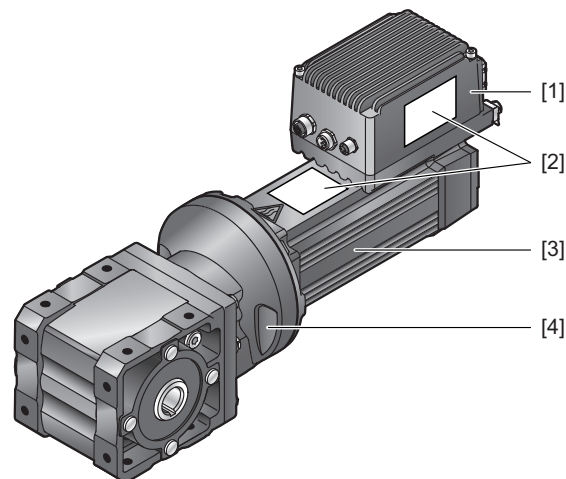
The decentralized extra-low voltage servo drive CMP ELVCD (ELVCD drive) is used in a system that consists of a DC 48 V voltage source and the ELVCD drive. The ELVCD drive is a combination of the following components:

- ELVCD inverter, integrated (→ 12) or mounted close to the motor (→ 14).
- Servomotor CMP/.../ELVCD
- Gear unit (option)

Information about the CMP servomotors and the gear units can be found in the respective documentation.

3.2 ELVCD inverter, integrated

The following figure shows an ELVCD drive with integrated ELVCD inverter:



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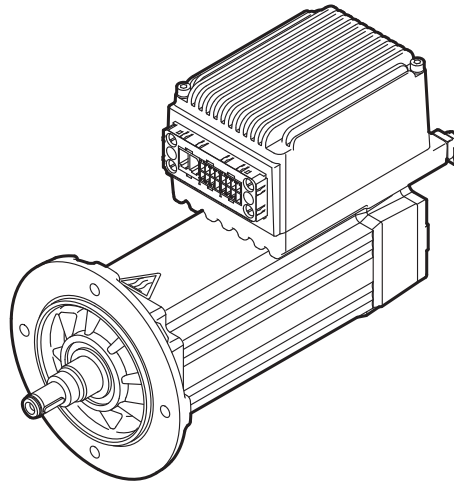
- [1] ELVCD inverter
- [2] Nameplate
- [3] Servomotor CMP/.../ELVCD
- [4] Gear unit (option)

3.2.1 Power plug positions

The ELVCD drive with integrated ELVCD inverter can be supplied with the following power plug positions:

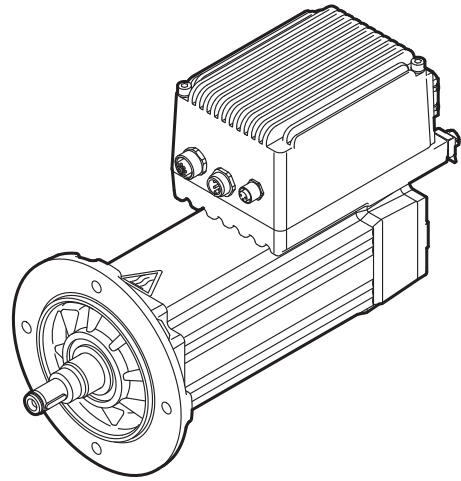
Power plug position 1

KKL1



Power plug position 3 (default)

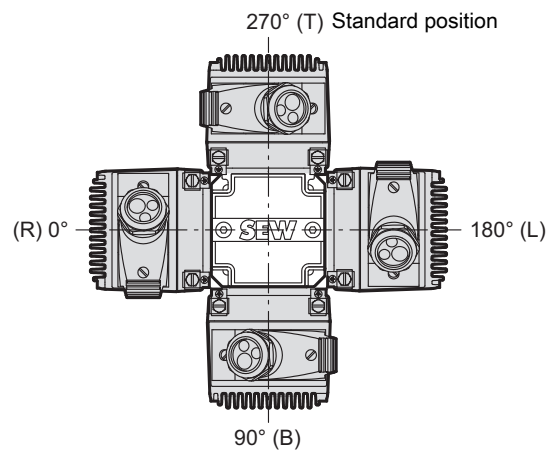
KKL3



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3.2.2 Inverter positions

The ELVCD drive is available with the following ELVCD inverter positions:

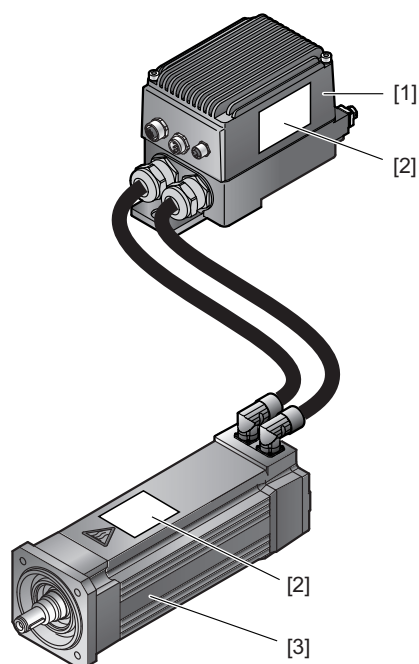


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Depending on the gear unit design, there may be restrictions regarding the ELVCD inverter position.

3.3 ELVCD inverter mounted close to the motor

The following figure shows an ELVCD drive with ELVCD inverter mounted close to the motor:



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- [1] ELVCD inverter
- [2] Nameplate
- [3] CMP/.../ELVCD servomotor, optionally with gear unit

3.3.1 Power plug positions

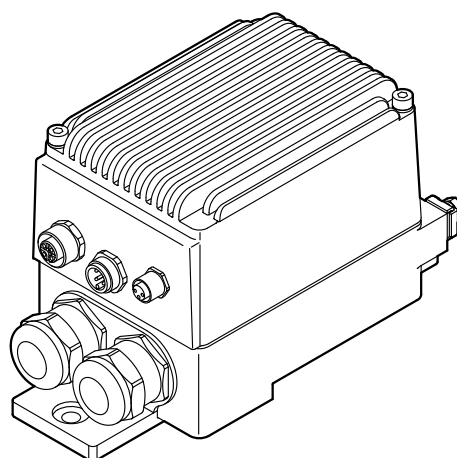
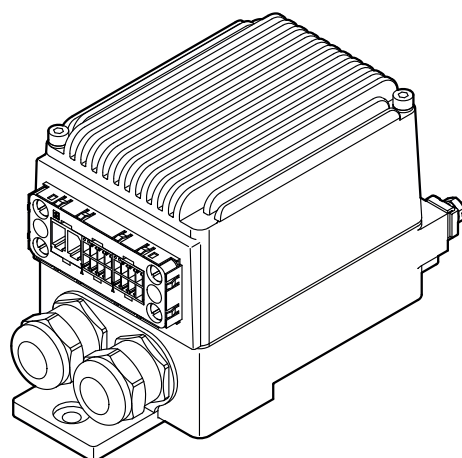
The ELVCD drive with the ELVCD inverter mounted close to the motor can be supplied with the following power plug positions:

Power plug position 1

KKL1

Power plug position 3 (default)

KKL3

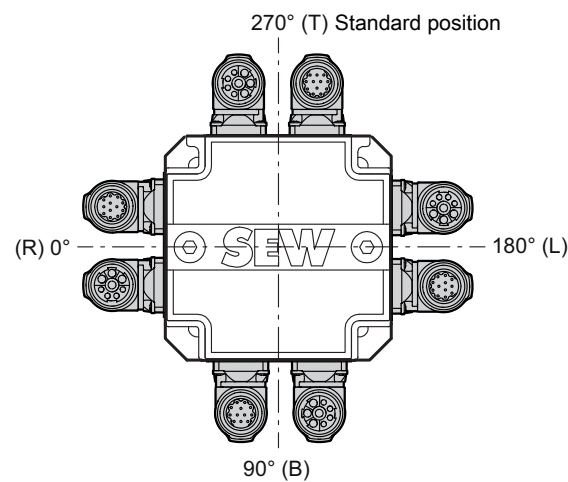


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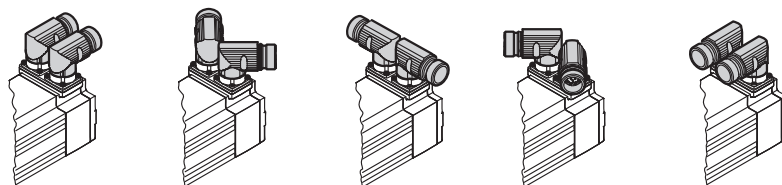
3.3.2 Motor plug positions

The motor can be supplied with the following motor plug positions:



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The following figure shows an example of the differently aligned motor plugs:



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The alignment of the plug connectors can be changed if necessary.

3.4 ELVCD inverter



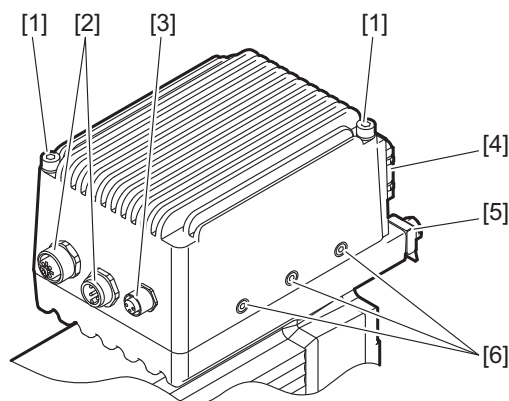
NOTICE

If you loosen the 3 screws [6], components may become loose within the ELVCD inverter.

Damage to the ELVCD inverter.

- Never loosen the 3 screws [6].

The following figure shows the ELVCD inverter:



9007211472339467

- [1] ELVCD inverter retaining screws
- [2] CAN interface plug connectors (→ 39)
- [3] Diagnostic interface (→ 41)
- [4] Power plug connector: Voltage supply and digital inputs/outputs (→ 32)
- [5] Equipotential bonding connection (→ 22)
- [6] Screws

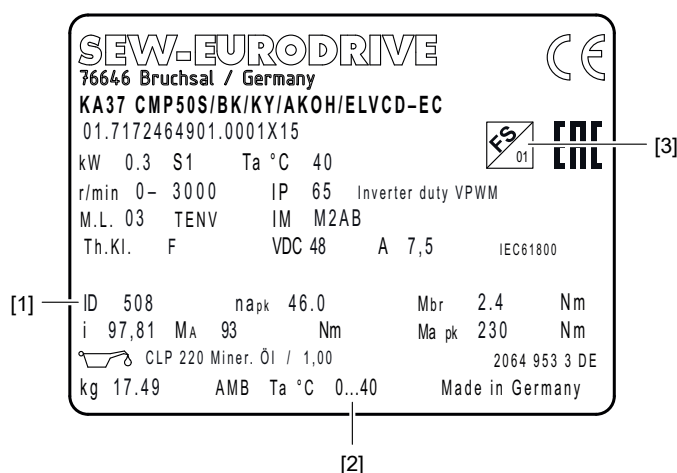
INFORMATION



Never open the device. Only SEW-EURODRIVE may perform repairs.

3.5 Nameplate

The nameplate can be found on the motor and the side of the inverter. The following figure gives an example of a nameplate of an ELVCD drive with helical-bevel gear unit.



20929219211

- [1] ID number of ELVCD drive
- [2] Ambient temperature
- [3] FS logo

Ambient temperature

ELVCD drives are available in standard design and low temperature design. Please observe the permitted ambient temperature on the nameplate.

FS logo

The FS logo on the nameplate is based on the combination of safety-related components that is installed. It is only present if the motor has been manufactured accordingly and contains at least one component that has undergone technical safety evaluation. The number specifies which components of the ELVCD drive are safety-related. The following numbers are possible:

Number	Safety-related component
01	ELVCD inverter
04	Encoder
07	ELVCD inverter and encoder

3.6 Type designation

The following table shows an example of the type designation of the **KA37 CMP50S/BK/KY/AK0H/ELVCD-EC** ELVCD drive:

KA	Gear unit type	
37	Gear unit size	
CMP	Motor series	
50S	Motor size	50S = Size 50S 50M = Size 50M
/		
BK	Brake (option)	BK = Permanent magnet brake BP = Spring-loaded brake
/		
KY	Temperature sensor	KY = KTY PK = PT1000
/		
AK0H	Encoder	RH1M = Resolver AK0H = HIPERFACE® encoder (multi-turn)
/		
ELVCD-EC	Drive design	ELVCD = drive with integrated inverter ELVCD-EC = drive with mounting close to the motor

The ELVCD drive is available as stand-alone motor or gearmotor.

Nearly all gear unit designs that can be combined with the CMP50S and CMP50M motors can be realized with the ELVCD drive.

4 Mechanical installation

4.1 Installation notes



INFORMATION

Adhere to the safety notes during installation.



⚠ WARNING

Improper installation of ELVCD drive or mount-on components.

Risk of injury.

- Adhere to the notes on installation.
- Before releasing shaft connections, make sure that there are no active torsional moments present (tensions within the system).



⚠ WARNING

Risk of injury if the ELVCD drive starts up unintentionally.

Severe or fatal injuries.

- Secure the output shaft against rotation.

4.2 Required tools and resources

- Set of wrenches
- Torque wrench
- Mounting device
- Compensation elements (shims and spacing rings), if necessary
- Fasteners for output elements
- Lubricant (e.g. NOCO® fluid)
- Standard parts are not included in the delivery

4.3 Installation tolerances for motor shaft ends

The following tables shows the permitted tolerances of the shaft ends and flanges of the ELVCD drive.

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

4.4 Permitted mounting position

The ELVCD drive is mounted in the system. Observe the mounting position specified on the motor nameplate.

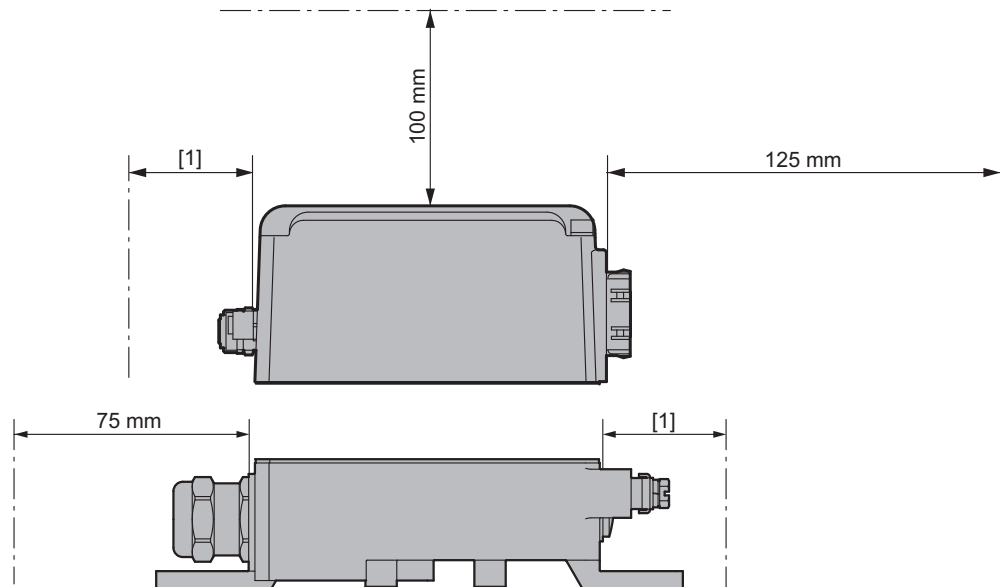
4.5 Installing the ELVCD drive

4.5.1 Notes

- When mounting close to the motor, it must be ensured that the ID on the nameplate of the motor is identical to the ID on the "nameplate of the inverter" (→ 16).
- Only install the ELVCD drive on a level, low-vibration, and torsionally rigid support structure.
- Thoroughly remove any anti-corrosion agent from the shaft end. Use a commercially available solvent. Do not allow the solvent to penetrate the bearings and sealing rings – this could damage the material.
- Align the motor carefully to avoid placing any unacceptable strain on the motor shafts. Observe the permitted overhung and axial loads specified in the gear unit catalog.
- Do not jolt or hammer the shaft end.
- Ensure sufficient clearance around the unit to allow for adequate cooling air supply. Warm outlet air of other units must not affect the cooling.
- Balance components that were subsequently mounted to the shaft with a half key (output shafts are balanced with a half key).
- Use suitable cable glands for the supply leads (use reducing adapters if necessary).
- Seal the cable entry properly.
- If the corrosion protection coating is damaged, restore the coating.
- Check whether the degree of protection specified in the operating instructions and on the nameplate is permitted in the ambient conditions on site.

4.5.2 Minimum installation clearance

Observe the minimum installation clearances as shown in the following figures. These apply to both the integrated inverter and mounting close to the motor:



18014410730571147

- [1] M12 plug connector, angled: 40 mm
M12 plug connector, straight: 75 mm

4.5.3 Installation in damp locations or outdoors

ELVCD drives are supplied in corrosion-resistant design for use in damp areas or in the open.

Repair damage to the paint work.

Condensation is not permitted for ELVCD drives.

4.5.4 Painting the ELVCD drive



NOTICE

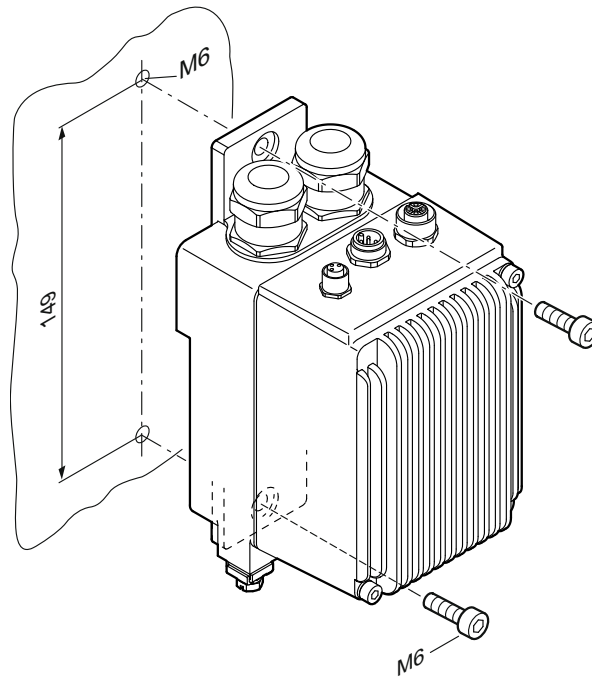
Breather valves and oil seals may be damaged during painting or re-painting.

Possible damage to property.

- Clean the surface of the ELVCD drive and make sure it is free from grease.
- Thoroughly cover the breather valves and sealing lip of the oil seals with strips prior to painting.
- Remove the strips after painting.

4.6 Mounting close to the motor

The following figure shows the mounting dimensions for mounting the ELVCD inverter close to the motor:



17823801739

For installation, use 2 M6 screws (preferably hexagon socket head screws or TORX screws) and thread locking compound.

5 Electrical installation

5.1 Installation notes

Observe the following points for electrical installation:

- Observe the general safety notes.
- Comply with all instructions referring to the technical data and the permissible conditions where the device is operated.

5.2 Installation planning taking EMC aspects into account

5.2.1 Notes on arranging and routing installation components

Successful installation of decentralized drives depends on selecting the correct cables, providing correct grounding and a functioning equipotential bonding.

Always apply the **relevant standards**.

Note the following:

5.2.2 Equipotential bonding

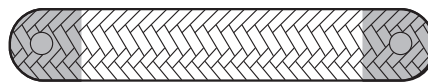
INFORMATION



Due to the extra-low voltage of DC 48 V, it is not necessary to connect a protective earth PE.

It is, however, essential that **low-impedance, HF-capable equipotential bonding** is provided (see also EN 60204-1 or DIN VDE 0100-540):

- Between the ELVCD drive and the mounting rail, provide for a connection over a wide area.
- To do so, use a ground strap (HF litz wire), for example, to connect the ELVCD drive and the grounding point of the plant.



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5.2.3 EMC-compliant installation

INFORMATION



This drive system is not designed for operation on a public low voltage supply system that supplies residential areas.

This is a product with restricted availability (categories C1 to C4 according to IEC 61800-3). This product may cause EMC interference. In this case, it is recommended for the operator to take suitable measures.

With respect to the EMC regulation, frequency inverters and ELVCD drives cannot be seen as stand-alone units. Regarding EMC, they can only be evaluated when they are integrated in a drive system. Conformity is declared for a described, CE-typical drive system. These operating instructions contain further information.

5.3 Installation instructions

5.3.1 Connecting a supply cable

- The nominal voltage of the ELVCD drive must correspond to the data for the supply voltage.
- Dimension the cable cross section according to the input current $I_{N\text{Inverter}}$ for rated power (see "Technical data" chapter).
- Install fuses F11/F12/F13 at the beginning of the supply cable upstream of the power supply unit (DC 24 V, DC 48 V) to protect the line, see chapter "Installation topology".
Size the fuses according to the cable cross section.
- Use only copper conductors with a minimum temperature range of 85 °C as supply cable.
- The DC 24 V and DC 48 V supplies have a common ground potential (GND). The central star point of the reference potential must be installed as close to the power supply units as possible.
- The maximum length of the supply cable between the power supply unit and the ELVCD drive must not exceed 10 m with a core cross section of 2.5 mm². If longer cables are required, contact SEW-EURODRIVE.
- If you connect more than one ELVCD drive to one power supply unit, install the drives in star configuration. The star point must be installed as close to the power supply unit as possible. Dimension the cable cross sections to the star point according to the total current. Contact SEW-EURODRIVE in such cases.

5.3.2 Contactor



NOTICE

Damage to the ELVCD inverter due to jog mode of the contactor.

Damage to the ELVCD inverter.

- Do not use the contactor (see chapter "Installation topology" (→ 24)) for jog mode but only for switching the ELVCD inverter on and off. Use the control commands for jog mode.
 - Observe a minimum switch-off time of 2 s for the contactor.
-
- If the contactor is installed in the DC 48 V supply cable, use only a contactor of utilization category DC-3 (EN 60947-4-1).

5.3.3 UL-compliant installation



INFORMATION

Due to UL requirements, the following chapters are always printed in English independent of the language of the publication:

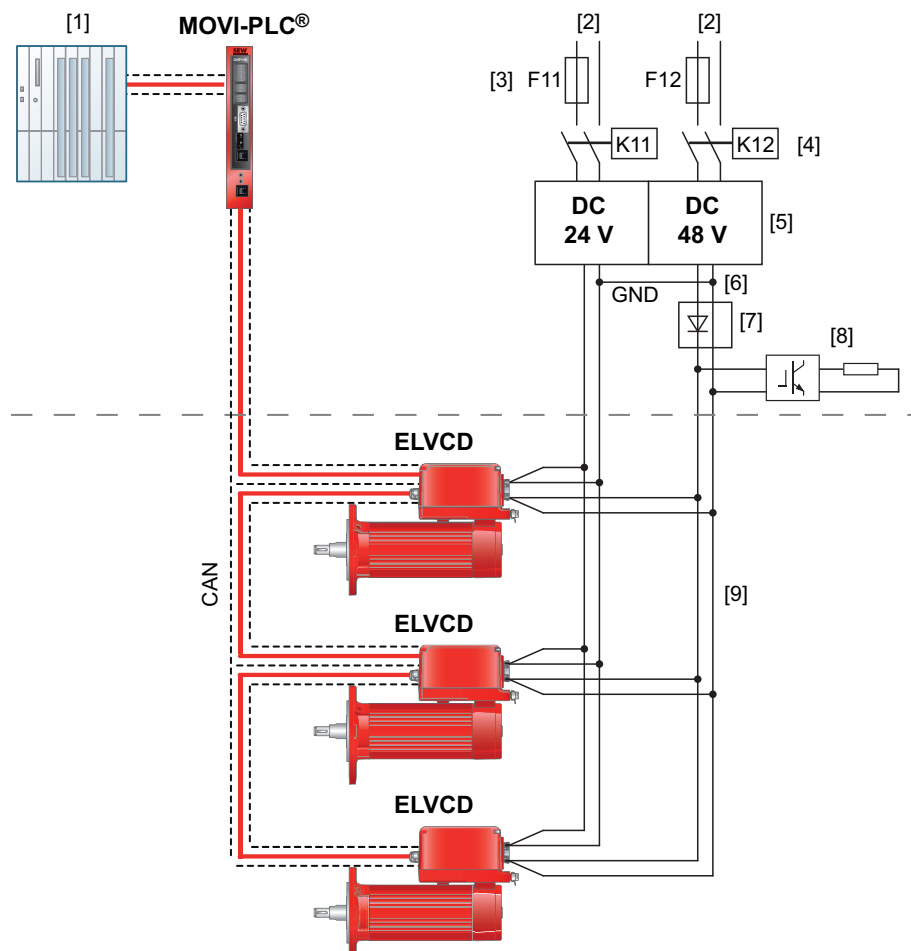
5.4 Installation topology (example)

INFORMATION



The following figure shows a basic installation topology with ELVCD drive.

Make sure to observe the installation instructions in the documentation of the MOVI-PLC® controller.

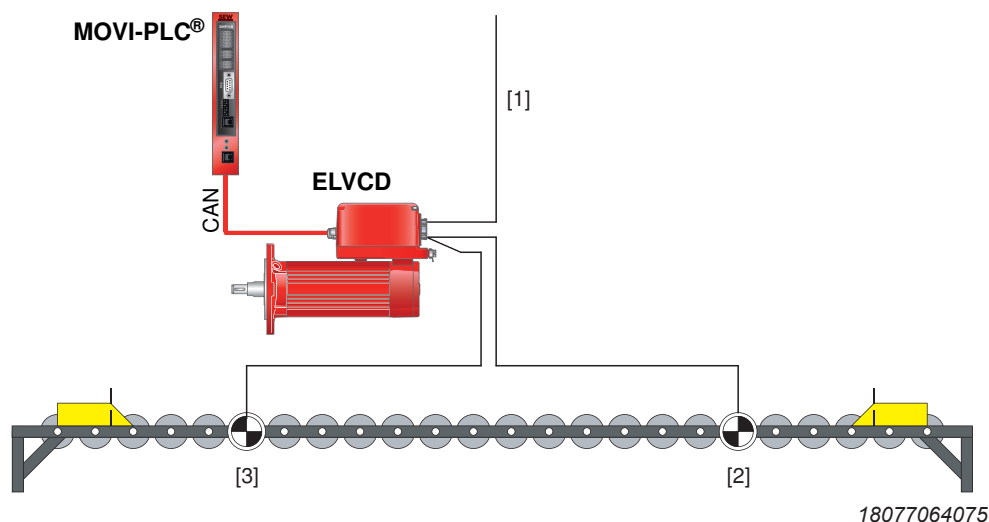


18014410730672779

- [1] Higher-level controller
- [2] Supply system
- [3] F11, F12: Fuse
- [4] K11, K12: Line contactor
- [5] Power supply units: DC 24 V (electronics), DC 48 V (power)
- [6] Common reference potential (GND)
- [7] Diode (optional)
- [8] External brake chopper and braking resistor (optional)
- [9] The 24 V electronics supply and the 48 V inverter DC link supply are provided by 1 shared connection cable or by 2 separate supply cables.

5.4.1 Switching example with digital inputs and limit switches

The following figure shows a switching example with digital inputs DI07 and DI08 for reading out limit switches:

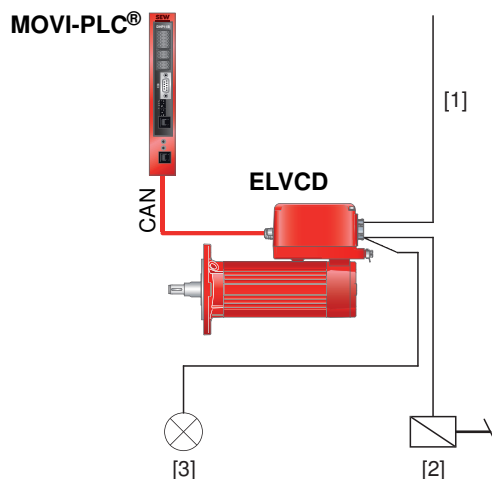


- [1] Supply of ELVCD drive
- [2] Limit switch CW/positive
- [3] Limit switch CCW/negative

The ELVCD drive can evaluate 9 digital inputs (2 of which are for limit switches) and forward these signals to the higher-level controller via the CAN bus.

5.4.2 Switching example with digital outputs

The following figure shows a switching example with digital outputs DO01 and DO02:

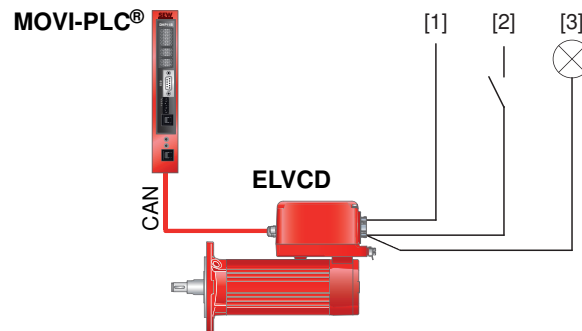


- [1] Supply of ELVCD drive
- [2] Relay
- [3] Signal lamp

The ELVCD drive has 2 parameterizable digital outputs. These can be set using the ELVCD DriveManager.

5.4.3 Switching example with enable input and ready signal

The following figure shows a switching example with input DI09 for enabling the ELVCD drive and the output for the "Ready" signal:



18087117451

- [1] Supply of ELVCD electronics
- [2] Enable/switch on output stage, set to 24 V (fixed), jumpered in plug connector or switchable
- [3] "Ready" signal lamp

5.5 Notes on the supply

5.5.1 Dimensioning the DC 24 V supply

The required power of the DC 24 V supply depends on the number and the current consumption of the connected ELVCD drives.

The current demand of an ELVCD drive is a combination of the basic current consumption of the electronics and the current consumption of the used options (e.g. brake).

5.5.2 Dimensioning the DC 48 V supply

The DC 48 V supply must provide the power that is required at the output shaft of the ELVCD drive. Determine the maximum power demand observing the efficiency.

A power supply with a nominal output of 500 W makes operation below the S1 characteristic curve possible (40 °C, see chapter Thermal characteristic curves). With dynamic capacity utilization, the power demand can be up to 1200 W.

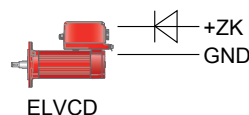
For further information, refer to chapter "Technical data" (→ 94).

5.5.3 Regenerative operation

In regenerative operation (braking operation) of the ELVCD drive, energy is fed into the DC 48 V supply circuit. This results in a rise of the supply voltage at the ELVCD inverter and at the 48 V power supply unit output. The inverter does not limit the voltage increase until the supply voltage exceeds the switch-on threshold of the brake chopper.

Switched-mode power supplies are equipped with output voltage monitoring. If the output voltage that is present at the power supply unit exceeds the value of the device-dependent switching threshold, this can lead to the voltage supply being switched off. The ELVCD drive is no longer supplied with 48 V and signals a failure. Further operation is only possible after a reset.

To avoid the possible regenerative voltage rise at the output of the 48 V power supply unit and the resulting switch-off, you may install a diode. Dimension the diode according to the currents and the voltage of the 48 V supply. Install the diode in the C 48 V supply as shown in the following figure:



20411863691

Industrial switched-mode power supplies have back-feeding protection. Back-feeding protection specifies how high the voltage may be at the output during regenerative operation of the ELVCD drive without the power supply being switched off or damaged. Please observe the information on the power supply data sheet.

If the voltage value of the back-feeding protection is higher than the switch-on threshold of the brake chopper, a diode does not need to be installed.

During braking operation of the ELVCD drive, the energy that is fed back is dissipated in the integrated braking resistor. This leads to additional heating of the ELVCD inverter, which must be taken into consideration in the thermal design of the drive (derating, see chapter "Thermal characteristic curves" (→ 99)).

Due to the use of an external brake chopper with a braking resistor, the braking energy is no longer dissipated in the ELVCD inverter. Appropriate derating is therefore not required. Please pay attention to correct electrical installation (see chapter "Installation topology (example)" (→ 24)). Please pay attention to the following information when setting the switching thresholds of the external brake chopper:

- The switch-on threshold of the external brake chopper must be less than the switch-off threshold of the internal brake chopper.
- The switch-off threshold of the external brake chopper must be more than the voltage of the DC 48 V supply circuit.
- If the switch-on threshold of the external brake chopper is less than the back-feeding protection of the switched-mode power supply, no diode is required.

5.6 CAN bus

5.6.1 Bus termination

In order to avoid disruptions in the bus system due to reflections, each system bus must be terminated with bus terminating resistors at the first and last physical stations.

Terminating the first system bus station

Use the MOVI-PLC® controller as the first system bus station.

- If the ELVCD drive is actuated via CAN 2, connect a terminating resistor of 120 Ω at the beginning of system bus CAN 2 between pin X32:2 and pin X32:3.
- If the ELVCD drive is actuated via CAN 1, connect a terminating resistor of 120 Ω at the beginning of system bus CAN 1 between pin X33:2 and pin X33:3.

Jumpering reference potential

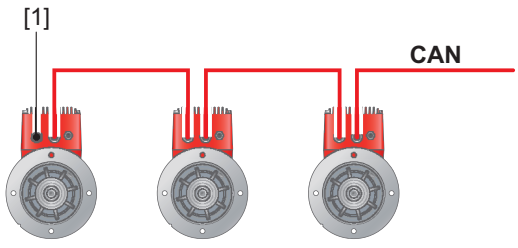
No potential shift should occur between the stations of system bus CAN 2.

No potential shift may occur between the stations of system bus CAN 1.

Suitable measures must be taken to ensure that no potential shift occurs between the system bus stations. For example, jumper the CAN_GND reference potential of the stations with a separate cable.

Terminating the last system bus station

Terminate the last system bus station by inserting a 120 Ω bus terminating resistor at plug connector X402 [1].



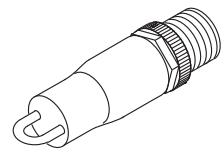
9007211481151755

[1] Bus terminating resistor 120 Ω

CAN terminating resistor

Part number: 13287036

Connection: M12



63050395932099851

5.6.2 Connection cables

The following table provides an overview of the cables available for this connection:

Cable	Length/installation type	Component
1 m: Part number 13237748 2 m: Part number 13237756 3 m: Part number 13286315 5 m: Part number 13286331 10 m: Part number 13286358 15 m: Part number 13286366	Fixed length 	ELVCD
M12, male, A-coded ↔ M12, female, A-coded		

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Cable	Length/installation type	Component
1 m: Part number 19111614 2 m: Part number 19111630 3 m: Part number 13301322 5 m: Part number 13295810 10 m: Part number 19129270 15 m: Part number 19129289  M12, female, A-coded ↔ Open	Fixed length 	MOVI-PLC®

5.6.3 Connection of cables with open end

The following table shows the core assignments of the cables with an open end and the assignments of the CAN bus interface at the MOVI-PLC® controller.

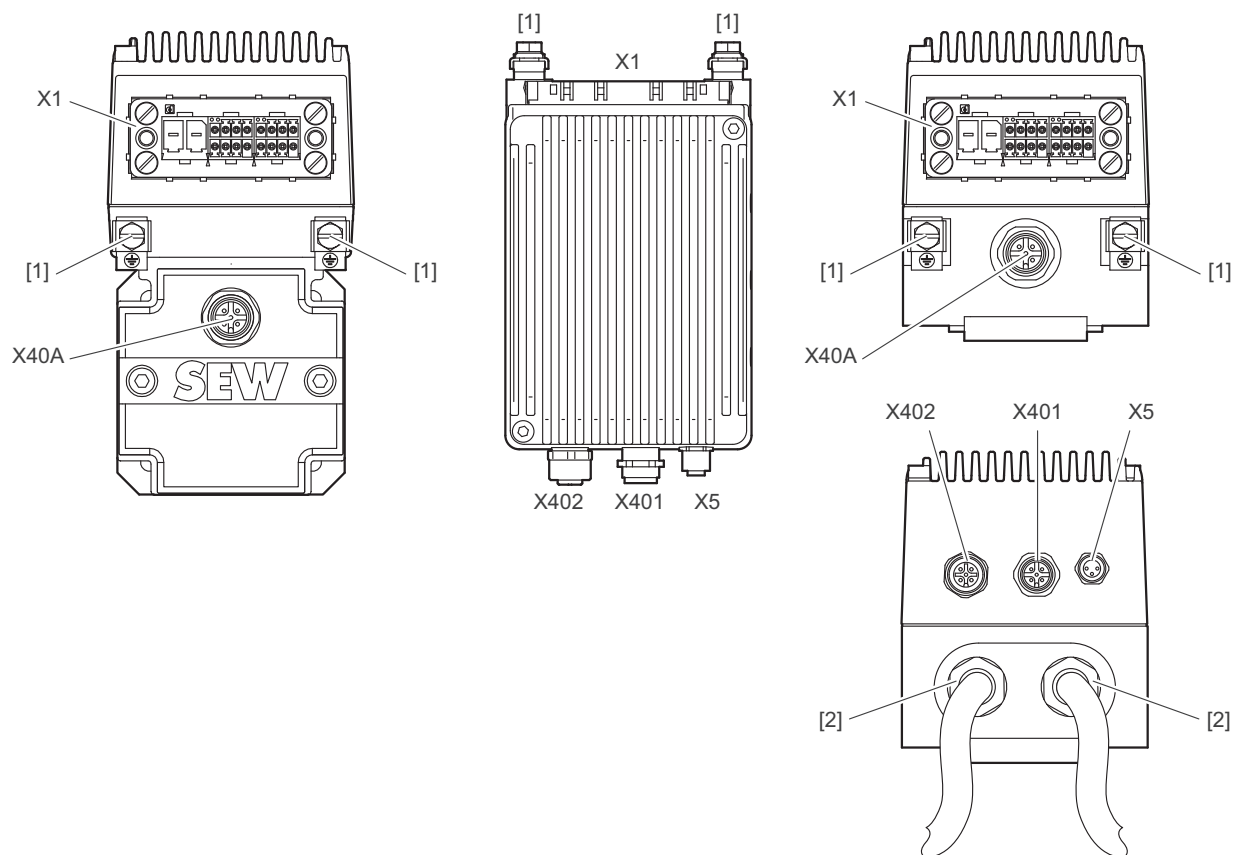
Connection cable		MOVI-PLC®		
Signal name	Core color	X32 (CAN 2)/X33 (CAN 1)		X26 (CAN 1)
		No.	Terminating resistor connection	No.
CAN_GND	Black	1		3
CAN_H	White	2	x	1
CAN_L	Blue	3	x	2

- The CAN 2 system bus is galvanically isolated. The ELVCD drive should preferably be connected to the CAN 2 (X32) interface.
- The CAN 1 system bus is not galvanically isolated.
- The pins of plug connectors X33 and X26 are jumpered internally in accordance with the table. When the ELVCD drive is connected to X26 (CAN 1), connect the terminating resistor to the pins of plug connector X33 which are marked with an "x" in the table above.
- Ensure that you do not combine the CANopen bus stations (e.g. the ELVCD drive) with MOVILINK® bus stations on a bus. However, if this is necessary, please contact SEW-EURODRIVE.

5.6.4 Connection cables with right-angle connectors

Connection cables with right-angle connectors can be purchased from specialist electrical retailers (e.g. PHOENIX CONTACT).

5.7 Positions of the plug connectors



9007220089443467

- [1] Equipotential bonding (→ 22)
- [2] Cable bushing of the motor and encoder cables (only for mounting close to the motor)
- X1 DC 24 V input, DC 48 V input and digital inputs/outputs (→ 32)
- X5 Diagnostic interface (→ 41)
- X40A STO connection (→ 38)
- X401 CAN interface – input (→ 39)
- X402 CAN interface – output (→ 40)

5.8 Electrical connections

5.8.1 Representation of connections

The wiring diagrams show the contact end of the connections.

5.8.2 Connection cables



INFORMATION

For more information on cable types, refer to the chapter "Technical data" (→ 94).

Connection cables are not included in the delivery.

Prefabricated cables for connecting SEW-EURODRIVE components can be ordered. For each connection, the available prefabricated cables are listed. Specify the part number and length of the required cable in your order.

The number and design of the required connection cables depend on the device design and the components to be connected. This is why you do not need all listed cables.

Cable types

The table below shows the depiction and what they mean:

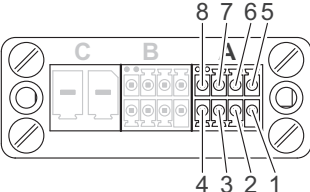
Depiction	Meaning
	Set length
	Variable length
	Suitable for cable carriers
	Not suitable for cable carriers

5.8.3 X1: DC 24 V input, DC 48 V input, and digital inputs/outputs

Function
- DC 24 V input for unit electronics supply - DC 48 V input for DC link supply - Digital inputs/outputs

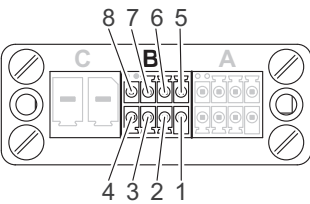
Connection type
Phoenix VARIOCON with 18 contacts

Module A

Connection image


No.	Name	Function
1	DO00	Digital output DO00, ready for operation
2	DI8	Digital input DI08, limit switch right/positive (locks at $n > 0$, clockwise rotation)
3	DI05	Digital input DI05, no function/transparent
4	DI03	Digital input DI03, no function/transparent
5	DI09	Digital input DI09, switch on output stage
6	DI07	Digital input DI07, limit switch left/negative (locks at $n < 0$, counterclockwise rotation)
7	DI04	Digital input DI04, no function/transparent
8	DI02	Digital input DI02, no function/transparent

Module B

Connection image


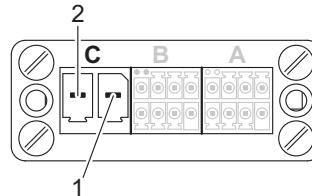
No.	Name	Function
1	DI01	Digital input DI01, no function/transparent
2	DO02	Digital output DO02, parameterizable (Parameter description)
3	res.	Reserved
4	GND	Reference potential for binary signals
5	DI00	Digital input DI00, no function/transparent

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No.	Name	Function
6	DO01	Digital output DO01, parameterizable (Parameter description)
7	DI06	Digital input DI06, no function/transparent
8	+24 V	DC 24 V voltage supply for electronics and digital inputs/outputs

Module C

Connection image



No.	Name	Function
1	GND	Reference potential for DC link and electronics
2	+DC link	DC 48 V voltage supply for DC link

INFORMATION

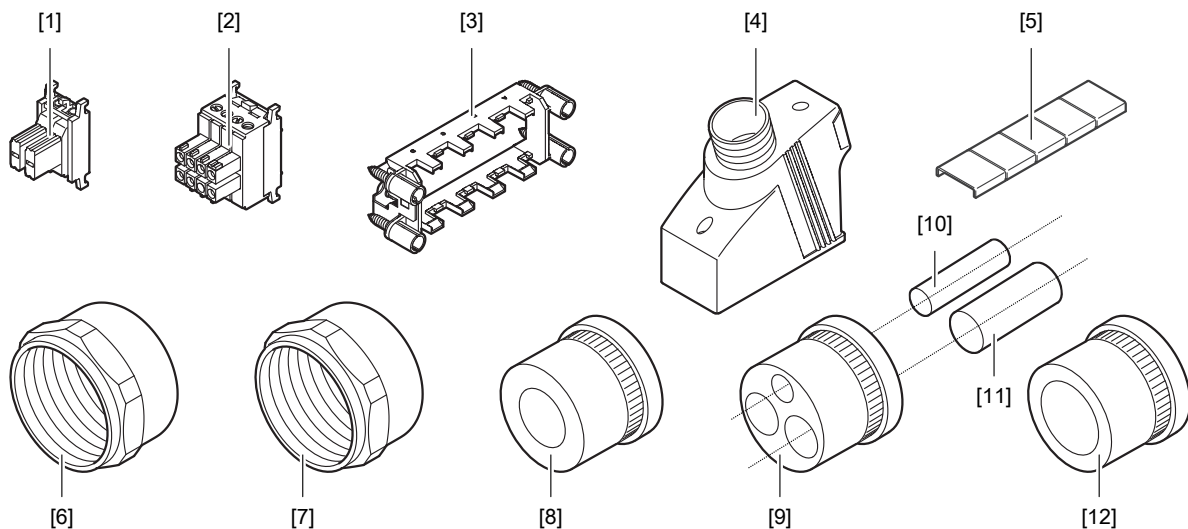


In order to enable the output stage, pin A5 and pin B8 must be jumpered, or DC 24 V must be applied to pin A5.

In order to switch the digital inputs with the DC 24 V electronic supply, pin B4 and pin C1 must be jumpered. In order to switch the digital inputs with the DC 24 V external voltage, pin B4 must be jumpered with the reference potential of the external voltage.

Connector part set ELVCD connector X1

Part number: 19175825, connection: Phoenix VARIOCON



9007220133339915

- [1] 1 × contact insert, 2-pin
- [2] 2 × contact insert, 8-pin
- [3] 1 × grommet frame
- [4] 1 × grommet housing
- [5] 1 × sign
- [6] 1 × pressure screw A, clamping opening 18.7 mm
- [7] 1 × pressure screw B, clamping opening 21.5 mm
- [8] 1 × rubber seal, single leadthrough 9 – 13 mm
- [9] 1 × rubber seal, multiple leadthrough 1 x 6 mm/2 x 9 mm
- [10] 1 × locking bolt 6 mm
- [11] 2 × locking bolts 9 mm
- [12] 1 × rubber seal, single leadthrough 11.5 – 15.5 mm

INFORMATION



Use one of the two pressure screws depending on the rubber seal.

Single leadthrough rubber seal → pressure screw A

Multiple leadthrough rubber seal → pressure screw B

Permitted connection cross section and current carrying capacity of the terminals

Module	Contact insert 8-pin	Contact insert 2-pin
Connection cross section	0.14 – 1.5 mm ²	0.2 – 4 mm ²
Current carrying capacity (max. continuous current)	10 A	20 A
Single conductor stripping length	6 mm	10 mm

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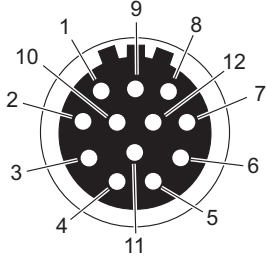
5.8.4 X2: Motor connection

The following table shows information about this connection:

Function		
Motor connection		
Connection type		
Cable with plug connector M23, 8-pin, female, type: BSTA 078		
Connection image		
No.	Name	Function
1	U	Motor phase U output
2	PE	PE connection
3	W	Motor phase W output
4	V	Motor phase V output
A	n.c.	Not connected
B	n.c.	Not connected
C	+	Brake +
D	-	Brake -

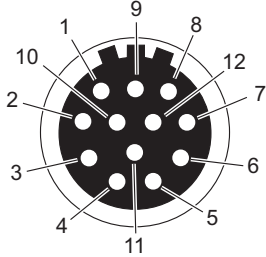
5.8.5 X3: Connection of resolver RH1M

The following table shows information about this connection:

Function		
Resolver RH1M connection (encoder)		
Connection type		
Cable with plug connector M23, 12-pin, female, 0°-coded		
Connection image		
		
No.	Name	Function
1	R1	Signal input, reference +
2	R2	Signal input, reference -
3	S1	Signal input, cosine +
4	S3	Signal input, cosine -
5	S2	Signal input, sine +
6	S4	Signal input, sine -
7	n.c.	Not connected
8	n.c.	Not connected
9	PK/KTY+	Temperature sensor connection PK/KTY+
10	PK/KTY-	Temperature sensor connection PK/KTY-
11	n.c.	Not connected
12	n.c.	Not connected

5.8.6 X3: AK0H HIPERFACE® encoder connection

The following table shows information about this connection:

Function		
AK0H HIPERFACE® encoder connection		
Connection type		
Cable with plug connector M23, 12-pin, female, 0°-coded		
Connection image		
		
No.	Name	Function
1	n.c.	Not connected
2	n.c.	Not connected
3	S1	Signal input, cosine +
4	S3	Signal input, cosine -
5	S2	Signal input, sine +
6	S4	Signal input, sine -
7	D -	RS485 connection -
8	D+	RS485 connection +
9	PK/KTY+	Temperature sensor connection PK/KTY+
10	PK/KTY-	Temperature sensor connection PK/KTY-
11	GND	Reference potential
12	Us	Supply voltage

5.8.7 X40A: STO connection



⚠ WARNING

Risk of injury due to non safety-related disconnection of the device if the connection is jumpered.

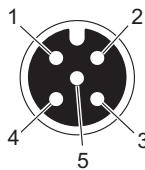
Severe or fatal injuries.

- Jumper this connection only if the device will not perform any safety functions according to EN ISO 13849-1.



INFORMATION

Use only shielded cables for this connection.

Function		
Input for safe disconnection		
Connection type		
M12, 5-pole, female, A-coded		
Connection image		
		
No.	Name	Function
1	+24V	DC 24 V output
2	+24V	DC 24 V output
3	STO1	DC 24 V input for safe disconnection
4	STO2	DC 24 V input for safe disconnection
5	GND	0V24 reference potential for safe disconnection

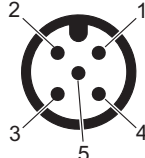
5.8.8 X401: CAN interface – input

INFORMATION



Use CAN connection cables with which the shield is connected to the connector housing in a way that is EMC-compliant. These cables ensure that there is a continuous connection to the housing of the device.

The following table shows information about this connection:

Function		
CAN interface – input		
Connection type		
M12, 5-pin, male, A-coded		
Connection image		
		
No.	Name	Function
1	Drain	Shield/equipotential bonding CAN bus
2	res.	Reserved
3	CAN_GND	Reference potential CAN bus
4	CAN_H	CAN data line (high)
5	CAN_L	CAN data line (low)

5.8.9 X402: CAN interface – output

INFORMATION



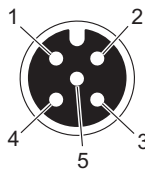
If there is no station connected here, you must terminate the bus with a 120 Ω resistor.

INFORMATION



Use CAN connection cables with which the shield is connected to the connector housing in a way that is EMC-compliant. These cables ensure that there is a continuous connection to the housing of the device.

The following table shows information about this connection:

Function		
CAN interface – output		
Connection type		
M12, 5-pin, female, A-coded		
Connection image		
		
No.	Name	Function
1	CAN_SHLD	Shield/equipotential bonding
2	res.	Reserved
3	GND	Reference potential
4	CAN_H	CAN data line (high)
5	CAN_L	CAN data line (low)

5.8.10 X5: Diagnostic interface



INFORMATION

Diagnostic interface X5 may only be used by SEW-EURODRIVE Service.
Never remove the screw plug from diagnostic interface X5.

6 Startup

6.1 Startup notes



⚠ WARNING

Electric shock due to missing or defective protection covers.

Severe or fatal injuries.

- Make sure all protection covers are installed properly.
- Never start the device if the protection covers are not installed.



⚠ CAUTION

Risk of burns due to hot surfaces of the device or connected options, e.g. braking resistors.

Injury.

- Provide for covers to secure hot surfaces.
- Install the protection devices according to the regulations.
- Check the protection devices on a regular basis.
- Let the device and the connected options cool down before you start working on them.



⚠ WARNING

Risk of injury due to device malfunction caused by incorrect device setting.

Severe or fatal injuries.

- Make sure that the installation was carried out by trained specialists.
- Check the parameters and data sets.
- Only use settings that are correct for the function.



INFORMATION

Observe the safety notes in chapter "Safety notes" > "Startup/Operation".



INFORMATION

To ensure fault-free operation, do not disconnect or connect signal cables during operation.

6.1.1 Use with absolute encoder AK0H

The ELVCD inverter does not have SRAM memory. Therefore, it cannot store the "Referenced" and "Number of encoder overflows" information if the voltage supply fails.

In order to avoid the reference travel after switching on, the MultiMotion program module calculates this information by evaluating various parameters during the boot phase.

However, this evaluation can only succeed if the drive has not left the multi-turn range of the absolute encoder (4096 motor revolutions) before switching off or in the switched-off condition. The ELVCD inverter operates with an absolute position resolution of 65536 motor revolutions.

If the drive leaves the multi-turn range of the absolute encoder before switching off, the ELVCD inverter loses the "Number of encoder overflows" information and is therefore no longer correctly referenced. The position that the ELVCD inverter then transmits no longer corresponds to the original position before switching off.

NOTICE

Danger due to faulty referencing after a voltage supply failure. If the travel range of the system is greater than the multi-turn range of the absolute encoder (4096 motor revolutions), the drive can leave the multi-turn range of the absolute encoder after a voltage supply failure.

The drive is then no longer correctly referenced. The drive can damage the system by colliding with the mechanical stop.

- Please ensure that the travel range of the machine is less than the multi-turn range of the absolute encoder.
- If this is not possible, ensure that a reference travel is carried out after running up the machine.

6.2 Requirements

The following requirements apply to startup:

- The drive is undamaged and not blocked.
- You have carried out the measures stipulated in chapter "Extended storage" (→ 89) after an extended storage period.
- You have established all of the connections correctly.
- The direction of rotation of the drive is correct.
- All protective covers are installed correctly.
- All motor protection equipment is active and set for the rated motor current.
- There are no other sources of danger.
- The surface of the drive is not covered by heat-sensitive or thermally insulating materials.

6.2.1 Required hardware and software

The following hardware and software must be present for startup:

Controller	Type	SD memory card	Program module
MOVI-PLC® (programmable)	DH.21B (standard)	OMH21B-T0	MultiMotion Light
	DH.41B (advanced)	OMH21B-T0	
		OMH41B-T2	MultiMotion
CCU (parameterizable)	DHF21B, DHR21B (standard)	OMC21B-T0	Application Configurator
	DHF41B, DHR41B (advanced)	OMC41B-T2	

Also observe the following points in particular:

- The SD memory card must be installed in the MOVI-PLC® controller.
- The specified technology points correspond with the minimum requirement.
- The MOVITOOLS® MotionStudio engineering software must be installed on the engineering PC.
- Version V180.100 or higher of the Application Configurator must be present.
- Type DHE21B and DHE41B CCU controllers are not supported.

6.2.2 Application modules for CCU

Device type "ELVCD" must be used in the Application Configurator. The following modules are available:

- Universal module x PD
- Universal module Technology

The description of the application modules can be found in the "Application Configurator for CCU" manual.

6.3 Additional information

Further information can be found in the following documents:

- Application Configurator
- MultiMotion
- MOVI-PLC® libraries

6.4 Startup with CCU

6.4.1 Preparing startup



INFORMATION

This chapter describes the startup of the ELVCD drive using the MultiMotion program module of the MOVITOOLS® MotionStudio software.

Refer to the "MultiMotion" manual for further information on the MultiMotion program module.

- ✓ The ELVCD drive must be properly installed, both mechanically and electrically.
 - ✓ The GND reference potential of the 24 V and the 48 V voltage supply are connected to the same potential.
1. Switch on the 24 V and the 48 V voltage supply of the ELVCD drive.
 2. Connect the engineering PC to the controller via Ethernet.
 3. Supply voltage to the controller.
 4. Start the MOVITOOLS® MotionStudio software.

6.4.2 Scanning network



INFORMATION

- The device is not detected by a network scan. Access with MOVITOOLS® MotionStudio always has to take place via the "ELVCD DriveManager" plug-in.
1. Select connection type "Ethernet" under "Select connection mode and create network".
 2. Make sure that you are in Online mode.
 3. Right-click on the network icon in the bottom window.
 4. Select menu item [Network Scan].
 - ⇒ The controller that is present in the supply system appears.
 5. Configure the device by dragging and dropping the device icon into the configuration window. An offline data set is created.

6.4.3 Performing startup

The startup procedure with CCU is described in the "Application Configurator for CCU" manual.

6.4.4 Finishing startup

In order to be able to work with the ELVCD drives, their ID numbers need to be assigned to SBus addresses. Proceed as follows:

- ✓ You know the ID numbers of all ELVCD drives to be started up. The ID numbers can be found on the "motor nameplates" (→ 16).
- ✓ The "ELVCD-DriveManager" plug-in is installed in MOVITOOLS® MotionStudio. You can obtain this plug-in from SEW-EURODRIVE.

- ✓ You are familiar with the handling of the "ELVCD-DriveManager" plug-in and the user interface. Information about the plug-in can be found in the "ELVCD DriveManager" (→ 73) chapter.
- 1. Right-click on the controller in the project.
 - ⇒ The context menu is displayed.
- 2. Click on menu command [ELVCD-DriveManager].
 - ⇒ The "ELVCD-DriveManager" is opened with a list of previously configured ELVCD drives.
- 3. Enter the ID numbers of the ELVCD drives in the "ID number" edit boxes.
- 4. Click the "SBUS" button.
 - ⇒ After a short delay, the "Axis-Connected" displays are shown in green. This indicates that the ELVCD drives are connected.
- ⇒ You can now control the ELVCD drives with the controller.

6.5 Startup with MOVI-PLC®

6.5.1 Preparing startup

INFORMATION



This chapter describes the startup of the ELVCD drive using the MultiMotion program module of the MOVITOOLS® MotionStudio software.

Refer to the "MultiMotion" manual for further information on the MultiMotion program module.

- ✓ The ELVCD drive must be properly installed, both mechanically and electrically.
- ✓ The GND reference potential of the 24 V and the 48 V voltage supply are connected to the same potential.
- 1. Switch on the 24 V and the 48 V voltage supply of the ELVCD drive.
- 2. Connect the engineering PC to the controller via Ethernet.
- 3. Supply voltage to the controller.
- 4. Start the MOVITOOLS® MotionStudio software.

6.5.2 Scanning network

INFORMATION

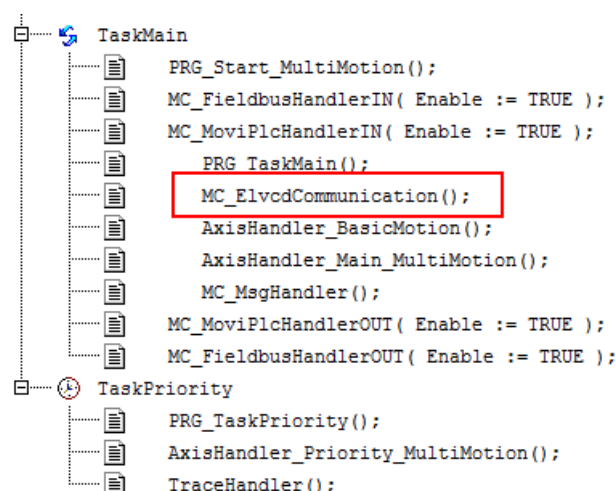


- The device is not detected by a network scan. Access with MOVITOOLS® MotionStudio always has to take place via the "ELVCD DriveManager" plug-in.
- 1. Select connection type "Ethernet" under "Select connection mode and create network".
- 2. Make sure that you are in Online mode.
- 3. Right-click on the network icon in the bottom window.

4. Select menu item [Network Scan].
 - ⇒ The controller that is present in the supply system appears.
5. Configure the device by dragging and dropping the device icon into the configuration window. An offline data set is created.

6.5.3 Startup procedure with MOVI-PLC®

- ✓ The current version of MultiMotion is installed on the engineering PC. The version information can be found under menu item [Help] > [Installed Components] > [Add-Ins] of MOVITOOLS® MotionStudio.
1. Right-click the MOVI-PLC® icon.
 2. In the [Programming] context menu, select [Create new PLC Editor project].
 3. Select one of the templates "AxisControl_MultiMotion" or "AxisControl_MultiMotion_Framework".
 4. Enter the name of the new PLC Editor project.
 5. Click the [OK] button to open the PLC Editor.
 6. To set the "Task configuration", switch to the "Resources" tab.
 7. In the "TaskPriority" folder, set the TaskPriority cycle time to a value of 10 ms.
 8. Add `MC_CommunicationTask_CAN ()`; to the last line of the TaskPriority.
 9. Under "TaskMain", insert entry `MC_ElvcdCommunication()`; before the line "AxisHandler_BasicMotion();", as shown in the following figure.



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10. Set the used CAN node to "enabled".
11. If necessary, remove the existing drives of SEW-EURODRIVE.
12. In the "Module parameter" tab, set the transmission rate of the relevant CAN bus (CAN 1 or CAN 2) of the MOVI-PLC® to 500 kBaud. The ELVCD drive only supports 500 kBaud. Changes via the parameter tree are not possible. The parameter tree requires correct settings.
13. Compile the project by pressing the <F11> key.
14. Log in by clicking on menu item [Online] > [Log in]. Confirm the load request by clicking on the [OK] button.
15. Load the PLC project as a boot project by clicking on the [Online] > [Generate boot project] menu item.

16. Start the project by pressing the <F5> key.
17. Proceed as described in the manual "MultiMotion program module for MOVI-PLC®".

6.5.4 Finishing startup

In order to be able to work with the ELVCD drives, their ID numbers need to be assigned to SBus addresses. Proceed as follows:

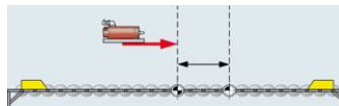
- ✓ You know the ID numbers of all ELVCD drives to be started up. The ID numbers can be found on the "motor nameplates" (→ 16).
 - ✓ The "ELVCD-DriveManager" plug-in is installed in MOVITOOLS® MotionStudio. You can obtain this plug-in from SEW-EURODRIVE.
 - ✓ You are familiar with the handling of the "ELVCD-DriveManager" plug-in and the user interface. Information about the plug-in can be found in the "ELVCD DriveManager" (→ 73) chapter.
1. Right-click on the controller in the project.
 - ⇒ The context menu is displayed.
 2. Click on menu command [ELVCD-DriveManager].
 - ⇒ The "ELVCD-DriveManager" is opened with a list of previously configured ELVCD drives.
 3. Enter the ID numbers of the ELVCD drives in the "ID number" edit boxes.
 4. Click the "SBUS" button.
 - ⇒ After a short delay, the "Axis-Connected" displays are shown in green. This indicates that the ELVCD drives are connected.
 - ⇒ You can now control the ELVCD drives with the controller.

6.6 Reference travel

6.6.1 Zero pulse positive direction

Reference travel takes place without motion, by setting the encoder offset to zero pulse in positive direction.

New actual position = current modulo position + offset

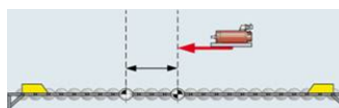


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6.6.2 Zero pulse negative direction

Reference travel takes place without motion, by setting the encoder offset to zero pulse in negative direction.

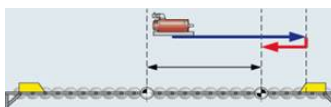
New actual position = current modulo position + offset



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6.6.3 Limit switch CW/positive

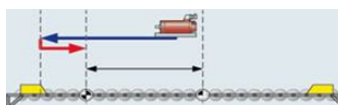
Reference travel takes place by approaching the limit switch in positive direction.
New actual position = offset



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6.6.4 Limit switch CCW/negative

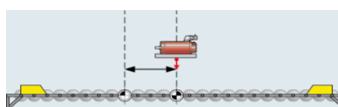
Reference travel takes place by approaching the limit switch in negative direction.
New actual position = offset



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6.6.5 Set reference point with enable

Referencing is performed by starting the "Homing" operating mode.
New actual position = zero



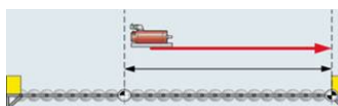
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6.6.6 Fixed stop positive

Reference travel takes place by approaching the stop in positive direction.
New actual position = offset

NOTICE! Danger from heavy collision. If the setting of parameter P303.0 Maximum current is non-permissible, the system can become damaged in the event of a collision with the fixed stop.

Set parameter *P303.0 Maximum current* as follows: Nominal motor current < Parameter *P303.0 Maximum current* < 32 A.



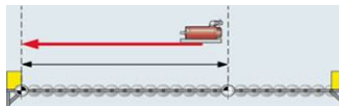
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6.6.7 Fixed stop negative

Reference travel takes place by approaching the stop in negative direction.
New actual position = offset

NOTICE! Danger from heavy collision. If the setting of parameter P303.0 Maximum current is non-permissible, the system can become damaged in the event of a collision with the fixed stop.

Set parameter *P303.0 Maximum current* as follows: Nominal motor current < Parameter *P303.0 Maximum current* < 32 A.



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6.7 Parameter list

No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (range/factory setting)	CANopen scaling or bit assignment
0_ Display values					
00_ Process values					
001.0	32769	0	Actual speed	-3000 – 0 – +3000 min ⁻¹	
002.0	32770	0	Actual velocity	(-2 ³¹ -1) – 0 – (+2 ³¹ -1) user units	
003.0	32771	0	Actual position	(-2 ³¹ -1) – 0 – (+2 ³¹ -1) increments	
004.0	32772	0	Actual position	(-2 ³¹ -1) – 0 – (+2 ³¹ -1) user units	
005.0	32773	0	Active current	0 – 400% I _{N Motor}	
006.0	197	0	Motor utilization	0 – 100%	1 Digit = 100 2 ⁻¹⁶ V
007.0	196	0	Device utilization	0 – 100%	1 Digit = 100 2 ⁻¹⁶ V
008.0	130	0	DC link voltage	0 – 60 V	1 Digit = 2 ⁻¹⁶ V
009.0	131	0	Motor temperature	°C	1 Digit = 2 ⁻⁴ °C
009.1	132	0	Power section temperature	°C	1 Digit = 2 ⁻⁴ °C
01_ Status displays					
011.0	32779	0	Inverter status	0: Not ready for operation 1: Switch-on inhibited 2: Not enabled 3: On 4: Enabled 5: Rapid stop active 6: Fault 7: STO active	
012.0	32780	0	Fault status	Fault number and fault text	
013.0	50	0	Warning status	0: No warning 1: Warning active	Bit 16
02_ STO status					

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No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (range/factory setting)	CANopen scaling or bit assignment
0__	Display values				
020.0	58	0	Normal state	Inactive/Active	Bit 15
021.0	58	0	STO safe state reached	Inactive/Active	Bit 12
022.0	58	0	Safety circuit fault	Inactive/Active	Bit 10
023.0	58	0	STO 1 feedback (PWM power driver off)	Inactive/Active	Bit 27
024.0	58	0	STO 2 feedback (driver supply off)	Inactive/Active	Bit 26
025.0	58	0	Input STO 1	Inactive/Active	Bit 25
026.0	58	0	Input STO 2	Inactive/Active	Bit 24
03_	Digital inputs				
030.0	32817	0	Digital input DI00	Inactive/Active	Bit 0
031.0	32817	0	Digital input DI01	Inactive/Active	Bit 1
032.0	32817	0	Digital input DI02	Inactive/Active	Bit 2
033.0	32817	0	Digital input DI03	Inactive/Active	Bit 3
034.0	32817	0	Digital input DI04	Inactive/Active	Bit 4
035.0	32817	0	Digital input DI05	Inactive/Active	Bit 5
036.0	32817	0	Digital input DI06	Inactive/Active	Bit 6
037.0	32817	0	Digital input DI07 (limit switch CCW/negative)	Inactive/Active	Bit 7
038.0	32817	0	Digital input DI08 (limit switch CW/positive)	Inactive/Active	Bit 8
039.0	32817	0	Digital input DI09 (controller enable)	Inactive/Active	Bit 9
05_	Digital outputs				
050.0	32818	0	Digital output DO00 (ready for operation)	Inactive/Active	Bit 0
051.0	32818	0	Digital output DO01 (Status of the function that is defined in parameter <i>P620.0</i>)	Inactive/Active	Bit 1
052.0	32818	0	Digital output DO02 (Status of the function that is defined in parameter <i>P621.0</i>)	Inactive/Active	Bit 2
053.0	32818	0	Digital output DO03 (Brake output)	Inactive/Active	Bit 3
07_	Device data				
070.0	23	0	Firmware version (Main version/subversion)	e.g.: 3.1	

No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (range/factory setting)	CANopen scaling or bit assignment
0__	Display values				
071.0	20	0	ID	e.g. 111	
072.0	27	0	Nominal motor voltage	48 V	1 Digit = 2^{-16} V
073.0	28	0	Nominal motor current	CMP 50S/ELVCD: 6.2 A CMP 50S/ELVCD-EC: 8.4 A CMP 50M/ELVCD: 8.6 A CMP 50S/ELVCD-EC: 11.7 A	1 Digit = 2^{-16} A
074.0	32	0	No-load speed	3000 min ⁻¹	1 Digit = 2^{-12} min ⁻¹
075.0	35	0	Stator inductance	CMP 50S: 0.64 mH CMP 50M: 0.33 mH	1 Digit = 2^{-24} H
075.1	36	0	Stator resistance	CMP 50S: 0.25 Ω CMP 50M: 0.11 Ω	1 Digit = 2^{-8} Ω
076.0	31	0	Torque constant	CMP 50S: 0.12 Nm/A CMP 50M: 0.13 Nm/A	1 Digit = 2^{-12} Nm/A
077.0	161	0	Angular encoder type	0: Resolver 1: Sine-cosine encoder	Bit 12, 13, 14, 15
077.1	170	0	Angular encoder configuration	0: Single-turn 1: Reserved 2: Multi-turn	Bit 0, 1
077.2	171	0	SINCOS pulses per revolution	0 – 512 – 65536	1 digit = 1
078.0	163	0	Rotor position offset	-180° – 0 – +180°	1 Digit = 180 2^{-15} °
078.1	34	0	Number of pole pairs	3	
079.0	4414	0	Encoder offset	$(-2^{31}-1) - 0 - (+2^{31}-1)$	1 digit = increment
08_	Fault and warning signals				
080.0	112	0	Motor overtemperature	Yes/no	Bit 2
080.1	112	0	Power electronics under-temperature/overtemperature	Yes/no	Bit 3
080.2	112	0	SINCOS supply fault	Yes/no	Bit 4
080.3	112	0	SINCOS RS485 communication error	Yes/no	Bit 5
080.4	112	0	SINCOS track signal fault	Yes/no	Bit 6
080.5	112	0	Resolver track signal fault or carrier failure	Yes/no	Bit 7
080.6	112	0	5 V electronics supply fault	Yes/no	Bit 8

No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (range/factory setting)	CANopen scaling or bit assignment
0__	Display values				
080.7	112	0	12 V electronics supply fault	Yes/no	Bit 9
080.8	112	0	24 V logic supply fault	Yes/no	Bit 10
080.9	112	0	Offset current measurement fault	Yes/no	Bit 12
081.0	112	0	DC link/output stage over-current	Yes/no	Bit 13
081.1	112	0	DC link undervoltage	Yes/no	Bit 14
081.2	112	0	DC link overvoltage	Yes/no	Bit 15
081.3	112	0	Hall sensor fault	Yes/no	Bit 16
081.4	112	0	I ² t_fault_motor_(I ² t_at_100 %)	Yes/no	Bit 18
081.5	112	0	I ² t_fault_controller_(I ² t_at_100%)	Yes/no	Bit 19
081.6	112	0	I ² t_at_80%	Yes/no	Bit 25
081.7	112	0	Temperature motor 5 °C below maximum	Yes/no	Bit 26
081.8	112	0	Temperature_output stage_5 °C_below_maximum	Yes/no	Bit 27
081.9	112	0	Lag error monitoring	Yes/no	Bit 28
082.0	112	0	Limit switch fault	Yes/no	Bit 30
082.1	113	0	Timeout at rapid stop	Yes/no	Bit 2
082.2	113	0	Reference travel fault	Yes/no	Bit 3
082.3	113	0	Motor and angular encoder identification	Yes/no	Bit 7
082.4	113	0	Travel program: unknown fault	Yes/no	Bit 10
082.5	113	0	Travel program: invalid jump destination	Yes/no	Bit 11
082.6	113	0	CAN communication error	Yes/no	Bit 22
082.7	113	0	RS232 communication error	Yes/no	Bit 23
082.8	113	0	Position data set fault	Yes/no	Bit 24
082.9	113	0	Faulty operating mode change	Yes/no	Bit 25
083.0	113	0	Fault in precalculation positioning	Yes/no	Bit 27
083.1	113	0	Stack_Overflow	Yes/no	Bit 29

No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (range/factory setting)	CANopen scaling or bit assignment
0__	Display values				
083.2	113	0	Checksum error	Yes/no	Bit 30
083.3	113	0	Initialization error	Yes/no	Bit 31

No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (range / factory setting)	CANopen scaling or bit assignment
1__	Setpoints				
10__	STO monitoring				
100.0	59	0	STO discrepancy time	2 – 150 – 1000 ms	1 Digit = 0.0001 ms
13__	Delays				
136.0	248	0	Rapid stop delay (multi-turn)	187 – 100000 – 8388607 min ⁻¹ s ⁻¹	1 Digit = 2 ⁻⁸ min ⁻¹ s ⁻¹
137.0	247	0	Limit switch delay (multi-turn)	187 – 100000 – 8388607 min ⁻¹ s ⁻¹	1 Digit = 2 ⁻⁸ min ⁻¹ s ⁻¹
138.0	257	0	Monitoring shutdown delay	2 – 500 60000 ms	1 Digit = 0.0001 ms

No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (range / factory setting)	CANopen scaling or bit assignment
2__	Control parameter				
20__	Speed control				
200.0	235	0	Speed controller configuration	0: Ramp inactive 1: Ramp active	Bit 0
201.0	236	0	Speed controller gain	0.1 – 0.5 – 64	1 Digit = 2 ⁻¹⁶
202.0	237	0	Speed controller time constant	0.2 – 8 100 ms	1 Digit = 0.0001 ms
203.0	242	0	Speed controller filter time	0.2 – 2.2 50 ms	1 Digit = 0.0001 ms
21__	Position control				
210.0	278	0	Position controller gain	0.1 – 0.2 – 64	1 Digit = 2 ⁻¹⁶
211.0	279	0	Position controller corrective speed	0 – 50 –32768 min ⁻¹	1 Digit = 2 ⁻¹² min ⁻¹
212.0	283	0	Position controller dead zone position difference	0 – 0.00031 –32768 re- volutions	1 Digit = 2 ⁻¹⁶ rev.
29__	Current control				
290.0	208	0	Current controller gain	0.1 – 64 CMP 50S: 2.2 CMP 50M: 2.1	1 Digit = 2 ⁻¹⁶
291.0	209	0	Current controller time constant	0.2 – 100 ms CMP 50S: 1.20 ms CMP 50M: 1.00 ms	1 Digit = 0.0001 ms

No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (range / factory setting)	CANopen scaling or bit assignment
3__	Motor parameters				
30_	Limits				
302.0	33	0	Maximum speed	2 – 3300 – 32768 min ⁻¹	1 Digit = 2 ⁻¹² min ⁻¹
303.0	29	0	Maximum current	0.11 – 32 A	1 digit = 1/92682 A
305.0	30	0	I ² t-time constant	400 – 10000 ms	1 Digit = 0.0001 ms
32_	Brake function				
325.0	51	0	Brake release time	0 – 200 6553.5 ms	1 Digit = 0.0001 ms
325.1	52	0	Brake application time	0 – 75 6553.5 ms	1 Digit = 0.0001 ms
35_	Direction of motor rotation				
350.0	48	0	Direction of rotation reversal	0: No (direction of rotation not reversed) 1: Yes (direction of rotation is reversed)	Bit 10

No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (range / factory setting)	CANopen scaling or bit assignment
6__	Terminal assignment				
60_	Digital inputs				
600.0	149	0	Activate digital output DI00	0: No 1: Yes	Bit 0
601.0	149	0	Activate digital output DI01	0: No 1: Yes	Bit 1
602.0	149	0	Activate digital output DI02	0: No 1: Yes	Bit 2
603.0	149	0	Activate digital output DI03	0: No 1: Yes	Bit 3
61_	Limit switches				
610.0	49	0	Limit switch option lock direction of rotation	0: Yes (direction of rotation locked) 1: No (direction of rotation not locked)	Bit 4
610.1	148	0	Limit switch type	0: NC contact 1: NO contact	Bit 2
62_	Digital outputs				

No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (range / factory setting)	CANopen scaling or bit assignment
6__ Terminal assignment					
620.0	137	0	Configure digital output DO01	0: No function 1: Output stage active 2: I ² t signal 3: Warning 4: Lag error	Bit 8, 9, 10, 11
621.0	137	0	Configure digital output DO02	0: No function 1: Output stage active 2: I ² t signal 3: Warning 4: Lag error	Bit 0, 1, 2, 3
622.0	162	0	Activate digital outputs	0: Reserved 1: Digital outputs deactivated 2 – 4: Reserved 5: Digital outputs activated	Bits 7, 8, 9
No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (range / factory setting)	CANopen scaling or bit assignment
7__ Control functions					
70_ Operating modes					
703.0	54	0	Controller enable logic	2: Enable via digital input DI09 and CAN bus (fixed setting)	
No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (range / factory setting)	CANopen scaling or bit assignment
8__ Device functions					
80_ Setup					
805.0	148	0	KTY temperature sensor configuration	0: Monitoring off 1 – 2: Reserved 3: PT1000 4: KTY83-1 5: KTY82-1 6: KTY82-2 7: KTY84-1_(SEW)	Bit 4, 5, 6, 7
805.1	37	0	KTY temperature sensor switch-off threshold	-40 – 145 – 150 °C	1 Digit = 2 ⁻⁴ °C

No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (range / factory setting)	CANopen scaling or bit assignment
8__	Device functions				
806.0	7	0	Undervoltage detection threshold value	0 – 40 V	1 Digit = 2 ⁻¹⁶ V
82_	Braking operation				
822.0	10	0	Brake chopper switch-on threshold U _{On}	Switch-off threshold < U _{On} < 60 V	1 Digit = 2 ⁻¹⁶ V
823.0	11	0	Brake chopper switch-off threshold U _{Off}	57 V < U _{Off} < switch-on threshold	1 Digit = 2 ⁻¹⁶ V
83_	Fault responses				
830.0	114/ 116	0	Motor overtemperature	0: No response 1: Display warning 2: Rapid stop 3: Immediate stop	Bit 2
831.0	114/ 116	0	Undertemperature/overtemperature of the power electronics	0: No response 1: Display warning 2: Rapid stop 3: Immediate stop	Bit 3
832.0	114/ 116	0	DC link undervoltage	0: No response 1: Display warning 2: Rapid stop 3: Immediate stop	Bit 13
833.0	114/ 116	0	I ² t motor fault (I ² t at 100%)	0: No response 1: Display warning 2: Rapid stop 3: Immediate stop	Bit 18
834.0	114/ 116	0	I ² t controller fault (I ² t at 100%)	0: No response 1: Display warning 2: Rapid stop 3: Immediate stop	Bit 19
835.0	114/ 116	0	I ² t at 80%	0: No response 1: Display warning 2: Rapid stop 3: Immediate stop	Bit 25
836.0	114/ 116	0	Motor temperature 5 °C below maximum limit	0: No response 1: Display warning 2: Rapid stop 3: Immediate stop	Bit 26

No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (range / factory setting)	CANopen scaling or bit assignment
8__ Device functions					
837.0	114/ 116	0	Output stage temperature 5 °C below maximum limit	0: No response 1: Display warning 2: Rapid stop 3: Immediate stop	Bit 27
838.0	114/ 116	0	Lag error monitoring	0: No response 1: Display warning 2: Rapid stop 3: Immediate stop	Bit 28
839.0	114/ 116	0	Limit switch fault	0: No response 1: Display warning 2: Rapid stop 3: Immediate stop	Bit 30
840.0	115/ 117	0	CAN communication error	0: No response 1: Display warning 2: Rapid stop 3: Immediate stop	Bit 22
88_ SBus communication					
886.0	320	0	CAN address	0 – 63	
887.0	324	0	CAN active	0: No 1: Yes	Bit 0
888.0	49	0	CAN active after bus faults	0: No 1: Yes	Bit 16
889.0	325	0	CAN DSP305 active	0: No 1: Yes	Bit 2
No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (range / factory setting)	CANopen scaling or bit assignment
9__ POS parameter					
90_ Reference travel					
907.0	49	0	Move to zero position after reference travel	0: Off 1: On	
92_ Position monitoring					
923.0	282	0	Lag error window (MultiMotion)	0 – 1 –32767 revolutions	1 Digit = 2 ⁻¹⁶ rev.
925.0	281	0	Response delay of lag error	0 – 200 –26214 ms	1 Digit = 0.0001 ms

6.8 Parameter description

6.8.1 Display values

Parameter 001.0

Actual speed (signed)

The parameter indicates the actual speed of the motor that the inverter calculates based on the encoder signals.

Parameter 002.0

Actual velocity

The parameter indicates the speed of the drive.

Parameter 003.0

Actual position

The parameter indicates the signed position of the drive in encoder increments.

Parameter 004.0

Actual position

The parameter indicates the signed position of the drive in user units.

Parameter 005.0

Active current

Range of values 0 – 400% of nominal motor current

The parameter indicates the current active current of the drive.

Parameter 006.0

Motor utilization

The parameter indicates the capacity utilization of the motor in % which has been determined using a motor temperature model.

Parameter 007.0

Device utilization

The parameter indicates the capacity utilization of the inverter in %.

Parameter 008.0

DC link voltage

The parameter indicates the voltage in %, measured in the DC link of the inverter.

Parameter 009.0

Motor temperature

The parameter indicates the temperature of the motor in °C.

Parameter 009.1

Power section temperature

The parameter indicates the temperature of the inverter output stage in °C.

Parameter 011.0**Inverter status**

The following inverter statuses are possible:

- Not ready for operation
- Switch-on inhibited
- Not enabled
- On
- Enabled
- Rapid stop active
- Fault
- STO active

Parameter 012.0**Fault status**

The parameter indicates the fault code and the fault designation.

Parameter 013.0**Warning status**

The parameter indicates whether a warning is active.

Parameter 020.0**Normal state**

The parameter indicates whether the drive is in a normal operating state.

Parameter 021.0**STO safe state reached**

The parameter indicates whether the STO safe state has been reached.

Parameter 022.0**Safety circuit fault**

This parameter indicates whether a fault has occurred in the safety circuit.

Parameter 023.0**STO 1 feedback (PWM power driver off)**

The parameter indicates that the power driver is switched off.

Parameter 024.0**STO 2 feedback (driver supply off)**

The parameter indicates that the driver supply is switched off.

Parameter 025.0

Input STO 1

The parameter indicates the state of the digital input STO 1.

Parameter 026.0

Input STO 2

The parameter indicates the state of the digital input STO 2.

Parameter 030.0

Limit switch type

The parameter indicates the limit switch type (NC or NO contact).

The limit switch type is configured in MultiMotion.

Parameter 030.0 – 036.0

Digital input DI00 – DI06

The parameters have no function for the ELVCD drive. The DriveManager displays the statuses of the digital inputs.

Parameter 037.0

Digital input DI07 (limit switch CCW/negative)

The parameter indicates the state of the digital input DI07 (limit switch CCW/negative).

Parameter 038.0

Digital input DI08 (limit switch CW/positive)

The parameter indicates the state of the digital input DI08 (limit switch CW/positive).

Parameter 039.0

Digital input DI09 (controller enable)

The parameter indicates the state of the digital input DI09 (controller enable). The parameter indicates whether the inverter is enabled.

Parameter 050.0

Digital output DO00 (ready for operation)

The parameter indicates the state of the digital output DO00 (ready for operation). The parameter indicates whether the drive is ready for operation.

Parameter 051.0

Digital output DO01

The parameter indicates the state of the digital output DO01. The parameter indicates whether the function set in parameter *P620.0* is active.

Parameter 052.0

Digital output DO02

The parameter indicates the state of digital output DO02. The parameter indicates whether the function set in parameter *P621* is active.

Parameter 053.0**Digital output DO03 (Brake output)**

The parameter indicates the state of the digital output DO03 (brake output). The parameter indicates whether the brake is released.

Parameter 070.0**Firmware version**

The parameter indicates the firmware version (main version, subversion) of the inverter.

Parameter 071.0**ID**

The parameter indicates the serial number (ID) of the inverter.

Parameter 072.0**Nominal motor voltage**

The parameter indicates the nominal voltage of the motor.

Parameter 073.0**Nominal motor current**

The parameter indicates the nominal current of the motor (rms value).

Parameter 074.0**No-load speed**

The parameter indicates the nominal speed of the motor.

Parameter 075.0**Stator inductance**

The parameter indicates the inductance of the motor stator.

Parameter 075.1**Stator resistance**

The parameter indicates the resistance of the motor stator.

Parameter 076.0**Torque constant**

The parameter indicates the torque constant of the motor.

Parameter 077.0**Angular encoder type**

The parameter indicates the encoder type (resolver/sine-cosine encoder).

Parameter 077.1**Angular encoder configuration**

The parameter indicates the configuration (single-turn/multi-turn) of the encoder (resolver/sine-cosine encoder).

Parameter 077.2**SINCOS pulses per revolution**

The parameter indicates the increments per revolution measured by the sine/cosine encoder (= 4 x number of sine cycles of the sine/cosine encoder).

Parameter 078.0**Offset rotor position**

The parameter indicates the offset of the rotor position in angular degree.

Parameter 078.1**Number of pole pairs**

The parameter indicates the number of pole pairs of the motor.

Parameter 079.0**Encoder offset**

The parameter indicates the encoder offset in increments.

Parameter 080.0**Signal: Motor overtemperature**

The parameter indicates whether the motor temperature is too high.

Parameter 080.1**Signal: Under-/overtemperature of the power electronics**

The parameter indicates whether the temperature in the power electronics of the inverter is too high or too low.

Parameter 080.2**Signal: SINCOS supply fault**

The parameter indicates whether

- the sine-cosine encoder supply is not present
- or the encoder is configured incorrectly.

Parameter 080.3**Signal: SINCOS-RS485 communication error**

The parameter indicates whether

- the communication of the sine-cosine encoder is not present
- or the encoder is configured incorrectly.

Parameter 080.4**Signal: SINCOS-track signals fault**

The parameter indicates whether

- the track signals of the sine-cosine encoder are not present
- or the encoder is configured incorrectly.

Parameter 080.5**Signal: Resolver track signals or carrier failure fault**

The parameter indicates whether

- the track signals of the resolver are present
- or the encoder is configured incorrectly.

Parameter 080.6**Signal: 5 V electronics supply fault**

The parameter indicates whether the 5 V electronics supply failed.

Parameter 080.7**Signal: 12 V electronics supply fault**

The parameter indicates whether the 12 V electronics supply failed.

Parameter 080.8**Signal: 24 V logic supply fault**

The parameter indicates whether the 24 V logic supply failed.

Parameter 080.9**Signal: Current measurement offset fault**

The parameter indicates an offset fault during current measurement. Contact SEW-EURODRIVE Service.

Parameter 081.0**Signal: DC link/output stage overcurrent fault**

The parameter indicates a defect in the winding or the output stage.

Parameter 081.1**Signal: DC link undervoltage**

The parameter indicates whether

- the power supply is not present
- or whether the value is set too high.

Parameter 081.2**Signal: DC link overvoltage**

The parameter indicates whether the DC link voltage is > 70 V.

Parameter 081.3**Signal: Hall sensor fault**

This parameter indicates whether a fault has occurred at the encoder. Check the encoder configuration.

Parameter 081.4**Signal I²t motor fault (I²t at 100%)**

The parameter indicates whether the calculated value I²t of the motor protection model has reached 100%.

Parameter 081.5**Signal I²t controller fault (I²t at 100%)**

The parameter indicates whether the calculated value I²t of the motor protection model has reached 100%.

Parameter 081.6**Signal I²t fault (I²t at 80%)**

The parameter indicates whether the calculated value I²t of the motor or controller protection model has reached 80%.

Parameter 081.7**Signal: Motor temperature 5 °C below maximum**

The parameter indicates whether the motor temperature reached the threshold of 5 °C below the permitted maximum.

Parameter 081.8**Signal: Output stage temperature 5 °C below maximum**

The parameter indicates whether the inverter output stage temperature reached the threshold of 5 °C below the permitted maximum.

Parameter 081.9**Signal: Lag error monitoring**

The parameter indicates whether actual position is outside the permitted lag error window.

Parameter 082.0**Signal: Limit switch fault**

The parameter indicates whether both limit switches are active at the same time.

Parameter 082.1**Signal: Timeout at rapid stop**

The parameter indicates whether rapid stop ramp is configured incorrectly.

Parameter 082.2**Signal: Reference travel fault**

The parameter indicates whether the reference travel has not been completed successfully. Check the configuration.

Parameter 082.3**Signal: Motor and angular encoder identification**

The parameter indicates whether the encoder identification is not correct. Check the encoder configuration.

Parameter 082.4**Signal: Travel program: unknown fault**

Contact SEW-EURODRIVE Service.

Parameter 082.5**Signal: Travel program: invalid jump destination**

Contact SEW-EURODRIVE Service.

Parameter 082.6**Signal: CAN communication error**

The parameter indicates whether the CAN bus communication failed. Check whether CAN bus addresses have been assigned twice.

Parameter 082.7**Signal: RS232 communication error**

The parameter indicates whether the serial communication is faulty. Check the diagnostics cable.

Parameter 082.8**Signal: Position data set fault**

Contact SEW-EURODRIVE Service.

Parameter 082.9**Signal: Faulty operating mode change**

The parameter indicates whether the output stage was switched on during operating mode change.

Parameter 083.0**Signal: Fault during positioning precalculation**

Contact SEW-EURODRIVE Service.

Parameter 083.1**Signal: Stack overflow**

Contact SEW-EURODRIVE Service.

Parameter 083.2**Signal: Checksum error**

Contact SEW-EURODRIVE Service.

Parameter 083.3

Signal: Initialization fault

Contact SEW-EURODRIVE Service.

6.8.2 Setpoints

Parameter 100.0

STO discrepancy time

The STO discrepancy time is the time within which the inverter tolerates bouncing (multiple closing and opening) of the STO inputs.

If an STO input bounces for longer than the STO discrepancy time, the inverter stops the motor with the rapid stop delay and triggers a fault message. Make sure that the STO input no longer bounces. After a reset the drive can be started again.

Parameter 136.0

Rapid stop delay (MultiMotion)

The parameter defines the rapid stop delay of the drive, which is triggered in the event of a rapid stop.

Parameter 137.0

Limit switch delay (MultiMotion)

The parameter defines the limit switch delay of the drive, which is triggered in the event of a collision with the limit switch.

Parameter 138.0

Monitoring shutdown delay

The parameter defines how long the delay until shutdown may be.

This parameter only monitors the deceleration movement. The delays themselves are defined by parameters *P136.0* and *P137.0*.

6.8.3 Control parameter

Parameter 200.0

Speed controller configuration

This parameter defines

- whether the speed setpoint is set by the position controller directly (ramp inactive, default setting, since profile is defined by MOVI-PLC®)
- or whether the speed setpoint of the position controller is changed via the internal ramp times. (Ramp active)

Parameter 201.0

Speed controller gain

This parameter defines the gain factor of the speed controller.

Parameter 202.0**Speed controller time constant**

This parameter defines the time constant of the speed controller.

Parameter 203.0**Speed controller filter time**

This parameter defines the filter time of the fed back actual speed.

Parameter 210.0**Position controller gain**

This parameter defines the gain factor of the position controller.

Parameter 211.0**Position controller corrective speed**

This parameter defines the value that is added to the setpoint speed in case of a deviation between setpoint and actual position.

Parameter 212.0**Position controller dead zone position difference**

This parameter defines the area where the position controller is not active.

Parameter 290.0**Current controller gain**

This parameter defines the gain factor of the current controller.

Parameter 291.0**Current controller time constant**

This parameter defines the time constant of the current controller.

6.8.4 Motor parameters**Parameter 302.0****Maximum speed**

This parameter defines the maximum speed $n_{\max}$ of the position controller.

The drive does not exceed this speed value even with a setpoint input that is greater than the maximum speed.

Parameter 303.0**Maximum current**

This parameter specifies the maximum current in case of overload.

Parameter 305.0**I²t-time constant**

This parameter defines the time constant for the motor protection model.

Parameter 325.0**Brake release time**

This parameter defines the delay until the brake is released.

Parameter 325.1**Brake application time**

You can use this parameter to set the time required for the mechanical brake to apply.

Parameter 350.0**Direction of rotation reversal**

This parameter assigns the respective angle counting direction, the required sign of speed and current/torque to a direction of movement.

6.8.5 Terminal assignment**Parameter 600.0 – 603.0****Activate digital input DI00, DI01, DI02, DI03**

Parameter *P600.0* defines whether digital input DI00 is active.

Parameter *P601.0* defines whether digital input DI01 is active.

Parameter *P602.0* defines whether digital input DI02 is active.

Parameter *P603.0* defines whether digital input DI03 is active.

If the digital input is active, the status of the digital input can undergo further processing in the MOVI-PLC® controller.

Parameter 610.0**Limit switch option lock direction of rotation**

The parameter defines if counterclockwise rotation is blocked as long as limit switch CCW/negative is active.

The parameter defines if clockwise rotation is blocked as long as limit switch CW/positive is active.

Parameter 610.1**Limit switch type**

This parameter defines the limit switch type (NC or NO contact).

Parameter 620.0, 621.0**Configuring digital outputs DO01, DO02**

Parameter *P620.0* defines the function of digital output DO01.

Parameter *P621.0* defines the function of digital output DO02.

You can set the following functions:

- 0: No function
- 1: Output stage active
- 2: I²t signal
- 3: Warning

4: Lag error

Parameter 622.0

Activate digital outputs

The parameter defines whether all digital outputs are activated.

You can only use the digital outputs if parameter $P622.0 = 5$ (active).

6.8.6 Control functions

Parameter 703.0

Controller enable logic

The parameter defines what kind of signals enable the controller. The parameter cannot be changed. Controller is enabled via digital input DI09 and the CAN bus.

6.8.7 Unit functions

Parameter 805.0

KTY temperature sensor configuration

The parameter defines the type of the KTY temperature sensor in the motor.

If parameter $P805.0 = 7$, the inverter calculates using the values of the standard KTY temperature sensor from SEW-EURODRIVE.

Parameter 805.1

KTY temperature sensor switch-off threshold

This parameter defines the maximum permissible motor temperature.

If the measured motor temperature exceeds this switch-off threshold, the inverter stops the motor with the rapid stop delay and triggers a fault message.

Parameter 806.0

Undervoltage detection threshold value

This parameter defines the threshold value for detection of an undervoltage fault in the DC link. If the DC link voltage drops below the set threshold value, the inverter sends the DC link undervoltage fault.

Parameter 822.0

Brake chopper switch-on threshold

This parameter determines the switch-on threshold of the brake chopper.

Parameter 823.0

Brake chopper switch-off threshold

This parameter determines the switch-off threshold of the brake chopper.

Parameters 830.0 – 840.0

Fault responses

Parameters *P830.0* – *P840.0* define the fault responses for the following faults.

Parameter	Fault	Factory setting	Bit	Adjustable responses ¹⁾
<i>P830.0</i>	Motor overtemperature	3: Immediate stop	Bit 2	0: No response => "114" = 0 and "116" = 0 1: Display warning => "114" = 1 and "116" = 0 2: Rapid stop => "114" = 0 and "116" = 1 3: Immediate stop => "114" = 1 and "116" = 1
<i>P831.0</i>	Undertemperature/ overtemperature of the power electronics	3: Immediate stop	Bit 3	
<i>P832.0</i>	DC link undervoltage	3: Immediate stop	Bit 13	
<i>P833.0</i>	I ² t motor fault (I ² t at 100%)	1: Display warning	Bit 18	
<i>P834.0</i>	I ² t controller fault (I ² t at 100%)	1: Display warning	Bit 19	
<i>P835.0</i>	I ² t at 80%	1: Display warning	Bit 25	
<i>P836.0</i>	Motor temperature 5 °C below maximum limit	3: Immediate stop	Bit 26	
<i>P837.0</i>	Output stage temperature 5 °C below maximum limit	3: Immediate stop	Bit 27	
<i>P838.0</i>	Lag error monitoring	3: Immediate stop	Bit 28	
<i>P839.0</i>	Limit switch fault	3: Immediate stop	Bit 30	
<i>P840.0</i>	CAN communication error	3: Immediate stop	Bit 22	0: No response => "115" = 0 and "117" = 0 1: Display warning => "115" = 1 and "117" = 0 2: Rapid stop => "115" = 0 and "117" = 1 3: Immediate stop => "115" = 1 and "117" = 1

1) The response is set by parameter indexes "114" – "117".

Parameter 886.0

CAN address

This parameter indicates the current CAN address of the drive. The address is set in MultiMotion.

Parameter 887.0

CAN active

The parameter defines whether CAN bus is set to active.

Parameter 888.0**CAN active after bus faults**

The parameter defines whether CAN bus remains active after bus faults.

Parameter 889.0**CAN DSP305 active**

This parameter indicates whether the automatic address assignment of the CAN bus is active.

6.8.8 POS parameter**Parameter 907.0****Move to zero position after reference travel**

The parameter defines whether the drive moves to the zero position after the reference travel.

Parameter 923.0**Lag error window (MultiMotion)**

This parameter defines the tolerance by which the actual position may deviate from the setpoint position without displaying a fault message.

Parameter 925.0**Response delay of lag error**

This parameter defines how long the actual position may be outside the tolerance window before the "lag error" message is displayed.

7 Operation

7.1 Operating notes

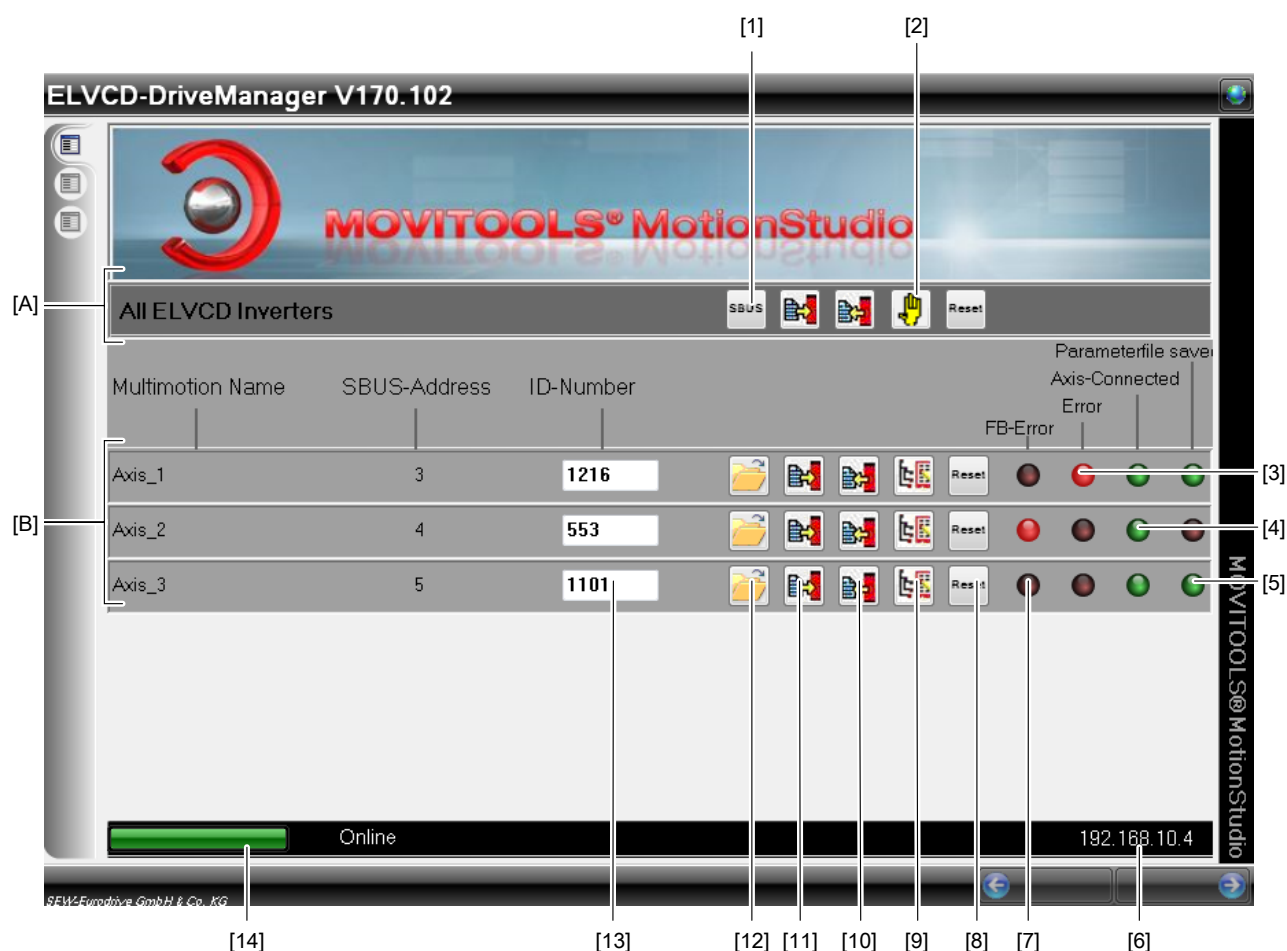
Observe the following notes during operation:

- If to command "Save parameter" is executed with an enabled drive ("Enabled_Stop" and "Enable_RapidStop" = TRUE) in interpolation operation, the drive signals "Ready for operation" but without the "InGear" message.
- During homing, the command "Save parameter" is executed as well. If "homing" is interrupted without the message "Homing Done", the drive signals "Ready for operation" but without the "InGear" message.

To switch back to operating state "InGear", set the enable bits "Enable_Stop" and "Enable_RapidStop" = TRUE.

7.2 ELVCD DriveManager

The following figure provides an overview of the "ELVCD DriveManager" plug-in:



[A] "All ELVCD inverters" area

The buttons in this area are used on all listed ELVCD drives.

[B] Single axes area

The edit boxes, buttons and status messages in this area are assigned to the respective axis. The ELVCD DriveManager only lists the axes configured in MultiMotion or in the Application Configurator.

[1] [SBUS] button

The "SBUS" button assigns SBus addresses to the axes on the basis of their ID number.

[2] [Manual mode] button

Use this button to switch to manual mode.

[3] "Inverter fault" status display

Red: There is a fault in the inverter. To display the fault code and other information, move the mouse pointer over the fault display. An overview of the fault codes can be found in section "Fault list" (→ 85).

Gray: There is no fault.

[4] "Axis-Connected" status display

Green: The drives communicate with the controller via the SBus. Initialization can take several seconds after starting the controller.

Gray: No communication via the SBus takes place.

[5] "Backed-up parameters" status display

Green: The parameter set of the ELVCD drives can be found in the folder "User Data" of the current project in MOVITOOLS®MotionStudio.

Gray: No parameter set present.

[6] "IP address" display

Display of IP address of controller in MOVITOOLS®MotionStudio.

[7] "Fault in program module" status display

Red: Fault in the processing of a program module. To display the fault code and other information, move the mouse pointer over the fault display. An overview of the fault codes can be found in section "Fault list" (→ 85).

Gray: There is no fault.

[8] [Reset] button

⚠ DANGER! Automatic start-up of the ELVCD drive after acknowledging an active fault. Severe or fatal injuries.

Ensure that an automatic start-up is not a danger to people and equipment.

All active faults with the exception of certain STO fault messages are acknowledged by pressing this button. These can only be acknowledged by restarting the drive. If the enable and setpoints ≠ 0 are still present after acknowledging the fault, the drive attempts to follow the setpoint.

[9] [Open parameter tree] button

Use this button to switch to the parameter tree display. Access to the parameters is possible during operation of the ELVCD drives, and changes become effective immediately.

[10] [Load parameter set into ELVCD inverter] button

This button is used to load the parameter set from the "UserData" folder of the current project in MOVITOOLS®MotionStudio into the ELVCD inverter. This action can only be carried out if the parameter set has been backed up beforehand and the "Backed up parameters" status display appears in green.

[11] [Back up parameter set from ELVCD inverter] button

This button is used to back up the parameter set of the ELVCD inverter in the "UserData" folder of the current project in MOVITOOLS®MotionStudio. After successfully backing up, the "Backed up parameters" status display appears in green.

[12] [Load parameter set] button

This button is used to open the dialog window for loading a parameter set.

[13] "ID number" display field

ID number of the ELVCD drives

ID number with yellow background: No SBus address has been assigned to the ID.

ID number with white background: An SBus address has been assigned on the basis of the ID.

[14] "Communication status" status display

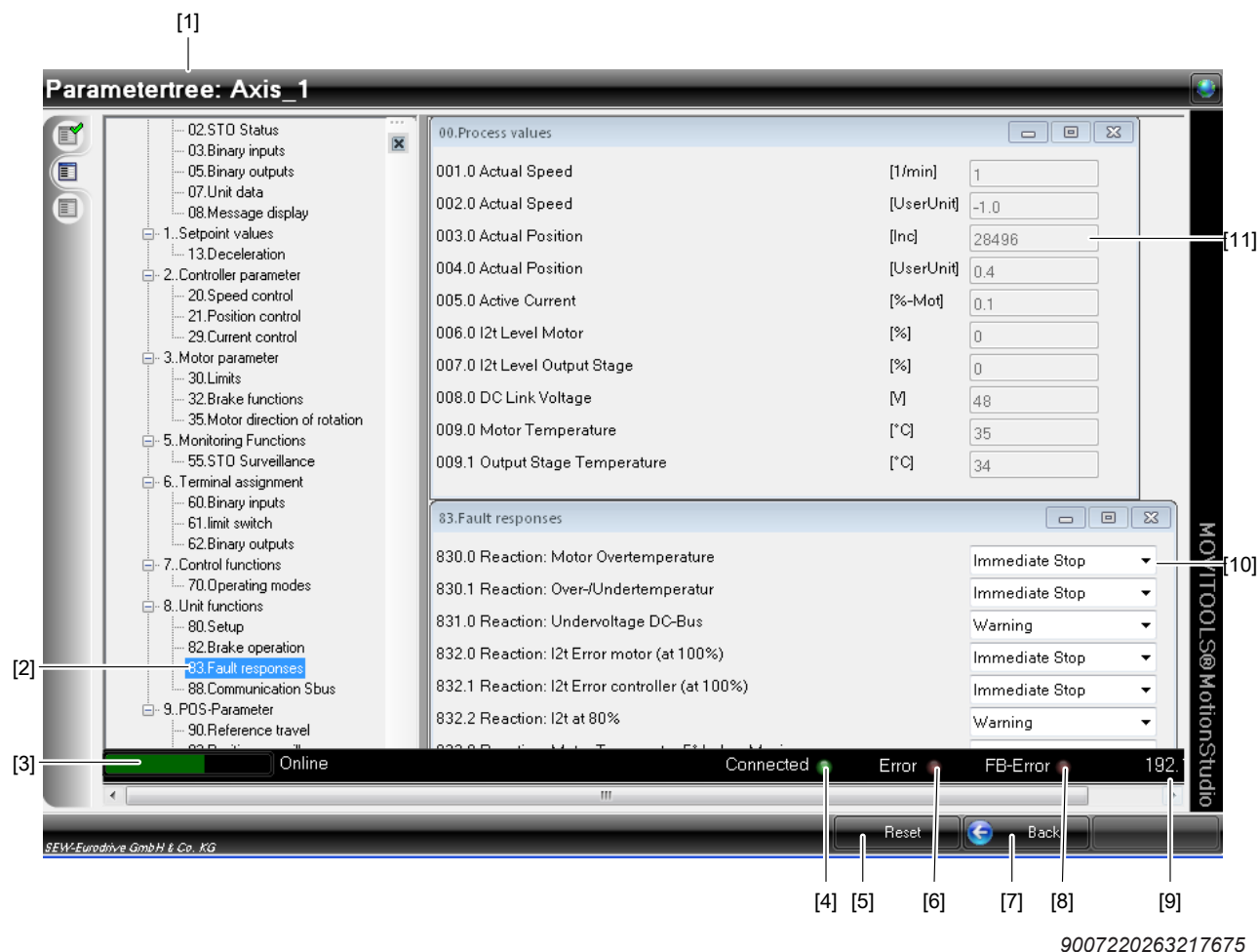
Display of communication status between the controller and MOVITOOLS®MotionStudio.

In order to execute diagnostic and control functions, the "Online" status must be signaled. This is shown in the form of a continuous green bar.

If the "Offline" status is displayed, check the Ethernet connection and its settings.

7.3 Parameter tree

The following figure provides an overview of the parameter tree:



[1] "Parameter tree: Axis n" window

The window title shows the axes which are currently being accessed.

[2] "Parameter group" node

To open the detailed view, double click on a parameter group.

[3] "Communication status" status message

Display of communication status between the controller and MOVITOOLS®MotionStudio.

In order to execute diagnostic and control functions, the "Online" status must be signaled. This is shown in the form of a continuous green bar. If the "Offline" status is displayed, check the Ethernet connection and its settings.

[4] "SBus communication" status display

Green: The drives communicate with the controller via the SBus. Initialization can take several seconds after starting the controller.

Gray: No communication via the SBus takes place.

[5] [Reset] button

⚠ DANGER! Automatic start-up of the ELVCD drive after acknowledging an active fault. Severe or fatal injuries.

Ensure that an automatic start-up is not a danger to people and equipment.

All active faults with the exception of certain STO fault messages are acknowledged by pressing this button. These can only be acknowledged by restarting the drive. If the enable and setpoints $\neq 0$ are still present after acknowledging the fault, the drive attempts to follow the setpoint.

[6] "Error" status display

Red: There is a fault in the inverter. To display the fault code and other information, move the mouse pointer over the fault display. An overview of the fault codes can be found in section "Fault list" (→ 85).

Gray: There is no fault.

[7] [Back] button

The view switches back to the overview window of the ELVCDDriveManager.

If you have changed a parameter, you have the choice between permanent and temporary retention of the changes:

- Click on the [Yes] button to stop the relevant axis of the ELVCD drive and back up the parameters in the ELVCD inverter.
- Click on the [No] button to discard the changes. The next time the ELVCD drive is started, the parameters backed up in the ELVCD inverter will be loaded.

[8] "FB-Error" status display

Red: Fault in the processing of a program module. To display the fault code and other information, move the mouse pointer over the fault display. An overview of the fault codes can be found in section "Fault list" (→ 85).

Gray: There is no fault.

[9] "IP address" display

Display of IP address of controller in MOVITOOLS®MotionStudio.

[10] "Parameter" choice box

Choice boxes have a white background. You can change the value of the parameter.

[11] "Parameter" display field

Display fields have a gray background. You cannot change the value of the parameter.

7.4 Manual mode



⚠ CAUTION

Risk of injury if the drive starts up unintentionally. Deactivating manual mode means that the process data of the higher-level controller is effective. If the enable signal is present via the process data, the drive can start up unintentionally.

Fatal or severe injuries and damage to property.

- Before deactivating manual mode, unintentional start-up of the drive unit can be prevented by activating STO or setting a "0" signal at DI09.
- Before deactivating manual mode, set the process data in such way that the drive is not enabled.
- Do not change the process data until manual mode has been deactivated.
- Take additional safety precautions depending on the application to avoid hazards to people and machinery.



NOTICE

The maximum speed, maximum acceleration and maximum delay defined in the axis configuration are not effective in manual mode.

Damage to the drive or the system.

- Ensure that you do not exceed the permissible limit values for setpoint speed and ramps using the setpoint inputs.



NOTICE

Undefined control statuses

Damage to the drive or the system.

- In the diagnostic menu of the engineering software, ensure that no control mode is active during manual mode in the bus monitor or the module diagnostics.



INFORMATION

Manual mode is only possible via the "ELVCD-DriveManager" plug-in. Manual mode directly via MOVITOOLS®MotionStudio is not possible.

Manual mode is only possible via Ethernet, not USB.

7.4.1 Requirements

Before activating manual mode, ensure that the following requirements have been met:

- The ELVCD drive has been successfully started up (→ 47).
- The motor axes have been configured.

7.4.2 Start manual mode

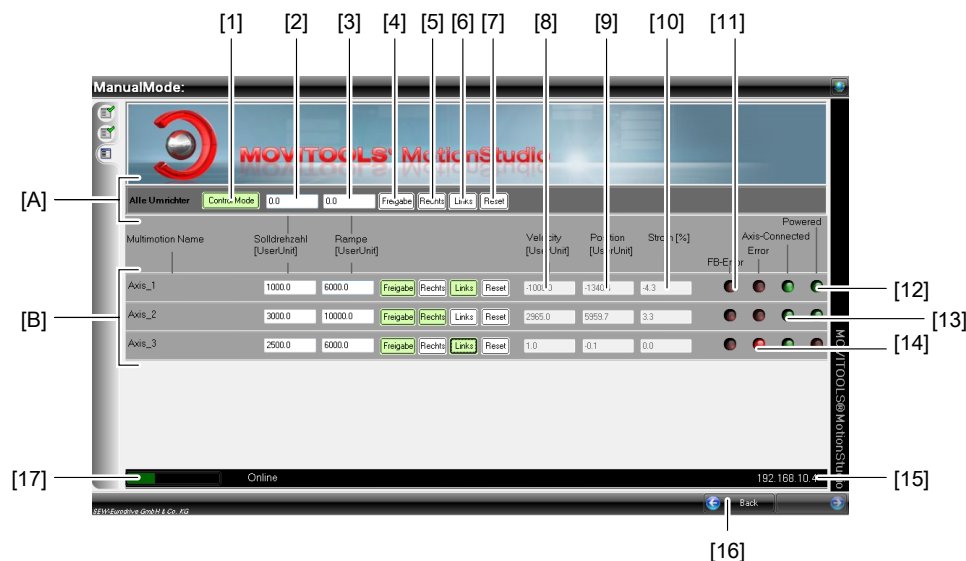
To start manual mode, proceed as follows:

1. Switch on the 24 V and the 48 V voltage supply of the ELVCD drive.
2. Connect the PC/laptop to the controller via Ethernet.

3. Switch on the voltage supply of the controller.
4. Start the MOVITOOLS® MotionStudio software.
5. Start the "ELVCD DriveManager" plug-in.
6. Activate manual mode with the relevant button. For further information, refer to chapter "ELVCD DriveManager" (→ 73).

7.4.3 Using manual mode

The figure below provides an overview of the "Manual mode" window:



21010803211

[A] "All ELVCD inverters" area

The buttons in this area are used on all listed ELVCD drives.

[B] Single axes area

The edit boxes, buttons and status messages in this area are assigned to the respective axis. The ELVCD DriveManager only lists the axes configured in MultiMotion or in the Application Configurator.

[1] [Control Mode] button

Manual mode is activated using this button. Actuation by the controller is prevented.

[2] "Setpoint speed" edit box

Enter the setpoint speed in user units in the edit box.

[3] "Ramp" edit box

Enter the ramp in user units in the edit box.

[4] [Enable] button

⚠ DANGER! Automatic start-up of the ELVCD drive after changing the enable. Severe or fatal injuries.

Ensure that an automatic start-up is not a danger to people and equipment.

Use this button to set the drive enable. The hardware enable must also be present. If a brake is present, it is released.

If you have entered a value of 0 in the "Setpoint speed" edit box or not assigned a direction specification using the [Right] and [Left] buttons, the drive goes into position control. Otherwise the drive is accelerated.

If you remove the enable, the drive is braked at the rapid stop ramp.

[5] [Right] button

This button is used to assign direction specification "Right".

[6] [Left] button

This button is used to assign direction specification "Left".

[7] [Reset] button

⚠ DANGER! Automatic start-up of the ELVCD drive after acknowledging an active fault. Severe or fatal injuries.

Ensure that an automatic start-up is not a danger to people and equipment.

All active faults with the exception of certain STO fault messages are acknowledged by pressing this button. These can only be acknowledged by restarting the drive. If the enable and setpoints $\neq 0$ are still present after acknowledging the fault, the drive attempts to follow the setpoint.

[8] "Velocity" display field

The display field shows the speed actual value in user units. Updating takes place cyclically.

[9] "Position" display field

The display field shows the position actual value in user units. Updating takes place cyclically.

[10] "Current" display field

The display field shows the motor current actual value in percentage of the nominal motor current. Updating takes place cyclically.

[11] "Fault in program module" status display

Red: Fault in the processing of a program module. To display the fault code and other information, move the mouse pointer over the fault display. An overview of the fault codes can be found in section "Fault list" (→ 85).

Gray: There is no fault.

[12] "Powered" status display

Green: The axis is enabled and supplied with current. If a brake is present, it is released.

Gray: The axis is not enabled and not supplied with current. If a brake is present, it is applied.

[13] "Axis-Connected" status display

Green: The drives communicate with the controller via the SBus. Initialization can take several seconds after starting the controller.

Gray: No communication via the SBus takes place.

[14] "Inverter fault" status display

Red: There is a fault in the inverter. To display the fault code and other information, move the mouse pointer over the fault display. An overview of the fault codes can be found in section "Fault list" (→ 85).

Gray: There is no fault.

[15] "IP address" display

Display of IP address of controller in MOVITOOLS®MotionStudio.

[16] [Back] button

Manual mode is exited using this button.

- The enable of the drive is canceled.
- The drives are braked with the rapid stop ramp.
- Actuation by the controller is enabled.
- The "Manual mode" window is closed.

[17] "Communication status" status display

Display of communication status between the controller and MOVITOOLS®MotionStudio.

In order to execute diagnostic and control functions, the "Online" status must be signaled. This is shown in the form of a continuous green bar.

If the "Offline" status is displayed, check the Ethernet connection and its settings.

7.5 CMP ELVCD status list

The MultiMotion program module shows the current status of the ELVCD drive. The following table shows a descriptions of the status:

Code	Operating status	Meaning
0	NOT_READY_TO_SWITCH_ON	The inverter performs a self-test. CAN communication not yet possible.
1	SWITCH_ON_DISABLED	The controller has completed the self-test. CAN communication is possible.
2	READY_TO_SWITCH_ON	The inverter waits until the digital input DI09 "Controller enable" is set to "1". (Controller enable logic "Digital input and CAN").
3	SWITCHED_ON	You can switch on the inverter output stage.
4	OPERATION_ENABLE	The motor is connected to the voltage supply. The motor is controlled according to the selected operating mode.
5	QUICKSTOP_ACTIVE	The Quick Stop Function is executed. The motor is connected to the voltage supply. The motor is controlled according to the Quick Stop function.

Code	Operating status	Meaning
6	FAULT	A fault occurred. The motor is de-energized.
17	STO_SAFESTOP	STO has been activated. The inverter safely switches off the motor torque. Brake is applied.

8 Service

8.1 Malfunctions

8.1.1 Malfunctions on the ELVCD drive

Fault	Possible cause	Measure
Motor heats up excessively and switches off with a fault.	Overload	- Perform power measurement. - If necessary, use a bigger motor or reduce the load. - Check travel profile.
	Ambient temperature too high.	Observe permitted temperature range.
	Insufficient cooling.	Clean the ELVCD drive.
Running noise on motor	Bearing damage	- Contact SEW-EURODRIVE Service. - Replace motor.
	Vibration of rotating parts	Rectify cause, possible imbalance.
Oil leaks in the connection box or at the motor/flange connection (with gearmotors only).	Internal seal defective.	- Contact SEW-EURODRIVE Service. - Have SEW-EURODRIVE Service change the internal seal.

8.1.2 Brake malfunctions

Fault	Possible cause	Measure
Brake does not release.	Inverter is defective.	- Contact SEW-EURODRIVE Service. - Have brake and motor replaced by SEW-EURODRIVE Service.
	The maximum permissible working air gap has been exceeded because the brake lining is worn.	- Contact SEW-EURODRIVE Service. - Have brake and motor replaced by SEW-EURODRIVE Service.
	The brake is defective.	- Contact SEW-EURODRIVE Service. - Have brake and brake control replaced by SEW-EURODRIVE Service.
Motor does not brake.	Brake lining is worn.	- Contact SEW-EURODRIVE Service. - Have brake and motor replaced by SEW-EURODRIVE Service.
	Braking torque is wrong.	Contact SEW-EURODRIVE Service.

8.2 Evaluating error messages using MultiMotion

INFORMATION



The MultiMotion program module displays software error codes in the "FBError" field, and displays inverter faults in the "Error(Inv)" field in the "Diagnostics" tab.

For a description of the inverter faults, see chapter "Fault list" (→ 85).

8.3 Function block error messages

Code	Error	Possible cause	Measure
16431824	E_ELVCD_POSITION_OUT_OF_VALID_ENCODER_RANGE	The drive has been moved out of the valid motor encoder range before switching off (4096 motor revolutions) and the referenced signal has been lost.	- Ensure that the motor encoder range is not left during positioning mode. - Perform another reference travel.
16461825	E_ELVCD_SERIAL_NUMBER_CHANGED	The serial number of the drive electronics has changed, since the drive electronics have been replaced or the order of the axis configuration has changed. The referenced signal has been lost.	Perform another reference travel.
16461826	E_ELVCD_PARAMETER_CONFIG_CHANGED	The parameter set has changed and the referenced signal has been lost.	Perform another reference travel.
16481828	E_ELVCD_INVALID_FIRMWARE	The firmware version is invalid.	Contact SEW-EURODRIVE Service.
16461829	E_ELVCD_LIMIT_SWITCHDECELERATION_OUT_OF_BOUNDS	The limit switch delay is not within the range of values.	Adapt the configuration.
16461830	E_ELVCD_QUICKSTOPDECELERATION_OUT_OF_BOUNDS	The rapid stop delay is not within the range of values.	Adapt the configuration.
16461831	E_ELVCD_LAGER-RORWINDOW_OUT_OF_BOUNDS	The lag error window is not within the range of values.	Adapt the configuration.
16461832	E_ELVCD_SEARCH-SPEED_OUT_OF_BOUNDS	The reference travel search speed is not within the range of values.	Adapt the configuration.
16461833	E_ELVCD_CLEARSPED_OUT_OF_BOUNDS	The reference travel retraction speed is not within the range of values.	Adapt the configuration.

8.4 Fault list

The following table helps you with troubleshooting. The fault codes are available in MultiMotion from version V180.100.

Code	CANopen code	Error	Possible cause	Measure
3	17168	Motor overtemperature	The KTY motor temperature sensor indicates that the motor temperature has exceeded the permitted limit.	- Check if the drive is unable to move freely. - Contact SEW-EURODRIVE Service.
4	16912	Undertemperature/overtemperature of the power electronics	The temperature of the power electronics is beyond the permitted range of $-40\text{ }^{\circ}\text{C}$ to $+85\text{ }^{\circ}\text{C}$.	- Check the ambient temperature. - Observe derating characteristic curve. - Contact SEW-EURODRIVE Service.
5	29586	Faulty sine-cosine supply	The angular encoder is defective or an incorrect angular encoder was selected.	Contact SEW-EURODRIVE Service.
6	29585	Sine-cosine R2485 communication error	The angular encoder is defective or an incorrect angular encoder was selected.	Contact SEW-EURODRIVE Service.
7	29584	Sine-cosine encoder track signal error or offset error	The angular encoder is defective or an incorrect angular encoder was selected.	Contact SEW-EURODRIVE Service.
8	29568	Faulty resolver signals/encoder supply	The angular encoder is defective or an incorrect angular encoder was selected.	Contact SEW-EURODRIVE Service.
9	20755	Error 5 V electronics supply	Internal fault	Contact SEW-EURODRIVE Service.
10	20756	Error 12 V electronics supply	24 V voltage supply failed.	Check and remedy the 24 V supply.
			Internal fault	Contact SEW-EURODRIVE Service.
11	20754	24 V supply fault	The 24 V voltage supply is outside the permitted range of 16 – 32 V.	Check and remedy the 24 V supply.
12		Conflict between hardware and firmware	Firmware does not match hardware.	Contact SEW-EURODRIVE Service.
13	21008	Current measurement offset error	Internal fault	Contact SEW-EURODRIVE Service.

Code	CANopen code	Error	Possible cause	Measure
14	8992	DC link/output stage overcurrent	The motor is defective, e.g. winding overloaded, short circuit between winding and housing, output stage defective.	Contact SEW-EURODRIVE Service.
15	12832	DC link under-voltage	The 48 V voltage supply has failed or does not have sufficient capacity, e.g. during acceleration.	- Ensure DC 48 V voltage supply. - Check if there is a link between failure and the acceleration process.
16	12816	DC link over-voltage	48 V voltage supply too high (> DC 70 V).	Reduce 48 V voltage supply.
17	29573	HALL track signal error	Internal fault	Contact SEW-EURODRIVE Service.
18	29574	PWM encoder fault	Internal fault	Contact SEW-EURODRIVE Service.
19	8978	I ² t error motor (I ² t at 100%). I ² t monitoring has tripped.	Incorrect nominal current setting	Check and correct the nominal motor current setting.
20	8977	I ² t error controller (I ² t at 100%). I ² t monitoring has tripped.	Incorrect nominal current setting	Check and correct the nominal motor current setting.
21	29575	PWM encoder initialization error	- Internal fault - PWM frequency could not be correctly determined.	Contact SEW-EURODRIVE Service.
22	20610	STO – PWM power driver plausibility error: Feedback ≠ PWM power driver	Internal fault	Contact SEW-EURODRIVE Service.
23	20609	STO – Driver supply plausibility error: Feedback ≠ driver supply	Internal fault	Contact SEW-EURODRIVE Service.
24	32903	STO – Plausibility STO 1 & 2 (STO 1 ≠ STO 2)	The STO plausibility check signals an error: Control inputs STO 1 & STO 2 are not activated at the same time.	Contact SEW-EURODRIVE Service.
26	9088	I ² t at 80%	The load threshold of 80% is reached.	Remove motor blockage.

Code	CANopen code	Error	Possible cause	Measure
27	17280	Motor temperature 5 °C below maximum limit	The motor temperature is reaching its critical limit.	Check and correct the configuration of the drive.
28	17024	Output stage temperature 5 °C below maximum limit	The thermal load of the drive is reaching its critical limit.	Check and correct the configuration of the drive.
29	34320	Lag error monitoring	The actual position of the motor has left the lag error window. The difference between actual value and setpoint is too large.	- Check the maximum current. - Check the motor for blockage. - Check the controller settings, particularly the internal closed loop systems for current and speed. - Check the acceleration parameters. - Check that the lag error window is sufficiently large.
31	34322	Limit switch fault Both limit switches are active simultaneously.	Limit switch signals are not plausible.	- Check the configuration of the limit switches. - If there are no limit switches connected, set the limit switch type to NO contact. - Check the wiring.
35	24985	Rapid stop timeout	The rapid stop ramp was not executed correctly.	Check and correct the acceleration value for rapid stop.
36	35456	Reference travel error	An error has occurred during reference travel.	- Check the reference travel configuration. - Check the controller setting.
40	24983	Motor identification and angular encoder fault	Error identifying the motor encoder	Contact SEW-EURODRIVE Service.
43	24979	Faulty travel program, unknown command	- Internal fault - Unknown travel program extension found.	Contact SEW-EURODRIVE Service.
44	24978	Fault travel program, jump destination	- Internal fault - Jump to a line outside the valid range.	Contact SEW-EURODRIVE Service.
46	33056	Node guarding timeout error	No new NMT message was received within the parameterized node guarding time.	- Check CAN cable. - Provide for EMC measures. - Check MOVI-PLC® for proper functioning.
55	33024	CAN communication error	A CAN communication error (SBus) has occurred.	- Check the CAN cable. - Check the shielding. - Switch the drive off and on again.

Code	CANopen code	Error	Possible cause	Measure
56	29968	RS232 communication error	Communication is interrupted.	- Provide for EMC measures. - Check the cable connection.
57	21889	Positioning data set error	The set acceleration value is too small for V_{max}.	Contact SEW-EURODRIVE Service.
58	25472	Operating mode change error	The operating mode was switched with enabled output stage.	Contact SEW-EURODRIVE Service.
60	24976	Position precalculation error	- Internal fault - The motor can no longer be braked up to the target position.	Contact SEW-EURODRIVE Service.
61	34690	SYNC_TIMEOUT	SYNC signal failure.	- Check MOVI-PLC® status. - Contact SEW-EURODRIVE Service.
62	24960	Stack overflow	Internal fault	Contact SEW-EURODRIVE Service.
63	21889	Checksum error	Internal fault	Contact SEW-EURODRIVE Service.
64	24967	Fault during initialization	Internal fault	Contact SEW-EURODRIVE Service.

8.5 Resetting fault messages



⚠ WARNING

Eliminating the cause of the fault or performing a reset can result in the unit restarting automatically.

Severe or fatal injuries.

- Program the application program such that the unit is not enabled when a fault occurs.

An error message can be acknowledged by sending a reset command of the controller or the PLC.

INFORMATION



After a safety-relevant fault, do not take the machine/system into operation until you have checked the safety functions for proper functioning.

8.6 Unit replacement

If the device is defective, send it to SEW-EURODRIVE Service or replace it. All components must be replaced when doing this: Servomotor, inverter and gear unit (if present).

8.7 Electronics Service by SEW-EURODRIVE

If you are unable to rectify a fault, contact SEW-EURODRIVE Service. For the addresses, refer to www.sew-eurodrive.com.

When contacting the SEW-EURODRIVE Service, always specify the following information so that our service personnel can assist you more effectively:

- Information on the device type on the nameplate (e.g. type designation, serial number, part number, product key, purchase order number)
- Brief description of the application
- Error message on the status display
- Nature of the fault
- Accompanying circumstances
- Unusual events preceding the problem

8.8 Shutdown

To shut down the ELVCD drive, de-energize the drive using appropriate measures.

8.9 Storage

Observe the following instructions when shutting down or storing the ELVCD drive:

- If you shut down and store the ELVCD drive for a longer period, you must close open cable bushings and cover ports with protective caps.
- Make sure that the unit is not subject to mechanical impact during storage.

Observe the notes on storage temperature in the "Technical data" chapter.

8.10 Extended storage

In case of extended storage, connect the unit to the supply voltage for at least 5 minutes every 2 years. Otherwise, the device's service life may be reduced.

8.11 Waste disposal

Observe the applicable national regulations. Dispose of materials separately in accordance with the nature of the materials and the regulations in force, for example:

- Electronics scrap (circuit boards)
- Plastics
- Sheet metal
- Copper
- Aluminum

9 Inspection and maintenance



⚠ WARNING

Danger of falling hoist.

Severe or fatal injuries.

- Secure or lower the hoist before carrying out any work (risk of falling).



⚠ WARNING

Risk of injury if the drive starts up unintentionally.

Severe or fatal injuries.

- Before starting work, de-energize the drive via a suitable external disconnection device.
- Secure the drive against unintended re-connection of the voltage supply.
- Secure the output shaft against rotation.



⚠ WARNING

Danger of burns due to hot surfaces of the device (e.g. the heat sink).

Serious injuries.

- Do not touch the device until it has cooled down sufficiently.



NOTICE

Damage to the drive.

Potential damage to property!

- Note that only SEW-EURODRIVE Service or specialists trained by SEW-EURODRIVE are allowed to carry out motor and/or brake maintenance.

9.1 Cleaning the drive

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

For this reason, you must clean the drives at regular intervals (after one year at the latest) to ensure a sufficiently large area for heat dissipation.

Insufficient heat dissipation can have unwanted consequences. The service life of the bearings and the inverter is reduced through operation at impermissibly high temperatures, because the bearing grease degrades.

9.2 Connection cables

Check all connection cables for damage or signs of fatigue at regular intervals. Replace if necessary.

9.3 Inspection and maintenance intervals

INFORMATION



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

The following factors may lead to shorter inspection and maintenance intervals:

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

9.3.1 Motor

The following table shows the inspection intervals for the motor:

Time interval	Activity	Design
Every 3000 hours of operation, at least every 6 months	Check for possible bearing damage in the event of running noise. In the event of bearing damage, have the bearing replaced by SEW-EURODRIVE Service or specialists trained by SEW-EURODRIVE.	• Specialists at customer site • Specialists trained by SEW-EURODRIVE • SEW-EURODRIVE Service
Recommendation: Every 10000 operating hours	Have the motor inspected by SEW-EURODRIVE Service or specialists trained by SEW-EURODRIVE.	• Specialists trained by SEW-EURODRIVE • SEW-EURODRIVE Service
Varying, depending on external factors	Touch up or renew the surfaces/ anti-corrosion coating.	• Specialists at customer site

9.3.2 Brake

- The brake does not require any maintenance.
- You cannot measure the working air gap directly, since the brake is integrated in the motor.
- If the permissible total brake work W_{insp} that was determined during configuration has been reached, you must have the brake replaced. Contact SEW-EURODRIVE.
- The BK brake may only be replaced by SEW-EURODRIVE.

If it is used as a holding brake, the brake must be inspected by SEW-EURODRIVE Service every 1 to 2 years. If it is used as a holding brake with braking work with emergency off switching, this inspection must be carried out every 3000 operating hours, and no later than after 2 years.

If braking work of 1000 kJ (brake BP04) and 350 kJ (brake BK02) is reached, you must have the motor and the brake replaced by SEW-EURODRIVE Service.

More information can be found in the "CMP Synchronous Servomotors" catalog.

10 Technical data

10.1 General

		CMP50S ELVCD		CMP50M ELVCD	
		Integrated	Mounted close to motor	Integrated	Mounted close to motor
DC link voltage	U_N	DC 48 V (maximum DC 60 V)			
Electronics connection voltage		DC 24 V $\pm 10\%$, Residual ripple $< 1.5 V_{SS, 100 \text{ Hz}}$ approx. 200 mA without brake + approx. 300 mA with brake + approx. 100 mA with CAN bus and I/Os			
Brake chopper		Switch-on threshold U_{on} : DC 60 V $\pm 5\%$ Switch-off threshold U_{off} : DC 57 V $\pm 5\%$ These are default values. The output stage is switched off at 70 V.			
Braking resistor		1 kW			
Maximum load		400 W			
Continuous load on heat sink		The braking resistor goes to high resistance in case of overload.			
Nominal input current	$I_{N\text{Inverter}}$	6.2 A	8.3 A	8.5 A	12.5 A
Maximum input current	$I_{N\text{max}}$	32 A for 2 s			
Output frequency	f_O	0 – 500 Hz			
Nominal motor current	$I_{N\text{Motor}}$	6.02 A	7.70 A	7.93 A	11.70 A
Motor standstill current	I_0	6.2 A	8.4 A	8.6 A	11.7 A
Motor power S1 at $\vartheta_U = 40^\circ \text{C}$	P_{Mot}	0.23 kW	0.30 kW	0.33 kW	0.47 kW
Nominal motor speed	n_N	3000 min ⁻¹			
Nominal motor torque at $\vartheta_U = 40^\circ \text{C}$	M_N	0.75 Nm	0.95 Nm	1.05 Nm	1.50 Nm
Motor standstill torque	M_0	0.8 Nm	1.05 Nm	1.15 Nm	1.5 Nm
PWM frequency		10 kHz			
Interference immunity according to EN 61800-3		Category C3			
Interference emission according to EN 61800-3		Category C3			
Ambient temperature of standard version according to EN 60721-3-3 without derating	ϑ_U	-20 °C – +50 °C			

		CMP50S ELVCD		CMP50M ELVCD	
		Integrated	Mounted close to motor	Integrated	Mounted close to motor
Ambient temperature of standard version, with derating	ϑ_U	40 °C – 50 °C 2% per K of the nominal motor current			
Ambient temperature of low-temperature version according to EN 60721-3-3	ϑ_U	-30 °C to +10 °C		-30 °C to +10 °C	
Storage temperature according to EN 60721-3-3	ϑ_L	-30 °C to +70 °C			
Climate class according to EN 60721-3-3		3K3 (no condensation)			
Protection class		III			
Degree of pollution according to EN 60664-1		2			
Proof of mechanical strength		According to EN 61800-5-1			
Degree of protection according to EN 60529		IP65 (Housing closed and all plug connectors inserted or sealed with protection caps)			
Operating mode according to EN 60034-1		S1, S3			
Type of cooling		Natural cooling to DIN 41751 and EN 61800-5-1			
Installation altitude		The following restrictions apply at $h \geq 1000$ m: - From 1000 m to max. 4000 m: I_N reduction by 1% per 100 m - From 2000 m to max. 4000 m: U_N reduction by AC 6 V per 100 m			
Cable length		max. 3 m, for motor and encoder respectively			

INFORMATION



Parameter *P303 Maximum current* limits the motor torque. The assignment of torque to maximum current can be found in section Characteristic curves.

10.2 Mass moments of inertia

		CMP50S ELVCD	CMP50M ELVCD
Without brake	J_{mot}	$0.42 \times 10^{-4} \text{ kgm}^2$	$0.67 \times 10^{-4} \text{ kgm}^2$
With BK02 brake	J_{mot}	$0.53 \times 10^{-4} \text{ kgm}^2$	$0.78 \times 10^{-4} \text{ kgm}^2$
With BP04 brake	J_{mot}	$0.48 \times 10^{-4} \text{ kgm}^2$	$0.73 \times 10^{-4} \text{ kgm}^2$

10.3 Masses

	CMP50S ELVCD	CMP50M ELVCD
Without motor	1.5 kg, cable length 1 m	
Integrated, without brake	2.9 kg	3.55 kg
Integrated, with brake	3.25 kg	3.9 kg

10.4 Interfaces

Digital inputs	
Input type	PLC-compatible according to EN 61131-2 (digital inputs type 1)
Signal level	–3 V to +5 V: "0" = contact open +15 V to +30 V: "1" = contact closed

Digital outputs	
Signal level	–3 V to +5 V: "0" = contact open +15 V to +30 V: "1" = contact closed
Current-carrying capacity	Maximum 20 mA, short-circuit proof against GND

SBus interface	
Standard	CAN specification 2.0 part A
Protocol	CANopen to DS301, DS402
Baud rate	500 kBaud
Address	Automatic according to DS305; address assignment according to serial number, can be set via MultiMotion configuration
Number of drives that can be addressed	8 If you address more than 8 drives in the supply system, the bus load must be checked.
Cable length	max. 100 m
Number of stations	max. 127 CAN stations
Timeout monitoring	Can be set via MultiMotion configuration, according to chapter "Startup"

10.5 Characteristic curves

10.5.1 Inverter input current calculation formulas

The inverter input current can be calculated for a defined load using the following formulas. When doing this, take a safety addition of at least 15% of the direct current supply into consideration during configuration.

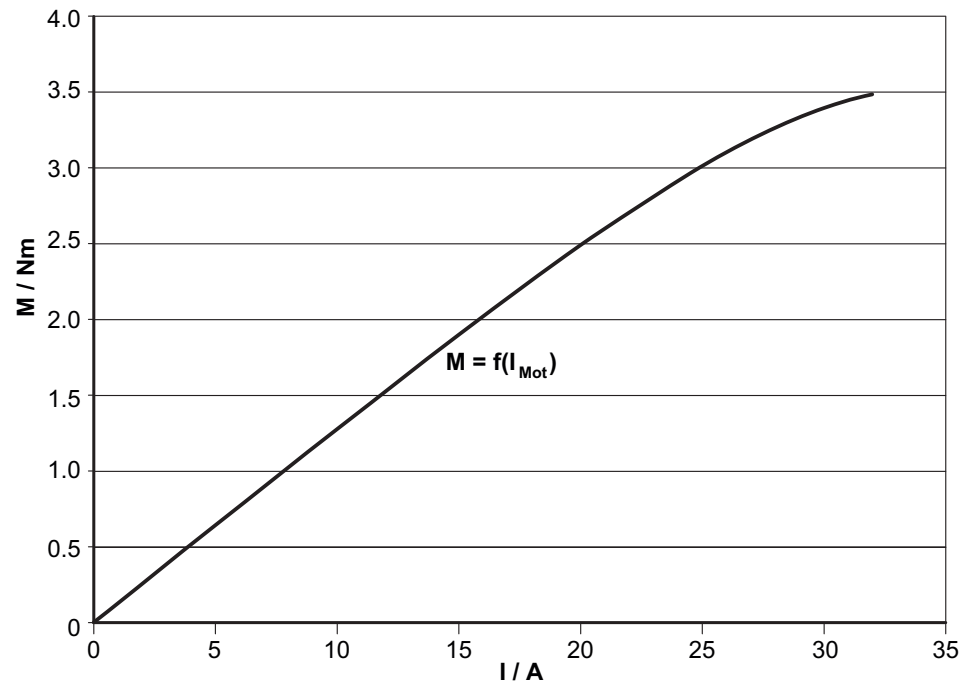
CMP50S ELVCD and ELVCD-DC

$$I_{DC} = 1.9949 \times 10^{-4} \times n + 1.7266 \times M^2 + 1.994 \times 10^{-3} \times M \times n$$

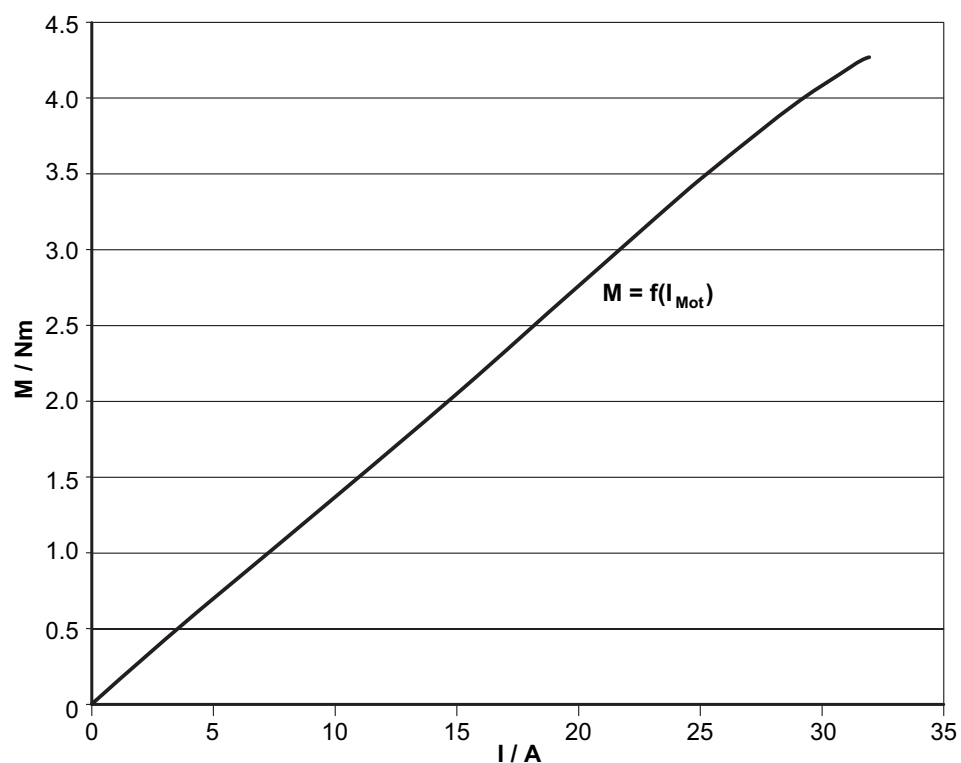
CMP50M ELVCD and ELVCD-DC

$$I_{DC} = 2.35686 \times 10^{-12} \times M + 7.23949 \times 10^{-1} \times M^2 + 2.36917 \times 10^{-3} \times M \times n$$

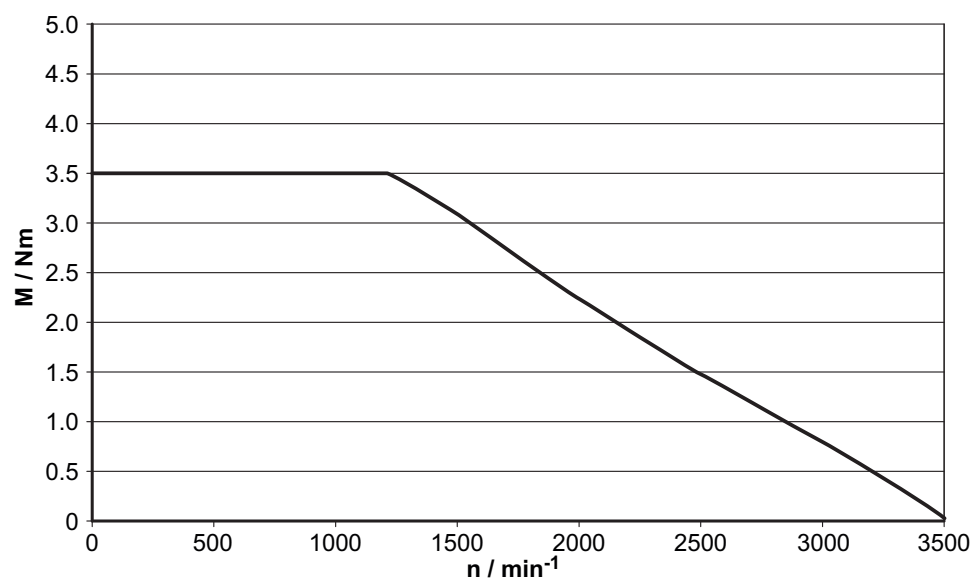
10.5.2 Torque-current characteristic curve for CMP50S ELVCD and CMP50S ELVCD-EC



9007213050150795

10.5.3 Torque-current characteristic curve for CMP50M ELVCD and CMP50M ELVCD-EC


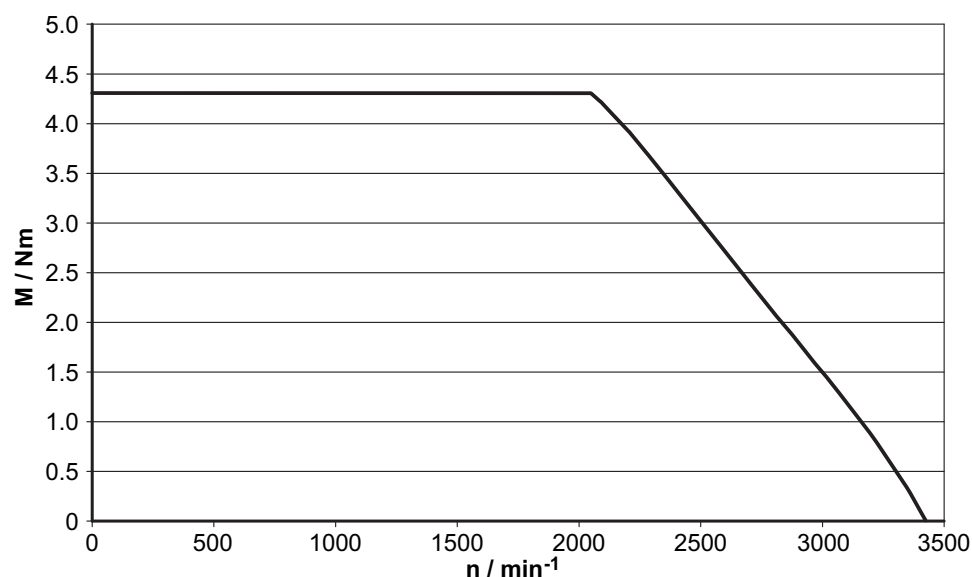
18014411017118475

10.5.4 Dynamic characteristic curve, CMP50S ELVCD and CMP50S ELVCD-EC


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10.5.5 Dynamic characteristic curve, CMP50M ELVCD and CMP50M ELVCD-EC



18014411016819723

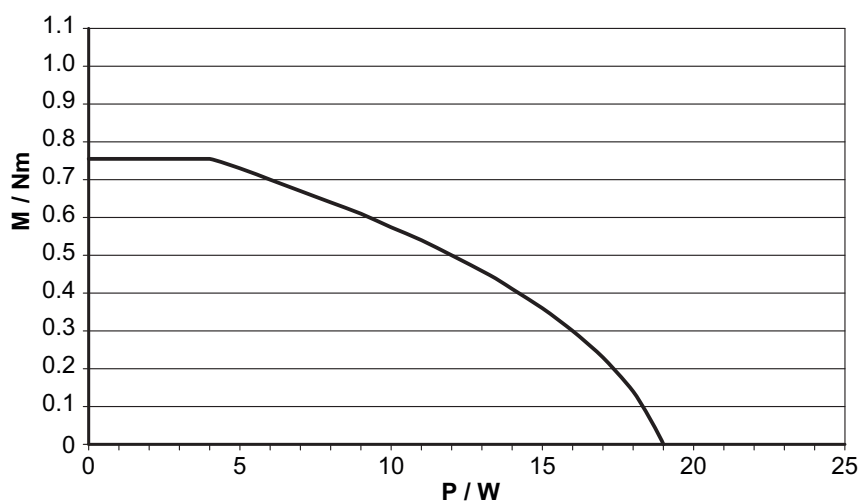
10.5.6 Thermal capacity utilization

The following table shows the possible thermal capacity utilization of the drive in S1 motoring operation at 40 °C:

Motor type	Drive design	Chopper power loss P_v	Nominal motor torque M_N		
			at 3000 min ⁻¹	at 1500 min ⁻¹	at 200 min ⁻¹
CMP50S	Mounted on inverter	0 W	0.75 Nm	0.80 Nm	0.80 Nm
		7.5 W	0.63 Nm	0.70 Nm	0.70 Nm
		15 W	0.63 Nm	0.45 Nm	0.45 Nm
	Mounting close to the motor	0 W	0.95 Nm	1.05 Nm	1.05 Nm
		7.5 W	0.95 Nm	1.00 Nm	1.00 Nm
		15 W	0.95 Nm	1.00 Nm	1.00 Nm
CMP50M	Mounted on inverter	0 W	1.05 Nm	1.10 Nm	1.15 Nm
		7.5 W	0.88 Nm	0.99 Nm	1.01 Nm
		15 W	0.50 Nm	0.71 Nm	0.74 Nm
	Mounting close to the motor	0 W	1.50 Nm	1.50 Nm	1.50 Nm
		7.5 W	1.30 Nm	1.40 Nm	1.40 Nm
		15 W	1.1 Nm	1.2 Nm	1.2 Nm

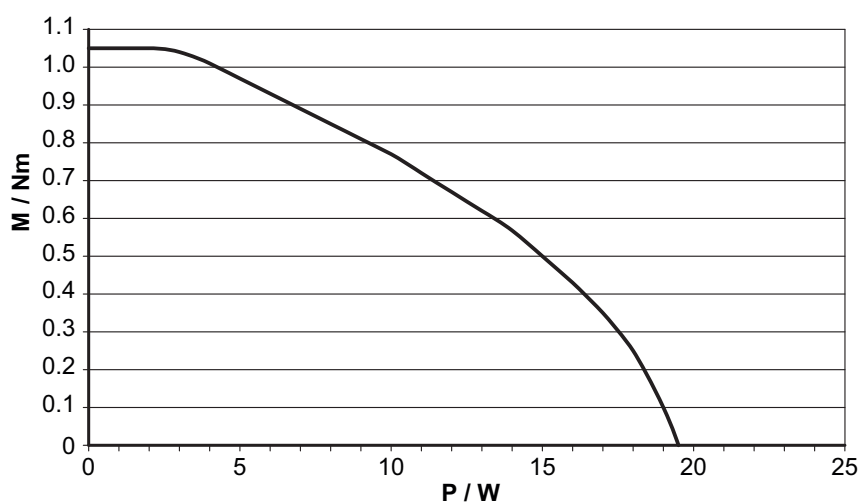
10.5.7 Thermal characteristic curves

The following diagrams show the possible thermal capacity utilization of the drives in operation with regenerative sequences. If an external brake chopper and braking resistor are used, the chopper power loss can be reduced to 0 W (→ 26).

Thermal capacity utilization of CMP50S ELVCD

17437928203

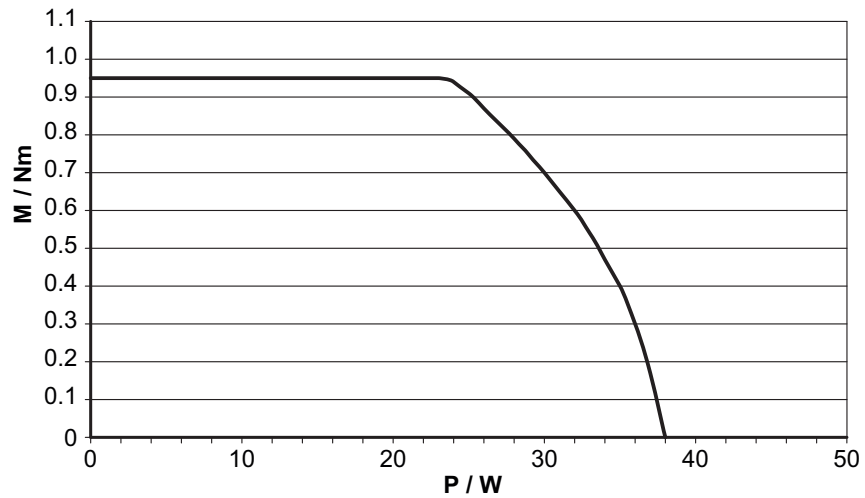
P Average chopper power loss

Thermal capacity utilization of CMP50M ELVCD

17437930891

P Average chopper power loss

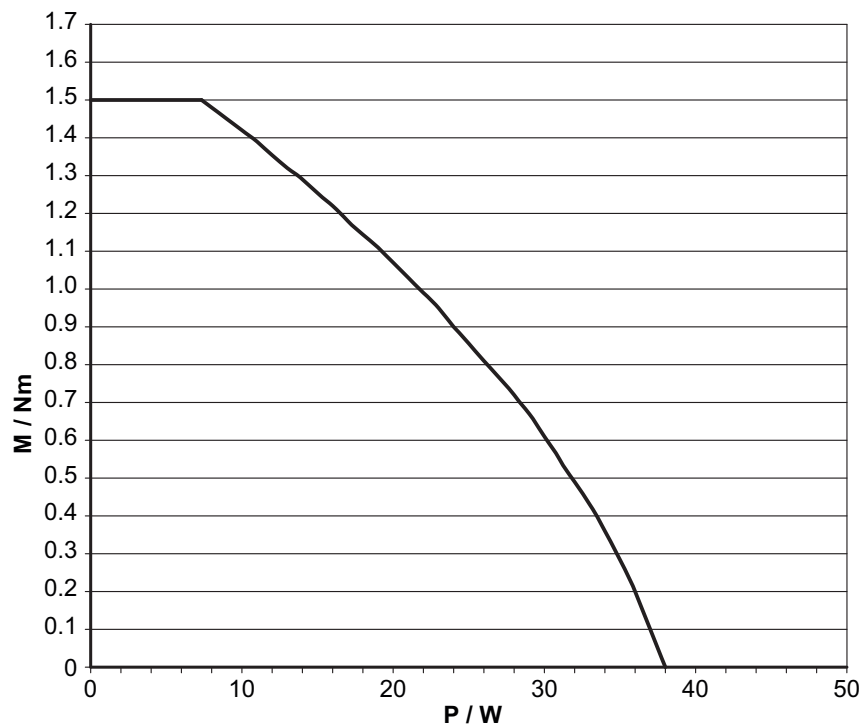
Thermal capacity utilization of CMP50S ELVCD-EC (mounting close to the motor)



17493675275

P Average chopper power loss

Thermal capacity utilization of CMP50M ELVCD-EC (mounting close to the motor)



9007216748413579

P Average chopper power loss

10.6 Brake

10.6.1 BP brake

CMP50S, CMP50M with brake BP04		
Nominal torque for slipping brake disk (relative speed between brake disk and friction surface: 1 m/s) at 20 °C	$M_{2, 20\text{ °C}}$	3.1 Nm
Minimum static braking torque (holding torque) at 100 °C	$M_{4, 100\text{ °C}}$	1.0 Nm
Minimal averaged dynamic braking torque in case of emergency off at 100 °C	$M_{1m, 100\text{ °C}}$	1.2 Nm
Permitted braking work per braking operation	W_1	0.6 kJ
Permitted braking work per hour	W_2	7.2 kJ
Permitted total braking work (braking work until maintenance)	W_{insp}	1.0×10^3 kJ
Power consumption of the coil	P	10.2 W
Brake response time	t_1	200 ms
Brake application time	t_2	75 ms

INFORMATION



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

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

INFORMATION



If the permitted braking work per braking W_1 is exceeded during braking or if the permitted total braking work W_{insp} is reached, it can no longer be guaranteed that the brake will be released.

In this case, the fault message 8977 or 8978 is signaled.

INFORMATION



For the current project planning standard for BK and BP brakes of the CMP50 ELVCD and the functional principle of the brakes, refer to the SEW-EURODRIVE "Synchronous Servomotors CMP40 – CMP112, CMPZ71 – CMPZ100" catalog.

If you have questions concerning the BP brake project planning, contact SEW-EURODRIVE support.

10.6.2 BK brake

CMP50S, CMP50M with brake BK02		
Minimum static braking torque (holding torque) at 100 °C	$M_{4, 100\text{ °C}}$	2.4 Nm
Minimal averaged dynamic braking torque in case of emergency off at 100 °C	$M_{1m, 100\text{ °C}}$	1.9 Nm
Maximum dynamic braking torque in case of emergency off	M_{1max}	5.3 Nm
Permitted braking work per braking operation	W_1	0.175 kJ

CMP50S, CMP50M with brake BK02		
Permitted braking work per hour	W_2	3.5 kJ
Permitted total braking work (braking work until maintenance)	W_{insp}	0.350×10^3 kJ
Power consumption of the coil	P	6.7 W
Brake response time	t_1	80 ms
Brake application time	t_2	20 ms

INFORMATION



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

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

INFORMATION



If the permitted braking work per braking W_1 is exceeded during braking or if the permitted total braking work W_{insp} is reached, it can no longer be guaranteed that the brake will be applied.

In this case, the drive does not brake.

10.7 CAN connection cables

When individual CAN connection cables are used, SEW-EURODRIVE recommends the cable type "Belden 9841/LOW-capacitance computer cable for EIA".

10.7.1 Description

24 AWG stranded TC wire, insulated with polyethylene, drilled, shielded with Beldfoil® (100%) + TC braid (90% shielding), 24 AWG stranded TC drain wire, PVC sheath.

10.7.2 Physical properties (in total)

Conductor: AWG			
Twisted-pairs	AWG	Stranding	Conductor material
1	24	7x32	TC – tinned copper

10.7.3 Mechanical properties (in total)

Mechanical properties (in total)	
Operating temperature	-30 °C to +80 °C
Nominal UL operating temperature	80 °C
Weight of raw cable	36 lbs/1000 ft.
Max. recommended tensile stress	72.3 lbs.

Mechanical properties (in total)	
Min. bending radius of secondary axis	2.5 inch
Applicable specifications and compliance with regulatory specifications (total)	
Applicable standards	
NEC/(UL) specification	CM
CEC/C(UL) specification	CM
AWM specification	UL style 2919 (30 V 80°)
EU CE mark (Y/N)	Yes
EU RoHS compliant (Y/N)	Yes
EU RoHS compliance date (MM/DD/YYYY)	01/01/2004
Plenum / Non-Plenum:	No
Plenum (Y/N)	
Plenum number	82841, 89841

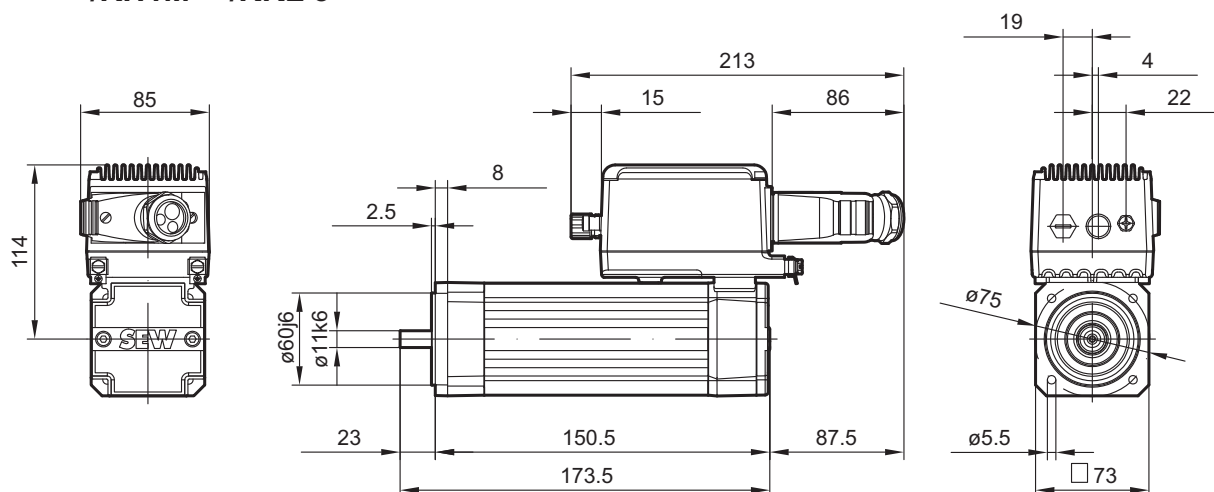
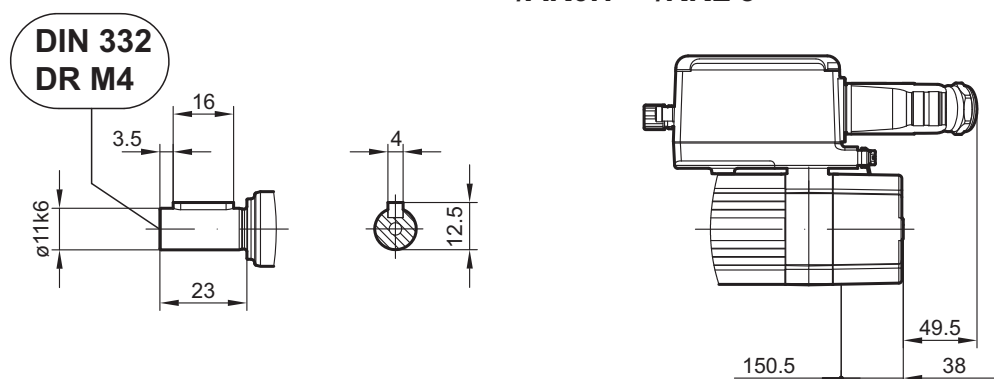
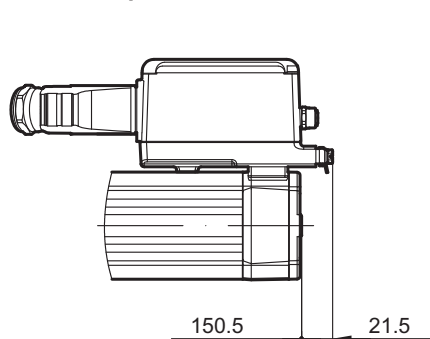
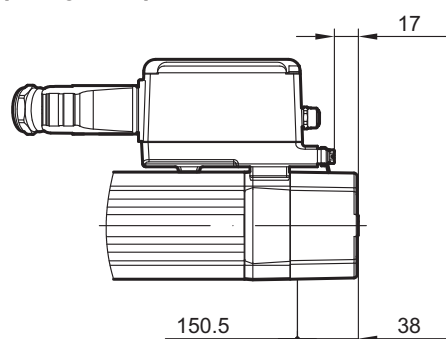
10.7.4 Electrical properties (in total)

Electrical properties (in total)	
Characteristic rated impedance Impedance (ohms)	120
Nominal capacitance conductor/conductor Capacitance (pF/ft)	12.8
Nominal capacitance conductor/other conductor & shield Capacitance (pF/ft)	23.0
Nominal propagation speed VP (%)	66
Nominal delay time Delay (ns/ft)	1.6
Nominal value of the direct current resistance of the conductor Nominal DC resistance at 20 °C (ohm/1000 ft)	24.0
Nominal value of the direct current resistance of the outer shield Nominal DC resistance at 20 °C (ohm/1000 ft)	3.4
Nominal attenuation Attenuation (dB/100ft)	0.6 (at 1 MHz)
Max. operating voltage – UL Voltage	300 V RMS 20 V RMS (UL AWM Style 2919)

Electrical properties (in total)	
Max. recommended amperage Amperage	2.1 A per conductor at 25 °C

10.8 Dimension drawings

10.8.1 Dimension drawing of CMP50S ELVCD

CMP50S ELVCD
08 472 00 14
/RH1M /KKL 3

/AK0H /KKL 3

/RH1M /KKL 1

/AK0H /KKL 1


9007212942147851

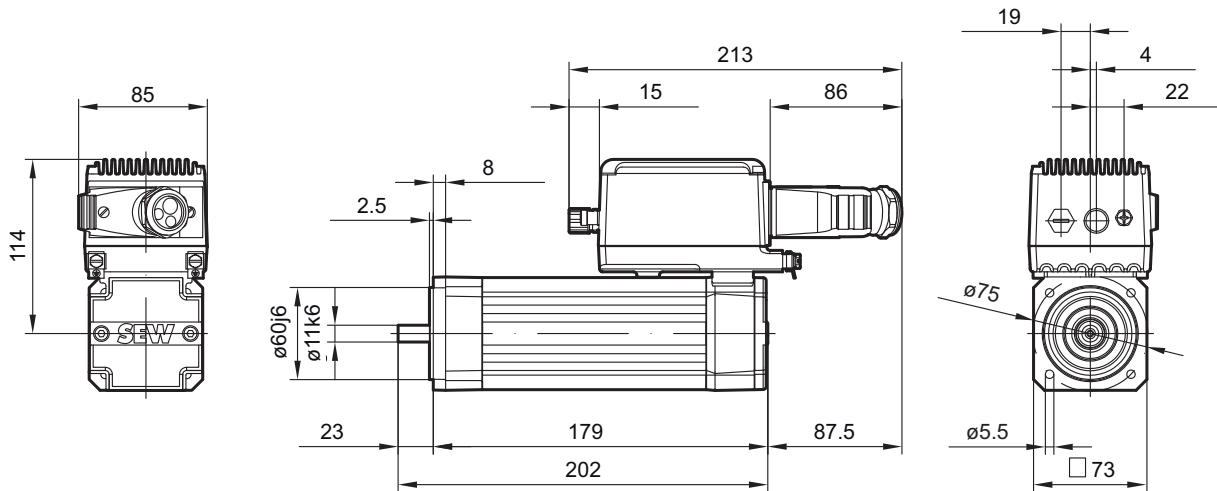
22759468/EN – 11/2017

10.8.2 Dimension drawing of CMP50S BK/BP ELVCD

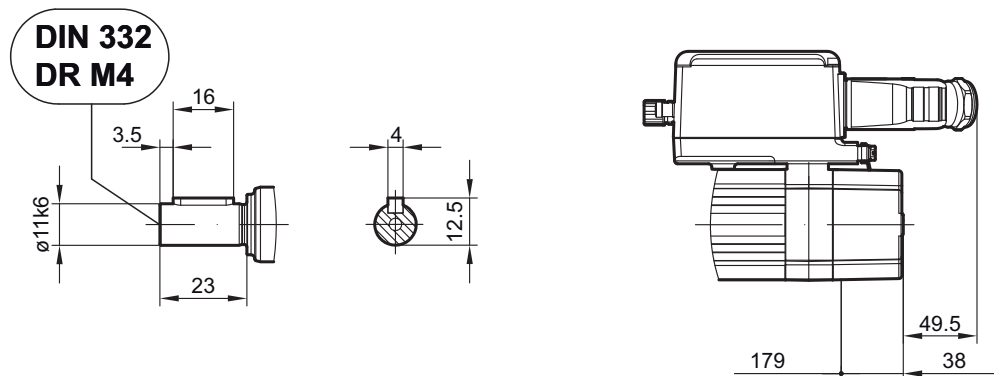
CMP50S BK/BP ELVCD

08 470 00 14

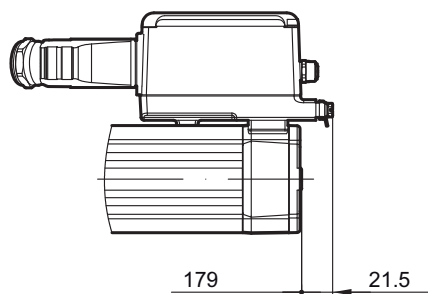
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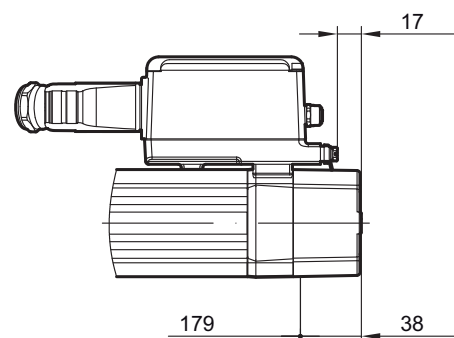
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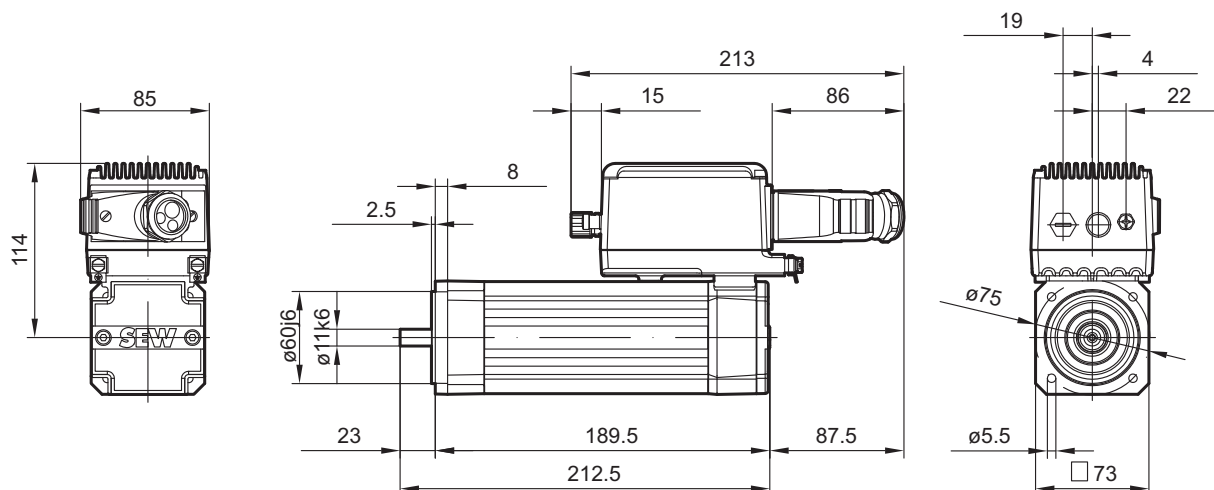
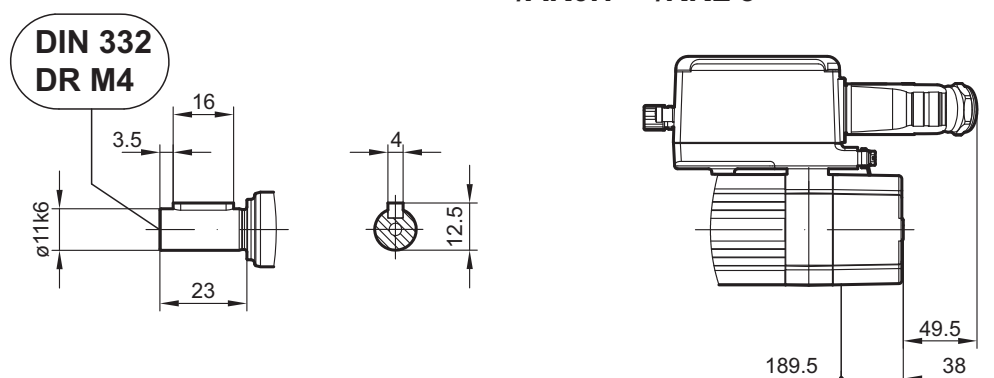
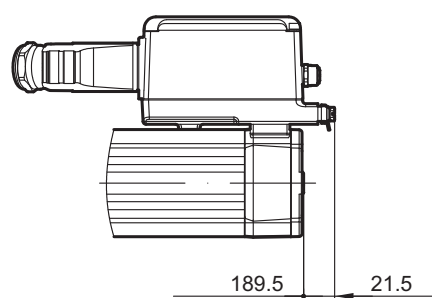
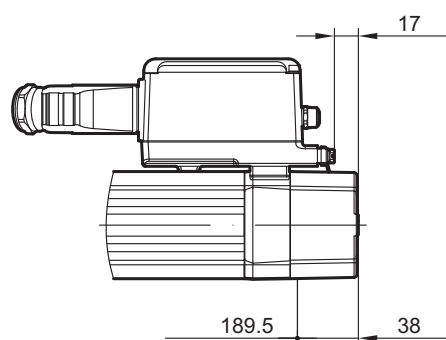
/RH1M /KKL 1



/AK0H /KKL 1



9007212942154251

10.8.3 Dimension drawing of CMP50M ELVCD
CMP50M ELVCD
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/AK0H /KKL 3

/RH1M /KKL 1

/AK0H /KKL 1


18014411017120651

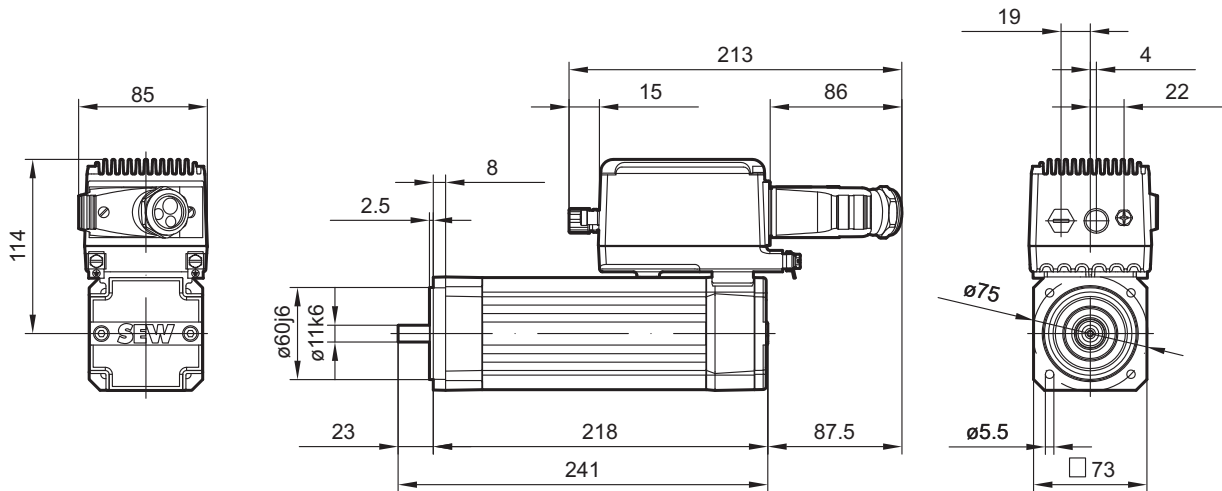
22759468/EN – 11/2017

10.8.4 Dimension drawing of CMP50M BK/BP ELVCD

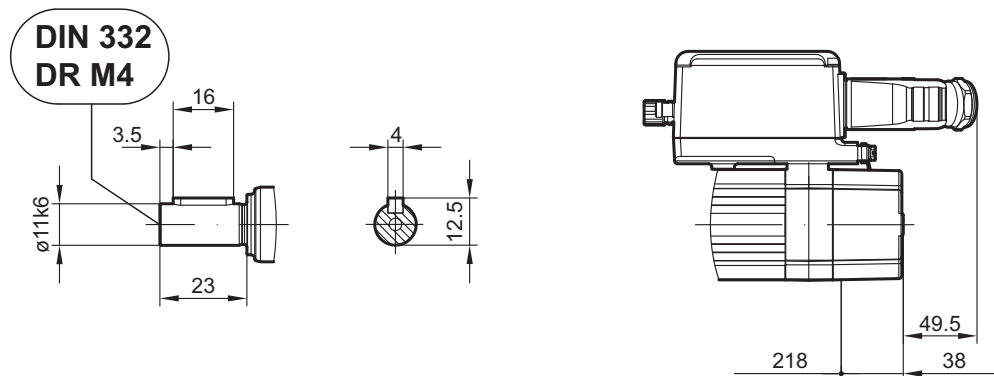
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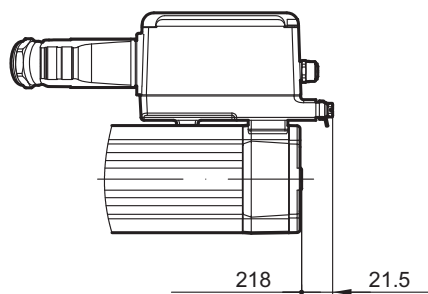
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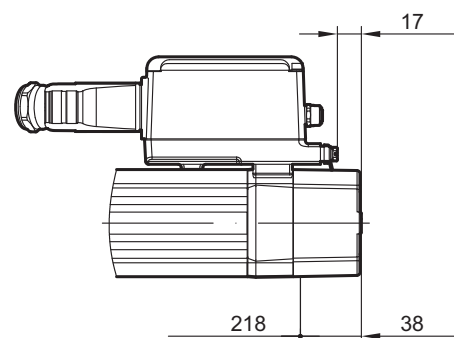
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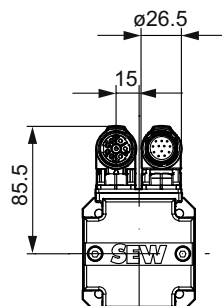
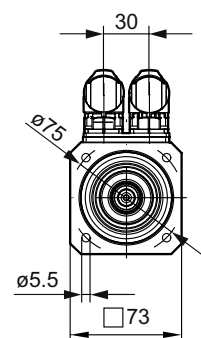
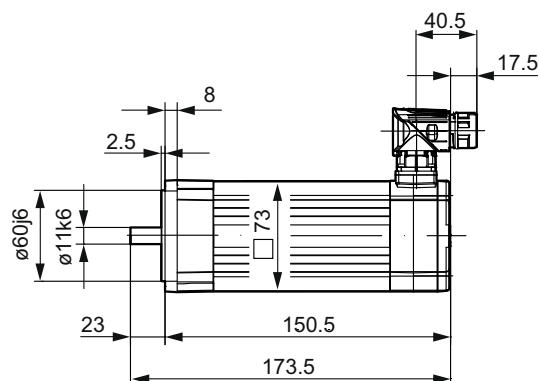
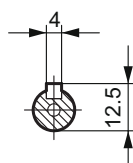
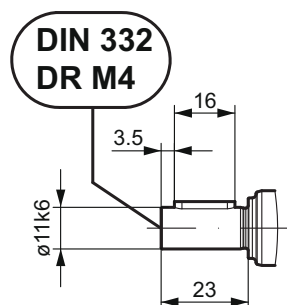
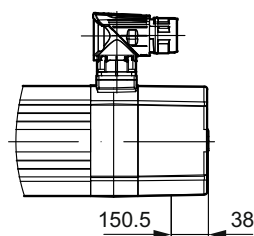
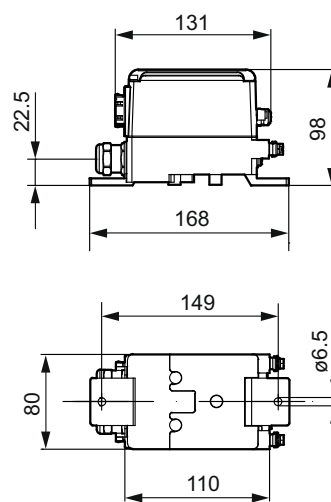
/RH1M /KKL 1



/AK0H /KKL 1



18014411017122827

10.8.5 Dimension drawing of CMP50S ELVCD-EC
CMP50S ELVCD EC
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/SB1

/RH1M

**/AK0H
/AK1H
/EK1H**

/KK


17926327819

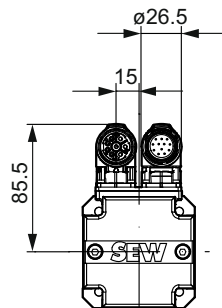
22759468/EN – 11/2017

10.8.6 Dimension drawing of CMP50S BK/BP ELVCD-EC

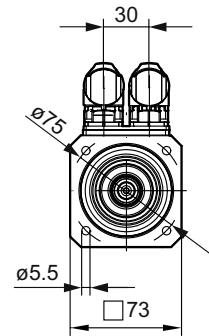
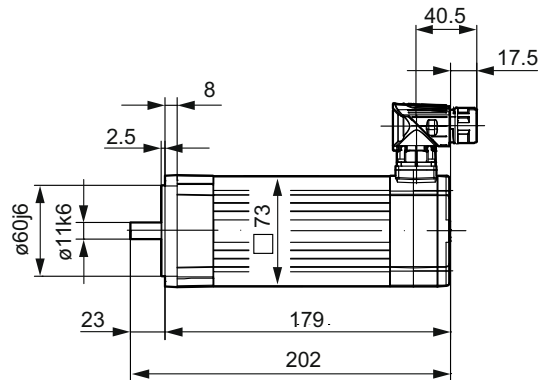
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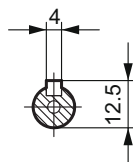
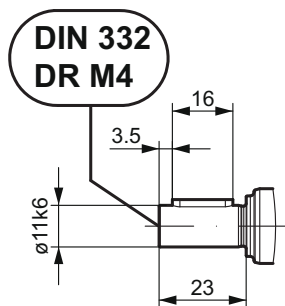
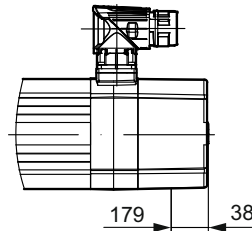
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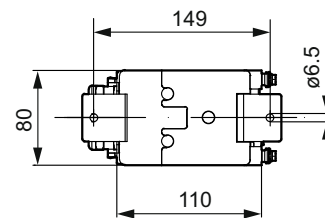
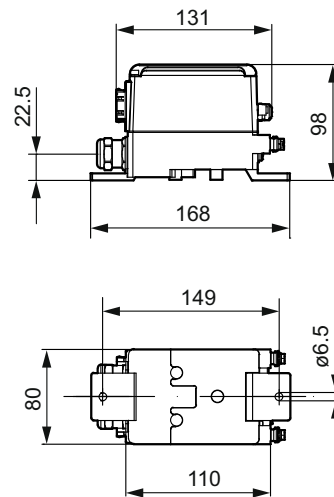
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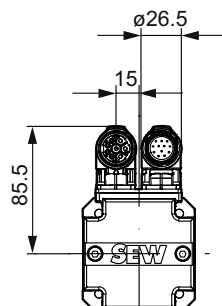
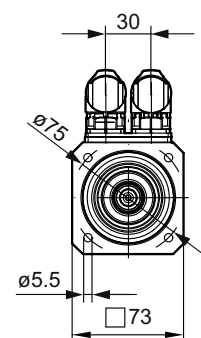
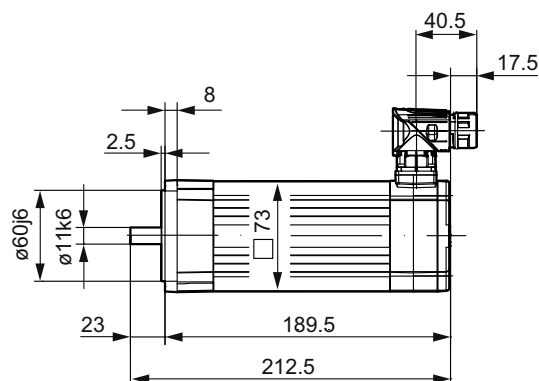
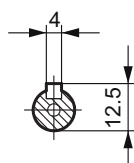
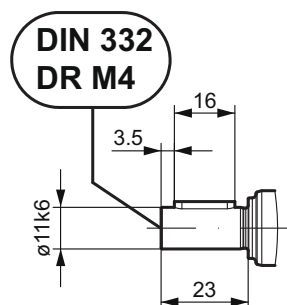
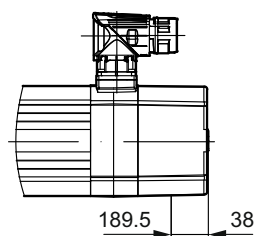
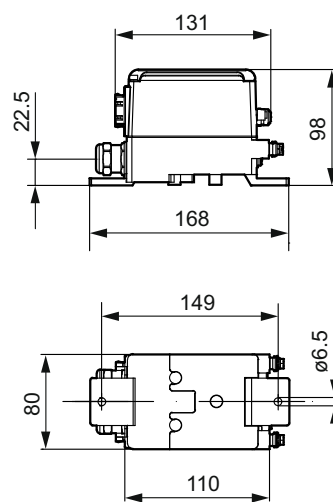
/AK0H
/AK1H
/EK1H



/KK



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10.8.7 Dimension drawing of CMP50M ELVCD-EC
CMP50M ELVCD EC
08 813 00 16
/SB1

/RH1M

**/AK0H
/AK1H
/EK1H**

/KK


17931299595

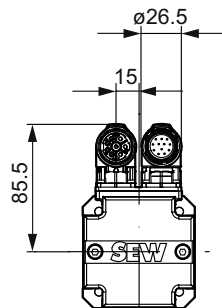
22759468/EN – 11/2017

10.8.8 Dimension drawing of CMP50M BK/BP ELVCD-EC

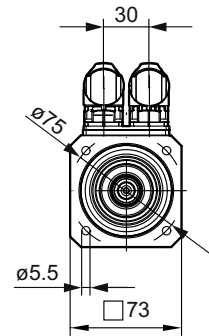
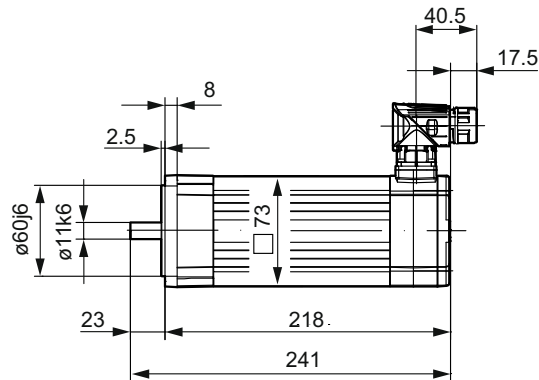
CMP50M BK/BP ELVCD EC

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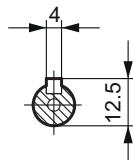
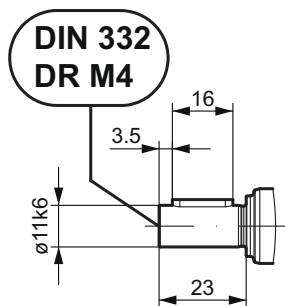
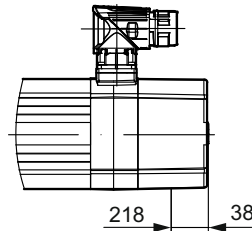
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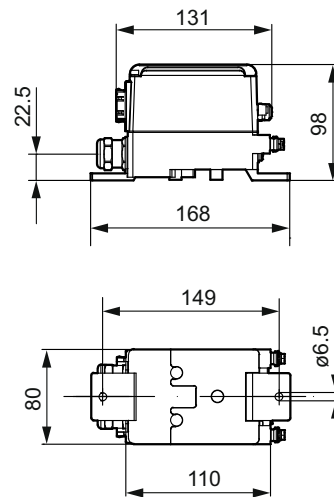
/RH1M



/AK0H
/AK1H
/EK1H



/KK



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11 Declaration of conformity

EU Declaration of Conformity



Translation of the original text

900700215/EN

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

declares under sole responsibility that the following products

decentralized extra-low voltage servo drives CMP..ELVCD..

in accordance with

EMC Directive	2014/30/EU (L 96, March 29, 2014, 79-106)	4)
RoHS Directive	2011/65/EU (L 174, July 1, 2011, 88-110)	
Applied harmonized standards:	EN 61800-3:2004/A1:2012 EN 50581:2012	

- 4) According to the EMC Directive, the listed products are not independently operable products. EMC assessment is only possible after these products have been integrated in an overall system. For the assessment, the product was installed in a typical plant configuration.

Bruchsal

19.07.2017

Place

Date

Johann Soder
 Managing Director Technology

a) b)

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

12 Address list

Algeria

Sales	Algiers	REDUCOM Sarl 16, rue des Frères Zaghroune Bellevue 16200 El Harrach Alger	Tel. +213 21 8214-91 Fax +213 21 8222-84 http://www.reducom-dz.com info@reducom-dz.com
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Argentina

Assembly Sales	Buenos Aires	SEW EURODRIVE ARGENTINA S.A. Ruta Panamericana Km 37.5, Lote 35 (B1619IEA) Centro Industrial Garín Prov. de Buenos Aires	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 http://www.sew-eurodrive.com.ar sewar@sew-eurodrive.com.ar
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Australia

Assembly Sales Service	Melbourne	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 3 9933-1000 Fax +61 3 9933-1003 http://www.sew-eurodrive.com.au enquires@sew-eurodrive.com.au
	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au

Austria

Assembly Sales Service	Vienna	SEW-EURODRIVE Ges.m.b.H. Richard-Strauss-Straße 24 1230 Wien	Tel. +43 1 617 55 00-0 Fax +43 1 617 55 00-30 http://www.sew-eurodrive.at sew@sew-eurodrive.at
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Bangladesh

Sales	Bangladesh	SEW-EURODRIVE INDIA PRIVATE LIMITED 345 DIT Road East Rampura Dhaka-1219, Bangladesh	Tel. +88 01729 097309 salesdhaka@seweurodrivebangladesh.com
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Belarus

Sales	Minsk	Foreign unitary production enterprise SEW- EURODRIVE RybalkoStr. 26 220033 Minsk	Tel. +375 17 298 47 56 / 298 47 58 Fax +375 17 298 47 54 http://www.sew.by sales@sew.by
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Belgium

Assembly Sales Service	Brussels	SEW-EURODRIVE n.v./s.a. Researchpark Haasrode 1060 Evenementenlaan 7 3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.be info@sew-eurodrive.be
Service Competence Center	Industrial Gears	SEW-EURODRIVE n.v./s.a. Rue de Parc Industriel, 31 6900 Marche-en-Famenne	Tel. +32 84 219-878 Fax +32 84 219-879 http://www.sew-eurodrive.be service-IG@sew-eurodrive.be

Brazil

Production Sales Service	São Paulo	SEW-EURODRIVE Brasil Ltda. Estrada Municipal José Rubim, 205 – Rodovia Santos Dumont Km 49 Indaiatuba – 13347-510 – SP	Tel. +55 19 3835-8000 sew@sew.com.br
Assembly Sales Service	Rio Claro	SEW-EURODRIVE Brasil Ltda. Rodovia Washington Luiz, Km 172 Condomínio Industrial Conpark Caixa Postal: 327 13501-600 – Rio Claro / SP	Tel. +55 19 3522-3100 Fax +55 19 3524-6653 montadora.rc@sew.com.br
	Joinville	SEW-EURODRIVE Brasil Ltda. Rua Dona Francisca, 12.346 – Pirabeiraba 89239-270 – Joinville / SC	Tel. +55 47 3027-6886 Fax +55 47 3027-6888 filial.sc@sew.com.br

Bulgaria

Sales	Sofia	BEVER-DRIVE GmbH Bogdanovetz Str.1 1606 Sofia	Tel. +359 2 9151160 Fax +359 2 9151166 bever@bever.bg
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Cameroon			
Sales	Douala	SEW-EURODRIVE S.A.R.L. Ancienne Route Bonabéri P.O. Box B.P 8674 Douala-Cameroun	Tel. +237 233 39 02 10 Fax +237 233 39 02 10 info@sew-eurodrive-cm
Canada			
Assembly Sales Service	Toronto	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, ON L6T 3W1	Tel. +1 905 791-1553 Fax +1 905 791-2999 http://www.sew-eurodrive.ca l.watson@sew-eurodrive.ca
	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. Tilbury Industrial Park 7188 Honeyman Street Delta, BC V4G 1G1	Tel. +1 604 946-5535 Fax +1 604 946-2513 b.wake@sew-eurodrive.ca
	Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2555 Rue Leger Lasalle, PQ H8N 2V9	Tel. +1 514 367-1124 Fax +1 514 367-3677 a.peluso@sew-eurodrive.ca
Chile			
Assembly Sales Service	Santiago de Chile	SEW-EURODRIVE CHILE LTDA Las Encinas 1295 Parque Industrial Valle Grande LAMP Santiago de Chile P.O. Box Casilla 23 Correo Quilicura - Santiago - Chile	Tel. +56 2 2757 7000 Fax +56 2 2757 7001 http://www.sew-eurodrive.cl ventas@sew-eurodrive.cl
China			
Production Assembly Sales Service	Tianjin	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 78, 13th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25323273 http://www.sew-eurodrive.cn info@sew-eurodrive.cn
Assembly Sales Service	Suzhou	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew-eurodrive.cn
	Guangzhou	SEW-EURODRIVE (Guangzhou) Co., Ltd. No. 9, JunDa Road East Section of GETDD Guangzhou 510530	Tel. +86 20 82267890 Fax +86 20 82267922 guangzhou@sew-eurodrive.cn
	Shenyang	SEW-EURODRIVE (Shenyang) Co., Ltd. 10A-2, 6th Road Shenyang Economic Technological Development Area Shenyang, 110141	Tel. +86 24 25382538 Fax +86 24 25382580 shenyang@sew-eurodrive.cn
	Taiyuan	SEW-EURODRIVE (Taiyuan) Co., Ltd. No.3, HuaZhang Street, TaiYuan Economic & Technical Development Zone ShanXi, 030032	Tel. +86-351-7117520 Fax +86-351-7117522 taiyuan@sew-eurodrive.cn
	Wuhan	SEW-EURODRIVE (Wuhan) Co., Ltd. 10A-2, 6th Road No. 59, the 4th Quanli Road, WEDA 430056 Wuhan	Tel. +86 27 84478388 Fax +86 27 84478389 wuhan@sew-eurodrive.cn
	Xi'An	SEW-EURODRIVE (Xi'An) Co., Ltd. No. 12 Jinye 2nd Road Xi'An High-Technology Industrial Development Zone Xi'An 710065	Tel. +86 29 68686262 Fax +86 29 68686311 xian@sew-eurodrive.cn
Sales Service	Hong Kong	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. +852 36902200 Fax +852 36902211 contact@sew-eurodrive.hk

Colombia			
Assembly Sales Service	Bogota	SEW-EURODRIVE COLOMBIA LTDA. Calle 17 No. 132-18 Interior 2 Bodega 6, Manzana B Santafé de Bogotá	Tel. +57 1 54750-50 Fax +57 1 54750-44 http://www.sew-eurodrive.com.co sew@sew-eurodrive.com.co
Croatia			
Sales Service	Zagreb	KOMPEKS d. o. o. Zeleni dol 10 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@inet.hr
Czech Republic			
Assembly Sales Service	Hostivice	SEW-EURODRIVE CZ s.r.o. Floriánova 2459 253 01 Hostivice	Tel. +420 255 709 601 Fax +420 235 350 613 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz
	Drive Service Hotline / 24 Hour Service	+420 800 739 739 (800 SEW SEW)	Service Tel. +420 255 709 632 Fax +420 235 358 218 servis@sew-eurodrive.cz
Denmark			
Assembly Sales Service	Copenhagen	SEW-EURODRIVEA/S Geminivej 28-30 2670 Greve	Tel. +45 43 95 8500 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk
Egypt			
Sales Service	Cairo	Copam Egypt for Engineering & Agencies Building 10, Block 13005, First Industrial Zone, Obour City Cairo	Tel. +202 44812673 / 79 (7 lines) Fax +202 44812685 http://www.copam-egypt.com copam@copam-egypt.com
Estonia			
Sales	Tallin	ALAS-KUUL AS Reti tee 4 75301 Peetri küla, Rae vald, Harjumaa	Tel. +372 6593230 Fax +372 6593231 http://www.alas-kuul.ee veiko.soots@alas-kuul.ee
Finland			
Assembly Sales Service	Hollola	SEW-EURODRIVE OY Vesimäentie 4 15860 Hollola	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
Service	Hollola	SEW-EURODRIVE OY Keskikankaantie 21 15860 Hollola	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
Production Assembly	Karkkila	SEW Industrial Gears Oy Santasalonkatu 6, PL 8 03620 Karkkila, 03601 Karkkila	Tel. +358 201 589-300 Fax +358 201 589-310 http://www.sew-eurodrive.fi sew@sew.fi
France			
Production Sales Service	Hagenau	SEW-USOCOME 48-54 route de Soufflenheim B. P. 20185 67506 Haguenau Cedex	Tel. +33 3 88 73 67 00 Fax +33 3 88 73 66 00 http://www.usocom.com sew@usocom.com
Production	Forbach	SEW-USOCOME Zone industrielle Technopôle Forbach Sud B. P. 30269 57604 Forbach Cedex	Tel. +33 3 87 29 38 00
	Brumath	SEW-USOCOME 1 Rue de Bruxelles 67670 Mommenheim Cedex	Tel. +33 3 88 37 48 00
Assembly Sales Service	Bordeaux	SEW-USOCOME Parc d'activités de Magellan 62 avenue de Magellan – B. P. 182 33607 Pessac Cedex	Tel. +33 5 57 26 39 00 Fax +33 5 57 26 39 09

France			
	Lyon	SEW-USOCOME 75 rue Antoine Condorcet 38090 Vaulx-Milieu	Tel. +33 4 74 99 60 00 Fax +33 4 74 99 60 15
	Nantes	SEW-USOCOME Parc d'activités de la forêt 4 rue des Fontenelles 44140 Le Bignon	Tel. +33 2 40 78 42 00 Fax +33 2 40 78 42 20
	Paris	SEW-USOCOME Zone industrielle 2 rue Denis Papin 77390 Verneuil l'Étang	Tel. +33 1 64 42 40 80 Fax +33 1 64 42 40 88
Gabon			
Sales	Libreville	SEW-EURODRIVE SARL 183, Rue 5.033.C, Lalala à droite P.O. Box 15682 Libreville	Tel. +241 03 28 81 55 +241 06 54 81 33 http://www.sew-eurodrive.cm sew@sew-eurodrive.cm
Germany			
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Production / Industrial Gears	Bruchsal	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Str. 10 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-2970
Production	Graben	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 76676 Graben-Neudorf P.O. Box Postfach 1220 – D-76671 Graben-Neudorf	Tel. +49 7251 75-0 Fax +49 7251-2970
	Östringen	SEW-EURODRIVE GmbH & Co KG, Werk Östringen Franz-Gurk-Straße 2 76684 Östringen	Tel. +49 7253 9254-0 Fax +49 7253 9254-90 oestringen@sew-eurodrive.de
Service Competence Center	Mechanics / Mechatronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 scc-mechanik@sew-eurodrive.de
	Electronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 scc-elektronik@sew-eurodrive.de
Drive Technology Center	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 40-42 30823 Garbsen (Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 dtc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dankritzer Weg 1 08393 Meerane (Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 dtc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 85551 Kirchheim (München)	Tel. +49 89 909552-10 Fax +49 89 909552-50 dtc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 40764 Langenfeld (Düsseldorf)	Tel. +49 2173 8507-30 Fax +49 2173 8507-55 dtc-west@sew-eurodrive.de
Drive Center	Berlin	SEW-EURODRIVE GmbH & Co KG Alexander-Meißner-Straße 44 12526 Berlin	Tel. +49 306331131-30 Fax +49 306331131-36 dc-berlin@sew-eurodrive.de
	Ludwigshafen	SEW-EURODRIVE GmbH & Co KG c/o BASF SE Gebäude W130 Raum 101 67056 Ludwigshafen	Tel. +49 7251 75 3759 Fax +49 7251 75 503759 dc-ludwigshafen@sew-eurodrive.de
	Saarland	SEW-EURODRIVE GmbH & Co KG Gottlieb-Daimler-Straße 4 66773 Schwalbach Saar – Hülzweiler	Tel. +49 6831 48946 10 Fax +49 6831 48946 13 dc-saarland@sew-eurodrive.de
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Indonesia

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	Surabaya	CV. Multi Mas Jl. Raden Saleh 43A Kav. 18 Surabaya 60174	Tel. +62 31 5458589 Fax +62 31 5317220 sianhwa@sby.centrin.net.id http://www.cvmultimas.com
Ireland			
Sales Service	Dublin	Alpert Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458 http://www.alpert.ie info@alpert.ie
Israel			
Sales	Tel Aviv	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 http://www.liraz-handasa.co.il office@liraz-handasa.co.il
Italy			
Assembly Sales Service	Milan	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Bernini, 14 20020 Solaro (Milano)	Tel. +39 02 96 980229 Fax +39 02 96 980 999 http://www.sew-eurodrive.it milano@sew-eurodrive.it
Ivory Coast			
Sales	Abidjan	SEW-EURODRIVE SARL Ivory Coast Rue des Pêcheurs, Zone 3 26 BP 916 Abidjan 26	Tel. +225 21 21 81 05 Fax +225 21 25 30 47 info@sew-eurodrive.ci http://www.sew-eurodrive.ci
Japan			
Assembly Sales Service	Iwata	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373814 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp hamamatsu@sew-eurodrive.co.jp
Kazakhstan			
Sales	Almaty	SEW-EURODRIVE LLP 291-291A, Tole bi street 050031, Almaty	Tel. +7 (727) 350 5156 Fax +7 (727) 350 5156 http://www.sew-eurodrive.kz sew@sew-eurodrive.kz
	Tashkent	SEW-EURODRIVE LLP Representative office in Uzbekistan 96A, Sharaf Rashidov street, Tashkent, 100084	Tel. +998 71 2359411 Fax +998 71 2359412 http://www.sew-eurodrive.uz sew@sew-eurodrive.uz
	Ulaanbaatar	IM Trading LLC Narny zam street 62 Sukhbaatar district, Ulaanbaatar 14230	Tel. +976-77109997 Fax +976-77109997 imt@imt.mn
Kenya			
Sales	Nairobi	SEW-EURODRIVE Pty Ltd Transnational Plaza, 5th Floor Mama Ngina Street P.O. Box 8998-00100 Nairobi	Tel. +254 791 398840 http://www.sew-eurodrive.co.tz info@sew.co.tz
Latvia			
Sales	Riga	SIA Alas-Kuul Katlakalna 11C 1073 Riga	Tel. +371 6 7139253 Fax +371 6 7139386 http://www.alas-kuul.lv info@alas-kuul.com

Lebanon			
Sales (Lebanon)	Beirut	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 510 532 Fax +961 1 494 971 ssacar@inco.com.lb
Sales (Jordan, Kuwait , Beirut Saudi Arabia, Syria)		Middle East Drives S.A.L. (offshore) Sin El Fil. B. P. 55-378 Beirut	Tel. +961 1 494 786 Fax +961 1 494 971 http://www.medrives.com info@medrives.com
Lithuania			
Sales	Alytus	UAB Irseva Statybininku 106C 63431 Alytus	Tel. +370 315 79204 Fax +370 315 56175 http://www.irseva.lt irmantas@irseva.lt
Luxembourg			
representation: Belgium			
Macedonia			
Sales	Skopje	Boznos DOOEL Dime Anicin 2A/7A 1000 Skopje	Tel. +389 23256553 Fax +389 23256554 http://www.boznos.mk
Malaysia			
Assembly Sales Service	Johor	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my
Mexiko			
Assembly Sales Service	Quéretaro	SEW-EURODRIVE MEXICO S.A. de C.V. SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial Quéretaro C.P. 76220 Querétaro, México	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx
Sales Service	Puebla	SEW-EURODRIVE MEXICO S.A. de C.V. Calle Zavaleta No. 3922 Piso 2 Local 6 Col. Santa Cruz Buenavista C.P. 72154 Puebla, México	Tel. +52 (222) 221 248 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx
Mongolia			
Technical Office	Ulaanbaatar	IM Trading LLC Naryn street 62 Union building, Suite A-403-1 Sukhbaatar district, Ulaanbaatar 14230	Tel. +976-77109997 Tel. +976-99070395 Fax +976-77109997 http://imt.mn/ imt@imt.mn
Morocco			
Sales Service	Bouskoura	SEW-EURODRIVE Morocco Parc Industriel CFCIM, Lot 55 and 59 Bouskoura	Tel. +212 522 88 85 00 Fax +212 522 88 84 50 http://www.sew-eurodrive.ma sew@sew-eurodrive.ma
Namibia			
Sales	Swakopmund	DB Mining & Industrial Services Einstein Street Strauss Industrial Park Unit1 Swakopmund	Tel. +264 64 462 738 Fax +264 64 462 734 anton@dbminingnam.com
Netherlands			
Assembly Sales Service	Rotterdam	SEW-EURODRIVE B.V. Industrieweg 175 3044 AS Rotterdam Postbus 10085 3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 Service: 0800-SEWHELP http://www.sew-eurodrive.nl info@sew-eurodrive.nl

New Zealand			
Assembly Sales Service	Auckland	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 30 Lodestar Avenue, Wigram Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz
Nigeria			
Sales	Lagos	Greenpeg Nig. Ltd Plot 296A, Adeyemo Akapo Str. Omole GRA Ikeja Lagos-Nigeria	Tel. +234-701-821-9200-1 http://www.greenpeg ltd.com bolaji.adekunle@greenpeg ltd.com
Norway			
Assembly Sales Service	Moss	SEW-EURODRIVE A/S Solgaard skog 71 1599 Moss	Tel. +47 69 24 10 20 Fax +47 69 24 10 40 http://www.sew-eurodrive.no sew@sew-eurodrive.no
Pakistan			
Sales	Karachi	Industrial Power Drives Al-Fatah Chamber A/3, 1st Floor Central Com- mercial Area, Sultan Ahmed Shah Road, Block 7/8, Karachi	Tel. +92 21 452 9369 Fax +92-21-454 7365 seweurodrive@cyber.net.pk
Paraguay			
Sales	Fernando de la Mora	SEW-EURODRIVE PARAGUAY S.R.L De la Victoria 112, Esquina nueva Asunción Departamento Central Fernando de la Mora, Barrio Bernardino	Tel. +595 991 519695 Fax +595 21 3285539 sewpy@sew-eurodrive.com.py
Peru			
Assembly Sales Service	Lima	SEW EURODRIVE DEL PERU S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe
Philippines			
Sales	Makati	P.T. Cerna Corporation 4137 Ponte St., Brgy. Sta. Cruz Makati City 1205	Tel. +63 2 519 6214 Fax +63 2 890 2802 mech_drive_sys@ptcerna.com http://www.ptcerna.com
Poland			
Assembly Sales Service	Łódź	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 92-518 Łódź	Tel. +48 42 293 00 00 Fax +48 42 293 00 49 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
	Service	Tel. +48 42 293 0030 Fax +48 42 293 0043	24 Hour Service Tel. +48 602 739 739 (+48 602 SEW SEW) serwis@sew-eurodrive.pl
Portugal			
Assembly Sales Service	Coimbra	SEW-EURODRIVE, LDA. Av. da Fonte Nova, n.º 86 3050-379 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt
Romania			
Sales Service	Bucharest	Sialco Trading SRL str. Brazilia nr. 36 011783 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro
Russia			
Assembly Sales Service	St. Petersburg	ЗАО «СЕВ-ЕВРОДРАЙФ» а. я. 36 195220 Санкт-Петербург	Tel. +7 812 3332522 / +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru

Sambia

representation: South Africa

Senegal

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

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

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

Sales	Bratislava	SEW-Eurodrive SK s.r.o. Rybničná 40 831 06 Bratislava	Tel. +421 2 33595 202, 217, 201 Fax +421 2 33595 200 http://www.sew-eurodrive.sk sew@sew-eurodrive.sk
	Košice	SEW-Eurodrive SK s.r.o. Slovenská ulica 26 040 01 Košice	Tel. +421 55 671 2245 Fax +421 55 671 2254 Mobile +421 907 671 976 sew@sew-eurodrive.sk

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Sales Service	Celje	Pakman - Pogonska Tehnika d.o.o. Ul. XIV. divizije 14 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net
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South Africa

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	Cape Town	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 bgriffiths@sew.co.za
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Sri Lanka			
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Swaziland			
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Sweden			
Assembly Sales Service	Jönköping	SEW-EURODRIVE AB Gnejsvägen 6-8 553 03 Jönköping Box 3100 S-550 03 Jönköping	Tel. +46 36 34 42 00 Fax +46 36 34 42 80 http://www.sew-eurodrive.se jonkoping@sew.se
Switzerland			
Assembly Sales Service	Basel	Alfred Imhof A.G. Jurastrasse 10 4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch
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	Nan Tou	Ting Shou Trading Co., Ltd. No. 55 Kung Yeh N. Road Industrial District Nan Tou 540	Tel. +886 49 255353 Fax +886 49 257878 sewtwn@ms63.hinet.net http://www.tingshou.com.tw
Tanzania			
Sales	Daressalam	SEW-EURODRIVE PTY LIMITED TANZANIA Plot 52, Regent Estate PO Box 106274 Dar Es Salaam	Tel. +255 0 22 277 5780 Fax +255 0 22 277 5788 http://www.sew-eurodrive.co.tz info@sew.co.tz
Thailand			
Assembly Sales Service	Chonburi	SEW-EURODRIVE (Thailand) Ltd. 700/456, Moo.7, Donhuaroh Muang Chonburi 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com
Tunisia			
Sales	Tunis	T. M.S. Technic Marketing Service Zone Industrielle Mghira 2 Lot No. 39 2082 Fouchana	Tel. +216 79 40 88 77 Fax +216 79 40 88 66 http://www.tms.com.tn tms@tms.com.tn
Turkey			
Assembly Sales Service	Kocaeli-Gebze	SEW-EURODRIVE Hareket Sistemleri San. Ve TIC. Ltd. Sti Gebze Organize Sanayi Böl. 400 Sok No. 401 41480 Gebze Kocaeli	Tel. +90 262 9991000 04 Fax +90 262 9991009 http://www.sew-eurodrive.com.tr sew@sew-eurodrive.com.tr

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Uruguay

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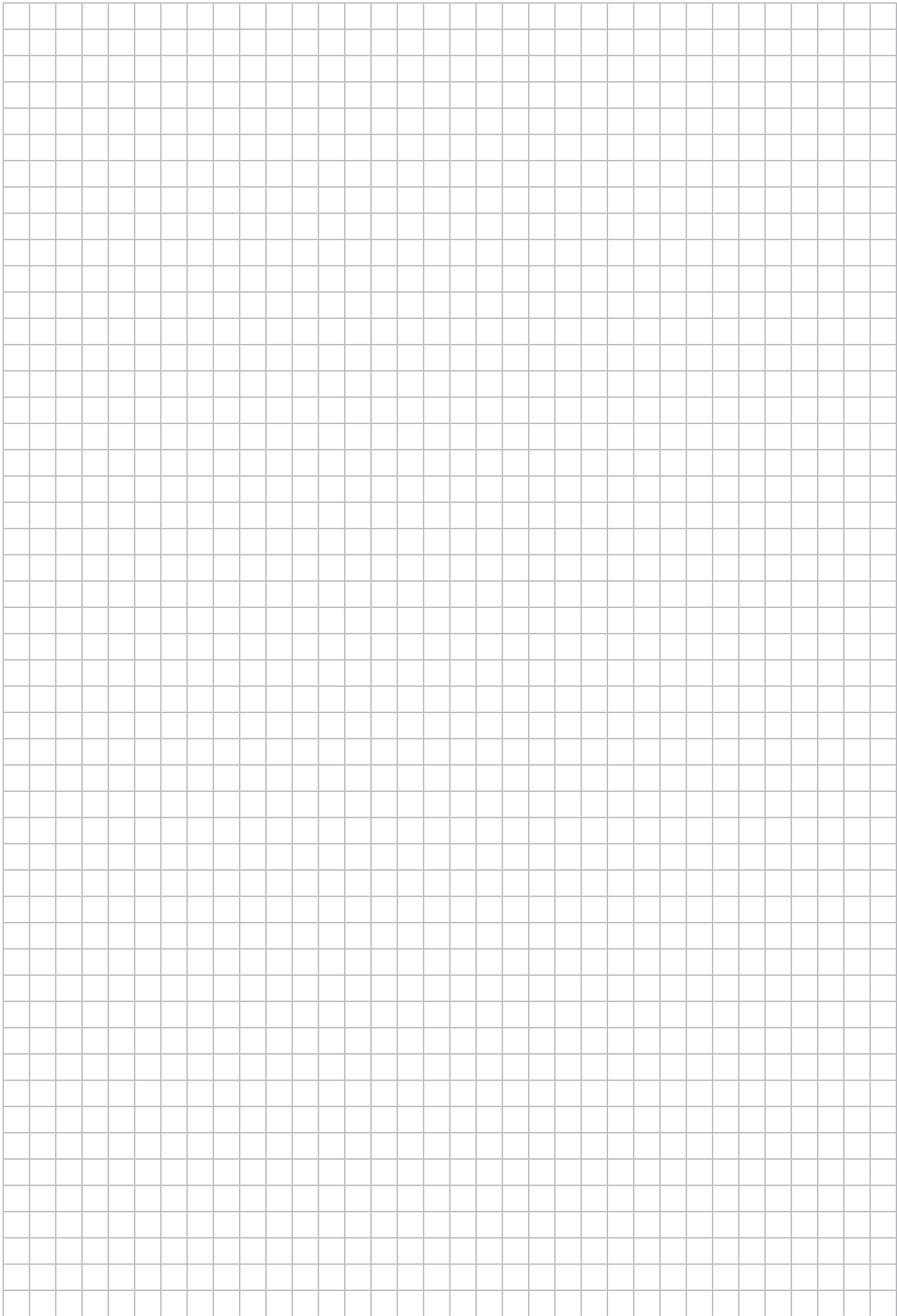
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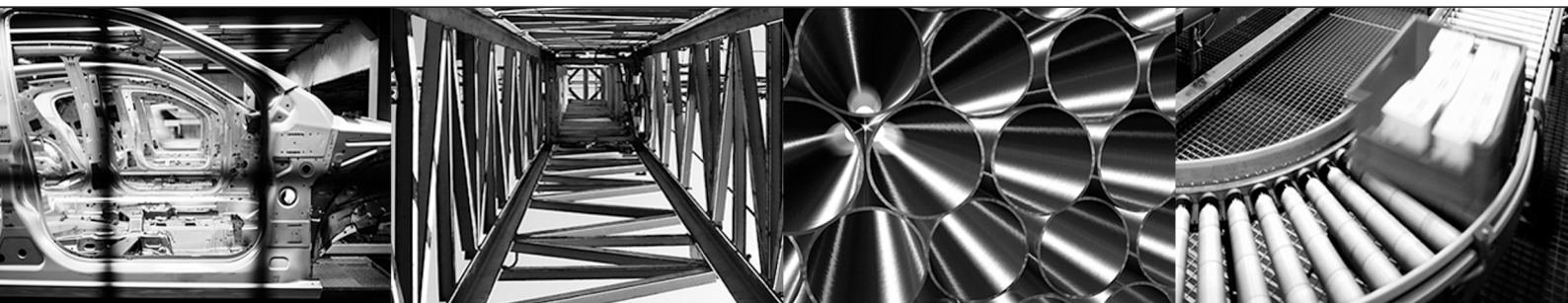
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