Operating Instructions

Stainless Steel Servo Gearmotors and Servomotors

PSH..CM2H.. and CM2H..

Edition 03/2025

31977693/EN

Table of Contents

1 General information ... 4
1.1 Structure of the safety notes ... 4

2 Safety notes ... 5
2.1 Preliminary information ... 5
2.2 Duties of the user ... 5
2.3 Functional safety technology ... 5
2.4 Target group ... 6
2.5 Creating a safe working environment ... 6
2.6 Designated use ... 8
2.7 Magnetic fields ... 8
2.8 Transportation ... 9
2.9 Installation/assembly ... 9
2.10 Electrical installation ... 9
2.11 Warning notes on the motor ... 10
2.12 Startup/operation ... 11

3 Motor structure ... 12
3.1 Nameplate and type designation ... 12

4 Mechanical installation ... 16
4.1 Before you start ... 16
4.2 Motor installation notes ... 16
4.3 Installation tolerances ... 17
4.4 Flange mounting of PSH..CM2H.. servo gearmotor ... 18
4.5 Flange mounting of CM2H.. servomotor ... 18

5 Electrical installation ... 22
5.1 General information ... 22
5.2 Additional regulations ... 23
5.3 Wiring notes ... 23
5.4 Overview of connection variants ... 24

6 Startup ... 32
6.1 Before you start ... 32
6.2 Startup with MOVISUITE® ... 32
6.3 Startup after storage ... 33

7 Inspection/maintenance ... 34
7.1 General information ... 34
7.2 Maintenance intervals ... 34

8 Malfunctions ... 36
8.1 General information ... 36
8.2 Servomotor malfunctions ... 36

9 Waste disposal ... 38

31977693/EN – 03/2025

1 General information

1.1 Structure of the safety notes

1.1.1 Meaning of signal words

The following table shows the graduation and meaning of the signal words in the safety notes.

Signal word	Meaning	Consequences if not observed
⚠ **DANGER**	Imminent danger	Death or severe injuries
⚠ **WARNING**	Possibly dangerous situation	Death or severe injuries
⚠ **CAUTION**	Possibly 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.	

1.1.2 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 automatic restart

31977693/EN – 03/2025

2 Safety notes

2.1 Preliminary information

The following general safety notes serve the purpose of preventing injury to persons 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 Duties of the user

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:

- The national and regional regulations governing safety and the prevention of accidents
- Product safety label on the product
- All other associated project planning documents, installation and startup instructions, as well as wiring diagrams
- Do not assemble, install or operate damaged products
- All system-specific specifications and regulations

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 Functional safety technology

The product includes the STO safety subfunction. As an option, additional safety subfunctions can be available for the product.

The safety subfunctions are deactivated in the delivery state. The product may not perform any safety function without higher-level safety systems.

Observe the product manual of the device for use of the STO safety subfunction or other safety subfunctions.

31977693/EN – 03/2025

2.4 Target group

Specialist for mechanical work

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

- Qualifications in the field of mechanics in accordance with the national regulations
- Familiarity with this documentation

Specialist for electrotechnical work

Any electrotechnical work may be performed only by electrically skilled persons with a suitable education. Electrically skilled persons in the context of this documentation are persons who are familiar with electrical installation, startup, troubleshooting, and maintenance of the product, and who possess the following qualifications:

- Qualifications in the field of electrical engineering in accordance with the national regulations
- Familiarity with this documentation

Additional qualifications

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 persons must have the express authorization of the company to operate, program, parameterize, label, and ground devices, systems, and circuits in accordance with the standards of safety technology.

Instructed persons

All work in the areas of transport, storage, installation, operation and waste disposal may only be carried out by persons who are trained and instructed appropriately. These instructions must enable the persons to carry out the required activities and work steps safely and in accordance with regulations.

2.5 Creating a safe working environment

Before you work on the product, ensure a safe working environment. Observe the following basic safety notes:

2.5.1 Performing work on the product safely

Defective or damaged product

Never install defective or damaged products. Observe the following information to avoid injuries or damage:

- Before installation, check the product for external damage and replace a damaged product.

Hot surfaces

The surfaces of the product can become very hot during operation. Observe the following information to avoid burns:

- Let the product and its accessories cool down before touching it.
- Do not touch any surfaces of the product during operation, except for the control elements.
- Observe the information signs and product safety labels on the product.

31977693/EN – 03/2025

Falling load

Observe the following information to avoid death or severe injury due to falling loads:

- Do not stand under the load.
- Secure the area where loads can fall down.
- Use personal protective equipment (such as helmet and safety shoes).
- Use a suitable lifting tool (chain hoist, forklift) and transport protection.

Sharp edges

Observe the following information to avoid cuts caused by sharp or non-deburred cutting edges:

- Wear safety gloves.

2.5.2 Performing electrical work safely

Observe the following information to perform electrical work safely:

Electrical work may only be performed by an electrically skilled person or an electronically instructed person under the supervision of an electrically skilled person.

The fact that the operation or display elements are no longer illuminated does not indicate that the product has been disconnected from the supply system and no longer carries any voltage.

Live parts

Always adhere to the 5 safety rules for all work on electrical components:

1. Disconnect.
2. Secure the device against a restart.
3. Check that no voltage is applied.
4. Ground and short-circuit.
5. Cover or isolate neighboring live parts.

Depending on the situation, it is possible to deviate from rules 4 and 5. Observe standard EN 50110-1.

Dangerous voltage

When the system is switched on, dangerous voltages are present at all power connections as well as any cables and terminals that are connected. This also applies even when the product is inhibited and the motor is in an idle state. Observe the following notes to avoid the risk of electric shock:

- Do not touch any exposed live parts (e.g. male contacts, connectors, terminals).
- Secure all open live components with a touch guard.
- Ensure that the terminal boxes are closed and screwed tight before applying the supply voltage.
- Before applying the supply voltage, make sure that all required covers are mounted.
- Secure the output shaft against rotation when working without touch guard.

31977693/EN – 03/2025

Danger due to electric arc

An electric arc may occur when plug-in connections are disconnected or connected while voltage is applied (e.g. connection between drive and control). In order to avoid damaging electrical components, observe the following information:

- Do not disconnect power connections during operation.
- Do not connect power connections during operation.
- Ensure that the product is de-energized before disconnecting and connecting the plug-in connections.

2.6 Designated use

The product is intended for installation in electrical systems 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 systems can be mobile or stationary.

The motors must be suitable for operation with inverters.

Only connect ohmic/inductive loads.

The product can be used to operate the following motors in industrial and commercial systems:

- AC asynchronous motors with squirrel-cage rotor
- Permanent-field three-phase current synchronous motors

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.

2.6.1 Restrictions under the European WEEE Directive 2012/19/EU

Options and accessories from SEW-EURODRIVE may only be used in combination with products from SEW-EURODRIVE.

2.7 Magnetic fields

The device contains permanent magnets that create strong magnetic fields even when de-energized. These fields can lead to malfunctions in active medical implants. Persons with such implants must stay away from the device.

31977693/EN – 03/2025

2.8 Transportation

Observe the following notes when transporting the device:

- Note that retaining straps attached to the products might be under tension. To avoid cutting injuries, remove the retaining straps carefully from the product and wear suitable protective clothing, if necessary.
- Ensure that the product is not subject to mechanical impact.

Inspect the shipment for damage as soon as you receive the delivery. Inform the shipping company immediately about any damage. If the product or the packaging is damaged, do not assemble, install, connect, or start up the product. If the packaging is damaged, the product itself may also be damaged.

The installed lifting eyebolts are in accordance with DIN 580. Observe the loads and regulations specified there. The tension force vector of the slings must not exceed a 45° angle in accordance with DIN 580.

If the product is not immediately installed, it must be stored in a dry and dust-free location. The product can be stored for up to 9 months without requiring any special measures before startup. Do not store the product outdoors.

If necessary, use suitable, adequately dimensioned transport aids.

Observe the notes on the climatic conditions in accordance with chapter "Technical data" in the corresponding product manual.

If necessary, use suitable, sufficiently dimensioned handling equipment.

2.9 Installation/assembly

Ensure that the product is installed and cooled in accordance with 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 no components are deformed or no insulation spaces are modified, particularly during transportation. Electrical components must not be mechanically damaged or destroyed.

2.9.1 Restrictions of use

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

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

2.10 Electrical installation

Ensure that all of the required covers are correctly attached after the 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).

31977693/EN – 03/2025

2.10.1 Required protective measure

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

2.10.2 Stationary application

The necessary preventive measure for the product is:

Type of energy transfer	Preventive measure
Direct power supply	Ground connection

2.10.3 Mobile application

Preventive measures that are required for the product according to IEC 61140 are:

- Protection through protective separation
- Discharge measures against electrostatic discharge (ESD) and capacitive coupling

2.10.4 Regenerative operation

The drive is operated as a generator due to the kinetic energy of the system/machine. Before opening the connection box, secure the output shaft against rotation.

2.11 Warning notes on the motor

Observe the warning notes specified on the motor. The following warning notes can be found on the motor:

Safety note	Meaning
	Warning of hot surfaces.

Warning notes can become dirty or illegible over time. Ensure that all warning and operating notes remain clearly legible.

31977693/EN – 03/2025

2.12 Startup/operation

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. Be sure to check the effectiveness of the protection devices after every modification.

In the event of deviations from normal operation, switch off the product. Possible deviations are increased temperatures, noise, or vibration, for example. Determine the cause. Contact SEW-EURODRIVE if necessary.

Risk of burns due to arcing: Do not disconnect power connections during operation. Do not connect power connections during operation.

When the system is switched on, dangerous voltages are present on all voltage-controlled product parts as well as any cables and terminals that are connected. This also applies even when the product is inhibited and the motor is in an idle state. Do not touch the components during operation.

If you disconnect the product from the voltage supply, do not touch any live components or power connections because capacitors might still be charged. Observe the following minimum switch-off time:

10 minutes.

Observe the corresponding information signs on the product.

The fact that the operation or display elements are no longer illuminated does not indicate that the product has been disconnected from the supply system and no longer carries any voltage.

Mechanical blocking or internal protective functions of the product can cause a motor standstill. Removing the cause of this problem or performing a reset can result in the machine or the system re-starting on its own. First, disconnect the product from the supply system before you 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.

31977693/EN – 03/2025

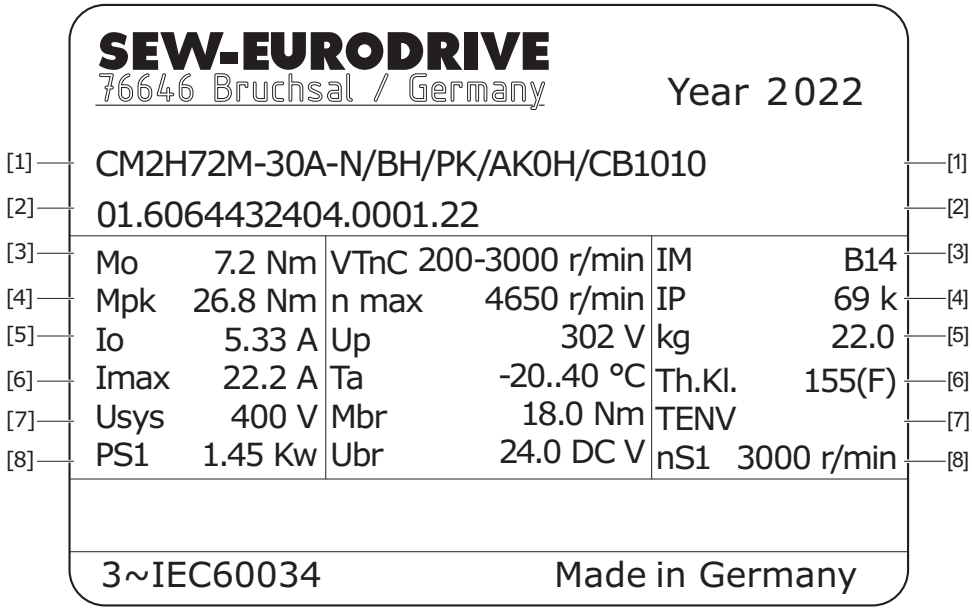
3 Motor structure

3.1 Nameplate and type designation

3.1.1 Nameplates on the gearmotor and motor

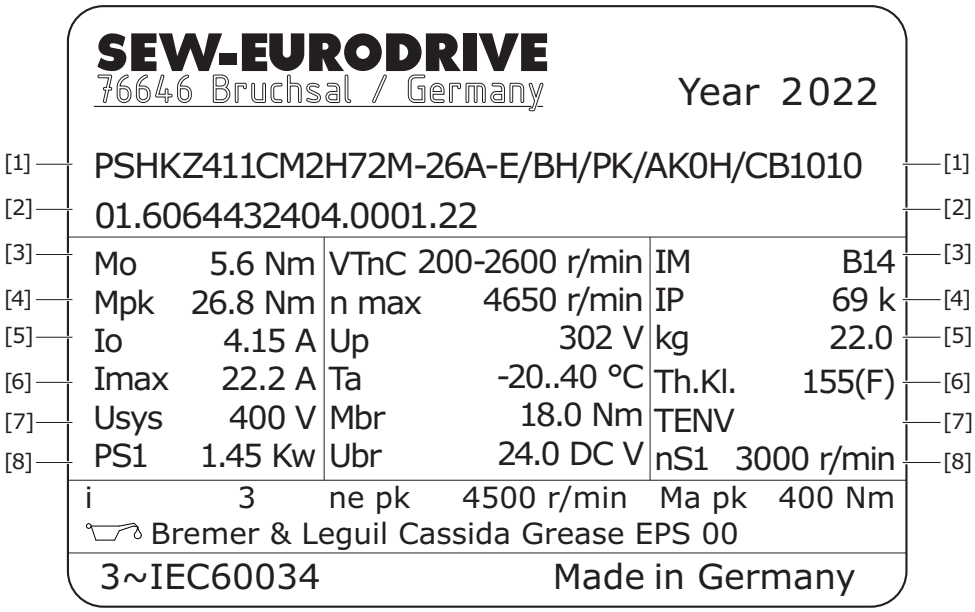
1st nameplate

The following figure shows the 1st nameplate of a CM2H.. motor:



36013359883

The following figure shows the 1st nameplate of a CM2H.. gearmotor:



9007235487976459

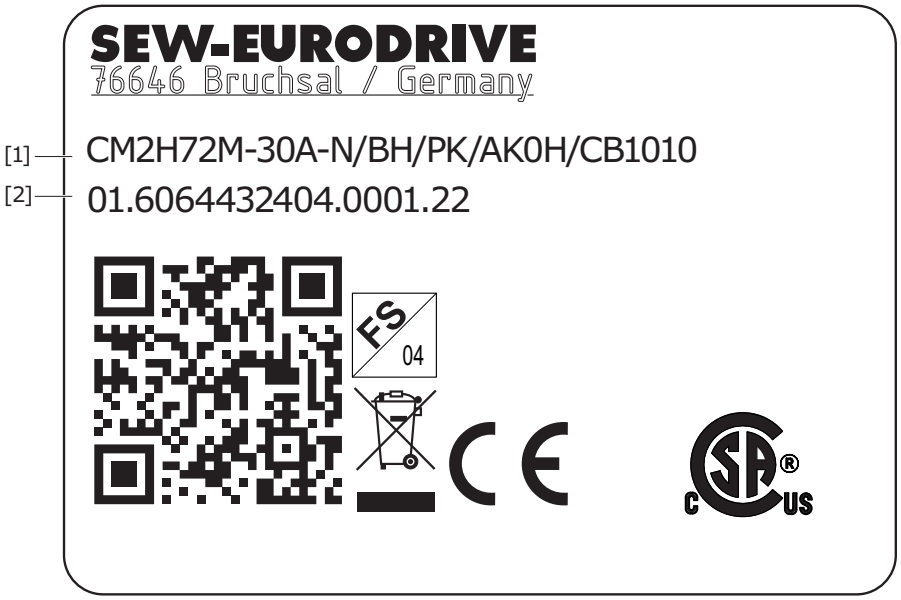
Line	Information
[1]	• Type designation
[2]	• Serial number

31977693/EN – 03/2025

Line	Information
[3]	• Standstill torque • Variable torque • Speed class • Mounting position
[4]	• Dynamic limit torque of the motor • Maximum permitted speed of the servomotor • Degree of protection according to IEC 60034-5
[5]	• Standstill current • Voltage at the open terminals of the motor at rated speed • Mass
[6]	• Maximum permitted current • Permitted ambient temperature range • Thermal class
[7]	• System voltage, voltage of the supplying inverter • Braking torque • TENV (Totally Enclosed Non-Ventilated)
[8]	• Rated power continuous duty • Brake voltage • Rated speed continuous duty

2nd nameplate

The following figure shows the 2nd nameplate of a CM2H.. motor:



51849565323

The following figure shows the 2nd nameplate of a CM2H.. gearmotor:

51849511819

Line	Information
[1]	• Type designation
[2]	• Serial number

The following table lists all the markings that can be provided on a nameplate, and an explanation of what they mean:

CE	CE marking to state compliance with European Directives, (see EU declaration of conformity or EU declaration of incorporation).
FS 02	FS logo with 2-digit number for identification of installed functional safety motor options.
MC170602 c SP us EnergyVerified	CSAe mark for confirmation of compliance with the Canadian efficiency limit values for AC motors
UK CA	The UKCA mark indicates compliance with British guidelines.
	Products and accessories may fall within the scope of the country-specific transposition of the WEEE Directive. Dispose of the product and its accessories in accordance with the national regulations of your country.
	Product label with QR code. The QR code on the product can be scanned. You will be redirected to the Digital Services of SEW-EURODRIVE. There, you have access to product-specific data, documents, and further services. **In the "Documentation" > "Data and documents" area, the product manual of the device with further information is available.**

31977693/EN – 03/2025

3.1.2 Type designation

The following example shows the structure of the type designation:

PSHKZ411CM2H72M-30A-E/BH/PK/AK0H/CB1010	
PSH	Gear unit series
KZ	Shaft design
411	Gear unit size
CM2H	Motor series
72	Motor size
M	Motor length
30	Speed class
A	System voltage
E	Shaft design
BH	Brake
PK	Temperature sensor
AK0H	Encoder
CB1010	Connection variant

31977693/EN – 03/2025

4 Mechanical installation

4.1 Before you start

Only install the device if the following conditions are met:

- The information on the drive's nameplate must match the output voltage of the inverter.
- The drive is undamaged (no damage caused by transportation or storage).
- All transport protection has been removed.
- Ambient temperature is as specified on the nameplate.

  Note that the temperature range of the mounted gear unit might also be restricted (see operating instructions of the gear unit).
- You have ensured that there are no oils, acids, gases, vapors, radiation, etc. present.

The specifications listed above refer to the standard designs. The requirements for special designs might vary from the standard. Refer to the order confirmation for deviating conditions. Make sure that the drive is designed according to the ambient conditions.

Functional safety

If the drive has the FS logo on the nameplate, observe the information on mechanical installation in the corresponding addendum to the operating instructions.

4.2 Motor installation notes

⚠ CAUTION

Sharp edges due to open keyway.

Risk of cutting injuries.

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

NOTICE

Possible damage to the motor due to improper mounting.

The drive system might be damaged.

- Observe the notes in this chapter.

- Take account of derating at an installation altitude > 1000 m above sea level.
- Protect the components from mechanical damage.
- For flange mounting, use the screws and tightening torques specified in chapter "Screw sizes and tightening torques for flange mounting".
- Align the device and driven machine carefully so that the output shaft is not subjected to impermissible load. Observe the permitted overhung and axial loads.
- Do not jolt or hammer the shaft end.
- Only install or remove belt pulleys and couplings using suitable devices and cover them with a touch guard. Avoid impermissible belt tension. Observe the admitted overhung loads due to the belt tension.

31977693/EN – 03/2025

- Motor shaft ends, output shafts, and flange surfaces must be thoroughly cleaned of anti-corrosion agents, contamination, or similar. Use a commercially available solvent for this purpose. The solvent must not get into the bearings or sealing rings as this can damage the material.
- Make sure that the customer's counter-bearing is unobstructed and can move freely.
- Ensure that the cooling air supply to the motor is unobstructed.
- Make sure that no warm exhaust air from other devices is drawn in.
- Balance parts to be subsequently mounted on the shaft only with half a key (motor shafts are balanced with half a key).
- Turn the rotor by hand and pay attention to unusual grinding noises.
- Check that the direction of rotation is correct in decoupled state.

4.2.1 Installation in damp locations or in the open

- If possible, arrange the motor and encoder connection in such a way that the connector cables are not pointing upwards.
- Clean the sealing surfaces of the connectors (motor or encoder connection) before reassembly.
- Replace embrittled seals.
- Check the required degree of protection.
- Note that, due to the exposed oil seal, the stand-alone motor with B5 flange fulfills the IP65 degree of protection and that the IP69 degree of protection is only fulfilled when mounted on a gear unit.
- Install covers (canopy) if necessary.

4.3 Installation tolerances

Shaft end	Flanges
Diameter tolerance according to EN 50347 • ISO k5 • Center hole according to DIN 332, shape DR	Centering shoulder tolerance according to EN 50347 • ISO j6

31977693/EN – 03/2025

4.4 Flange mounting of PSH..CM2H.. servo gearmotor

Use the screw sizes and tightening torques specified in the table for flange mounting the gearmotor.

Motor size	Stainless steel screws A2 – 70	Tightening torque Nm
PSH..CM2H42..	M4	1.5
PSH..CM2H52..	M5	3.5
PSH..CM2H62..	M6	6
PSH..CM2H72..	M8	16
PSH..CM2H82..	M10	30

4.5 Flange mounting of CM2H.. servomotor

In order to connect the CM2H.. servomotor with the B5 flange option to the KES.., RES.., and WES.. gear units from SEW-EURODRIVE or third-party gear units, use the AESQSH adapter.

4.5.1 Screw sizes and tightening torques for mounting on the AESQSH.. adapter

Use the paper gaskets supplied with the gear unit for sealing.

Use the screw sizes and tightening torques specified in the table for flange mounting.

Adapter	Motor size	Thread diameter	Screw
AESQSH 80/1	CM2H52	M5	M5x16 (A2-70)
AESQSH 100/4	CM2H62	M8	M8x20 (A2-70)
AESQSH 115/3	CM2H72	M8	M8x20 (A2-70)
AESQSH 140/3	CM2H82	M10	M10x25 (A2-70)

4.5.2 Figure and note concerning the installation of the AESQS.. adapter

NOTICE

Damage to the adapter due to ingress of moisture or dirt (e.g. dust) when a motor/drive is attached to the adapter.

Damage to the adapter.

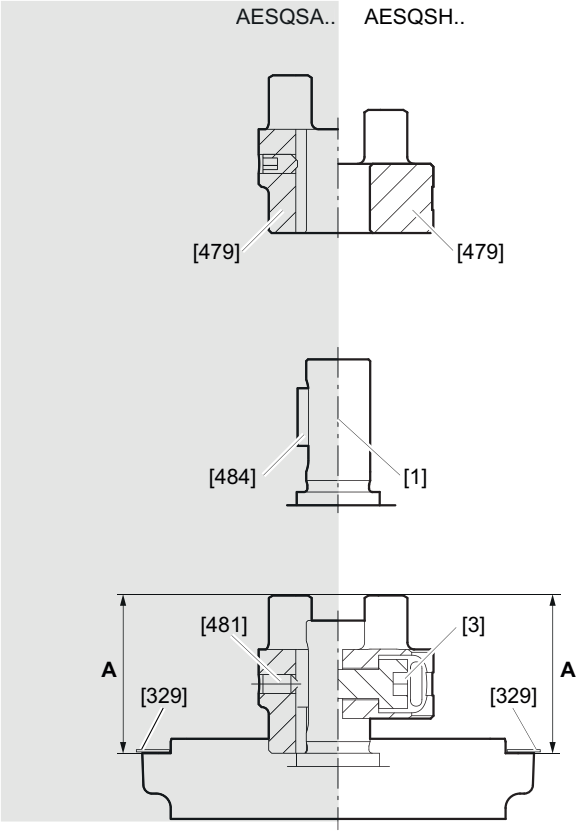
- Seal the adapter with the supplied flat gasket.
- When the motor/drive to be attached has openings or bores that provide access to the inside of the adapter, seal these against dust or liquid.

INFORMATION

With AESQSA..: To avoid contact corrosion, SEW-EURODRIVE recommends applying NOCO-Paste to the motor shaft before mounting the coupling half.

With AESQSH..: Use of NOCO-Paste is not permitted.

31977693/EN – 03/2025



40040432651

[1] Motor shaft
[3] Clamping screw
[329] Flat gasket
[479] Coupling half
[481] Set screw
[484] Key
A Distance A

4.5.3 Mounting of motor to adapter AESQSH.. with coupling half pre-mounted to motor shaft

1. Clean the motor shaft [1] and the flange surfaces of the motor and the adapter.
2. Unscrew the clamping screw [3] of the coupling until the screw head is lying against the lateral pin. Then continue turning for half a revolution so that the coupling half [479] is spread apart.
3. Slide the coupling half onto the motor shaft up to distance "A". The values for distance "A" are listed in the table in chapter "Distances and tightening torques".
4. Check the position of the coupling half. The values for distance "A" are listed in the table in chapter "Distances and tightening torques".
5. Secure the coupling half to the motor shaft. Tighten the clamping screw of the coupling half. The values for tightening torque "T_A" are listed in the table in chapter "Distances and tightening torques".

31977693/EN – 03/2025

6. Seal the contact surfaces between adapter and motor with the supplied flat gasket.
7. Mount the motor to the adapter so that the claws of the two coupling halves mesh. Adhere to the tightening torques specified in chapter "Tightening torques for motor to adapter". **Information!** The mounting force can be reduced by lightly greasing or oiling the coupling ring or the coupling half. To do this, only use mineral oil-based oil or grease without additives.

⇨ The required insertion force for joining the two coupling halves is compensated for after final assembly and therefore does not pose a risk of axial load on adjacent bearings.

4.5.4 Distances and tightening torques

Adapter	Coupling bore Ø	Distance A	Screws		Tightening torque T_A in Nm	
	mm	mm	AESQSA..	AESQSH..	AESQSA..	AESQSH..
AESQSA/AESQSH80	11	34	M4	M5	1	8.1
	14					
AESQSA/AESQSH100	14	40.2	M5	M6	2	14
	16					
	19					
AESQSA/AESQSH115	19	49.2	M5	M6	2	14
	22		–		–	14
	24		M5		2	14
AESQSA/AESQSH140	24	58.2	M6	M8	4.8	34
	28					
	32					

4.5.5 Permitted loads

NOTICE

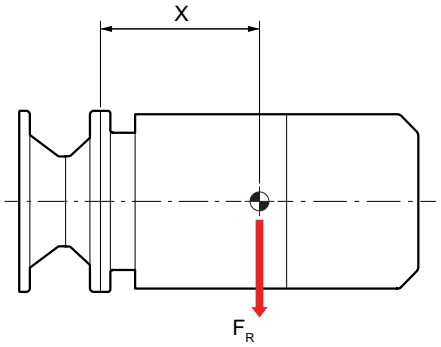
The gear unit can become overloaded due to excessive weight or the excessive power rating of an attached motor.

Gear unit damage.

- Note that the load data specified in the following table is not to be exceeded.
- Ensure that the permitted power rating (torque and speed) on the adapter is adhered to according to the nameplate.

31977693/EN – 03/2025

The following figure shows the load caused by the mass of the motor:



⊗ Motor center of gravity
x Distance between adapter flange and motor center of gravity
F_R Overhung load

Permitted loads for gear unit type series R..7, K..7, and W..9:

Adapter	x[1)] mm	Gear unit input end flange diameter mm	F_R[1)] N
AESQS80	77	105	200
		≥ 120	370
AESQS100	113	105	200
		≥ 120	350
AESQS115	113	≥ 120	300
AESQS140	144	120	300
		≥ 160	1550

1) Maximum load values for connection screws of strength class 8.8. If the center of gravity distance x increases, the maximum permitted weight F_R of the attached motor must be reduced linearly. If the center of gravity distance x decreases, the maximum permitted weight F_R must not be increased.

31977693/EN – 03/2025

5 Electrical installation

5.1 General information

⚠ WARNING

Danger due to live parts.

Severe or fatal injuries.

- Comply with the assembly specifications from the manufacturer.
- Switch off the electrical system before working on the main switch and prevent it from being switched on accidentally.
- Ensure that work is carried out by trained specialists only.
- Observe the 5 safety rules before commencing the work: Disconnect. Secure the device against a restart. Check that no voltage is applied. Ground and short-circuit it. Cover or cordon off neighboring live parts.

⚠ WARNING

Electric shock caused by missing or faulty ground connection.

Severe or fatal injuries.

- Each product must be secured with a ground connection.
- Make sure to install the ground connection correctly.
- Operate the product only with correctly connected protective earth, even for short-time measuring or test purposes.

⚠ WARNING

Electric shock when disconnecting or connecting voltage-carrying connectors.

Severe or fatal injuries.

- Disconnect all supply voltages.
- Make sure that the device is de-energized.
- Never plug or unplug the connectors while they are energized.

⚠ WARNING

Electric shock due to regenerative operation. Moving the output element generates a voltage at the male contacts of the power connector.

Severe or fatal injuries.

- Do not touch the male contacts in the power connector.
- Attach a touch guard to the power connector if no mating connector is plugged in.

⚠ WARNING

Unsecured key flung out of the keyway.

Severe or fatal injuries.

- Only operate the motor with attached customer output element (e.g. gear unit), or with a suitably secured key.

31977693/EN – 03/2025

Observe the following information when working on the motor and with the motor:

- During installation, observe the instructions in chapter "Safety notes" (→ 🗎 5).
- Observe the information on the nameplate.
- Operate the motors only with a frequency inverter.

5.2 Additional regulations

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

5.3 Wiring notes

5.3.1 Protecting the brake control system against interference

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

Switched-mode power cables include in particular:

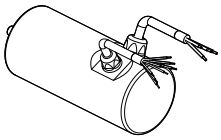
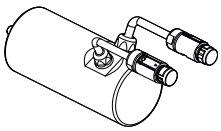
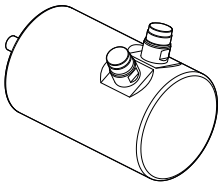
- Output cables from servo inverters, converters, soft start units and brake units
- Supply cables for braking resistors and similar options

31977693/EN – 03/2025

5.4 Overview of connection variants

As standard, the electrical connection of CM2H.. stainless steel servomotors is realized using a cable outlet with a connector in two-cable technology. Alternatively, you can use radial connectors to connect external cables directly to the motor. When doing this, pay attention to the compatibility of the connectors.

Note that the power cable and the encoder cable have the same connection variant. You can choose a cable length of 0.5 to 20 m. For easy connection, refer to the suitable cables in chapter "Prefabricated cables".

Connection	Designation		Connector size
CB0		Brakemotor cable Open cable end	–
CM0		Motor cable Open cable end	–
CB1		Brakemotor cable M23 connector	Power/signal: M23 speedTec ready
CM1		Motor cable M23 connector	Power/signal: M23 speedTec ready
SB3		Brakemotor connector M23 connector in stainless steel design	Power/signal: M23 non speedTec
SM3		Motor connector M23 connector in stainless steel design	Power/signal: M23 non speedTec

31977693/EN – 03/2025

5.4.1 Wiring diagrams

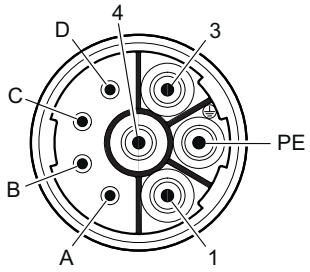
Connection of power connector

The connection diagram of the connector depicts the contact end of the connections.

Function
Power connection

Connection type
M23, TE Connectivity – Intercontec Products, series 923, SEW-EURODRIVE insert, coding ring: without, male

Pin assignment



Assignment for motor

Contact	Signal	Without brake	With brake BH..
A	Reserved	Do not connect	Do not connect
B	Reserved	Do not connect	Do not connect
C	Reserved	Do not connect	Brake +
D	Reserved	Do not connect	Brake -
PE	PE	Protective earth	Protective earth
1	U	Motor phase U	Motor phase U
3	W	Motor phase W	Motor phase W
4	V	Motor phase V	Motor phase V

31977693/EN – 03/2025

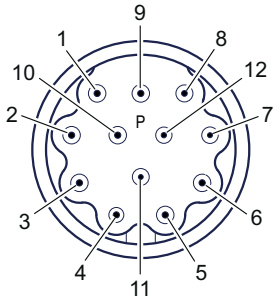
Connection of signal connector

The connection diagram of the connector depicts the contact end of the connections.

Function
Signal connection

Connection type
M23, TE Connectivity – Intercontec Products, series 923, SEW-EURODRIVE insert, coding ring: without, male

Pin assignment



Assignment for motor

Contact	Signal	With RH1M resolver	With AK0H / AK1H / EK1H encoder
1	R1 Ref +	Reference +	Do not connect
2	R2 Ref-	Reference -	Do not connect
3	S1 Cos+	Cosine +	Cosine +
4	S3 Cos -	Cosine -	Cosine -
5	S2 Sin +	Sine +	Sine +
6	S4 Sin -	Sine -	Sine -
7	Reserved	Do not connect	Data -
8	Reserved	Do not connect	Data +
9	PK	Motor protection	Motor protection
10	PK	Motor protection	Motor protection
11	Reserved	Do not connect	Protective earth
12	Reserved	Do not connect	Voltage

31977693/EN – 03/2025

Connection diagrams of the brake control with brake /BH

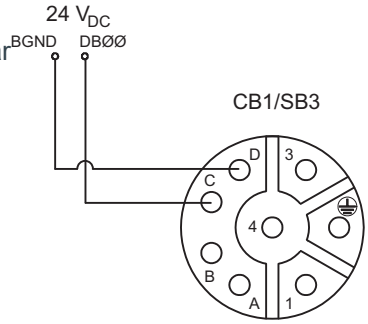
NOTICE

Malfunction and damage to the brake due to reverse polarity.

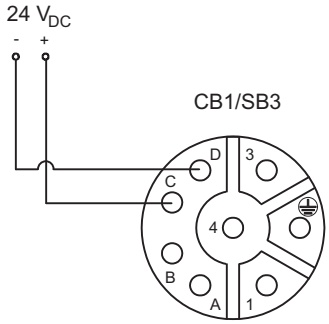
Damage to brake

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

With MOVIDRIVE® modular



With third-party inverters



The brake must be protected against overvoltages in the following cases, e.g. by means of a varistor protection circuit:

- For operation with third-party inverters,
- For brakes that are not supplied directly from inverters from SEW-EURODRIVE.

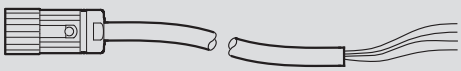
5.4.2 Prefabricated cables

Prefabricated cables are available from SEW-EURODRIVE for connecting and extending the CB1/CM1 and SB3/SM3 variants.

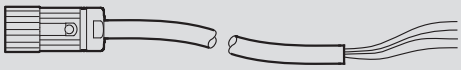
Prefabricated power cables

Motor cable

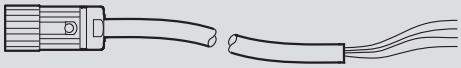
Design for CB1/CM1 connection variant

	Motor side		Inverter side	Fixed installation	Cable carrier installation
Cable type	**Connector type/size**	**Cable cross section**	**Connector type/size**	**Part number**	
Motor cable	SM1/M23 SpeedTec	4 × 1.5 mm²	Open end	28125002	28125010
		4 × 2.5 mm²		28125029	28125037
		4 × 4 mm²		28125045	28125053

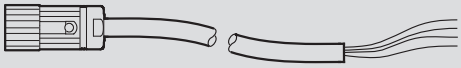
Design for SB3/SM3 connection variant

	Motor side		Inverter side	Fixed installation	Cable carrier installation
Cable type	**Connector type/size**	**Cable cross section**	**Connector type/size**	**Part number**	
Motor cable	SM1/M23	4 × 1.5 mm²	Open end	05904544	05906245
		4 × 2.5 mm²		05904552	05906253
		4 × 4 mm²		05904560	05904803

Connection

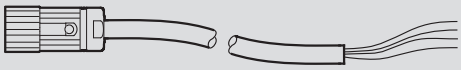
Motor side						Inverter side
Contact M23	**Signal**	**Core color**	**Core color IEC 60757**	**Marking**	**Assembly**	**Description**
A	Reserved	–	–	–	Not prefabricated	Do not connect
B	Reserved	–	–	–	Not prefabricated	Do not connect
C	Reserved	–	–	–	Not prefabricated	Do not connect
D	Reserved	–	–	–	Not prefabricated	Do not connect
1	U	Black	BK	U/L1	Not prefabricated	Motor connection phase U
2	PE	Yellow/green	GNYE	–	Not prefabricated	Protective earth connection
3	W	Black	BK	W/L3	Not prefabricated	Motor connection phase W

31977693/EN – 03/2025

Motor side  Inverter side						
Contact M23	Signal	Core color	Core color IEC 60757	Marking	Assembly	Description
4	V	Black	BK	V/L2	Not prefabricated	Motor connection phase V

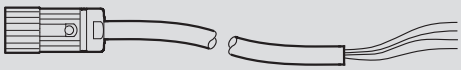
Brakemotor cable for BH.. brake

Design for CB1/CM1 connection variant

	Motor side  Inverter side			Fixed installation	Cable carrier installation
Cable type	Connector type/size	Cable cross section	Connector type/size	Part number	
Brakemotor cable[1] for BH.. brake	SB1/M23 SpeedTec	4 × 1.5 mm² + 3 × 1 mm²	Open end	28125207	28125215
		4 × 2.5 mm² + 3 × 1 mm²		28125223	28125231
		4 × 4 mm² + 3 × 1 mm²		28125258	28125266

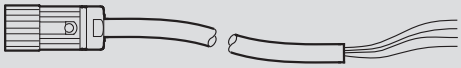
1) The cable contains 3 cores but only 2 cores are used.

Design for SB3/SM3 connection variant

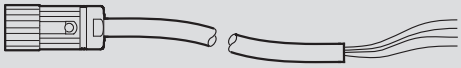
	Motor side  Inverter side			Fixed installation	Cable carrier installation
Cable type	Connector type/size	Cable cross section	Connector type/size	Part number	
Brakemotor cable[1] for BH.. brake	SB1/M23	4 × 1.5 mm² + 3 × 1 mm²	Open end	13354345	13354388
		4 × 2.5 mm² + 3 × 1 mm²		13354353	13354396
		4 × 4 mm² + 3 × 1 mm²		13354361	13421603

1) The cable contains 3 cores but only 2 cores are used.

Connection

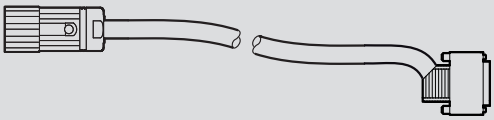
Motor side  Inverter side						
Contact M23	Signal	Core color	Core color IEC 60757	Marking	Assembly	Description
A	Reserved	–	–	–	Not prefabricated	Do not connect
B	Reserved	–	–	–	Not prefabricated	Do not connect

31977693/EN – 03/2025

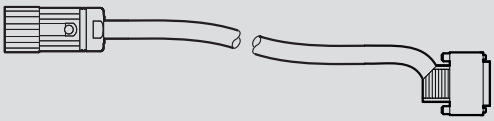
Motor side  Inverter side						
Contact M23	Signal	Core color	Core color IEC 60757	Marking	Assembly	Description
C	Brake +	Black	BK	BH (1)	Not prefabricated	Brake connection +
D	Brake -	Black	BK	BH (3)	Not prefabricated	Brake connection -
1	U	Black	BK	U/L1	Not prefabricated	Motor connection phase U
2	PE	Yellow/green	GNYE	–	Not prefabricated	Protective earth connection
3	W	Black	BK	W/L3	Not prefabricated	Motor connection phase W
4	V	Black	BK	V/L2	Not prefabricated	Motor connection phase V

Prefabricated encoder cables for MOVI-C® inverters

Design for CB1/CM1 connection variant

	Motor side  Inverter side			Fixed installation	Cable carrier installation
Cable type	Connector type/size	Cable cross section	Connector type/size	Part number	
Encoder cable RH1M resolver	SB1/M23	4 × 2 × 0.25 + 2 × 0.5	D-SUB/15-pin	28125622	28125630
Encoder cable AK0H HIPERFACE® encoder	SB1/M23	4 × 2 × 0.25 + 2 × 0.5	D-SUB/15-pin	28125665	28125673

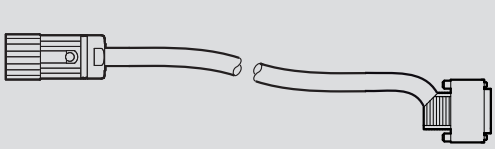
Design for SB3/SM3 connection variant

	Motor side  Inverter side			Fixed installation	Cable carrier installation
Cable type	Connector type/size	Cable cross section	Connector type/size	Part number	
Encoder cable RH1M resolver	M23	5 × 2 × 0.25	D-SUB/15-pin	13327429	13327437
Encoder cable AK0H HIPERFACE® encoder	M23	6 × 2 × 0.25	D-SUB/15-pin	13324535	13324551

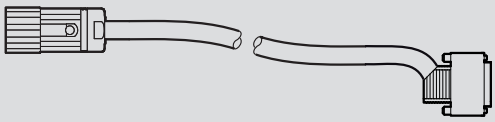
31977693/EN – 03/2025

Prefabricated encoder cables for MOVIDRIVE® B inverters

Design for CB1/CM1 connection variant

	Motor side		Inverter side	Fixed installation	Cable carrier installation
Cable type	**Connector type/size**	**Cable cross section**	**Connector type/size**	**Part number**	
RH1M resolver encoder cable	SB1/M23	4 × 2 × 0.25 + 2 × 0.5	D-SUB/9-pin	28125649	28125657
Encoder cable AK0H HIPERFACE® encoder	SB1/M23	4 × 2 × 0.25 + 2 × 0.5	D-SUB/15-pin	28125681	28125703

Design for SB3/SM3 connection variant

	Motor side		Inverter side	Fixed installation	Cable carrier installation
Cable type	**Connector type/size**	**Cable cross section**	**Connector type/size**	**Part number**	
RH1M resolver encoder cable	M23	5 × 2 × 0.25	D-SUB/9-pin	1994875	1993194
Encoder cable AK0H HIPERFACE® encoder	M23	6 × 2 × 0.25	D-SUB/15-pin	13324535	13324551

Assembling the cables

Observe the following when you assemble the cables yourself:

- The socket contacts for the motor connection are implemented as crimping contacts. Only use suitable tools for crimping.
- Insulate the connecting wires. Cover the connections with heat shrink tubings.
- Incorrectly installed socket contacts can be removed without removal tools.

31977693/EN – 03/2025

6 Startup

6.1 Before you start

Ensure the following before startup:

- Observe the 5 safety rules before commencing the work: Disconnect. Secure the device against a restart. Check that no voltage is applied. Ground and short-circuit it. Cover or cordon off neighboring live parts.
- Ensure that work is carried out by trained specialists only.
- Only qualified specialists are allowed to carry out work on drives with functionally safe motor options.
- The drive must be undamaged and not blocked.
- All connections, especially the PE, have been made correctly.
- There are no other sources of danger.
- All motor protection devices are activated.
- Never connect or disconnect connectors while they are energized.
- Do not touch the male contacts in the power connector.
- Install a touch guard at the power connector if no mating connector is plugged in.
- Operate the motors only with a frequency inverter.
- Prior to startup, configure the SEW-EURODRIVE frequency inverter using the suitable engineering software.
- Only operate the motor with attached customer output element (e.g. gear unit), or with a suitably secured key.
- The motor surface must not be covered by heat-sensitive or insulating materials.
- All protection covers are installed correctly.
- Let the unit cool down sufficiently before you start working on it.
- First, determine and eliminate the cause of the fault before acknowledging a motor protection fault at the frequency inverter.
- Do not acknowledge a motor protection fault several times at the frequency inverter.
- With brakemotors, check for proper function of the brakes.
- Operate the BH brake only as a holding brake.
- The brake may only be applied when the speed is ≤ 20 min^{-1}. For greater speeds, contact SEW-EURODRIVE.
- Observe the information on the nameplate.
- After an extended storage period (independent of the ambient conditions), observe the information in chapter "Startup after storage".

6.2 Startup with MOVISUITE®

Pay attention to the technical data specifications in the MOVISUITE® software.

Compare the technical data on the nameplate of the motor with the data in the MOVISUITE® software.

Due to the brake and encoder options, the values for nominal motor current and nominal torque (of the motor) must be modified in the software.

31977693/EN – 03/2025

6.3 Startup after storage

If you use a motor that has been stored for a longer period of time (depending on the ambient conditions), observe the following points in addition to chapter "Before start-up":

- Run in the motor at low speed and without axial or radial shaft load for 10 revolutions in each direction so that the bearing lubrication is again distributed evenly.
- For brakemotors with BH.. brake, SEW-EURODRIVE recommends the following routine: 1 minute running at 300 min^{-1}, brake application 1 – 2 times per second.
- The bearing grease service life is reduced after storage periods > 1 year.
- After more than 4 years in storage, have the motor inspected for signs of aging of the ball bearings grease by SEW-EURODRIVE.
- Check whether the motor has absorbed moisture due to the longer storage time. Measure the insulation resistance with a measurement voltage of DC 500 V.

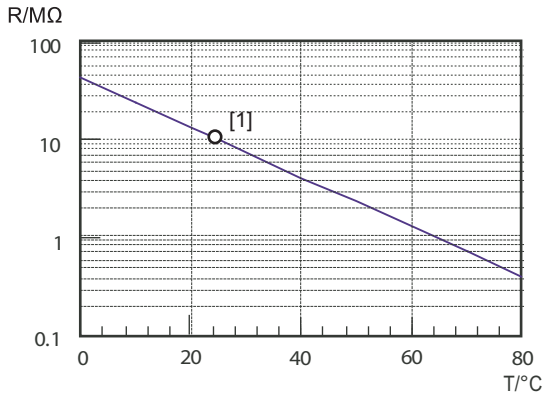
  The insulation resistance depends greatly on the temperature. You can measure the insulation resistance between the connection pins and the motor housing using an insulation measuring device. If the insulation resistance is not sufficient, the motor must be dried.

INFORMATION

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

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

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



9007202147046283

[1] Resistance temperature point (RT point)

7 Inspection/maintenance

7.1 General information

⚠ WARNING

Risk of injury if the drive starts up unintentionally.

Severe or fatal injuries.

- Before you start working on the unit, disconnect the motor and all connected options from the power supply.
- Secure the motor against unintended power-up.

⚠ WARNING

Deactivating the functional safety devices.

Severe or fatal injuries.

- All work on functional safety components may be carried out only by qualified personnel.
- All work on functional safety components must be carried out strictly in accordance with the specifications in these operating instructions and the corresponding addendum to the operating instructions. Otherwise, the warranty will become void.

⚠ CAUTION

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

Risk of burns.

- Let the motor cool down sufficiently before you start working on it.

INFORMATION

Observe the information of the machine and system manufacturer in the machine maintenance plan.

Repairs

Only SEW-EURODRIVE or repair workshops or plants that provide the necessary expertise may repair or modify the motor/brakemotor.

Before you take the motor back into operation, check to see if the regulations have been adhered to. Confirm the compliance with a corresponding identification on the motor or by issuing a test report.

Perform a safety and functional check following all maintenance and repair work (thermal protection).

7.2 Maintenance intervals

INFORMATION

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

31977693/EN – 03/2025

Factors that can shorten inspection and maintenance intervals include:

- Number of real emergency stop 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 generative torques or torsional vibrations
- External environmental factors, such as moisture, high degree of UV exposure, low ambient temperatures, etc.

Unit / part of unit	Time interval	What should I do?
Servomotor	• Every 10 000 operating hours[1)]	Inspect the servomotor: • Check ball bearing. • Clean cooling air ducts. • Check PE connection for proper functioning.
BH.. brake	• At least after 3 months, depending on the operating conditions	Inspect the brake: • Connect the brake connections to the controlled power supply unit and determine the opening voltage by increasing the voltage from 10 to 24 V (clicking of the brake). Contact SEW-EURODRIVE if necessary. • Check the braking torque. Grind in the brake if necessary, see chapter "Startup after storage". • Contact SEW-EURODRIVE Service when maintenance is required.

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

8 Malfunctions

8.1 General information

⚠ WARNING

Risk of injury if the drive starts up unintentionally.

Severe or fatal injuries.

- Before you start working on the unit, disconnect the motor and all connected options from the power supply.
- Secure the motor against unintended power-up.

⚠ CAUTION

Risk of burns due to hot surfaces.

Injury.

- Let the product cool down before touching it.

NOTICE

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

Damage to property, damage to the motor.

- First, determine the cause of the fault before acknowledging a motor protection fault.
- Do not acknowledge a motor protection fault more than once.

8.2 Servomotor malfunctions

Fault	Possible cause	Measure
Motor does not start	Supply cable interrupted	Check connections and correct, if necessary
	Thermal motor protection tripped	Check the thermal motor protection for correct setting and correct fault, if necessary
	Inverter defective, overloaded, connected incorrectly, or set incorrectly	Check inverter; check wiring
Incorrect direction of rotation	Incorrect setpoint polarity	Check inverter; check setpoints
Motor is buzzing and has high current consumption	Drive blocked	Check drive
	Brake does not release	Check brake connections, correct if necessary
	Failure on the encoder cable	Check the encoder cable
	Inverter set incorrectly	Check the inverter

31977693/EN – 03/2025

Fault	Possible cause	Measure
Motor heats up too much (measure temperature; significantly above 120 °C)	Overload	Check load for sluggishness; use larger motor or reduce load, if necessary; check the travel profile
	Ambient temperature too high	Observe the permitted temperature range
	Insufficient cooling	Correct the cooling air supply or clear the cooling air ducts; retrofit the forced cooling fan, if necessary
	Nominal duty type (S1 to S10, EN 60034) exceeded, e.g. caused by excessive effective torque	Adjust the nominal duty type of the motor to the required operating conditions; consult a specialist, if necessary, to determine the correct drive
	Inverter not optimized	Check the inverter
Running noise on the motor	Bearing damage	Contact SEW-EURODRIVE.
		Replace the motor
	Vibration of rotary parts	Eliminate the cause, and imbalance, if necessary

31977693/EN – 03/2025

9 Waste disposal

Dispose of the product and all parts separately in accordance with their material structure and the national regulations. Put the product through a recycling process or contact a specialist waste disposal company. If possible, divide the product into the following categories:

- Iron, steel or cast iron
- Stainless steel
- Magnets
- Aluminum
- Copper
- Electronic parts
- Plastics

The following materials are hazardous to health and the environment. These materials must be collected and disposed of separately:

- Oil and grease

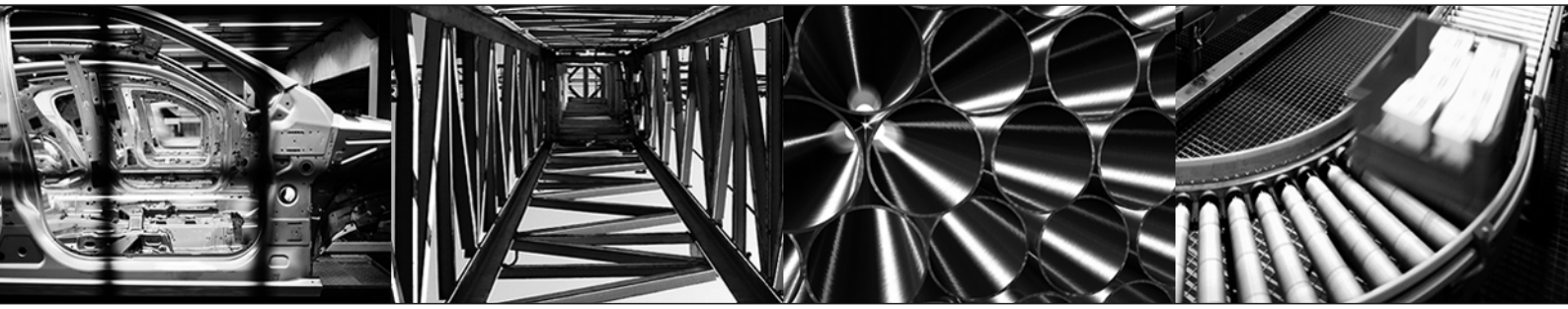
  Collect used oil and grease separately according to type. Ensure that the used oil is not mixed with solvent. Dispose of used oil and grease correctly.
- Screens
- Capacitors

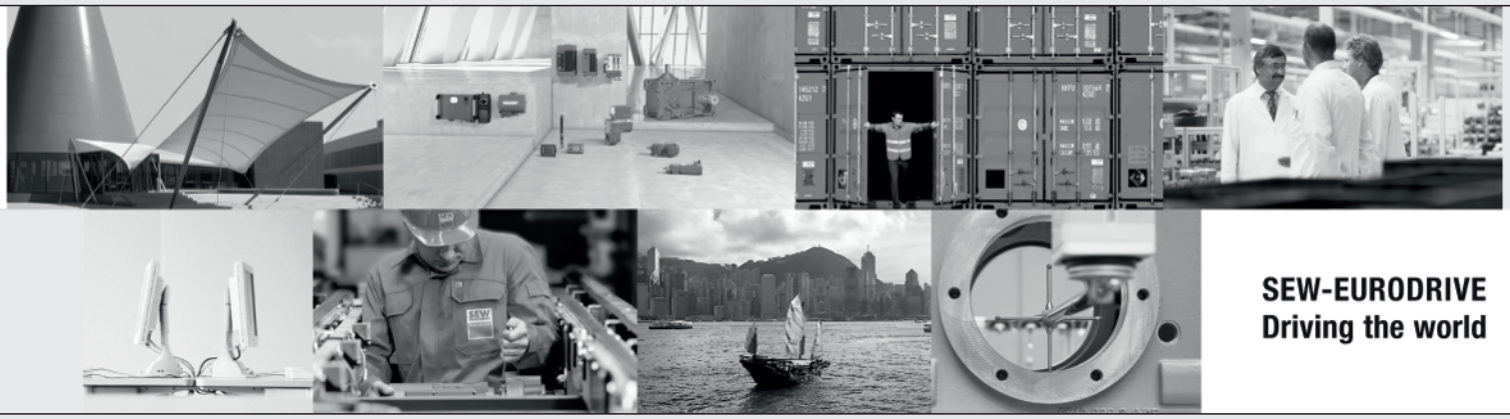
Waste disposal according to WEEE Directive 2012/19/EU

This product and its accessories may fall within the scope of the country-specific application of the WEEE Directive. Dispose of the product and its accessories according to the national regulations of your country.

For further information, contact the responsible SEW-EURODRIVE branch or an authorized partner of SEW-EURODRIVE.

31977693/EN – 03/2025





SEW-EURODRIVE GmbH & Co KG
Ernst-Blickle-Str. 42
76646 BRUCHSAL
GERMANY
Tel. +49 7251 75-0
Fax +49 7251 75-1970
sew@sew-eurodrive.com
→ www.sew-eurodrive.com