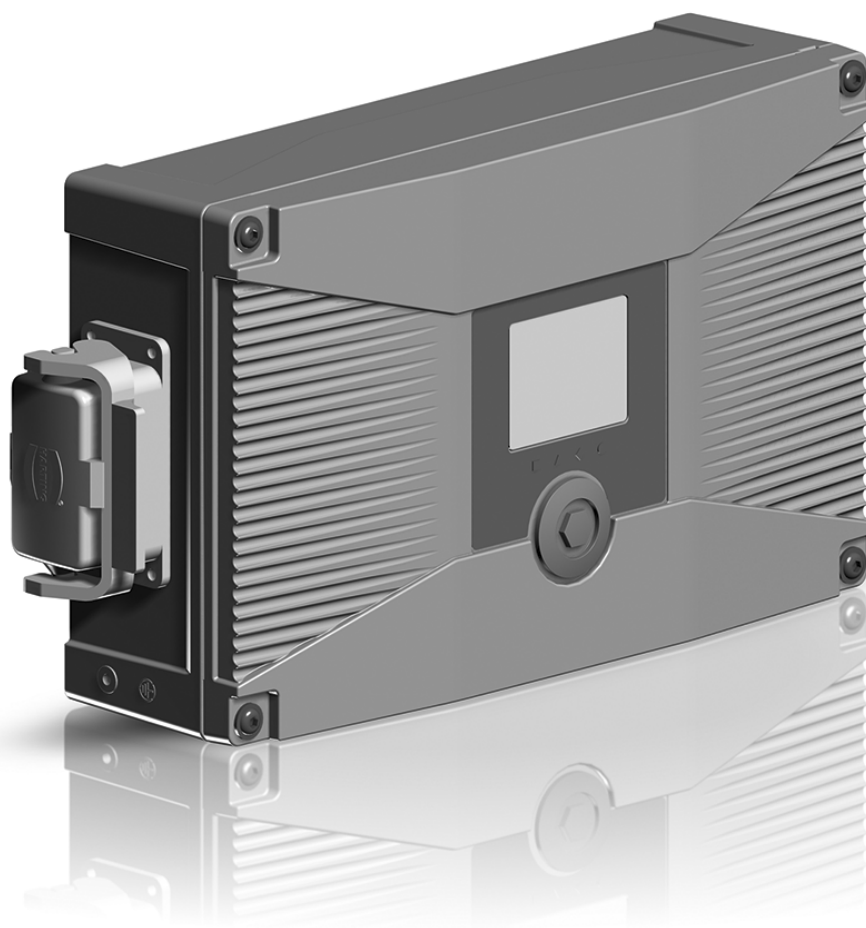




SEW
EURODRIVE

Operating instructions



Drive and application controller
PHE..C-B15-.0X0..B-00/..



Table of contents

1	General information	6
1.1	About this documentation	6
1.2	Other applicable documentation	6
1.3	Structure of the safety notes	6
1.4	Decimal separator in numerical values	7
1.5	Rights to claim under limited warranty	7
1.6	Recycling, reprocessing, reuse	7
1.7	Product names and trademarks	8
1.8	Copyright notice	8
2	Safety notes	9
2.1	Preliminary information	9
2.2	Duties of the user	9
2.3	Target group	9
2.4	IT security	10
2.5	Designated use	12
2.6	Functional safety technology	14
2.7	Transport	14
2.8	Installation/assembly	14
2.9	Electrical installation	14
2.10	Protective separation	15
2.11	Startup/operation	15
3	Device structure	17
3.1	Type designation	17
3.2	Scope of delivery	18
3.3	Device overview	18
3.4	Main nameplate	19
3.5	Product label	20
3.6	Product safety labels	21
3.7	Function units	21
3.8	Accessories	25
4	Functional safety	27
4.1	Integrated safety technology	27
4.2	Safety requirements	30
4.3	Connection variants	33
5	Mechanical installation	35
5.1	Requirements	35
5.2	Mounting position	36
5.3	Minimum clearance	37
5.4	Waste heat	37
5.5	Installation	38
6	Electrical installation	39
6.1	Installation notes	39
6.2	Motor types	39

6.3	Low-voltage supply systems	39
6.4	UL-compliant installation	39
6.5	Electromagnetic compatibility (EMC)	40
6.6	Cable routing	41
6.7	Protective measures against electrical hazards	42
6.8	Using prefabricated cables	46
6.9	Line components	47
6.10	Connection blocks	49
6.11	Electrical connections	50
7	Startup	75
7.1	For your safety	75
7.2	Requirements	75
7.3	Startup procedure	76
8	Operation	77
8.1	For your safety	77
8.2	Relative cyclic duration factor (cdf)	77
8.3	Duty types	78
8.4	Status and error messages	79
8.5	Fault information	81
8.6	IT security	83
9	Service	84
9.1	Inspection/maintenance	84
9.2	Device replacement	84
9.3	Cleaning	85
9.4	Fault information	85
9.5	SEW-EURODRIVE Service	85
9.6	Shutdown	86
9.7	Storage	86
9.8	Extended storage	86
9.9	IT security guidelines for secure disposal	87
9.10	Waste disposal	88
10	Technical data	89
10.1	Marks	89
10.2	General information	90
10.3	Current reduction (derating)	91
10.4	Input data	91
10.5	Output data	92
10.6	Axis data	92
10.7	Motor types	93
10.8	Safety technology	96
10.9	Communication and control unit	97
10.10	Ports and services	98
10.11	Dimension drawing	99
11	Contacting SEW-EURODRIVE	100

Index 101

1 General information

1.1 About this documentation

The documentation at hand is the original.

This documentation is an integral part of the product. The documentation is intended for all employees who perform work on the product.

Make sure this documentation is accessible and legible. Ensure that persons responsible for the systems and their 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 if you require further information, contact SEW-EURODRIVE.

1.2 Other applicable documentation

Observe the corresponding documentation for all additional components.

1.3 Structure of the safety notes

1.3.1 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

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.

1.3.3 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 suspended load

1.3.4 Structure of embedded safety notes

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

This is the formal structure of an embedded safety note:

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

1.4 Decimal separator in numerical values

In this document, a period is used to indicate the decimal separator.

Example: 30.5 kg

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 Recycling, reprocessing, reuse

When manufacturing products, SEW-EURODRIVE makes sure to keep the use of new natural resources to a minimum in the interests of the circular economy. Key aspects here are the recycling of materials as well as the inspection and/or processing of returned components and their reuse in new products. These processes are only used at SEW-EURODRIVE if the resulting materials and components correspond to the quality of new products.

1.7 Product names and trademarks

The product names mentioned in this documentation are trademarks or registered trademarks of the respective titleholders.

1.8 Copyright notice

© 2026 SEW-EURODRIVE. All rights reserved. Copyright law prohibits the unauthorized reproduction, modification, distribution, and use of this document – in whole or in part.

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 connection and 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 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.

Any work affecting cybersecurity should be carried out by people with basic knowledge of IT topics, especially when dealing with digital tools and network structures. A basic understanding of IT and OT security as well as knowledge of the relevant regulations are required.

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.

2.4 IT security

2.4.1 Contact



SEW-EURODRIVE offers the following communication channels for IT security:

- Report incidents regarding cybersecurity by e-mail to cert@sew-eurodrive.com or via the contact form on the Product Security Management website (<http://go.sew/psm>).
- Security advisories can be found in the SEW-EURODRIVE Online Support.
 - For automatic updates on new and changed security advisories, subscribe to the newsletter on the Product Security Management page (<http://go.sew/psm>).
- If you need support with the configuration, contact SEW-EURODRIVE Service.

2.4.2 IT security of the product



The IT security of the product is only guaranteed when used in an environment secured by defense-in-depth strategies.

Further information, e.g. regarding additional organizational measures to meet regulatory requirements, refer to "IT security in the context of regulatory requirements" (→ 11).

Potential hazards

Access points for manipulations

The device has interfaces that allow remote access to non-safety functions. In this context, "remote access" means that access is made available directly or indirectly via the local communication interfaces of the device with a software function beyond the physical limits of machine, inverter, and brake. These interfaces allow all parameters to be changed without a safety protocol.

- Potential hazards**
- Potential hazards posed by unauthorized individuals with remote access to the software functions include:
- Unintended actuation of the power section, resulting in hazardous movement at the motor shaft.
 - Unintended actuation of the brake (brake release), resulting in hazardous movement at the motor shaft.
 - Unintended activation of a digital output.
 - Unintended actuation of external actuators.
- Further potential hazards due to unintentional or unauthorized interference can occur due to:
- Excessive heating of the device and motor, resulting in thermal destruction.
 - Manipulation of the speed, resulting in accelerations and decelerations.

Technically excluded hazards

- The following hazards due to remote access by an unauthorized person are technically excluded:
- Danger due to electric shock due to corruption of general electrical safety, e.g. the separation between high and extra-low voltage.

2.4.3 IT security of the environment



For drive and control components that are integrated in a network (e.g. fieldbus, Wi-Fi, or Ethernet network), settings can even be made from more remote locations. This entails the danger of a parameter change that is not visible externally resulting in unexpected, but not uncontrolled system behavior, which in turn may impact negatively on operational safety and reliability, system availability, or data security.

Observe the following:

- The IT security of the product is only guaranteed when used in an environment secured by defense-in-depth strategies.
- Particularly in networked systems based on Wi-Fi or Ethernet and at engineering interfaces, ensure that unauthorized access is prevented. Using IT-specific security standards, such as network segmentation, adds to the security of the ports.
 - For information on the communication interfaces of the device, refer to this documentation.
 - In particular, refer to chapter "Ports and services" (→ 98) regarding the provided services of the communication interfaces.
- Ensure that clear responsibility for security is guaranteed during operation. SEW-EURODRIVE recommends an IT security management system in accordance with ISO/IEC 27001 and ISO/IEC 62443-2-4.

2.4.4 IT security in the context of regulatory requirements



Below you will find information on adhering to cybersecurity requirements with regard to various regulations.

EU Machinery Regulation

The EU Machinery Regulation (Regulation 2023/1230, "MR") sets special requirements on safety components and machines to protect them from corruption.

The described device integrates safety components that can be used to reduce hazards in machines. The safety subfunctions are implemented only electronically, without the use of software. The functionality of the safety-related components cannot therefore be corrupted via software.

Observe the following:

- Perform a risk assessment and risk minimization of the machine according to ISO 12100.
- Implement suitable technical and organizational measures to prevent unauthorized access to safety-relevant and non-safety-relevant functions, if their manipulation can lead to a hazard according to the risk assessment (see "Potential hazards" (→ 10)).
 - The data flow via the non-safe interfaces must be monitored for manipulation in the higher-level controller. The controller environment can be protected, for example, by a firewall, access control with user account management, physical access protection, and physical network separation.

Protection of the STO control

The safety subfunction STO is implemented only electronically, without the use of software. The software functions of the device have no effect on the STO safety subfunction. A potential attacker has no means of compromising the safety subfunctions by manipulating software or data that is transmitted to the device.

Observe the following:

- Secure the machine and its components that control the STO safety subfunction against possible compromise.

EU Data Act

The product offers "Access by Design" for all data generated by the product and thus meets the requirements of the EU Data Act (Regulation 2023/2854):

Storing data

- Data in the product is stored until it is actively deleted or overwritten.
- Log and scope data is automatically overwritten in the designated ring buffers as soon as they are full.
- Scope data is only stored in the device-internal RAM and is deleted after the device is restarted.

Accessing data

- All data can be read out using SEW-EURODRIVE engineering software.

Deleting data

- For information on deleting data, refer to "IT security guidelines for secure disposal" (→ 87).

Data transmission

- The product does not automatically transfer data to devices in its environment.

Quality of service

- The device enables acyclic access to all data at rest stored on the device.
- The response time depends on the communication interface used.

For information regarding the data generated by the product, stored internally and transferred to other devices in the environment, as well as regarding deletion of data, refer to "IT security guidelines for secure disposal" (→ 87).

2.5 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.

2.5.1 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.

2.5.2 Lifting applications

To avoid danger of fatal injury by falling hoists, observe the following points when using the product in lifting applications:

- The product is not designed for use as a safety device in lifting applications.
- Use additional monitoring systems or mechanical protection devices.

2.5.3 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
- Use in applications with impermissibly high mechanical vibration and shock loads
- Use at an elevation of more than 4000 m above sea level

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

- The reduction of the nominal output current and/or the line voltage is considered according to the data in chapter "Technical data" (→ 89) in the documentation.

- Above 2000 m above sea level, the air and creepage distances are only sufficient for overvoltage class II according to EN 60664. At altitudes above 2000 m above sea level, limiting measures must therefore be taken that reduce the line side overvoltage from category III to category II for the entire system.
- If a protective electrical separation (in accordance with EN 61800-5-1 and EN 60204-1) is required, then implement this outside the product at altitudes of more than 2000 m above sea level.

2.6 Functional safety technology

If the documentation does not expressly permit it, the product must not perform any safety sub-function without higher-level safety systems.

2.7 Transport

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.

Observe the following notes when transporting the device:

- Ensure that the product is not subject to mechanical impact.
- Before transportation, cover the connections with the supplied protection caps.
- Only place the product on the cooling fins or on the side without connectors during transportation.
- Always use all attachment points if available. The attachment points are designed to carry only the mass of the product. Do not apply any additional loads.

If necessary, use suitable, sufficiently dimensioned handling equipment.

Observe the information on climatic conditions in chapter "Technical data" (→ 89) of the documentation.

2.8 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.

Observe the notes in chapter "Mechanical installation" (→ 35) in the documentation.

2.9 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).

2.9.1 Required protective measure

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

2.9.2 Stationary application

The necessary preventive measure for the product is:

Type of energy transfer	Preventive measure
Direct power supply	Ground connection

2.9.3 Mobile application

The necessary protective measures for the product are:

Type of energy transfer	Protective measure
Direct power supply	Ground connection
MOVITRANS® contactless energy transfer system	Protection through protective separation Discharge measures against electrostatic discharge (ESD) and capacitive coupling

2.9.4 Regenerative operation

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

2.10 Protective separation

The product meets all requirements for protective separation of power and electronics connections in accordance with IEC 61800-5-1. The connected signal circuits must meet requirements according to SELV (**S**afety **E**xtra **L**ow **V**oltage) or PELV (**P**rotective **E**xtra **L**ow **V**oltage) to ensure protective separation. The installation must meet the requirements for protective separation.

In order to avoid exceeding the permitted contact voltages in SELV or PELV power circuits in the event of an error, continuous equipotential bonding is required in the vicinity of these power circuits. If this is not possible, other protective measures must be taken. These protective measures are described in IEC 61800-5-1.

2.11 Startup/operation

Make sure that any existing transport protection is removed.

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

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 protective 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.

Do not separate the connection to the product during operation. This may result in dangerous electric arcs damaging the product.

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.

Cover unused connections with the supplied protection caps during operation.

3 Device structure

3.1 Type designation

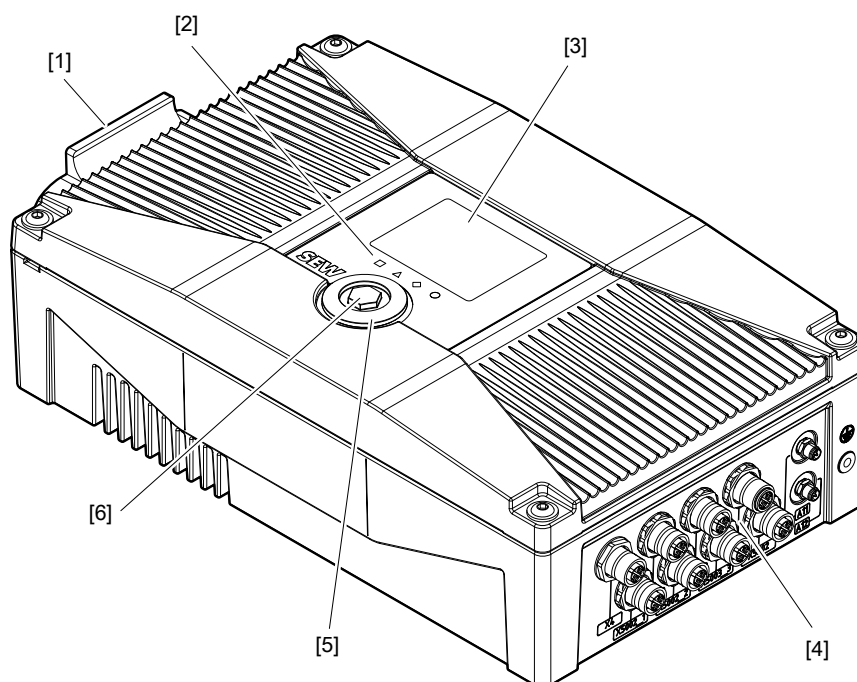
PHE	Drive and Application Controller
.	Motor connection: 2 = HAN® 10E 3 = HAN® 10E_1 (special design)
.	Signal interfaces: 1 = Communication package 1
C	compact
-	
B	Power supply: 3-phase current with auxiliary DC link
15	Maximum S1 device power: 1.5 kW
-	
.	Brake control: 2 = Control for 2-wire brakes 3 = Control for 3-wire brakes from SEW-EURODRIVE
0	Design: Standard design
X0	Auxiliary axis connection: without a connection for an auxiliary axis
..	Communication: E4 = Ethernet W1 = WLAN World W2 = WLAN USA/CSA
B-00	Generation B standard device
/	
.	Reference phase: 0 = none X = LX Z = LZ
.	HWC inputs: 0 = none 1 = 1 HWC input 2 = 2 HWC inputs
.	Option bus: 1 = Ethernet X4233 2 = SBus X4101 3 = SBus ^{PLUS} X4251 (in development)

3.2 Scope of delivery

Component	Part number
1 × PHE..C-B15-.0X0..B-00/..	Configurable
Protective caps for all plug connectors	—

3.3 Device overview

The following figure provides an example of an overview of the most important device components and the position of the labels on the device:

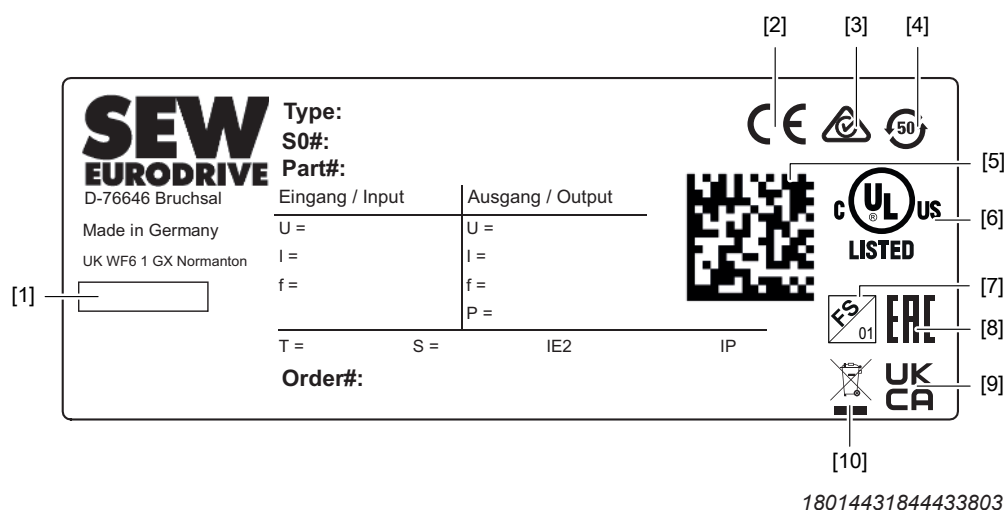


55367629067

- [1] Motor connection
- [2] Status LEDs
- [3] Status display with infrared interface
- [4] Connection block
- [5] Status LED ring
- [6] Screw plug for Ethernet service interface and reset pushbutton

3.4 Main nameplate

The main nameplate lists information about the device type. The following figure shows an example of a main nameplate:



- [1] Product name
- [2] CE marking
- [3] RCM mark (depending on device certification)
- [4] China RoHS-2 marking
- [5] Data matrix code (with part number and production number)
- [6] UL marking (depending on device certification)
- [7] Marking for functional safety (depending on device certification)
- [8] EAC marking
- [9] UKCA marking
- [10] Marking for WEEE Directive

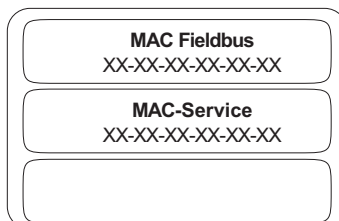
Depending on the device design, the following information is listed on the main nameplate:

Value	Specification
Type	Type designation
S0#	Production number
Part#	Part number (for customer-specific devices)
U	Voltage
I	Current
f	Frequency
P	Rated output power
T	Ambient temperature
S	Apparent output power
IE2	Energy efficiency class
IP	Degree of protection
Order#	Purchase order number for country variant (for customer-specific devices)

3.5 Product label

3.5.1 MAC address label

The MAC addresses for the controller (MAC CONTROLLER) are given on the MAC address label. The following figure shows an example of a MAC address label:



9007232039580171

3.5.2 QR code

Product label with QR code. The QR code 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.

The following figure shows an example of a product label:



18014433531072523

3.6 Product safety labels

Caution signs must be attached at various points on the device to warn about particular hazards. Ensure that the following caution signs for identifying hazardous areas are complete and legible:

Hazard symbol	Meaning
	Warning of hot surfaces
	General hazard
 10 min	Warning of dangerous electric voltage

3.7 Function units

3.7.1 Power section

The function module consists of the following internal elements.

Frequency inverter on MOVIMOT® basis

The frequency inverter controls asynchronous motors. Observe the permitted motor assignments in chapter "Technical data" (→ 89).

Brake control

The brake control system is responsible for the supply and control of the SEW-EURODRIVE disk brakes. Only connect approved SEW-EURODRIVE disk brakes to the device.

Motor types



INFORMATION

Unsuitable motor monitoring can lead to a malfunction. Only connect motors with thermostat (TH) to the device.

The device supports a variety of global motors from SEW-EURODRIVE. For a list of motor types, refer to chapter "Motor types" (→ 93).

Observe the possible brake voltage in chapter "Output data" (→ 92).

3.7.2 Communication and control unit

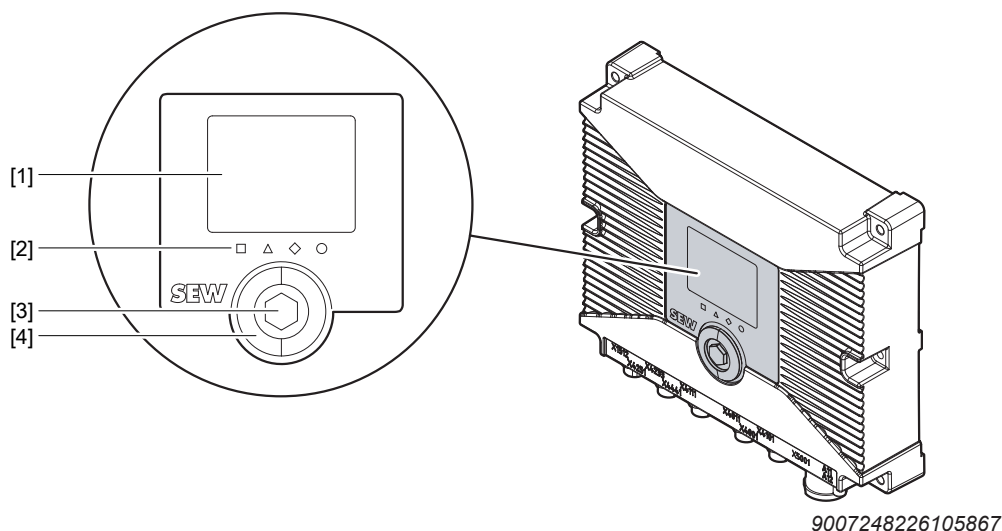
The function module consists of the following internal elements.

Control type

The device is equipped with a FHM35A controller.

Service unit

The service unit is used for startup, diagnostics, and maintenance of the device. It is equipped with a status display and an Ethernet service interface. The following figure shows the service unit:



- [1] Status display with infrared interface
- [2] Status LEDs
- [3] Ethernet service interface, Ethernet RJ45
- [4] Status LED ring

Status display and status LEDs

The status display and status LEDs display status or error messages and thus enable you to record the current state of the device.

For further information, refer to chapter "Status and error messages" (→ 79) and to the respective project-specific documentation. If you have any queries, contact SEW-EURODRIVE.

Ethernet service interface

The Ethernet service interface connects the device with an engineering PC for configuration and maintenance purposes.

For further information, refer to chapter "".

Infrared interface

You can use the infrared keypad to remotely control the device via the infrared interface. The infrared keypad is available as a separate accessory.

The infrared interface is not active in delivery state.

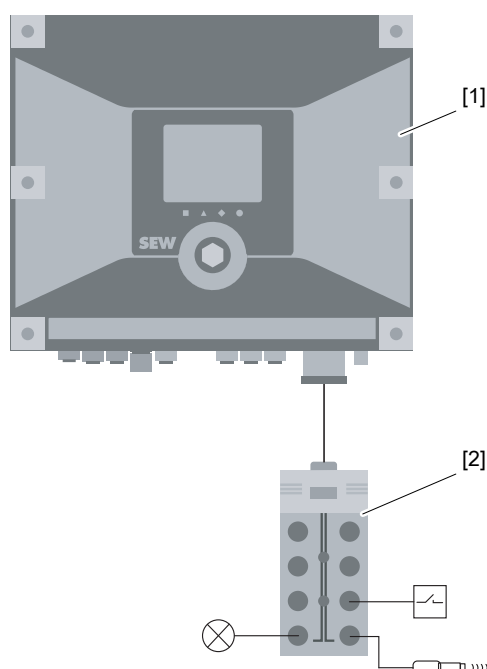
Fieldbus interface

The device is equipped with an UDP-capable Ethernet interface for connection to the fieldbus. The fieldbus connection is made via plug connectors. For further information, refer to chapter "Electrical connections" (→ 50).

The fieldbus interface is deactivated in delivery state.

Digital inputs and outputs

The device has connections for digital inputs and outputs. You connect the sensors and actuators required for your application to the digital inputs and outputs. To connect several sensors and actuators to the device at the same time, use the sensor/actuator box which is available as an accessory. For further information, refer to chapter "Accessories" (→ 25). The following figure shows an example of a sensor/actuator box connection:



48971366155

- [1] Device
- [2] Sensor/actuator box with M23 connector and M12 connections for e.g.:
- Switch
 - Inductive sensors
 - Light barriers
 - Indicator lights

WLAN function

The following descriptions apply to devices with Wi-Fi function (type designation "W4"):

WLAN module



INFORMATION

Operation of the device with radio modem is only permitted indoors.

The device has a radio module with Wi-Fi client functionality for connection to a wireless infrastructure network. Communication is based on the Wi-Fi 6 standard. A 5 GHz band based on the IEEE 802.11a standard is available.

The radio connection is intended for communication with the higher-level controller. The device can be reached in the network as an end station.

Functional description

Before logging into an access point for the first time and during handover, the radio modem searches for a suitable access point according to the user configuration. This phase is called "probing phase".

The probing phase during handover starts when the signal level of the radio modem drops below a certain value (cell search threshold). If the signal level of the detected access point is higher by a certain value (delta SNR) than the signal level of the current access point, the radio modem logs into the new access point (Association/Authentication/4-Way Handshake with WPA2-PSK). Process data communication is not possible during the probing and registration phase. The probing phase can be shortened by limiting the available channels according to the regulatory domain to the channels that exist in the plant.

Encryption

The device supports the following Wi-Fi security standards:

- WPA2-AES-PSK

WPA2-AES-PSK is recommended as an encryption method. Encryption methods using a Radius server are not recommended because of impractical latency times during login and connection transfer.

Antenna connections

The antenna connections are equivalent. You can configure the type of use.

Connect a 50 Ω terminating resistor to unused antenna connections. The part numbers of available antennas and terminating resistors as well as further information on the connections can be found in chapter "Electrical connections" (→ 50).

Further information

For additional information about the antennas in different areas of application, refer to the following documentation:

- "WNI Wireless Network Installation – Compact Slotted Waveguide System" installation instructions
- "WNI Wireless Network Installation – Standard Slotted Waveguide System" installation instructions
- "WNI Wireless Network Installation – Radiating Cable System" installation instructions
- "WNI Wireless Network Installation – EMS Mounting Rail System with Integrated Slotted Waveguide" installation instructions
- "WNI Wireless Network Installation – Configuration Wi-Fi via Slotted Waveguide" manual
- "MOVIPRO® Communication Material" operating instructions

3.7.3 Power supply

Energy is supplied to the device via a three-phase current supply system, a power rectifier and a line filter. The power rectifier supplies the DC link voltage. The line filter complies with limit value class C3 according to EN 61800-3 on the supply system side without further measures:

3.8 Accessories

3.8.1 Available accessories

INFORMATION



The scope of delivery does not include accessories, such as installation and mounting material or connection cables.

If you are unsure about the accessories you require, contact SEW-EURODRIVE. For further information on accessories, refer to the following documentation: addendum to operating instructions "MOVIPRO® – accessories". The following accessories are available for the device:

	Part number
Connection cable	
Refer to the corresponding connections described in chapter "Electrical connections" (→ 50) for information on connection cables for motors and other components.	
Connection component	
STO jumper plug	11747099
CAN terminating resistor 120 Ω	13287036
CAN T-piece	13290967
Keypad	
For further information, refer to the following documentation: operating instructions "MOVIPRO® accessories – PZO00A-BFBIR0-01/.. keypad".	
PZO00A-BFBIR0-01/L001	17975972
PZO00A-BFBIR0-01/L002	17975980
PZO00A-BFBIR0-01/L003	17975999
PZO00A-BFBIR0-01/L004	17976006
PZO00A-BFBIR0-01/L005	17976014
Braking resistors	
For more information, refer to chapters "Technical data" (→ 89) and "Use of braking resistors" (→ 26).	
BW200-003/k1.5	08282919
BW200-005/k1.5	08282838
M12 parameter memory	
M12 parameter memory	17976340

	Part number
Sensor/actuator boxes	
For further information, refer to chapter "Electrical connections" (→ 50).	
Sensor/actuator box 1 m (4 connections)	18255477
Sensor/actuator box 3 m (4 connections)	18255485

Use of braking resistors



INFORMATION

For the device variant with control via a 3-wire brake (PHE..C-B15-3..) in combination with a motor with 3-wire brake (e.g. motors from SEW-EURODRIVE), the brake coil is used as braking resistor. Do not connect any external braking resistor in this case.

If a motor without holding brake is connected in the device variant with control for a 2-wire brake, SEW-EURODRIVE recommends connecting a braking resistor. For the device variant with control for a 3-wire brake, you may only connect motors with a brake.

	Motor + 3-wire brake	Motor + 2-wire brake	Motor without brake	External braking resistor
Control for 2-wire brake PHE..C-B15-2..	• ¹⁾	—	—	Required
	—	•	—	Required
	—	—	•	Required
Control for 3-wire brake PHE..C-B15-3..	•	—	—	Not possible
	—	• ²⁾	—	Not possible

Key

- = Can be used
- = Cannot be used

¹⁾ Not recommended by SEW-EURODRIVE.

²⁾ Only possible if all of the following conditions are met:

- Use of a suitable brake from SEW-EURODRIVE
- In the MOVIVISION® software, the option "Deactivate brake center tap" is set in the drive parameterization.

4 Functional safety

4.1 Integrated safety technology

4.1.1 Safe state

For safety-related operation of the device, safe torque off is defined as safe condition, see "STO – Safe Torque Off" (→ 28). The safety concept is based on this definition.

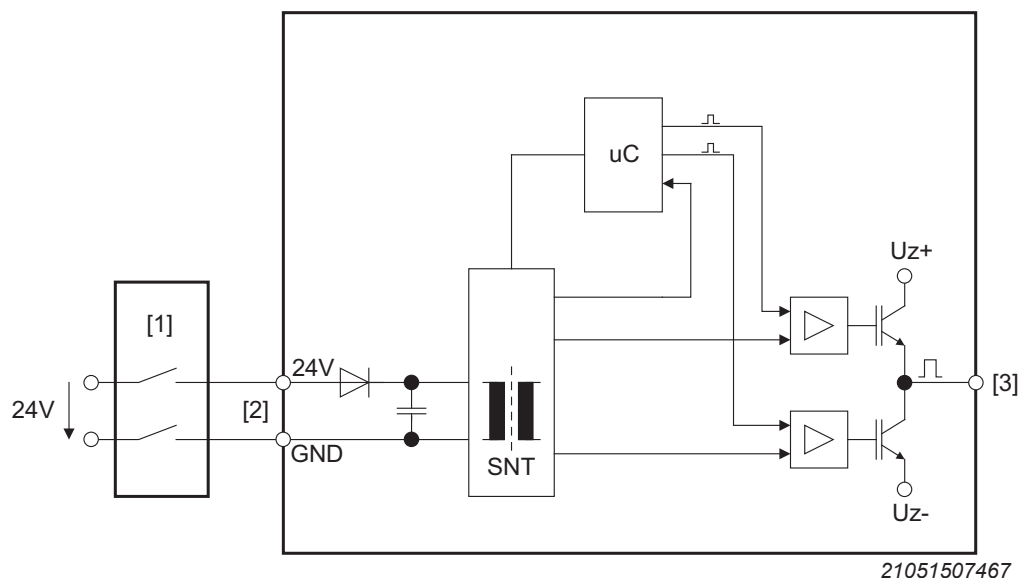
4.1.2 Safety concept

- The device allows for the connection of an external safety controller or an external safety relay. They de-energize all active elements that generate the pulse trains to the power output stage (IGBT) when a connected command device (e.g. emergency stop button with latching function) is activated. For this purpose, the safety-related DC 24 V supply is disconnected.

This ensures that the frequency inverter no longer supplies power to the motor for generating torque.

- Disconnecting the safety-related DC 24 V supply voltage ensures that the voltage supplies required for operating the drive are safely interrupted.
- Instead of galvanic isolation of the drive from the supply system using contactors or switches, the disconnection of the safety-related DC 24 V supply described here safely prevents the gating of the power semiconductors in the frequency inverter. This means the rotary-field generation for the respective motor is deactivated even though the mains voltage is still present.

The following figure shows the safety concept:



- [1] Safety relay external
[2] Safety-related 24 V voltage supply
[3] Motor phase

INFORMATION

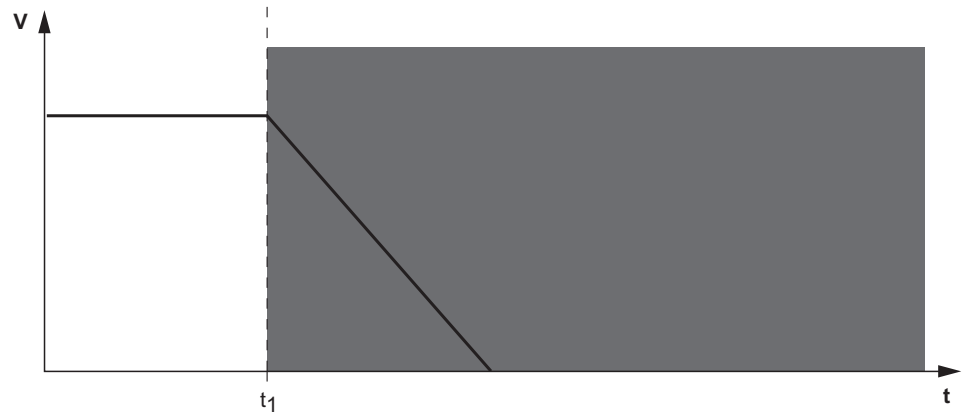
Observe chapter "Restrictions" (→ 30).



4.1.3 Safety sub-functions

STO – Safe Torque Off

When the safety sub-function is active, the power supply to the motor is interrupted and the drive cannot generate any torque. This safety sub-function corresponds to a non-controlled stop according to EN 60204-1, stop category 0.



18014400480354315

- = Safety sub-function active
- v = Speed
- t = Time
- t_1 = Point in time at which STO is activated.

INFORMATION

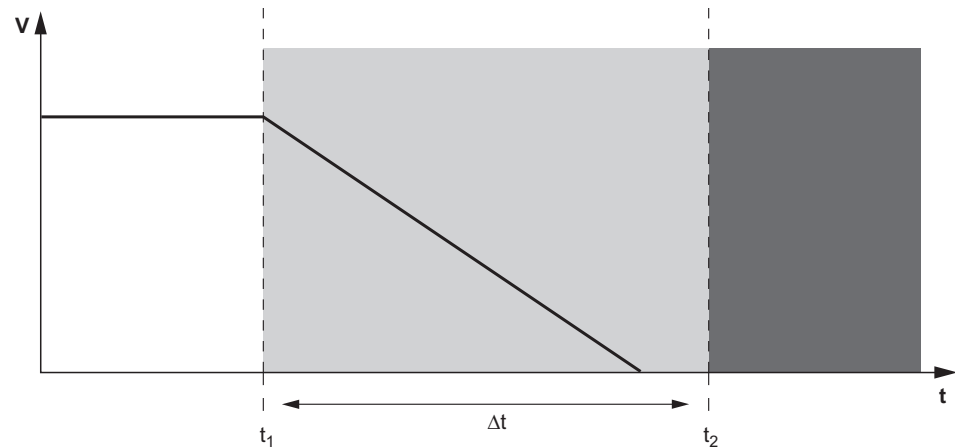


The motor coasts to a halt or is stopped mechanically.
Controlled standstill is preferred, if possible.

SS1-t – Safe Stop 1 with time control

When the SS1-t safety sub-function is active, the motor is brought to a standstill electrically. The STO safety sub-function will be triggered after a specified, safety-related time.

This safety sub-function corresponds to a controlled stop of the drive according to EN 60204-1, stop category 1.



18014400480359435

- = SS1-t safety sub-function monitored
- = STO safety sub-function active
- v = Speed
- t = Time
- t_1 = Point in time at which SS1-t is activated and motor deceleration is triggered.
- t_2 = Point in time at which STO is activated.
- Δt = Safety-related period of time

INFORMATION



- The SS1-t function does not monitor the stopping of the drive.
- The safety-related period of time Δt allows the drive to come to a stop. In the event of a fault, the drive does not come to a stop and becomes de-energized at the time t_2 (STO).

4.1.4 Limitations

INFORMATION



The safety function STO does not provide galvanic isolation. It therefore does not provide any protection against electric shocks. As a result, it is not possible to implement an emergency off setup with the STO safety function in the normative sense. For that purpose, the entire system needs to be deactivated with a line disconnecter.

- The brake controller integrated in this device and the standard brake integrated in brakemotors are not safety-related and therefore not part of the safety functions described in chapter "Drive safety functions". If the brake controller and/or the motor brake fails, the drive can coast for much longer depending on the application (i.e. the friction and inertia of the system). In the case of regenerative loads (e.g. lifting axes, declining conveying lines), the drive can even accelerate. This must be taken into account in the risk analysis of the system/machine. Additional safety measures will have to be implemented (e.g. safety brake system).
 - Use the device only with an additional brake system for application-specific safety functions that require active deceleration (braking) of the dangerous movement.
- When using the SS1(c) function as described in chapter "Drive safety functions", the brake ramp of the drive is not monitored with respect to safety. In the case of an error, the drive might not be decelerated during the delay time, or it might even be accelerated in the worst case. In this event, the safety-related deactivation via the "STO function" (→ 28) is only activated after the set time delay has passed. You must take the resulting danger into account in the risk analysis of the system/machine and you must implement additional safety measures.
- The system/machine manufacturer must perform a system/machine-specific risk analysis without fail. The use of the device must be taken into account.
- The safety concept is only suitable for performing mechanical work on driven system/machine components.
- If the 24 V supply voltage is disconnected, the supply voltage is still present at the frequency inverter DC link.
- To perform work on the electrical section of the drive system, you must disconnect the supply voltage using an external maintenance switch.

4.2 Safety requirements

4.2.1 Requirements

The safety functions of the device may only be used for safe operation of the system or machine if they are integrated correctly in an application-specific, higher-level safety function or safety system.

We recommend that the system/machine manufacturer performs a risk assessment.

The system/machine manufacturer should perform a functional test after successful startup. The system/machine manufacturer and the operator are responsible for compliance of the system or machine with applicable safety regulations.

The following requirements are mandatory when installing and operating the device in safety-related applications.

4.2.2 Installation requirements

- You must not shorten hybrid cables from SEW-EURODRIVE. Use these hybrid cables with the original cable lengths and the prefabricated plug connectors. Ensure proper connections.
- Observe the following when routing the safety-related control cables and the cable to the temperature circuit breaker (TH):
 - Route these cables separately from power supply cables. This does not apply to hybrid cables from SEW-EURODRIVE.
 - Route these lines in separate cables. This does not apply to hybrid cables from SEW-EURODRIVE.
 - Ensure that there is no parasitic voltage.
 - Route these cables in an EMC-compliant manner.
 - Apply the shielding on both sides of the housing.
 - Route the cables permanently so that they are protected against external damage.
- Outside an electrical installation space, you must use shielded cables.
- Design the cabling in accordance with the standard EN 60204-1.
- Observe the values specified for safety components without fail when designing the safety circuits.
- The maximum length for the cable between the safety controller and the device is 30 m.
- Do not use the safety-related 24 V supply voltage for feedback.
- For all 24 V supply voltages of the inverter, the field distributor and all stations on the fieldbus, only voltage sources with safe disconnection (SELV/PELV) in accordance with EN 60204-1 and EN 61131-2 are permitted.
In the event of a single fault, the voltage between the outputs or between any output and grounded parts may not exceed DC 60 V.
- For safety-related applications with the device, you must remove the jumper plug at X5502.
- When planning the installation, observe the technical data of the device.
- A degree of protection of at least IP 54 must be guaranteed. This can be achieved only if unused connectors and covers are sealed correctly.

4.2.3 Requirements for the external safety controller

You can also use a safety relay as an alternative to a safety controller. In that case, observe the following requirements.

- For safety-relevant applications up to Performance Level d according to EN ISO 13849-1, the safety controller and all other safety-related subsystems must be approved for at least Performance Level d according to EN ISO 13849-1 or SIL 2 according to EN 61508. To determine the performance level of the overall application, you can use the method described in EN ISO 13849-1 to combine several safety-related subsystems without a PFH-value calculation. However, SEW-EURODRIVE recommends determining the PFH value for the overall application. You can find the PFHd value for the device in chapter "Technical data" (→ 89).
- For safety-related applications up to SIL 2 according to EN 62061, the safety controller and all other safety-related subsystems must be approved for at least SIL 2 according to EN 61508 or Performance Level d according to EN ISO 13849-1. You must also determine the probability of a dangerous failure per hour (PFHd value). The PFH value of the device applies when determining the PFHd value for the overall application.

Application	Safety controller requirements
Performance Level d according to EN ISO 13849-1	Performance Level d according to EN ISO 13849-1 SIL 2 according to EN 61508
SIL 2 according to EN 62061	Performance Level d according to EN ISO 13849-1 SIL 2 according to EN 61508

- The wiring with the external safety controller must be suitable for the required safety class (see manufacturer documentation). Safety circuits require 2-pole disconnection.
- The values specified for the safety controller must be strictly adhered to when designing the circuit.
- The switching capacity of the safety relays or the relay outputs of the safety controller must correspond at least to the maximally permitted, limited output current of the 24 V voltage supply.

Observe the manufacturer's instructions concerning the permitted contact loads and fusing that may be required for the safety contacts. If the manufacturer provides no specific information, the contacts must be protected with 0.6 times the nominal value of the maximum contact load specified by the manufacturer.

- To ensure protection against unintended restart in accordance with DIN EN ISO 14118, you must design and connect the safety controllers in such a way that resetting the control device alone does not lead to a restart. A restart may be performed only after a manual reset of the safety circuit.

4.2.4 Startup requirements

- Startup of the system/machine must be documented. The safety functions of the system/machine must be checked and verified.

Observe the limitations for the safety functions of the device provided in chapter "Limitations" (→ 30) when verifying safety functions. If necessary, deactivate non-safety-related parts and components, such as the motor brake, that affect the result of the verification.

- For operating the device in safety-related applications, the disconnecting device and correct wiring must always be verified and documented during startup. A disconnecting device is, for example, a safety relay or a safety controller.
- During the startup procedure/function test, the correct assignment of the respective voltage supply must be checked by a measurement.
- The function test must be carried out in succession for all potentials, i.e. separately.

4.2.5 Requirements for operation

- Operation is only allowed within the limits specified in the data sheets. This applies to both the external safety relay and the device.
- To achieve performance level d, the STO function must be checked at least once a year. Depending on the process, the performance level can also be checked each time the machine/system is switched on.
- To prevent mechanical damage or crossfaults, control the cables regularly. Observe the information on intervals in the service plan of the system and plant manufacturer.

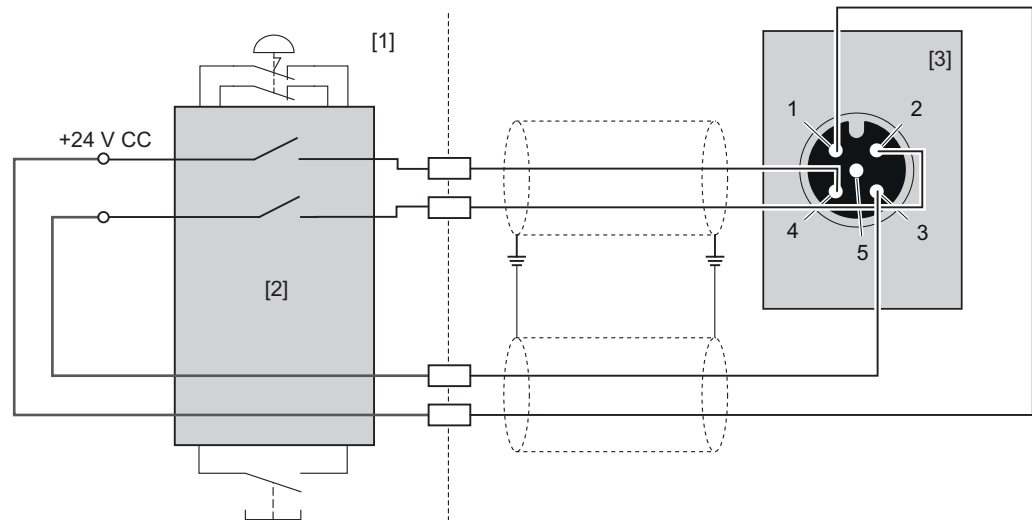
4.3 Connection variants

4.3.1 Basic considerations

- For group disconnection, several devices can be provided with 24 V by a single safety relay. The maximum number "n" of devices results from the maximum permitted contact rating of the safety relay and the maximum permitted voltage drop of the DC 24 V supply for these devices.
- Other requirements of the safety relay manufacturer (such as protecting the output contacts against welding) must be strictly observed. The basic conditions described in the conditions of the certification report for the device also applies to cable routing.
- For EMC reasons, the maximum cable length is limited to 30 m. Other instructions published by the manufacturer on the use of safety relays for specific applications must also be observed.
- A calculation based on the technical data for the device must be performed separately for each group disconnection.

4.3.2 Connection of an external safety relay for STO with M12 connector

The following figure shows a connection example with a safety relay and disconnection of all poles:



9007229923759243

- [1] Installation space
- [2] Safety relay
- [3] Device with connector X5502 for STO

5 Mechanical installation

5.1 Requirements



⚠ WARNING

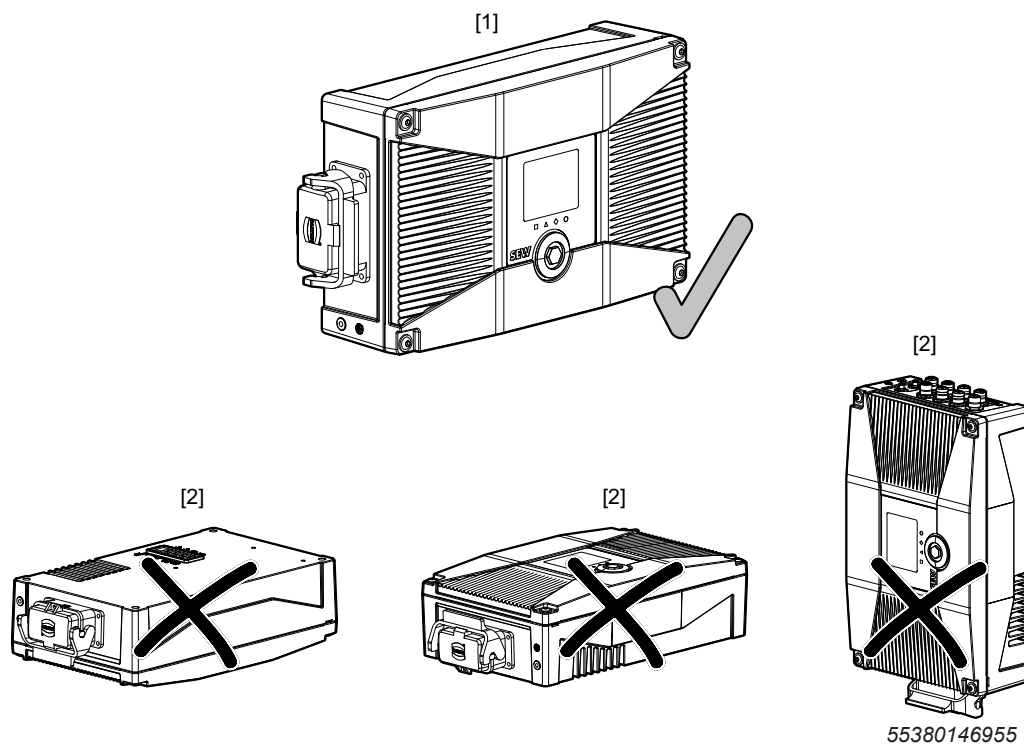
Risk of crushing due to falling load.

Severe or fatal injuries.

- Secure the area where loads can fall down.
 - Do not stand under the load.
-
- Trained specialists perform the installation.
 - The information provided in the technical data and the permitted conditions for the operating location of the device are observed.
 - The minimum clearance and the required gaps for using a mounting plate are complied with. For more information, refer to chapter "Minimum clearance" (→ 37).
 - Only mount the device using the mounting options intended for it.
 - The selection and dimensioning of the mounting and locking elements are in line with the applicable standards, the technical data of the devices, and the local requirements.
 - The bore dimensions are calculated in line with the respective mounting type.
 - The mounting and locking elements fit into the existing bores, threads, and countersinks.
 - All display and actuator elements are visible and accessible after installation.
 - The device is positioned in such a way that it will not collide with other components or design elements along the travel path.
 - Fasten the device in such a way that it is not exposed to shocks or vibrations during operation that exceed loads according to DIN EN 60721-3-3/-5 3M4/5M2.
 - Use suitable damping elements or vibration dampers to mechanically decouple the device and minimize the impact load.

5.2 Mounting position

The following figure shows permitted and non-permitted mounting positions:



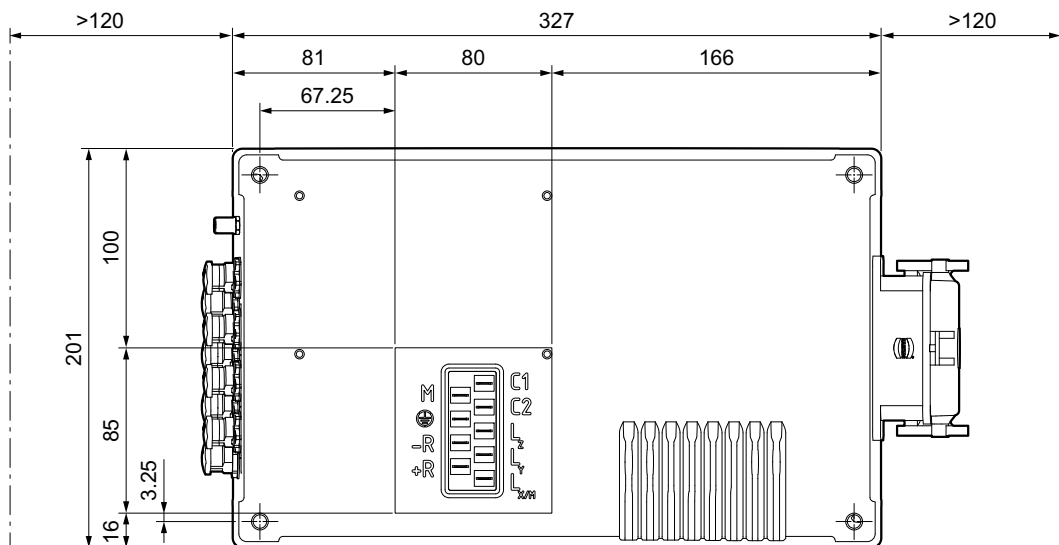
- [1] Permitted vertical mounting position
[2] Impermissible mounting positions

5.3 Minimum clearance

INFORMATION



- Observe the following required minimum clearances during installation:
 - When connecting the cables and connectors
 - When handling the display, diagnostics, and operating elements
 - For heat convection at the cooling fins if the product has cooling fins
- Further information on the required minimum clearances can be found in the dimension drawings in chapter "Technical data" (→ 89).



9007254634890379

5.4 Waste heat

Ensure that the cooling fins can dissipate waste heat into the environment by free convection.

You can ensure optimum heat convection as follows:

- Use SEW-EURODRIVE mounting systems or suitable spacers, e.g.:
 - Spacers
 - Profiles
 - Square pipes
 - Mounting plates
 - T-carriers
 - Rails
- Ensure that the cooling fins are not located in a closed hollow space.
- Observe the minimum clearance of 15 mm between the highest cooling fin and the next surface, e.g. a mounting plate.
- Avoid heat sources in the immediate proximity of the device.

5.5 Installation



⚠ WARNING

Electric shock from live connections.

Severe or fatal injuries.

- Prevent contact with the feed plug X1261 at the rear of the device using design measures. For further information, refer to chapter "X1261: AC 400 V contact conductor connection" (→ 52).



NOTICE

External force too high.

Damage to the thread or the screw.

- Do not exceed the maximum tightening torque of 3.1 Nm to 3.5 Nm.



⚠ CAUTION

Risk of injury due to sharp edges.

Minor injuries.

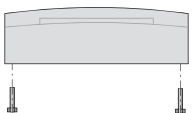
- Wear suitable protective gloves.

Use the accessories that are available from SEW-EURODRIVE for mounting:

- "Mounting kit with EMS angle brackets", part number 18220789

The included brackets are mounted to the narrow sides of the device.

The following options are available for mechanical mounting:

Variant	Fastening
 Tapped holes on the rear of the device See chapter "Technical data" (→ 89)	• 4 × screws

5.5.1 Tapped holes on the rear of the device

The device has 4 tapped holes on the rear of the device. Refer to the dimension drawing in chapter "Technical data" (→ 89) for information on the dimensions for mounting using tapped holes.

6 Electrical installation

6.1 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.

6.2 Motor types

INFORMATION



Unsuitable motor monitoring can lead to a malfunction. Only connect motors with thermostat (TH) to the device.

The device supports a variety of global motors from SEW-EURODRIVE. For a list of motor types, refer to chapter "Motor types" (→ 93).

Observe the possible brake voltage in chapter "Output data" (→ 92).

6.3 Low-voltage supply systems

The device is only suitable and approved for operation on the following systems:

- TN and TT systems with directly grounded star point

6.4 UL-compliant installation

INFORMATION



Due to UL requirements, the following chapter is always printed in English and in some cases in French, regardless of the language of this documentation.

6.4.1 (Field wiring) Power terminals

Use 75 °C copper wire only.

6.4.2 Short circuit current rating

Suitable for use on a circuit capable of delivering not more than 5000 rms symmetrical amperes when protected by 25 A, 600 V non-semiconductor fuses or 500 V minimum 25 A maximum inverse time circuit breakers.

Max. voltage is limited to 500 V.

6.4.3 Branch circuit protection

Integral solid state short circuit protection does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electrical Code and any additional local codes.

WARNING - The opening of the branch-circuit protective device may be an indication that a fault current has been interrupted. To reduce the risk of fire or electric shock, current-carrying parts and other components of the controller should be examined and replaced if damaged. If burnout of the current element of an overload relay occurs, the complete overload relay must be replaced.

ATTENTION - LE DÉCLENCHEMENT DU DISPOSITIF DE PROTECTION DU CIRCUIT DE DÉRIVATION PEUT ÊTRE DÙ À UNE COUPURE QUI RÉSUITE D'UN COURANT DE DÉFAUT. POUR LIMITER LE RISQUE D'INCENDIE OU DE CHOC ÉLECTRIQUE, EXAMINER LES PIÈCES PORTEUSES DE COURANT ET LES AUTRES ÉLÉMENTS DU CONTRÔLEUR ET LES REMPLACER S'ILS SONT EN-DOMMAGÉS. EN CAS DE GRILLAGE DE L'ÉLÉMENT TRAVERSÉ PAR LE COURANT DANS UN RELAIS DE SURCHARGE, LE RELAIS TOUT ENTIER DOIT ÊTRE REMPLACÉ.

For maximum branch circuit protection see table below:

	SCCR: 5 kA/500 V	
	When protected by:	
Model	Non Semiconductor Fuses (currents are maximum values)	Inverse-Time Circuit Breaker (currents are maximum values)
PHE..C-B15-...	25 A/600 V	25 A/500 V

6.4.4 Motor overload protection

The devices are provided with load and speed-sensitive overload protection and thermal memory retention upon shutdown or power loss.

The trip current is adjusted to 140 % of the rated motor current. For further information, refer to chapter "Technical data".

6.4.5 Environmental rating

Type 1

6.4.6 Wiring diagrams

For wiring diagrams, refer to chapter "Electrical installation".

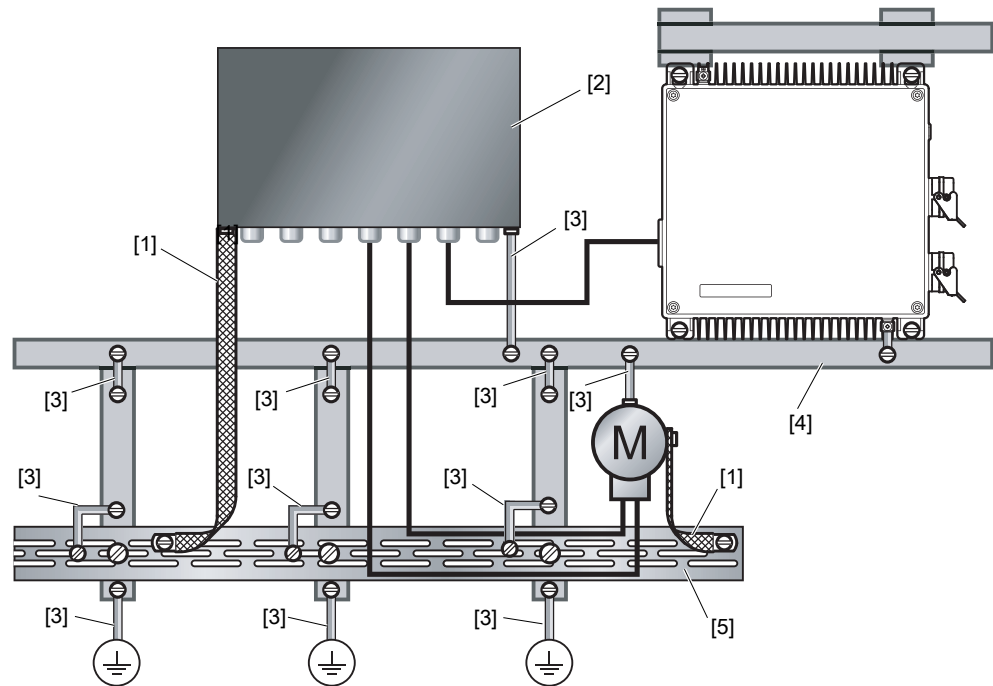
6.5 Electromagnetic compatibility (EMC)

For further information on EMC-compliant installation, refer to the following documentation: "Drive Engineering – Practical Implementation, Electromagnetic Compatibility (EMC) in Drive Engineering".

6.5.1 EMC-compliant installation

Ensure that there is a HF-capable equipotential bonding for all drive components. Use low-impedance, HF-capable connectors such as HF litz wire or ground straps. Standard protective earth conductors do not achieve sufficient equipotential bonding regarding HF and EMC.

For further information, refer to chapter "Installing ground connection or equipotential bonding" (→ 42).



54652610187

- | | | | |
|-----|----------------------------|-----|--------------------------------------|
| [1] | HF litz wire, ground strap | [4] | Machine base / vehicle support frame |
| [2] | Product | [5] | Cable duct |
| [3] | Protective earth (PE) | | |

6.6 Cable routing

Observe the following when routing the cables:

- Use suitable cables to connect power supply and communication. For more information on connection descriptions, refer to chapter "Electrical connections" (→ 50).
- Route power cables and signal cables in separate cable ducts.
- Maintain the greatest possible distance between power cables and signal cables.
- Avoid using long cables running parallel to one another.

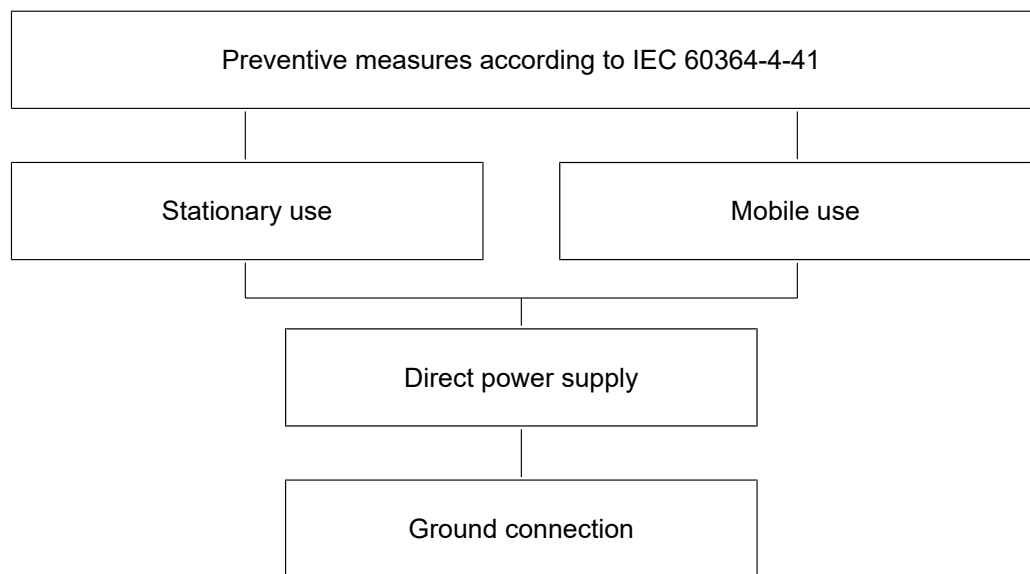
For further information on EMC compliant installation, refer to the following documentation: "Drive Engineering – Practical Implementation, Electromagnetic Compatibility (EMC) in Drive Engineering".

6.6.1 Shielding

- Utilize the shielded power cables and electronics cables.
- Connect the shield to ground on both sides with flat contact. In the case of multiple-shielded cables, also connect the inner shields to ground on both sides with a flat contact.
- Use EMC-capable connectors.
- For external bus connections, refer to the bus-specific installation instructions.

6.7 Protective measures against electrical hazards

6.7.1 Overview



9007223426450699

6.7.2 Installing ground connection or equipotential bonding



⚠ WARNING

Electric shock due to faulty ground connection or faulty protective bonding.
Severe or fatal injuries.

- Make sure you install the ground connection and protective bonding correctly.

You must protect all electrical operating resources, such as the device or the motor, using ground connection or protective bonding.

Tools required

Socket wrench with wrench size 8 mm

Leakage currents

Leakage currents $\geq$ AC 3.5 mA/DC 10 mA may occur during normal operation. To avoid dangerous shock currents in accordance with EN 61800-5-1, strictly observe the following:

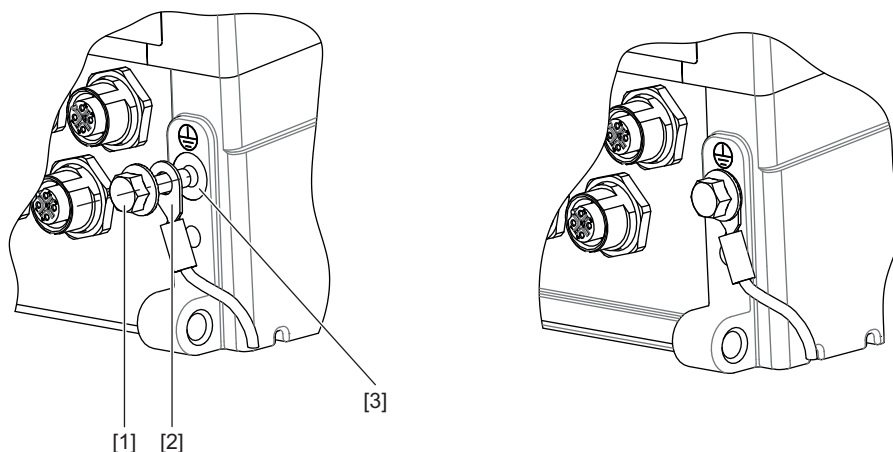
- The protective earth (PE) connection must meet the requirements for systems with high earth-leakage currents.
- Note that the required cable cross section of the PE conductor depends on the cable cross section of the supply cable. Select the cable cross section of the PE conductor according to the following requirements:
 - Supply cable $< 10 \text{ mm}^2$: Install two PE conductors with a cable cross section corresponding to the supply cable. Both PE conductors have to be connected to different connection points and routed in parallel. Alternatively, use a copper PE conductor with a cable cross section of 10 mm^2 .
 - Supply cable $10 \text{ mm}^2 - 16 \text{ mm}^2$: Route a copper PE conductor with a cable cross section corresponding to the supply cable.

Procedure

Device without braking resistor

Always ground the device using the shortest possible route.

The connection points for ground connection or equipotential bonding are on the narrow sides of the device. They are marked with a "ground" $\oplus$ icon.



9007211207752203

- [1] M5 $\times$ 10 screw
- [2] Crimp cable lug for M5
- [3] Connection point

✓ Note the different cable cross section of the supply line during installation. For further information, refer to chapter "Leakage currents" ($\rightarrow$ 43).

1. Remove the screw.
2. Push the crimp cable lug onto the screw.
3. Tighten the screw with a maximum tightening torque of 2.5 Nm.

Device with braking resistor**INFORMATION**

For the device variant with control via a 3-wire brake (PHE..B-15-3..) in combination with a motor with 3-wire brake (e.g. motors from SEW-EURODRIVE), the brake coil is used as braking resistor. Do not connect any external braking resistor in this case.

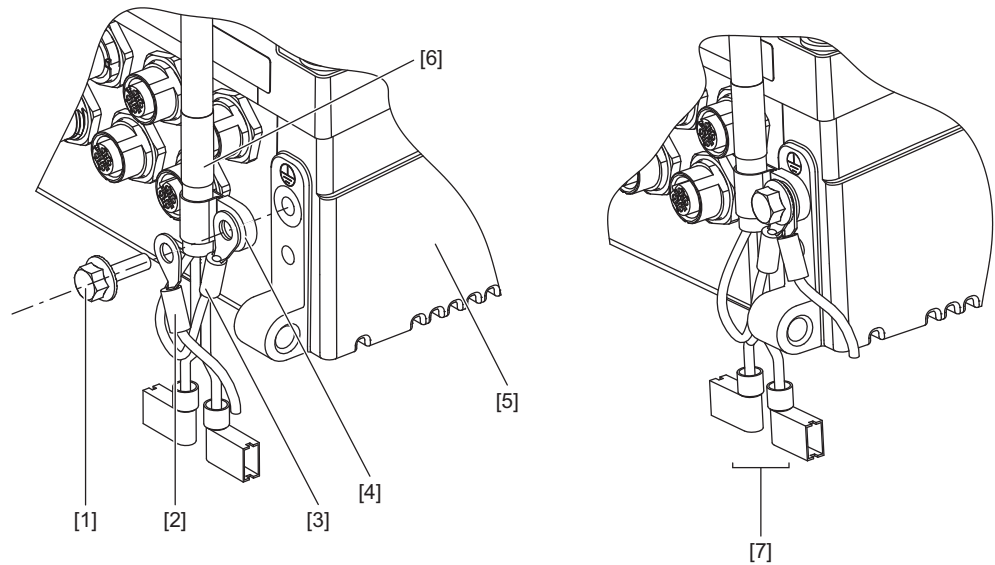
If a motor without holding brake is connected in the device variant with control for a 2-wire brake, SEW-EURODRIVE recommends connecting a braking resistor. For the device variant with control for a 3-wire brake, you may only connect motors with a brake.

Preparing the braking resistor cable

Proceed as follows to install the braking resistor cable:

1. Remove the plastic sheath of the braking resistor cable [6] over a length of at least 260 mm.
2. Remove the shield of the braking resistor cable [6] over a length of at least 30 mm.
3. Fold back the braided shield over the plastic sheath of the braking resistor cable [6].
4. Fix the braided shield in position with heat shrink tubing. Make sure that at least 20 mm of the braided shield remain blank.
5. Shorten the PE connection cable of the braking resistor [3] to at least 85 mm.
6. Crimp the ring cable lug for M5 to the PE connection cable of the braking resistor [3].
7. Crimp a suitable female push-on connector (6.3 mm) to each of the remaining conductors of the braking resistor [7].

Installing the PE



11951066763

- [1] M5 × 10 screw
- [2] Crimp cable lug for M5 (PE connection cable of the device)
- [3] Crimp cable lug for M5 (PE connection cable of the braking resistor)
- [4] Shield terminal
- [5] Housing
- [6] Braking resistor cable
- [7] Female push-on connector

- ✓ Note the different cable cross section of the supply line during installation. For further information, refer to chapter "Leakage currents" (→ 43).
- 1. Guide the shield terminal [4] over the braking resistor cable [6].
- 2. Place the shield terminal [4] onto the braided shield. Ensure that the braided shield of the braking resistor cable is completely surrounded by the shield terminal.
- 3. Take a screw [1] and push the crimp cable lug [2], the crimp cable lug [3] and the shield terminal [4] onto it.
- 4. Tighten the screw [1] with a maximum tightening torque of 2.5 Nm.
- 5. Plug the brown conductor of the braking resistor into the push-on connector +R of the signal feed connector X1261.
- 6. Plug the white conductor of the braking resistor into the push-on connector -R of the signal feed connector X1261.

Connection points for mobile applications

For mobile applications, the type of energy transfer determines how you have to apply protective measures against electrical hazards.

Direct power supply

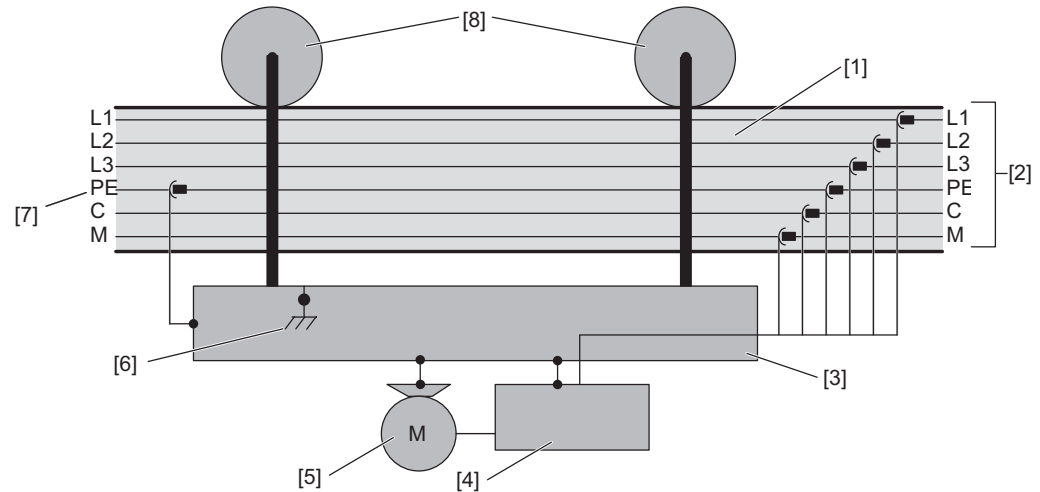
The ground connection protects mobile systems with direct power supply against electrical hazard according to IEC 60364-4-41.

Observe the following rules:

- Ground the device using the shortest possible route (PE).
- Use a grounding cable in the color combination green/yellow.

The ground connection must be ensured via 2 mobile contact outlets (sliding contacts).

The following figure schematically shows a mobile system with direct power supply via sliding contacts:



9007208976704523

- | | |
|-------------------------------|------------------|
| [1] Stationary system section | [5] Motor |
| [2] Power supply | [6] Vehicle mass |
| [3] Vehicle support frame | [7] PE |
| [4] Application controller | [8] Wheels |

6.8 Using prefabricated cables

SEW-EURODRIVE uses prefabricated cables for certifications, type tests, and approval of the devices. The cables available from SEW-EURODRIVE meet all the requirements necessary for the functions of the device and the connected components. The devices under consideration are always the basic devices including all components to be connected and corresponding connection cables.

For this reason, SEW-EURODRIVE recommends that you only use the prefabricated cables listed in the documentation.

6.8.1 Using third-party cables

If third-party cables are used – even if these cables are technically equivalent – SEW-EURODRIVE will not accept any liability and cannot guarantee compliance with device properties or that the device will function correctly.

If you use third-party cables for connecting the device and connected components, ensure their compliance with applicable national regulations. Note that the technical features of the device or unit network might be affected inadvertently when using third-party cables. This concerns in particular the following properties:

- Mechanical properties (e.g. IP degree of protection, cable carrier suitability)
- Chemical properties (e.g. silicone and halogen free, resistance to substances)
- Thermal properties (e.g. thermal stability, increase in device temperature, flammability class)
- EMC behavior (such as interference emission limit values, compliance with interference immunity values stipulated in standards)
- Functional safety (approvals according to EN ISO 13849-1)

Third-party cables not explicitly recommended by SEW-EURODRIVE must meet at least the requirements of the following standards and have been permitted according to these standards:

- IEC 60309
- IEC 61984
- IEC 60204

6.9 Line components

6.9.1 Selecting the residual current device

The inverter can cause a direct current in the PE conductor.

Proceed as follows to select the residual current device:

1. If using a residual current device is not mandatory according to the standards, SEW-EURODRIVE recommends not using a residual current device.
2. **▲ WARNING!** No protection against electric shock if an incorrect type of residual current device is used. Severe or fatal injuries.
If a residual current device (residual current device RCD or residual current monitor RCM) is provided, use an all-current-sensitive RCD or RCM of type B.
3. If a residual current device is required, select the residual current device according to the requirements for protecting persons, fire protection or system protection. Observe the tripping characteristic, the deceleration and the rated tripping current of the residual current device during selection.
4. During project planning, note that leakage currents which are as low as possible occur in the system for operational reasons.
5. If the operational leakage currents are too high, you can distribute the current supply among several RCDs.

6.9.2 Line fuse types

Install the fuses at the beginning of the supply line behind the supply bus junction.

Line protection types in utilization categories gL, gG:

- Nominal fusing voltage $\geq$ nominal line voltage
- Depending on the frequency inverter utilization, the nominal fusing current must be dimensioned for 100% of the frequency inverter nominal current.

Miniature circuit breaker with characteristics B, C:

- Miniature circuit breaker nominal voltage $\geq$ nominal line voltage
- The nominal current of the miniature circuit breaker must be 10% above the frequency inverter nominal current.

6.9.3 Selecting line fuses

Install the fuses at the beginning of the supply line behind the supply bus junction.

Observe the following when designing the line fuses:

- Design the fuses according to the current carrying capacity of the conductor rail in use.

- Observe applicable regulations and standards. The line fuses must fulfill their protective function. For UL installations, observe the specifications in chapter "UL-compliant installation" (→ 39).
- Do not select the line fuse larger than required to protect the supply system cable and conductor rails. If the cross section of the supply cable to the device is not sufficient, select a stronger supply cable.
- Observe the information on current supply in chapter "Input data" (→ 91).
- The rated current of the line fuses must be dimensioned generously for the maximum continuous power (sum of all consumers).
- If you use circuit breakers, SEW-EURODRIVE recommends devices with tripping characteristic C, tripping characteristic D or slower. The rated current should be at least 1 A per vehicle. This means: At least 16 A for 16 vehicles, at least 25 A for 25 vehicles.
- If the line fuse trips unexpectedly when switching on, a line choke can be connected upstream to the central supply. For information on suitable line chokes, refer to chapter "ND.. line chokes" in the following documentation: "MOVIDRIVE® MDX60B/61B" system manual.

The following applies when using fuses on the vehicles:

Line protection types in utilization categories gL, gG:

- Nominal fusing voltage $\geq$ nominal line voltage
- Depending on the frequency inverter utilization, the nominal fusing current must be dimensioned for 100% of the frequency inverter nominal current.

Miniature circuit breaker with characteristics B, C:

- Miniature circuit breaker nominal voltage $\geq$ nominal line voltage
- The nominal current of the miniature circuit breaker must be 10% above the frequency inverter nominal current.

6.9.4 Contactors

Only use contactors in utilization category AC-3 (EN 60947-4-1) as line and brake contactors.

6.10 Connection blocks



⚠ 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.



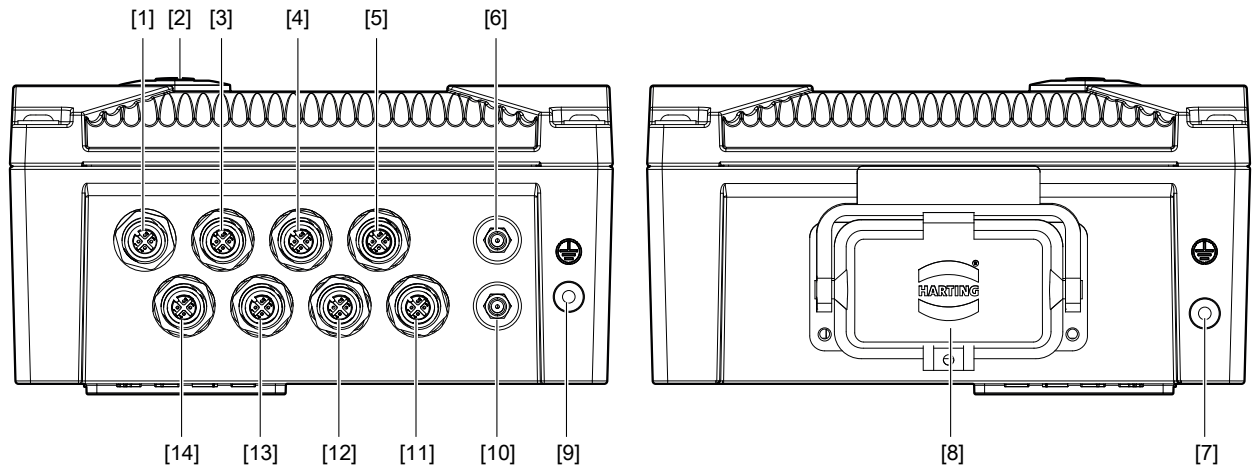
INFORMATION

Some connections depend on the device design. For information regarding the type of connection present at your device, refer to the device designation and the designations of the function units on the nameplates. For further information on function units, refer to chapter "Device structure" (→ 17).



INFORMATION

For further information on the individual connections and connection cables, refer to chapter "Electrical connections" (→ 50).



9007254628169739

- [1] Option bus:
 X4233 Ethernet fieldbus
 X4101 SBus
 X4251 SBus^{PLUS}
- [2] X4223 Ethernet service interface
- [3] X4011 RS485 interface – external
- [4] X4111 CAN bus – external
- [5] X4441 M12 parameter memory
- [6] A11 WLAN port A
- [7] PE Protective bonding
- [8] X2013 Motor with brake control
 X2014
- [9] PE Protective bonding
- [10] A12 WLAN port B
- [11] X5502 Safe disconnection – input
- [12] X5003 Digital input – communication and control unit
- [13] X5002_2 Digital inputs/outputs – communication and control unit
- [14] X5002_1 Digital inputs/outputs – communication and control unit

6.11 Electrical connections

6.11.1 Representation of connections

The wiring diagrams show the contact end of the connections.

6.11.2 Cable structure

Diagram

The following table shows the cable structure based on an example:

Figure	Meaning
(	Cable shield
4	Number of core pairs (in twisted cables only)
X	
2	Number of cores

Figure	Meaning
X	G – with protective earth, green-yellow X - without protective earth
0.25	Core cross section in mm ²
)	Cable shield
+	A plus sign is added to cores with other features.
...	

Examples

The following examples illustrate the cable structure:

- **3G1.5:**
Cable with 3 cores of 1.5 mm² each, one of them is a green-yellow PE conductor.
- **((2X2X0.25)+4G2.5):**
Shielded hybrid cable with
 - 4 twisted-pair cables of 0.25 mm² each, shielded, and
 - 4 power cores of 2.5 mm² each, one of them is a green-yellow PE conductor.

6.11.3 Connection cables

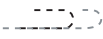
Connection cables are not included in the delivery.

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 depictions used and what they mean:

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

6.11.4 X1261: AC 400 V contact conductor connection

**⚠ WARNING**

Electric shock from blank live connections.

Severe or fatal injuries.

- Use safe, insulated female push-on connectors for installation.
- To avoid coming into contact with unused male push-on connectors, you have to install the touch guard on unused male push-on connectors.

**⚠ WARNING**

Electric shock from live connections.

Severe or fatal injuries.

- Note the following points for selecting suitable female push-on connectors:
- Use safe, insulated female push-on connectors for installation.
- The installed female push-on connectors must comply with the standard DIN 46 245 part 3, DIN 46 247 part 3 or DIN 46 346 part 3.
- Use the female push-on connector only with the insulating housing specified by the manufacturer.
- Make sure that each female push-on connector is plugged in correctly and latched.
- The latching function of the female push-on connector cannot be guaranteed for multiple use. Therefore, use a new female push-on connector after single use.

NOTICE

Damage caused by corrosion.

Damage of connection X1261.

- The push-on contacts of connection X1261 are accessible from the outside. Ensure that the push-on contacts do not come into contact with water or other corrosive substances.

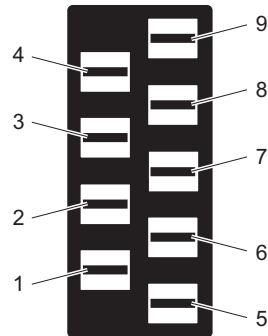
Function

AC 400 V connection for units with half-wave control supplied by the conductor rail

Connection type

Male push-on connectors 6.3 mm

Connection diagram



Assignment

Contact	Function	
1	+R	Braking resistor (+)
2	-R	Braking resistor (-)
3	PE	Protective bonding
4	M	Signal output M
5	L _{X/M}	Line connection phase X/jumper to signal contact control. This phase is used for the signal output M.
6	L _Y	Line connection phase Y
7	L _Z	Line connection phase Z
8	C2/n.c.	Control input C2 (For PHE../2.. device variants) Not assigned (for PHE../1.. device variants)
9	C1	Control input C1 (For PHE../1.. device variants)

6.11.5 X2013: Motor with brake control

NOTICE

Damage or malfunction due to motors with built-in brake rectifiers.

Damage to the drive system or its environment.

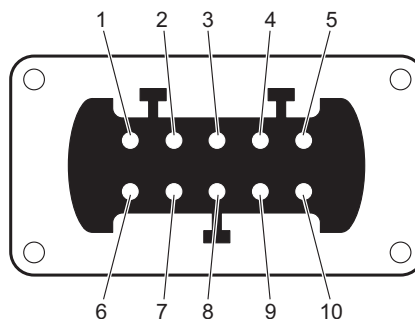
- Do not use motors with built-in brake rectifiers in conjunction with this device.

Function

Power connection for motor with brake up to 4 kW

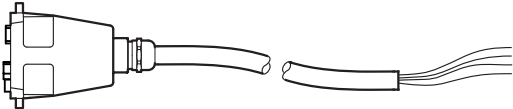
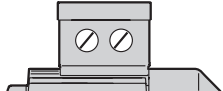
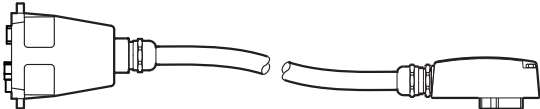
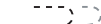
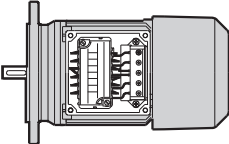
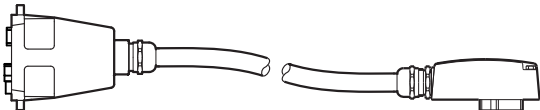
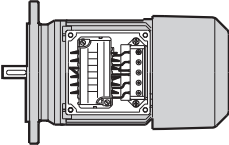
Connection type

Han® 10 E

Connection diagram**Assignment**

Contact	Function	
1	U	Motor phase U output
2	V	Motor phase V output
3	W	Motor phase W output
4	13	Brake terminal 13 (red)
5	15	Brake terminal 15 (blue)
6	14	Brake terminal 14 (white)
7	res.	Reserved
8	res.	Reserved
9	TH	Motor temperature sensor (+)
10	TH	Motor temperature sensor (-)
PE	PE	Protective bonding

Connection cables

Cable	Length/installation type	Component
Part number: 18164242  Han® 10 E ↔ open (terminal box connection M4)	Variable length 	DRS71 DRE80 – DRE90 DRN80 – DRN90 
Part number: 18164277 𐀀  Han® 10 E ↔ IS 𐀀	Variable length 	DRS71 𐀀 DRE80 – DRE90 𐀀 DRN80 – DRN90 𐀀 
Part number: 18164323 𐀁  Han® 10 E ↔ IS 𐀁	Variable length 	DRS71 𐀁 DRE80 – DRE90 𐀁 DRN80 – DRN90 𐀁 

6.11.6 X2014: Motor with brake controller

NOTICE

Damage or malfunction due to motors with built-in brake rectifiers.

Damage to the drive system or its environment.

- Do not use motors with built-in brake rectifiers in conjunction with this device.

Function
Power connection for motor with brake up to max. 4 kW

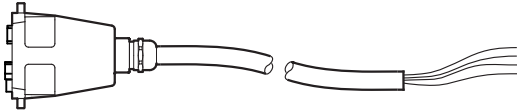
Connection type
Han® 10 E

Wiring diagram

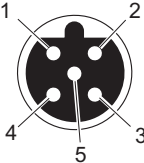
No.	Name	Function
1	U1	Motor phase U output
2	V2	Motor phase V output
3	W3	Motor phase W output
4	1	Brake terminal 13 (red)
5	n.c.	Not connected
6	2	Brake terminal 14 (white)
7	res.	Reserved
8	res.	Reserved
9	3	Brake terminal 15 (blue)
10	n.c.	Not connected
PE	PE	PE connection

33962022/EN – 05/2026

Connection cables

Cables	Length/installation type	Type	Component
Part number: 28128702  Han® 10 E ↔ Open	Variable length 	D/1.5	Motor See chapter "Motor types" (→ 39) 

6.11.7 X4011: RS485 interface – external

Function		
RS485 interface for external components		
Connection type		
M12, 5-pin, female, B-coded		
Connection diagram		
		
Assignment		
Contact	Function	
1	+24V	DC 24 V output
2	RS-	RS485 data line (-)
3	GND	Reference potential
4	RS+	RS485 data line (+)
5	res.	Reserved

6.11.8 X4101: CAN bus – system bus

INFORMATION

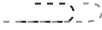


If there is no station connected here, you must terminate the bus with a 120 Ω resistor.

Function		
CAN system bus – output		
Connection type		
M12, 5-pin, female, A-coded		
Connection diagram		
Assignment		
Contact	Function	
1	CAN_SHLD	Shield/equipotential bonding CAN bus
2	+24V	DC 24 V output
3	GND	Reference potential
4	CAN_H	CAN data line (high)
5	CAN_L	CAN data line (low)

33962022/EN – 05/2026

Connection cables

Cable	Length/installation type	Component
Standard lengths: 1 m: Part number: 13237748 2 m: Part number: 13237756 3 m: Part number: 13286315 4 m: Part number: 13286323 5 m: Part number: 13286331 10 m: Part number: 13286358 15 m: Part number: 13286366 Order-specific lengths: 1.5 m: Part number: 13286293 2.5 m: Part number: 13286307 Cable design: ((1X2X0.2)+(1X2X0.32)+1X0.32)  M12, male, A-coded ↔ M12, female, A-coded	Fixed length 	—
Standard lengths: 2 m: Part number: 13281364 5 m: Part number: 13281402 Order-specific lengths: 1 m: Part number: 13281348 1.5 m: Part number: 13281356 2.5 m: Part number: 13281372 3 m: Part number: 13281380 4 m: Part number: 13281399 10 m: Part number: 13281410 15 m: Part number: 13281429 Cable design: ((1X2X0.2)+(1X2X0.32)+1X0.32)  M12, male, A-coded ↔ open	Fixed length 	—

Conductor assignment

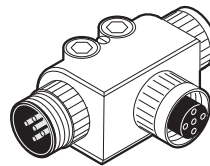
Part number	Signal name	Conductor color
13281348	CAN_SHLD	–
13281356	+24V	Red
13281364	GND	Black
13281372	CAN_H	White
13281380	CAN_L	Blue
13281399		
13281402		
13281410		
13281429		

Connection components

CAN T-piece

Part number: 13290967

Connection: M12

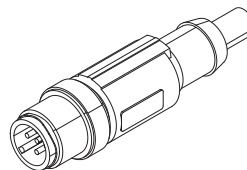


9007204911485067

CAN terminating resistor

Part number: 13287036

Connection: M12

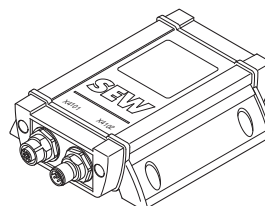


22822010891

PZO00A-SAZIR0-C000-03 display unit

Part number: 28249186

Connection: M12



24926926987

6.11.9 X4111: CAN bus – external

INFORMATION



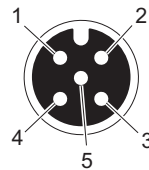
If there is no station connected here, you must terminate the bus with a 120 Ω resistor.

Function

CAN bus for external components

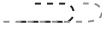
Connection type

M12, 5-pin, female, A-coded

Connection diagram**Assignment**

Contact	Function	
1	CAN_SHLD	Shield/equipotential bonding CAN bus
2	+24V	DC 24 V output
3	GND	Reference potential
4	CAN_H	CAN data line (high)
5	CAN_L	CAN data line (low)

Connection cables

Cable	Length/installation type	Component
Standard lengths: 1 m: Part number: 13237748 2 m: Part number: 13237756 3 m: Part number: 13286315 4 m: Part number: 13286323 5 m: Part number: 13286331 10 m: Part number: 13286358 15 m: Part number: 13286366 Order-specific lengths: 1.5 m: Part number: 13286293 2.5 m: Part number: 13286307 Cable design: ((1X2X0.2)+(1X2X0.32)+1X0.32)  M12, male, A-coded ↔ M12, female, A-coded	Fixed length 	—
Standard lengths: 2 m: Part number: 13281364 5 m: Part number: 13281402 Order-specific lengths: 1 m: Part number: 13281348 1.5 m: Part number: 13281356 2.5 m: Part number: 13281372 3 m: Part number: 13281380 4 m: Part number: 13281399 10 m: Part number: 13281410 15 m: Part number: 13281429 Cable design: ((1X2X0.2)+(1X2X0.32)+1X0.32)  M12, male, A-coded ↔ open	Fixed length 	—

33962022/EN – 05/2026

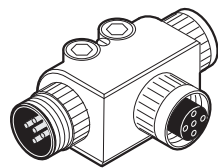
Conductor assignment

Part number	Signal name	Conductor color
13281348	CAN_SHLD	–
13281356	+24V	Red
13281364	GND	Black
13281372	CAN_H	White
13281380	CAN_L	Blue
13281399		
13281402		
13281410		
13281429		

Connection components

CAN T-piece

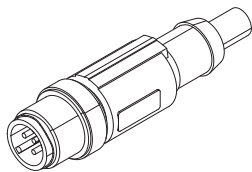
Part number: 13290967
 Connection: M12



9007204911485067

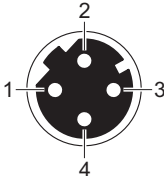
CAN terminating resistor

Part number: 13287036
 Connection: M12



22822010891

6.11.10 X4233: Ethernet fieldbus

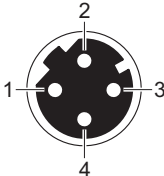
Function		
Ethernet fieldbus interface, 4-pin		
Connection type		
M12, 4-pin, female, D-coded		
Connection diagram		
		
Assignment		
1	TX+	Sending cable (+)
2	RX+	Receiving cable (+)
3	TX-	Sending cable (-)
4	RX-	Receiving cable (-)

Connection cable

Cable	Length/installation type	Component
Part number: 19105401 Cable design: (2X2X0.14)  M12, 4-pin, D-coded, male ↔ M12, 4-pin, D-coded, female	Fixed length 2 m 	-

33962022/EN – 05/2026

6.11.11 X4251: SBus^{PLUS} system bus

Function		
EtherCAT®-based SEW system bus SBus ^{PLUS}		
Connection type		
M12, 4-pin, female, D-coded		
Connection diagram		
		
Assignment		
Contact	Function	
1	TX+	Sending cable (+)
2	RX+	Receiving cable (+)
3	TX-	Sending cable (-)
4	RX-	Receiving cable (-)

6.11.12 X4441: M12 parameter memory

INFORMATION



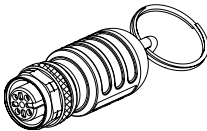
To use an unwritten parameter memory on an already configured device, the device must be restarted to apply the configuration.

Function		
Interface for connecting the M12 parameter memory		
Connection type		
M12, 5-pin, male, A-coded		
Connection diagram		
Assignment		
Contact	Function	
1	GND	Reference potential
2	+5V	DC 5 V output
3	D-	Data line (-)
4	D+	Data line (+)
5	res.	Reserved

Connection component

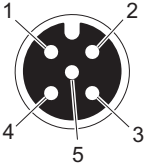
M12 parameter memory

Part number: 17976340
Connection: M12

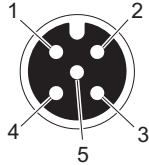


15014326923

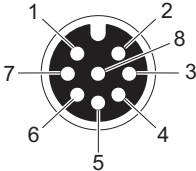
6.11.13 X5002_1: Digital inputs/outputs – communication and control unit

Function		
Digital inputs/outputs of the communication and control unit		
Connection type		
M12, 5-pin, female, A-coded		
Connection diagram		
		
Assignment		
Contact	Function	
1	+24V	DC 24 V output
2	DI01/DO01	Binary input 02/Binary output 02
3	GND	Reference potential
4	DI00/DO00	Binary input 01/Binary output 01
5	FE	Equipotential bonding / functional earth

6.11.14 X5002_2: Digital inputs/outputs – communication and control unit

Function		
Digital inputs/outputs of the communication and control unit		
Connection type		
M12, 5-pin, female, A-coded		
Connection diagram		
		
Assignment		
Contact	Function	
1	+24V	DC 24 V output
2	DI03/DO03	Binary input 04/Binary output 04
3	GND	Reference potential
4	DI02/DO02	Binary input 03/Binary output 03
5	FE	Equipotential bonding / functional earth

6.11.15 X5003: Digital input – communication and control unit

Function		
Digital input of communication and control unit		
Connection type		
M12, 8-pin, female, A-coded		
Connection diagram		
		
Assignment		
Contact	Function	
1	DI04/DO04	Binary input 05/Binary output 05
2	DI05/DO05	Binary input 06/Binary output 06
3	DI06/DO06	Binary input 07/Binary output 07
4	DI07/DO07	Binary input 08/Binary output 08
5	+24V	DC 24 V output
6	res.	Reserved
7	GND	Reference potential
8	res.	Reserved

6.11.16 X5502: Safe disconnection – input

INFORMATION



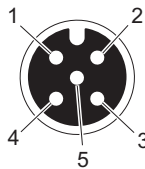
To avoid non safety-related shutdown, jumper this connection only if the product will not perform any safety functions according to EN ISO 13849-1.

INFORMATION



Use only shielded cables for this connection.

This connection is marked with a yellow ring.

Function		
Input for safe disconnection		
Connection type		
M12, 5-pin, female, A-coded		
Pin assignment		
		
No.	Name	Function
1	+24V	DC 24 V output
2	STO-	0V24 reference potential for safe disconnection
3	0V24	0V24 reference potential
4	STO+	DC 24 V input for safe disconnection
5	res.	Reserved

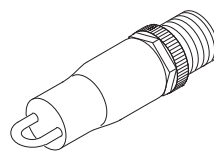
Connection cables

Cable	Length/installation type	Component
Part number: 28129261 Cable design: ((1x2xAWG24)+(1x2xAWG22))  M12, 5-pin, male, A-coded ↔ M12, 5-pin, male, A-coded	Variable length 	Terminal box of the safety relay/safety controller
Part number: 28129253 Cable design: (2×0.75)  M12, 5-pole, male, A-coded ↔ M12, 5-pole, male, A-coded	Variable length 	Terminal box of the safety relay/safety controller

Connection component

STO jumper plug

Part number: 11747099
 Structure: bridged 1+4/2+3
 Connection: M12



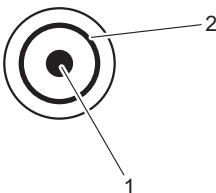
72057595186840843

6.11.17 A11: WLAN port A

INFORMATION



If you do not use the connection, assign a 50 Ω resistor to it.

Function		
Antenna connection of the WLAN module, send and receive functionality		
Connection type		
Socket connector RP-SMA		
Connection diagram		
		
Assignment		
Contact	Function	
1	inner conductor	Inner conductor
2	outer conductor	Outer conductor

Connection components

Antennas

The following table lists all the antennas available from SEW-EURODRIVE that can be used with the device:

Antenna	For use with	Part number
Coupler radiating cable R-SMA 2.4 GHz	Radiating cable	13003356
Coupler radiating cable R-SMA 5 GHz	Radiating cable	18231942
Coupler waveguide R-SMA 2.4 GHz	Slotted waveguide	18244327
Coupler waveguide R-SMA 5 GHz	Slotted waveguide	18235840

Operation with other kinds of antenna is not permitted.

50 Ω terminating resistor

Part number: 19051972

Connection: RP-SMA connector

6.11.18 A12: WLAN port B

INFORMATION



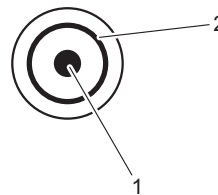
If you do not use the connection, assign a 50 Ω resistor to it.

Assignment

Antenna connection of the WLAN module, send and receive functionality

Connection type

Socket connector RP-SMA

Connection diagram**Assignment**

Contact	Function
1	inner conductor
2	outer conductor

1	inner conductor	Inner conductor
2	outer conductor	Outer conductor

Connection components

Antennas

The following table lists all the antennas available from SEW-EURODRIVE that can be used with the device:

Antenna	For use with	Part number
Coupler radiating cable R-SMA 2.4 GHz	Radiating cable	13003356
Coupler radiating cable R-SMA 5 GHz	Radiating cable	18231942
Coupler waveguide R-SMA 2.4 GHz	Slotted waveguide	18244327
Coupler waveguide R-SMA 5 GHz	Slotted waveguide	18235840

Operation with other kinds of antenna is not permitted.

50 Ω terminating resistor

Part number: 19051972

Connection: RP-SMA connector

7 Startup

7.1 For your safety



NOTICE

Danger due to arcing.

Damage to electrical components.

- Do not disconnect power connections during operation.
- Do not connect power connections during operation.



INFORMATION

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

7.2 Requirements

- You have installed the device correctly both mechanically and electrically.
- You have configured the system and the connected drives correctly.
- Safety measures prevent an accidental startup of the drive.
- Safety measures prevent danger to people and machines.

7.2.1 Required hardware



INFORMATION

To ensure fault-free operation, the M12 parameter memory must be plugged in.

- PC or laptop with USB interface
- USB11A interface adapter

7.2.2 Required software

- Parameterizable plant software MOVIVISION® parameter and diagnostics tool
- MOVITOOLS® MotionStudio engineering software version 6.10 or later (optional)

7.3 Startup procedure

7.3.1 Settings

During startup, the different components of the device are parameterized and/or installed:

- Install user program of the processing unit
- Parameterize the frequency inverter

To establish the connection to the device controller, use the X4223 interface: Ethernet service interface.

7.3.2 Software

Use the latest version of the following software to make all the required settings:

- MOVITOOLS® MotionStudio
- FTP software
- MOVIVISION® parameter and diagnostics tool

7.3.3 Additional information

For further information, refer to the following documentation:

- "MOVIVISION® Parameter and Diagnostics Tool" manual
- "MOVIVISION® – MOVIPRO® Software Interface" manual
- "MOVIDRIVE® MDX60B/61B" system manual
- "MOVIMOT® MM..D with DRS/DRE/DRP AC Motors" operating instructions

8 Operation

8.1 For your safety



⚠ WARNING

Electric shock due to charged capacitors.

Severe or fatal injuries.

- Observe a minimum switch-off time after disconnecting the supply voltage: **10 minutes.**



⚠ CAUTION

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

Injury.

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



INFORMATION

- For operating modes with encoder feedback, parameters must not be changed in cycles faster than 2 seconds. This ensures that the encoders are initialized.
- The maximum output frequency in the VFC operating modes without encoder feedback is 150 Hz.
- The maximum output frequency in the V/f operating mode and all operating modes with encoder feedback is 599 Hz.
- If the maximum output frequency is exceeded, error 08 "Speed monitoring" is displayed.

8.2 Relative cyclic duration factor (cdf)

The cyclic duration factor (cdf) is the ratio between the period of loading and the cycle duration. The cycle duration is the sum of times of operation and times at rest and de-energized. The typical value for the cycle duration is 10 min.

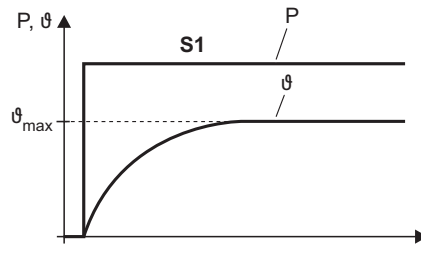
$$cdf = \frac{\text{sum of times of operation } (t1+t2+t3)}{\text{cycle duration } (T)} \times 100\%$$

27021597976207755

8.3 Duty types

8.3.1 Duty type S1

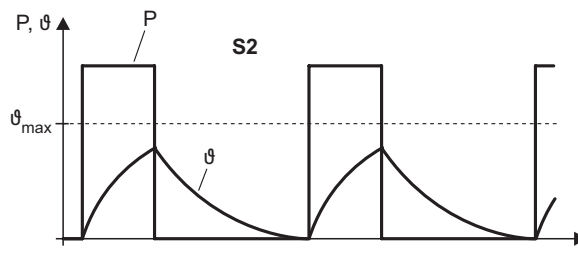
Continuous duty: Operation with a constant loading condition, the motor achieves a thermal steady state.



2325833867

8.3.2 Duty type S2

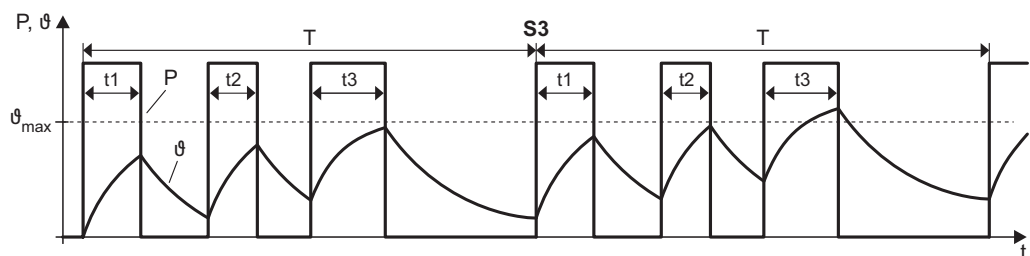
Short-time duty: Operation at constant loading condition for a limited, given time followed by a time at rest. The motor returns to ambient temperature during the rest period.



2325835787

8.3.3 Duty type S3

Intermittent periodic duty: The switch-on sequence does not affect the temperature rise. Characterized by a sequence of identical duty cycles, each including a time of operation at constant load and a time at rest. Described by the relative cyclic duration factor (cdf) in %.



2325831947

8.3.4 Duty types S4 to S10

Intermittent periodic duty: The startup current affects the temperature rise. Characterized by a sequence of identical duty cycles, each including a time of operation at constant load and a time at rest. Described by the relative cyclic duration factor (cdf) in % and the number of cycles per hour.

8.4 Status and error messages

8.4.1 Status display

The device's status display shows the current operating status. There are two kinds of status and error messages: from the device and from the user program. Status and error messages from the device are issued when no user program is active.

For more information on possible status and error messages of the user program, refer to the respective project-specific documentation. If you have any queries, contact SEW-EURODRIVE.

INFORMATION



If the timeout monitoring function of the status display is switched off, the last status issued by the user program is shown on the status display.

Only switch off the timeout monitoring function in exceptional cases.

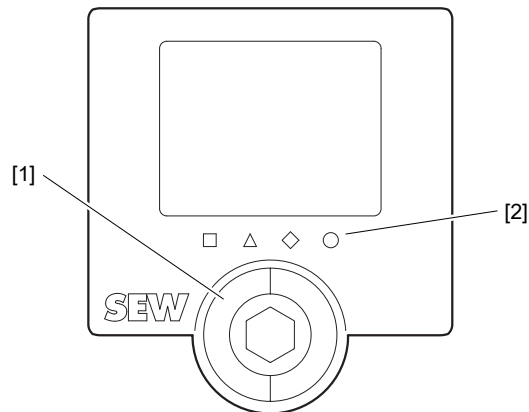
Inform the operating personnel accordingly.

The following table shows the status and error messages of the device:

Code	Possible cause	Measure
SEW	DC 24 V voltage supply of the communication and control unit is present.	—
.....	The user program has not updated the values of the status display within 3 s. There is an error in the user program, in the device, or in the internal system bus.	- Restart the device. Check whether the device starts correctly. If the device does not start, reload the user program into the device. - If the status message is repeatedly shown in operation, contact SEW-EURODRIVE service.
SF 888	The device cannot boot after switch-on. The communication and control unit of the device is defective or has a serious error.	Contact SEW-EURODRIVE Service.
SF 881	- The device cannot find a valid system image. - The internal memory of the communication and control unit is faulty.	Contact SEW-EURODRIVE Service.

8.4.2 Status LEDs

The status LEDs display the current operating state.



9007248228715403

[1] Status LED ring

[2] Status LEDs "Square □", "Delta △", "Diamond ◇", "Circle ○"

Status LED ring

The status LED ring can be easily seen even from a longer distance and shows the application status roughly.

State	Meaning	Measure
Red	An error is present.	For more detailed information, refer to the status display and the other status LEDs.

Further states can be defined project-specifically via the application software.

"Square □" status LED

State	Meaning	Measure
Off	The FHM35A controller is not supplied with voltage.	Check the backup voltage at the X1512 signal feed connector.
Red	The device cannot boot after switch-on. The communication and control unit of the device is defective or has a serious error.	Contact SEW-EURODRIVE Service.
Flashes red	The firmware is faulty.	Contact SEW-EURODRIVE Service.
Orange	- The product cannot find a valid system image. - The internal memory of the communication and control unit is faulty.	Contact SEW-EURODRIVE Service.
Green	The firmware has booted. The product is ready for operation.	–

"Delta Δ" status LED – application software

The status LED is controlled by the application software on a project-specific basis.

"Diamond ◇" status LED – application software

The status LED is controlled by the application software on a project-specific basis.

"Circle ○" status LED – fieldbus

State	Meaning	Measure
LED off	Wi-Fi is switched off, e.g. in delivery state.	–
LED flashes green	Wi-Fi searches for a network (scanning/probing).	–
LED permanently green	Wi-Fi is connected to an access point.	–

8.5 Fault information

8.5.1 For your information

If the application reports a failure, the respective error number of the highest prioritized error is displayed on the status display of the device or on the PZO display unit. Two error states are distinguished:

- ERP (Error Pending): An error is present.
- ERA (Error waiting for Acknowledge): The error is no longer present. But the error has not yet been acknowledged.

In the MOVIVISION® plant software all active errors or errors that have not been acknowledged yet are displayed in plain text at the node for the inverter. For further information, refer to the following documentation: "Parameterizable Plant Software MOVIVISION® – Error Messages in Connection with a MAXOLUTION® System Solution" manual.

8.5.2 Switch-off responses

The following switch-off responses occur in the frequency inverter depending on the error. In all cases, the frequency inverter of the device remains inhibited in error status.

Immediate stop

The device can no longer decelerate the drive. In the event of an error, the output stage goes to high-resistance and the brake is applied immediately.

Rapid stop

The drive is decelerated with the stop ramp. The brake is applied when the stop speed is reached. The output stage goes to high resistance after the brake application time has elapsed.

Emergency stop

The drive is decelerated with the emergency stop ramp. The brake is applied when the stop speed is reached. The output stage goes to high resistance after the brake application time has elapsed.

8.5.3 Acknowledging fault messages

The drive may restart automatically depending on the setting after fault elimination or after a reset. Establish a safe working environment before eliminating a fault if automatic restart of the driven machine is not permitted for safety reasons.

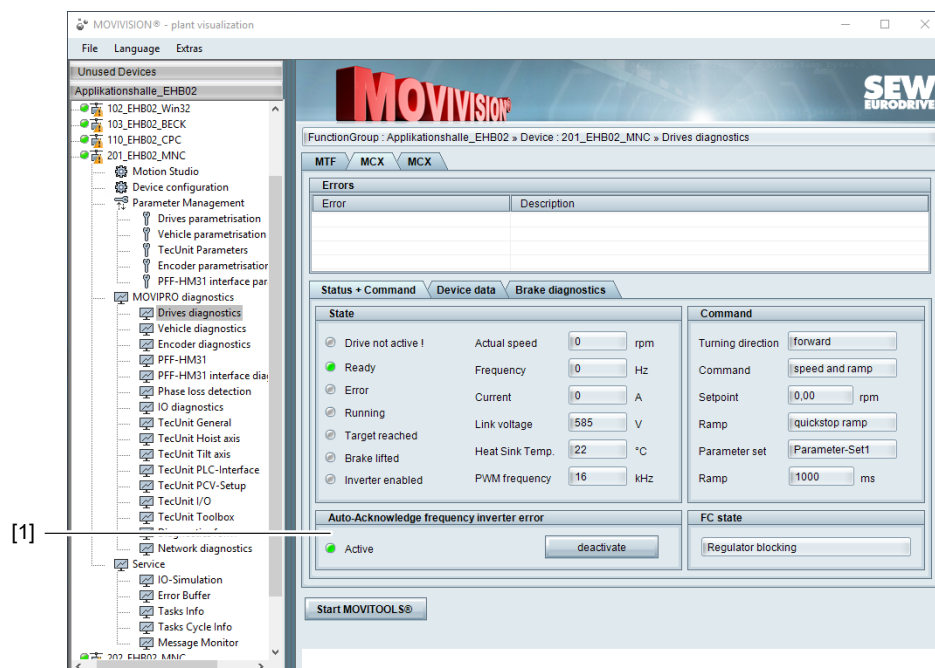
Manual reset

To perform a manual reset, switch off the voltage supply. Adhere to a minimum switch-off time of 1 minute. Switch the supply voltage back on.

Auto reset

The device has an auto reset function. Due to this function, the software automatically performs up to 5 resets. You can deactivate the auto reset function temporarily in the MOVIVISION® plant software at the node for the inverter (e.g. for scope recording).

A maximum of 5 auto resets are possible during an auto reset phase. If the auto reset function has reset 5 errors, no further auto reset is possible. In this case you have to reset manually.



[1] Deactivation of auto reset function

9007230795786123

33962022/EN – 05/2026

8.6 IT security

8.6.1 Hardening measures



Perform the following hardening measures:

- Report incidents regarding cybersecurity by e-mail to cert@sew-eurodrive.com or via the contact form on the Product Security Management website (<http://go.sew/psm>).
- Regularly check which security advisories are available in the Online Support of SEW-EURODRIVE.
- Evaluate the fault memories and diagnostics information of your products regularly and check whether there are entries that affect IT security.

8.6.2 Guidelines for secure operation



Various service accesses can be activated on the device. Authentication is implemented by using user-defined access data. This data is not used to defend against attacks on IT security, but rather to protect against unintentional modification. This is the reason why it cannot be changed.

To prevent misuse of the service access, network access must be restricted according to state-of-the-art technology. For more information, refer to section "IT security of the environment" (→ 11).

8.6.3 Guidelines for user account management



The product uses various administrative service accounts. These are not relevant for operation and are only used for service purposes. The account is protected by static device-specific access data.

9 Service

9.1 Inspection/maintenance

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

The device is maintenance-free. SEW-EURODRIVE does not stipulate any regular inspection work. However, it is recommended that you check the following components regularly:

- Connection cables:
If cables become damaged or fatigued, replace them immediately.
- Cooling fins (if available):
Remove any deposits to ensure sufficient cooling.
- Fans (if available):
Check whether the fans function properly.

9.2 Device replacement

9.2.1 Notes on device replacement

To enable rapid device replacement, the device is connected to its periphery using plug connectors. Hardware and software support the straightforward replacement of a defective device. The M12 parameter memory connected to X4441 plays a central role in this.

During startup, all settings for access to the central data server are stored here. A replaced device can use the information from the M12 parameter memory to log in to the system controller and request a valid data set.

INFORMATION



Observe the following notes for device replacement:

- Insert the M12 parameter memory only when the device is switched off.
- All network-specific data, e.g. the IP address of the controller, is stored in the M12 parameter memory. This allows for quick and straightforward replacement in service cases without complex re-parameterization, but does not replace specific startup steps such as reference travel.

9.2.2 Replacing the device

Proceed as follows to replace the device:

1. Disconnect the device from the power supply and remove it from the plant.
2. Loosen the screw fittings of the M12 parameter memory and remove it from the X4441.
3. Plug the M12 parameter memory into the X4441 connection of a new device and tighten the screw fitting.
4. Install the new device in the plant and connect it to the power supply.

For more information, refer to the "MOVIVISION® – MOVIPRO® software interface" manual.

9.3 Cleaning

Before cleaning the device, disconnect it from the grid. Disconnect the conductor rail from the power if required.

Clean the device only with solvent-free cleaning agent.

9.4 Fault information

INFORMATION



For more information on the fault memory and on acknowledging fault messages, refer to chapter "Fault information" (→ 81).

9.5 SEW-EURODRIVE Service

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

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

- Information 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
- Type of fault
- Accompanying circumstances
- Unusual events preceding the problems

9.6 Shutdown



⚠ WARNING

Electric shock due to charged capacitors.

Severe or fatal injuries.

- Observe a minimum switch-off time after disconnecting the supply voltage: **10 minutes.**

To shut down the device, disconnect it from the power supply using appropriate measures.

9.7 Storage

Observe the following information when shutting down or storing the device:

- Cover the connections with the supplied protection caps.
- Place the device on a side without connectors.
- Ensure that the device is not subject to mechanical impact.
- Observe the information on storage temperature in chapter "Technical data" (→ 89).

9.8 Extended storage

Electrolytic capacitors are used in the frequency inverters. They are subject to aging effects when de-energized. If the device is connected to the voltage supply directly after a long storage period, the capacitors can be damaged.

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

If you have not performed maintenance regularly every 2 years, SEW-EURODRIVE recommends that you increase the supply voltage slowly up to the maximum voltage. This can be done, for example, by using a variable transformer for which the output voltage has been set according to the following overview:

- Stage 1: AC 0 V to AC 350 V within a few seconds
- Stage 2: AC 350 V for 15 minutes
- Stage 3: AC 420 V for 15 minutes
- Stage 4: AC 500 V for 1 hour

9.9 IT security guidelines for secure disposal

9.9.1 Removing the product from its intended environment



If you consider the data stored on the product relevant to IT security, remove the data in accordance with the section "Secure removal of data stored in the product." (→ 87)

Although this product does not independently transmit data to devices in its environment, other devices in the environment, such as controllers, HMIs, engineering PCs, or operator panels, can read and store data from the product. This includes reference data, configuration data, log data and other data belonging to the product.

If the data stored in the environment is classified as relevant for IT security, remove this data according to the documentation of the respective devices in the environment.

For data that can be saved with the engineering software from SEW-EURODRIVE, refer to "Deleting data saved using the engineering software" (→ 87).

9.9.2 Secure removal of data stored in the product



You can reset the data saved in the product to the factory settings using the reset pushbutton.

This encompasses the following data, if available on the device variant:

- Configuration of the device
- Device name
- IP address
- Log files
- Application software
- Control parameters

9.9.3 Deleting data saved using the engineering software



Using the configurable plant software MOVIVISION®, you can retrieve all product data and store it locally or on remote memory systems.

If you consider the data stored in this way relevant to IT security, delete or overwrite it when removing the product from its environment.

When data is saved by an engineering software in the environment of the product, the following data types and data volumes are created:

Software	Data type	Data volume
MOVIVISION®	Proprietary SEW device format	< 1 MB
MOVIVISION®	Optional log data in text format	Dynamic, maximum 18 GiB per device

9.9.4 Removing a customer data backup



You can delete a customer data backup using the MOVIVISION® software.

Some of the data of the product is stored on removable storage media. If the data on the removable storage medium is classified as sensitive data from the operator's point of view and is not intended for later use, it can be deleted using the MOVIVISION® software before waste disposal.

9.10 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
- Rechargeable batteries
- Batteries



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.



Waste disposal in accordance with Battery Regulation 2023/1542

This product contains batteries or accumulators. Dispose of this product and the batteries or accumulators separately from the municipal waste in accordance with the national regulations.

10 Technical data

10.1 Marks

10.1.1 Basic device

The device complies with the following regulations and guidelines:

Mark	Definition
	CE marking to state compliance with European directives (see EU declaration of conformity or EU declaration of incorporation).
	The waste disposal of this product is performed in compliance with the WEEE Directive 2012/19/EU.
	The EAC mark indicates compliance with the requirements of the technical regulations of the Customs Union (Eurasian Economic Union), Armenia, Belarus, Kazakhstan, Kyrgyzstan, and Russia.
	The China RoHS mark indicates compliance with the directive SJ/T 11364-2014 regarding the restriction of use of certain hazardous substances in electrical and electronic equipment and its packaging.
	The UL and cUL mark indicate UL approval. cUL is equally eligible for approval by the CSA.
	The RCM mark indicates compliance with the technical regulations of the Australian Communications and Media Authority (ACMA).
	The UKCA mark indicates compliance with British directives (see UK declaration of conformity or UK declaration of incorporation).

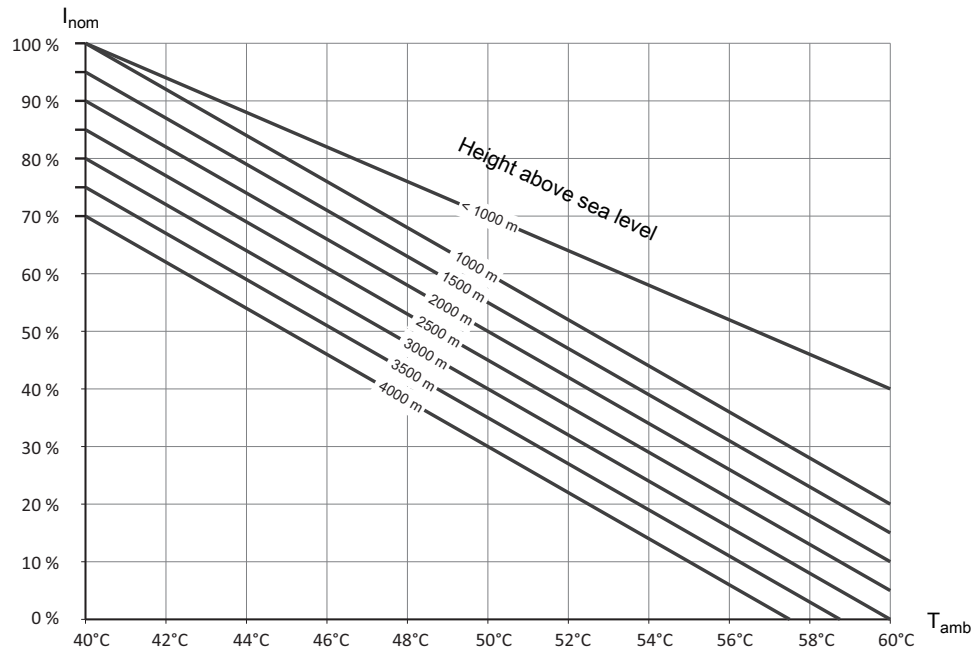
10.2 General information

Basic device	
Electromagnetic compatibility according to EN 61800-3	Interference emission: C3 Interference immunity: 2. Environment (industrial) A level of 1800 V is reached for fast transients (burst) on the power supply connections and signal cables.
Ambient temperature without derating	+5 to +40 °C (non-condensing) Device is thermally intrinsically safe; if the heat sink temperature is too high, the device is switched off with the error message "Overtemperature".
Ambient temperature with derating	+40 – +60 °C $h < 1000$ m above sea level: I_{nom} reduction by 3% per K $h > 1000$ m above sea level: I_{nom} reduction by 4% per K See also chapter "Current reduction (derating)" (→ 91).
Installation altitude with derating	$h > 1000$ m above sea level: I_{nom} reduction by 1% per 100 m $h > 2000$ m above sea level: V_{line} reduction by 6 V per 100 m Refer to chapter "Current reduction (derating)" (→ 91) and "Restrictions of use" (→ 13).
Climate class according to EN 60721-3-3	Class 3K3, no condensation
Storage temperature to EN 60721-3-3	-25 – +70 °C
Degree of protection	IP65 (except connection X1261, see chapter "X1261: AC 400 V contact conductor connection" (→ 52))
Vibration resistance	2M2 (IEC 60721-3-2:1997) 3M4 (IEC 60721-3-3:1994) 5M2 (IEC 60721-3-5:1997)
Mass	4.95 kg
Dimensions W × H × D	327 × 201 × 102 mm

10.3 Current reduction (derating)

The following diagram shows how to reduce the output current in dependence of installation altitude and ambient temperature for a PWM of 4 kHz. For the underlying parameters, refer to chapter "Technical data" (→ 89).

In addition, observe the "restrictions of use" (→ 13) and the reduction of line voltage U_{line} by 6 V per 100 m.



9007220215653259

I_{nom} = Nominal current strength
 T_{amb} = Ambient temperature

10.4 Input data

Basic unit		
Power supply		Three-phase current
Input voltage range	V_{IN}	3 × AC 380 V – 500 V (EN 50160)
Line frequency	f_{line}	50 – 60 Hz
Line current (at $V_{line} = 3 \times AC 400 V$)	I_{line}	AC 3.5 A
SCCR		5 kA
Fuse		25 A

10.5 Output data

INFORMATION



The rated output power is decisive for the maximum output power of the device. The performance data of the single axes may deviate from these values.

Basic unit		
Operating mode		S1 (IEC 60034-1)
Rated output power	P_{2_N}	1.5 kW

10.6 Axis data

Motor with brake control X2013		
Axis type PFA		MM..D
Nominal output power S1 (EN 60034-1)	P_A	1.5 kW at $f_{PWM} = 4$ kHz
Apparent output power	S_N	2.77 kVA
Nominal output current S1 (EN 60034-1)	I_N	AC 4 A
Current limitation	I_{max}	6 A, motor, duration depending on the utilization
Output voltage	V_A	3 × AC 0 – 500 V
Output frequency	f_{max}	2 – 120 Hz
PWM frequency	f_{PWM}	Adjustable: 4/8/16 kHz
Speed range	n_A	-6000 – 0 – +6000 min ⁻¹
Resolution	Δn_A	0.01 Hz
Power loss at S_N	P_{vmax}	3.0 W
Possible brake voltage with 3-wire brake	V_B	120 V, 230 V (recommended), 400 V
Maximum brake holding current of 2-wire brake		DC 0.41 A
Output voltage brake control of 2-wire brake		DC value $\triangleq 0.45 \times (V_{Ly} - V_{Lz})$

10.7 Motor types

The device supports the following global motors from SEW-EURODRIVE:

Power rating	Motor types	Brake, standard	Brake, option
0.25 kW	DT63L4, 50 Hz, 400 V (IEC)	BR03	–
	DR63L4, 50/60 Hz (global)	BR03	–
	DRN71MS4, 50/60 Hz (global)	BE03	BE05
	DR63L4, 50 Hz, 400 V (IEC)	BR03	BR03
	DRE80S4, 50 Hz, 400 V (IEC)	BE05	BE1
	DRN71MS4, 50 Hz, 400 V (IEC)	BE03	BE05
	DRN71MS4, 60 Hz, 460 V (IEC)	BE03	BE05
	DRN71MS4, 60 Hz, 460 V (ABNT)	BE03	BE05
	DR2S63M4, 50 Hz, 400 V (IEC)	BE03	BE03
	DR2S63M4, 60 Hz, 460 V (IEC)	BE03	BE03
	DRU71SJ4, 50 Hz, 400 V (IEC)	BE05	BE1
0.37 kW	DT71D4, 50 Hz, 400 V (IEC)	BMG05	–
	DZ71D4, 60 Hz, 380 V (ABNT)	BE05	BMG05
	DRS71S4, 60 Hz, 380 V (ABNT)	BE05	BE1
	DRS71S4, 50/60 Hz (global)	BE05	BE1
	DRN71M4, 50/60 Hz (global)	BE05	BE1
	DRS71S4, 50 Hz, 400 V (IEC)	BE05	BE1
	DRS71S4, 60 Hz, 460 V (IEC)	BE05	BE1
	DRE80S4, 50 Hz, 400 V (IEC)	BE05	BE1
	DRN71M4, 50 Hz, 400 V (IEC)	BE05	BE1
	DRN71M4, 60 Hz, 460 V (IEC)	BE05	BE1
	DRN71M4, 60 Hz, 460 V (ABNT)	BE05	BE1
	DR2S71MS4, 50 Hz, 400 V (IEC)	BE05	BE1
	DR2S71MS4, 60 Hz, 460 V (IEC)	BE05	BE1
	DRE71SJ4, 50 Hz, 400 V (IEC)	BE05	BE1
	DRU71MJ4, 50 Hz, 400 V (IEC)	BE05	BE1

Power rating	Motor types	Brake, standard	Brake, option
0.55 kW	DT80K4, 50 Hz, 400 V (IEC)	BMG1	–
	DZ80K4, 60 Hz, 380 V (ABNT)	–	BMG1
	DRS71M4, 60 Hz, 380 V (ABNT)	BE1	BE05
	DRS71M4, 50/60 Hz (global)	BE1	BE05
	DRN80MK4, 50/60 Hz (global)	BE1	BE05
	DRS71M4, 50 Hz, 400 V (IEC)	BE1	BE05
	DRS71M4, 60 Hz, 460 V (IEC)	BE1	BE05
	DRE80M4, 50 Hz, 400 V (IEC)	BE1	BE05
	DRN80MK4, 50 Hz, 400 V (IEC)	BE1	BE05
	DRN80MK4, 60 Hz, 460 V (IEC)	BE1	BE05
	DRN80MK4, 60 Hz, 460 V (ABNT)	BE1	BE05
	DR2S71M4, 50 Hz, 400 V (IEC)	BE1	BE05
	DR2S71M4, 60 Hz, 460 V (IEC)	BE1	BE05
	DRE71MJ4, 50 Hz, 400 V (IEC)	BE1	BE05
	DRU80SJ4, 50 Hz, 400 V (IEC)	BE1	BE05
0.75 kW	DT80N4, 50 Hz, 400 V (IEC)	BMG1	–
	DZ80N4, 60 Hz, 380 V (ABNT)	–	BMG1
	DRE80S4, 60 Hz, 380 V (ABNT)	BE1	BE05
	DRE80M4, 50/60 Hz (global)	BE1	BE05
	DRN80M4, 50/60 Hz (global)	BE1	BE05
	DRS80S4, 50 Hz, 400 V (IEC)	BE1	BE05
	DRS80S4, 60 Hz, 460 V (IEC)	BE1	BE05
	DRE80M4, 50 Hz, 400 V (IEC)	BE1	BE05
	DRE80M4, 60 Hz, 460 V (IEC)	BE1	BE05
	DRN80M4, 50 Hz, 400 V (IEC)	BE1	BE05
	DRN80M4, 60 Hz, 460 V (IEC)	BE1	BE05
	DRN80M4, 60 Hz, 460 V (ABNT)	BE1	BE05
	DR2S80MK4, 50 Hz, 400 V (IEC)	BE1	BE05
	DR2S80MK4, 60 Hz, 460 V (IEC)	BE1	BE05
	DRE71MJ4, 50 Hz, 400 V (IEC)	BE1	BE05
	DRU80MJ4, 50 Hz, 400 V (IEC)	BE1	BE2

Power rating	Motor types	Brake, standard	Brake, option
1.1 kW	DT90S4, 50 Hz, 400 V (IEC)	BMG2	–
	DZ90S4, 60 Hz, 380 V (ABNT)	–	BMG2
	DRE80M4, 60 Hz, 380 V (ABNT)	BE2	BE1
	DRE90M4, 50/60 Hz (global)	BE2	BE1
	DRN90S4, 50/60 Hz (global)	BE2	BE1
	DRS80M4, 50 Hz, 400 V (IEC)	BE2	BE1
	DRS80M4, 60 Hz, 460 V (IEC)	BE2	BE1
	DRE90M4, 50 Hz, 400 V (IEC)	BE2	BE1
	DRE90M4, 60 Hz, 460 V (IEC)	BE2	BE1
	DRN90S4, 50 Hz, 400 V (IEC)	BE2	BE1
	DRN90S4, 60 Hz, 460 V (IEC)	BE2	BE1
	DRN90S4, 60 Hz, 460 V (ABNT)	BE2	BE1
	DR2S80M4, 50 Hz, 400 V (IEC)	BE2	BE1
	DR2S80M4, 60 Hz, 460 V (IEC)	BE2	BE1
	DRE80SJ4, 50 Hz, 400 V (IEC)	BE2	BE1
	DRU90MJ4, 50 Hz, 400 V (IEC)	BE2	BE1
1.5 kW (star connection only)	DT90L4, 50 Hz, 400 V (IEC)	BMG2	–
	DZ90L4, 60 Hz, 380 V (ABNT)	–	BMG2
	DRE90M4, 60 Hz, 380 V (ABNT)	BE2	BE1
	DRE90L4, 50/60 Hz (global)	BE2	BE1
	DRN90L4, 50/60 Hz (global)	BE2	BE1
	DRS90M4, 50 Hz, 400 V (IEC)	BE2	BE1
	DRS90M4, 60 Hz, 460 V (IEC)	BE2	BE1
	DRE90L4, 50 Hz, 400 V (IEC)	BE2	BE1
	DRE90L4, 60 Hz, 460 V (IEC)	BE2	BE1
	DRN90L4, 50 Hz, 400 V (IEC)	BE2	BE1
	DRN90L4, 60 Hz, 460 V (IEC)	BE2	BE1
	DRN90L4, 60 Hz, 460 V (ABNT)	BE2	BE1
	DRE80MJ4, 50 Hz, 400 V (IEC)	BE2	BE1
	DRU90LJ4, 50 Hz, 400 V (IEC)	BE2	BE5

10.8 Safety technology

10.8.1 Safety-related characteristic value STO

Characteristic safety values	
Approved safety classes	Performance Level d to EN ISO 13849-1 SIL 2 to EN 61800-5-2
Probability of dangerous failure per hour (= PFHd value)	0 (fault exclusion)
Service life or proof test interval in accordance with EN 61508	20 years, after which the component must be replaced with a new one
Safe state	Safe Torque Off (STO)

10.8.2 STO interfaces

X5502		
Control voltage range for a safe state	Pin 2, 4	DC 0 V – 5 V
Maximum permitted residual current in safe state	Pin 2, 4	DC 10 mA
Control voltage range for a non-safe state	Pin 2, 4	DC 18 V – 30 V
Nominal output current	Pin 1, 3	DC 500 mA
Output current limit	Pin 1, 3	Max. DC 2 A (until thermal switch-off)
Power consumption	Pin 2, 4	4 W (plus the additional power at the electronics port of an optional external axis)
Input capacitance	Pin 2, 4	100 µF (plus the additional capacity at the electronics port of an optional external axis)

10.9 Communication and control unit

10.9.1 Control type

INFORMATION



The overall output power of the 24 V voltage supply at the plug connectors for buses and digital inputs/outputs must not exceed 48 W.

Type	FHM35A
Engineering	Engineering is performed via the Ethernet service interface and the plant software MOVIVISION®.

Binary inputs	
Compatibility	PLC-compatible according to IEC 61131-2:2008-04 type 3 "Standard operating ranges for digital inputs (current sinking)"
Internal resistance	≈ 4.5 kΩ
Current consumption	≈ 5.3 mA
High level	DC +13 V – +30 V
Low level	DC -3 V – +5 V
Switch-on delay	typ. 250 μs
Power off delay	typ. 250 μs

Binary outputs	
Compatibility	PLC-compatible to IEC 61131-2:2008-04 "Rated values and operating ranges for current sourcing digital a.c. outputs" All outputs are short-circuit proof, protected against overload and external-voltage-proof up to 30 V.
Nominal current	Max. DC 500 mA per digital output
Output current limit	Maximum 1.1 A
Inductive loads	Dissipation of inductive switch-off energy up to 1 J per output at X5001 Freewheeling diodes are not integrated.
Low level	DC 0 V
High level	DC 24 V ± 10%
Switch-on delay	typ. 100 μs
Power off delay	typ. 150 μs

24 V voltage supply for buses	
Nominal voltage	DC 24 V ± 10%
Nominal current	Max. DC 500 mA per connection
Output current limit	Maximum 1.1 A The continuous output current must not exceed 500 mA.

10.9.2 Ethernet interfaces

Ethernet interfaces X4223, X4233, X4251		
Format		IEEE 802.3
	X4223	10BASE-T, 100BASE-TX, 1000BASE-T
	X4233, X4251	10BASE-T, 100BASE-TX
Maximum cable length		100 m according to IEEE 802.3

10.9.3 CAN interfaces

CAN interfaces X4101, X4111	
General information	According to CAN specification 2.9, parts A and B Transmission technology according to ISO 11898 A maximum of 64 stations
Baud rate	125 kBaud – 1 MBaud
Maximum cable length	Depends on the baud rate according to CAN specification
Bus termination	120 ohm internal termination

10.9.4 RS485 interfaces

RS485 interfaces X4011/X4001	
General information	EIA485 standard
Baud rate	2.4 – 115.2 kBaud
Bus termination	The interface is terminated internally with a dynamic terminating resistor.

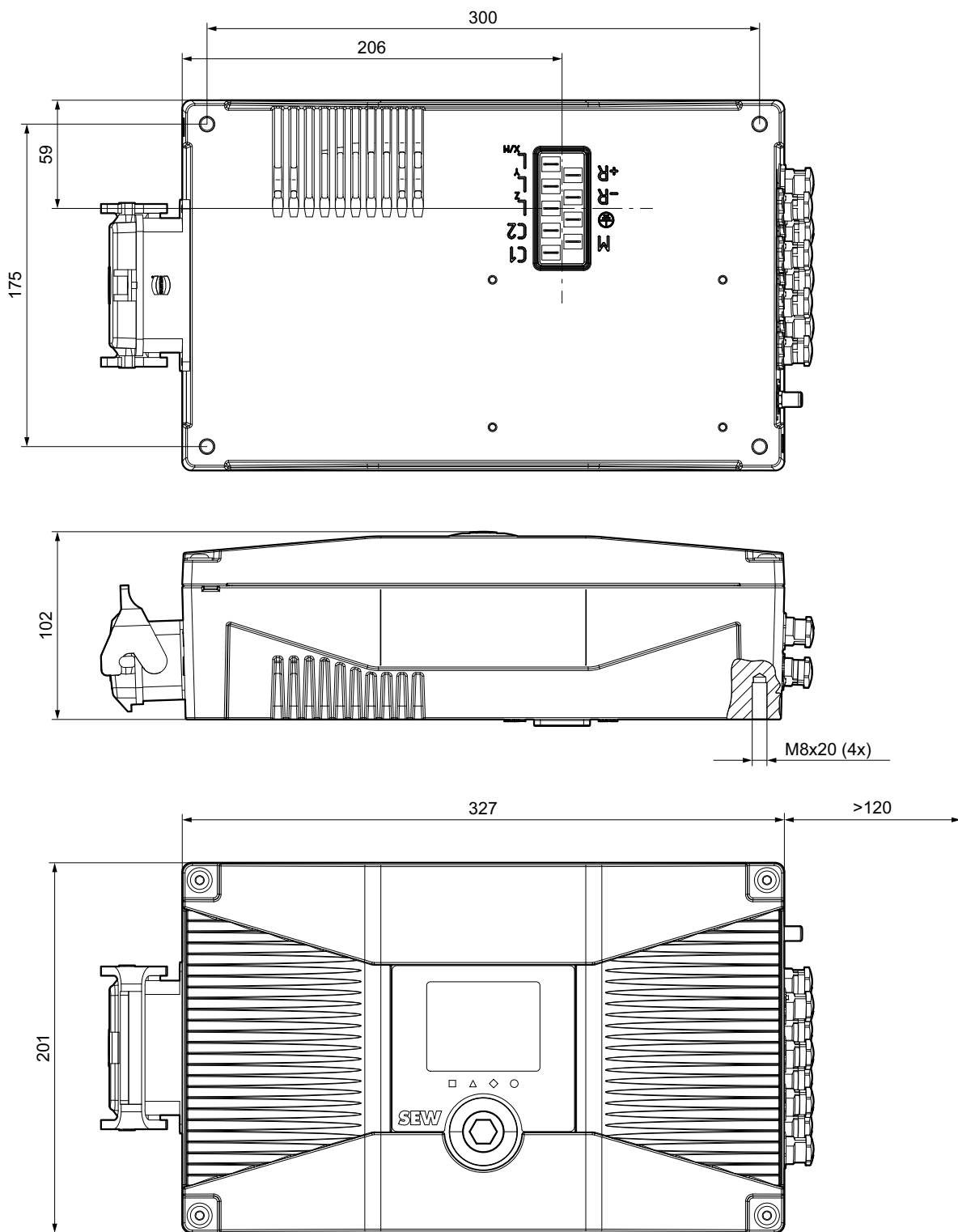
10.10 Ports and services

For information on the product's Wi-Fi- and Ethernet-based ports and services, refer to the following documentation:

- "Ports and services for Wi-Fi- and Ethernet-based communication" manual

10.11 Dimension drawing

The dimension drawing shows the mechanical dimensions in mm:



The recommended minimum clearance for connection cables and plug connectors in the dimension drawing can vary depending on the cables used.

11 Contacting SEW-EURODRIVE

You can find the worldwide contact data and locations on the **SEW-EURODRIVE website** via the following link or the QR code shown below.

<https://www.sew-eurodrive.de/contacts-worldwide>



SEW
EURODRIVE



Index

A

A11	73
A12	74
Acknowledging fault messages	82
Antennas	
Near field coupler	73, 74
Vehicle coupler	73, 74
Assembly	
Safety notes	14

B

Brake control	21
---------------------	----

C

Cable design	50
Cable routing	41
Caution signs	21
CDF, see relative cyclic duration factor	77
Characteristic safety values	96
Cleaning	85
Conditions, safety	30
Requirements for the installation	31
Requirements for the safety controller	32
Requirements on startup	32
Conditions, safety-related	
Requirements for operation	33
Connection	
Conductor rail	52
Digital input	70
Motor with brake control	54
Motor with brake controller	56
Connection block	49
Connection component	
CAN terminating resistor	61, 64
Connection components	
50 Ω terminating resistor	73, 74
CAN T-piece	61, 64
M12 parameter memory	67
PZO00A-SAZIR0-C000-03 display unit	61
STO jumper plug	72
Connection via M12 connector	
External safety relay	34
Connections	50
Contactors	48

Controller	22
Cooling	37
Derating	13, 91
Installation altitude	13, 91
Copyright notice	8

D

Decimal separator	7
Derating	13
Diagram	91
Designated use	12
Device	
Replacement	84
Shutting down the device	86
Dimension drawing	99
Duty types	78

E

Electrical hazard	42
Electrical installation	14, 39
Cable routing	41
Safety notes	14
Electromagnetic compatibility (EMC)	40
Embedded safety notes	7
EMC (electromagnetic compatibility)	40
EMC conditions	31
EMC-compliant installation	41
Emergency stop	82
Encryption	24
Error messages	79
Ethernet interface	23
Ethernet service interface	22
Extended storage	86
External safety controller, requirement for	32
External safety relay, requirement for	32

F

Fault information	81
Fieldbus interface	23
Frequency inverter	21
Function units	21
Functional safety technology	
Safety note	14
Fuse	47

G

Ground connection	42
Device without braking resistor	43
Grounded star point.....	39

H

Hazard symbols	
Meaning.....	6
Hybrid cables.....	31

I

Immediate stop	81
Infrared interface	22
Input fuse	47
Inspection	84
Installation	38
Ground connection	42
UL-compliant	39
Installation notes	39
Derating.....	13
Installation altitude > 1000 m	13
Installation regulations.....	31
Integrated safety technology	
Safety subfunctions	28

L

Lifting applications	13
Limitations	30
Line fuse	47
Line protection.....	47

M

M12 parameter memory	67
MAC address label	20
Maintenance	84
Markings	89
Maximum line length	33
Mechanical installation	
Cooling	37
Installation	38
Minimum clearance	37
Mounting position	36
Waste heat	37
Memory card	
Device replacement.....	85
Minimum clearance	37

Motor types	21, 39
Mounting position.....	36
MOVIMOT®	21

N

Nameplate	
Main nameplate	19
Notes	
Designation in the documentation	6
Meaning of the hazard symbols.....	6

O

Operation	
Duty types.....	78
Safety notes.....	15

P

Parameterization.....	76
Preventive measures against electrical hazards .	42
Probability of a dangerous failure	32, 96
Product names.....	8
Protective bonding	42
Protective separation	15

R

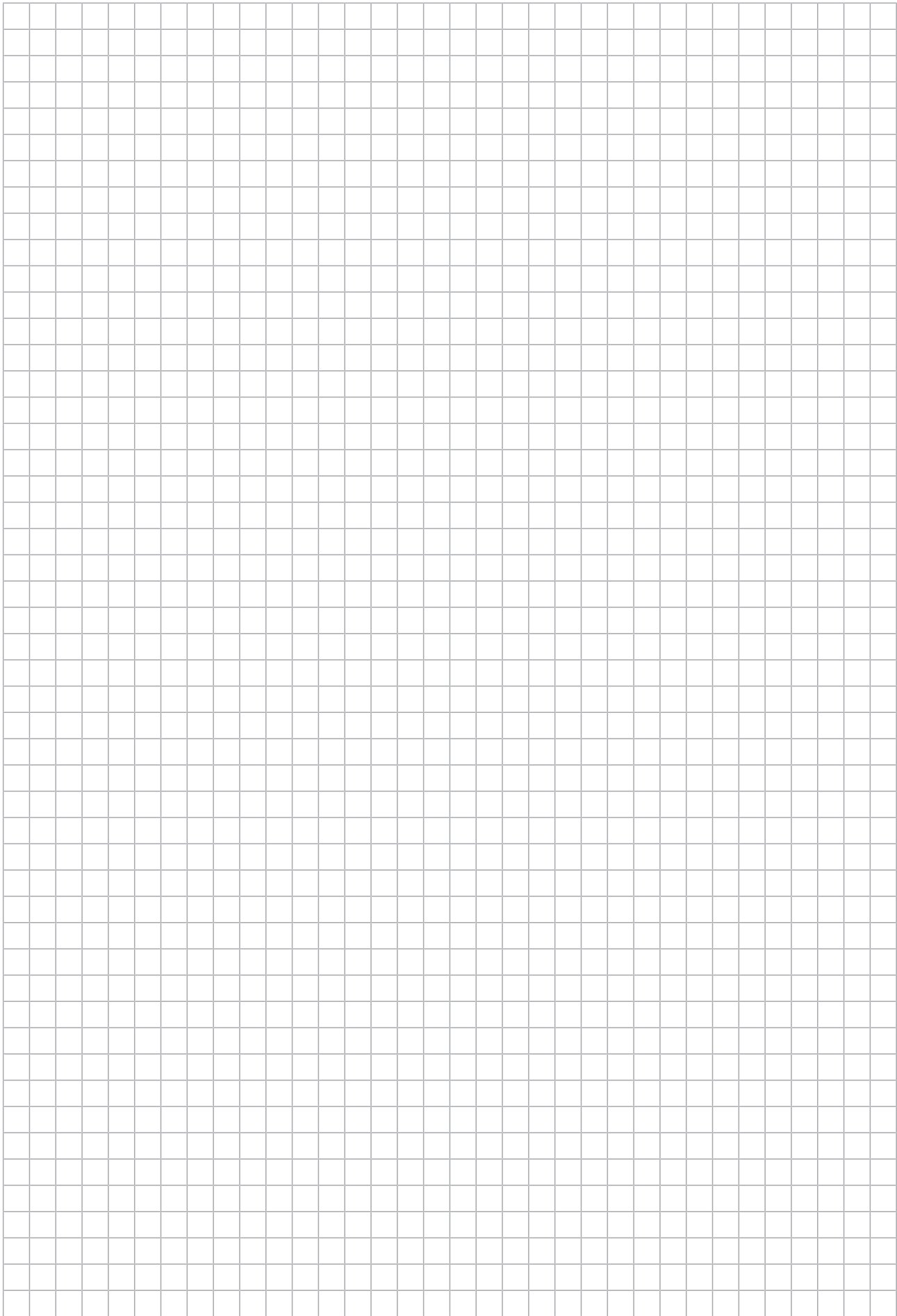
Rapid stop.....	81
RCD (residual current device)	47
Relative cyclic duration factor	77
Removing jumpers	31
Removing stored data.....	87
Repair	84
Requirement	
For external safety controller	32
For installation	31
For operation	33
For startup	32
Reset	82
Reset, manual.....	82
Residual current device	47
Restriction of use	13
Rights to claim under limited warranty	7

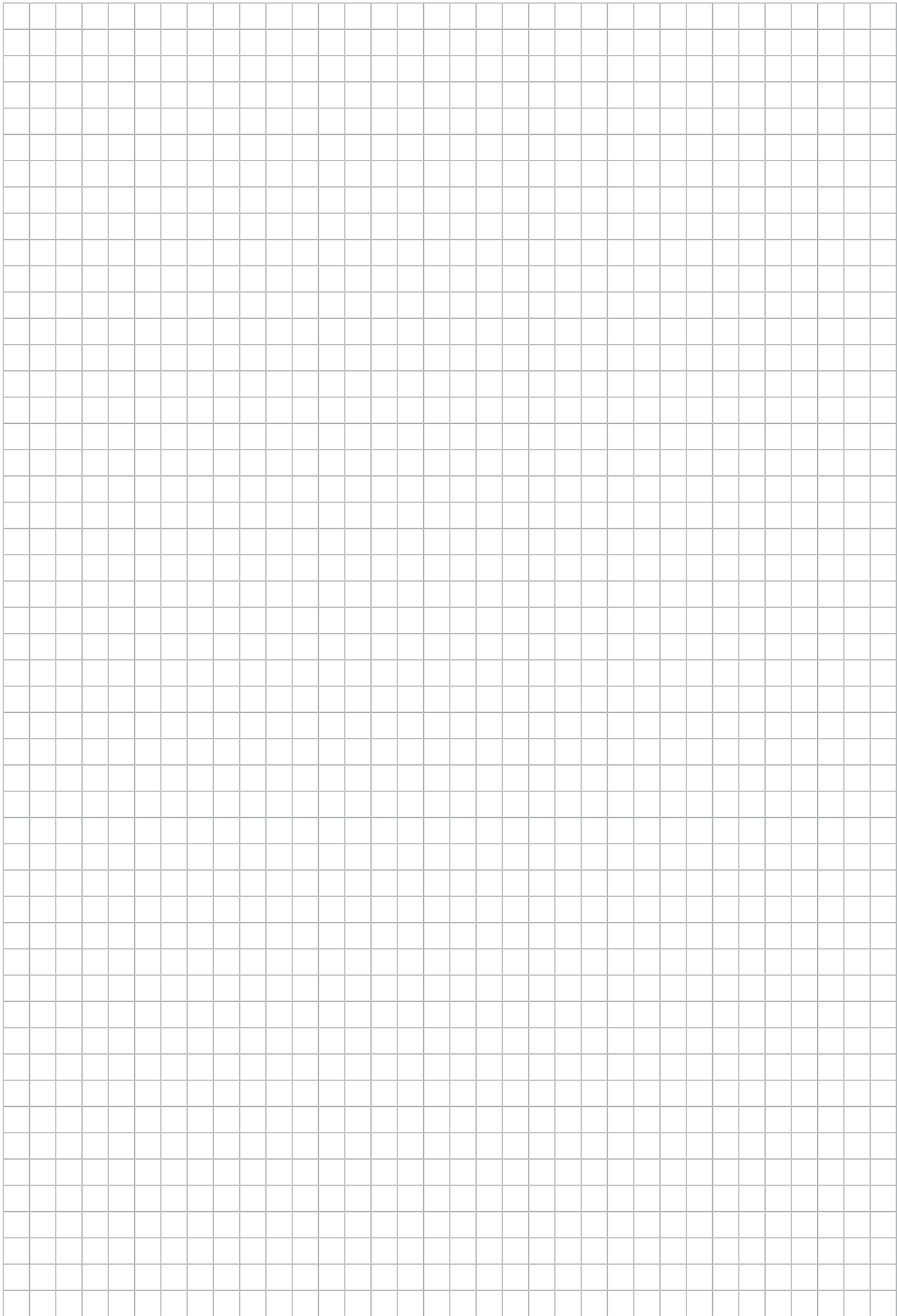
S

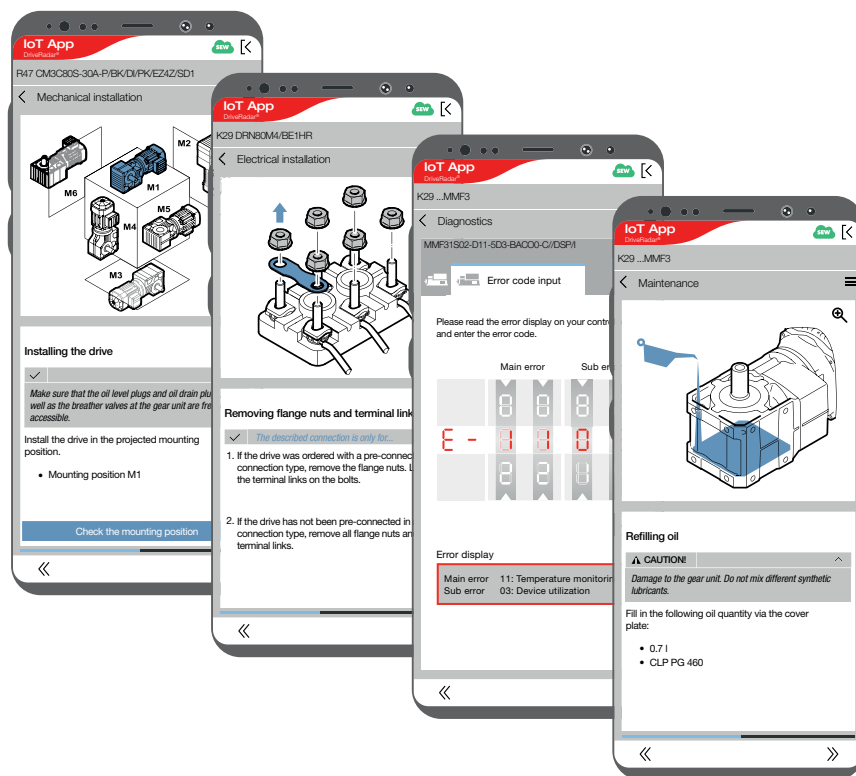
Safe state.....	27, 96
Safety conditions	30
Safety controller, requirement for	32

Safety notes		Storage	86
Assembly	14	Switch-off responses	81
Installation	14	T	
Installation altitude > 1000 m	13	Tapped holes	38
Meaning of the hazard symbols	6	Target group	9
Operation	15	Technical data	
Preliminary information	9	Axis data	92
Regenerative operation	15	CAN interfaces	98
Startup	15	General information	90
Structure of section-related safety notes	6	Input data	91
Structure of the embedded safety notes	7	Motor types	93
Safety relay		Output data	92
Requirement for	32	RS485 interfaces	98
Safety sub-function	14	Safety technology	96
Safety subfunctions	28	TN system	39
Safety sub-functions		Trademarks	8
SS1-t – Safe Stop 1	29	Transport	14
STO – Safe Torque Off	28	TT system	39
Safety technology		U	
Limitations	30	UL-compliant installation	39
Safe state	27	Unit overview	18
Technical data	96	Usage	12
Scope of delivery	18	V	
SD memory card		Verification of disconnection devices	33
Device replacement	85	Verifying safety functions	32
Section-related safety notes	6	W	
Separation, protective	15	Warnings	
Service	85	Designation in the documentation	6
Device replacement	84, 85	Waste heat	37
Service interface	22	Wi-Fi security standards	24
Service unit	22	Wiring diagrams	50
Shielding	42	Wiring specifications	31
Shutdown	86	WLAN security	24
Signal words in safety notes	6	X	
Software	76	X1261	52
SS1-t – Safe Stop 1	29	X2013	54
Startup		X2014	56
Safety notes	15	X4011	58
Startup procedure	76	X4101	59
Startup procedure	76	X4111	62
Status display	22	X4233	65
Status LED	22	X4251	66
Status LEDs	80		
Status reports	79		
STO – Safe Torque Off	28		

X4441	67	X5003	70
X5002_1	68	X5502	71
X5002_2	69		







<https://iotapp.io>



THE GREEN SIDE OF DRIVE

Documentation and technical information on your smartphone –
paperless and always available





SEW-EURODRIVE
Driving the world

SEW
EURODRIVE

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