



SEW
EURODRIVE

Operating Instructions



Contactless Energy Transfer System
MOVITRANS® TES31A Decentralized Supply Unit



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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 further components.

1.3 Structure of the safety notes

1.3.1 Meaning of signal words

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

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

1.3.2 Structure of section-related safety notes

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

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



SIGNAL WORD

Type and source of hazard.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the hazard.

Meaning of the hazard symbols

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

Hazard symbol	Meaning
	General hazard
	Warning of dangerous electrical voltage
	No access for persons with pacemakers or implanted defibrillators.
	Warning of hot surfaces
	Warning about suspended load
	Warning of automatic restart

1.3.3 Structure of embedded safety notes

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

This is the formal structure of an embedded safety note:

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

1.4 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 Product names and trademarks

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

1.7 Copyright notice

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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:

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

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

2.3 Electromagnetic fields

Observe national installation regulations, such as the DGUV (German Social Accident Insurance) regulation 15 – "Electromagnetic fields" as well as DIN EN 12198-1:2000+A1:2008 during installation, startup, and operation of systems with contactless energy transfer by induction for use in industrial workplaces.

2.4 Target group

Specialist for mechanical work	Any mechanical work may be performed only by adequately qualified specialists. Specialists in the context of this documentation are persons who are familiar with the design, mechanical installation, troubleshooting, and maintenance of the product who possess the following qualifications: • Qualification in the mechanical area 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 who possess the following qualifications: • Qualification in the electrotechnical area in accordance with the national regulations • Familiarity with this documentation
Additional qualification	In addition to that, these persons must be familiar with the valid safety regulations and laws, as well as with the requirements of the standards, directives, and laws specified in this documentation. The persons must have the express authorization of the company to operate, program, parameterize, label, and ground devices, systems, and circuits in accordance with the standards of safety technology.
Instructed persons	All work in the areas of transportation, storage, operation and waste disposal must be carried out by persons who are trained appropriately. The purpose of the instruction is to give persons the ability to perform the required tasks and work steps in a safe and correct manner.

2.5 Designated use

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

The product is intended for stationary use in industrial and commercial systems with contactless energy transfer systems.

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.

Technical data and information on the connection conditions are provided on the nameplate and in the 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

You may use options and accessories from SEW-EURODRIVE exclusively in connection with products from SEW-EURODRIVE.

2.6 Functional safety technology

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

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 is damaged, it must not be assembled, installed or started up.

Observe the following notes when transporting the device:

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

If necessary, use suitable, sufficiently dimensioned handling equipment.

Observe the information on climatic conditions in the chapter "Technical data" 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" (→ 23) in the documentation.

2.8.1 Restrictions of use

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

- Use in potentially explosive atmospheres
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, and radiation
- Operation in applications with impermissibly high mechanical vibration and shock loads in excess of the regulations stipulated in EN 61800-5-1
- Use at an elevation of more than 2000 m above sea level

The product can be used at altitudes above 1000 m above sea level up to 2000 m above sea level under the following conditions:

- Taking the reduced nominal output current into consideration, see chapter "Technical data" of the documentation.

2.8.2 Low-Temperature Applications

At ambient temperatures below -5 °C (e.g. with cold store applications) the material properties of the product change due to the cold.

To prevent damages to the product, observe the following notes in case of such low temperatures:

- Do not loosen any plug-in connections.
- Do not expose the product to high mechanical loads.
- Only perform inspection or maintenance work at higher temperatures.

2.9 Electrical installation

Ensure that all of the required covers are correctly attached after carrying out 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 preventive measure

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

2.10 Protective separation

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

2.11 Startup/operation

Observe the safety notes in the chapters "Startup" (→ 79) and "Operation" (→ 105) in this documentation.

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 preventive measures may be required for applications with increased hazard potential. Be sure to check the effectiveness of the protection devices after every modification.

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

When the device is switched on, dangerous voltages are present at all power connections as well as at any connected cables and terminals. This is also the case even if the product is inhibited.

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

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 LED and other 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.

Cover unused connections with the supplied protection caps during operation.

Mechanical blocking or internal protective functions of the product can cause the power to interrupt. Removing the cause of this problem or performing a reset can result in the machine or system restarting on its own. If this is not permitted for the drive-controlled machine or system for safety reasons, first disconnect the product from the supply system and then start troubleshooting.

Risk of burns: The surface temperature of the product can exceed 60 °C during operation. Do not touch the product during operation. Let the product cool down before touching it.

3 Device structure

3.1 Type designation

TES31A	MOVITRANS® stationary supply unit	
...	Nominal power:	
	030	3.2 kW
	080	8 kW
	140	14 kW
	160	16 kW
–		
E	Increased degree of protection	
F	Heat sink and fan	
.	Load current:	
	1	12 A (1 load connection)
	3	30 A (1 load connection)
	4	42.5 A (1 load connection)
	6	60 A (2 load connections)
	7	75 A (2 load connections)
	8	85 A (2 load connections)
–		
5	Connection voltage: AC 400/500 V	
.	Radio interference suppression level:	
	A	C1
	B	C2
3	Connection type: 3-phase	
–		
.	System frequency:	
	A	25 kHz
	B	50 kHz
	C	140 kHz
	E	20 kHz

3.2 Short designation

The following short designations are used in this documentation:

Device	Short designation
MOVITRANS® TES31A030-EF3-5B3-B decentralized supply unit (3.2 kW, 50 kHz, 30 A)	Device
MOVITRANS® TES31A080-EF3-5B3-A decentralized supply unit (8 kW, 25 kHz, 30 A)	Device
MOVITRANS® TES31A080-EF4-5B3-A decentralized supply unit (8 kW, 25 kHz, 42.5 A)	Device
MOVITRANS® TES31A080-EF6-5B3-A decentralized supply unit (8 kW, 25 kHz, 60 A)	Device
MOVITRANS® TES31A080-EF8-5B3-A decentralized supply unit (8 kW, 25 kHz, 85 A)	Device
MOVITRANS® TES31A080-EF3-5B3-B decentralized supply unit (8 kW, 50 kHz, 30 A)	Device
MOVITRANS® TES31A080-EF6-5B3-B decentralized supply unit (8 kW, 50 kHz, 60 A)	Device
MOVITRANS® TES31A140-EF3-5B3-B decentralized supply unit (14 kW, 50 kHz, 30 A)	Device
MOVITRANS® TES31A140-EF6-5B3-B decentralized supply unit (14 kW, 50 kHz, 60 A)	Device
MOVITRANS® TES31A160-EF7-5B3-E decentralized supply unit (16 kW, 20 kHz, 75 A,)	Device
MOVITRANS® TES31A160-EF3-5B3-A decentralized supply unit (16 kW, 25 kHz, 30 A)	Device
MOVITRANS® TES31A160-EF4-5B3-A decentralized supply unit (16 kW, 25 kHz, 42.5 A)	Device
MOVITRANS® TES31A160-EF6-5B3-A decentralized supply unit (16 kW, 25 kHz, 60 A)	Device
MOVITRANS® TES31A160-EF8-5B3-A decentralized supply unit (16 kW, 25 kHz, 85 A)	Device

3.3 Scope of delivery

The scope of delivery includes the following components:

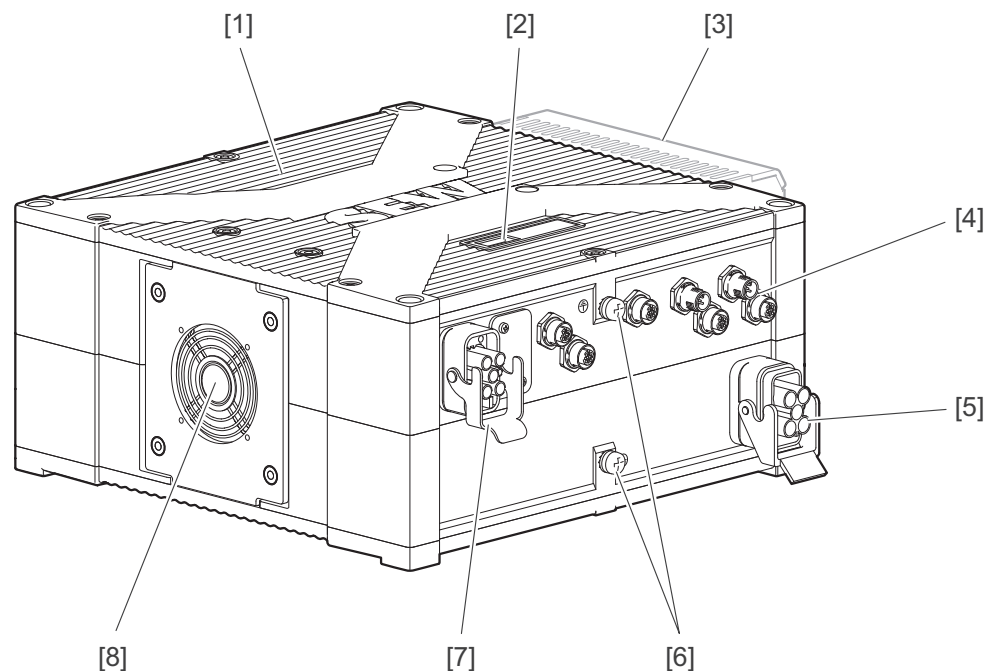
Component
MOVITRANS® TES31A030-EF3-5B3-B decentralized supply unit (3.2 kW, 50 kHz, 30 A)
or
MOVITRANS® TES31A080-EF3-5B3-A decentralized supply unit (8 kW, 25 kHz, 30 A)
or
MOVITRANS® TES31A080-EF4-5B3-A decentralized supply unit (8 kW, 25 kHz, 42.5 A)
or
MOVITRANS® TES31A080-EF6-5B3-A decentralized supply unit (8 kW, 25 kHz, 60 A)
or
MOVITRANS® TES31A080-EF8-5B3-A decentralized supply unit (8 kW, 25 kHz, 85 A)
or
MOVITRANS® TES31A080-EF3-5B3-B decentralized supply unit (8 kW, 50 kHz, 30 A)
or
MOVITRANS® TES31A080-EF6-5B3-B decentralized supply unit (8 kW, 50 kHz, 60 A)
or
MOVITRANS® TES31A140-EF3-5B3-B decentralized supply unit (14 kW, 50 kHz, 30 A)
or
MOVITRANS® TES31A140-EF6-5B3-B decentralized supply unit (14 kW, 50 kHz, 60 A)
or
MOVITRANS® TES31A160-EF7-5B3-E decentralized supply unit (16 kW, 20 kHz, 75 A,)
or
MOVITRANS® TES31A160-EF3-5B3-A decentralized supply unit (16 kW, 25 kHz, 30 A)
or
MOVITRANS® TES31A160-EF4-5B3-A decentralized supply unit (16 kW, 25 kHz, 42.5 A)

Component	
or	
MOVITRANS® TES31A160-EF6-5B3-A decentralized supply unit (16 kW, 25 kHz, 60 A)	
or	
MOVITRANS® TES31A160-EF8-5B3-A decentralized supply unit (16 kW, 25 kHz, 85 A)	
Protective covers for all plug connectors	
Component	Part number
2× jumper plug	11747099

3.4 Device overview

Devices with a load current of 12 A, 30 A, 42.5 A with 1 load connection

The following figure shows the device structure:

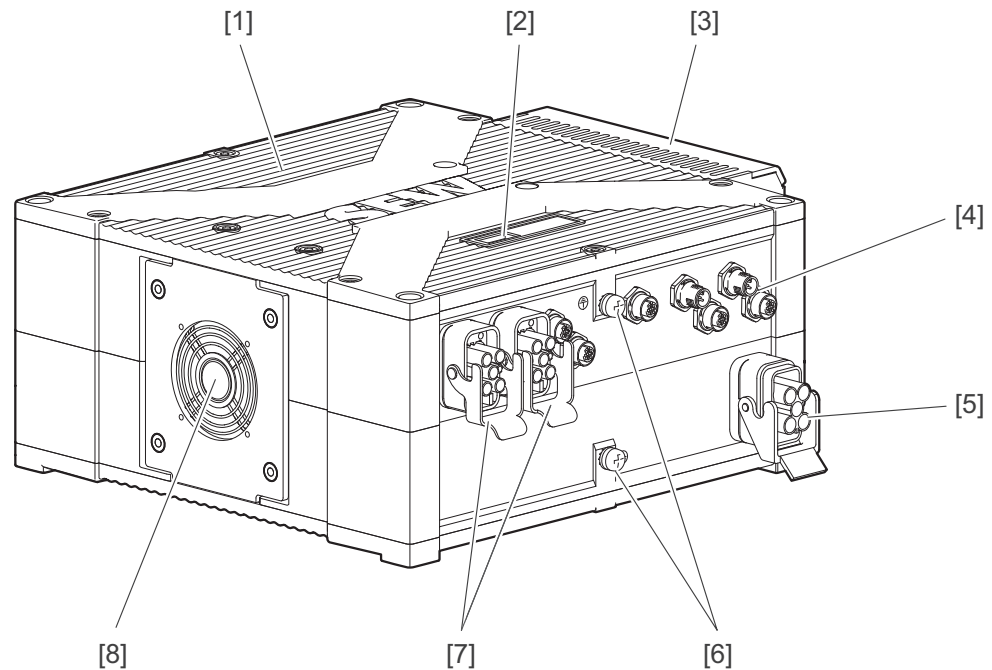


27021618392778379

- [1] Housing
- [2] Display elements
- [3] Gyrator 8 kW
- [4] Signal and bus connections
- [5] Line connection
- [6] Connection for ground connection (PE)
- [7] Load connection
- [8] Fan

Devices with a load current of 60 A, 75 A, 85 A with 2 load connections

The following figure shows the device structure:

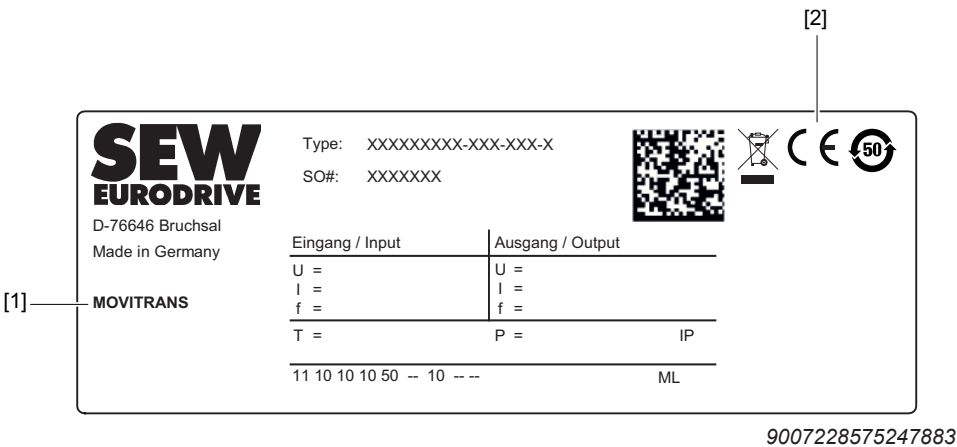


9007222535252491

- [1] Housing
- [2] Display elements
- [3] Gyrator 8 kW
- [4] Signal and bus connections
- [5] Line connection
- [6] Connection for ground connection (PE)
- [7] Load connection
- [8] Fan

3.5 Nameplate

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



- [1] Product name
- [2] Approval identification

Depending on the product design, the following information is listed on the nameplate:

Value	Specification
Type	Type designation
SO#	Serial number
U	Voltage
I	Current
f	Frequency
T	Ambient temperature
P	Rated output power
IP	Degree of protection

3.6 Accessories

3.6.1 Accessory components

	Part number
PC CAN interface adapter	18210597
Note that the connection cable M12 ↔ D-sub (part number 18125751) as well as the D-sub gender changer (part number 19188714) must be ordered separately.	
Fan subassembly with connection cable and connector for the following devices: • All 14 kW devices • All 16 kW devices • TES31A080-EF6-5B3-B (50 kHz, 60 A, 8 kW) • TES31A080-EF3-5B3-B (50 kHz, 30 A, 8 kW)	28230337
Fan subassembly with connection cable and connector (for all other devices)	28241517



INFORMATION

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



INFORMATION

For available connection cables, refer to chapter "Electrical connections" (→ 35).

Compensation box

The following components are available for the track compensation:

	Other applicable documentation
MOVITRANS® compensation box TCS31A	Operating instructions MOVITRANS® compensation box TCS31A
MOVITRANS® compensation box TCS10B	Operating instructions MOVITRANS® installation material TCS, TVS, TLS, TIS



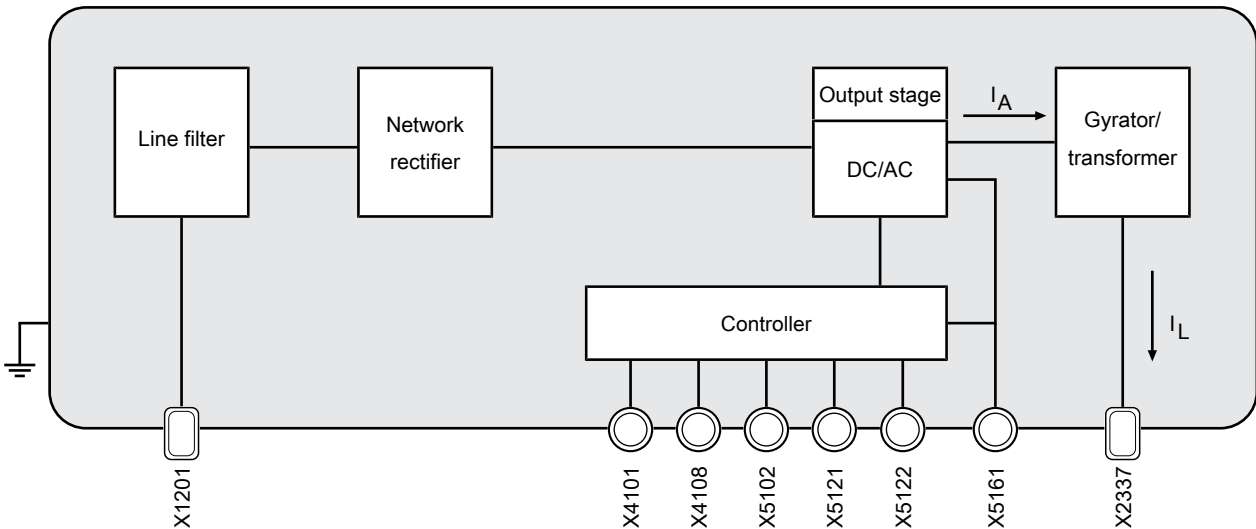
INFORMATION

On simple tracks, one TCS31A compensation box is adequate. On longer tracks, you may also use one or several TCS10B compensation boxes. You can find information about determining the number of compensation boxes in the MOVITRANS® configuration manual.

For further information on compensation, refer to the chapter "Compensation" (→ 102).

3.7 Operating principle

The block diagram below shows the basic structure of the device:



20628791435

X1201	AC 400 V input
X4101	CAN system bus – output (System bus 1)
X4108	CAN system bus – input (System bus 1)
X5102	Digital inputs/outputs of power section
X5121	Synchronization signal MOVITRANS® – output
X5122	Synchronization signal MOVITRANS® – input
X5161	Input for dual-channel disconnection of the power section (output stage inhibit) without safety function
X2337	Load connection of the line cables 1 and 2

4 Mechanical installation

4.1 Requirements



⚠ WARNING

Risk of crushing if the load falls.

Severe or fatal injuries.

- Do not stand under the load.
- Secure the area where loads can fall down.

NOTICE

Risk of collision.

Damage to plant and device components.

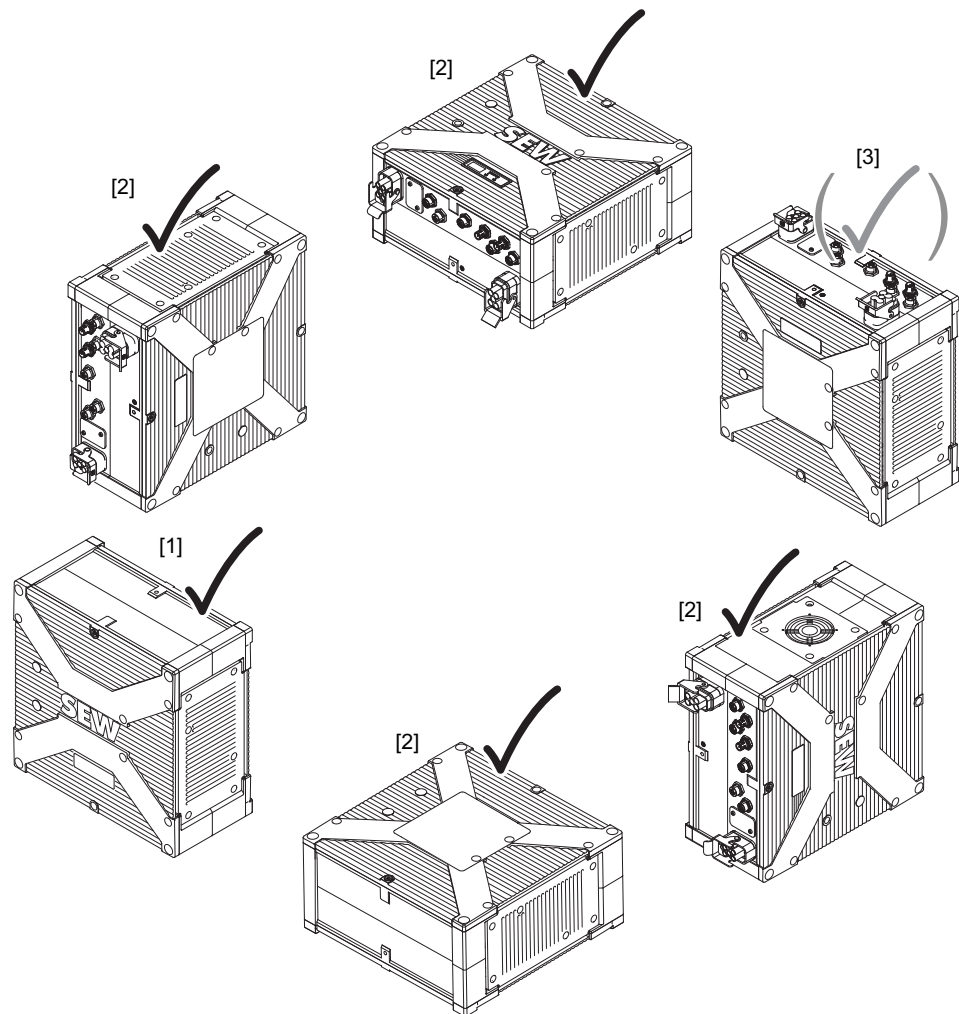
- Always position the device so that it will not collide with other components, design elements or persons along the travel path.

Comply with the following prerequisites:

- 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" (→ 24).
- The device is only mounted using the intended mounting options.
- 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 type of fixture. For more information, refer to chapter Assembly.
- The mounting and locking elements fit into the existing bores, threads and counter-sinks.
- All display and actuator elements are visible and accessible after installation.

4.2 Mounting position

The following figure shows permitted and not permitted mounting positions:



23873802251

- [1] Preferred mounting position
- [2] Permitted mounting position
- [3] Conditionally permitted mounting position (only after consultation with SEW-EURODRIVE)

4.3 Minimum clearance

Keep a minimum distance of 300 mm around the device.

4.4 Waste heat

Make sure that

- waste heat can be dissipated by the fan at the side of the device
- sufficient ventilation of the device is ensured
- the device is not located in the immediate vicinity of other heat sources
- a minimum clearance of 300 mm is observed if several devices are used

4.5 Installation

NOTICE

Damage due to high external forces.

Damage to the thread or the screw.

- Do not exceed the maximum permitted tightening torque.

To attach the device, it is equipped with 4 through bores in the corners with a diameter of 6.8 mm and M8 threads on both sides.

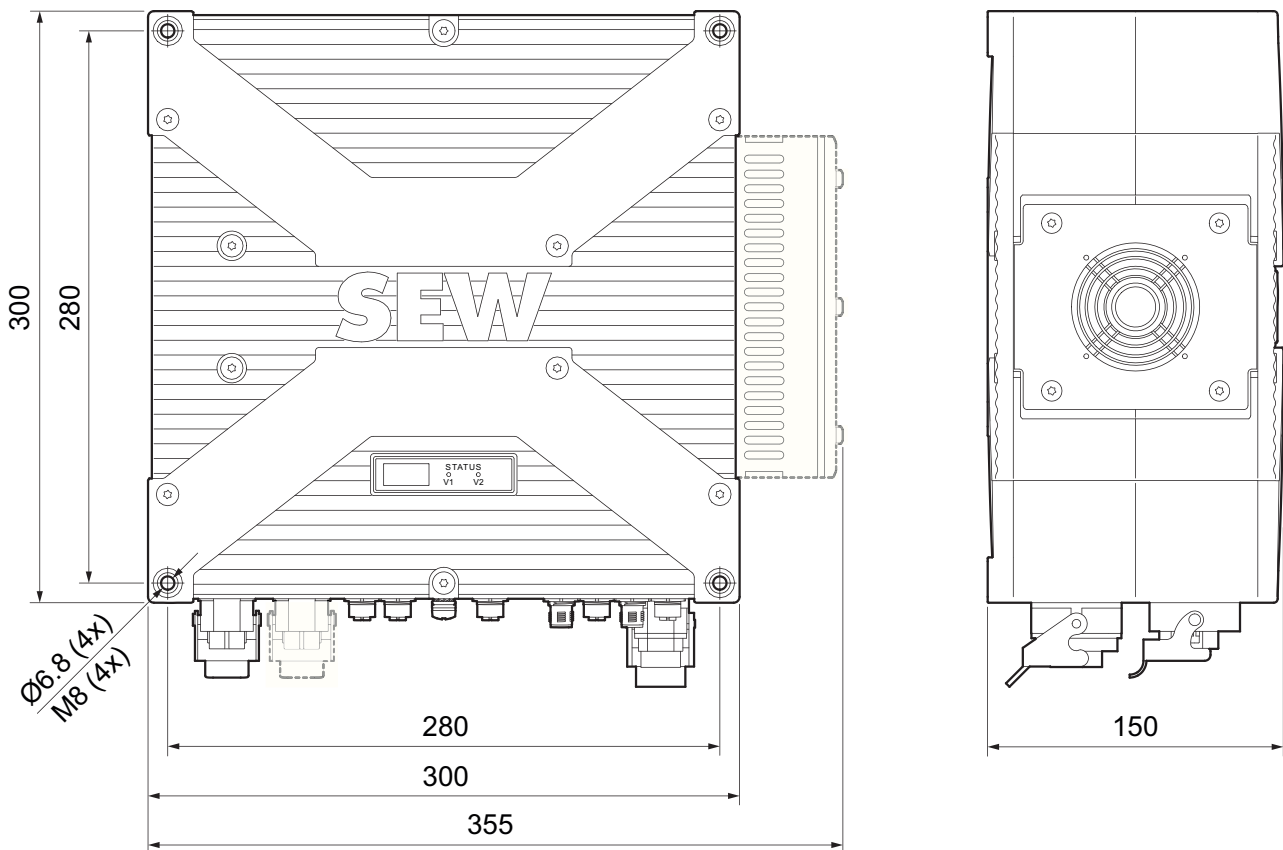
Observe the following:

- The maximum permitted tightening torque for the retaining screws is 6 Nm.
- When selecting and dimensioning the mounting and safety elements, observe the applicable standards, the technical data of the device, and the local circumstances.
- Only use mounting and locking elements that fit into the existing bores, threads and countersinks.
- Observe the respective minimum distances and clearances, see chapter "Minimum clearance" (→ 24).
- Observe the connector dimensions and minimum permitted bending radii of the connection cables, see chapter "Electrical connections" (→ 35).

4 Mechanical installation

Installation

The following figure shows the required dimensions in mm:



18014422128827787

5 Electrical installation

5.1 Installation notes

Observe the following points for electrical installation:

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

5.2 Low-voltage supply systems

The device is suited and allowed for operation in the following systems:

- TN and TT systems with directly grounded star point
- IT systems with non-grounded star point

SEW-EURODRIVE recommends using insulation monitors with pulse-code measurement. The use of such devices prevents the earth-leakage monitor from mis-tripping due to the earth capacitance of the inverter.

No EMC limits are specified for interference emission in IT systems.

5.3 Cable routing

Observe the following when routing the cables:

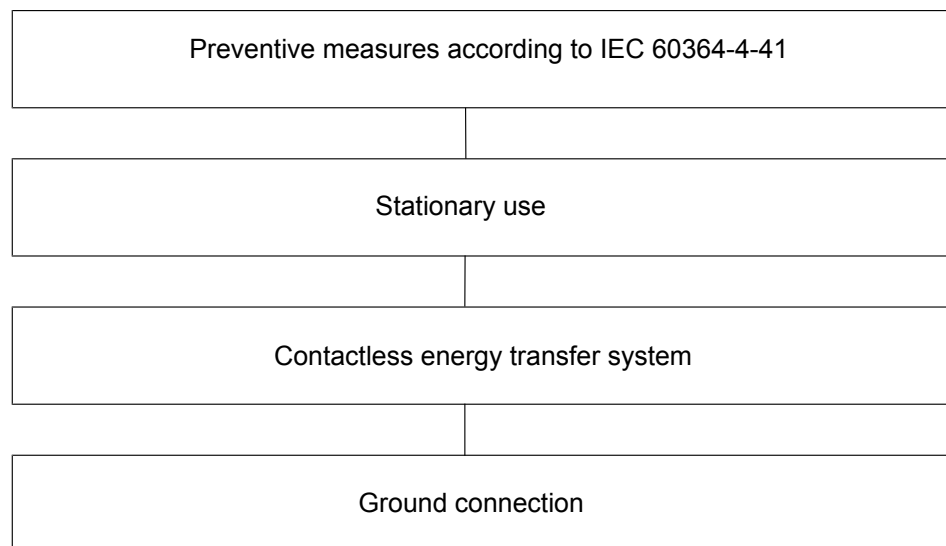
- Use suitable cables to connect power supply and communication. For more information on connection descriptions, refer to the chapter "Electrical connections" (→ 35).
- Route power cables and signal cables in separate cable ducts.
- Maintain the greatest possible distance between power cables and signal 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".

5.4 Protective measures against electrical hazards

5.4.1 Overview

The following figure is an overview of the protective measures against electrical hazards:



25798566539

5.4.2 Installing ground connection or equipotential bonding



⚠ WARNING

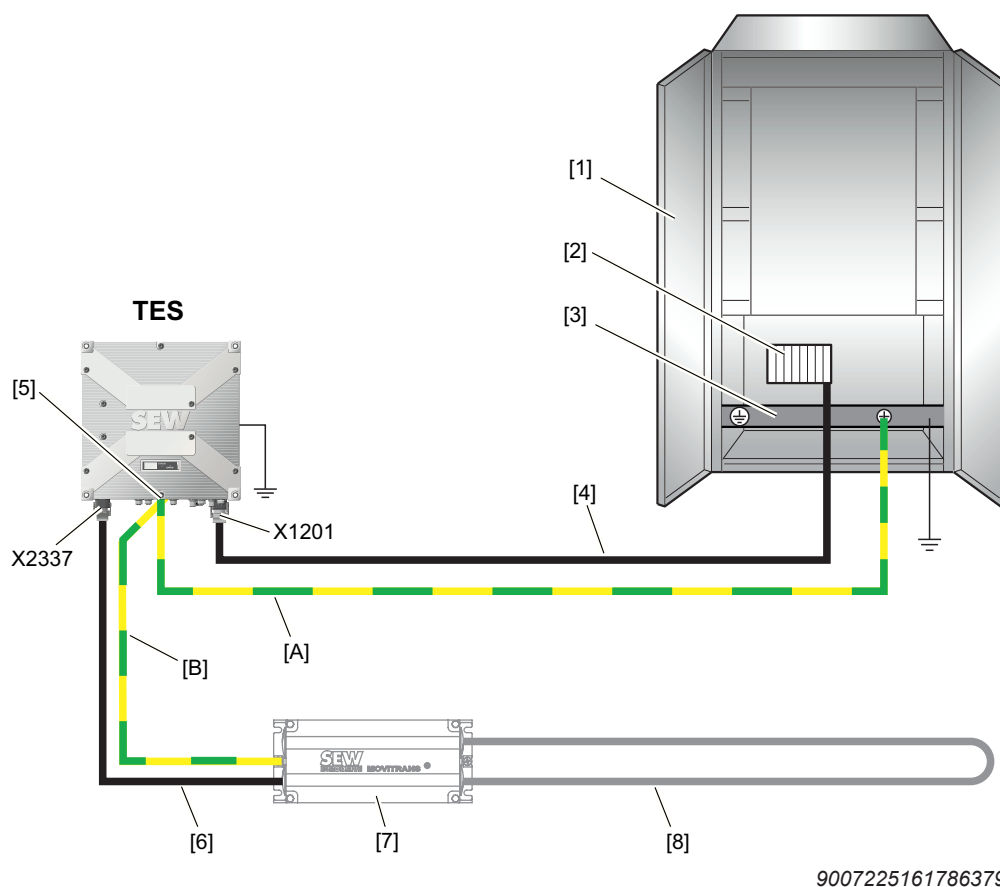
Electric shock due to faulty ground connection or equipotential bonding.

Severe or fatal injuries.

- Make sure to install the ground connection and equipotential bonding correctly.

You have to protect all electrical operating resources such as the device or the motor using ground connection or equipotential bonding.

5.4.3 Required cable cross section



9007225161786379

- [1] Control cabinet
- [2] Terminal strip AC 400 V
- [3] Equipotential bonding rail
- [4] Supply cable
- [A] PE
At least the same cross section as the supply cable, recommended: 10 mm² Cu
- [B] PE (equipotential bonding cable)
Cross section 6 mm² Cu per load cable or 16 mm² Cu
- [5] Connection position for ground connection
- [6] Load cable
- [7] MOVITRANS® installation material, such as TVS connection distributor (shown in the figure) or TCS compensation box
- [8] TLS line cable

AC 400 V input (X1201)

Leakage currents $\geq$ AC 3.5 mA/DC 10 mA can occur in normal operation.

According to DIN EN 61800-5-1, you have to install a second PE conductor in addition to the internal protective earth of the supply cable.

Observe the following information:

- The cross section of the PE conductor [A] must correspond at least to the cross section of the supply cable [4]. If the cross section is $< 4 \text{ mm}^2$, you have to route the PE conductor [A] in such a way that it is mechanically protected.
 - SEW-EURODRIVE recommends to install a PE conductor with a minimum cross section of $10 \text{ mm}^2 \text{ Cu}$. Installed in this way, the device acts as an equipotential bonding rail for grounding other MOVITRANS® installation material. Doing so saves installation outlay.
1. Route the PE conductor [A] in parallel to the supply cable [4].
 2. Wire the PE conductor to an equipotential bonding cable or equipotential bonding rail [3] with a minimum cross section of $10 \text{ mm}^2 \text{ Cu}$ or $16 \text{ mm}^2 \text{ Al}$.
 3. Connect the PE conductor to the protective earth [5] connection position of the device. Do not exceed the maximum permitted tightening torque of 3.5 Nm.

Load connection TLS (X2337)

According to DIN EN 61800-5-1, you have to install a second PE conductor with a minimum cross section of $6 \text{ mm}^2 \text{ Cu}$ in addition to the internal protective earth of the load cable.

With 2 load cables, route 2 PE cables with a cross section of 6 mm^2 . As an alternative, you can use 1 PE cable with a cross section of 16 mm^2 .

1. Route the PE conductor [B] in parallel to the load cable [6].
2. Connect the PE conductor [B] to the device on the connection position for protective earth [5] as shown in the above figure. A requirement is that the PE conductor [A] has a minimum cross section of 10 mm^2 as recommended by SEW-EURODRIVE.

INFORMATION



If the cross section of the PE conductor [A] is smaller, do the following: Route the PE conductor [B] in parallel to the load cable [6]. Wire the PE conductor [B] to an equipotential bonding cable or equipotential bonding rail [3] with a minimum cross section of $10 \text{ mm}^2 \text{ Cu}$ or $16 \text{ mm}^2 \text{ Al}$.

Load cable on TVS connection distributor or TCS compensation box

To connect load cables to a TVS connection distributor or TCS compensation box, do the following:

1. Place the shield of the load cable [6] onto an EMC screw fitting.
2. Connect the PE conductor of the load cable [6] to the inside of the TVS connection distributor or to the TCS compensation box TCS [7].
3. Place conductors 1 and 3 of the load cable [6] together onto the TLS1 connection position.
4. Place conductors 2 and 4 of the load cable [6] together onto the TLS2 connection position.
5. Connect the PE conductor [B] (minimum cross section $6 \text{ mm}^2 \text{ Cu}$) for each load cable to the outside of the TVS connection distributor or to the TCS compensation box. When using 2 load cables, you can use a protective earth conductor with double the cross section.

TLS line cable on TVS connection distributor or TCS compensation box

1. Route the line cable [8] through plastic cable glands into the terminal compartment of the TVS connection distributor or TCS compensation box. The line cables must already be prefabricated with cable lugs.
2. Connect the line cables to the designated connection positions for the incoming and outgoing conductors.

5.5 Line components

5.5.1 Residual current device



⚠ WARNING

No protection against electric shock if an incorrect type of residual current device is used.

Severe or fatal injuries.

- The product can cause direct current in the PE conductor. If a residual current device (RCD) or a residual current monitoring device (RCM) is used for protection in the event of a direct or indirect contact, only a type B RCD or RCM is permitted on the supply end of the product.
- If the use of a residual current device is not mandatory according to the standards, SEW-EURODRIVE recommends not to use a residual current device.

5.5.2 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.

Observe the following general conditions when designing the fuses:

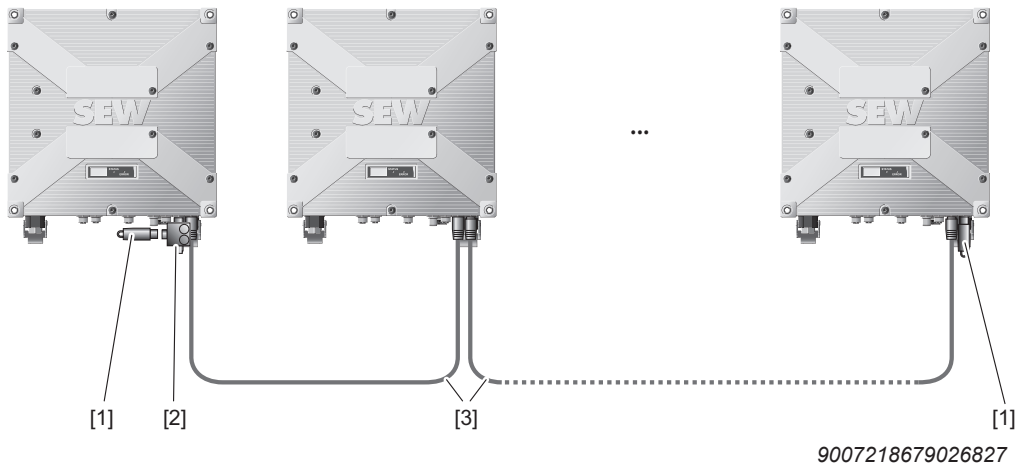
- The current carrying capacity of the conductor rail in use
- The cross sections of cables and conductors in use
- National regulations, such as UL approval

5.5.3 Contactors

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

5.6 SBus installation of several devices

The following figure shows the installation for SBus communication.



- [1] CAN terminating resistor (→ 43)
- [2] CAN T-piece (→ 43)
- [3] Cable

The total cable length permitted for SBus communication depends on the set SBus baud rate:

SBus baud rate	Total cable length
125 kBd	500 m
250 kBd	250 m
500 kBd (standard)	100 m
1000 kBd	25 m

5.7 Connection block



⚠ WARNING

Electric shock when disconnecting or connecting voltage-carrying plug connectors.

This can result in severe or fatal injuries.

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

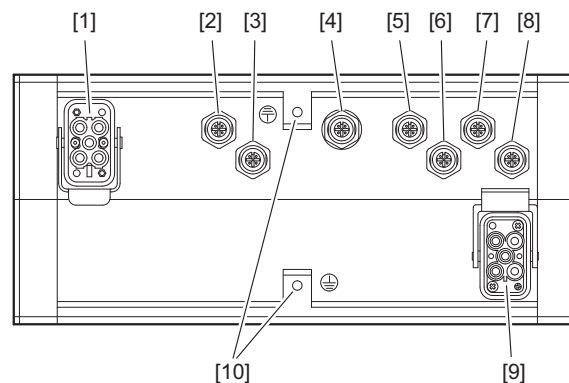
INFORMATION



For further information on the individual connections and connection cables, refer to chapter "Electrical connections" (→ 35).

The connection designations for your device are specified on the connection block label on the device. Make sure that the latches of the connections engage after you plugged the plug connectors into the connections.

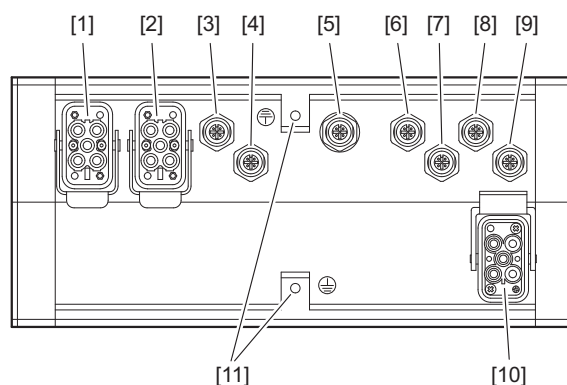
5.7.1 Devices with 12 A, 30 A, 42.5 A



18014419138394891

[1]	X2337	Load connection TLS
[2]	X5102_1	Digital inputs – power section
[3]	X5102_2	Digital outputs – power section
[4]	X5161	Device interface for dual-channel disconnection – input without safety function
[5]	X5122	Synchronization signal MOVITRANS® – input
[6]	X5121	Synchronization signal MOVITRANS® – output
[7]	X4108	CAN system bus – input (system bus 1)
[8]	X4101	CAN system bus – output (system bus 1)
[9]	X1201	AC 400 V input
[10]	PE	Ground connection

5.7.2 Devices with 60 A, 75 A, 85 A



9007222528835467

[1]	X2337	Load connection TLS
[2]	X2337	Load connection TLS
[3]	X5102_1	Digital inputs – power section
[4]	X5102_2	Digital outputs – power section
[5]	X5161	Device interface for dual-channel disconnection – input without safety function
[6]	X5122	Synchronization signal MOVITRANS® – input
[7]	X5121	Synchronization signal MOVITRANS® – output
[8]	X4108	CAN system bus – input (system bus 1)
[9]	X4101	CAN system bus – output (system bus 1)
[10]	X1201	AC 400 V input
[11]	PI	Ground connection

5.8 Electrical connections

5.8.1 Representation of connections

The wiring diagrams show the contact end of the connections.

5.8.2 Connection cables

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.

Requirements for the connection cables

Only use prefabricated cables from SEW-EURODRIVE.

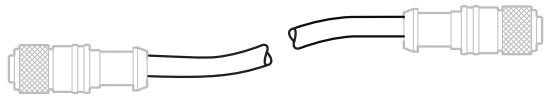
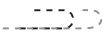
INFORMATION



The connection cables for load connections must be configured with the following nominal voltage: $U_0/U = 600\text{ V}/1000\text{ V}$

Cable types

The table below shows the depiction and what they mean:

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

5.8.3 Cable structure

Diagram

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

Depiction	Meaning
(	Cable shield
4	Number of core pairs (in twisted cables only)
X	
2	Number of cores
X	G - with green-yellow PE conductor X - without PE
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:

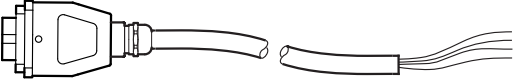
- **3G1.5:**
Cable with 3 cores of 1.5 mm² each, one of them is a green-yellow PE conductor.
- **((2X2X0.25)+4G2.5):**
Shielded hybrid cable with
 - 4 twisted-pair cables of 0.25 mm² each, shielded, and
 - 4 power cores of 2.5 mm² each, one of them is a green-yellow PE conductor.

5.8.4 X1201: AC 400 V input

Function		
AC 400 V input to supply devices up to 16 kW		
Connection type		
Han® Q 4/2, male		
Wiring diagram		
No.	Name	Function
1	L1	Supply system phase 1
2	L2	Supply system phase 2
3	L3	Supply system phase 3
4	n.c.	Not connected
11	n.c.	Not connected
12	n.c.	Not connected
PE	PE	PE connection

Connection cables

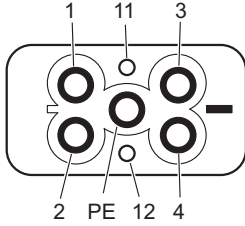
Cable	Length/installation type	Component
Part number: 18174221 Cable design: (4G2.5) Only permitted for decentralized supply units with device output power of up to 8 kW. Han® Q 4/2 ↔ open with conductor end sleeves	Variable length	—

Cable	Length/installation type	Component
Part number: 11745614 Cable design: (4G4)  Han® Q 4/2 ↔ Open with conductor end sleeves	Variable length 	–

Conductor assignment

Part number	Signal name	Core color
18174221 11745614	L1	Black/1
	L2	Black/2
	L3	Black/3
	PE	Green-yellow

5.8.5 X2337: Load connection TLS

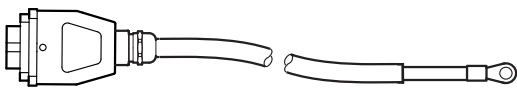
Function		
Load connection of the line cables 1 and 2		
Connection type		
Han® Q 4/2, female		
Connection diagram		
		
No.	Name	Function
1	TLS1	Line cable 1
2	TLS2	Line cable 2
3	TLS1	Line cable 1
4	TLS2	Line cable 2
11	DI00	Data reception direction 00
12	/OSI	/Output stage inhibit
PE	PE	PE connection



INFORMATION

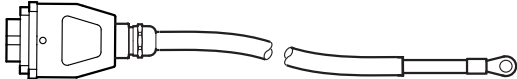
Pins 11 and 12 must be jumpered to enable the output stage. The SEW-EURODRIVE cable that is configurable in length comes equipped with this jumper. In device variants with 2 load connections, you have to jumper pins 11 and 12 at both sockets.

Connection cable/cable lug M8

Cable	Length/installation type	Component
Part number: 18182313 Cable design: (5G6)  Han® Q 4/2, male ↔ cable lug M8	Variable length 	TES TCS31A

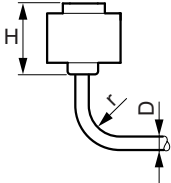
Cables are labeled according to the pin number of the connector.

Connection cable / cable lug 5 x M6

Cable	Length/installation type	Component
Part number: 28135377 Cable design: (5G6)  Han® Q 4/2, male ↔ cable lug 5 x M6	Variable length 	TVS10A

This connection cable (cable lug 5 × M6) is required for synchronizing 3 decentralized supply units in combination with a TVS10A connection distributor.

Connector height/bending radius

	Connector height	Cable diameter	Minimum permitted bending radius
	H	D	r
	117 mm	< 18.1 mm	4 x cable diameter

5.8.6 X4101: CAN bus – system bus

INFORMATION



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

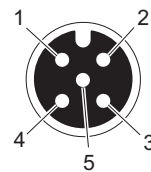
Function

CAN system bus – output

Connection type

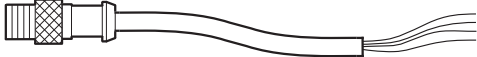
M12, 5-pole, female, A-coded

Connection image



No.	Name	Function
1	CAN_SHLD	Shield/equipotential bonding
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

Cables	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 Custom 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 Custom 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

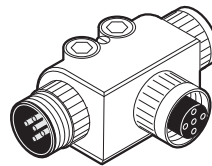
Part number	Signal name	Color coding
13281348	CAN_SHLD	–
13281356	+24V	Red
13281364	GND	Black
13281372	CAN_H	White
13281380	CAN_L	Blue
13281399		
13281402		
13281410		
13281429		

Connection components

CAN T-piece

Part number: 13290967

Connection: M12

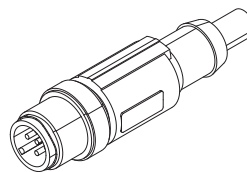


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CAN terminating resistor

Part number: 13287036

Connection: M12



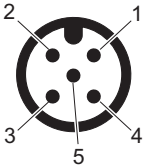
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5.8.7 X4108: CAN bus – system bus

INFORMATION



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

Function		
CAN system bus – input		
Connection type		
M12, 5-pole, male, A-coded		
Connection diagram		
		
No.	Name	Function
1	CAN_SHLD	Shield/equipotential bonding
2	res.	Reserved
3	GND	Reference potential
4	CAN_H	CAN data line (high)
5	CAN_L	CAN data line (low)

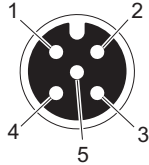
Connection cables

Cables	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 Custom lengths: 1.5 m: Part number: 13286293 2.5 m: Part number: 13286307 Cable design: ((1X2X0.2)+(1X2X0.32)+1X0.32)  M12, female, A-coded ↔ M12, male, A-coded	Fixed length 	—
Standard lengths: 2 m: Part number 19111630 5 m: Part number 13295810 Custom lengths: 1 m: Part number 19111614 1.5 m: Part number 19111622 2.5 m: Part number 19111649 3 m: Part number 13301322 4 m: Part number 19111657 10 m: Part number 19129270 15 m: Part number 19129289 Cable design: ((1X2X0.2)+(1X2X0.32)+1X0.32)  M12, female, A-coded ↔ Open	Fixed length 	—

Conductor assignment

Part number	Signal name	Core color
19111630	CAN_SHLD	Gray
13295810	+24V	Red
19111614	GND	Black
19111622	CAN_H	White
19111649	CAN_L	Blue
19111657		

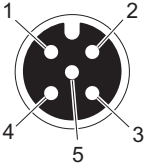
5.8.8 X5102_1: Digital inputs – power section

Function		
Digital inputs/outputs of power section		
Connection type		
M12, 5-pole, female, A-coded		
Wiring diagram		
		
No.	Name	Function
1	+24V	DC 24 V output
2	DI01	Data reception direction 01
3	0V24	0V24 reference potential
4	DI00	Data reception direction 00:with fixed assignment "output stage inhibit"
5	FE	Equipotential bonding / functional earth

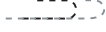
Connection cable

Cable	Length/installation type	Component
Length 60 cm: Part number: 19078021 Length 1 m: Part number: 25640704 Length 10 m: Part number: 25640712 Cable design: (5X0.34)  M12, 5-pin, male, A-coded ↔ M12, 5-pin, male, A-coded	Fixed length 	—
1.5 m: Part number: 19166214 3 m: Part number: 19166206 Cable design: 5X0.34  M12 male ↔ M12 female	Fixed length 	

5.8.9 X5102_2: Digital outputs – power section

Function		
Digital inputs/outputs of power section		
Connection type		
M12, 5-pole, female, A-coded		
Wiring diagram		
		
No.	Name	Function
1	+24V	DC 24 V output
2	DO01	Digital output nm 01
3	0V24	0V24 reference potential
4	DO00	Digital output nm 00
5	FE	Equipotential bonding / functional earth

Connection cable

Cable	Length/installation type	Component
Length 60 cm: Part number: 19078021 Length 1 m: Part number: 25640704 Length 10 m: Part number: 25640712 Cable design: (5X0.34)  M12, 5-pin, male, A-coded ↔ M12, 5-pin, male, A-coded	Fixed length 	—
1.5 m: Part number: 19166214 3 m: Part number: 19166206 Cable design: 5X0.34  M12 male ↔ M12 female	Fixed length 	

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5.8.10 X5121: MOVITRANS® synchronization signal

INFORMATION



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

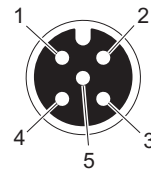
Function

Synchronization signal MOVITRANS® – output

Connection type

M12, 5-pole, female, A-coded

Connection diagram



No.	Name	Function
1	FE/CAN_SHLD	Equipotential bonding / functional earth/Shield/equipotential bonding
2	+24V	DC 24 V output
3	GND	Reference potential
4	SYNC_H/ CAN_H	Synchronization signal (high)/CAN data line (high)
5	SYNC_L/ CAN_L	Synchronization signal (low)/CAN data line (low)

Connection cables

Cables	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 Custom 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 Custom 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

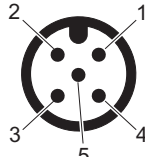
Part number	Signal name	Color coding
13281348	CAN_SHLD	–
13281356	+24V	Red
13281364	GND	Black
13281372	CAN_H	White
13281380	CAN_L	Blue
13281399		
13281402		
13281410		
13281429		

5.8.11 X5122: MOVITRANS® synchronization signal

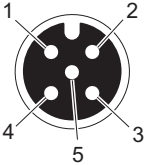
INFORMATION



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

Function		
Synchronization signal MOVITRANS® – input		
Connection type		
M12, 5-pole, male, A-coded		
Connection diagram		
		
No.	Name	Function
1	FE/CAN_SHLD	Equipotential bonding / functional earth/Shield/equipotential bonding
2	res.	Reserved
3	GND	Reference potential
4	SYNC_H/ CAN_H	Synchronization signal (high)/CAN data line (high)
5	SYNC_L/ CAN_L	Synchronization signal (low)/CAN data line (low)

5.8.12 X5161: Device interface for dual-channel disconnection – input

Function		
Input for dual-channel disconnection of the power section (output stage inhibit)		
Connection type		
M12, 5-pole, female, A-coded		
Wiring diagram		
		
No.	Name	Function
1	+24V	DC 24 V output
2	/OSI-	0V24 reference potential for "/output stage inhibit" dual-channel
3	0V24	0V24 reference potential
4	/OSI+	DC 24 V input for "/output stage inhibit" dual-channel
5	res.	Reserved

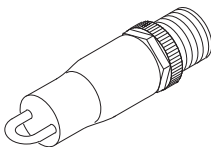
Connection component

Jumper plug

Part number: 11747099

Structure: bridged 1+4/2+3

Connection: M12



72057595186840843

6 Parameters

6.1 Notes

The following sections describe the information windows in the parameter tree view with the display values for start up and the device functions.

The parameter names correspond to those displayed in MOVITOOLS® MotionStudio. The factory setting is indicated in **bold**.

Usually, the parameter menu is only required for startup and in case of service. Optionally, you can equip the device with an appropriate communication option.

You have the following options to set the parameters:

- Via PC-CAN interface adapter at the PC with the MOVITOOLS® MotionStudio software
- Via the SBus interface with customer's programming

Refer to the Appendix for a description of the indexes of the individual parameter settings.

You can open the windows by double-clicking the parameters of the parameter groups "Display values", "Setpoints/modulation", "Device functions". Refer to the "Modular Engineering Software System MOVITOOLS® MotionStudio MOVITRANS® Parameter Tree" documentation for detailed information on the individual parameters.

Always use the latest edition of the documentation and the software.

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

6.2 Parameter overview by parameter tree

Display values

Parameters	Index		Note
	Dec.	Sub	
Display values – device data			
Device type	9701	1 – 5	
Device family	9701	10	
Nominal power	9701	12	
Nominal load current	10538	113	
Output frequency	9793	1	
Firmware part number	9701	30	
Firmware status	9701	31	
Firmware release	9701	32	
Signature	9823	1 – 5	

Parameters	Index		Note
	Dec.	Sub	
Display values – process values			
Fault code	9702	5	
Subfault code	10071	1	
Output stage	8310	0	
Active frequency	10538	1	
Active setpoint	10538	129	
Operating mode	10538	100	
Ramp time	10232	21	
Output voltage	8723	0	
Output current	8326	0	
Load voltage	10538	130	
Load current	10089	1	
DC link voltage	8325	0	
DC link current	10538	110	
Active power	10467	42	
Switching angle			Calculated value
Heat sink temperature of output stage	10538	126	
Status word	8310	0	

Parameters	Index		Note
	Dec.	Sub	
Display values – min./max. values			
Minimum output voltage	8973	0	

Parameters	Index		Note
	Dec.	Sub	
Display values – min./max. values			
Maximum output voltage	8974	0	
Minimum output current	8975	0	
Maximum output current	8976	0	
Minimum load current	8977	0	
Maximum load current	8978	0	
Minimum DC link voltage	8985	0	
Maximum DC link voltage	8986	0	
Minimum active power	10538	122	
Maximum active power	10538	123	
Min. heat sink temperature of output stage	10538	127	
Max. heat sink temperature of output stage	10538	128	
Reset statistical data	8596	0	0 – No action 100 – Min./Max. values

Parameters	Index		Note
	Dec.	Sub	
Display values – fault memory t-x (x = 0, 1, 2)			
Fault code t-x	10531+x	1	
Subfault code t-x	10531+x	2	
Output stage	10531+x	7	
Frequency	10531+x	31	
Setpoint	10531+x	23	
Operating mode	10531+x	34	
Ramp time	10531+x	24	
Output voltage	10531+x	28	
Output current	10531+x	25	
Load voltage	10531+x	35	
Load current	10531+x	30	
DC link voltage	10531+x	26	
DC link current	10531+x	27	
Switching angle			Calculated value
Heat sink temperature of output stage	10531+x	17	
Binary inputs DI00 – DI01	10531+x	8	
Drive running hours	10531+x	5	

Setpoints/modulation

Parameters	Index		Note
	Dec.	Sub	
Display values – status binary terminals			
Binary input DI00	8334	0	Bit0
Binary input DI01	8334	0	Bit1
Binary output DO00	8349	0	Bit0
Binary output DO01	8349	0	Bit1
Parameters	Index		Note
	Dec.	Sub	
Display values – statistics			
Energy meter	8330	0	
Power-applied hours	8328	0	
Drive running hours	8329	0	
Parameters	Index		Note
	Dec.	Sub	
Setpoints/modulation – setpoint preselection			
Operating mode	10538	100	Voltage control Current control Power control
Control signal source	8462	0	Terminals SBus 1 SBus 2 Parameter control word
Setpoint source	8461	0	Parameter setpoint SBus 1 SBus 2 Fixed setpoints Technology
Frequency mode	10233	1	fa - df fa fa + df
Damping	10233	2	Off On
Parameters	Index		Note
	Dec.	Sub	
Setpoints/modulation – fixed setpoints			
Active setpoint	10538	129	
Fixed setpoint I00	10420	1	0 – 100 – Max %

Parameters	Index		Note
	Dec.	Sub	
Setpoints/modulation – fixed setpoints			
Fixed setpoint I01	8814	0	0 – Max %
Fixed setpoint I10	8815	0	0 – 50 – Max %
Fixed setpoint I11	8816	0	0 – 100 – Max %

Parameters	Index		Note
	Dec.	Sub	
Setpoints/modulation – ramps			
Active ramp time	10232	21	
Ramp time T00	10232	27	0 – 500 – 10000 ms
Ramp time T01	10232	28	0 – 500 – 10000 ms
Ramp time T10	10232	29	0 – 500 – 10000 ms
Ramp time T11	10232	30	0 – 500 – 10000 ms

Device functions

Parameters	Index		Note
	Dec.	Sub	
Device functions – reset behavior			
Auto reset	8618	0	OFF, ON
Restart time	8619	0	50 – 30000 ms
Reset counter	10236	1	

Parameters	Index		Note
	Dec.	Sub	
Device functions – setup			
Reset statistical data	8596	0	No action Fault memory kWh counter Operating hours Min./max. values
Factory setting	8594	0	No Standard Basic initialization
Manual reset	8617	0	No , yes

Parameters	Index		Note
	Dec.	Sub	
Device functions – process data description			
Setpoint description PO1	8304	0	
Setpoint description PO2	8305	0	

Parameters	Index		Note
	Dec.	Sub	
Device functions – process data description			
Setpoint description PO3	8306	0	
Actual value description PI1	8307	0	
Actual value description PI2	8308	0	
Actual value description PI3	8309	0	
PO data enable	8622	0	No, yes

Parameters	Index		Note
	Dec.	Sub	
Device functions – fault responses			
Response SBus 1 – timeout	10516	1	No response
Response SBus 2 – timeout	8936	0	Display only
Response to external fault	9729	16	Inhibit output stage
Response U _{DC link} under-voltage	10235	1	No response
Response to line phase failure	9729	4	Display only Inhibit output stage
Response to switching angle outside tolerance band	9729	25	No response Display only
Minimum active power at enable	10538	112	0 – 20000 W 0 = Monitoring deactivated

Parameters	Index		Note
	Dec.	Sub	
Device functions – serial communication SBus 1			
SBus 1 address	8600	0	0 – 127
SBus 1 group address	8601	0	0 – 63
SBus 1 timeout interval	8602	0	0 – 1 – 65 sec.
SBus 1 baud rate	8603	0	125 kBaud 250 kBaud 500 kBaud 1 MBaud

Parameters	Index		Note
	Dec.	Sub	
Device functions – serial communication SBus 2			
SBus 2 address	8932	0	0 – 127
SBus 2 group address	8933	0	0 – 63
SBus 2 timeout interval	8934	0	0 – 1 – 65 sec.

Parameters	Index		Note
	Dec.	Sub	
Device functions – serial communication SBus 2			
SBus 2 baud rate	8939	0	125 kBaud 250 kBaud 500 kBaud 1 MBaud

Parameters	Index		Note
	Dec.	Sub	
Device functions – terminal functions			
Binary input DI01	8335	0	No function Fixed setpoint changeover /External fault /Output stage inhibit
Binary output DO00	8843	0	No function /Failure Ready
Binary output DO01	8350	0	No function /Failure Ready

Parameters	Index		Note
	Dec.	Sub	
Device functions – fan control			
Fan	8961	0	Off, on, automatic

Parameters	Index		Note
	Dec.	Sub	
Device functions – synchronization			
Sync mode	10538	144	MP master MP slave
Sync phase angle	10422	1	0 – 360°
Sync timeout response	10244	1	No response Display only Inhibit output stage
Interface function	10547	1	None SBus 2 Sync

Parameters	Index		Note
	Dec.	Sub	
Device functions – technology			
Setpoint source	8461	0	Parameter setpoint SBus 1 SBus 2 Fixed setpoints Technology
Fixed setpoint I00 (lower)	10420	1	0 – 100 – Max %
Fixed setpoint I01 (upper)	8814	0	0 – Max %
Power limit L00 (bottom)	10538	41	0 – 20000 W
Power limit L01 (upper)	10538	42	0 – 20000 W
Ramp time T00	10232	27	0 – 500 – 10000 ms
Ramp time T01 (settling time)	10232	28	0 – 500 – 10000 ms
Fixed setpoint I10 (lower)	8815	0	0 – 50 – Max %
Fixed setpoint I11 (upper)	8816	0	0 – 100 – Max %
Power limit L10 (bottom)	10538	43	0 – 20000 W
Power limit L11 (upper)	10538	44	0 – 20000 W
Ramp time T10	10232	29	0 – 500 – 10000 ms
Ramp time T11 (settling time)	10232	30	0 – 500 – 10000 ms

6.3 Parameter description

6.3.1 Display values

Unit data

The following information is displayed in the "Device data" window:

- Device type
- Device family
- Nominal power in W
- Nominal load current in A
- Output frequency in Hz
- Firmware part number
- Firmware status
- Firmware release
- Signature → The editable device name is displayed here.

Process values

The following information is displayed in the "Process values" window:

Fault

- Fault code

This is where the current fault status is displayed using the respective fault code. If a fault has occurred, another field with the designation "Subcode" appears below the "Code" field. For a complete list of all fault messages, refer to the chapter "Fault list" (→ 108).

- Output stage

The output stage status is displayed. The following display values are possible:

- Inhibited
- Released

Modulation

- Active frequency in Hz

The output frequency is displayed. The output frequency depends on the device variant (see "Output frequency" in the "Device data" window).

Setpoint

- Active setpoint in %

The setpoint input is displayed. The specified setpoint is determined based on the setpoint source or control signal source/fixed setpoints. The percentages of the setpoint are based on the respective nominal values depending on the operating mode and device type.

- Voltage control: 100% correspond to a nominal output voltage of AC 400 V
- Current control: 100% correspond to the load current I_L
- Power control: 100% correspond to the nominal output power P_N

- Operating mode

The following display values are possible:

- Voltage control
- Current control

– Power control

SEW-EURODRIVE recommends activating the current control for common MOVITRANS® applications. You can set the operating mode in the "Setpoint selection" (→ 65) window.

Process values

- Ramp time in ms

The active ramp time is displayed. You can set the ramp times in the "Ramps" window in the "Setpoints/modulation" parameter group.

- Output voltage in V

The rms value of the output voltage of the output stage status is displayed.

- Output current in A

The rms value of the output current I_A is displayed. The output current is proportional to the transferred apparent power. The reactive power consumption is minimized by track compensation.

- Load voltage in V

- Load current in A

The rms value of the load current I_L is displayed. A so-called gyrator circuit provides for a constant load current independent of the load.

The gyrator circuit also contains a transformer which provides with its gear ratio for the nominal load current to flow at the device output at 100% setpoint. The nominal load current is displayed in the "Device data" window.

- DC link voltage in V

- DC link current in A

- Switching angle in °

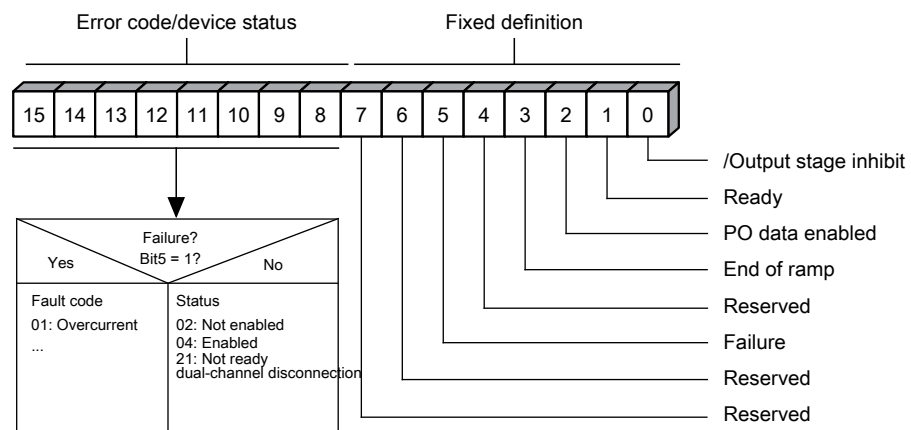
- Active power in W

The active power measured in the DC link is displayed.

- Heat sink temperature of output stage in °C
- Status word display

The status word is 16 bits wide. The less significant byte, the basic status block, consists of 8 status bits with fixed definition. The higher-level status byte either contains the device state or the fault code. Depending on the fault bit, the device status or, in the event of problems (fault bit = 1), the fault code is displayed for fault bit = 0. The fault bit is reset by resetting the fault, and the current device status is displayed again.

The current status word is displayed according to the window Process data description process input data word PI1 (status word 1).



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Bit	Control command	Assignment
0	/Output stage inhibit	0 = Output stage inhibited 1 = Output stage enabled
1	Supply unit ready for operation	0 = Supply unit not ready for operation 1 = Supply unit ready for operation
2	PO data enabled	0 = PO data inhibited 1 = PO data enabled
3	End of ramp	0 = End of ramp not reached 1 = End of ramp reached
5	Failure	0 = No failure 1 = Failure present

Min./max. values

The following minimum and maximum process values, recorded since the last time the device was switched on, are displayed in the "Min./max. values" window:

- Output voltage in V
- Output current in A
- Load current in A
- DC link voltage in V
- Active power in W
- Heat sink temperature of output stage in °C

Reset statistical data

You have the following options to reset the "Min./max. values":

- Select the option "Min./max. values" in the "Min./max. values" window in the selection list "Reset statistic data".
- Select the option "Min./max. values" in the "Setup" window in the selection list "Reset statistic data".

Fault memory

The device can store several faults in the fault memories t-0, t-1, and t-2.

The faults are stored in chronological order with the most recent fault event being stored in fault memory t-0. If more than 3 faults occur, the last fault event in fault memory t-2 is overwritten.

The following information is stored:

Fault t-x

- Fault code
- Subfault code
- Output stage
- Frequency in Hz
- Setpoint in %
- Operating mode
- Ramp time in ms
- Output voltage in V
- Output current in A
- Load voltage in V
- Load current in A
- DC link voltage in V
- DC link current in A
- Switching angle in °
- Heat sink temperature of output stage in °C
- Binary inputs DI00 to DI01
- Enable hours in h

Status binary terminals

The current status of the binary input and output terminals is displayed in the "Status binary terminals" window.

Binary inputs

- Binary input DI00 (with fixed assignment "Output stage inhibit")
- Binary input DI01 with the parameterized function

- Binary outputs
- Binary output DO00 with the parameterized function
 - Binary output DO01 with the parameterized function

Statistics

The following information is displayed in the "Statistics" window:

- Energy meter in kWh
Total of the electric active energy
- Power-applied hours in h
Total number of hours in which the device is supplied with power.
- Enable hours in h

6.3.2 Setpoints/modulation

Setpoint selection

In the "Setpoint preselection" window, you can set the operating mode, the control source, and the setpoint source.

Operating mode

You can set the following operating modes:

- **Current control**
- Voltage control
- Power control

SEW-EURODRIVE recommends activating the current control operating mode.

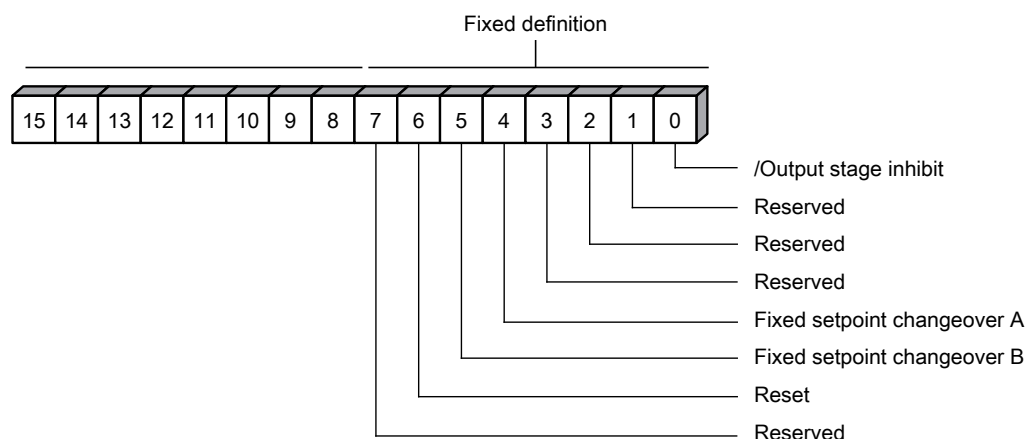
Control signal source

Use the control signal source to set where the device gets its control commands (output stage inhibit, etc.) from. If the setpoint source "Fixed setpoints" is activated, the fixed setpoint lxx is selected via the control commands of the control signal source.

You can set the following control signal sources:

- **Terminals**
Control via binary inputs.
- SBus 1
Control is performed via cyclical process data communication via SBus 1. The control commands are transferred to the device via process output data word PO1 (control word 1).
- SBus 2
Control is performed via cyclical process data communication via SBus 2. The control commands are transferred to the device via process output data word PO1 (control word 1).
- Parameter control word
Control is performed via a parameter WRITE service to the parameter with index 8785/0 via SBus 1 or SBus 2.

The following figure provides an overview of the control word structure:



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Control command	Control signal source				Assignment
	Terminals	Control word SBus 1 (PO1)	Control word SBus 2 (PO1)	Parameter control word (SBus 1 or SBus 2)	
/Output stage inhibit	DI00 (& DI01)	DI00 & Bit0 (& DI01)			0 = Inhibited 1 = Enabled
Fixed setpoint changeover A	—	Bit4			See setpoint source
Fixed setpoint changeover B	(DI01)	Bit5 (OR DI01)			
Reset	—	Bit6			0 = No reset 1 = Fault reset

Setpoint source

This parameter specifies the source for the setpoint with ramp time for the device.

The following options can be selected:

- **Fixed setpoints**

The setpoint comes from the fixed setpoints. The selection of the active fixed setpoint lxx and the active ramp time Txx is performed via the activated control signal source and the control commands fixed setpoint changeover A/B:

- Via the binary input terminal DI01, if additionally parameterized with the terminal function "Fixed setpoint changeover B" (control signal source: terminals)
- Via Bit4 and Bit5 of the control word from the process output data PO1 (control signal source: SBus 1 or SBus 2)
- Via Bit4 and Bit5 of the parameter control word (control signal source: parameter control word)

Fixed setpoint changeover B Bit5/DI01	Fixed setpoint changeover A Bit4	Setpoint	Ramp time
0	0	Fixed setpoint I00	Ramp time T00

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Fixed setpoint changeover B Bit5/DI01	Fixed setpoint changeover A Bit4	Setpoint	Ramp time
0	1	Fixed setpoint I01	Ramp time T01
1	0	Fixed setpoint I10	Ramp time T10
1	1	Fixed setpoint I11	Ramp time T11

- **SBus 1**
Setpoint input is performed via process data communication via SBus 1. The setpoint is in the process output data word 2 (PO2). The set ramp time T00 is active.
- **SBus 2**
Setpoint input is performed via process data communication via SBus 2. The setpoint is in the process output data word 2 (PO2). The set ramp time T00 is active.
- **Parameter setpoint**
Setpoint input is performed via the parameter WRITE service of index 10237/10. This can be carried out via the SBus 1 or SBus 2 interface. The set ramp time T00 is active.
- **Technology**
The active setpoint and the active ramp time are determined via the technology function. See the "Technology" parameter window.

Frequency mode

The frequency mode makes it possible to set a defined frequency shift between several supply units.

- **fa - df**
The output frequency of the device corresponds to the nominal frequency - 2%.
- **fa**
The output frequency of the device corresponds to the nominal frequency.
- **fa + df**
The output frequency of the device corresponds to the nominal frequency + 2%.

INFORMATION

If the interface function is configured to "Sync" you cannot set a frequency change in the frequency mode.

Damping

This parameter activates or deactivates a damping algorithm. Activate the damping function if the load current tends to oscillate.

- **Off**
The damping algorithm is deactivated.
- **On**
The damping algorithm is active.

Fixed setpoints

The following information is displayed in the "Fixed setpoints" window:

- **Active setpoint in %**
The active setpoint is displayed. The section "Setpoint selection" (→ 65) (selecting the setpoint source) describes how the active setpoint is determined.

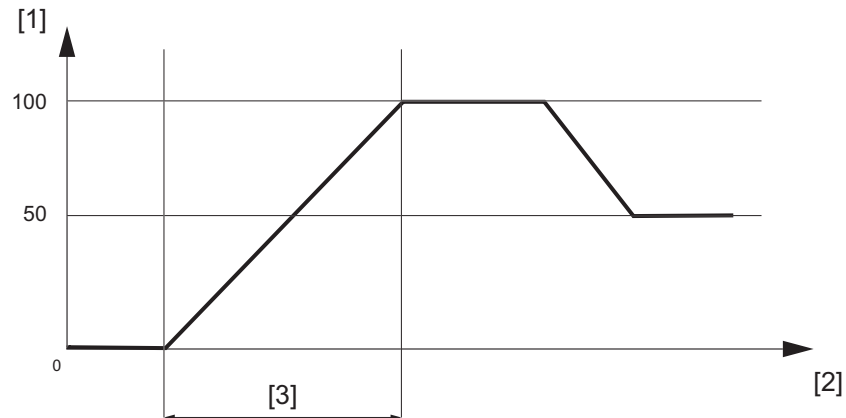
- Fixed setpoint I00 in %
100% preset
- Fixed setpoint I01 in %
0% preset
- Fixed setpoint I10 in %
50% preset
- Fixed setpoint I11 in %
100 % preset

Ramps

You can set the ramp times Txx in the "Ramps" window. Setting range: 0 – 500 – 10000 ms

The ramp time is based on a setpoint difference of 100%.

In case of a setpoint change, the drive moves to the new setpoint using the respective ramp.



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- [1] Setpoint in %
- [2] Time in ms
- [3] Txx

- Active ramp time in ms

The active ramp time is displayed here. The section "Setpoint selection" (→ 65) (selecting the setpoint source) describes how the active ramp time is determined.

- Ramp time T00 in ms
500 preset
- Ramp time T01 in ms
500 preset
- Ramp time T10 in ms
500 preset
- Ramp time T11 in ms
500 preset

6.3.3 Device functions

Reset response

Device faults can be reset automatically after a specific time that can be set in the "Reset behavior" window.



▲ WARNING

Automatic restart of the system due to auto reset.

Severe or fatal injuries.

- Do not activate the auto reset function if an automatically restarting system poses a hazard to people or equipment.

Auto reset

You can activate or deactivate the auto reset function.

- **Off**

The auto reset function is deactivated.

- **On**

The auto reset function is active.

In the event of an error, this function automatically resets the device after the set restart time. A maximum of 3 auto resets are possible during an auto reset phase. If more than 3 errors occur, no more auto resets are possible until one of the following actions has been carried out:

- A fault reset as described in section "Fault reset" (→ 110)
 - The device is completely switched off and then on again
- Auto reset is now possible again.

The following faults can be reset:

- Overcurrent
- Overtemperature
- $V_{DC\ link}$ undervoltage
- External terminal
- Line phase failure
- Performance monitoring
- Timeout SBus 1
- Timeout SBus 2
- External synchronization loss

INFORMATION



The auto reset function only resets faults that have an output stage inhibit as fault response. A fault without output stage inhibit is displayed as fault response until the fault is reset according to chapter "Fault reset".

Restart time in s

Setting range: **0.05 s** to 30 s

Here you can set the interval between the time when the fault occurs and the time it is reset.

Reset counter

The number of resets still possible is displayed here.

When the auto reset function is activated, up to 3 automatic resets are possible.

Setup

You can reset statistic data, set factory settings and perform fault resets in the "Setup" window.

Reset statistical data

The following options are available:

- **No action**

- Fault memory

The stored statistic data of the fault memory can be reset with the "Fault memory" selection.

- Min./max. values

Here you can set the "Min./max. values" to the current values.

- kWh counter

Here you can reset the stored kWh counter.

- Operating hours counter

Here you can reset the stored operating hours counter.

Factory setting

The following options are available:

- **No**

- Default

The stored setting parameters are reset to their factory settings. However, statistic data must be reset separately using the *Reset statistical data* parameter.

- Basic initialization

Select factory settings (basic initialization) to restore the factory settings of the stored parameters. The statistic data (fault memory, kWh counter) is reset as well during this process.

Manual reset

You can perform a fault reset using the parameter tree entry "Manual reset". For more reset options, refer to the chapter "Fault reset" (→ 110).

- **No**

- Yes

Process data description

The content of the process data is displayed in the "Process data description" window. The predefined contents of the process output data *PO1/PO2/PO3* are displayed via the following parameters *POx*.

- Setpoint description PO1: Control word 1
- Setpoint description PO2: Setpoint
- Setpoint description PO3: No function

The predefined contents of the process input data *PI1/PI2/PI3* are displayed via the following parameters *PIx*.

- Actual value description PI1: Status word 1
- Actual value description PI2: Temperature (heat sink temperature of the output stage)
- Actual value description PI3: Power (active power measured in the DC link)
- PO data enable

– On

The process output data that was last sent from the fieldbus control become effective.

– Off

The last valid process output data remain in effect.

Fault responses

You can set programmable fault responses in the "Fault responses" window.

You can set the following responses:

Response	Description
No response	The signaled fault is ignored. The fault is not displayed and no fault response is performed.
Display only	The fault is indicated by the status LED V2 and is displayed in MOVITOOLS® MotionStudio. If the respective parameter is set, a fault message is sent via the binary output terminals. The device does not output any fault response. You can reset the fault.
Inhibit output stage	The device is switched off immediately. The corresponding fault message is displayed. The output stage is inhibited. If the respective parameter is set, the ready signal is revoked via the binary output terminals. The device can only be enabled if you perform a fault reset.

SBus 1/2 timeout response

If no cyclical data transfer (process data communication) takes place via the system bus during the set time, the device executes the set fault response.

Factory setting: Inhibit output stage

INFORMATION



SBus timeout monitoring is only active if:

- Process data telegrams are received via the SBus for the first time.
- SBus is selected as setpoint or control signal source.

Response $U_{DC \text{ link}}$
undervoltage

Use this parameter to program a response that is triggered in the event of $U_{DC \text{ link}}$ undervoltage.

Factory setting: Display only

Response to external fault

Use this parameter to program a response that is triggered via an input terminal with the parameter setting "/External fault".

Factory setting: Inhibit output stage



INFORMATION

The parameter "External fault response" is visible only after the terminal function "/ External fault" has been activated.

Response to line
phase failure

Use this parameter to program a response that is triggered in the event of line phase failure.

Factory setting: Display only

Response to
switching angle
outside tolerance
band

Use this parameter to program a response that indicates that the switching angle is outside the specified tolerance band.

Minimum active
power at enable

Value range: 0 – 20000 W

Here you can set the minimum active power at enable. If the active power is below the set value when the output stage is enabled, the fault "Performance monitoring" (Fault code.subcode 7.30) is issued and the output stage is inhibited. If the minimum active power is set to 0, the performance is not monitored.

Performance monitoring is not active until 2 s after the setpoint ramp.

Serial communication

In the "Serial communication SBus 1/2" window, addresses and communication data are set.



INFORMATION

System bus 2 can be set via the parameter "Interface function" in the "Synchronization" window, see chapter "Synchronization" (→ 76).

- SBus 1/2 address

Setting range: 0 – 127

The system bus address of the device is set here.

- SBus 1/2 group address

Setting range: 0 – 63

Here, the system bus group address for multicast telegrams of the device is set.

- SBus 1/2 timeout interval

Setting range: 0 – 1 – 650 s

This parameter sets the monitoring time for cyclical data transmission via the system bus. If no cyclical data transfer (process data communication) takes place during the set time via the system bus, the device executes the set error response. See parameter *Response SBus 1/2 - timeout*. The cyclic data transmission is not monitored via the system bus when the SBus timeout delay is set to "0".

- SBus 1/2 baud rate

Setting range: 125, 250, **500**, 1000 kBaud

This parameter is used for setting the transmission speed of the system bus.

Terminal functions

You can assign functions to the inputs and outputs in the "Terminal functions" window.

Binary input DI01

You can set the parameters of the input terminal to the following functions:

- **No function**

- Fixed setpoint changeover

The fixed setpoint changeover B activates another fixed setpoint (see parameter "Fixed setpoints" (→ 67)).

- /External fault

If a faulty signal is read at DI01 (DI01 = "0"), the "External terminal" error (error code.subcode = 26.0) is issued.

- /Output stage inhibit

This function allows to use terminal DI01 as an additional enable terminal.

Binary outputs DO00 – DO01

You can assign the following functions to the binary outputs:

- No function

- /fault

- Ready for operation

Function	Binary output		Factory-set
	"0" signal	"1" signal	
No function	Always "0" signal	-	-
/fault	Collective fault signal	No malfunction	DO01
Ready for operation	Not ready for operation	Ready for operation	DO00

Fan control

You can set the fan in the "Fan control" window.

You can choose one of the following options:

Fan

- Off

The fan is continuously switched off.

Information: Depending on the ambient temperature, overtemperature shutdown of the output stage is expected in continuous nominal operation.

- On
The fan rotates permanently with maximum speed.
- **Automatic**
The fan is controlled dependent on the device utilization and the ambient temperature.

Synchronization

There are 2 possible synchronization modes:

- Single-point
- Multi-point

For further information on synchronization, refer to the product description "MOVITRANS® TES31A Decentralized Supply Unit"

Interface function

With the "Interface function" you can configure the use of the connection X5122 and X5121.

The following settings can be made:

- No function
- Sync

The connection X5122 and X5121 is used as synchronization interface. The synchronization parameters "Sync mode", "Sync phase angle" and "Response Sync timeout" can be edited.

- **SBus 2**

The connection X5122 and X5121 is used as an additional SBus interface. Further settings of the SBus 2 interface can be made in the "Serial communication SBus 2" window.

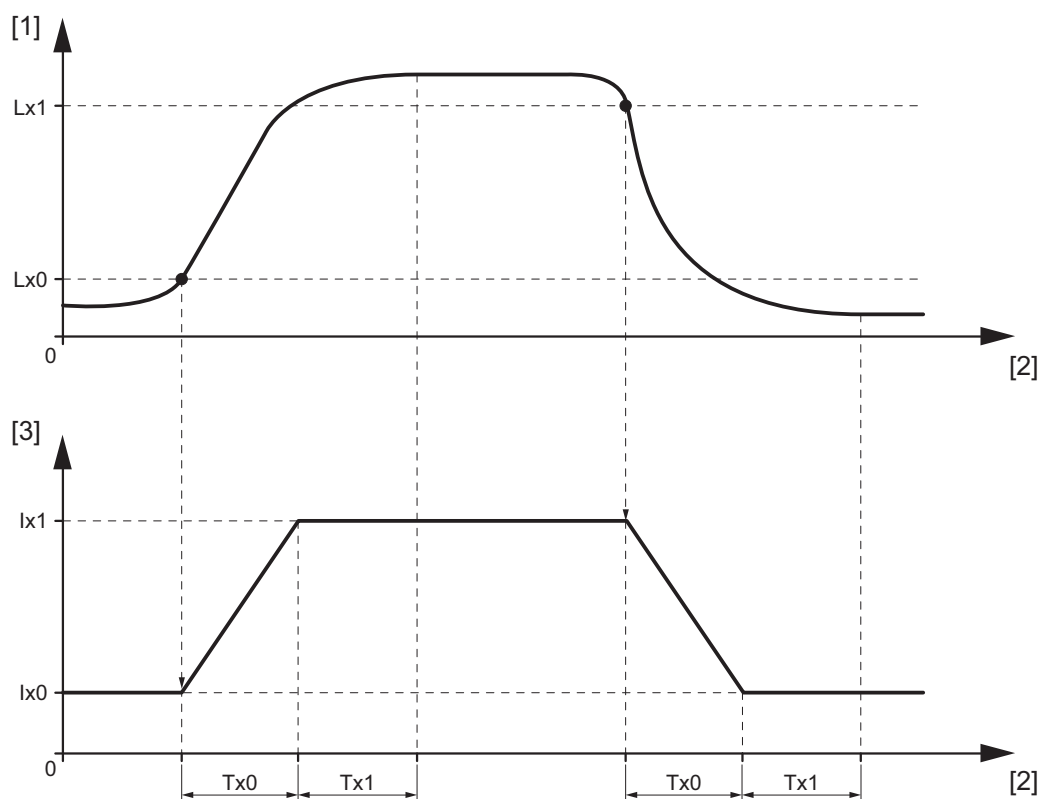
Technology

The technology function enables a power-dependent setpoint input.

The goal of this function is to decrease the standby losses during the contactless energy transfer.

Depending on the power measurement in the device, the setpoint input is performed as follows:

- Low power demand (without consumer) → low setpoint input
- High power demand (with consumer) → high setpoint input



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- [1] Active power in W
 [2] Time in ms
 [3] Setpoint in %
 Lx0 Power limit (lower)
 Lx1 Power limit (upper)
 lx0 Fixed setpoint (lower)
 lx1 Fixed setpoint (upper)
 Tx0 Ramp time in ms
 Tx1 Settling time in ms

You can specify the type of the setpoint source in the "Technology" window:

Setpoint source

- Parameter setpoint
- SBus 1
- SBus 2
- Fixed setpoint
- Technology

Power-dependent
setpoint adjust-
ment 0/1

To use the power-dependent setpoint adjustment, you have to select the setpoint source "Technology".

Switching between 2 parameter sets "Power-dependent setpoint adjustment 0 or 1" is possible with the control command "Fixed setpoint changeover B".

Fixed setpoint changeover B	"0"	"1"
Used fixed setpoints	Fixed setpoint I00/I01	Fixed setpoint I10/I11
Used power limits	Power limit L00/L01	Power limit L10/L11
Used times	Ramp time T00/T01	Ramp time mode T10/T11

- Fixed setpoint I00/I10 (lower) in %
- Fixed setpoint I01/I11 (upper) in %
- Power limit L00/L10 (lower) in W

You can set the lower power limit. If the value falls below the lower power limit, the upper fixed setpoint I01/I11 becomes active.

- Power limit L00/L10 L01/L11 (upper) in W

You can set the upper power limit. If the value falls below the upper power limit, the lower fixed setpoint I00/I10 becomes active.

- Ramp time T00/T10 in ms
- Ramp time T01/T11 (settling time) in ms

The settling time is the time passed after completion of the ramp until the next setpoint change is possible.

6.3.4 Manual operation

In the "Manual operation" window, you can manually set control commands and setpoints. Manual mode supports the startup of the device and the compensation of the line conductor.



⚠ WARNING

Automatic start-up of the system when switching off manual mode.

Severe or fatal injuries.

- Ensure that an automatic start-up does not pose a hazard to people and equipment.
- Inhibit the output stage ("0" signal to DI00).

Activating/deactivating manual mode

Manual mode can be activated/deactivated by clicking the [Activate/deactivate manual mode] button.

- Control

In the "Control" field, control commands can be transferred to the device. Terminal DI00 must be set to "1" to enable the output stage.

- Setpoint

You can preset a setpoint of 0 – Max% for the device.

7 Startup

7.1 For your safety



⚠ WARNING

Risk of injury due to device malfunction caused by incorrect device setting.
Severe or fatal injuries.

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



⚠ WARNING

Electric shock due to missing or defective protection covers.
Severe or fatal injuries.

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



INFORMATION

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

7.2 Requirements

The following conditions apply to startup:

- The device must be installed correctly both mechanically and electrically.
- The system and connected drives must be configured correctly.
- Safety measures prevent accidental drive startup.
- Safety measures prevent danger to persons or machines.

7.3 Control via terminals

With factory settings, the device is prepared for terminal mode without external control.

The following factory settings are activated:

Parameters	Setting
Control signal source	Terminals
Setpoint source	Fixed setpoints
Fixed setpoint I00 in %	100
Ramp time T00 in ms	500
Operating mode	Current control

The output stage enable takes place at the device connections:

- X2337 → connecting pin 11 and pin 12
The load cable from SEW-EURODRIVE that is configurable in length has this jumper.
- X5102_1 → connecting pin 4 with +24 V
(Can be achieved by plugging in the jumper plug)
- X5161 → connecting pin 1 and pin 4 as well as pin 2 and pin 3
(Can be achieved by plugging in the jumper plug)

7.4 Operation with the MOVITOOLS® MotionStudio engineering software

7.4.1 About MOVITOOLS® MotionStudio

Tasks

The MOVITOOLS® MotionStudio engineering software enables you to perform the following tasks with consistency:

- Establishing communication with devices
- Executing functions with the devices

Engineering via interface adapters

If your device supports the "SBus" or "Serial" communication options, you can use a suitable interface adapter for engineering.

The interface adapter is additional hardware that you can obtain from SEW-EURODRIVE. You can use it to connect your engineering PC with the respective communication option of the device.

The type of interface adapter you require depends on the communication options of the respective device.

Communication channels

The SEW Communication Server is integrated into the engineering software MOVITOOLS® MotionStudio for establishing communication with the devices.

The SEW Communication Server allows you to create communication channels. Once the channels are established, the devices communicate via these communication channels using their communication options. You can operate up to 4 communication channels at the same time.

MOVITOOLS® MotionStudio supports the following types of communication channels:

- Serial (RS485) via interface adapters
- System bus (SBus) via interface adapters
- Ethernet TCP/IP, PROFINET IO, EtherNet/IP™, Modbus/TCP
- EtherCAT®
- Fieldbus (PROFIBUS DP-V1)
- Non-proprietary software interface Tool Calling Interface

The available channels can vary depending on the device and its communication options.

Functions

The MOVITOOLS® MotionStudio engineering software enables you to perform the following tasks with consistency:

- Parameterization (e. g. in the parameter tree of the device)
- Startup
- Visualization and diagnostics
- Programming

MOVITOOLS® MotionStudio provides the right tools for every device type.

7.4.2 First steps

Starting the software and creating a project

Proceed as follows:

1. Select the following item from the Windows start menu: [Start] / [Programs] / [SEW] / [MOVITOOLS MotionStudio] / [MOVITOOLS MotionStudio]
⇒ MOVITOOLS® MotionStudio is started.
2. Create a project with a name and directory.

Establishing communication and scanning the network

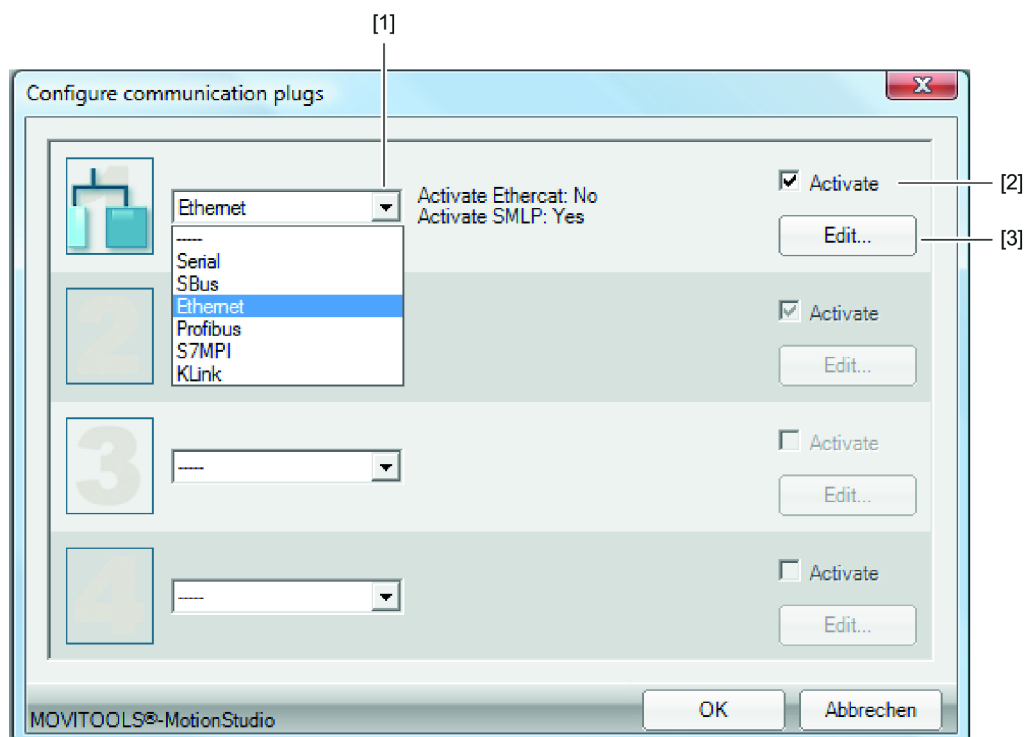
Proceed as follows:

1. Click "Configure communication channels" [1] in the toolbar.



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⇒ The following window opens.



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2. From the drop-down list [1], select the communication type.
3. Activate the selected communication type [2].
4. To edit the settings of the selected communication type, click the button [3].
5. If necessary, change the preset communication parameters. When doing so, refer to the detailed description of the communication channels.
6. Scan your network via the "Device scan" icon [1] in the toolbar.



[1]

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Connection mode

Overview

The MOVITOOLS® MotionStudio engineering software differentiates between "online" and "offline" connection mode. You determine the connection mode yourself. MOVITOOLS® MotionStudio starts up in the connection mode that was set before the program was closed.

INFORMATION



The "online" communication mode is **not** a response message which informs you that you are currently connected to the device or that your device is ready for communication.

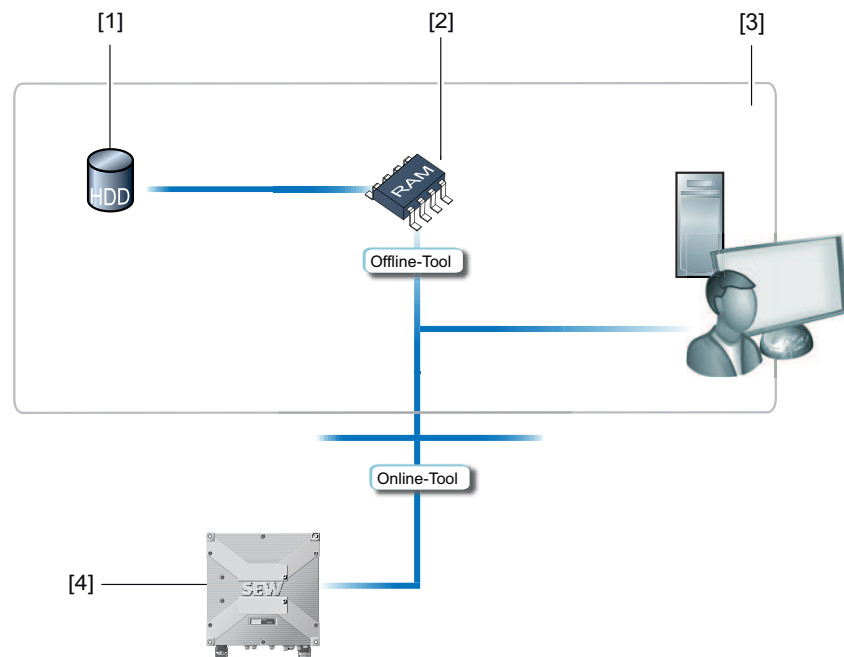
- Should you require this feedback, observe chapter "Setting the cyclical accessibility test" in the online help (or the manual) of MOVITOOLS® MotionStudio.

INFORMATION



Project management commands (such as "download" and "upload"), the online device status, and the "device scan" work independently of the set connection mode.

Depending on the selected connection mode, you can choose offline or online tools specific to your device. The following figure illustrates the two types of tools:



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- [1] Hard drive of the engineering PC
- [2] RAM of the engineering PC
- [3] Engineering PC
- [4] Device

Tools	Description
Online tools	Changes made using online tools affect only the device [4]. • Execute the "Upload (device → PC)" function if you want to transfer the changes to your RAM [2]. • Save your project so that the changes can be stored on the hard disk [1] of your engineering PC [3].
Offline tools	Changes made using offline tools affect only the RAM [2] at first. • Save your project so that the changes can be stored on the hard disk [1] of your engineering PC [3]. • Execute the "Download (PC → device)" function if you want to transfer the changes to your device [4] as well. Check the parameterization afterwards.

Selecting the communication mode (online or offline)

Proceed as follows:

1. Select the connection mode:
 - For functions (online tools) that should directly influence the device, switch to online mode by using the icon [1].
 - For functions (offline tools) that should directly influence the device, switch to offline mode by using the icon [2].



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2. Select the device node.
3. Select the tools for configuring the device from the context menu.

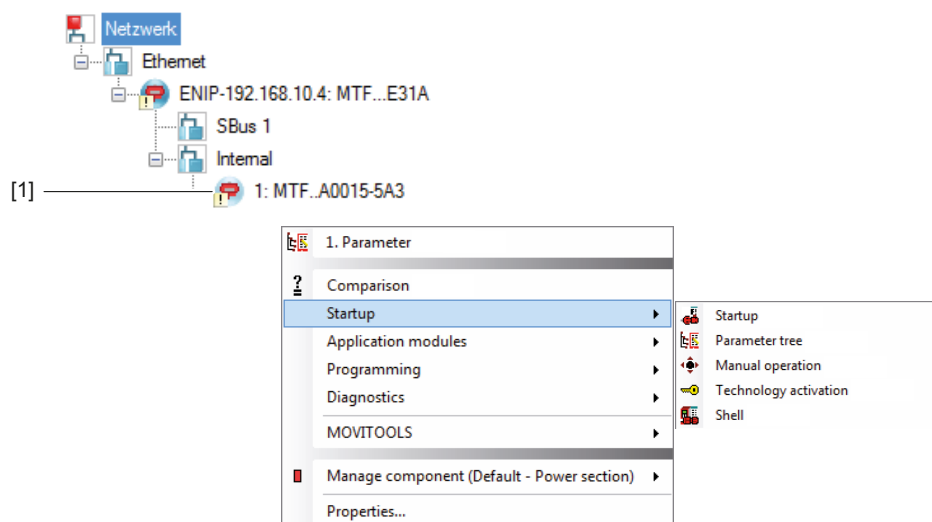
Configuring devices

The following example uses a MOVIFIT® device to show how to display the tools for configuring the device.

The connection mode is "online". The device has been scanned in the network view.

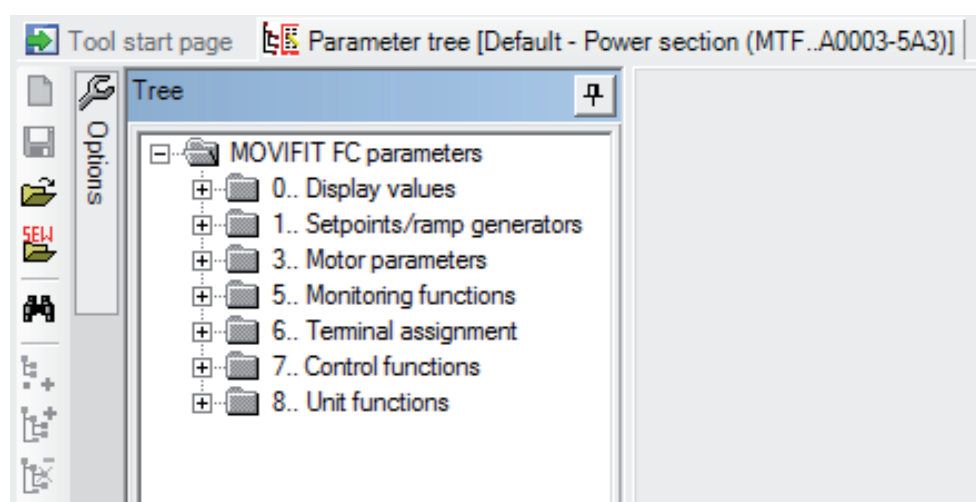
Proceed as follows:

1. Select the device (in this example the power section [1]) in the network view.
2. Right-click to open the context menu.



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3. Select the tool for configuring the device (in this example the command [Startup] > [Parameter tree]).



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7.4.3 Communication SBus (CAN) via interface adapter

Engineering via interface adapter (SBus)

Since your device supports the "SBus" communication option, you can use a suitable interface adapter for engineering.

The interface adapter is additional hardware that you can obtain from SEW-EURODRIVE. You can use it to connect your engineering PC with the respective communication option of the device.

The following table shows you the available types of interface adapters (option) and suitable devices:

Type of interface adapter (option)	Order No.	Scope of delivery	Devices
PC-CAN interface from SEW-EURODRIVE (including prefabricated connection cable with integrated terminating resistor)	18210597	- Prefabricated cable with 9-pin D-sub connector for connection to the device, length 2 m - A 120 ohm terminating resistor is fitted to one end of the prefabricated cable (between CAN_H and CAN_L).	- MOVIAXIS® - MOVIDRIVE® B - MOVITRAC® B - MOVI-PLC® (<i>basic and advanced</i>) - MOVITRANS® TPS and TES

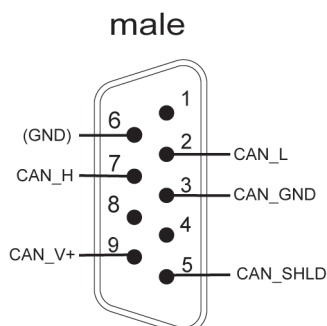
To connect the PC CAN interface to the device, you need an additional connection cable with terminating resistor. The scope of delivery of the PC CAN interface from SEW-EURODRIVE includes a prefabricated connection cable on the device with terminating resistor. Therefore, only this PC-CAN interface is described in the following chapter.

Starting up the USB-CAN interface

This section describes how to connect the PC-CAN interface from SEW-EURODRIVE to the SBus interface or your devices and what must be considered for this.

CAN pin assignment

The following figure shows the pin assignment of the 9-pin D-sub connector of the PC-CAN interface from SEW-EURODRIVE (view from top):

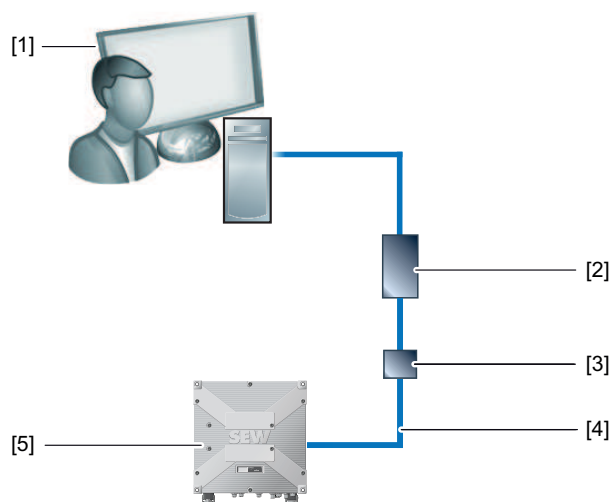


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Connecting the USB-CAN interface to the unit

The connection via the CAN interface is described in chapter "X4101: CAN bus – system bus" (→ 41).

The following figure shows how the USB-CAN interface [2] from SEW-EURODRIVE is connected with the device [5] and the PC [1] via the SBus interface.



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- [1] PC with USB port
- [2] USB-CAN interface with prefabricated connection cable with terminating resistor (included in the delivery)
- [3] D-sub gender changer
- [4] Connection cable M12 ↔ D-sub
- [5] Device

Proceed as follows to connect the USB-CAN interface with the PC and your device:

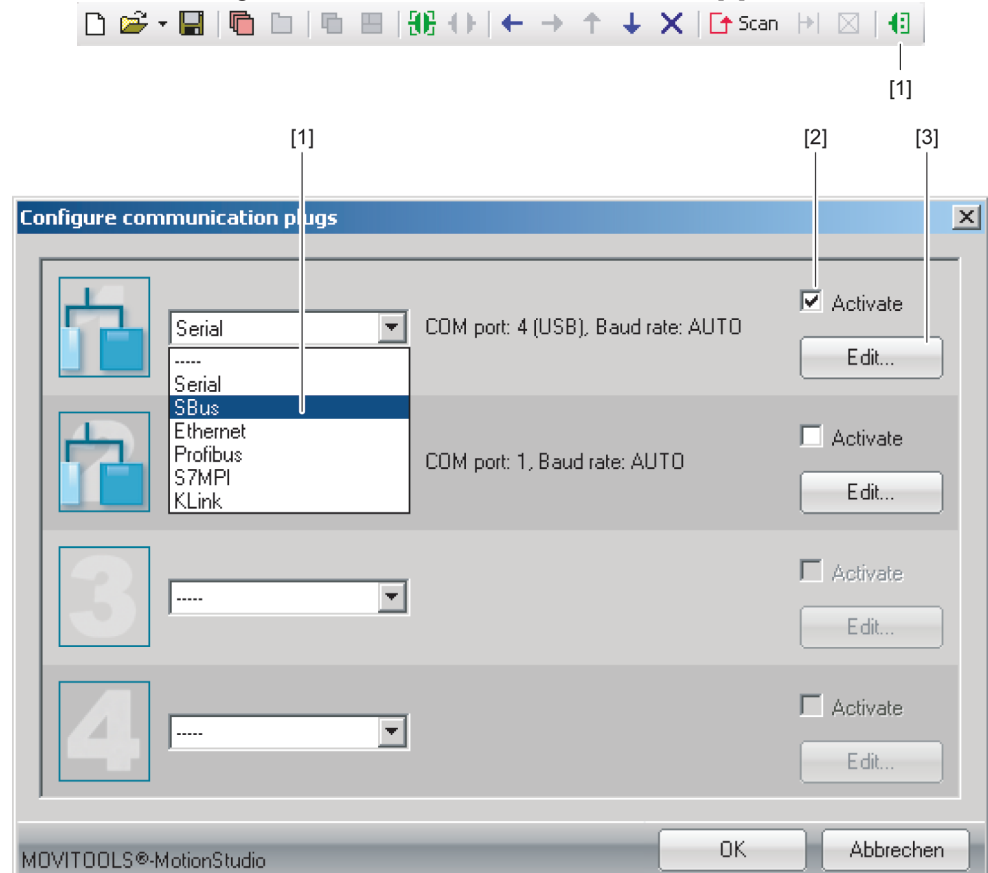
1. Connect the 9-pin D-sub connector of the USB-CAN interface with the prefabricated connection cable. Make sure that the cable end with the terminating resistor leads to the USB-CAN interface.
2. Connect the second cable end (without terminating resistor) to the SBus interface of the device [5] using the connection cable [4] and D-sub gender changers [3].
3. If the USB-CAN interface is connected to the first or last device in a network, connect a CAN terminating resistor to the device.
4. Plug the USB-A connector of the USB cable into a free USB interface on your PC [1].

Configuring the SBus communication

You need an SBus connection between your PC and the devices you want to configure. You can use a USB-CAN interface for this purpose.

Proceed as follows to configure an SBus connection:

1. Click on "Configure communication connections" [1] in the toolbar.



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Communication parameters for SBus

The following table describes the [Basic setting] for the SBus communication channel:

Communication parameter	Description	Information
Baud rate	Transmission speed with which the connected PC communicates with the device in the network via the communication channel	- Adjustable values (permitted total cable length): – 125 kBaud (500 m) – 250 kBaud (250 m) – 500 kBaud (100 m) (Default setting) – 1 Mbaud (25 m) - All connected devices must support the same baud rate

The following table describes the [Advanced setting] for the SBus communication channel:

Communication parameter	Description	Information
Parameter telegrams	Telegram with a single parameter	Used to transfer a single parameter of a device
Multi-byte telegrams	Telegram with several parameters	Used to transfer the complete parameter set of a device
Timeout	Waiting time in [ms] that the master waits for a response from the slave after it has made a request	• Default setting: – 100 ms (parameter telegram) – 350 ms (multi-byte telegram) • Increase the value if not all devices are detected during a network scan
Repetitions	Number of request retries after the timeout is exceeded	Default setting: 3

7.4.4 Executing functions with the devices

Reading or changing device parameters

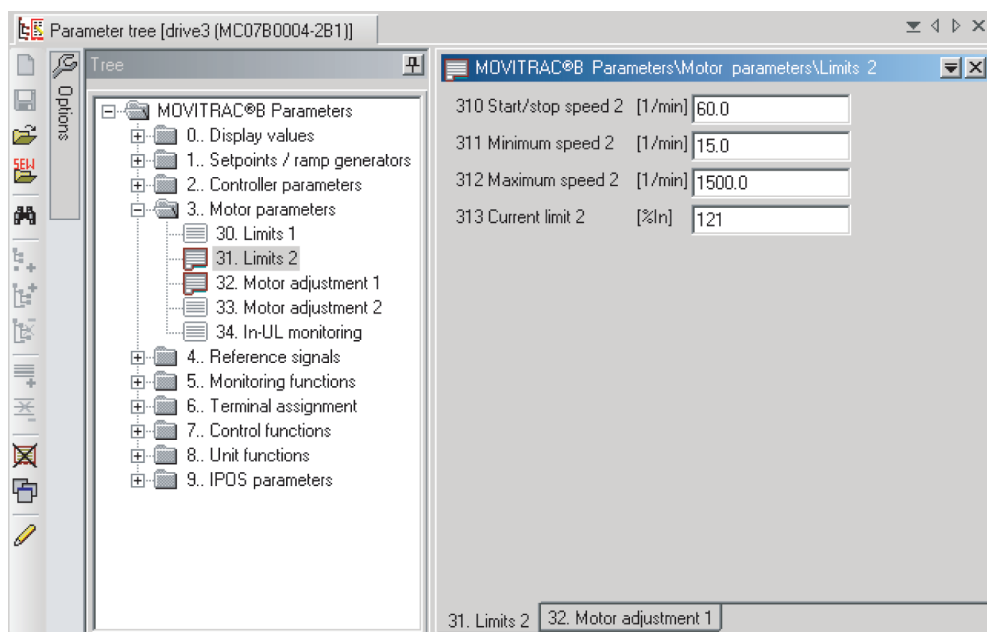
Proceed as follows:

1. Switch to the required view (project view or network view).
2. Select the connection mode:
 - If you want to read/change parameters directly on the **device**, switch to online mode by using the icon [1].
 - If you want to read/change parameters in the **project**, switch to offline mode by using the icon [2].



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3. Select the device you want to parameterize.
4. Choose the command [Startup] > [Parameter tree] from the context menu.
 - ⇒ This opens the "Parameter tree" view on the right section of the screen.
5. Expand the parameter tree to the node you require.



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6. To display a specific group of device parameters, double-click on the group.
7. Press the enter key to finalize any changes you make to numerical values in the input fields.

INFORMATION



For detailed information about the device parameters, refer to the parameter list for the device.

Starting up devices (online)

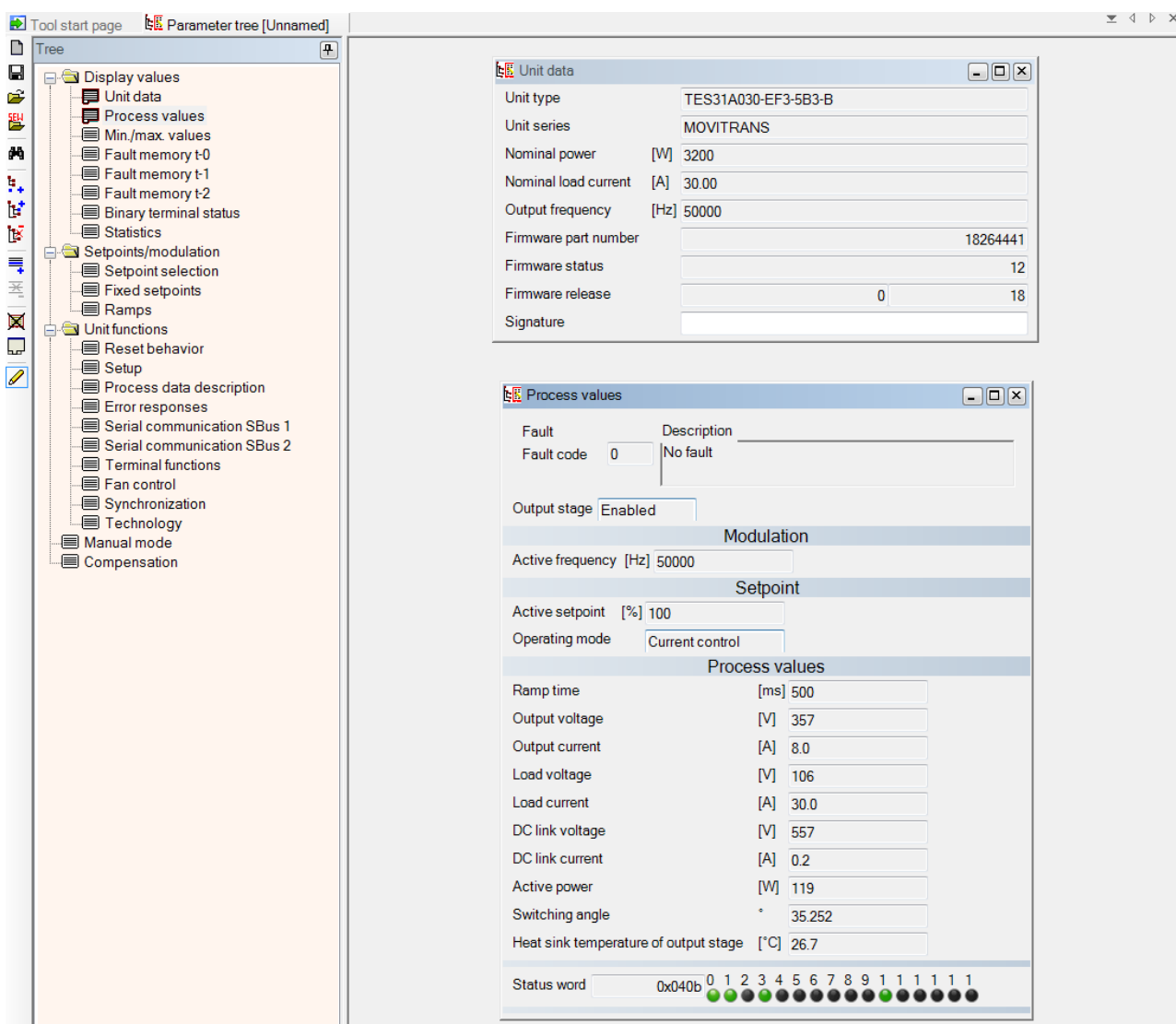
Proceed as follows:

1. Switch to the network view.
2. Switch to online mode by using the icon [1].



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3. Select the device you want to start up.
 4. Choose the command [Startup] > [Parameter tree] from the context menu.
- ⇒ The parameter tree is displayed.



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5. Parameterize the device according to your requirements. In the "Setup" window, you can reset the delivery state by selecting "Factory setting" (default).
6. Parameterize the following sources:
 - ⇒ Setpoint source: The settings of the setpoint source depend on the system environment.

- ⇒ Control signal source: You can control the device via various control signal sources. The control signal source depends on the system environment, e.g. the higher-level controller.
- 7. The line cable compensation is performed during startup. To do so, the load current I_L must be set variably. You can do this by using the manual mode in MOVITOOLS® MotionStudio. Observe the chapter Status and error messages.

7.5 Communication via system bus

Via its SBus interface, the device allows for a connection to a higher-level automation system. The device always functions as SBus slave. SBus master can be control devices (PLC) and PCs with a CAN bus interface. If the device is to be controlled via a fieldbus, set the fieldbus gateway as the master, e.g. DFP21B/UOH11B.

As a requirement for the communication via SBus, install the stations (master and slaves) as described in chapter "Electrical installation" (→ 27). The SBus is a CAN bus according to the CAN specification 2.0, parts A and B. It supports all services offered by the MOVILINK® SEW device profile.

7.5.1 MOVILINK® protocol

The MOVILINK® protocol handles automation tasks, such as the control and configuration of the device via cyclical data exchange, as well as startup and display tasks.

Various telegram types are specified for the communication with a master control. These types of telegrams can be divided into 2 categories:

- Process data telegrams
- Parameter telegrams

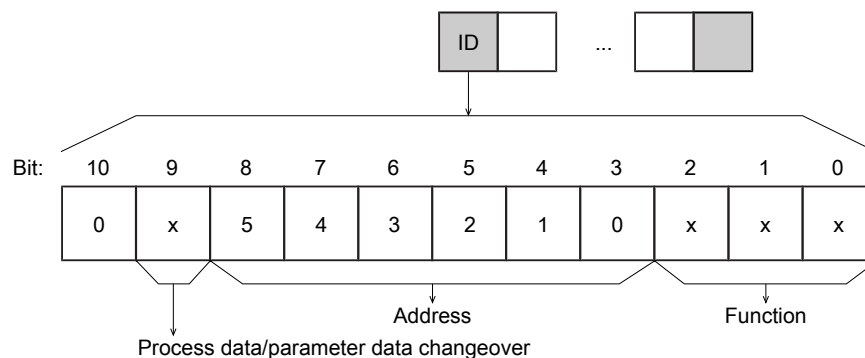
The device can receive and respond to parameter and process data telegrams as SBus slave.

CAN bus identifier

To differentiate between the various types of telegrams on the SBus, the identifier (ID) of an SBus telegram is made up of the telegram type and the SBus address. The SBus address is set via the "SBus address" parameter or the "SBus group address" parameter.

The CAN bus identifier consists of 11 bits, since only standard identifiers are used. The 11 bits of the identifier are divided into 3 groups:

- Function (bits 0 – 2)
- Address (bits 3 – 8)
- Process data/parameter data changeover (bit 9)



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Bit 10 is reserved and must be 0. Bit 9 is used to differentiate between process data telegrams bit 9 = 0 and parameter data telegrams bit 9 = 1. For parameter and process data telegrams, the address contains the "SBus address" of the device. The device is addressed with a request telegram. For group parameters and group process data telegrams, the address contains the "SBus group address".

Creating the identifiers

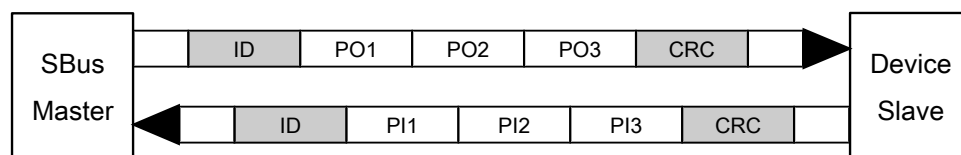
The following table shows the relationship between the type of telegram and the address when creating the identifiers for SBus MOVILINK® telegrams:

Identifier	Telegram type
$8 \times \text{SBus address} + 3$	Process output data telegrams (PO)
$8 \times \text{SBus address} + 4$	Process input data telegrams (PI)
$8 \times \text{SBus group address} + 6$	Group process output data telegram (GPO)
$8 \times \text{SBus address} + 512 + 3$	Parameter request telegram
$8 \times \text{SBus address} + 512 + 4$	Parameter response telegram
$8 \times \text{SBus address} + 512 + 6$	Group parameter request telegram

Process data telegrams

Process data telegrams consist of a process output data and a process input data telegram. The process output data telegram is sent from the master to a slave and contains the setpoints for the slave. The process input data telegram is sent from the slave to the master and contains the actual values of the slave.

The setting for the number of process data items is fixed at the value "3 process data words".



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The master control can arbitrarily send the asynchronous process output data that is responded to by the device with a process input data telegram within at most a milli-second.

The content of the process data is fixed:

Process output data PO	Content	Description
PA1	Control word 1	See (→ 65)
PA2	Setpoint	The setpoint is coded in 0.01 % (10000 _{dec} → 100 %).
PA3	No function	
Process input data PI	Content	Description
PI1	Status word 1	See
PI2	Temperature	The output stage heat sink temperature is coded in 0.01 % (2000 _{dec} → 20 %).
PI3	Power (active power measured in the DC link)	The active power is coded in 1 W (1000 _{dec} → 1000 W).

The device can monitor the cyclical process data communication.

A monitoring time can be set via the *SBus timeout delay* parameter. The device performs the fault response set in the *SBus-timeout response* parameter if there is no data exchange via process data telegrams within this time.

Group process data telegram

The group process data message is sent from the master to one or more slaves with the same SBus group address. The telegram has the same structure as the process output data telegram. This telegram can be used for sending the same setpoint values to several slaves which share the same SBus group address. The slaves do not respond to the telegram.



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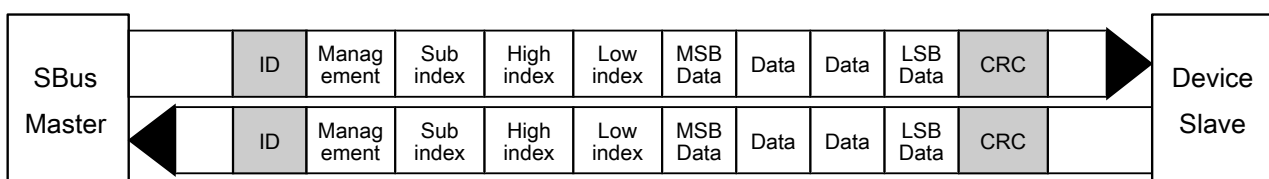
Parameter telegrams

Parameter messages are made up of a parameter request message and a parameter response message. To read or write a parameter value, the parameter request telegram is sent by the master.

The parameter telegrams are structured as follows:

- Parameter index
 - Management byte → byte 0
 - Subindex byte → byte 1
 - Index high byte → byte 2
 - Index low byte → byte 3
- 4 data bytes → byte 4 (MSB) – byte 7 (LSB)

The management byte specifies which service should be performed. Index and sub-index determine the parameter the service is carried out for. The four data bytes contain the numerical value that is read or written. A list of all parameters supported by the device is attached. The parameter response message is sent by the slave in response to the parameter request message from the master. Request and response telegrams have the same structure.



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Management of the parameter telegram

The entire parameterization sequence is coordinated with byte 0 "Management". This byte provides important service parameters, such as:

- Service identification
- Data length
- Execution of the executed service
- Status of the executed service

Bits 0 – 3 contain the service identification and thus the service to be carried out.

Bit 4 and bit 5 set the 4 byte data length for the write service.

The handshake mode bit (bit 6) is always 0: asynchronous communication.

The status (bit 7) indicates whether the service is carried out properly or with faults.

Byte 0: Management							
MSB							LSB
7	6	5	4	3	2	1	0
Status bit: 0 = No fault while executing service 1 = Fault while executing service	Handshake bit: 0 = asynchronous, send response immediately	Data length: 11 = 4 bytes		Service identification: 0000 = No service 0001 = Read 0010 = Write parameter 0011 = Write parameter volatile 0100 = Read minimum 0101 = Read maximum 0110 = Read default			

Index addressing

The following bytes determine the parameter to be read or written via the fieldbus system.

- Byte 1: Sub index
- Byte 2: Index high
- Byte 3: Index low

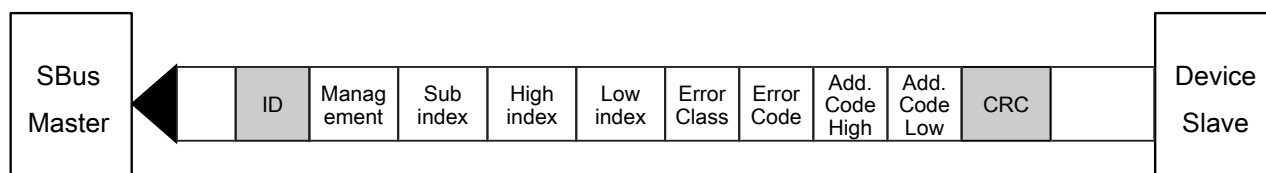
The parameters of the device are addressed with a uniform index including subindex regardless of the fieldbus system which is connected.

Data range

The data are in byte 4 to byte 7 of the parameter telegram. This means up to 4 bytes of data can be transmitted per service. The data is always entered with right-justification. Byte 7 contains the least significant data byte (LSB data), thus byte 4 is the most significant data byte (MSB data).

Telegram for incorrect execution of service

The status bit in the management byte is set to signal that a service has been performed incorrectly (status bit = 1). If the status bit (bit 7) signals a fault, the fault code is entered in the data range of the parameter telegram. Bytes 4 – 7 send back the return code in a structured format.



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Return codes for parameterization

In case of incorrect parameter setting, the device returns various return codes to the parameterizing master. The return codes offer detailed information on the cause for the fault. All of these return codes are structured in accordance with EN 50170. The structure comprises the following elements:

- Fault class
- Fault code
- Additional code

Return codes that are provided by the device are all included in fault class "Fault class 8 = other fault" and in the "Fault code = 0 (other fault code)". The fault can be identified more precisely using the "additional code" element:

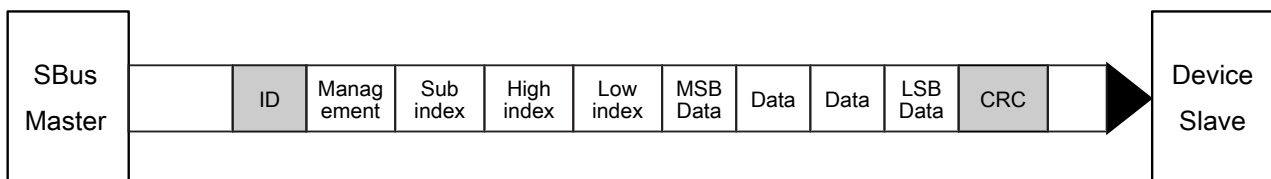
Additional code high (hex)	Additional code low (hex)	Meaning
00	00	No fault
00	10	Illegal parameter index
00	11	Function/parameter not implemented
00	12	Read access only
00	13	Parameter lock is active
00	14	Factory setting is active
00	15	Value for parameter too large
00	16	Value for parameter too small
00	17	Required option card missing for this function/parameter
00	18	Error in system software
00	19	Parameter access only via RS-485 process interface to X13
00	1A	Parameter access only via RS485 diagnostic interface
00	1B	Parameter is access-protected
00	1C	Controller inhibit required
00	1D	Invalid value for parameter

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Additional code high (hex)	Additional code low (hex)	Meaning
00	1E	Factory setting was activated
00	1F	Parameter was not saved in EEPROM
00	20	Parameter cannot be changed when output stage is enabled

Group parameter telegram

The group parameter telegram is sent from the master to one or more slaves with the same SBus group address. It has the same structure as the process request telegram. You can only write parameters to the slave devices with this telegram. The slaves do not respond to the telegram.



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7.5.2 Reading a parameter

Following an example of how to read a parameter (see Parameters ordered by indexes) from the device by means of parameter communication.

The device (SBus slave) has the SBus address 3.

- **Identifier:** Parameter request telegram
 $8 \times \text{SBus address} + 512 + 3 = 539 (21B_{\text{hex}})$
- **Administration:** Read parameter, 4 bytes long, $0011\ 0001\ b = 31_{\text{hex}}$
- **Index:** Load current, 10089
 $10089 = 2769_{\text{hex}}$ (index low = 69_{hex} , index high = 27_{hex}), subindex 1

The SBus master sends the following CAN message:

ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
21B	31	01	27	69	00	00	00	00

The device responds as an example:

ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
21C	31	01	27	69	00	00	2E	E0

According to parameter table: Measurement index = 22; unit = Ampere; conversion index = -3

Numerical value: $2EE0_{\text{hex}} = 12000$

This means the load current is $12000\ \text{mA} = 12000\ \text{A} \times 0.001 = 12\ \text{A}$.

7.6 Control via SBus

7.6.1 Control via process data telegrams

If the device is to be controlled via the process data telegrams, make the following settings:

Parameter	Setting
Control signal source	SBus 1 or SBus 2
Setpoint source	SBus 1 or SBus 2

In addition, parameterize the respective parameters *SBus timeout interval* and *Response SBus timeout*.

Example

The device with SBus address 3 is controlled cyclically by a PLC (SBus master). The process output data (PO) are sent every 10 ms.

Identifier (ID):

Process output data telegram (PO)

$$8 \times \text{SBus address} + 3 = 8 \times 3 + 3 = 27_{\text{dec}} = 1B_{\text{hex}}$$

PO1, Control word 1

Bit 0 = 1: /Output stage inhibit

The following applies: PO1 = 01_{hex}

To enable the output stage, set all digital inputs with the function "/Output stage inhibit" to "1".

PO2, setpoint:

Setpoint: 100%, which means PO2 = 10000 = 2710_{hex}

This means the SBus master sends:

ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5
1B	00	01	27	10	00	00
	PO1		PO2		PO3	

The device responds to the process output data telegram (PO) with the process input data telegram (PI):

ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5
1C	04	03	FF	0A	01	75
	PI1		PI2		PI3	

PI1 (byte0, byte1) → status word:

- Byte 0 state, 04: Output stage enabled
- Byte 1 basic status block, bit0 = 1: Output stage enabled, bit 1 = "1": Ready

PI2 (Byte2, Byte3): Maximum temperature, 09A1_{hex} = 2465_{dec} → 24.65 °C

PI3 (Byte4, Byte5): Active power, 0216_{hex} = 534_{dec} → 534 W

7.6.2 Control via parameter telegrams

You can control the device via parameter telegrams. In contrast to the process data telegrams, the parameter telegrams can also be sent acyclically.

Parameterize the following:

Parameter	Setting
Control signal source	Parameter control word
Setpoint source	Parameter setpoint

Parameter control word

The device with SBus address 3 is controlled via a PLC.

Identifier (ID):

$$8 \times \text{SBus address} + 512 + 3 = 8 \times 3 + 512 + 3 = 539 = 21B_{\text{hex}}$$

Management byte:

Write parameter volatile, 4 byte: 33_{hex}

Index:

Parameter control word, 8785 (index low = 51_{hex} , index high = 22_{hex}), subindex: 0

ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
21B	33	00	22	51	00	00	00	00

Parameter setpoint

A setpoint of 100% ($100.000_{\text{dec}} = 0186A0_{\text{hex}}$) is determined for the device.

Identifier (ID):

$$8 \times \text{SBus address} + 512 + 3 = 8 \times 3 + 512 + 3 = 539 = 21B_{\text{hex}}$$

Management byte:

Write parameter volatile, 4 bytes: 33_{hex}

Index:

Parameter setpoint, 10237 (index low = FD_{hex} , index high = 27_{hex}), subindex 10

ID	Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7
21B	33	0A	27	FD	00	01	86	A0

7.7 Compensation

7.7.1 Track compensation/fine compensation

The inductance of the line cable increases as the cable length increases. This inductive reactance is compensated by connecting compensation capacitors in series. When configuring systems with longer line cables, fixed (unchangeable), capacitance values (track compensation) are already provided in the track design. In addition, you must perform a fine compensation using the TCS31A compensation box during startup. This allows for the best possible resonance adjustment in the system.

7.7.2 Prerequisites

MOVITOOLS® MotionStudio is required for compensation.

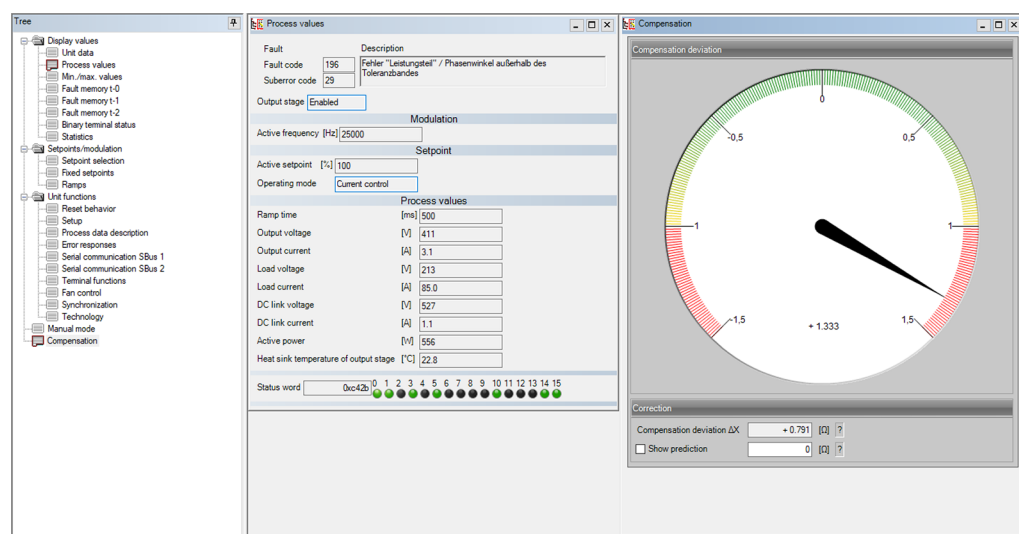
In order to be able to perform the compensation successfully, the setpoint must be varied when the output stage is enabled. This can be done via the setpoint input or by using the manual mode in MOVITOOLS® MotionStudio.

The device allows compensation with any power transmission.

7.7.3 Procedure

Perform the following steps to ensure successful startup:

1. Establish a connection to the TES31A decentralized supply unit using the MOVITOOLS® MotionStudio software.
2. Select the "Process values" window under "Display values" in the parameter tree view.
3. Check the values displayed in the "Process values" window.
 - Fault status = No fault
 - Output current = 0.0 A
 - Active setpoint = 0%
4. Select the "Compensation" window in the parameter tree view.



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5. Enable the output stage.

6. Gradually increase the setpoint to 100% in 10% increments without causing the output current to exceed its nominal value I_{AN} .
7. If you cannot set the setpoint to 100% without exceeding the nominal output current I_{AN} : Perform the compensation procedure at a setpoint lower than 100%.
8. Evaluate the compensation based on the pointer in the window "Normalized compensation deviation". Nominal power transmission is possible within the green range of -1 to 1. Values close to 0 have a positive effect on efficiency and overload capacity.
9. In case the displayed compensation value is not within the green range adjust the interconnection of the TCS31A compensation box. Otherwise, the TES31A supply unit receives less power than the nominal power.

Setting the compensation

Set the compensation if one of the following points applies:

- The pointer lies outside of the green range.
- The device signals fault 196.29 "Switching angle outside the tolerance band".

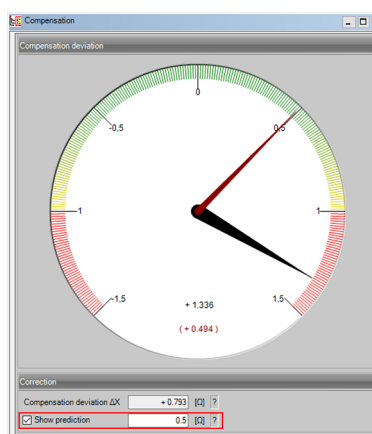
To do so, change the interconnection of the TCS31A compensation box accordingly:

- $\Delta X > 0$: Increase the impedance value by ΔX .
- $\Delta X < 0$: Decrease the impedance value by ΔX .

The recommended correction impedance ΔX can be found in the window "correction".

Using software, you can check if the recommended correction impedance will suffice for compensation before you adjust the interconnection of the TCS31A compensation box:

1. Tick the check box "Show compensation value for a correction impedance of" and enter the desired correction impedance into the input field.
 - ⇒ A second pointer is displayed. This pointer indicates which compensation value is achieved using the correction impedance.



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If the second pointer is within the green range of -1 to 1, the compensation is correctly set after the interconnection in the TCS31A compensation box (fine compensation) has been corrected.

If the interconnection possibilities of the TCS31A compensation box do not suffice to reach the green range, you must adjust the track compensation. To do so, install an additional TCS10B compensation box in the track.

2. Disconnect the device from the supply system.

3. **⚠ WARNING!** Residual voltage from charged capacitors. Severe injuries can occur. Do not touch live product parts and power connections as the capacitors might be charged. Adhere to a minimum switch-off time of 10 minutes.
Adjust the track compensation if necessary. Change the interconnection of the TC-S31A compensation box (fine compensation). For information on setting the fine compensation, refer to the operating instructions "Compensation box TCS31A".
4. Check the compensation again, see chapter "Procedure" (→  102).
5. Set the setpoint input as required after compensation has been performed.

8 Operation

8.1 For your safety



⚠ WARNING

Health hazards may arise for persons with medical devices, e.g. pacemakers, due to electromagnetic fields.

This can result in severe or fatal injuries.

- Observe a minimum clearance of 1 m from the inductive charging technology.
- Document this in operating instructions. Attach a suitable sign to the system as per the national provisions.



⚠ WARNING

Risk of injury and possible damage to property due to automatic restart of the drive after fault elimination or after a reset.

Fatal or severe injuries and damage to property.

- Disconnect the device from the power supply before rectifying a fault if automatic restart of the driven machine is not permitted for safety reasons.
- After a reset, make sure that the drive can start up automatically depending on the setting.



⚠ CAUTION

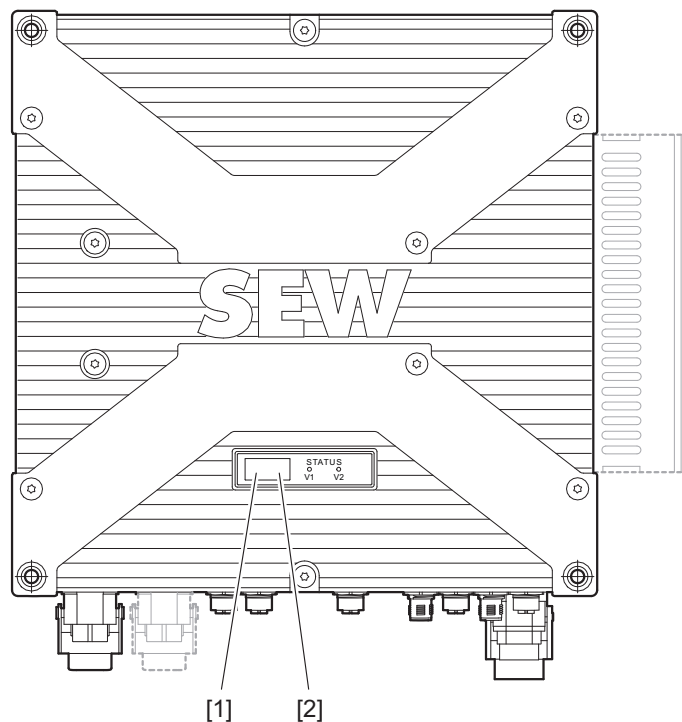
Risk of burns due to hot surfaces of the device or connected options, e.g. braking resistors.

Injury.

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

8.2 Status and fault messages

The following figure shows the control and display elements of the device:



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- [1] LED V1
[2] LED V2

8.2.1 Status of LED V1

The status LED V1 indicates the following operating states:

Status LED	Meaning	Measure
Off	No operation	Check the line voltage
Steady yellow	No enable, device ready for operation	Check the connections for the enable, especially at: - X2337 → jumper pin 11 with pin 12 available - X5102_1 → pin 4 connected with +24 V - X5161 → jumpers pin 1 with pin 4 and pin 2 with pin 3 available
Flashing green	Device active (in operation), line cable is energized	-
Steady red	Fault, display via LED V2	For measures, refer to the Error list

8.2.2 Status of LED V2

Status LED V2 shows the following in case of failures or faults:

Status LED	Code	Subcode	Meaning
Green-yellow alternating	7	30	"DC link" fault Performance monitoring
Green-red alternating	68	11	"External synchronization" fault lost synchronization, sync signal invalid
Steady yellow	7	2	"DC link voltage" fault $V_{DC\ link}$ undervoltage
	6	0	"Line phase failure" fault
	50	8	"Hardware" fault 15VOK or SMPS signal faulty
Flashing yellow	46	0	"Timeout SBus #2" fault System bus (CAN) 2 timeout
	47	0	"Timeout SBus #1" fault System bus (CAN) 1 timeout
Yellow-red alternating	26	0	"External terminal" fault
Steady red	1	0	"Overcurrent" fault
Flashing red	11	10	"Overtemperature" fault
Off	xx	x	- General error during initialization - Temporary failure - Device defective

For further information, refer to chapter Error list.

8.2.3 Fault list

The factory-set fault response is listed in the "Response (P)" column. "(P)" means that the response can be set in the "Fault response" window.

Code	Meaning	Response (P)	Sub-code	Meaning	Possible cause	Measure
01	Overcurrent	Output stage inhibit	0	Inversion in software current limiting	Short circuit at output	• Rectify the short circuit
					Load output open	• Connect line cable
					Incorrect compensation	• Correct the compensation
					Faulty output stage	• Contact SEW-EURODRIVE
01	Overcurrent	Output stage inhibit	5	Inversion in hardware current limiting	Short circuit at output	• Rectify the short circuit
					Load output open	• Connect line cable
					Incorrect compensation	• Correct the compensation
					Faulty output stage	• Contact SEW-EURODRIVE
02	UCE monitoring fault	Output stage inhibit	0		Faulty output stage	• Contact SEW-EURODRIVE
06	Line phase failure	Display only (P)	0		Line phase failure of the supply system cable	• Check supply system cable and fuse
07	DC link voltage	Display only (P)	2	U _{DC link} under-voltage	Line voltage too low	• Connect correct line voltage
					Voltage drop too large on supply system cable	• Design power supply system line so that the voltage drop is relatively small
07	DC link	Output stage inhibit	30	Performance monitoring	- Parameterized minimum planned performance not reached 0 W → monitoring off	• Check parameterization of the threshold
11	Overtemperature	Output stage inhibit	10		Thermal overload of device	- Ensure sufficient cooling - Check fan control - Observe permitted ambient temperature
26	External terminal	Output stage inhibit (P)	0		Read external error signal via respective input	- Correct external error - Make sure that the relevant DI is set to "1"

Code	Meaning	Response (P)	Sub-code	Meaning	Possible cause	Measure
46	Timeout SBus #2	Output stage inhibit (P)	0	Timeout system bus CAN2	Error during communication via system bus 2	Check system bus connection
47	Timeout SBus #1	Output stage inhibit (P)	0	Timeout system bus CAN1	Error during communication via system bus 1	Check system bus connection
50	Hardware	Output stage inhibit	8	"15VOK" or SMPS signal faulty	Temporary failure	• Reset the fault
					SMPS defective	• Contact SEW-EURODRIVE
68	External synchronization	Output stage inhibit (P)	11	Synchronization lost, sync signal invalid	Error during transmission of the sync signal	• Check synchronization connection • Check master/slave settings
196	Power section	Output stage inhibit	26	Inverter UZOFL signal Hardware fault	Regenerative power supply in synchronization mode	• Check the synchronization wiring • Check phase angle of the synchronization
196	Power section	Output stage inhibit	28	Gyrator over-voltage	Incorrect compensation	• Correct the compensation
196	Power section	Output stage inhibit	29	Switching angle outside the tolerance band	Incorrect compensation	• Correct the compensation

If fault codes are displayed that are not listed here, consult SEW-EURODRIVE.

8.3 Fault reset

The status display on the device cover shows the current device status. In case of repeated malfunctions, contact the SEW-EURODRIVE Service.

Perform the following steps to reset the fault:

- Switch the power supply off and back on again.
- Perform an edge change from "1" → "0" via the control command "/output stage inhibit". The procedure is identical to revoking the release.

The edge change can occur with one of the following input signals:

- Terminal DI00
- Terminal DI01, if "/output stage inhibit" is selected for terminal function DI01.
- Control bit 0 in control word via SBus 1/SBus 2, if the control signal source is selected accordingly.
- If the control signal source is selected accordingly, perform an edge change "0" → "1" via control bit 6 in control word via SBus 1/SBus 2.
- Auto reset if the auto reset function is switched on and the auto reset counter > 0.
- Perform a manual reset via parameter (index 8617/0) by sending a "1" in bit 0.

9 Service

9.1 Status and fault messages

The status LEDs show status and error messages and so allow you to record the current state of the device.

For further information, refer to the chapter "Status and fault messages" (→ 106). If you are unclear about any of the information in this documentation or if you require further information, contact SEW-EURODRIVE.

9.2 Inspection/maintenance

The MOVITRANS® system for contactless energy transfer by SEW-EURODRIVE is a wear-free system. Observe the following note.

INFORMATION



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

Damage or indications of fatigue may occur. Perform the following tests/maintenance tasks:

- Connection cable:
If cables become damaged or fatigued, replace them immediately.
- Ventilation duct:
In order to ensure sufficient cooling, remove any deposits which occur.
- Fan assembly:
Check whether the fan assembly functions properly.

9.3 Electronics Service by SEW-EURODRIVE

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

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

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

9.4 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.

9.5 Storage

Observe the following instructions 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 notes on storage temperature in chapter "Technical data" (→ 115).

9.6 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 may be reduced.

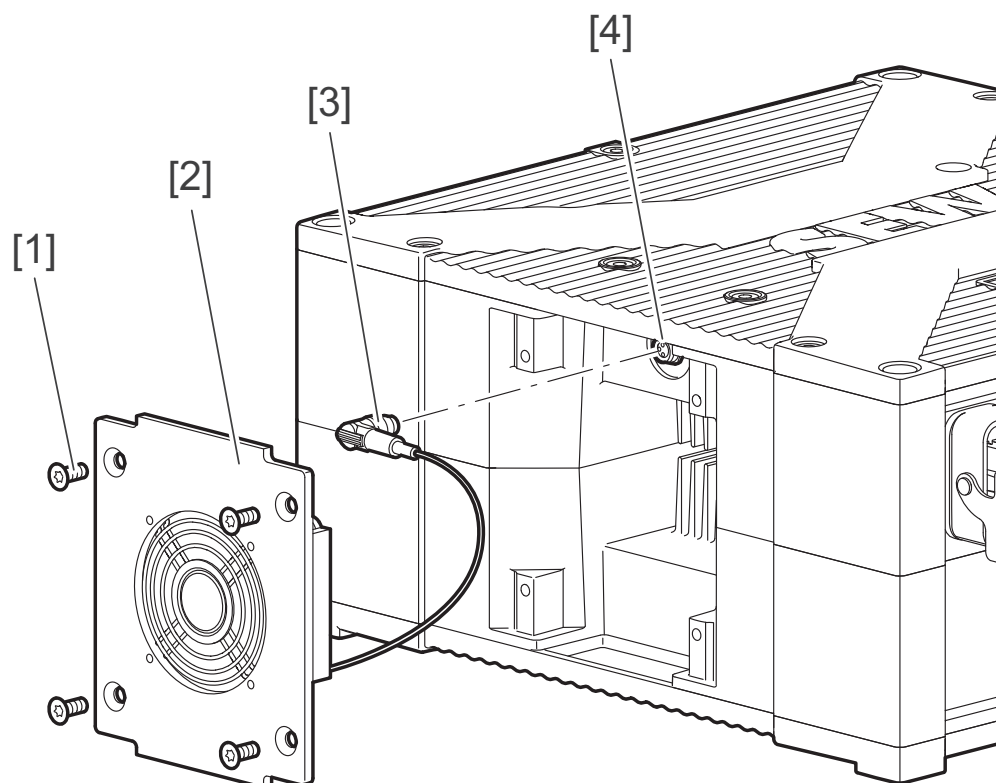
If you have not performed maintenance regularly every 2 years, SEW-EURODRIVE recommends that you increase the supply voltage slowly up to the maximum voltage. This can be done, for example, by using a variable transformer for which the output voltage has been set according to the following overview:

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

9.7 Cleaning

Clean the device with a clean cloth and a suitable cleaning agent. Observe the following information during cleaning:

- De-energize the device.
- Clean the device only with solvent-free cleaning agent.
- Do not clean the device with a high-pressure cleaning device.
- Observe the degree of protection of the device.



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- [1] Countersunk screw M5 × 12
- [2] Fan subassembly with connection cable and connector
- [3] M8 connector
- [4] M8 connection

Cleaning or replacing the fan may be required after a long operating time.

✓ Proceed as follows for removal:

1. Loosen the 4 retaining screws [1].
2. Remove the fan subassembly [2].
3. Remove the connector [3] from the connection [4] by turning the knurls.

For installation, install the components in reverse order. Observe the correct mounting position of the fan subassembly. The required tightening torque is 3.3 Nm.

Plan the cleaning intervals according to the conditions at the operating location.

9.8 Waste disposal

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

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

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

- Oil and grease

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

- Screens
- Capacitors



Waste disposal according to WEEE Directive 2012/19/EU

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

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

10 Technical data

10.1 Design with operating voltage AC 400/500 V

The data in the following table is valid for all devices, regardless of power and type.

General technical data		
Storage temperature	ϑ_L	-25 – +70 °C
Degree of protection		IP54
Installation altitude	h	I_{N2} reduction at 1000 m to 2000 m above sea level: 1% per 100 m

10.1.1 3.2 kW devices

Basic properties		
Ambient temperature	ϑ_A	-5 to +45 °C
Mass		10.7 kg
Dimensions W × H × D		300 mm × 300 mm × 150 mm
Input		
Power supply connection		AC 3~
Connection voltage	U_{line}	3 × AC 380 V to 500 V ±10%
Line frequency	f_{line}	50 Hz to 60 Hz ± 5%
Nominal line current	I_{line}	AC 5.5 A
Output		
Nominal output power	P_N	3200 W
Nominal output voltage	U_{N2}	AC 340 V
Nominal output current	I_{N2}	AC 10.9 A
Switch-off current	I_{Amax}	AC 14.5 A
Overload behavior	Disconnection of the output stage when switch-off current limit is reached and in case of overtemperature	

System frequency B

TES31A030-EF3-5B3-B output		
Output frequency	f_O	50 kHz
Load current	I_L	AC 30 A
Nominal load voltage	U_{LN}	AC 160 V

10.1.2 8 kW devices

Basic properties		
Ambient temperature	ϑ_U	-25 – +40 °C
Mass		12.4 kg
Dimensions W × H × D		355 mm × 300 mm × 150 mm
Input		
Line connection		AC 3~
Connection voltage	V_{line}	3 × AC 380 V to 500 V ±10%
Line frequency	f_{line}	50 Hz to 60 Hz ± 5%
Nominal line current	I_{line}	AC 12.8 A
Output		
Nominal output power	P_N	8000 W
Nominal output voltage	U_{N2}	AC 400 V
Nominal output current	I_{N2}	AC 20.7 A
Switch-off current	I_{Amax}	AC 30.8 A
Overload behavior	Disconnection of the output stage when switch-off current limit is reached and in the event of overtemperature	

System frequency A

TES31A080-EF3-5B3-A output		
Output frequency	f_A	25 kHz
Load current	I_L	AC 30 A
Nominal load voltage	U_{LN}	AC 423 V
TES31A080-EF4-5B3-A output		
Output frequency	f_A	25 kHz
Load current	I_L	AC 42.5 A
Nominal load voltage	U_{LN}	AC 397 V
TES31A080-EF6-5B3-A output		
Output frequency	f_A	25 kHz
Load current	I_L	AC 60 A
Nominal load voltage	U_{LN}	AC 212 V
TES31A080-EF8-5B3-A output		
Output frequency	f_A	25 kHz
Load current	I_L	AC 85 A
Nominal load voltage	U_{LN}	AC 199 V

System frequency B

TES31A080-EF3-5B3-B output		
Output frequency	f_A	50 kHz
Load current	I_L	AC 30 A
Nominal load voltage	U_{LN}	AC 423 V
TES31A080-EF6-5B3-B output		
Output frequency	f_A	50 kHz
Load current	I_L	AC 60 A
Nominal load voltage	U_{LN}	AC 212 V

10.1.3 14 kW devices

Basic properties		
Ambient temperature	ϑ_U	-25 – +40 °C
Mass		12.4 kg
Dimensions W × H × D		355 mm × 300 mm × 150 mm
Input		
Line connection		AC 3~
Connection voltage	V_{line}	3 × AC 380 V to 500 V ±10%
Line frequency	f_{line}	50 Hz to 60 Hz ± 5%
Nominal line current	I_{line}	AC 22.5 A
Output		
Nominal output power	P_N	14000 W
Nominal output voltage	U_{N2}	AC 400 V
Nominal output current	I_{N2}	AC 37.8 A
Switch-off current	I_{Amax}	AC 53.9 A
Overload behavior	Disconnection of the output stage when switch-off current limit is reached and in the event of overtemperature	

System frequency B

TES31A140-EF3-5B3-B output		
Output frequency	f_A	50 kHz
Load current	I_L	AC 30 A
Nominal load voltage	U_{LN}	AC 535 V
TES31A140-EF6-5B3-B output		
Output frequency	f_A	50 kHz
Load current	I_L	AC 60 A

TES31A140-EF6-5B3-B output

Nominal load voltage	U_{LN}	AC 267 V
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10.1.4 16 kW devices**Basic properties**

Ambient temperature	ϑ_U	-25 – +40 °C
Mass		12.4 kg
Dimensions W × H × D		355 mm × 300 mm × 150 mm

Input

Line connection		AC 3~
Connection voltage	V_{line}	3 × AC 380 V – 500 V ±10%
Line frequency	f_{line}	50 Hz ±10%
Nominal line current	I_{line}	AC 25.1 A

Output

Nominal output power	P_N	16 kW
Nominal output voltage	U_{N2}	AC 400 V
Nominal output current	I_{N2}	AC 42 A
Switch-off current	I_{Amax}	AC 61.6 A
Overload behavior	Disconnection of the output stage when switch-off current limit is reached and in the event of overtemperature	

System frequency A**TES31A160-EF3-5B3-A output**

Output frequency	f_A	25 kHz
Load current	I_L	AC 30 A
Nominal load voltage	U_{LN}	AC 592 V

TES31A160-EF4-5B3-A output

Output frequency	f_A	25 kHz
Load current	I_L	AC 42.5 A
Nominal load voltage	U_{LN}	AC 481 V

TES31A160-EF6-5B3-A output

Output frequency	f_A	25 kHz
Load current	I_L	AC 60 A
Nominal load voltage	U_{LN}	AC 296 V

TES31A160-EF8-5B3-A output

Output frequency	f_A	25 kHz
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TES31A160-EF8-5B3-A output		
Load current	I_L	AC 85 A
Nominal load voltage	U_{LN}	AC 240 V

System frequency E

TES31A160-EF7-5B3-E output		
Output frequency	f_A	20 kHz
Load current	I_L	AC 75 A
Nominal load voltage	U_{LN}	AC 257 V

10.1.5 General electronics data

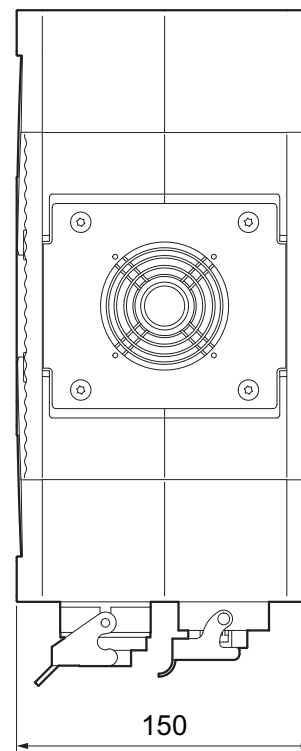
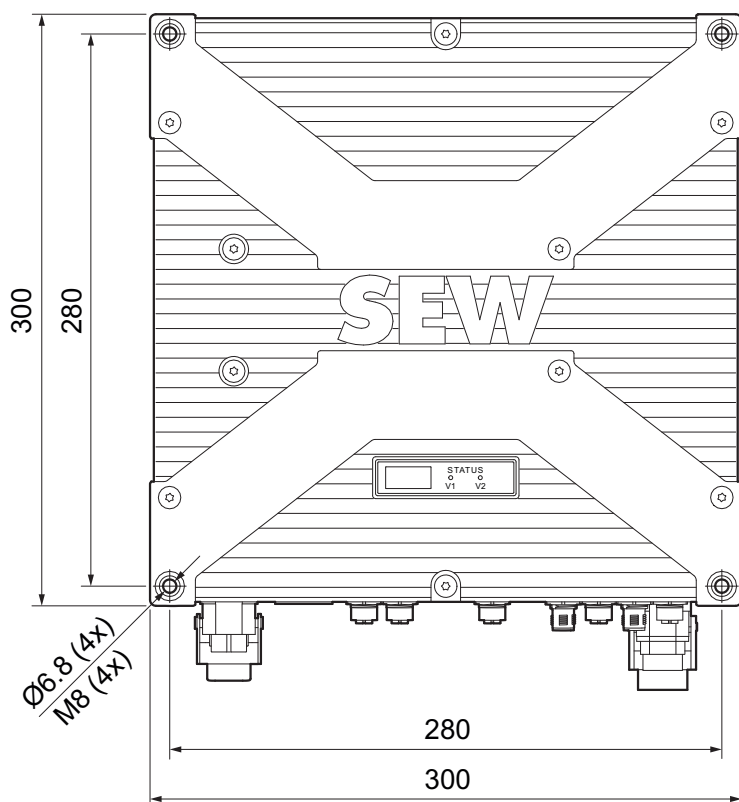
The data in the following table is valid for all devices, regardless of power and type.

Electronics data		
DC 24 V outputs	I_{max}	DC 800 mA
Binary outputs		Notice: Do not apply external voltage. PLC-compatible in accordance with EN 61131-2: 2 ms $I_{max} = 50$ mA (short-circuit proof)
Binary inputs		PLC-compatible in accordance with EN 61131-2 Isolated via optocoupler $R_i \approx 3$ k Ω , $I_E \approx 10$ mA

10.2 Dimension drawings

10.2.1 3.2 kW

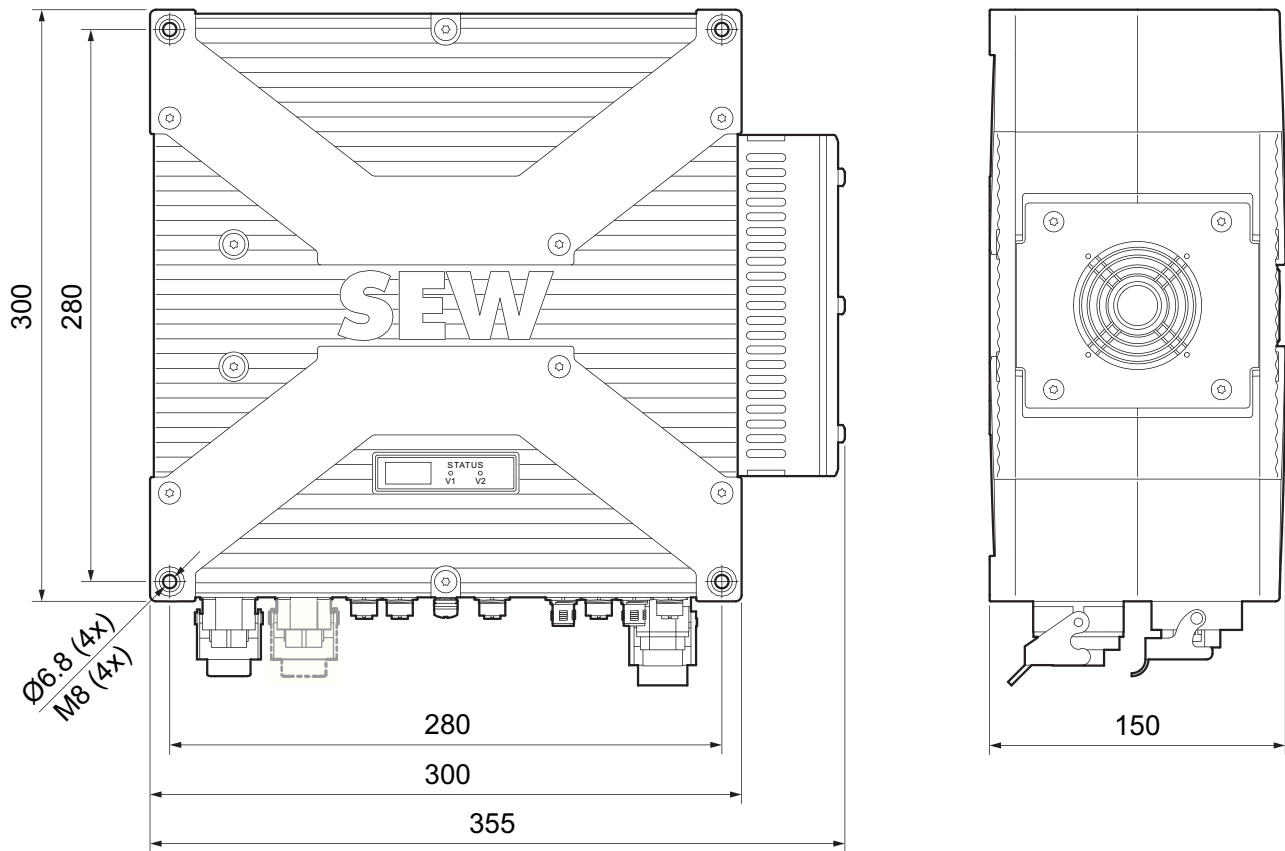
The dimension drawing shows the mechanical dimensions in mm:



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10.2.2 8 kW, 14 kW, 16 kW

The dimension drawing shows the mechanical dimensions in mm:



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11 Appendix

11.1 Parameters ordered by indexes

Index: 16-bit index for addressing the parameter via interfaces

Parameter: Parameter name

Unit: Abbr. = Abbreviation of the unit

Size: = Measurement index

Cv.: = Conversion index, for converting into the basic unit

Access: RO = Read only, E = output stage inhibit must be active during writing, RW = read/write, N = the value is written by EEPROM in the RAM upon restart

Default: Factory setting

Index			Parameters	Unit	Size	Cv.	Access	Default	Note
Dec.	Hex.	Sub							
8301	206D	0	Device type		0	0	RO	0	822E0228 _{hex}
8304	2070	0	Setpoint description PO1		0	0	RO	9	9 = Control word 1
8305	2071	0	Setpoint description PO2		0	0	RO	2	23 = Setpoint
8306	2072	0	Setpoint description PO3		0	0	RO	0	0 = No function
8307	2073	0	Actual value description PI1		0	0	RO	6	6 = Status word 1
8308	2074	0	Actual value description PI2		0	0	RO	12	12 = Temperature
8309	2075	0	Actual value description PI3		0	0	RO	13	23 = Power
8310	2076	0	Status word 1		0	0	RO	0	See status word description (→ 61)
8325	2085	0	DC link voltage	mV	21	-3	RO	0	
8326	2086	0	Output current	mA	22	-3	RO	0	
8328	2088	0	Power-applied hours	min	4	60	N/RO	0	
8329	2089	0	Drive running hours	min	4	60	N/RO	0	
8330	208A	0	Kilowatt hours	10 ⁵ Ws	8	5	N/RO	0	
8334	208E	0	Status of basic device binary inputs		0	0	RO	0	
8335	208F	0	Binary input DI01		0	0	N/E/RW	0	0 = No function 6 = Fixed setpoint changeover 11 = External fault 42 = Output stage inhibit, 0-active

Index			Parameters	Unit	Size	Cv.	Access	Default	Note
Dec.	Hex.	Sub							
8349	209D	0	Status of binary outputs on basic device		0	0	RO	0	
8350	209E	0	Binary output DO01		0	0	N/E/ RW	1	0 = No function 1 = Failure, 0-active 2 = Ready
8461	210D	0	Setpoint source		0	0	N/RW	21	15 = Parameter setpoint 16 = SBus 1 20 = SBus 2 21 = Fixed setpoints 30 = Technology
8462	210E	0	Control signal source		0	0	N/E/ RW	0	0 = Terminals 3 = SBus 1 5 = SBus 2 6 = Parameter control word
8594	2192	0	Factory setting		0	0	N/E/ RW	0	0 = No 1 = Standard 3 = Basic initialization
8596	2194	0	Delete history		0	0	N/RW	0	0 = No action 1 = Fault memory 2 = kWh counter 3 = Operating hours 100 = Min./max. values
8600	2198	0	CAN1 address		0	0	N/RW	0	0 – 127, step 1
8601	2199	0	CAN1 group address		0	0	N/RW	0	0 – 63, step 1
8602	219A	0	CAN1 timeout time	ms	4	-3	N/RW	1000	0 – 650000, step 10
8603	219B	0	CAN1 baud rate		0	0	N/RW	2	0 = 125 1 = 250 2 = 500 3 = 1000
8617	21A9	0	Manual reset		0	0	RW	0	0 = No 1 = Yes
8618	21AA	0	Auto reset active		0	0	N/RW	0	0 = Off 1 = On
8619	21AB	0	Auto reset time	ms	4	-3	N/RW	50	50 – 30000, step 1
8622	21AE	0	Enable process data		0	0	N/RW	1	0 = No 1 = Yes

Index			Parameters	Unit	Size	Cv.	Access	Default	Note
Dec.	Hex.	Sub							
8723	2213	0	Output voltage	mV	21	-3	RO	0	
8785	2251	0	Parameter control word		0	0	RW	0	See control word 1 (→ 65) Bit0 and Bit1 are "&"-linked with the switch positions (EING0/EING1)
8814	226E	0	Fixed setpoint I01	m%	24	-3	N/RW	0	0 – Max × 1000, Step 1000
8815	226F	0	Fixed setpoint I10	m%	24	-3	N/RW	50000	
8816	2270	0	Fixed setpoint I11	m%	24	-3	N/RW	100000	
8843	228B	0	Binary output DO00		0	0	N/E/ RW	2	0 = No function 1 = Failure, 0-active 2 = Ready
8932	22E4	0	CAN2 address		0	0	N/RW	0	0 – 127, step 1
8933	22E5	0	CAN2 group address		0	0	N/RW	0	0 – 63, step 1
8934	22E6	0	CAN2 timeout time	ms	4	-3	N/RW	1000	0 – 650000, step 10
8936	22E8	0	CAN2 timeout response		0	0	N/E/ RW	4	0 = No response 1 = Display only 4 = Output stage inhibit
8939	22EB	0	CAN2 baud rate		0	0	N/E/ RW	2	0 = 125 1 = 250 2 = 500 3 = 1000
8961	2301	0	Fan control		0	0	N/E/ RW	2	0 = Off 1 = On 2 = Automatic
8973	230D	0	Minimum output voltage	mV	21	-3	RO	0	
8974	230E	0	Maximum output voltage	mV	21	-3	RO	0	
8975	230F	0	Minimum output current	mA	22	-3	RO	0	
8976	2310	0	Maximum output current	mA	22	-3	RO	0	
8977	2311	0	Minimum actual current	mA	22	-3	RO	0	
8978	2312	0	Maximum actual current	mA	22	-3	RO	0	
8985	2319	0	Minimum DC link voltage	mV	21	-3	RO	0	
8986	231A	0	Maximum DC link voltage	mV	21	-3	RO	0	

Index			Parameters	Unit	Size	Cv.	Access	Default	Note
Dec.	Hex.	Sub							
9617	2591	13	Part number of configuration data set		0	0	RO	0	
9617	2591	14	Configuration data set status		0	0	RO	0	
9617	2591	15	Configuration data set version		0	0	RO	0	
9701	25E5	1	Device identification string (0 – 3)		0	0	RO	0	'TES3'
9701	25E5	2	Device identification string (4 – 7)		0	0	RO	0	'1A03'
9701	25E5	3	Device identification string (8 – 11)		0	0	RO	0	'0-EF'
9701	25E5	4	Device identification string (12 – 15)		0	0	RO	0	'3-5B'
9701	25E5	5	Device identification string (16 – 19)		0	0	RO	0	'3-B'
9701	25E5	10	Device family		0	0	RO	14	14 = MOVITRANS®
9701	25E5	11	Variant ID		0	0	RO		
9701	25E5	12	Device power	W	9	0	RO	3200	
9701	25E5	13	Voltage range	mV	21	-3	RO	500000	
9701	25E5	30	Firmware part number (basic device)		0	0	RO	0	18264441
9701	25E5	31	Firmware status (basic device)		0	0	RO	0	51
9701	25E5	32	Firmware release number		0	0	RO	0	
9702	25E6	5	Fault code		0	0	RO	0	See fault list (→ 108)
9729	2601	4	Fault response "Line phase failure"		0	0	N/E/RW	1	0 = No response 1 = Display only 4 = Inhibit output stage
9729	2601	16	Fault response "External fault"		0	0	N/E/RW	4	0 = No response 1 = Display only 4 = Inhibit output stage
9729	2601	25	Fault response "Switching angle outside tolerance band"		0	0	N/E/RW	1	0 = No response 1 = Display only
9793	2641	1	Output frequency	Hz	28	0	RO	50000	
9823	265F	1	Signature 0		0	0	N/RW	0	
9823	265F	2	Signature 1		0	0	N/RW	0	
9823	265F	3	Signature 2		0	0	N/RW	0	

Index			Parameters	Unit	Size	Cv.	Access	Default	Note
Dec.	Hex.	Sub							
9823	265F	4	Signature 3		0	0	N/RW	0	
9823	265F	5	Signature 4		0	0	N/RW	0	
10071	2757	1	Subfault code		0	0	RO	0	See fault list (→ 108)
10089	2769	1	Load current	mA	22	-3	RO	0	
10232	27F8	21	Ramp time	ms	4	-3	RO	0	
10232	27F8	27	Ramp time T00	ms	4	-3	N/E/ RW	500	0 – 10000, step 1
10232	27F8	28	Ramp time T01	ms	4	-3	N/E/ RW	500	
10232	27F8	29	Ramp time T10	ms	4	-3	N/E/ RW	500	
10232	27F8	30	Ramp time T11	ms	4	-3	N/E/ RW	500	
10233	27F9	1	Frequency mode		0	0	N/E/ RW	10	9 = fa - df 10 = fa 11 = fa + df
10233	27F9	2	Damping		0	0	N/E/ RW	0	0 = Off 1 = On
10235	27FB	1	Fault response "U _{DC} link undervoltage"		0	0	N/E/ RW	1	0 = No response 1 = Display only 4 = Inhibit output stage
10236	27FC	1	Reset counter		0	0	RO	0	0 – 3 0: If reset function off
10237	27FD	10	Parameter setpoint	m%	24	-3	RW	0	0 – Max × 1000, Step 1000
10244	2804	1	Fault response "Sync timeout"		0	0	N/E/ RW	0	0 = No response 1 = Display only 2 = Inhibit output stage
10411	28AB	1	Operating hours	min	4	60	RO	0	
10420	28B4	1	Fixed setpoint I00	m%	24	-3	N/RW	100000	0 – Max × 1000, Step 1000
10422	28B6	1	Sync phase angle	m°	12	-3	N/RW	0	0 – 360000, step 1000
10467	28E3	42	Active power	W	9	0	RO	0	
10516	2914	1	Response SBus 1 timeout		0	0	N/E/ RW	4	0 = No response 1 = Display only 4 = Output stage inhibit

Fault memory t-0

Index			Parameters	Unit	Size	Cv.	Access	Default	Note
Dec.	Hex.	Sub							
10531	2923	1	Fault code t-0		0	0	RO	0	
10531	2923	2	Subfault code t-0		0	0	RO	0	
10531	2923	3	Developer code t-0		0	0	RO	0	
10531	2923	4	Power-applied hours t-0	min	4	60	RO	0	
10531	2923	5	Drive running hours t-0	min	4	60	RO	0	
10531	2923	6	Internal power-applied hours t-0	min	4	60	RO	0	
10531	2923	7	Device status t-0		0	0	RO	0	
10531	2923	8	Binary inputs t-0		0	0	RO	0	
10531	2923	17	Heat sink temperature of output stage t-0	m°C	17	-3	RO	0	
10531	2923	23	Setpoint t-0	m%	24	-3	RO	0	
10531	2923	24	Ramp time t-0	ms	4	-3	RO	0	
10531	2923	25	Output current t-0	mA	22	-3	RO	0	
10531	2923	26	DC link voltage t-0	mV	21	-3	RO	0	
10531	2923	27	DC link current t-0	mA	22	-3	RO	0	
10531	2923	28	Output voltage t-0	mV	21	-3	RO	0	
10531	2923	30	Load current t-0	mA	22	-3	RO	0	
10531	2923	31	PWM period t-0	ns	4	-9	RO	0	
10531	2923	34	Operating mode t-0		0	0	RO	0	See 10538/100
10531	2923	35	Load voltage t-0	mV	21	-3	RO	0	

Fault memory t-1

Index			Parameters	Unit	Size	Cv.	Access	Default	Note
Dec.	Hex.	Sub							
10532	2924	1	Fault code t-1		0	0	RO	0	
10532	2924	2	Subfault code t-1		0	0	RO	0	
10532	2924	3	Developer code t-1		0	0	RO	0	
10532	2924	4	Power-applied hours t-1	min	4	60	RO	0	
10532	2924	5	Drive running hours t-1	min	4	60	RO	0	
10532	2924	6	Internal power-applied hours t-1	min	4	60	RO	0	
10532	2924	7	Device status t-1		0	0	RO	0	
10532	2924	8	Binary inputs t-1		0	0	RO	0	
10532	2924	17	Heat sink temperature of output stage t-1	m°C	17	-3	RO	0	
10532	2924	23	Setpoint t-1	m%	24	-3	RO	0	

Index			Parameters	Unit	Size	Cv.	Access	Default	Note
Dec.	Hex.	Sub							
10532	2924	24	Ramp time t-1	ms	4	-3	RO	0	
10532	2924	25	Output current t-1	mA	22	-3	RO	0	
10532	2924	26	DC link voltage t-1	mV	21	-3	RO	0	
10532	2924	27	DC link current t-1	mA	22	-3	RO	0	
10532	2924	28	Output voltage t-1	mV	21	-3	RO	0	
10532	2924	30	Load current t-1	mA	22	-3	RO	0	
10532	2924	31	PWM period t-1	ns	4	-9	RO	0	
10532	2924	34	Operating mode t-1		0	0	RO	0	See 10538/100
10532	2924	35	Load voltage t-1	mV	21	-3	RO	0	

Fault memory t-2

Index			Parameters	Unit	Size	Cv.	Access	Default	Note
Dec.	Hex.	Sub							
10533	2925	1	Fault code t-2		0	0	RO	0	
10533	2925	2	Subfault code t-2		0	0	RO	0	
10533	2925	3	Developer code t-2		0	0	RO	0	
10533	2925	4	Power-applied hours t-2	min	4	60	RO	0	
10533	2925	5	Drive running hours t-2	min	4	60	RO	0	
10533	2925	6	Internal power-applied hours t-2	min	4	60	RO	0	
10533	2925	7	Device status t-2		0	0	RO	0	
10533	2925	8	Binary inputs t-2		0	0	RO	0	
10533	2925	17	Heat sink temperature of output stage t-2	m°C	17	-3	RO	0	
10533	2925	23	Setpoint t-2	m%	24	-3	RO	0	
10533	2925	24	Ramp time t-2	ms	4	-3	RO	0	
10533	2925	25	Output current t-2	mA	22	-3	RO	0	
10533	2925	26	DC link voltage t-2	mV	21	-3	RO	0	
10533	2925	27	DC link current t-2	mA	22	-3	RO	0	
10533	2925	28	Output voltage t-2	mV	21	-3	RO	0	
10533	2925	30	Load current t-2	mA	22	-3	RO	0	
10533	2925	31	PWM period t-2	ns	4	-9	RO	0	
10533	2925	34	Operating mode t-2		0	0	RO	0	See 10538/100
10533	2925	35	Load voltage t-2	mV	21	-3	RO	0	

Index			Parameters	Unit	Size	Cv.	Access	Default	Note
Dec.	Hex.	Sub							
10538	292A	1	Active PWM period	ns	4	-9	RO	0	

Index			Parameters	Unit	Size	Cv.	Access	Default	Note
Dec.	Hex.	Sub							
10538	292A	41	Power limit L00	W	9	0	N/RW	0	0 – 20000, step 1
10538	292A	42	Power limit L01	W	9	0	N/RW	0	0 – 20000, step 1
10538	292A	43	Power limit L10	W	9	0	N/RW	0	0 – 20000, step 1
10538	292A	44	Power limit L11	W	9	0	N/RW	0	0 – 20000, step 1
10538	292A	100	Operating mode		0	0	N/E/ RW	1	0 = Voltage control 1 = Current control 2 = Power control 3 = Direct control
10538	292A	110	DC link current	mA	22	-3	RO	0	
10538	292A	112	Minimum feed-in power	mW	9	-3	N/E/ RW	0	0 – 20000000, step 1000
10538	292A	113	Nominal load current	mA	22	-3	RO	0	
10538	292A	122	Minimum active power	mW	9	-3	RO	0	
10538	292A	123	Maximum active power	mW	9	-3	RO	0	
10538	292A	126	Heat sink temperature of output stage	m°C	17	-3	RO	0	
10538	292A	127	Minimum heat sink temperature output stage	m°C	17	-3	RO	0	
10538	292A	128	Maximum heat sink temperature output stage	m°C	17	-3	RO	0	
10538	292A	129	Active setpoint	m%	24	-3	RO	0	
10538	292A	130	Load voltage	mV	21	-3	RO	0	
10538	292A	144	Sync mode		0	0	N/E/ RW	0	0 = MP master 1 = MP slave
10547	2933	1	Interface function		0	0	N/E/ RW	1	0 = None 1 = SBus 2 2 = Sync

Size and conversion index

The respective basic unit for conversion is **printed in bold**.

Physical quantity	Measurement index	Unit	Abbreviation	Conversion	
				Conversion index	Factor
	0	Dimensionless		0	1

Physical quantity	Measurement index	Unit	Abbreviation	Conversion	
				Conversion index	Factor
Time	4	Second	s	0	1
		Millisecond	ms	-3	10^{-3}
		Microsecond	μ s	-6	10^{-6}
		Nanosecond	ns	-9	10^{-9}
		Minute	min	60	60
Power	9	Watt	W	0	1
		Milliwatt	mW	-3	10^{-3}
Energy	8	Watt second	Ws	0	1
		Hecto-kilowatt second	10^5 Ws	5	10^5
Angle	12	Degree	$^{\circ}$	0	1
		Millidegree	m°	-3	10^{-3}
Temperature	17	Degree Celsius	$^{\circ}\text{C}$	0	1
		Millidegree Celsius	$m^{\circ}\text{C}$	-3	10^{-3}
Electrical voltage	21	Volt	V	0	1
		Millivolt	mV	-3	10^{-3}
Electrical current	22	Amp	A	0	1
		Milliamp	mA	-3	10^{-3}
Electrical resistance	23	Ohm	Ω	0	1
		Milliohm	m Ω	-3	10^{-3}
Ratio	24	Percent	%	0	1
		Millipercents	m%	-3	10^{-3}
Frequency	28	Hertz	Hz	0	1

12 Address list

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Service	Hollola	SEW-EURODRIVE OY Keskikankaantie 21 15860 Hollola	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
	Tornio	SEW-EURODRIVE Oy Lossirannankatu 5 95420 Tornio	Tel. +358 201 589 300 Fax +358 3 780 6211 http://www.sew-eurodrive.fi sew@sew.fi
Production Assembly	Karkkila	SEW Industrial Gears Oy Santasalonkatu 6, PL 8 03620 Karkkila, 03601 Karkkila	Tel. +358 201 589-300 Fax +358 201 589-310 http://www.sew-eurodrive.fi sew@sew.fi
France			
Production Sales Service	Hagenau	SEW-USOCOME 48-54 route de Soufflenheim B. P. 20185 67506 Hagenau Cedex	Tel. +33 3 88 73 67 00 Fax +33 3 88 73 66 00 http://www.usocome.com sew@usocome.com
Production	Forbach	SEW-USOCOME Zone industrielle Technopôle Forbach Sud B. P. 30269 57604 Forbach Cedex	Tel. +33 3 87 29 38 00
	Brumath	SEW-USOCOME 1 Rue de Bruxelles 67670 Mommernheim Cedex	Tel. +33 3 88 37 48 00

France			
Assembly Sales Service	Bordeaux	SEW-USOCOME Parc d'activités de Magellan 62 avenue de Magellan – B. P. 182 33607 Pessac Cedex	Tel. +33 5 57 26 39 00 Fax +33 5 57 26 39 09
	Lyon	SEW-USOCOME 75 rue Antoine Condorcet 38090 Vaulx-Milieu	Tel. +33 4 74 99 60 00 Fax +33 4 74 99 60 15
	Nantes	SEW-USOCOME Parc d'activités de la forêt 4 rue des Fontenelles 44140 Le Bignon	Tel. +33 2 40 78 42 00 Fax +33 2 40 78 42 20
	Paris	SEW-USOCOME Zone industrielle 2 rue Denis Papin 77390 Verneuil l'Étang	Tel. +33 1 64 42 40 80 Fax +33 1 64 42 40 88
Gabon			
Representation: Cameroon			
Germany			
Headquarters Production Sales	Bruchsal	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
Production / Industrial Gears	Bruchsal	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Str. 10 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-2970
Production	Graben	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-0 Fax +49 7251-2970
	Östringen	SEW-EURODRIVE GmbH & Co KG, Werk Östringen Franz-Gurk-Straße 2 76684 Östringen	Tel. +49 7253 9254-0 Fax +49 7253 9254-90 oestringen@sew-eurodrive.de
Service Competence Center	Mechanics / Mechatronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 scc-mechanik@sew-eurodrive.de
	Electronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 scc-elektronik@sew-eurodrive.de
Drive Technology Center	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 40-42 30823 Garbsen (Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 dtc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dankritzer Weg 1 08393 Meerane (Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 dtc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 85551 Kirchheim (München)	Tel. +49 89 909552-10 Fax +49 89 909552-50 dtc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 40764 Langenfeld (Düsseldorf)	Tel. +49 2173 8507-30 Fax +49 2173 8507-55 dtc-west@sew-eurodrive.de
Drive Center	Berlin	SEW-EURODRIVE GmbH & Co KG Alexander-Meißner-Straße 44 12526 Berlin	Tel. +49 306331131-30 Fax +49 306331131-36 dc-berlin@sew-eurodrive.de
	Hamburg	SEW-EURODRIVE GmbH & Co KG Hasselbinnen 11 22869 Schenefeld	Tel. +49 40 298109-60 Fax +49 40 298109-70 tb-hamburg@sew-eurodrive.de
	Ludwigshafen	SEW-EURODRIVE GmbH & Co KG c/o BASF SE Gebäude W130 Raum 101 67056 Ludwigshafen	Tel. +49 7251 75 3759 Fax +49 7251 75 503759 dc-ludwigshafen@sew-eurodrive.de
	Saarland	SEW-EURODRIVE GmbH & Co KG Gottlieb-Daimler-Straße 4 66773 Schwalbach Saar – Hülzweiler	Tel. +49 6831 48946 10 Fax +49 6831 48946 13 dc-saarland@sew-eurodrive.de

Germany

	Ulm	SEW-EURODRIVE GmbH & Co KG Dieselstraße 18 89160 Dornstadt	Tel. +49 7348 9885-0 Fax +49 7348 9885-90 dc-ulm@sew-eurodrive.de
	Würzburg	SEW-EURODRIVE GmbH & Co KG Nürnbergerstraße 118 97076 Würzburg-Lengfeld	Tel. +49 931 27886-60 Fax +49 931 27886-66 dc-wuerzburg@sew-eurodrive.de
Drive Service Hotline / 24 Hour Service			0 800 SEWHELP 0 800 7394357

Great Britain

Assembly Sales Service	Normanton	SEW-EURODRIVE Ltd. DeVilliers Way Trident Park Normanton West Yorkshire WF6 1GX	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk
Drive Service Hotline / 24 Hour Service			Tel. 01924 896911

Greece

Sales	Athens	Christ. Boznos & Son S.A. 12, K. Mavromichali Street P.O. Box 80136 18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr
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Hungary

Sales Service	Budapest	SEW-EURODRIVE Kft. Csillaghegyi út 13. 1037 Budapest	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 http://www.sew-eurodrive.hu office@sew-eurodrive.hu
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Iceland

Sales	Reykjavik	Varma & Vélaverk ehf. Knarrarvogi 4 104 Reykjavik	Tel. +354 585 1070 Fax +354 585)1071 http://www.varmaverk.is vov@vov.is
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India

Registered Office Assembly Sales Service	Vadodara	SEW-EURODRIVE India Private Limited Plot No. 4, GIDC POR Ramangamdi • Vadodara - 391 243 Gujarat	Tel. +91 265 3045200 Fax +91 265 3045300 http://www.seweurodriveindia.com salesvadodara@seweurodriveindia.com
Assembly Sales Service	Chennai	SEW-EURODRIVE India Private Limited Plot No. K3/1, Sipcot Industrial Park Phase II Mambakkam Village Sriperumbudur - 602105 Kancheepuram Dist, Tamil Nadu	Tel. +91 44 37188888 Fax +91 44 37188811 saleschennai@seweurodriveindia.com
	Pune	SEW-EURODRIVE India Private Limited Plant: Plot No. D236/1, Chakan Industrial Area Phase- II, Warale, Tal- Khed, Pune-410501, Maharashtra	Tel. +91 21 35 628700 Fax +91 21 35 628715 salespune@seweurodriveindia.com
Sales Service	Gurgaon	SEW-EURODRIVE India Private Limited Drive Center Gurugram Plot no 395, Phase-IV, UdyogVihar Gurugram , 122016 Haryana	Tel. +91 99588 78855 salesgurgaon@seweurodriveindia.com

Indonesia

Sales	Medan	PT. Serumpun Indah Lestari Jl.Pulau Solor no. 8, Kawasan Industri Medan II Medan 20252	Tel. +62 61 687 1221 Fax +62 61 6871429 / +62 61 6871458 / +62 61 30008041 sil@serumpunindah.com serumpunindah@yahoo.com http://www.serumpunindah.com
	Jakarta	PT. Cahaya Sukses Abadi Komplek Rukan Puri Mutiara Blok A no 99, Sunter Jakarta 14350	Tel. +62 21 65310599 Fax +62 21 65310600 csajkt@cbn.net.id

Indonesia			
	Jakarta	PT. Agrindo Putra Lestari JL.Pantai Indah Selatan, Komplek Sentra Industri Terpadu, Pantai indah Kapuk Tahap III, Blok E No. 27 Jakarta 14470	Tel. +62 21 2921-8899 Fax +62 21 2921-8988 aplindo@indosat.net.id http://www.aplindo.com
	Surabaya	PT. TRIAGRI JAYA ABADI Jl. Sukosemolo No. 63, Galaxi Bumi Permai G6 No. 11 Surabaya 60111	Tel. +62 31 5990128 Fax +62 31 5962666 sales@triagri.co.id http://www.triagri.co.id
	Surabaya	CV. Multi Mas Jl. Raden Saleh 43A Kav. 18 Surabaya 60174	Tel. +62 31 5458589 Fax +62 31 5317220 sianhwa@sby.centrin.net.id http://www.cvmultimas.com
Ireland			
Sales Service	Dublin	Alpert Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458 http://www.alpert.ie info@alpert.ie
Israel			
Sales	Tel Aviv	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 http://www.liraz-handasa.co.il office@liraz-handasa.co.il
Italy			
Assembly Sales Service	Milan	SEW-EURODRIVE S.a.s. di SEW S.r.l. & Co. Via Bernini,12 20020 Solaro (Milano)	Tel. +39 02 96 980229 Fax +39 02 96 980 999 http://www.sew-eurodrive.it milano@sew-eurodrive.it
Ivory Coast			
Sales	Abidjan	SEW-EURODRIVE SARL Ivory Coast Rue des Pêcheurs, Zone 3 26 BP 916 Abidjan 26	Tel. +225 21 21 81 05 Fax +225 21 25 30 47 info@sew-eurodrive.ci http://www.sew-eurodrive.ci
Japan			
Assembly Sales Service	Iwata	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373814 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp
Kazakhstan			
Sales Service	Almaty	SEW-EURODRIVE LLP 291-291A, Tole bi street 050031, Almaty	Tel. +7 (727) 350 5156 Fax +7 (727) 350 5156 http://www.sew-eurodrive.kz sew@sew-eurodrive.kz
	Tashkent	SEW-EURODRIVE LLP Representative office in Uzbekistan 96A, Sharaf Rashidov street, Tashkent, 100084	Tel. +998 71 2359411 Fax +998 71 2359412 http://www.sew-eurodrive.uz sew@sew-eurodrive.uz
	Ulaanbaatar	IM Trading LLC Olympic street 28B/3 Sukhbaatar district, Ulaanbaatar 14230, MN	Tel. +976-77109997 Fax +976-77109997 imt@imt.mn
Latvia			
Sales	Riga	SIA Alas-Kuul Katlakalna 11C 1073 Riga	Tel. +371 6 7139253 Fax +371 6 7139386 http://www.alas-kuul.lv info@alas-kuul.com
Lebanon			
Sales (Lebanon)	Beirut	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 510 532 Fax +961 1 494 971 ssacar@inco.com.lb

Lebanon

Sales (Jordan, Kuwait , Beirut Saudi Arabia, Syria)	Middle East Drives S.A.L. (offshore) Sin El Fil. B. P. 55-378 Beirut	Tel. +961 1 494 786 Fax +961 1 494 971 http://www.medrives.com info@medrives.com
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Lithuania

Sales	Alytus	UAB Irseva Statybininku 106C 63431 Alytus	Tel. +370 315 79204 Fax +370 315 56175 http://www.irseva.lt irmantas@irseva.lt
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Luxembourg

Representation: Belgium

Macedonia

Sales	Skopje	Boznos DOOEL Dime Anicin 2A/7A 1000 Skopje	Tel. +389 23256553 Fax +389 23256554 http://www.boznos.mk
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Malaysia

Assembly Sales Service	Johor	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my
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Mexico

Assembly Sales Service	Quéretaro	SEW-EURODRIVE MEXICO S.A. de C.V. SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial Quéretaro C.P. 76220 Querétaro, México	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@sew-eurodrive.com.mx
Sales Service	Puebla	SEW-EURODRIVE MEXICO S.A. de C.V. Calzada Zavaleta No. 3922 Piso 2 Local 6 Col. Santa Cruz Buenavista C.P. 72154 Puebla, México	Tel. +52 (222) 221 248 http://www.sew-eurodrive.com.mx scmexico@sew-eurodrive.com.mx

Mongolia

Technical Office	Ulaanbaatar	IM Trading LLC Olympic street 28B/3 Sukhbaatar district, Ulaanbaatar 14230, MN	Tel. +976-77109997 Tel. +976-99070395 Fax +976-77109997 http://imt.mn/ imt@imt.mn
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Morocco

Sales Service Assembly	Bouskoura	SEW-EURODRIVE Morocco SARL Parc Industriel CFCIM, Lot. 55/59 27182 Bouskoura Grand Casablanca	Tel. +212 522 88 85 00 Fax +212 522 88 84 50 http://www.sew-eurodrive.ma sew@sew-eurodrive.ma
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Namibia

Sales	Swakopmund	DB MINING & INDUSTRIAL SUPPLIES CC Einstein Street Strauss Industrial Park Unit1 Swakopmund	Tel. +264 64 462 738 Fax +264 64 462 734 anton@dbminingnam.com
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Netherlands

Assembly Sales Service	Rotterdam	SEW-EURODRIVE B.V. Industrieweg 175 3044 AS Rotterdam Postbus 10085 3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 Service: 0800-SEWHELP http://www.sew-eurodrive.nl info@sew-eurodrive.nl
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New Zealand			
Assembly Sales Service	Auckland	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 30 Lodestar Avenue, Wigram Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz
Nigeria			
Sales	Lagos	Greenpeg Nig. Ltd Plot 296A, Adeyemo Akapo Str. Omole GRA Ikeja Lagos-Nigeria	Tel. +234-701-821-9200-1 http://www.greenpegltd.com bolaji.adekunle@greenpegltd.com
Norway			
Assembly Sales Service	Moss	SEW-EURODRIVE A/S Solgaard skog 71 1599 Moss	Tel. +47 69 24 10 20 Fax +47 69 24 10 40 http://www.sew-eurodrive.no sew@sew-eurodrive.no
Pakistan			
Sales	Karachi	Industrial Power Drives Al-Fatah Chamber A/3, 1st Floor Central Com- mercial Area, Sultan Ahmed Shah Road, Block 7/8, Karachi	Tel. +92 21 452 9369 Fax +92-21-454 7365 seweurodrive@cyber.net.pk
Paraguay			
Sales	Fernando de la Mora	SEW-EURODRIVE PARAGUAY S.R.L De la Victoria 112, Esquina nueva Asunción Departamento Central Fernando de la Mora, Barrio Bernardino	Tel. +595 991 519695 Fax +595 21 3285539 sewpy@sew-eurodrive.com.py
Peru			
Assembly Sales Service	Lima	SEW EURODRIVE DEL PERU S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe
Philippines			
Sales	Makati	P.T. Cerna Corporation 4137 Ponte St., Brgy. Sta. Cruz Makati City 1205	Tel. +63 2 519 6214 Fax +63 2 890 2802 mech_drive_sys@ptcerna.com http://www.ptcerna.com
Poland			
Assembly Sales Service	Łódź	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 92-518 Łódź	Tel. +48 42 293 00 00 Fax +48 42 293 00 49 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
	Service	Tel. +48 42 293 0030 Fax +48 42 293 0043	24 Hour Service Tel. +48 602 739 739 (+48 602 SEW SEW) serwis@sew-eurodrive.pl
Portugal			
Assembly Sales Service	Coimbra	SEW-EURODRIVE, LDA. Av. da Fonte Nova, n.º 86 3050-379 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt
Romania			
Sales Service	Bucharest	Sialco Trading SRL str. Brazilia nr. 36 011783 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro

Russia			
Assembly Sales Service	St. Petersburg	ЗАО «СЕВ-ЕВРОДРАЙФ» 188660, Russia, Leningrad Region, Vse- volozhsky District, Korabselki, Aleksandra Nevskogo str. building 4, block 1 P.O. Box 36 195220 St. Petersburg	Tel. +7 812 3332522 / +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru
Senegal			
Sales	Dakar	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 338 494 770 Fax +221 338 494 771 http://www.senemeca.com senemeca@senemeca.sn
Serbia			
Sales	Belgrade	DIPAR d.o.o. Ustanicka 128a PC Košum, IV floor 11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 office@dipar.rs
Singapore			
Assembly Sales Service	Singapore	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com
Slovakia			
Sales	Bernolákovo	SEW-Eurodrive SK s.r.o. Priemyselná ulica 6267/7 900 27 Bernolákovo	Tel. +421 2 33595 202, 217, 201 Fax +421 2 33595 200 http://www.sew-eurodrive.sk sew@sew-eurodrive.sk
Slovenia			
Sales Service	Celje	Pakman - Pogonska Tehnika d.o.o. Ul. XIV. divizije 14 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net
South Africa			
Assembly Sales Service	Johannesburg	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 248-7289 http://www.sew.co.za info@sew.co.za
	Cape Town	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 bgriffiths@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 48 Prospecton Road Isipingo Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 902 3815 Fax +27 31 902 3826 cdejager@sew.co.za
	Nelspruit	SEW-EURODRIVE (PROPRIETARY) LIMITED 7 Christie Crescent Vintonia P.O.Box 1942 Nelspruit 1200	Tel. +27 13 752-8007 Fax +27 13 752-8008 robermeyer@sew.co.za
South Korea			
Assembly Sales Service	Ansan	SEW-EURODRIVE KOREA CO., LTD. 7, Dangaengi-ro, Danwon-gu, Ansan-si, Gyeonggi-do, Zip 425-839	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-eurodrive.kr master.korea@sew-eurodrive.com

South Korea			
	Busan	SEW-EURODRIVE KOREA CO., LTD. 28, Noksansandan 262-ro 50beon-gil, Gangseo-gu, Busan, Zip 618-820	Tel. +82 51 832-0204 Fax +82 51 832-0230
Spain			
Assembly Sales Service	Bilbao	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 48170 Zamudio (Vizcaya)	Tel. +34 94 43184-70 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es
Sri Lanka			
Sales	Colombo	SM International (Pte) Ltd 254, Galle Raod Colombo 4, Sri Lanka	Tel. +94 1 2584887 Fax +94 1 2582981
Swaziland			
Sales	Manzini	C G Trading Co. (Pty) Ltd Simunye street Matsapha, Manzini	Tel. +268 7602 0790 Fax +268 2 518 5033 charles@cgtrading.co.sz www.cgtradingswaziland.com
Sweden			
Assembly Sales Service	Jönköping	SEW-EURODRIVE AB Gnejsvägen 6-8 553 03 Jönköping Box 3100 S-550 03 Jönköping	Tel. +46 36 34 42 00 Fax +46 36 34 42 80 http://www.sew-eurodrive.se jonkoping@sew.se
Switzerland			
Assembly Sales Service	Basel	Alfred Imhof A.G. Jurastrasse 10 4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch
Taiwan			
Sales	Taipei	Ting Shou Trading Co., Ltd. 6F-3, No. 267, Sec. 2 Tung Huw S. Road Taipei	Tel. +886 2 27383535 Fax +886 2 27368268 Telex 27 245 sewtwn@ms63.hinet.net http://www.tingshou.com.tw
	Nan Tou	Ting Shou Trading Co., Ltd. No. 55 Kung Yeh N. Road Industrial District Nan Tou 540	Tel. +886 49 255353 Fax +886 49 257878 sewtwn@ms63.hinet.net http://www.tingshou.com.tw
Tanzania			
Sales	Daressalam	SEW-EURODRIVE PTY LIMITED TANZANIA Plot 52, Regent Estate PO Box 106274 Dar Es Salaam	Tel. +255 0 22 277 5780 Fax +255 0 22 277 5788 http://www.sew-eurodrive.co.tz info@sew.co.tz
Thailand			
Assembly Sales Service	Chonburi	SEW-EURODRIVE (Thailand) Ltd. 700/456, Moo.7, Donhuaroh Muang Chonburi 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com
Tunisia			
Sales	Tunis	T. M.S. Technic Marketing Service Zone Industrielle Mghira 2 Lot No. 39 2082 Fouchana	Tel. +216 79 40 88 77 Fax +216 79 40 88 66 http://www.tms.com.tn tms@tms.com.tn
Turkey			
Assembly Sales Service	Kocaeli-Gebze	SEW-EURODRIVE Ana Merkez Gebze Organize Sanayi Böl. 400 Sok No. 401 41480 Gebze Kocaeli	Tel. +90 262 9991000 04 Fax +90 262 9991009 http://www.sew-eurodrive.com.tr sew@sew-eurodrive.com.tr

Ukraine

Assembly Sales Service	Dnipropetrovsk	SEW-EURODRIVE, LLC Robochya str., bld. 23-B, office 409 49008 Dnipro	Tel. +380 56 370 3211 Fax +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua
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United Arab Emirates

Drive Technology Center	Dubai	SEW-EURODRIVE FZE PO Box 263835 Jebel Ali Free Zone – South, P.O. Box Dubai, United Arab Emirates	Tel. +971 (0)4 8806461 Fax +971 (0)4 8806464 info@sew-eurodrive.ae
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Uruguay

Assembly Sales	Montevideo	SEW-EURODRIVE Uruguay, S. A. Jose Serrato 3569 Esquina Corumbe CP 12000 Montevideo	Tel. +598 2 21181-89 Fax +598 2 21181-90 sewuy@sew-eurodrive.com.uy
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USA

Production Assembly Sales Service	Southeast Region	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Production +1 864 439-9948 Fax Assembly +1 864 439-0566 Fax Confidential/HR +1 864 949-5557 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly Sales Service	Northeast Region	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com
	Midwest Region	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 332-0038 cstroy@seweurodrive.com
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	Western Region	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, CA 94544	Tel. +1 510 487-3560 Fax +1 510 487-6433 cshayward@seweurodrive.com
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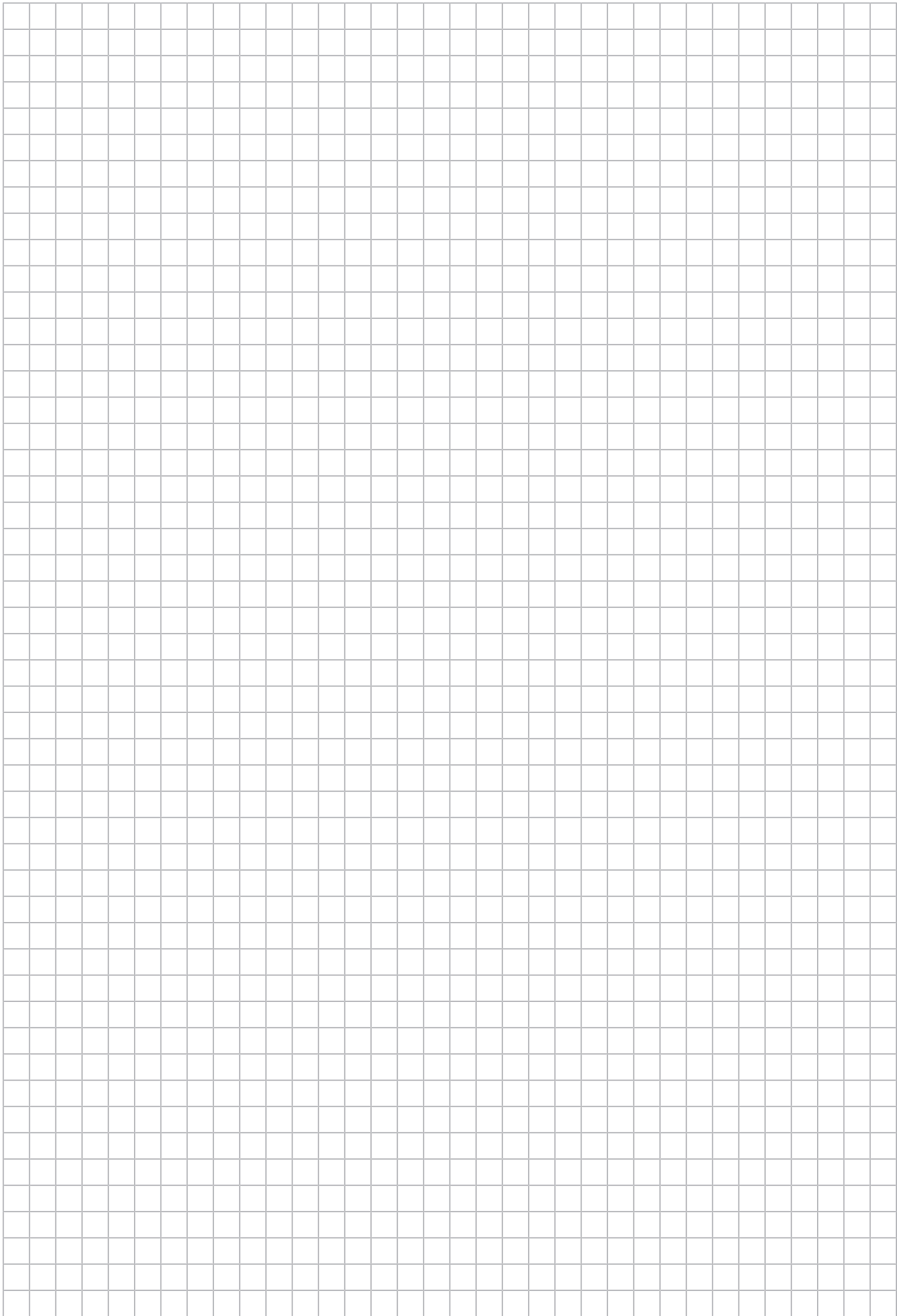
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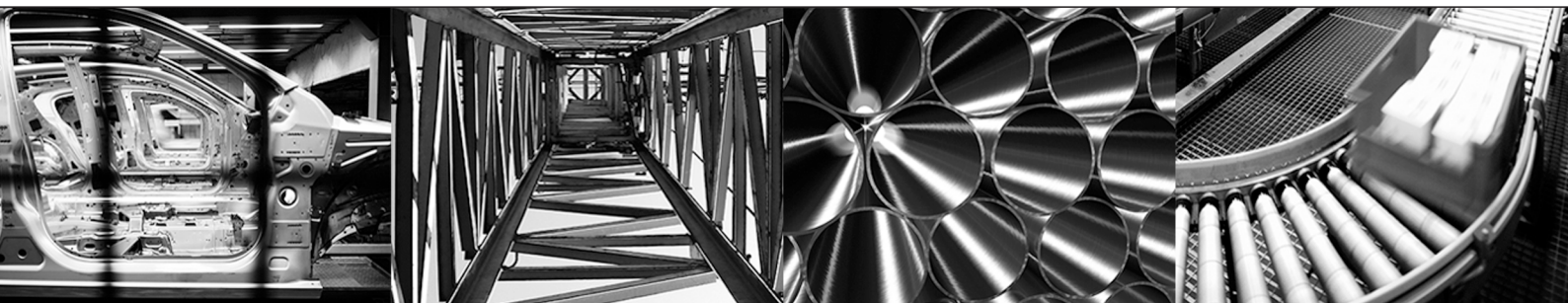
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