



SEW
EURODRIVE

Operating Instructions



Decentralized Drive Unit
MOVIFIT® compact



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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 Structure of the safety notes

1.2.1 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.	

1.2.2 Structure of section-related safety notes

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

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



SIGNAL WORD

Type and source of hazard.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the hazard.

Meaning of the hazard symbols

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

Hazard symbol	Meaning
	General hazard
	Warning of dangerous electrical voltage
	Warning of hot surfaces
	Warning of automatic restart

1.2.3 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.

1.3 Decimal separator in numerical values

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

Example: 30.5 kg

1.4 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.

1.5 Other applicable documentation

Observe the following additional documentation:

- Operating instructions "AC motors DR..71 – 315, ..."

This documentation can be downloaded and ordered on the Internet (<http://www.sew-eurodrive.de>).

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:

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

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

2.3 Target group

Specialist for mechanical work	Any mechanical work may be performed only by adequately qualified specialists. Specialists in the context of this documentation are persons who are familiar with the design, mechanical installation, troubleshooting, and maintenance of the product, and who possess the following qualifications: • Qualifications in the field of mechanics in accordance with the national regulations • Familiarity with this documentation
Specialist for electrotechnical work	Any electrotechnical work may be performed only by electrically skilled persons with a suitable education. Electrically skilled persons in the context of this documentation are persons who are familiar with electrical installation, startup, troubleshooting, and maintenance of the product, and who possess the following qualifications: • Qualifications in the field of electrical engineering in accordance with the national regulations • Familiarity with this documentation
Additional qualifications	In addition to that, these persons must be familiar with the valid safety regulations and laws, as well as with the requirements of the standards, directives, and laws specified in this documentation. The persons must have the express authorization of the company to operate, program, parameterize, label, and ground devices, systems, and circuits in accordance with the standards of safety technology.
Instructed persons	All work in the areas of transport, storage, installation, operation and waste disposal may only be carried out by persons who are trained and instructed appropriately. These instructions must enable the persons to carry out the required activities and work steps safely and in accordance with regulations.

2.4 Designated use

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

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

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

The systems can be mobile or stationary.

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

- AC asynchronous motors with squirrel-cage rotor

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

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

Do not use the product as a climbing aid.

2.4.1 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.

2.4.2 Hoist applications

The inverter may not be used for lifting applications or on slopes.

The motor starter is suitable for lifting applications only to a limited degree. The motor starter may not be used as a safety device for lifting applications.

2.5 Functional safety technology

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

2.6 Transport

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

Observe the following notes when transporting the device:

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

If necessary, use suitable, sufficiently dimensioned handling equipment.

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

2.7 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" in the documentation.

2.7.1 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 4000 m above sea level

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

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

2.8 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 Protective separation

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

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

2.10 Startup/operation

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

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

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

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

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:

1 minute.

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.

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

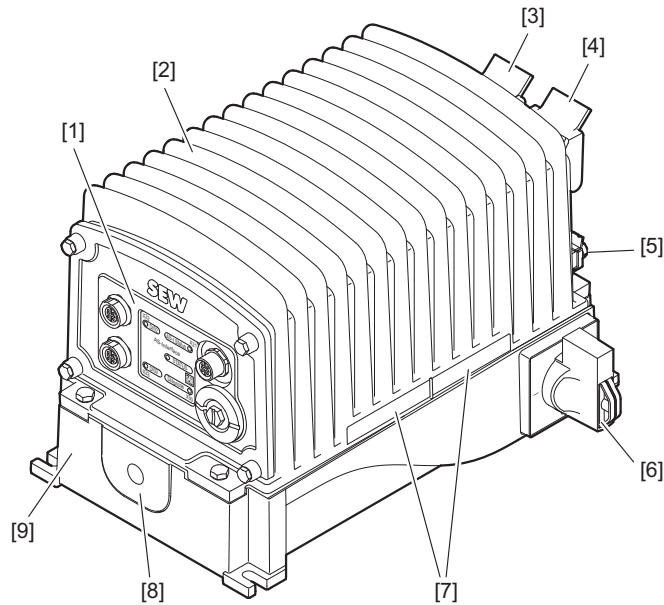
Risk of burns: The surface temperature of the product can exceed 60 °C during operation. Do not touch the product during operation. Let the product cool down before touching it.

3 Device structure

3.1 Design of the drive unit

MOVIFIT® compact is a decentralized drive unit for controlling AC motors.

The following image shows a MOVIFIT® compact dual-motor starter with AS-Interface:



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- [1] Control unit
- [2] EBOX with cooling fins and electronics (inverter or motor starter)
- [3] X9 connection for motor 1
- [4] X8 connection for motor 2, (with the dual-motor starter design only)
- [5] PE connection ⚡ (outside)
- [6] Maintenance switch, can be locked
- [7] Nameplate
- [8] Cable seal for cable diameter 13 – 15 mm
- [9] ABOX with FieldPower® contact module (connection unit)

3.2 Designs

MOVIFIT® compact is available in the following designs:

- Inverter for 1 motor with clockwise and counterclockwise rotation
4 setpoint speeds with binary or AS-Interface control
1 variable setpoint speed with SBus control
- Dual-motor starter for 2 motors with 1 direction of rotation each. The direction of rotation depends on the phase sequence.
- Reversing starter for 1 motor with clockwise and counterclockwise rotation

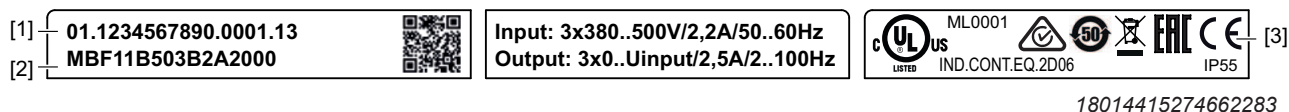
MOVIFIT® compact is available with the following control units:

- Control unit with AS-Interface
- Control unit with binary signal inputs and outputs
- Control unit with SBus interface
- Control unit with IO-Link interface

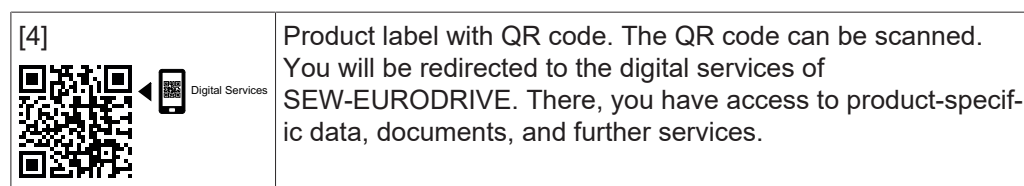
3.3 Type designations

3.3.1 Nameplate

The image shows examples of the MOVIFIT® compact inverter nameplates:



- [1] Serial number
[2] Type designation
[3] The right-hand nameplate can be found beneath the motor connections.
[4] Product label



3.3.2 Type designation

The following table shows an example of the type designation of the MOVIFIT® compact inverter **MBF11B-503-B2-A2-0-00**:

MB	Series	MB = MOVIFIT® compact
F	Device type	F = Frequency inverter S = Motor starter
11	Device power/ design	07 = 0.75 kW inverter 11 = 1.1 kW inverter 15 = 1.5 kW inverter 2R = 2.2 kW reversing starter 4R = 4.0 kW reversing starter 4D = 2 × 2.2 kW dual-motor starter
B	Version	
-		
50	Connection voltage	50 = AC 380 – 500 V
3	Connection type	3 = 3-phase
-		
B	Control	K = Via AS-Interface B = Binary control S = Via SBus L = Via IO-Link
2	Version	
-		
A2	Connection module	A1 = ABOX, standard A2 = ABOX with maintenance switch
-		
0	Filter	0 = Without filter A = With EMC filter
-		
00	Design	00 = Standard design 03 = Special design with AS-Interface, compatible with MOVIFIT® basic

3.4 Purchase order numbers

3.4.1 Standard design AS-Interface or binary control

The following table shows the purchase order numbers of MOVIFIT® compact in the standard designs:

Device type	Control via AS-Interface		Binary control	
	Type	Purchase order number	Type	Purchase order number
Inverter	MBF07B-503-K2-A1-0-00	EB000101	MBF07B-503-B2-A1-0-00	EB000102
	MBF07B-503-K2-A1-A-00	EB000109	MBF07B-503-B2-A1-A-00	EB000110
	MBF07B-503-K2-A2-0-00	EB000105	MBF07B-503-B2-A2-0-00	EB000106
	MBF07B-503-K2-A2-A-00	EB000113	MBF07B-503-B2-A2-A-00	EB000114
	MBF11B-503-K2-A1-0-00	EB000103	MBF11B-503-B2-A1-0-00	EB000104
	MBF11B-503-K2-A1-A-00	EB000111	MBF11B-503-B2-A1-A-00	EB000112
	MBF11B-503-K2-A2-0-00	EB000107	MBF11B-503-B2-A2-0-00	EB000108
	MBF11B-503-K2-A2-A-00	EB000115	MBF11B-503-B2-A2-A-00	EB000116
	MBF15B-503-K2-A1-0-00	EB000117	MBF15B-503-B2-A1-0-00	EB000118
	MBF15B-503-K2-A1-A-00	EB000121	MBF15B-503-B2-A1-A-00	EB000122
	MBF15B-503-K2-A2-0-00	EB000119	MBF15B-503-B2-A2-0-00	EB000120
	MBF15B-503-K2-A2-A-00	EB000123	MBF15B-503-B2-A2-A-00	EB000124
Reversing starter	MBS2RB-503-K2-A1-0-00	EB000501	MBS2RB-503-B2-A1-0-00	EB000502
	MBS2RB-503-K2-A2-0-00	EB000505	MBS2RB-503-B2-A2-0-00	EB000506
	MBS4RB-503-K2-A1-0-00	EB000503	MBS4RB-503-B2-A1-0-00	EB000504
	MBS4RB-503-K2-A2-0-00	EB000507	MBS4RB-503-B2-A2-0-00	EB000508
Dual-motor starter	MBS4DB-503-K2-A1-0-00	EB000509	MBS4DB-503-B2-A1-0-00	EB000510
	MBS4DB-503-K2-A2-0-00	EB000511	MBS4DB-503-B2-A2-0-00	EB000512

These standard designs (**motor starter** and **inverter with binary control**) are compatible with MOVIFIT® basic with regard to control.

The special designs "MBF...-03" (**inverter with AS-Interface**) and "MBS...-03" (**motor starter with AS-Interface**) are compatible with MOVIFIT® basic with regard to control (see following page).

INFORMATION



Note that 2 motors must always be connected for the MOVIFIT® compact dual-motor starter. If you want to only operate 1 motor, use a MOVIFIT® compact reversing starter.

3.4.2 Standard design SBus

The following table shows the purchase order numbers of MOVIFIT® compact in the SBus designs:

Device type	Control via SBus	
	Type	Purchase order number
Inverter	MBF07B-503-S2-A1-0-00	EB000139
	MBF07B-503-S2-A1-A-00	EB000137
	MBF07B-503-S2-A2-0-00	EB000138
	MBF07B-503-S2-A2-A-00	EB000140
	MBF11B-503-S2-A1-0-00	EB000143
	MBF11B-503-S2-A1-A-00	EB000141
	MBF11B-503-S2-A2-0-00	EB000142
	MBF11B-503-S2-A2-A-00	EB000144
	MBF15B-503-S2-A1-0-00	EB000148
	MBF15B-503-S2-A1-A-00	EB000146
	MBF15B-503-S2-A2-0-00	EB000147
	MBF15B-503-S2-A2-A-00	EB000145
Reversing starter	MBS2RB-503-S2-A1-0-00	EB000514
	MBS2RB-503-S2-A2-0-00	EB000513
	MBS4RB-503-S2-A1-0-00	EB000516
	MBS4RB-503-S2-A2-0-00	EB000515
Dual-motor starter	MBS4DB-503-S2-A1-0-00	EB000518
	MBS4DB-503-S2-A2-0-00	EB000517

3.4.3 Special designs "MBF...-03" and "MBS...-03"

The following table shows the purchase order numbers of MOVIFIT® compact in the special designs "MBF...-03" and "MBS...-03" with AS-Interface.

Device type	Control via AS-Interface	
	Type	Purchase order number
Inverter	MBF07B-503-K2-A1-0-03	EB000128
	MBF07B-503-K2-A1-A-03	EB000132
	MBF07B-503-K2-A2-0-03	EB000130
	MBF07B-503-K2-A2-A-03	EB000134
	MBF11B-503-K2-A1-0-03	EB000129
	MBF11B-503-K2-A1-A-03	EB000133
	MBF11B-503-K2-A2-0-03	EB000131
	MBF11B-503-K2-A2-A-03	EB000135
	MBF15B-503-K2-A1-0-03	EB000136
	MBF15B-503-K2-A1-A-03	EB000126
	MBF15B-503-K2-A2-0-03	EB000125
	MBF15B-503-K2-A2-A-03	EB000127
Reversing starter	MBS2RB-503-K2-A1-0-03	EB000519
	MBS2RB-503-K2-A2-0-03	EB000520
	MBS4RB-503-K2-A1-0-03	EB000521
	MBS4RB-503-K2-A2-0-03	EB000522
Dual-motor starter	MBS4DB-503-K2-A1-0-03	EB000523
	MBS4DB-503-K2-A2-0-03	EB000524

These special designs are compatible with MOVIFIT® basic with regard to control.

INFORMATION



Note that 2 motors must always be connected for the MOVIFIT® compact dual-motor starter. If you want to only operate 1 motor, use a MOVIFIT® compact reversing starter.

4 Mechanical installation

4.1 Installation notes

Observe the following notes for installation:

- Always observe the general safety notes.
- Only install MOVIFIT® on a level, low-vibration, and torsionally rigid substructure; see chapter "Permitted mounting position".
- Strictly observe all instructions referring to the technical data and the permissible conditions regarding the place of installation.
- Only use the provided attachment options when mounting the device.
- When selecting and dimensioning the mounting and safety elements, observe the applicable standards, the technical data of the units, and the local circumstances.
- Use the right cable seals for the cables.
- Close off unused cable entries with seals (without cable entry).
- Cover the unused plug connectors with blind caps.
- Use suitable mating connectors with plug connector variants.

4.2 Tools required

- Set of wrenches
- Socket wrench, SW7 mm
- Socket wrench, SW8 mm
- Torque wrench
- Screwdriver set

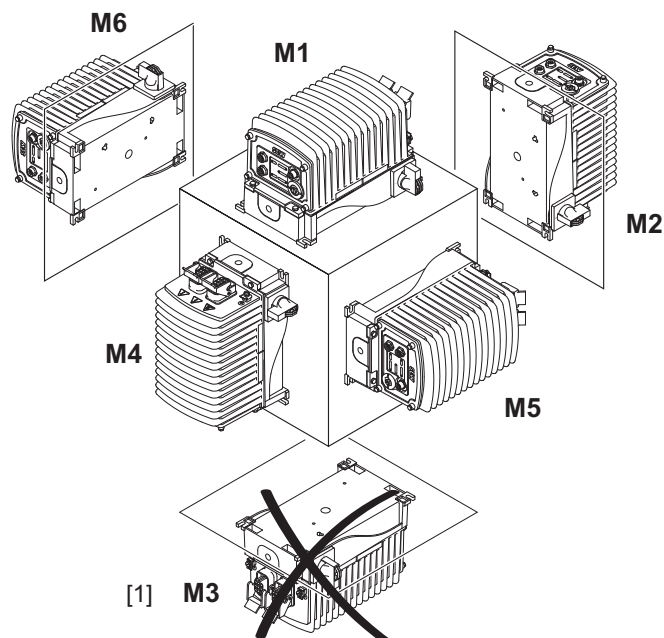
4.3 Installation requirements

Make sure that the following requirements are met before you start installing the device:

- The information on the nameplate of the MOVIFIT® device corresponds to the mains voltage.
- The MOVIFIT® device is undamaged (no damage caused by transport or storage).
- The ambient temperature corresponds to the specifications in chapter "Technical data".
- The MOVIFIT® device must **not** be installed under the following damaging ambient conditions:
 - Potentially explosive atmosphere
 - Oils
 - Acids
 - Gases
 - Vapors
 - Radiation
 - etc.

4.4 Permitted mounting position

The following illustration shows the mounting positions of the MOVIFIT® compact device.

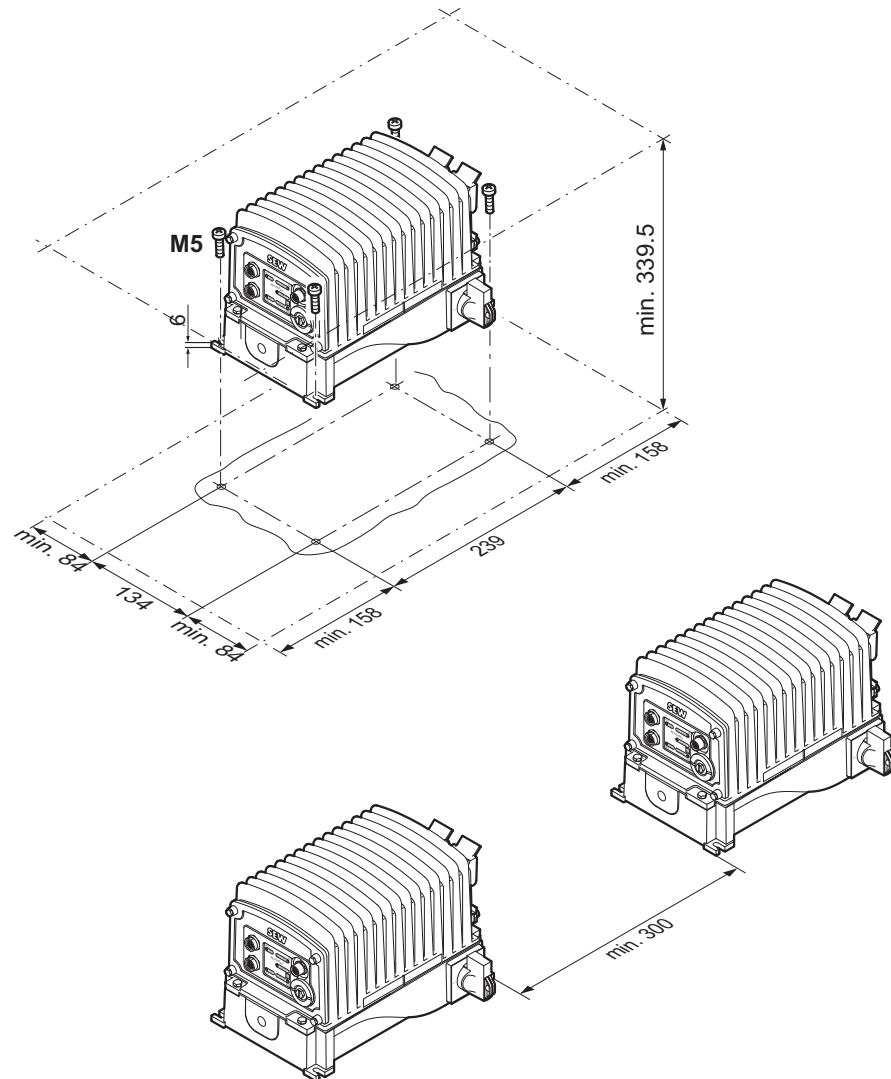


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- [1] Do not install the MOVIFIT® compact device **in mounting position M3**.
The MOVIFIT® compact device may be installed in any other mounting position.

4.5 Setting up the drive unit

Mount the MOVIFIT® compact device with 4 screws according to the following figure:
(Tightening torque 2.0 – 2.4 Nm)



9007216193334795

5 Electrical installation

5.1 Installation notes

Observe the following notes for installation:

- Always observe the general safety notes.
- Only install MOVIFIT® on a level, low-vibration, and torsionally rigid substructure; see chapter "Permitted mounting position".
- Strictly observe all instructions referring to the technical data and the permissible conditions regarding the place of installation.
- Only use the provided attachment options when mounting the device.
- When selecting and dimensioning the mounting and safety elements, observe the applicable standards, the technical data of the units, and the local circumstances.
- Use the right cable seals for the cables.
- Close off unused cable entries with seals (without cable entry).
- Cover the unused plug connectors with blind caps.
- Use suitable mating connectors with plug connector variants.

5.2 Installation planning in consideration of EMC aspects

INFORMATION



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

MOVIFIT® compact can cause EMC interference within the permitted limit range according to EN 61800-3. In this case, it is recommended that the user take the appropriate measures.

For detailed information on EMC-compliant installation, refer to the SEW-EURODRIVE documentation "Drive Engineering – Practical Implementation, Electromagnetic Compatibility in Drive Engineering".

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

You must always apply the **relevant standards**.

Observe the information in the following chapters in particular.

5.2.1 EMC-compliant installation

INFORMATION



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

This is a product with restricted availability (categories C1 to C4 according to EN 61800-3). This product may cause EMC interference. In this case, it is recommended that the user take the appropriate measures.

5.2.2 Equipotential bonding

Regardless of the PE connection, it is essential that low-impedance, **HF-capable equipotential bonding** be provided (see also EN 60204-1 or DIN VDE 0100-540):

- Establish an extensive connection between MOVIFIT® compact and the system.
- To do so, use a ground strap (HF litz wire) to connect MOVIFIT® compact and the system's grounding point.

[1] The housing above the ABOX is made from plastic. The mechanical installation of MOVIFIT® compact does **not create a conductive connection** of ABOX and mounting plate.

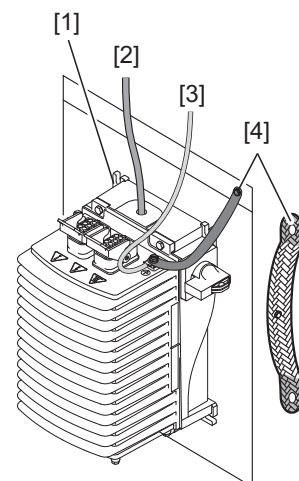
[2] PE conductor in the supply system cable

[3] 2nd PE conductor via separate terminals

[4] EMC-compliant equipotential bonding, e.g. using a ground strap (HF litz wire)

The contact surfaces must be free of paint.

- Do not use the cable shields of data lines for equipotential bonding.



5.3 Low-voltage supply systems

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

- TN and TT systems with directly grounded star point

5.4 Installation instructions

5.4.1 Connecting supply system cables

- The nominal voltage and frequency of the MOVIFIT® device must correspond to the data for the supply system.
- The cable cross section should be dimensioned according to the input current I_{line} for rated power (see chapter "Technical data").
- Install fuses at the beginning of the supply system cable behind the supply bus junction.

The following fuses are permitted:

- Fuses in utilization category gG
- Power circuit breakers with characteristic B or C
- Motor circuit breaker

Dimension the fuses according to the cable cross section.

- Note the information in chapter "Technical data" when selecting the fuse.

5.4.2 Selecting the residual current device

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

Proceed as follows to select the residual current device:

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

5.4.3 Line contactor

- Use contactor switch contacts of utilization category AC-3 according to EN 60947-4-1 to connect the supply system cable.
- Do not use the line contactor K (see Chapter "Installation topology") for jog mode but only for switching on or off the device. Observe a minimum switch-off time of 10 s for the line contactor K.

5.4.4 Notes on PE connection

**▲ WARNING**

Improperly connecting the PE can cause an electric shock.
Severe or fatal injuries.

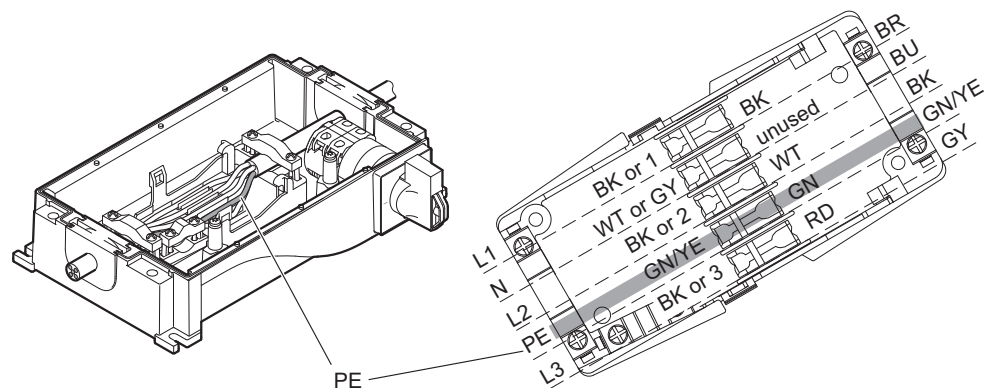
- Observe the following notes regarding PE connection.

For decentralized devices, there are two instances where separate connection of a protective earth/equipotential bonding is required:

- Since frequency inverters generally have a leakage current > 3.5 mA during operation, a PE connection with at least 10 mm^2 or the connection of a second fully functional protective earth is required in accordance with IEC 61800-5-1.
- Stable EMC-proof communication requires a low-impedance connection between the device and equipotential bonding (generally the cable duct). For connections with a length of more than 2 m to the cable duct, the use of HF litz wire is mandatory for the connection.
- If both conditions can be met by using a conductor, only one protective earth / equipotential bonding is required.

PE connection in the device

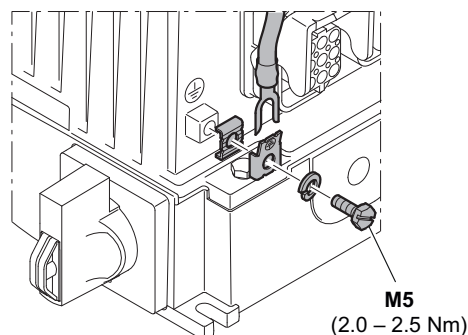
Establish a PE connection in the device.



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PE connection on outside of housing

A **second** PE connection cable must be fitted to the outside of the housing.



9007216193464459

The cross section of the second PE connection cable must be no less than 4 mm^2 and no smaller than the cross section of the mains cable.

5.4.5 Installation altitude higher than 1000 m above sea level

MOVIFIT® devices with supply voltages of 380 to 500 V can be used at altitudes above 1000 up to 4000 m above sea level. To do so, you must observe the following basic conditions.

- At heights above 1000 m above sea level, the nominal continuous power is reduced due to reduced cooling: I_N reduction by 1% per 100 m.
- At altitudes of 2000 to 4000 m above sea level, you must take limiting measures which reduce the line side overvoltage from category III to category II for the entire system.

5.4.6 Protection devices

MOVIFIT® drives have integrated protection devices against overloads and short circuits. External overload devices are not necessary.

External measures are required to fully meet the requirements of the EN 61800-5-1 standard for motor protection. One possible measure is protection through the motor's temperature detection with a temperature sensor and the associated evaluation, for example.

5.4.7 UL-compliant installation

INFORMATION



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

Field Wiring Power Terminals

Use 60/75 °C fine stranded copper wire only sized AWG 14 – 10, suitable for 1 wire per terminal.

Short Circuit Current Ratings

Suitable for use on a circuit capable of delivering not more than 10,000 rms symmetrical amperes when protected as follows:

All models are rated 10 kA when protected as follows:

- 500 V minimum, 20 A maximum, non-semiconductor fuses or
- 500 V minimum, 20 A maximum, inverse time circuit breakers with an interrupting rating not less than 10,000 rms symmetrical amperes.
- MOVIFIT® compact MBF only: Combination Motor Controller Model MS132-2.5, manufactured by ABB Rated 500 V, 2.5 A

The max. voltage is limited to 500 V.

Suitable for motor group installation on a circuit capable of delivering not more than 10,000 rms symmetrical amperes when protected as follows:

All models are rated 10 kA for group installation when protected as follows:

- 500 V minimum, 20 A maximum, non-semiconductor fuses or
- 500 V minimum, 20 A maximum inverse time circuit breakers with an interrupting rating not less than 10,000 rms symmetrical amperes.

The max. voltage is limited to 500 V.

Branch Circuit Protection

Integral solid state short circuit protection does not provide branch circuit protection. Branch circuit protection must be provided in accordance with the National Electrical Code and any additional local codes (US) or Canadian Electrical Code, Part 1 (CA).

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

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

For maximum branch circuit protection see table below.

	SCCR: 10 kA/500 V when protected by		
Model	Non-semiconductor fuses	Inverse time circuit breakers	Combination Motor Controllers
MOVIFIT® compact MBF	20 A maximum 500 V minimum	20 A maximum 500 V minimum	ABB Model MS132-2.5, rated 500 V, 2.5 A
MOVIFIT® compact MBS	20 A maximum 500 V minimum	20 A maximum 500 V minimum	—

Motor Overload Protection

MOVIFIT® compact is provided with load and speed-sensitive overload protection and thermal memory retention upon shutdown or power loss.

The trip current is adjusted to 140 % of the rated motor current.

Ambient Temperature

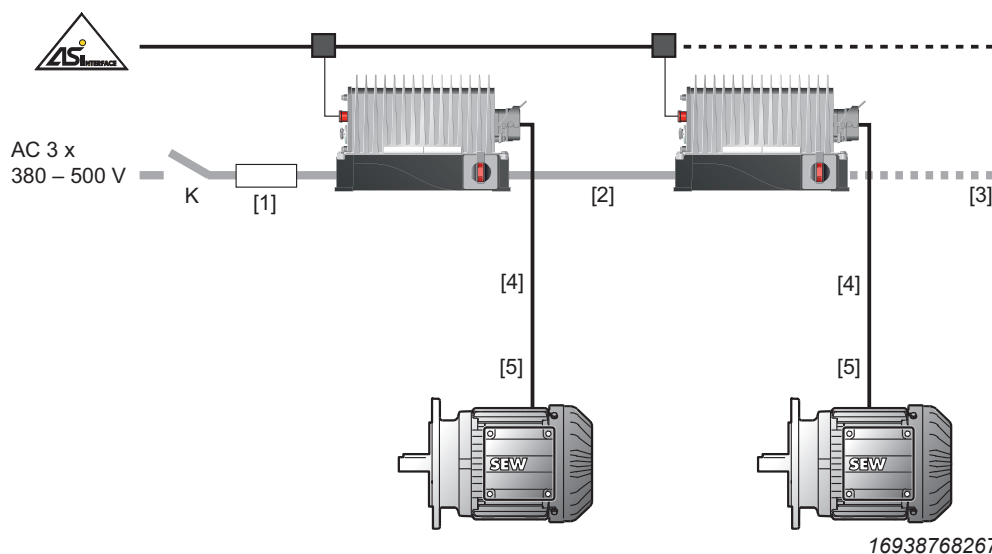
MOVIFIT® compact is suitable for an ambient temperature of 40 °C, max. 60 °C with de-rated output current. To determine the output current rating at temperatures above 40 °C, the output current should be de-rated by 3 % per K between 40 °C and 60 °C.

Wiring Diagram

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

5.5 Installation topology

The following figure shows the general installation topology of MOVIFIT® compact with AS-Interface control:



K: Line contactor

Cable protection device Type	Power bus (power supply cable)					Motor cable	
	Supply impedance upstream of each protection device	Conductor cross section		Rated value or setting of protection device I_N	Maximum cable length ¹⁾	Minimum conductor cross section	Maximum length
		Minimum	Maximum				
[1]		[2]			[3]	[4]	[5]
B16	500 mΩ	2.5 mm ²	6.0 mm ²	16 A	130 m	1.5 mm ²	3 m
B16	500 mΩ	2.5 mm ²	6.0 mm ²	20 A	94 m	2.5 mm ²	3 m
B20	500 mΩ	4.0 mm ²	6.0 mm ²	20 A	140 m	2.5 mm ²	3 m
B25 ²⁾	500 mΩ	4.0 mm ²	6.0 mm ²	25 A	114 m	2.5 mm ²	3 m

1) Maximum cable length when using power circuit breakers with characteristic B ($I_A = 5 \times I_N$, switch-off time = 0.1 s)

2) Do not use the B25 cable protection device in an installation that is not UL-compliant.

The table shows typical characteristics at an ambient temperature of 40 °C with routing type B2 according to EN 60204-1.

The applicable country-specific standards and regulations must also be observed for individual project planning and installation.

5.6 Power bus connection (line cable)



⚠ WARNING

Dangerous voltages in the ABOX can cause electric shock.

Severe or fatal injuries.

- De-energize the MOVIFIT® device. Observe the minimum switch-off time after disconnection from the supply system:
 - 1 minute



⚠ WARNING

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

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.



⚠ WARNING

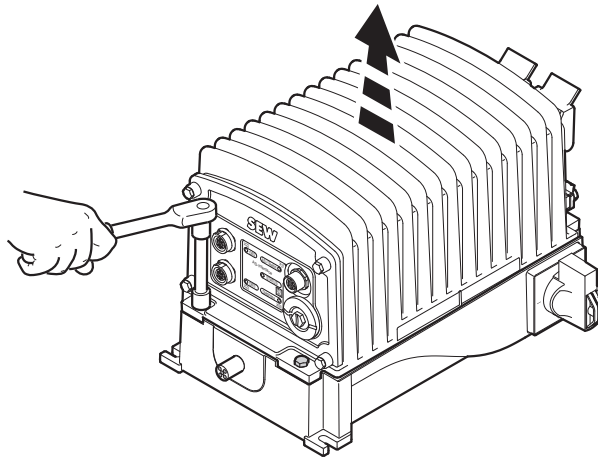
Danger of burns due to hot surfaces of the device (e.g. the heat sink).

Severe injuries.

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

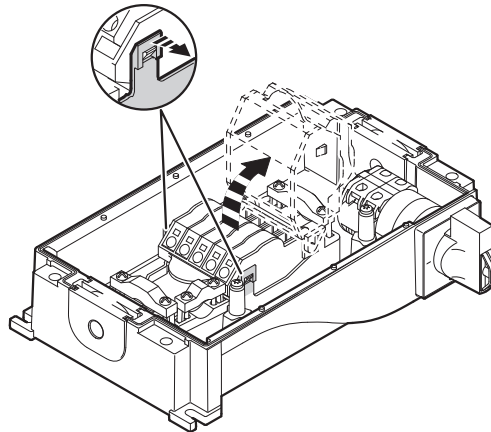
Connect the MOVIFIT® compact device to the power bus as follows.

1. Loosen the 4 screws and remove the EBOX from the ABOX.



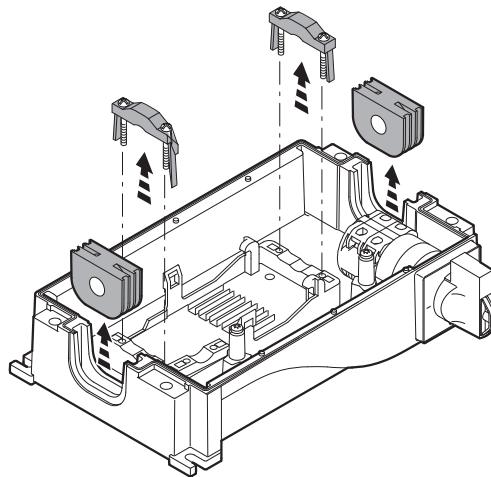
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2. Pull both locking tabs to the outside and tilt up the upper part of the FieldPower® contact module.



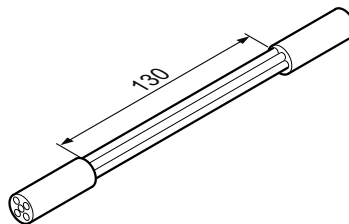
16938791947

3. Loosen the 4 screws and remove the strain relief brackets. Remove the two cable seals.



16938794635

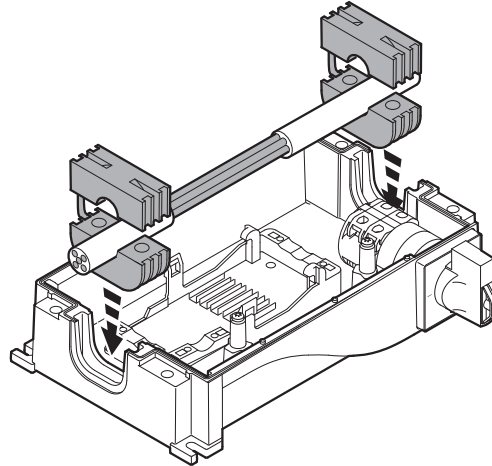
4. Remove the sheath of the power supply cable with a suitable stripping tool.



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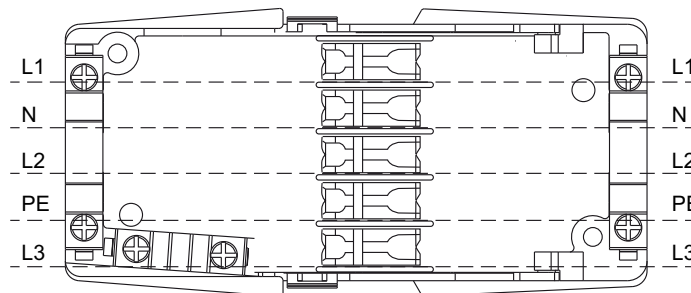
5. Fix the cable seals around the power supply cable.

6. **NOTICE!** An impermissible cable seal can cause penetration by moisture or dust. The MOVIFIT® compact device can become damaged. Only use cable seals that are approved for the diameter of the power supply cable (→ 164). Insert the cable seals with the power supply cable in the recesses in the ABOX.



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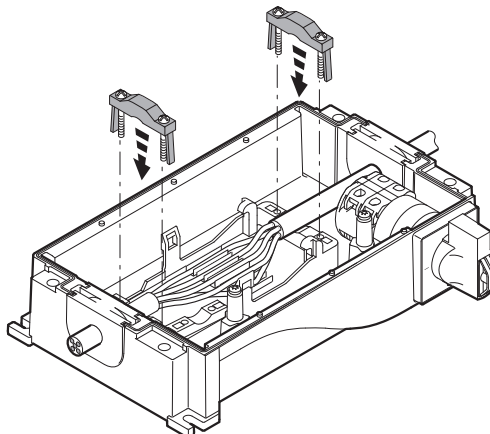
7. **⚠ WARNING!** Risk of crushing due to wrong direction of rotation or damage to property if the phases are connected in reverse. Severe or fatal injuries and irreparable damage to the device. Observe the following connection diagram and prevent short circuits. Insert the cores of the power supply cable into the cable entries in accordance with the following connection diagram:



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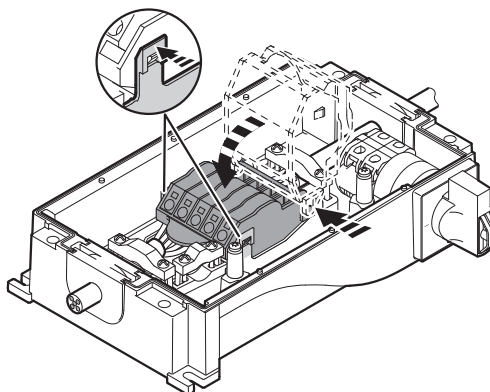
Core	Core color/core marking		
	According to:		
	IEC 60757	UL 1277 TC-ER	UL 62 STOOW
L1	Brown	Black or 1	Black
N	Blue	White or gray	–
L2	Black	Black or 2	White
PE	Green/yellow	Green/yellow	Green
L3	Gray	Black or 3	Red

8. Screw the strain relief brackets to the ABOX and fasten the power supply cable to the brackets (tightening torque: 0.6 Nm).



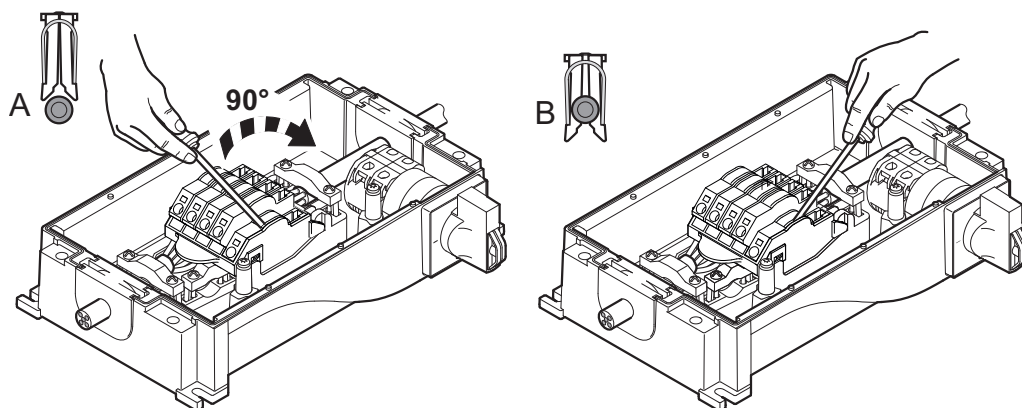
1693880011

9. Place the upper part of the contact module on the hinge hooks. Tilt down the upper part of the contact module until it latches on both sides.



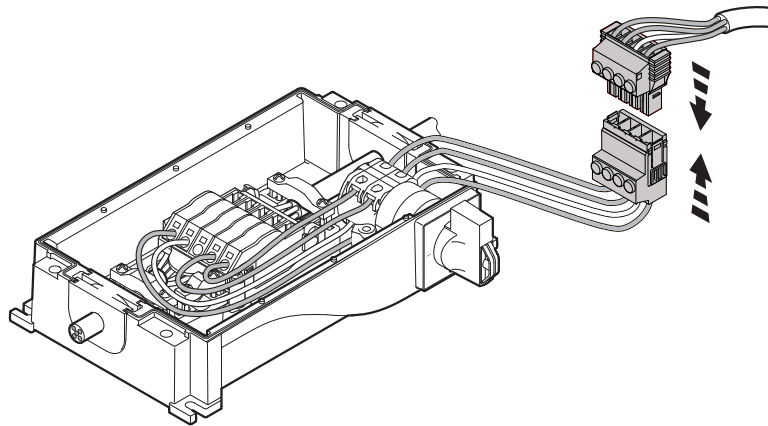
16938802699

10. Use the screwdriver (blade width 3 – 3.5 mm) to lever all contacts of the insulation displacement connector downwards.



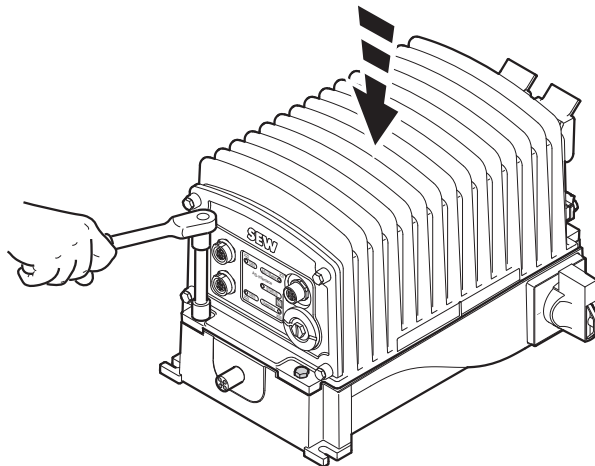
16938818187

11. Plug the supply system plug connector of the EBOX into the socket of the ABOX.



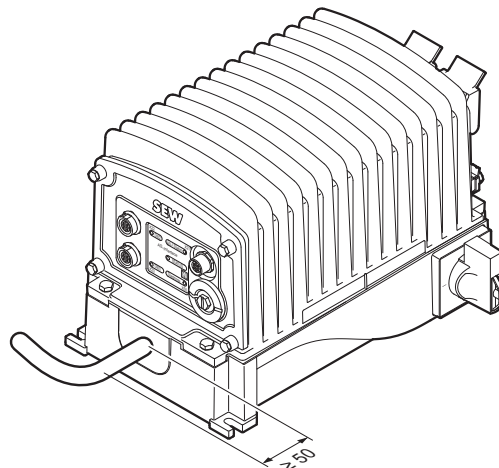
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12. Position the EBOX on the ABOX. Screw on the EBOX with 4 screws (tightening torque: 2 Nm). Avoid crushing the cable.



16938820875

13. **NOTICE!** Damage to device from penetration by moisture or dust by bending the power supply cable.
Do **not** bend the power supply cable within a minimum distance of 50 mm from the device. The MOVIFIT® compact basic device only meets the IP54 requirements if the power supply cable is **not** bent within 50 mm of the unit.



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5.7 Motor connection

5.7.1 Motor connection variants



⚠ WARNING

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

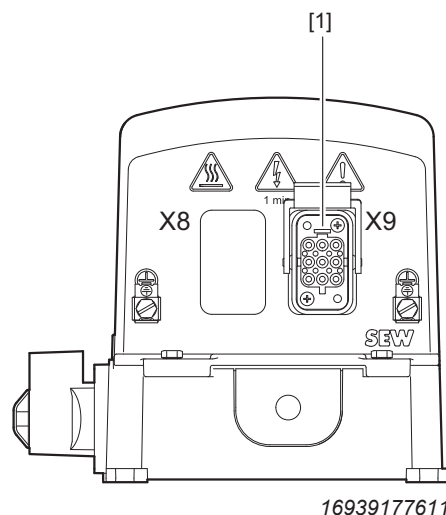
- Disconnect all supply voltages.
- Make sure that the device is de-energized.
- Never plug or unplug the plug connectors while they are energized.

The following figure shows the motor plug connector designs for MOVIFIT® compact:

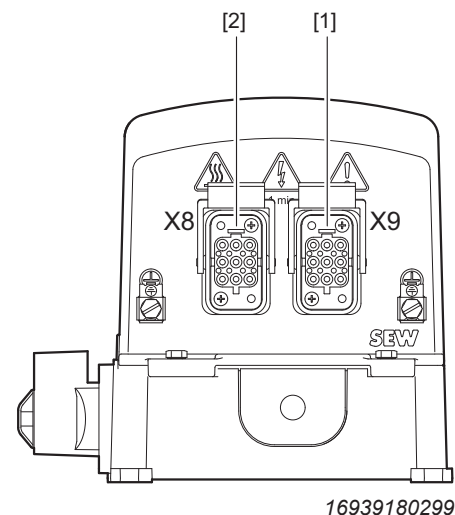
MOVIFIT® compact inverter

MOVIFIT® compact reversing starter

MOVIFIT® compact dual-motor starter



16939177611



16939180299

[1] X9 Motor 1 connection

[2] X8 Motor 2 connection

INFORMATION



Note that 2 motors must always be connected for the MOVIFIT® compact dual-motor starter. If you want to only run 1 motor, use a MOVIFIT® compact reversing starter.

5.7.2 X9, (X8): Motor connection

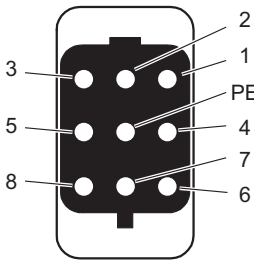
Plug connector X8 is only present on the MOVIFIT® compact dual-motor starter.

Connection

The following table provides information about this connection:

Function
Power connection for motor with brake

Connection type
Q 8/0, female

Connection diagram


No.	Name	Function
1	U	Motor phase U output
2	n. c.	Not assigned
3	W	Motor phase W output
4	L1	Supply of mechanical brake (only with MOVIFIT® compact inverter)
5	n. c.	Not assigned
6	L2_S	Supply of mechanical brake switched (only with MOVIFIT® compact inverter)
7	V	Motor phase V output
8	n. c.	Not assigned
PE	PE	Protective earth

Connection cable



NOTICE

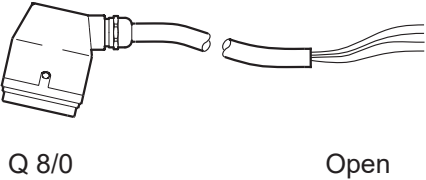
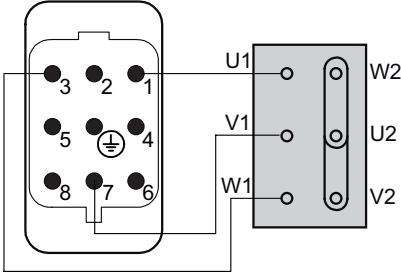
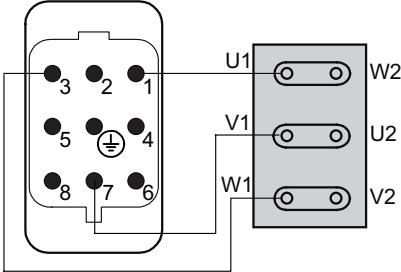
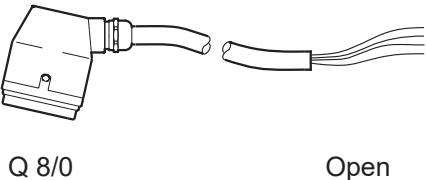
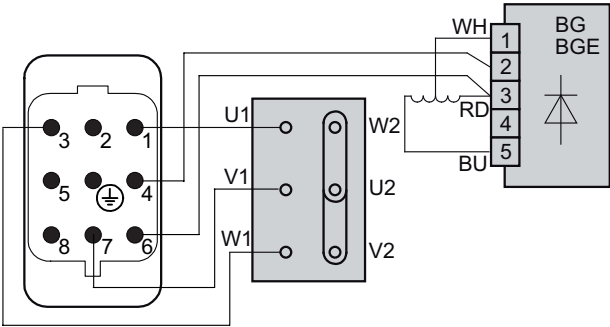
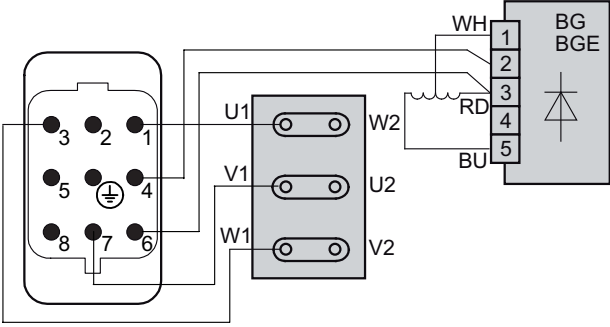
Danger due to short circuit. The motor outputs of the MOVIFIT® compact motor starter are not protected against short circuits.

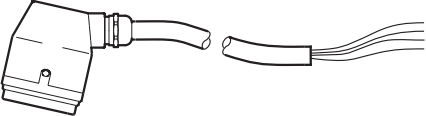
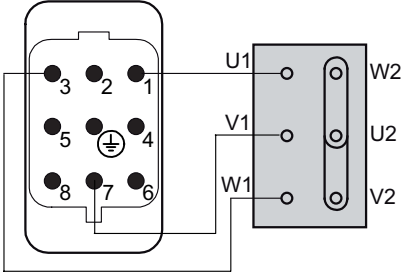
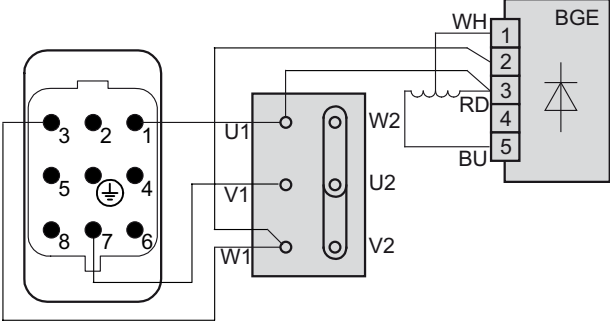
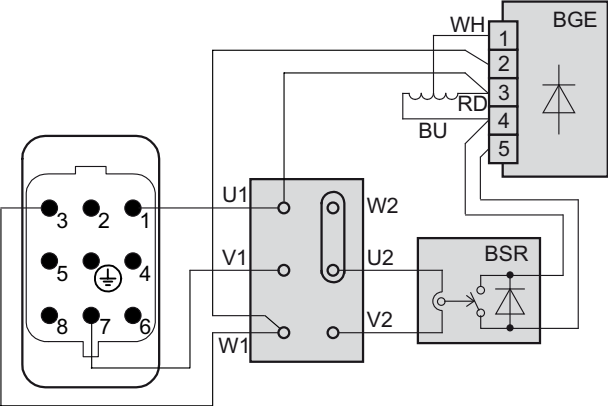
Irreparable damage to the MOVIFIT® compact motor starter.

- Observe the following wiring diagrams.
- Prevent any short circuits between the conductors.

31959490/EN – 01/2024

The following table shows possible motor cables:

Connection cable and component		Motor connection
MOVIFIT® compact	Motor cable	
	Cable design: 4G2.5, unshielded, 3 m Part number: 18148743  Q 8/0 Open	Motor without brake, Δ-connection  2719757451 Motor without brake, Δ-connection  2719762187
MOVIFIT® compact inverter	Motor cable	
	Cable design: 7G2.5, unshielded, 3 m Part number: 18149928  Q 8/0 Open	Motor with brake, Δ-connection  19168160395 Motor with brake, Δ-connection  19170163723

Connection cable and component		Motor connection
MOVIFIT® compact	Motor cable	
MOVIFIT® compact motor starter	Cable design: 4G2.5, unshielded, 3 m Part number: 18148743	Motor without brake
		 2719757451
		Motor with brake
		 9007218424935691
		Motor with brake and BSR brake control system
		 9007218424991499
		For applications with regenerative operation, SEW-EURODRIVE recommends using the BSR brake control system.

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Motor cable connection

4-core

The following table shows the conductor assignments of the 4-conductor motor cable with part number **18148743**, the associated pins of the plug connector, and the associated terminals at the motor:

Plug connector No.	Motor cables Conductor color / conductor marking	Terminal on motor
1	Black/1	U1
3	Black/3	W1
7	Black/2	V1
2, 4, 5, 6, 8	Not connected	
PE	Green/yellow	PE

7-core

The following table shows the conductor assignments of the 7-conductor motor cable with part number **18149928**, the associated pins of the plug connector, and the associated terminals at the motor:

Plug connector No.	Motor cable Conductor color / conductor marking	Terminal on motor
1	Black/1	U1
3	Black/3	W1
4	Black/4	2 ¹⁾
6	Black/6	3 ¹⁾
7	Black/2	V1
2, 5, 8	Not connected	
PE	Green/yellow	PE

1) Terminal on brake rectifier

Mating connector

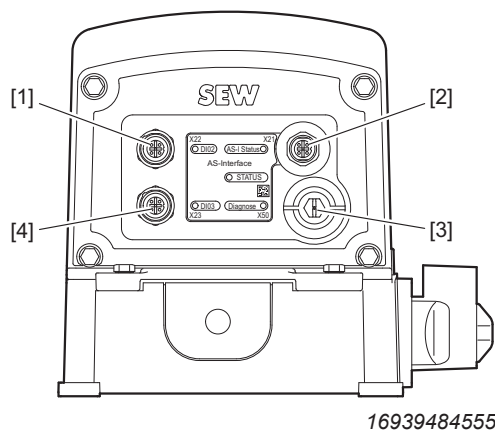
In order to assemble this motor cable, use a plug connector of type Q 8/0. If a mating connector with a metal housing is used, pay attention to the following:

- Ensure a suitable shield connection.
- Connect the housing of the mating connector with PE.

5.8 Control unit connections

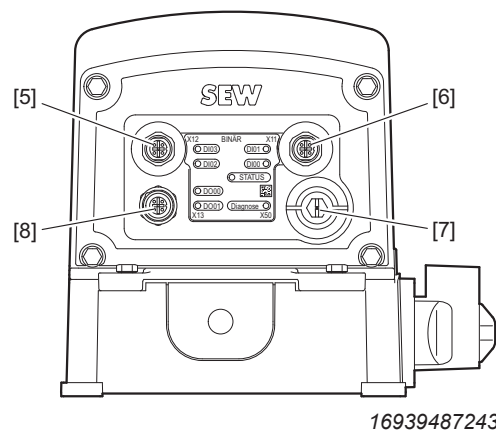
The following figure shows the control unit designs for MOVIFIT® compact:

**MOVIFIT® compact
with AS-Interface**



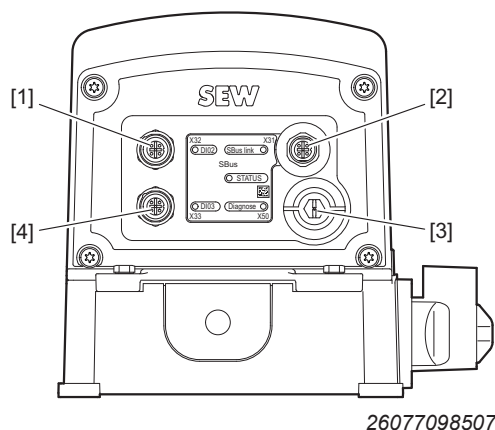
- [1] X22 Binary input sensor 2
- [2] X21 Connection AS-interface
- [3] X50 Diagnostic interface
- [4] X23 Binary input sensor 3

**MOVIFIT® compact
with binary control**



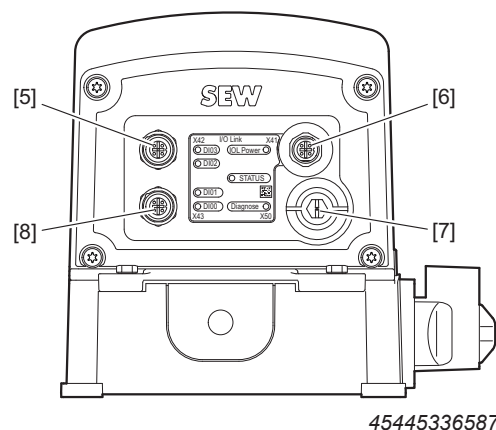
- [5] X12 Signal inputs DI02 + DI03
- [6] X11 Signal inputs DI00 + DI01
- [7] X50 Diagnostic interface
- [8] X13 Signal outputs DO00 + DO01

**MOVIFIT® compact
with SBus interface**



- [1] X32 Signal input DI02
- [2] X31 SBus interface
- [3] X50 Diagnostic interface
- [4] X33 Signal input DI03

**MOVIFIT® compact
with IO-Link interface**



- [5] X42 Signal inputs DI02 + DI03
- [6] X41 IO-Link interface
- [7] X50 Diagnostic interface
- [8] X43 Signal input DI00 + DI01

INFORMATION

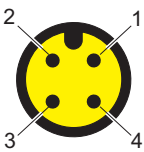


Only use M12 plug connectors with a straight outlet when connecting the digital inputs/outputs.

5.9 Connections of MOVIFIT® compact with AS-Interface

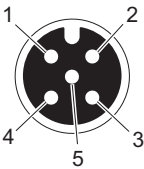
5.9.1 X21: AS-Interface connection

The following table provides information on this connection:

Function		
AS-Interface – input		
Connection type		
M12, 4-pin, male, A-coded, straight outlet		
Connection image		
		
No.	Name	Function
1	AS-Interface +	AS-Interface +
2	n. c.	Not connected
3	AS-Interface –	AS-Interface –
4	n. c.	Not connected

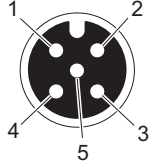
5.9.2 X22: Binary input sensor 2

The following table provides information on this connection:

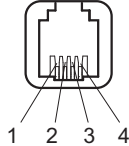
Function		
Digital input sensor 2		
Connection type		
M12, 5-pin, female, A-coded, straight outlet		
Connection image		
		
No.	Name	Function
1	+24 V	DC 24 V output (sensor supply)
2	n. c.	Not connected
3	0V24	0V24 reference potential
4	DI02	Digital input sensor 2
5	n. c.	Not connected

5.9.3 X23: Binary input sensor 3

The following table provides information on this connection:

Function		
Digital input sensor 3		
Connection type		
M12, 5-pin, female, A-coded, straight outlet		
Connection diagram		
		
No.	Name	Function
1	+24 V	DC 24 V output (sensor supply)
2	n. c.	Not connected
3	0V24	0V24 reference potential
4	DI03	Digital input sensor 3
5	n. c.	Not connected

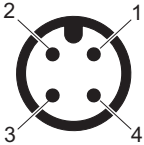
5.9.4 X50: Diagnostic interface

Function		
Diagnostic interface		
Connection type		
RJ10, female		
Connection diagram		
		
No.	Name	Function
1	+5 V	5 V supply
2	RS+	RS485 Diagnostic interface
3	RS-	RS485 Diagnostic interface
4	0V5	0V5 reference potential for RS485

5.10 Connections of MOVIFIT® compact with binary control

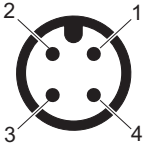
5.10.1 X11: Signal inputs 0 and 1

The following table provides information on this connection:

Function		
Digital inputs 0 and 1		
Connection type		
M12, 4-pin, male, A-coded, straight outlet		
Connection diagram		
		
No.	Name	Function
1	n. c.	Not connected
2	DI01	Digital input 1
3	0V24	0V24 reference potential
4	DI00	Digital input 0

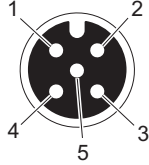
5.10.2 X12: Signal inputs 2 and 3

The following table provides information on this connection:

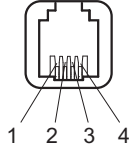
Function		
Digital inputs 2 and 3		
Connection type		
M12, 4-pin, male, A-coded, straight outlet		
Connection diagram		
		
No.	Name	Function
1	n. c.	Not connected
2	DI03	Digital input 3
3	0V24	0V24 reference potential
4	DI02	Digital input 2

5.10.3 X13: Signal outputs 0 and 1

The following table provides information on this connection:

Function		
Digital outputs 0 and 1		
Connection type		
M12, 5-pin, female, A-coded, straight outlet		
Connection diagram		
		
No.	Name	Function
1	+24 V	DC 24 V output
2	DO01	Digital output 1
3	0V24	0V24 reference potential
4	DO00	Digital output 0
5	n. c.	Not connected

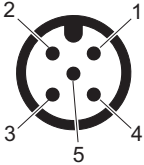
5.10.4 X50: Diagnostic interface

Function		
Diagnostic interface		
Connection type		
RJ10, female		
Connection diagram		
		
No.	Name	Function
1	+5 V	5 V supply
2	RS+	RS485 Diagnostic interface
3	RS-	RS485 Diagnostic interface
4	0V5	0V5 reference potential for RS485

5.11 MOVIFIT® compact connections with SBus Interface

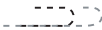
5.11.1 X31: SBus interface

The following table shows information about this connection:

Function		
SBus – Input		
Connection type		
M12, 5-pin, male, A-coded, straight outlet		
Connection diagram		
		
No.	Name	Function
1	CAN_SHLD	Shield/equipotential bonding CAN bus
2	n.c.	Not assigned
3	CAN_GND	Reference potential CAN bus
4	CAN_H	CAN data line (high)
5	CAN_L	CAN data line (low)

Connection cables

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

Connection cable		Conformity/part number	Length/installation type	Operating voltage
 M12, 5-pin, A-coded, female M12, 5-pin, A-coded, male		CE: 13286331	5 m 	DC 60 V
		CE: 13286358	10 m 	
		CE: 13286366	15 m 	
 M12, 5-pin, A-coded, female Open		CE: 13295810	5 m 	DC 60 V
		CE: 19129270	10 m 	
		CE: 19129289	15 m 	

Connection of cables with open end

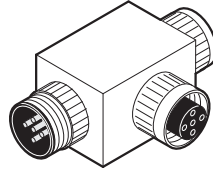
The following table shows the core assignment of the cables with the following part numbers:

Part number	Signal name	Conductor color
13295810	CAN_SHLD	Bare litz wire
19129270	n.c.	Red
19129289	CAN_GND	Black
	CAN_H	White
	CAN_L	Blue

SBus T-piece

The following image shows an example of a SBus T-piece for the distribution of the SBus signals:

- Part number: 13290967
- Connection: M12, 5-pin, 1 x male and 2 x female, A-coded



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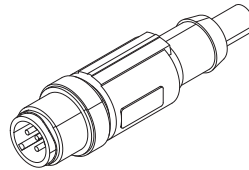
Information on the connection can be found in chapter "SBus connection examples".

SBus terminating resistor

You can use the following terminating resistor in connection with the CAN T-piece as a terminating resistor for the SBus cable:

- Part number: 13287036
- Connection: M12, 5-pin, male, A-coded
- Color: Black
- Resistance: 120 Ω
- Degree of protection: IP65

The following figure shows the terminating resistor:

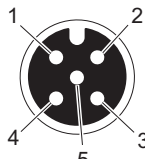


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Information on the connection can be found in chapter "SBus connection examples".

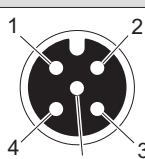
5.11.2 X32: Signal input DI02

The following table shows information about this connection:

Function		
Binary input DI02		
Connection type		
M12, 5-pin, female, A-coded, straight outlet		
Connection diagram		
		
No.	Name	Function
1	+24 V	DC 24 V output
2	n. c.	Not assigned
3	0 V 24	0 V 24 reference potential
4	DI02	Binary input DI02
5	n. c.	Not assigned

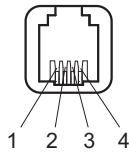
5.11.3 X33: Signal input DI03

The following table shows information about this connection:

Function		
Binary input DI03		
Connection type		
M12, 5-pin, female, A-coded, straight outlet		
Connection diagram		
		
No.	Name	Function
1	+24 V	DC 24 V output
2	n. c.	Not assigned
3	0 V 24	0 V 24 reference potential
4	DI03	Binary input DI03
5	n. c.	Not assigned

5.11.4 X50: Diagnostic interface

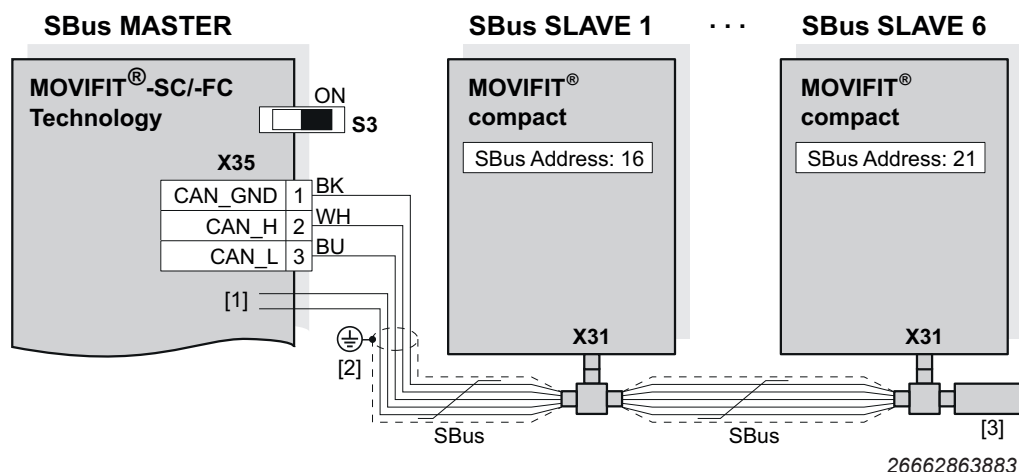
The following table shows information about this connection:

Function		
Diagnostic interface		
Connection type		
RJ10, female		
Wiring diagram		
		
No.	Name	Function
1	+5 V	5 V supply
2	RS+	RS485 diagnostic interface
3	RS-	RS485 diagnostic interface
4	0V5	0V5 reference potential for RS485

5.12 SBus connection examples

5.12.1 Connection example with MOVIFIT® SC, FC Technology

The following figure shows a connection example with MOVIFIT® SC/FC Technology:



- [1] Do not connect the remaining cores.
- [2] Grounding of the shielding with EMC cable gland
- [3] SBus terminating resistor

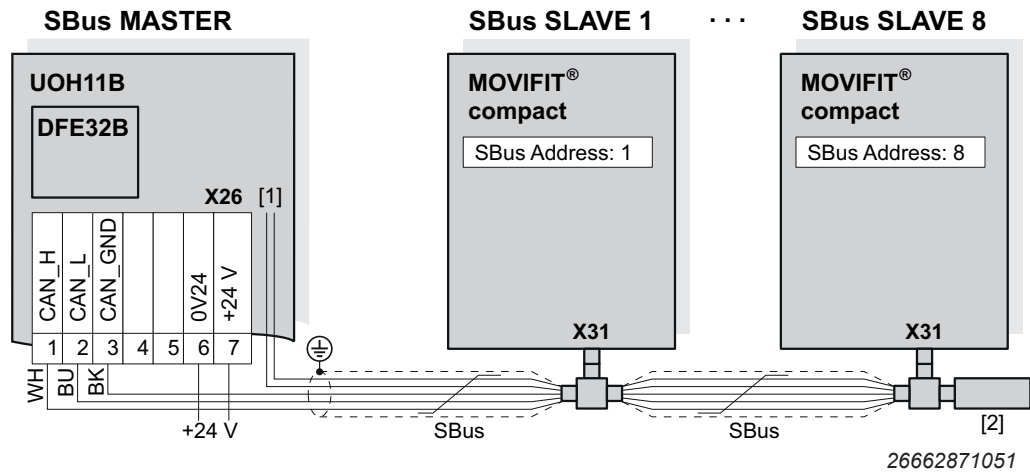
Together with a MOVIFIT® SC/FC Technology device as a SBus Master, you can connect a maximum of 6 MOVIFIT® compact devices as SBus slave devices.

To prevent malfunctions in the bus system due to reflections, etc., the SBus segment must be terminated using terminating resistors at the first and last physical stations.

In MOVIFIT® SC and FC, the terminating resistor has already been implemented. Activate the terminating resistor by setting DIP switch S3 to ON.

5.12.2 Connection example with Gateway DFx/UOH11B

The following figure shows a connection example with Gateway DFx/UOH11B:



[1] Do not connect the remaining cores.

[2] SBus terminating resistor

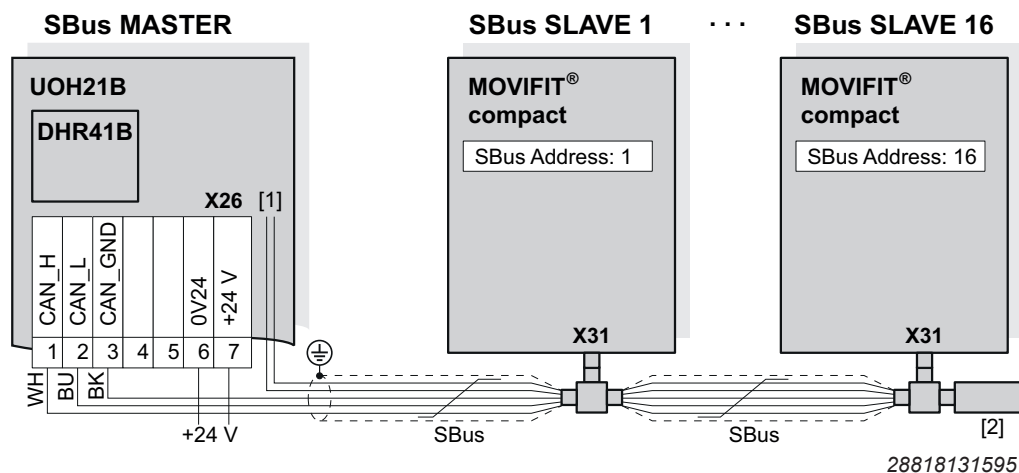
Together with a Gateway DFx as a SBus Master, you can connect a maximum of 8 MOVIFIT® compact devices as SBus slave devices.

To prevent malfunctions in the bus system due to reflections, etc., the SBus segment must be terminated using terminating resistors at the first and last physical stations.

The terminating resistor has already been implemented in Gateway DFx/UOH11B.

5.12.3 Connection example with Controller DHx/UOH21B

The following figure shows a connection example with Controller DHx/UOH21B:



[1] Do not connect the remaining cores.

[2] SBus terminating resistor

Together with a Controller DHx as a SBus Master, you can connect a maximum of 16 MOVIFIT® compact devices as SBus slave devices.

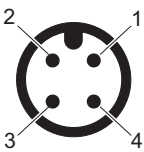
To prevent malfunctions in the bus system due to reflections, etc., the SBus segment must be terminated using terminating resistors at the first and last physical stations.

The terminating resistor has already been implemented in Controller DHx/UOH21B.

5.13 X41: MOVIFIT® compact connections with IO-Link

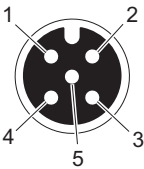
5.13.1 IO-Link interface

The following table shows information about this connection:

Function		
IO-Link input		
Connection type		
M12, 4-pin, male, A-coded, straight outlet		
Wiring diagram		
		
No.	Name	Function
1	L+	Supply voltage +V DC
2	n.c.	Not assigned
3	L-	Supply voltage 0 V (GND)
4	C/Q	IO-Link communication (signal cable)

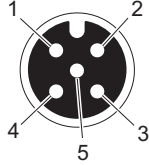
5.13.2 X42: Signal inputs 2 and 3

The following table shows information about this connection:

Function		
Binary inputs 2 and 3		
Connection type		
M12, 5-pin, female, A-coded, straight outlet		
Wiring diagram		
		
No.	Name	Function
1	+24 V	DC 24 V output
2	DI02	Binary input 2
3	0V24	0V24 reference potential
4	DI03	Binary input 3
5	n. c.	Not assigned

5.13.3 X43: Signal inputs 0 and 1

The following table shows information about this connection:

Function		
Binary inputs 0 and 1		
Connection type		
M12, 5-pin, female, A-coded, straight outlet		
Wiring diagram		
		
No.	Name	Function
1	+24 V	DC 24 V output
2	DI00	Binary input 0
3	0V24	0V24 reference potential
4	DI01	Binary input 1
5	n. c.	Not assigned

5.14 **Connecting the MBBG11A operator panel**

The MOVIFIT® compact device has an X50 diagnostic interface (RJ10 socket contact).
The diagnostic interface is located on the connection block of the control unit.

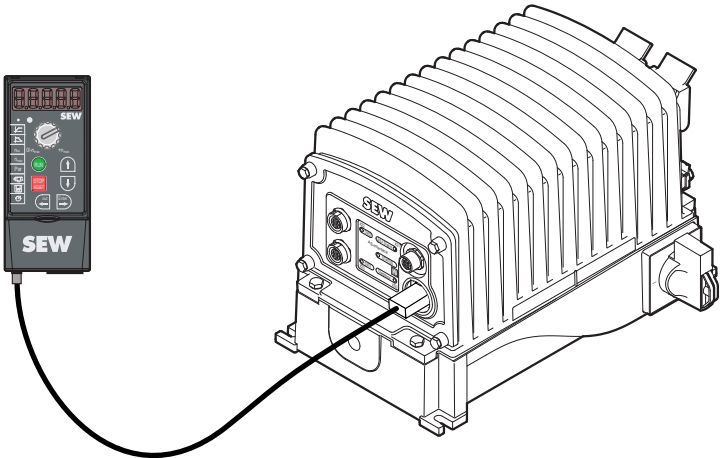
You must remove the screw plug before plugging in the connector into the diagnostic interface.

⚠ WARNING! Risk of burns on hot surfaces of the MOVIFIT® compact device.
Severe injuries.
Wait until the MOVIFIT® compact device has adequately cooled down before touching it.

⚠ CAUTION! The ensured degree of protection will be lost if the screw plug of the diagnostic interface X50 is not installed. The MOVIFIT® compact device can become damaged.
If no screw plug is screwed into the diagnostic interface, you must ensure that no moisture and dust can penetrate the MOVIFIT® compact device.
Use the cable enclosed with the operator terminal to connect the operator terminal to the MOVIFIT® compact device.

Scope of delivery:

Type	Part number	Scope of delivery
MBBG11A	28230809	• MBBG11A operator panel • Cable with RJ10 – RJ10 plug connector



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5.15 Connecting a PC/laptop

The MOVIFIT® compact unit has an RJ10 diagnostic interface for startup, parameterization and service on the connection block of the control unit.

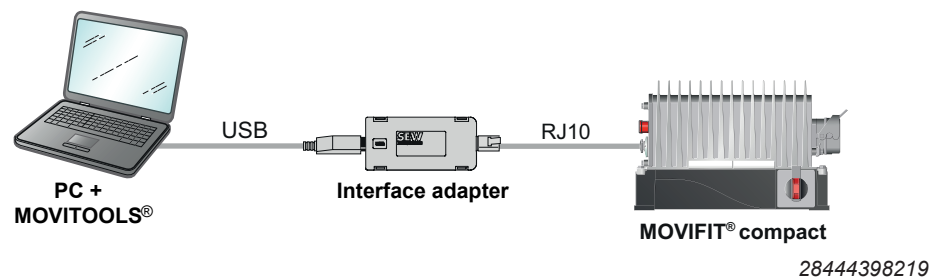
⚠ WARNING! Risk of burns on hot surfaces of the MOVIFIT® compact device. Severe injuries.

Wait until the MOVIFIT® compact device has adequately cooled down before touching it.

⚠ CAUTION! The ensured degree of protection will be lost if the screw plug of the diagnostic interface X50 is not installed. The MOVIFIT® compact device can become damaged.

If no screw plug is screwed into the diagnostic interface, you must ensure that no moisture and dust can penetrate the MOVIFIT® compact device.

The diagnostic interface is connected to a commercially available PC/laptop with one of the following interface adapters with a USB interface.



The following interface adapters are available:

Designation	Part number
USM21A	28231449

Each of the following components are included in the scope of delivery:

- Interface adapter
- Cable with RJ10 plug connector
- USB interface cable

6 Startup

6.1 Startup notes



INFORMATION

You must comply with the general safety notes in chapter "Safety Notes" during start-up.



⚠ WARNING

Dangerous voltages in the ABOX can cause electric shock.

Severe or fatal injuries.

- De-energize the MOVIFIT® device. Observe the minimum switch-off time after disconnection from the supply system:
 - 1 minute



⚠ 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.



⚠ WARNING

Risk of crushing if the motor starts up unintentionally.

Severe or fatal injuries and damage to property.

- Before starting the work, switch off the power to the MOVIFIT® device.
- Secure the MOVIFIT® device against unintentional activation.



⚠ WARNING

Uncontrolled device behavior due to ineffective EMERGENCY OFF circuit.

Severe or fatal injuries.

- Comply with the installation notes.
- Always have the installation carried out by trained specialists.



⚠ WARNING

Device malfunction due to incorrect device setting.

Severe or fatal injuries.

- Observe the startup instructions.
- Always have the installation carried out by trained specialists.
- Check the parameters.
- Only use settings that are correct for the function.

**⚠ WARNING**

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

Severe injuries.

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

**NOTICE**

Danger due to arcing.

Damage to electrical components.

- Do not unplug the power connectors during operation. Do not plug in the power connectors during operation.
- Never remove the EBOX during operation.

**INFORMATION**

During startup and parameterization, written parameters are stored in non-volatile memory (e.g. in an EEPROM). However, memory modules only allow a limited number of write cycles.

- For this reason, ensure that write accesses to parameters do not take place cyclically.

6.2 Prerequisites

The following prerequisites are required for startup:

- The MOVIFIT® compact device must be mechanically and electrically installed in accordance with regulations.
- Appropriate safety measures prevent the drives from starting up unintentionally.
- Appropriate safety measures must be taken to prevent risk of injury or damage to the machine.

The following hardware must be present in order to start up and parameterize the MOVIFIT® compact device:

- MBBG11A operator panel, see chapter "Connecting the MBBG11A operator panel"
- or PC/laptop, see chapter "Connecting a PC/laptop"
- or IO-Link master with IO-Link variant

The following software must be installed on the PC or laptop in order to start up and parameterize the MOVIFIT® compact inverter:

- MOVITOOLS® MotionStudio, version 6.3 or later

6.3 Startup procedure for the MOVIFIT® compact inverter

To start up the inverter, proceed as follows:

1. Check the connection of the MOVIFIT® compact device.
⇒ See chapter "Electrical installation".
2. Ensure that the motor does not start up, and that there is no hazard from an unwanted motor startup.
3. Power on the line voltage. The "STATUS" LED illuminates in yellow.
4. Connect the MBBG11A operator panel or PC/laptop to the MOVIFIT® compact device.
⇒ See chapter "Connecting the MBBG11A operator panel"
⇒ or chapter "Connecting a PC/laptop".

There are two ways of starting up the inverter:

- Use the Easy mode for a quick startup of SEW-EURODRIVE motors.
 - Use the Pro mode to start up third-party motors. The system requires more data to start up third-party motors.
5. To start up in the Easy mode, set the following parameters on the MBBG11A operator panel (→ 96) or on the PC/laptop (→ 99):
⇒ You can find the parameter list in chapter "Parameter list of the MOVIFIT® compact inverter" (→ 102).

Parameters for the Easy mode (with 4-pole SEW-EURODRIVE motors)

SEW-EURODRIVE motor				
Variable	Setting on the MBBG11A operator panel		Parameters in MOVITOOLS® MotionStudio	
			Group	Parameter
Startup mode		EASY	3	<i>Startup = EASY</i>
Nominal motor voltage		UoLt	3	<i>Nominal voltage</i>
Nominal motor power		PoUEr	3	<i>Nominal power</i>
"Commence motor startup" function		CALC = St Art	3	<i>Commence startup = Yes¹⁾</i>
Acceleration ramp			1	<i>P-130 Ramp up</i>
Deceleration ramp			1	<i>P-131 Ramp down</i>
Setpoint speed n1		n1	1	<i>P-170 fixed setpoint n1</i>
Setpoint speed n2		n2	1	<i>P-171 fixed setpoint n2</i>
Setpoint speed n3		n3	1	<i>P-172 fixed setpoint n3</i>
Setpoint speed n4		n4	1	<i>P-173 fixed setpoint n4</i>

In order to operate with LVFC control, the following parameters are also required:

Operating mode		ModE = LVFC	7	<i>P-700 operating mode = LVFC</i>
----------------	---	-------------	---	------------------------------------

1) Click the [Commence startup] button in MOVITOOLS® MotionStudio.

Parameters for the Pro mode (with 4-pole third-party motors)

Third-party motor				
Variable	Setting on the MBBG11A operator panel		Parameters in MOVITOOLS® MotionStudio	
			Group	Parameter
Nominal motor voltage		UoLt	3	Nominal voltage
Nominal motor power		PoUEr	3	Nominal power
Nominal motor current		AMPEr	3	Nominal motor current
Nominal motor frequency		hErtZ	3	Nominal frequency
Nominal motor speed		rPM	3	Nominal speed
"Commence motor startup" function		CALC = St Art	3	Commence startup = Yes ¹⁾
Acceleration ramp			1	P-130 Ramp up
Deceleration ramp			1	P-131 Ramp down
Setpoint speed n1		n1	1	P-170 fixed setpoint n1
Setpoint speed n2		n2	1	P-171 fixed setpoint n2
Setpoint speed n3		n3	1	P-172 fixed setpoint n3
Setpoint speed n4		n4	1	P-173 fixed setpoint n4

In order to operate with LVFC control, the following parameters are also required:

Operating mode		ModE = LVFC	7	P-700 operating mode = LVFC
----------------	---	-------------	---	-----------------------------

1) Click the [Commence startup] button in MOVITOOLS® MotionStudio.

6. **NOTICE!** The ensured degree of protection will be lost if the screw plug of the diagnostic interface is not installed or improperly installed. The MOVIFIT® compact device can become damaged.
Make sure the screw plug of the diagnostic interface has a seal and screw it in.
7. Switch off the line voltage.
8. Set the AS-Interface slave address of the MOVIFIT® compact device (only for MOVIFIT® compact with AS-Interface).
⇒ See chapter "Assigning the AS-Interface slave address".
9. Start up the higher-level controller.
10. Plug in the motor connector at the MOVIFIT® compact.
11. Power on the line voltage.

You can now control the MOVIFIT® compact drive with the higher-level controller (via binary signals or AS-Interface).

6.4 Startup procedure for MOVIFIT® compact motor starter

To start up the motor starter, proceed as follows:

1. Check the connection of the MOVIFIT® compact device.
 - ⇒ See chapter "Electrical installation".
2. Ensure that the motor does not start up, and that there is no hazard from an unwanted motor startup.
3. Switch on the line voltage. The "STATUS" LED illuminates in yellow.
4. Connect the MBBG11A operator panel or PC/laptop to the MOVIFIT® compact device.
 - ⇒ See chapter "Connecting the MBBG11A operator panel"
 - ⇒ or chapter "Connecting a PC/laptop".
5. For a simple startup, set the parameters of the motor as described in the following chapters. The following operating modes are available in the MOVIFIT® compact motor starter for operating an asynchronous motor:
 - ⇒ Voltage limiting
 - ⇒ Current limiting
6. **NOTICE!** Loss of the ensured degree of protection if the screw plug is not installed or not installed correctly on the diagnostic interface. Damage to the MOVIFIT® compact device.
Make sure the screw plug of the diagnostic interface has a seal and screw it in.
7. Switch off the line voltage.
8. Set the AS-Interface slave address of the MOVIFIT® compact device (only with MOVIFIT® compact with AS-Interface).
 - ⇒ See chapter "Assigning the AS-Interface slave address".
9. Start up the higher-level controller.
10. Connect the plug of the motor to the MOVIFIT® compact.
11. Switch on the line voltage.

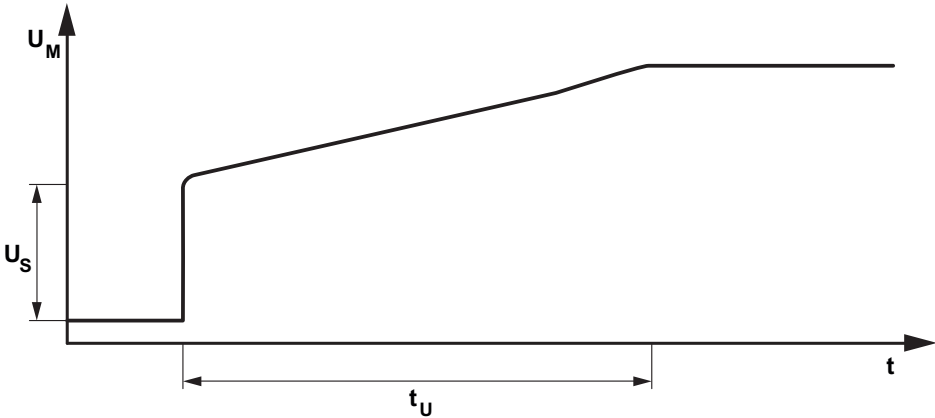
The MOVIFIT® compact drive can now be controlled using the higher-level controller (binary signals or via AS-Interface).

6.4.1 Parameters for "Voltage limiting" operating mode

Description

The MOVIFIT® compact motor starter increases the motor voltage along a ramp within the set time $t_U = 0 - 2\text{ s}$ up to the nominal value.

You can set the starting voltage at which the acceleration procedure begins within the limits $U_S = 40 - 80\%$ of the motor voltage U_M via the parameters *Start voltage drive 1* or *Start voltage drive 2*.



When you cancel the enable, the MOVIFIT® compact motor starter reduces the motor voltage along a ramp within the set braking time.

Parameter In order to start up in "Voltage limiting" operating mode, set the following parameters:

"Voltage limiting" operating mode				
Size	Setting on the MB-BG11A operator panel		Parameters in MOVITOOLS® MotionStudio	
			Group	Parameter
Start mode	Par	P-01 drive 1 = 0	7	<i>Start mode drive 1</i> = Voltage-limited
		P-02 drive 2 ¹⁾ = 0	7	<i>Start mode drive 2</i> = Voltage-limited ¹⁾
Nominal motor current		P-03 drive 1	3	<i>Nominal motor current drive 1</i>
		P-04 drive 2 ¹⁾	3	<i>Nominal motor current drive 2¹⁾</i>
Soft start time t _U		P-05 drive 1	1	<i>P-130 soft start time drive 1</i>
		P-06 drive 2 ¹⁾	1	<i>P-131 soft start time drive 2¹⁾</i>
Braking time		P-07 drive 1	1	<i>Braking time drive 1</i>
		P-08 drive 2 ¹⁾	1	<i>Braking time, drive 2¹⁾</i>
Starting voltage U _s		P-11 drive 1	3	<i>Starting voltage drive 1</i>
		P-12 drive 2 ¹⁾	3	<i>Starting voltage drive 2¹⁾</i>

1) Only with dual-motor starter

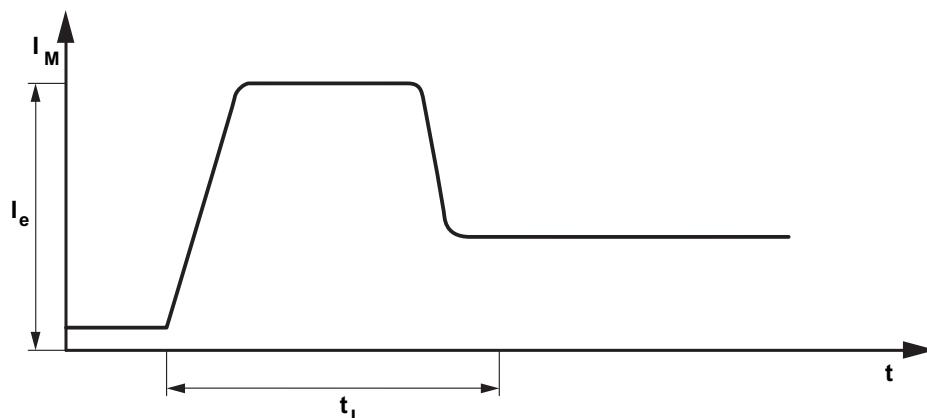
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6.4.2 Parameters for "Current limiting" operating mode

Description

When the drive starts, the MOVIFIT® compact motor starter imposes the current I_e into the motor. The current I_e is defined with parameter *P13 Current limit*. The motor accelerates depending on the motor current I_M .

Time t_i is used to monitor the starting procedure. The motor current must leave its increased startup value within the monitoring time t_i and have dropped to the nominal current or below. If the motor is still carrying a current that is greater than the nominal motor current after monitoring time t_i , the MOVIFIT® compact motor starter switches to fault condition F 34 (Start time monitoring error); see chapter "MOVIFIT® compact motor starter error list" (→ 144).



Parameter

In order to start up in "Current limiting" operating mode, set the following parameters:

"Current limiting" operating mode				
Size	Setting on the MB-BG11A operator panel		Parameters in MOVITOOLS® MotionStudio	
			Group	Parameter
Start mode	Par	P-01 drive 1 = 1	7	Start mode drive 1 = current limited
		P-02 drive 2 ¹⁾ = 1	7	Drive 2 start mode = current-limited ¹⁾
Nominal motor current		P-03 drive 1	3	Nominal motor current drive 1
		P-04 drive 2 ¹⁾	3	Nominal motor current drive 2 ¹⁾
Current limit I _e		P-13 drive 1	3	Current limit drive 1
		P-14 drive 2 ¹⁾	3	Current limit drive 2 ¹⁾
Starting phase monitoring time t _i		P-09 drive 1	5	Starting phase monitoring time drive 1
		P-10 drive 2 ¹⁾		Starting phase monitoring time drive 2 ¹⁾

1) Only with dual-motor starter

6.5 Assigning the AS-Interface slave address

SEW-EURODRIVE delivers MOVIFIT® compact with AS-Interface with the address 0.

The following options are available for assigning the AS-Interface address of the MOVIFIT® compact (address 1A – 31A and 1B – 31B):

- **Automatic address assignment** within a configured AS-Interface system after replacing a MOVIFIT® compact drive.

The following prerequisites must be fulfilled:

- The new MOVIFIT® compact drive must have the address 0.
- If you replace several MOVIFIT® compact drives, they must be replaced individually one after the other.

- **Manual address assignment via the plant master**

Connect the drives to the AS-Interface cable one after another. This prevents several MOVIFIT® compact drives from being given the same AS-Interface address.

- **Manual address assignment using a hand-held AS-Interface programming device**

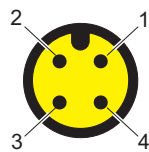
When connecting the MOVIFIT® compact drive to the AS-Interface cable, pay attention to the information in the following chapter.

6.5.1 Assigning the slave address using a hand-held programming device

Hand-held AS-Interface programming devices offer the following functions:

- Reading out and changing an AS-Interface slave address
- Reading out the AS-Interface profile
- Reading out and changing the data and parameter bits
- Function test and test run.

To use a hand-held programming device, you need a connecting cable that fits the AS-Interface plug connector X21 on the MOVIFIT® compact device (see following illustration).



1: AS-Interface +

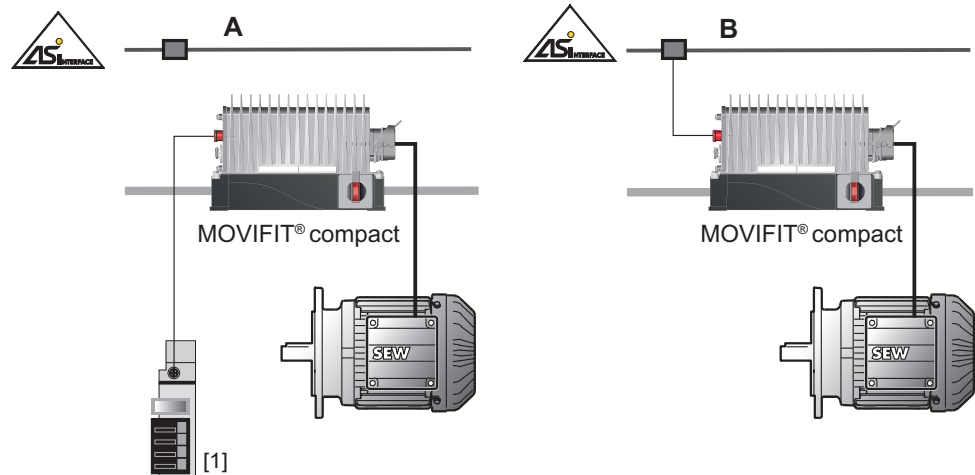
2: n. c.

3: AS-Interface -

4: n. c.

Example:

1. Disconnect the AS-Interface nodes from the AS-Interface network **individually** and address them with the hand-held programming device (step **A**).
2. Then integrate the AS-Interface node in the AS-Interface network again (step **B**).



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[1] AS-Interface hand-held programming device

6.6 Startup in conjunction with SBus

Proceed as follows to startup the MOVIFIT® compact device with SBus connection:

1. Check the connection of the MOVIFIT® compact device.
⇒ See chapter "Electrical installation".
2. Set the SBus address.
⇒ See chapter "Assigning the SBus address".
3. Make sure that the SBus baud rate (Parameter *P884*) is set to 500 kBaud (factory setting).
4. Terminate the bus termination at the first and the last SBus participant.
⇒ See chapter "Bus termination".
5. Start up the MOVIFIT® compact inverter or motor starter.
⇒ See chapter "Startup procedure for the MOVIFIT® compact inverter"
⇒ or chapter "Startup procedure for the MOVIFIT® compact motor starter".

When SBus communication is active, the "SBus link" LED must light green.

6.6.1 Assigning the SBus address

SEW-EURODRIVE supplies MOVIFIT® compact with the SBus address 0.

The following table shows the permitted SBus addresses:

SBus Master	Permitted SBus addresses for the MOVIFIT® compact slaves
MOVIFIT® SC, FC Technology function level	16 – 21
Gateway DFx/UOH11B	1 – 8
Controller DHx/UOH21B	1 – 16

You have the following options for assigning the SBus address of MOVIFIT® compact:

- **Manual address assignment with MOVITOOLS® MotionStudio**
Set the SBus address in the parameter tree under "8 device functions" > "88 serial communication SBus" > "881 SBus address".
See chapter "Parameterization with PC/laptop".
- **Manual address assignment with the MBBG11A keypad**
Set the SBus address on the MBBG11A operator panel with parameter *111*.
See chapter "Parameterization with MBBG11A operator panel".

6.6.2 Bus termination

To prevent malfunctions in the bus system due to reflections, etc., the SBus segment must be terminated using terminating resistors at the first and last physical stations.

Bus termination in MOVIFIT® SC/FC

The bus terminating resistor has already been implemented in the MOVIFIT® SC/FC ABOX.

If a MOVIFIT® SC/FC device is installed at the start or end of an SBus segment, activate the SBus terminating resistor at DIP switch S3 in the MOVIFIT® ABOX.

- DIP switch S3 = ON: Bus terminating resistor is enabled.
- DIP switch S3 = OFF: Bus terminating resistor is **not** enabled.
(factory setting)

Bus termination in Gateway DFx/UOH11B

The bus terminating resistor has already been implemented in Gateway DFx/UOH11B.

Bus termination in Controller DHx/UOH21B

The bus terminating resistor has already been implemented in Controller DHx/UOH21B.

Bus termination on MOVIFIT® compact

If a MOVIFIT® compact device is installed at the start or end of an SBus segment, install the SBus terminating resistor as follows:

- Insert a SBus T-piece into the SBus interface X31.
- Insert a SBus terminating resistor into the SBus T-piece.

INFORMATION



Examples of the installation of the SBus terminating resistor can be found in chapter "SBus connection examples" (→ 53).

6.6.3 Communication with the SBus Master

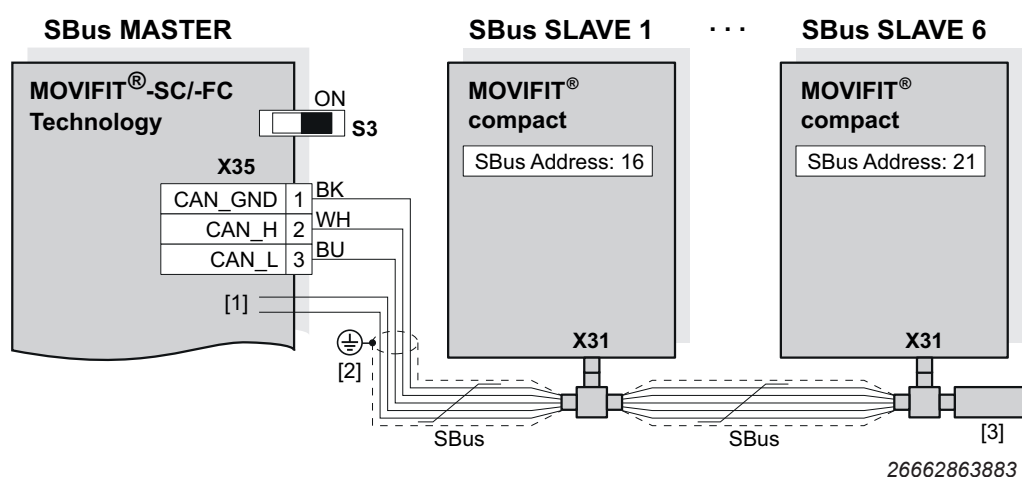
The description of the process data exchange with the SBus Master can be found in chapter "Functions of the MOVIFIT® compact with SBus" (→ 118).

6.6.4 Application example: transparent mode MOVIFIT® FC Technology with 6 FC slave devices

The transparent mode for MOVIFIT® FC Technology offers the following functionality:

- Control of the integrated frequency inverter via 3 process data words
The times for the acceleration and deceleration ramp must be provided cyclically by the higher-level controller.
- Control of 6 other externally connected MOVIFIT® compact slave devices via 3 process data words each.
- MOVIFIT® compact can use 2 binary inputs to evaluate external sensors.

The following figure shows a connection example with a MOVIFIT® FC Technology and 6 MOVIFIT® compact SBus slave devices:



- [1] Do not connect the remaining cores.
 [2] Grounding of the shielding with EMC cable gland
 [3] SBus terminating resistor

The MOVIFIT® compact slave units are controlled with the SBus addresses 16 – 21.

The following figure shows a TIA configuration example for transparent mode MOVIFIT® FC Technology with 6 MOVIFIT® compact slave devices:

Device overview					
	Module	Rack	Slot	I address	Q address
	▼ buc-mtx-technology-s12-cu	0	0	1983*	
	► Ethernet Interface	0	0 X1	1982*	
	F-Module I/O (5/4 Byte)_1	0	1	18...26	18...25
	01 PD Status- / Controlword_1	0	2	392...393	394...395
	01 Byte Inputs DI00-DI07 / Outputs DO0...	0	3	5	5
	03 PD Power section / Slave / S12_1	0	4	694...699	694...699
	03 PD MOVIFIT Compact Adr16	0	5	264...269	264...269
	03 PD MOVIFIT Compact Adr17	0	6	270...275	270...275
	03 PD MOVIFIT Compact Adr18	0	7	276...281	276...281
	03 PD MOVIFIT Compact Adr19	0	8	282...287	282...287
	03 PD MOVIFIT Compact Adr20	0	9	288...293	288...293
	03 PD MOVIFIT Compact Adr21	0	10	332...337	332...337

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6.7 Startup in connection with IO-Link

6.7.1 Overview of IO-Link

IO-Link is a registered trademark. IO-Link is only allowed to be used by members of the IO-Link community and non-members who have purchased the corresponding license. The detailed user information can be found in the IO-Link Community Rules: <https://io-link.com>.

IO-Link is a globally standardized I/O technology (IEC 61131-9) for communicating with sensors and actuators. IO-Link is a point-to-point communication between IO-Link master and IO-Link device, and is not a fieldbus. You can find more information about IO-Link on the Internet at: <https://io-link.com>.

Components

The IO-Link system consists of the following basic components:

- IO-Link master
- IO-Link device (e.g. sensors, motor starter)
- Unshielded 3 or 5-core standard cables
- Engineering tool for configuring and parameterizing the IO-Link device

The IO-Link master establishes the connection between the IO-Link device and the automation system.

The IO-Link master communicates using various fieldbuses. An IO-Link master can have several IO-Link ports (channels). An IO-Link device can be connected to each port (peer-to-peer communication). In principle, any combination of IO-Link masters and IO-Link devices is possible.

Note the following points when combining IO-Link devices which have different IO-Link specifications:

- IO-Link V1.0 and V1.1 devices with IODD version V1.0 can be operated on an IO-Link master according to V1.0.
- IO-Link devices according to V1.0 and V1.1 can be operated on an IO-Link master according to V1.1.

Transmission types

Transmission with IO-Link is divided into 3 data types:

- Process data: cyclical data

The process data of the IO-Link device is transmitted cyclically and the process data size is also determined by the IO-Link device. Data from 0 to 12 bytes is possible depending on the device process. The data refers to input and output in each case.

- IO-Link device data: acyclic data

IO-Link device data can be parameters, identification data and diagnostics information. It is exchanged acyclically, and at the request of the IO-Link master. IO-Link device data can be written to the IO-Link device as well as read from the IO-Link device.

- Events: acyclic data

If an event occurs, the IO-Link device signals an existing event to the IO-Link master, and the IO-Link master reads the event. Events can be error messages, such as a short circuit, warnings or maintenance data, such as contamination or overheating. Error messages are transmitted from the IO-Link device to the controller or the HMI via the IO-Link master. The IO-Link master can also transmit events and conditions of the IO-Link device. Such events are, for example, wire breaks or communication errors.

Transmission speed

According to the IO-Link specification V1.1, 3 data transmission rates (baud rates) are specified:

- COM 1 = 4.8 kBaud
- COM 2 = 38.4 kBaud
- COM 3 = 230.4 kBaud

An IO-Link device only supports one of the defined data transmission rates; for MOVIFIT® compact, this is COM3. The IO-Link master automatically adapts to the data transmission rate supported by the device.

IO-Link works with a 24 V level. If transmissions fail, the telegram is repeated two more times. Only after the second retry has failed does the IO-Link master detect a communication failure and report this to the higher-level controller.

IODD electronic device description (IO Device Description)

An electronic device description is available for each device (IODD: IO Device Description).

The IODD contains information such as:

- Communication properties
- Device parameters with range of values and default value
- Identification, process and diagnostic data
- Device data
- Text description
- Picture of the device
- Logo of the manufacturer

The structure of the IODD is the same for all devices from all manufacturers. The IO-Link configuration tools of the master manufacturers always display the structure of the IODD in the same way. This guarantees the same handling for all IO-Link devices, regardless of the manufacturer. The IODDs for MOVIFIT® compact can be downloaded via IODDfinder (<https://ioddfinder.io-link.com>), a central non-proprietary database for IODDs. IODDfinder is a service of the IO-Link community; this platform provides an overview of all IO-Link devices.

IO-Link profiles

Device profiles are defined to standardize access to the devices. The data structure, data content and basic functionality are defined in the device profiles. This ensures each user has a uniform view, and identical program access to a significant number of different devices. MOVIFIT® compact fulfills the requirements for CommonProfile ID 0x4000 according to IO-Link Common Profile Specification Version 1.1.

6.7.2 IO-Link parameters

Access options

In addition to parameterization via the SEW-EURODRIVE diagnostic interface (see chapters "Parameterization with the MBBG11A operator panel" (→ 93) and "Parameterization with the PC/laptop" (→ 99)), it is also possible to parameterize the device complete via IO-Link parameter services and common IO-Link configuration tools:

- Online via the IO-Link system master ("system master" for short)
- Off-site via an IO-Link USB master

IO-Link parameter services

There are 2 different access methods for the ISDU (Index Service Data Unit) parameter services:

- ISDU single parameter access involves direct read or write access to an individual device parameter. The consistency assurance and validity check only relate to the device parameter addressed. The order in which the parameters are accessed may be relevant here.
- With ISDU block parameterization, several individual parameter accesses are bracketed by the IO-Link system commands 03 "ParamDownloadStart" and 04 "ParamDownloadEnd". This approach enables an entire parameter set to be uploaded and downloaded consistently.

Common IODD-based IO-Link configuration tools use block parameterization and automatically generate the necessary system commands at the beginning and end of the access. Individual parameter accesses may be used for online access from the control level (PLC). The motor startup procedure for the MOVIFIT® compact inverter differs slightly here (see chapter "Startup" (→ 86)).

Note the following properties for the block parameter services:

During a block parameter upload, other access channels, such as write access via the SEW-EURODRIVE diagnostic interface, are temporarily blocked so that a consistent data set can be retrieved via IO-Link. During block parameter upload, the saved configuration values are always read from the NV memory of the device in the case of writable configuration parameters in the MOVIFIT® compact¹⁾.

During block parameter download, a device-internal data set buffer with the current parameter values is pre-initialized in the background after the download is started (system command 03 "ParamDownloadStart"). Subsequent individual parameter write accesses are first redirected to this buffer instead of taking effect directly. When the download is completed via the corresponding system command 04 "ParamDownloadEnd", the data in the data set buffer is checked for validity in its entirety (access authorizations, compliance with limit values, plausibility).

If the check is successful, the data set is saved effectively and in the non-volatile data set buffer in its entirety. The sequence of the individual parameter accesses within the bracketing by system commands 03/04 thus loses its relevance. If the validity check fails, system command 04 is given a negative acknowledgment and the data transmit-

ted up to that point is discarded ("rollback"). Parallel write access via other interfaces is also blocked during the block parameter download. System command 05 "ParamDownloadStore" can be used instead of system command 04 "ParamDownloadEnd" to transfer the written data set directly to the data memory of the IO-Link system master as well, see chapter "DataStorage" (→ 88).

- 1) Corresponds to the MOVILINK® "ReadEeprom" service. In contrast, the current RAM actual values (MOVILINK® "Read" service) are returned when individual parameters are read. These can differ from the saved NV configuration values in individual cases.

IO-Link ISDU parameter indexing

With IO-Link, device parameters are indexed via an index-subindex combination. The device parameters available with the MOVIFIT® compact are stored in an IODD file for the respective device variant. There are ISDU standard parameters defined by IO-Link (see also IO-Link specification) and device parameters for specific manufacturers. With MOVIFIT® compact, each device parameter for a specific manufacturer is assigned an IO-Link ISDU index in the range 1001 to 1200. All device parameters for specific manufacturers are exclusively addressed with sub-index 0 for MOVIFIT® compact.

Standard IO-Link parameter list for all MOVIFIT® compact variants

ISDU index		Name	Access R: Read W: Write	Data type	Values
hex.	dec.				
0x02	2	System Command	W	8-bit UInteger	1: ParamUploadStart 2: ParamUploadEnd 3: ParamDownloadStart 4: ParamDownloadEnd 5: ParamDownloadStore 6: ParamBreak 129: Application Reset 131: Back-to-box
0x10	16	Vendor Name	R	64-octet string	SEW-EURODRIVE GmbH & Co KG
0x11	17	Vendor Text	R	64-octet string	www.sew-eurodrive.com
0x12	18	Product Name	R	64-octet string	MOVIFIT® compact IO-Link
0x13	19	Product ID	R	64-octet string	Inverter: MBF15B Dual-motor starter: MBS4DB Reversing starter: MBS2RB, MB-S4RB
0x15	21	Serial Number	R	16-octet string	–
0x16	22	Hardware Revision	R	64-octet string	–
0x17	23	Firmware Revision	R	64-octet string	–
0x18	24	Application-specific Tag	R/W	32-octet string	Default value: ***
0x19	25	Function Tag	R/W	32-octet string	Default value: ***
0x20	26	Location Tag	R/W	32-octet string	Default value: ***
0x24	36	Device Status	R	8-bit UInteger	Default value: 0
0x25	37	Detailed Device Status	R	Array [4] of 3-octet OctetString	–

IO-Link parameter list for the MOVIFIT® compact inverter

ISDU Index ¹⁾		Name	Access R: Read W: Write	Data type	Values/range of values Comments	MOVILINK® Index Subindex
hex.	dec.					
0x3EA	1002	Rated frequency	R/W	32-bit UInteger	10000 – 500000	8630.0
0x3EB	1003	Rated speed	R/W	32-bit UInteger	10000 – 6000000	8642.0
0x3EC	1004	Maximum speed	R/W	32-bit UInteger	15000 – 6000000	8517.0

ISDU Index ¹⁾		Name	Access R: Read W: Write	Data type	Values/range of values Comments	MOVILINK® Index Subindex
hex.	dec.					
0x3ED	1005	Premagnetization time	R/W	32-bit UInteger	0 – 2000	8526.0
0x3F3	1011	Nominal motor current	R/W	32-bit UInteger	100 – 300000	8648.0
0x3F5	1013	Rated power	R/W	32-bit UInteger	90 – 3000	10546.13
0x3F6	1014	Rated voltage	R/W	32-bit UInteger	20000 – 700000	8652.0
0x3FD	1021	Ramp t11 up	R/W	32-bit UInteger	125 – 1500000	8807.0
0x3FF	1023	Boost	R/W	32-bit UInteger	0 – 50000	10546.23
0x401	1025	Output Current	R	32-bit UInteger	-2147483648 – 2147483647	8326.0
0x402	1026	DC link voltage	R	32-bit UInteger	0 – 4294967295	8325.0
0x403	1027	Basic unit firmware	R	32-bit UInteger	0 – 4294967295	10546.27
0x405	1029	Heat sink temperature	R	32-bit UInteger	-2147483648 – 2147483647	8327.0
0x409	1033	Output Current %	R	32-bit UInteger	0 – 4294967295	8321.0
0x40A	1034	Current limit	R/W	32-bit UInteger	0 – 150000	8516.0
0x40E	1038	UL motor current weighting factor	R/W	32-bit UInteger	0 – 100000	10546.38
0x40F	1039	Cosine Phi	R/W	32-bit UInteger	500 – 950	8674.0
0x410	1040	PWM frequency	R/W	32-bit UInteger	4 = 4 kHz 16 = 16 kHz	10546.40
0x411	1041	Startup	R/W	32-bit UInteger	0 = Easy 1 = Pro	10546.41
0x412	1042	Operating mode	R/W	32-bit UInteger	0 = Vf 1 = LVFC	10546.42
0x413	1043	Commence startup	R/W	32-bit UInteger	0 = Ready 1 = Start 2 = Finished	10546.43
0x415	1045	Ramp t11 down	R/W	32-bit UInteger	125 – 1500000	8808.0

ISDU Index ¹⁾		Name	Access R: Read W: Write	Data type	Values/range of values Comments	MOVILINK® Index Subindex
hex.	dec.					
0x42A	1066	Fixed setpoint n1	R/W	32-bit UInteger	-6000000 – -15000 15000 – 6000000	8489.0
0x42B	1067	Fixed setpoint n2	R/W	32-bit UInteger	-6000000 – -15000 15000 – 6000000	8490.0
0x42C	1068	Fixed setpoint n3	R/W	32-bit UInteger	-6000000 – -15000 15000 – 6000000	8491.0
0x42D	1069	Fixed setpoint n4	R/W	32-bit UInteger	-6000000 – -15000 15000 – 6000000	10096.31
0x431	1073	Front option firmware	R	32-bit UInteger	0 – 4294967295	8300.0
0x432	1074	Unit type	R	32-bit UInteger	0 – 4294967295	8301.0
0x435	1077	Inverter status	R	32-bit UInteger	0 – 4294967295	8310.0
0x437	1079	Signature 1	R/W	4-octet string	–	8314.0
0x438	1080	Signature 2	R/W	4-octet string	–	8315.0
0x439	1081	Signature 3	R/W	4-octet string	–	8316.0
0x43A	1082	Signature 4	R/W	4-octet string	–	8317.0
0x43C	1084	Manual reset	R/W	32-bit UInteger	0 = No 1 = Yes	8617.0
0x443	1091	Binary inputs	R	32-bit UInteger	0..4294967295	8334.0
0x447	1095	Factory setting	R/W	32-bit UInteger	0 = No 2 = Delivery state ²⁾	8594.0
0x448	1096	Speed	R	32-bit in- teger	-2147483648 – 2147483647	8318.0
0x44B	1099	Fault code t-0	R	32-bit UInteger	0 – 4294967295	8366.0
0x44C	1100	Fault code t-1	R	32-bit UInteger	0 – 4294967295	8367.0
0x44D	1101	Fault code t-2	R	32-bit UInteger	0 – 4294967295	8368.0
0x44E	1102	Fault code t-3	R	32-bit UInteger	0 – 4294967295	8369.0
0x44F	1103	Suberror code t-0	R	32-bit UInteger	0 – 4294967295	9304.0

ISDU Index ¹⁾		Name	Access R: Read W: Write	Data type	Values/range of values Comments	MOVILINK® Index Subindex
hex.	dec.					
0x450	1104	Suberror code t-1	R	32-bit UInteger	0 – 4294967295	9305.0
0x451	1105	Suberror code t-2	R	32-bit UInteger	0 – 4294967295	9306.0
0x452	1106	Suberror code t-3	R	32-bit UInteger	0 – 4294967295	9307.0
0x453	1107	Internal code t-0	R	32-bit UInteger	0 – 4294967295	8883.0
0x454	1108	Internal code t-1	R	32-bit UInteger	0 – 4294967295	8884.0
0x455	1109	Internal code t-2	R	32-bit UInteger	0 – 4294967295	8885.0
0x456	1110	Internal code t-3	R	32-bit UInteger	0 – 4294967295	8886.0
0x45A	1114	Setpoint description PO1	R/W	32-bit UInteger	9 = Control word	8304.0
0x45B	1115	Setpoint description PO2	R/W	32-bit UInteger	1 = Setpoint speed 11 = Setpoint speed [%]	8305.0
0x45C	1116	Setpoint description PO3	R/W	32-bit UInteger	0 = No function 8 = Ramp	8306.0
0x45D	1117	Actual value descrip- tion PI1	R/W	32-bit UInteger	6 = Status word	8307.0
0x45E	1118	Actual value descrip- tion PI2	R/W	32-bit UInteger	1 = Actual speed 2 = Output current 8 = Actual speed [%]	8308.0
0x45F	1119	Actual value descrip- tion PI3	R/W	32-bit UInteger	7 = Status word 2	8309.0
0x460	1120	PO1 setpoint	R	32-bit UInteger	0 – 4294967295	8455.0
0x461	1121	PO2 setpoint	R	32-bit UInteger	0 – 4294967295	8456.0
0x462	1122	PO3 setpoint	R	32-bit UInteger	0 – 4294967295	8457.0
0x463	1123	PI1 actual value	R	32-bit UInteger	0 – 4294967295	8458.0
0x464	1124	PI2 actual value	R	32-bit UInteger	0 – 4294967295	8459.0
0x465	1125	PI3 actual value	R	32-bit UInteger	0 – 4294967295	8460.0
0x486	1158	Operating mode	R	32-bit UInteger	0 = Vf 1 = LVFC	10546.158

ISDU Index ¹⁾		Name	Access R: Read W: Write	Data type	Values/range of values Comments	MOVILINK® Index Subindex
hex.	dec.					
0x487	1159	Startup	R	32-bit UInteger	0 = Easy 1 = Pro	10546.159
0x488	1160	Rated power	R	32-bit UInteger	0, 90 – 3000	10546.160
0x489	1161	Rated voltage	R	32-bit UInteger	0, 20000 – 700000	10546.160
0x48A	1162	Rated frequency	R	32-bit UInteger	0, 10000 – 500000	10546.160
0x48B	1163	Rated speed	R	32-bit UInteger	0, 10000 – 6000000	10546.160
0x48C	1164	Nominal motor current	R	32-bit UInteger	0, 100 – 300000	10546.160
0x48D	1165	Cosine Phi	R	32-bit UInteger	0, 500 – 950	10546.160
0x48E	1166	Premagnetization time	R	32-bit UInteger	0 – 2000	10546.160

1) Subindex = 0

2) Excluded from data storage

IO-Link parameter list for the MOVIFIT® compact starter

ISDU Index		Name	Access R: Read W: Write	Data type	Values/range of values Comments	MOVILINK® Index Subindex
hex.	dec.					
0x3E9	1001	Start mode drive 1	R/W	32-bit UInteger	0 = Voltage Limiting 1 = Current limiting	10546.201
0x3EA	1002	Start mode drive 2	R/W	32-bit UInteger	0 = Voltage Limiting 1 = Current limiting	10546.202
0x3EB	1003	Rated motor current 1	R/W	32-bit UInteger	100 – 10000	8648.0
0x3EC	1004	Rated motor current 2	R/W	32-bit UInteger	100 – 10000	8649.0
0x3ED	1005	Soft startup time drive 1	R/W	32-bit UInteger	0 – 2000	10096.1
0x3EE	1006	Soft startup time drive 2	R/W	32-bit UInteger	0 – 2000	10096.2
0x3EF	1007	Braking time drive 1	R/W	32-bit UInteger	0 – 2000	10546.207
0x3F0	1008	Braking time drive 2	R/W	32-bit UInteger	0 – 2000	10546.208

ISDU Index		Name	Access R: Read W: Write	Data type	Values/range of values Comments	MOVILINK® Index Subindex
hex.	dec.					
0x3F1	1009	Monitoring time for starting phase drive 1	R/W	32-bit UInteger	0 – 5000	10546.209
0x3F2	1010	Monitoring time for starting phase drive 2	R/W	32-bit UInteger	0 – 5000	10546.210
0x3F3	1011	Starting voltage drive 1	R/W	32-bit UInteger	40 – 80	10546.211
0x3F4	1012	Starting voltage drive 2	R/W	32-bit UInteger	40 – 80	10546.212
0x3F5	1013	Current limit drive 1	R/W	32-bit UInteger	100 – 500	10546.213
0x3F6	1014	Current limit drive 2	R/W	32-bit UInteger	100 – 500	10546.214
0x3F7	1015	Boot mode drive 1	R/W	32-bit UInteger	0 = Off 1 = On	10546.215
0x3F8	1016	Boot mode drive 2	R/W	32-bit UInteger	0 = Off 1 = On	10546.216
0x3F9	1017	Boot voltage drive 1	R/W	32-bit UInteger	60 – 100	10546.217
0x3FA	1018	Boot voltage drive 2	R/W	32-bit UInteger	60 – 100	10546.218
0x3FB	1019	Boot duration drive 1	R/W	32-bit UInteger	100 – 2000	10546.219
0x3FC	1020	Boot duration drive 2	R/W	32-bit UInteger	100 – 2000	10546.220
0x3FD	1021	Increased switching operation drive1	R/W	32-bit UInteger	0 = Off 1 = On	10546.221
0x3FE	1022	Increased switching operation drive2	R/W	32-bit UInteger	0 = Off 1 = On	10546.222
0x403	1027	Basic unit firmware	R	32-bit UInteger	0 – 4294967295	10546.27
0x431	1073	Front option firmware	R	32-bit UInteger	0 – 4294967295	8300.0
0x432	1074	Unit type	R	32-bit UInteger	0 – 4294967295	8301.0
0x435	1077	Starter status	R	32-bit UInteger	0 – 4294967295	8310.0
0x437	1079	Signature 1	R/W	4-octet string	–	8314.0
0x438	1080	Signature 2	R/W	4-octet string	–	8315.0

ISDU Index		Name	Access R: Read W: Write	Data type	Values/range of values Comments	MOVILINK® Index Subindex
hex.	dec.					
0x439	1081	Signature 3	R/W	4-octet string	–	8316.0
0x43A	1082	Signature 4	R/W	4-octet string	–	8317.0
0x43C	1084	Manual reset	R/W	32-bit UInteger	0 = No 1 = Yes	8617.0
0x443	1091	Binary inputs	R	32-bit UInteger	0 – 4294967295	8334.0
0x447	1095	Factory setting	R/W	32-bit UInteger	0 = No 2 = Delivery state ¹⁾	8594.0
0x44B	1099	Fault code t-0	R	32-bit UInteger	0 – 4294967295	8366.0
0x44C	1100	Fault code t-1	R	32-bit UInteger	0 – 4294967295	8367.0
0x44D	1101	Fault code t-2	R	32-bit UInteger	0 – 4294967295	8368.0
0x44E	1102	Fault code t-3	R	32-bit UInteger	0 – 4294967295	8369.0
0x44F	1103	Suberror code t-0	R	32-bit UInteger	0 – 4294967295	9304.0
0x450	1104	Suberror code t-1	R	32-bit UInteger	0 – 4294967295	9305.0
0x451	1105	Suberror code t-2	R	32-bit UInteger	0 – 4294967295	9306.0
0x452	1106	Suberror code t-3	R	32-bit UInteger	0 – 4294967295	9307.0
0x453	1107	Internal code t-0	R	32-bit UInteger	0 – 4294967295	8883.0
0x454	1108	Internal code t-1	R	32-bit UInteger	0 – 4294967295	8884.0
0x455	1109	Internal code t-2	R	32-bit UInteger	0 – 4294967295	8885.0
0x456	1110	Internal code t-3	R	32-bit UInteger	0 – 4294967295	8886.0
0x45A	1114	Setpoint description PO1	R/W	32-bit UInteger	14 = Control word SC	8304.0
0x45B	1115	Setpoint description PO2	R/W	32-bit UInteger	0 = No function	8305.0
0x45C	1116	Setpoint description PO3	R/W	32-bit UInteger	0 = No function	8306.0

ISDU Index		Name	Access R: Read W: Write	Data type	Values/range of values Comments	MOVILINK® Index Subindex
hex.	dec.					
0x45D	1117	Actual value description PI1	R/W	32-bit UInteger	14 = Status word SC	8307.0
0x45E	1118	Actual value description PI2	R/W	32-bit UInteger	14 = Status word SC	8308.0
0x45F	1119	Actual value description PI3	R/W	32-bit UInteger	0 = No function	8309.0
0x460	1120	PO1 setpoint	R	32-bit UInteger	0 – 4294967295	8455.0
0x461	1121	PO2 setpoint	R	32-bit UInteger	0 – 4294967295	8456.0
0x462	1122	PO3 setpoint	R	32-bit UInteger	0 – 4294967295	8457.0
0x463	1123	PI1 actual value	R	32-bit UInteger	0 – 4294967295	8458.0
0x464	1124	PI2 actual value	R	32-bit UInteger	0 – 4294967295	8459.0
0x465	1125	PI3 actual value	R	32-bit UInteger	0 – 4294967295	8460.0

1) Excluded from data storage

6.7.3 Events

An event error code is assigned to each device fault.

Event code	Type	Name	Description	SEW-EURODRIVE error code
6145 (0x1801)	Error	Overcurrent	Overcurrent output stage inverter	1
6146 (0x1802)		Overcurrent motor 1	Overcurrent at motor terminal X9 (Reversing starter/dual-motor starter, motor 1)	1
6147 (0x1803)		Overcurrent motor 2	Overcurrent at motor terminal X8 (Dual-motor starter, motor 2)	1
6150 (0x1806)		Phase failure	Failure of one or more line phases	6
6151 (0x1807)		DC link voltage	DC link voltage too high	7
6153 (0x1809)		Motor startup	Error during startup of motor in the Pro mode	9
6155 (0x180b)		Thermal overload	Thermal overload of the output stage	11
6162 (0x1812)		CPU	CPU fault	18
6169 (0x1819)		EEPROM	EEPROM fault	25
6172 (0x181c)		IO-Link timeout	Communication error IO-Link	28
6178 (0x1822)		Start time monitoring motor 1	Start time monitoring error (Reversing starter/dual-motor starter, motor 1)	34
6179 (0x1823)		Start time monitoring motor 2	Start time monitoring error (Dual-motor starter, motor 2)	34
6180 (0x1824)		MBBG11A timeout	MBBG11A timeout error	36
6181 (0x1825)		Software run-time	Runtime error inverter/starter software	37
6184 (0x1828)		Bootsync	Boot synchronization/boot status error power section	40
6187 (0x182b)		Internal communication	Communication problem between internal control section and power section	43
6188 (0x182c)		Device overload	Device overload	44
6189 (0x182d)		Initialization	Initialization error	45
6190 (0x182e)		Initialization power section	Invalid power section identifier/power section firmware	94
6194 (0x1832)		Supply voltage	Supply voltage error in internal power section	50

Event code	Type	Name	Description	SEW-EURODRIVE error code
6228 (0x1854)	Error	Overload of motor	Thermal overload of motor (for inverter variant)	84
6229 (0x1855)		Overload of motor 1	Thermal overload of motor at X9 (reversing starter/dual-motor starter, motor 1)	84
6230 (0x1856)		Overload of motor 2	Thermal overload of motor at X8 (dual-motor starter, motor 2)	84
6238 (0x185e)		Detected power section	Detected power section does not correspond to the configured power section	94
6241 (0x1861)		Copy dataset	Error during data backup with the MB-BG11A operator panel	97
6242 (0x1862)		Flash code CRC	CRC calculation via flash code	98
6243 (0x1863)		Copy dataset	Data set not compatible with device variant	97
6262 (0x1876)		Power section has detected communication failure	Communication failure detected by power section (reversing starter/dual-motor starter)	118
6340 (0x18c4)		Power section collective error	Power section collective error, error assignment not possible (inverter)	196
6399 (0x18ff)		Collective error	Error cannot be assigned	—

6.7.4 Startup

MOVIFIT® compact starter

	Individual parameter access	Block parameter access
1	Set the device parameters appropriately for the application.	
2	—	Perform a parameter download to the IO-Link device.
3	The parameterization is completed.	

MOVIFIT® compact inverter with default premagnetization

	Individual parameter access	Block parameter access
1	Set the device parameters appropriately for the application and the motor parameters according to the motor nameplate data.	
2	Set the premagnetization time parameter (ISDU index 1005) to the value 0. The value 0 corresponds to the "Use default premagnetization time" functionality for the IO-Link variant.	
3	Set the startup parameter (ISDU index 1043) to the value 1 "Commence start-up".	
4	–	Perform a parameter download to the IO-Link device.
5	The parameterization is completed.	

Setting motor parameters in the Easy mode

When starting up a motor in the Easy mode (ISDU index 1041 = 0 "Easy"), only set the two configuration values of the nominal motor power (ISDU index 1013) and nominal motor voltage (ISDU index 1014) of the connected motor.

The other motor parameters are:

- Rated motor frequency configuration value (ISDU index 1002)
- Nominal motor speed configuration value (ISDU index 1003)
- Premagnetization time configuration value (ISDU index 1005)
- Nominal motor current configuration value (ISDU index 1011)
- Motor cos phi configuration value (ISDU index 1039)

These parameters are estimated internally in the device using an SEW-EURODRIVE motor with the same performance, and the associated configuration values are not used¹⁾.

The estimated values determined by the internal startup calculation can be read out for checking via the following display parameters:

- Rated motor frequency display value (ISDU index 1162)
- Nominal motor speed display value (ISDU index 1163)
- Premagnetization time display value (ISDU index 1166)
- Nominal motor current display value (ISDU index 1164)
- Motor cos phi display value (ISDU index 1165)

1) When these configuration parameters are read out, the configuration values last entered by the user are always displayed in the block and single parameter mode.

Setting motor parameters in the Pro mode

When starting up a motor in the Pro mode (ISDU index 1041 = 1 "Pro"), all configuration values of the motor parameters are used as specified by the user. The premagnetization time (ISDU index 1005) can be limited to an internal, motor-dependent minimum value. It is possible to read back the limited actual value of the premagnetization time via ISDU index 1166.

Adjusting premagnetization time

	Individual parameter access	Block parameter access
1	Set the device parameters appropriately for the application and the motor parameters according to the motor nameplate data.	
2	First set the premagnetization time parameter (ISDU index 1005) to the value 0. The value 0 corresponds to the "Use default premagnetization time" functionality for the IO-Link variant.	
3	Set the startup parameter (ISDU index 1043) to the value 1 "Commence start-up".	
4	–	Perform a parameter download to the IO-Link device.
5	–	Perform a parameter upload to read back the calculated default premagnetization time.
6	Use the current display value of the premagnetization time (ISDU index 1166) as the base value and write the correspondingly modified premagnetization time to ISDU index 1005. ¹⁾	
7	–	Perform a parameter download to the IO-Link device.
8	The parameterization is completed.	

1) Complete deactivation of the premagnetization phase is not possible. The device always limits the premagnetization time to a motor-dependent minimum value. If the appropriate value for the premagnetization time is known, you can enter this in step 2 when accessing the block parameters, and steps 5 to 7 are no longer necessary.

6.7.5 DataStorage

IO-Link provides a mechanism for consistent backup of an IO-Link device data set in the IO-Link system master. In the event of a device replacement, you can use this to restore the appropriate device configuration in the IO-Link device.

If one of the corresponding backup modes "Backup/Restore" or "Restore" is active in the corresponding port of the IO-Link system master, replace a defective IO-Link device with a compatible replacement unit. After the device has been replaced, the master automatically writes the previously saved parameterization back to the replacement unit.

The aim of IO-Link data management is to enable defective IO-Link devices to be exchanged without the use of tools such as an IO-Link configuration tool.

The IO-Link device uses the "Datastore upload" IO-Link event to inform the system master whether there has been a relevant change in the device data set. Depending on the datastore backup mode set, the system master decides whether it has to read out the data set via upload and save it in its backup data set, or must overwrite the data in the device with the backup data set via download.

The datastore upload event is also saved as a "Datastore upload flag" in the device. After a voltage interruption or a restart, the system master can decide whether to perform an upload or download based on the stored datastore upload flag and a device data set checksum.

Master port Backup mode	Behavior when datastore upload event is set
Commissioning	No response, data backup inactive
Backup/restore	System master reads the data set from the device and saves it in its backup data set. The upload resets the datastore upload event and flag in the device. Restore case: see "Behavior on startup with deviating data set checksum".
Restore	System master overwrites the data set in the device with its backup data set. The download resets the datastore upload event and flag in the device.

The saved datastore upload flag is not part of the device data set to be saved. If you would like to know the status, read it out via ISDU index 1154.

Master port Backup mode	Examples of use
Commissioning	- Startup phase with frequent readjustments - Data backup generally not desired/required
Backup/restore	Application-related parameter set changes occasionally occur in the IO-Link device (e.g. formulation changeovers). This change to the current parameterization triggers a datastore upload event and saves the current "formulation" in the system master. When the device is replaced, the system master always loads the current/last valid formulation into the replacement unit. However, this mode carries the risk of unintentionally overwriting the backup data set in the system master. Therefore, when replacing the device, make sure that the datastore upload flag is not set on the replacement unit. To do this, delete the upload flag, e.g. by establishing the delivery state or using the IO-Link system command 131 = Back-to-box.
Restore	Permanent fixing of the parameterization. The IO-Link device always runs with the backup data set fixed in the system master, and is always overwritten with the backup data set of the system master in the event of a device replacement. It is only possible to trigger a change to an existing backup data set by reconfiguring the port configuration in the system master.

The following options are available for influencing the setting of the datastore upload event:

Type of data change	Effect on the datastore upload event
Data changes via IO-Link single parameter access	Datastore upload event is not set.
Data changes via IO-Link block parameter access with IO-Link system command 0x04 "ParamDownloadEnd"	Datastore upload event is not set.
Data changes via IO-Link block parameter access with IO-Link system command 0x05 "ParamDownloadStore"	Datastore upload event is set.
IO-Link system command 129 (0x81) "Application Reset"	Datastore upload event is set.
IO-Link system command 131 (0x83) "Back-to-box"	Datastore upload event is deleted.
Data changes via SEW-EURODRIVE diagnostic interface (see following paragraph)	Datastore upload event is set. ¹⁾

Type of data change	Effect on the datastore upload event
Establishing the delivery state	Datastore upload event is deleted.

1) Exception: Establishing the delivery state

Data changes via SEW-EURODRIVE diagnostic interface:

Before making any intended data changes via the SEW-EURODRIVE diagnostic interface, temporarily reset the master port configuration to commissioning mode. Otherwise, even the first written (partial) parameter can trigger the datastore upload event. This immediately blocks all further parameter access via the diagnostic interface. In the meantime, the master uploads the changed data or overwrites the changed data again. This avoids unnecessary access error messages when the data is changed using the SEW-EURODRIVE diagnostic interface.

Common IODD-based IO-Link configuration tools use the IO-Link system command 0x05 "ParamDownloadStore" as standard for the IO-Link block parameter download, in which the datastore upload event and flag are set. However, some tools also allow the IO-Link system command 0x04 "ParamDownloadEnd" to be used without setting the datastore upload event and flag.

Without the datastore upload event, the system master only recognizes a data change when the IO-Link communication is restarted based on the deviating data set checksum. The system master also reacts to a checksum deviation at startup by uploading or downloading the data set depending on the current backup mode, and the status of the saved datastore upload flag:

IO-Link master Backup mode	Behavior on startup with deviating data set checksum
Commissioning	No response – data backup inactive
Backup/restore	Datastore upload flag set: The system master transfers the data set from the IO-Link device to its backup memory. Datastore upload flag not set: The system master overwrites the data set in the IO-Link device. The datastore upload flag can be set in the IO-Link device after the restart because the system master will not yet have been able to process and acknowledge/delete the associated datastore upload event. This is due, for example, to a voltage interruption or the connection of a device after an off-site data change on an IO-Link USB master.
Restore	The system master overwrites the data set in the IO-Link device. This behavior is independent of the state of the datastore upload flag. Any datastore upload flag that may have been set is deleted by the download.

If the backup mode is changed in the system master, the backup data set in the system master is deleted.

IO-Link master Backup mode	Behavior when the configuration is changed to ... mode
Commissioning	Backup data set in the system master remains deleted.
Backup/restore	Backup data set in the system master is initially empty. The system master reacts according to the upload event.
Restore	When there is a switch to restore mode, the backup data set in the system master is deleted, read once out of the device and saved in the system master. This is done irrespective of the current upload flag.

If you want to transfer an intended adjustment of the device parameterization to the backup data set of the system master online in restore mode, first set the master port to commissioning mode. In this state, the parameterization of the IO-Link device must be adjusted, and then switched back to restore mode.

If you want to transfer an off-site parameterization carried out via the IO-Link USB master to the backup data set of the system master, the following must be done when the device is reconnected:

- if the system master is configured to backup/restore mode, the datastore upload flag must be set in the device.
- if the system master is configured to restore mode, the backup memory in the system master must still be empty (→ one-time data transfer).

6.7.6 Special features of MOVIFIT® compact with IO-Link

24 V backup mode

The IO-Link actuator supply can be used to back up the control electronics of the MOVIFIT® compact without the output stage itself being supplied with line voltage. The following restrictions apply in backup mode:

- Incomplete actual value displays of power section parameters
- No direct triggering of motor startup possible via individual parameters (IO-Link + MOVILINK®)
- No factory setting possible via ISDU index 1095/MOVILINK® index 8594

"System command" (ISDU index 0x02)*IO-Link system command 129 (0x81) = Application Reset*

With IO-Link system command 129 (0x81) = Application Reset, the following parameters/ISDU indices are set to the default value:

MOVIFIT® compact inverter variant	MOVIFIT® compact starter variant
Index 1004 Maximum speed	Index 1005 Soft start time drive 1
Index 1021 Ramp Down	Index 1006 Soft start time drive 2
Index 1045 Ramp Up	Index 1007 Braking time drive 1
Index 1023 Boost	Index 1008 Braking time drive 2
Index 1034 Maximum motor current	Index 1009 Monitoring time start phase drive 1
Index 1038 UL motor current weighting factor	Index 1010 Monitoring time start phase drive 2
Index 1040 PWM frequency	Index 1013 Current limit drive 1
Index 1066 Fixed speed 1	Index 1014 Current limit drive 2
Index 1067 Fixed speed 2	Index 1015 Boost mode drive 1
Index 1068 Fixed speed 3	Index 1016 Boost mode drive 2
Index 1069 Fixed speed 4	Index 1017 Boost voltage drive 1
Index 1114 Setpoint description PO1	Index 1018 Boost voltage drive 2
Index 1115 Setpoint description PO2	Index 1019 Boost duration drive 1
Index 1116 Setpoint description PO3	Index 1020 Boost duration drive 2
Index 1117 Actual value description PI1	Index 1021 Increased switching operation drive 1
Index 1118 Actual value description PI2	Index 1022 Increased switching operation drive 2
Index 1119 Actual value description PI3	Index 1114 Setpoint description PO1
	Index 1115 Setpoint description PO2
	Index 1116 Setpoint description PO3
	Index 1117 Actual value description PI1
	Index 1118 Actual value description PI2
	Index 1119 Actual value description PI3

Motor startup data and tag or signature parameters are retained.

If MOVIFIT® compact is enabled, the IO-Link system command 129 is blocked (error code: 0x80, additional code: 0x20, error message: Service temporarily not available).

IO-Link system command 131 (0x83) = Back-to-box

IO-Link communication is terminated and a factory setting is performed. Renewed IO-Link communication is only possible again by switching the device off/on (24 V IO-Link and line voltage). If MOVIFIT® compact is enabled, the IO-Link system command 131 is blocked (error code: 0x80, additional code: 0x20, error message: Service temporarily not available).

6.8 Parameterization with the MBBG11A operator panel

6.8.1 MBBG11A operator panel description

Function

You can start up, parameterize, and control MOVIFIT® compact devices in manual mode with the MBBG11A operator panel. In addition to that, the keypad displays important information about the state of the drive.

Features

- 7-segment display
- Setpoint adjuster/potentiometer (only for inverters in setpoint adjuster mode)
- Navigation bar for displaying the current menus and the operating mode
- 6 keys for menu guidance, executing functions, and for setting parameters
- Connection cables

Key assignment

The following illustration shows the key assignments of the MBBG11A operator panel:

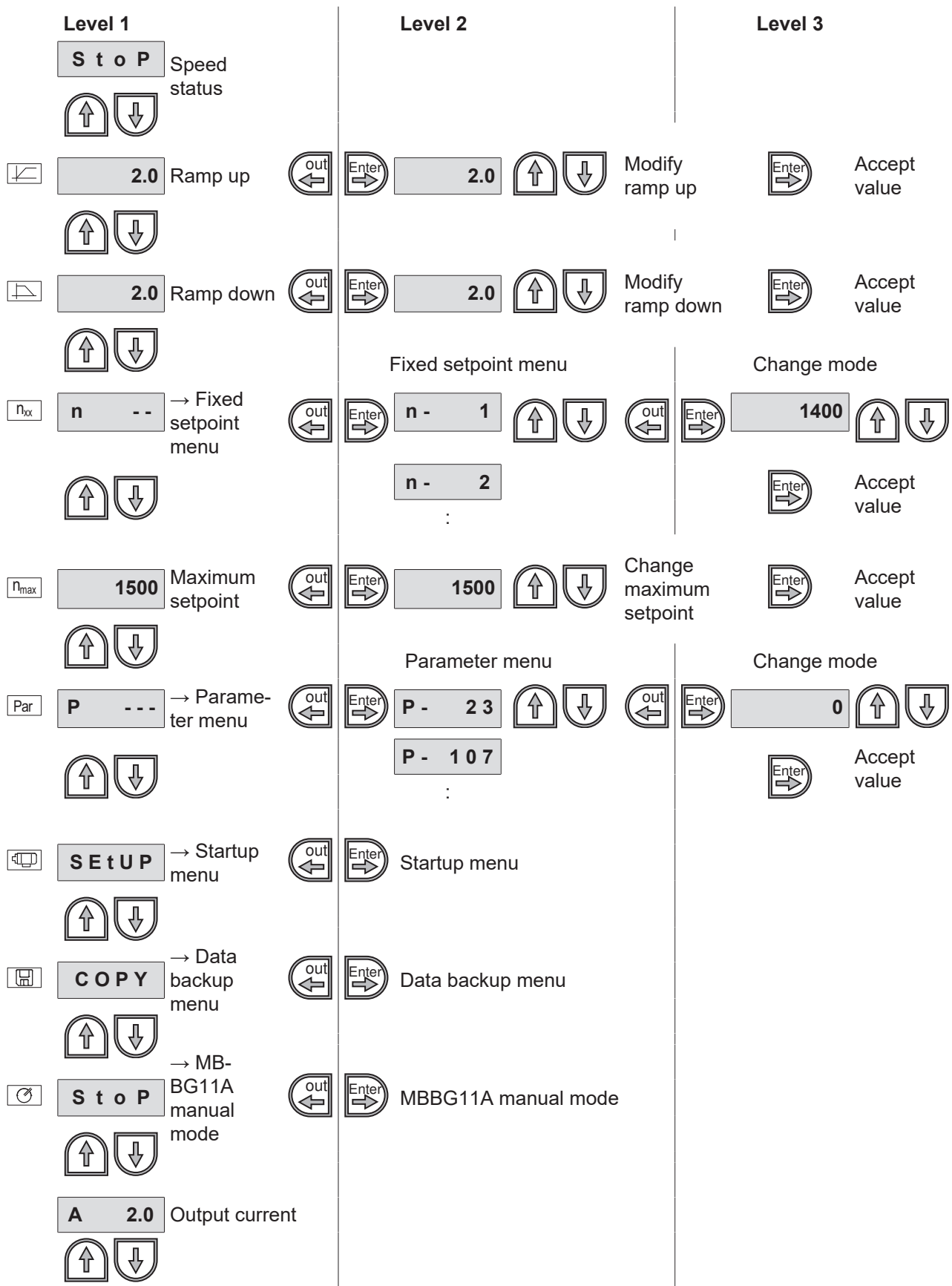


17186799371

Key  <UP>	• Select an icon • Increase value
Key  <DOWN>	• Select an icon • Decrease value
Key  <OUT>	• Deactivate icon • Exit Parameter menu
Key  <ENTER>	• Activate icon • Open parameter menu
Key  <RUN>	• Start bus/automatic mode • Enable drive in manual mode
Key  <STOP/RESET>	• Stop drive • Reset error

6.8.2 Operation

The following illustration shows the menu guidance of the MBBG11A operator panel:



Menu system

If you select an icon with the <UP> or <DOWN> button, the LED of the icon illuminates. With icons that only represent display values, the current display value appears on the 7-segment display.

Status display

If the drive is enabled, the operator panel displays the calculated actual speed.

Error display

If an error occurs, the operator panel displays the fault code flashing, e.g. "F-11", see chapter "Service" > "MOVIFIT® compact error list".

Warnings

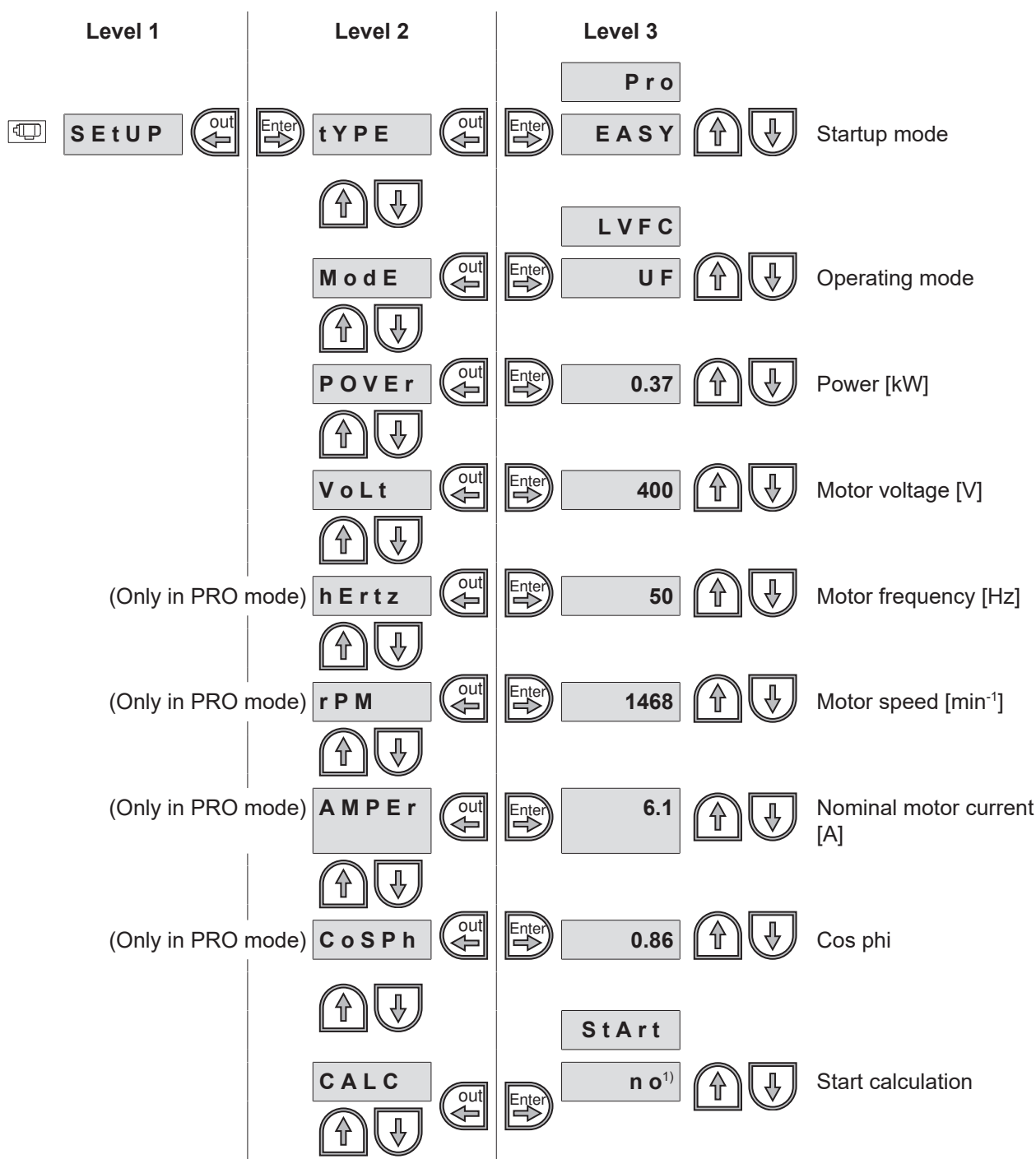
Some parameters cannot be changed in all operating statuses. If you attempt to do this anyway, the operator panel displays a warning code, e.g.: "r-32". The warning code that is displayed depends on your action. The meaning of the warning codes can be found in chapter "Operation" > "Operating displays of the MBBG11A operator panel".

6.8.3 Inverter parameterization

You can only switch to the "SETUP" menu in the operating state "No enable". The "SETUP" menu provides 2 startup modes:

- In Easy mode (display: "EASY") you can only start up 4-pole motors from SEW-EURODRIVE.
- In PRO mode (display: "Pro") you can start up third-party motors.

The following illustration shows the menu guidance for starting up in the "SETUP" menu:



1) Display after switching on = "no", display after completing startup = "donE"

Saving parameters



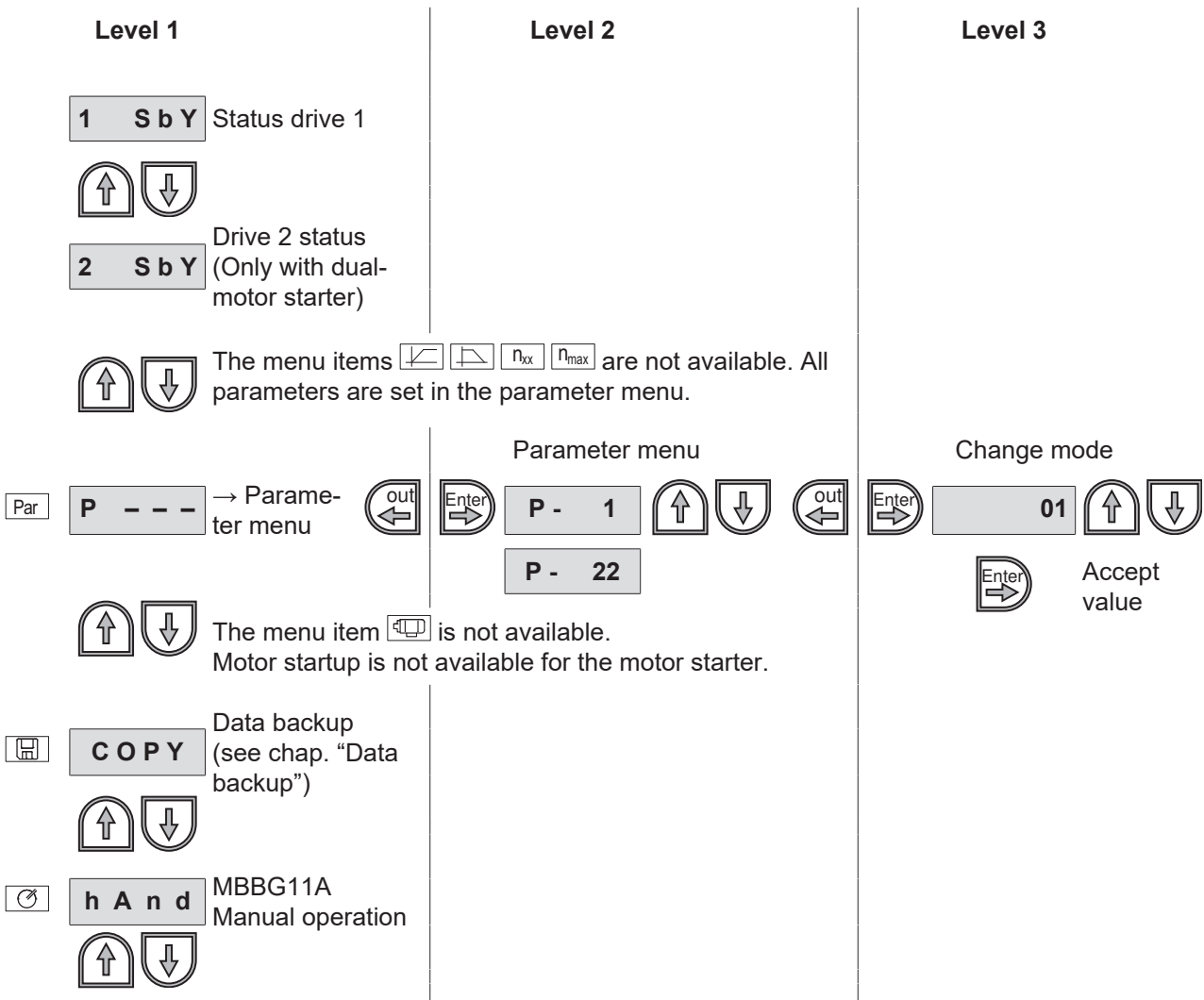
INFORMATION

Commence startup and parameter saving by setting the value in the last menu “CALC” to “StArt”.

If you exit the "SETUP" menu using the <OUT> key without completing the startup, the previously changed values will **not** be saved.

6.8.4 Motor starter parameterization

The following illustration shows the menu guidance during motor starter parameterization:



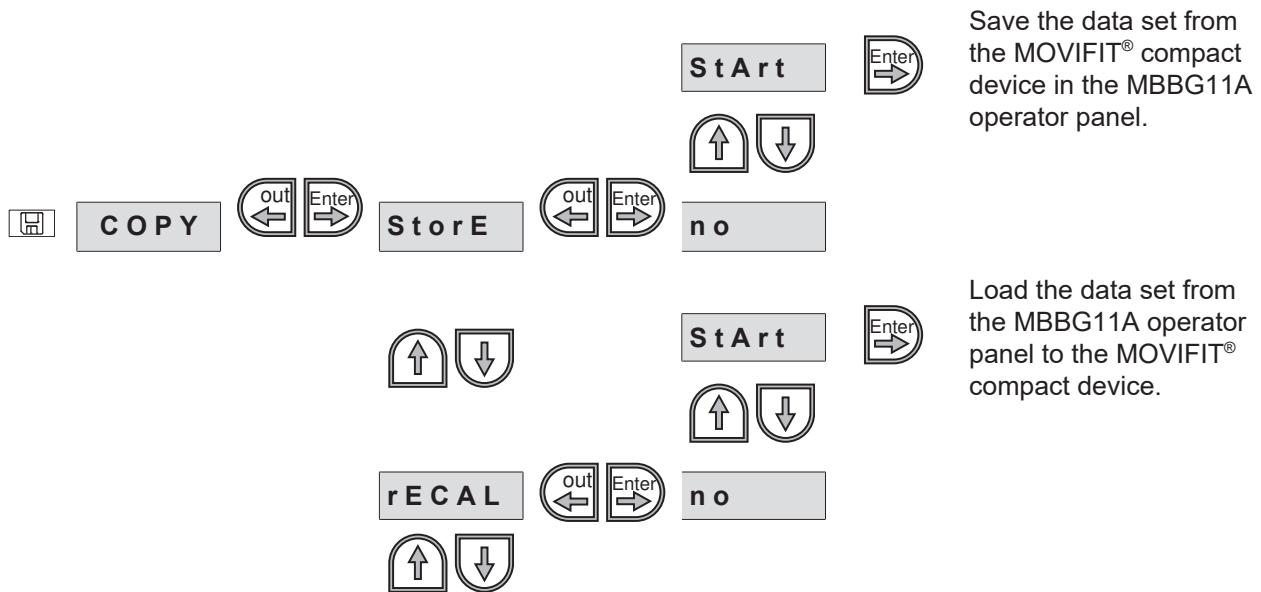
31959490/EN – 01/2024

6.8.5 Data backup

SEW-EURODRIVE recommends backing up the data set after startup. The data set can then be re-used for other MOVIFIT® compact devices with identical motors. Switch from the main menu to the data backup menu. The data backup menu provides 2 functions:

- Save the data set from the MOVIFIT® compact device in the MBBG11A operator panel (display: "StorE").
- Load the data set from the MBBG11A operator panel to the MOVIFIT® compact device (display: "rECAL").

The following illustration shows the menu guidance of the data backup menu:



Saving the data set from the MOVIFIT® compact device in the MBBG11A operator panel

Save the data set in the MBBG11A operator panel as shown in the menu guidance above. During the saving process, the MBBG11A operator panel displays "u.u."

After saving, the following appears for 1 second:

- The positive acknowledgment "donE"
- Or an error code in the form "r-xx".

Then "no" is displayed again.

If you press the <OUT> key twice, you return to the main menu.

Loading the data set from the MBBG11 operator panel to the MOVIFIT® compact device

The data set can only be loaded to the MOVIFIT® compact device in "No enable" operating state.

Load the data set to the MOVIFIT® compact as shown in the menu guidance above. During the saving process, the MBBG11A operator panel displays "d. d."

After saving, the following appears for 1 second:

- The positive acknowledgment "donE"
- Or an error code in the form "r-xx".

Then "no" is displayed again.

To enable the MOVIFIT® compact again, press the <RUN> key.

6.9 Parameterization with the PC/laptop

6.9.1 MOVITOOLS® MotionStudio

The "MOVITOOLS® MotionStudio" software package is the SEW-EURODRIVE cross-device engineering tool that you can use to access all SEW-EURODRIVE drive units. You can use MOVITOOLS® MotionStudio for startup and diagnosis of the MOVIFIT® compact.

Install the latest software version of MOVITOOLS® MotionStudio on your PC/laptop.

MOVITOOLS® MotionStudio can communicate with the drives using many different communication and field bus systems.

The following chapters describe the simplest application for connecting a PC/laptop to a MOVIFIT® inverter via the X50 diagnostic interface (point-to-point coupling).

6.9.2 First steps with MOVITOOLS® MotionStudio

Starting the software and creating a project

To start MOVITOOLS® MotionStudio and create a project, proceed as follows:

1. Start the MOVITOOLS® MotionStudio from the Windows start menu via:
[Start] > [Programs] > [SEW] > [MOVITOOLS MotionStudio] > [MOVITOOLS MotionStudio]
2. Create a project with a name and directory.

Establishing a communication and scanning the network

To establish communication with MOVITOOLS® MotionStudio and to scan your network, proceed as follows:

- ✓ There is a serial connection between your PC/laptop and the MOVIFIT® compact device via the interface adapter.

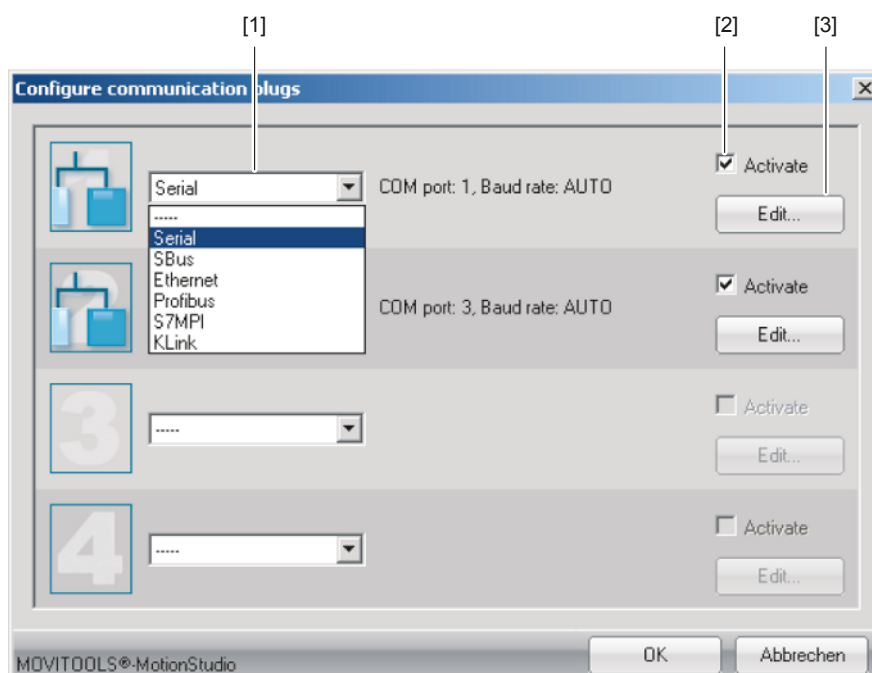
1. Click the icon [1] in the toolbar.



[1]

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⇒ The following window is displayed.



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2. Select the communication type "Serial" from the drop-down list [1].

⇒ In this example, the 1st communication channel is enabled with the communication type "Serial" [2].

3. Click the button [3].
⇒ This displays the settings for the communication type "Serial".



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4. In the "COM-Port" choice box, select the port to which the MOVIFIT® compact device is connected to the PC/laptop via the interface adapter.
5. Scan your network (device scan). To do so, click the [Start network scan] button [1] in the toolbar.



[1]

27021598896943499

6.9.3 Parameterization with MOVITOOLS® MotionStudio

Set the parameters as follows:

1. In the network of MOVITOOLS® MotionStudio, click the displayed MOVIFIT® compact device with the right mouse button.
2. Select "Startup" > "Parameter tree" in the context menu.
⇒ The parameter tree appears.
3. Double-click the required parameter group.
4. Click the input field of the parameter.
5. Enter the parameter value and confirm the entry with the <ENTER> key.

An overview of the parameters can be found in the chapters "Parameter list of the MOVIFIT® compact inverter" (→ 102) and "Parameter list for the MOVIFIT® compact motor starter" (→ 107).

6.10 Parameter list for the MOVIFIT® compact inverter

The following tables show the device-related parameters of the MOVIFIT® compact inverter:

MOVITOOLS® MotionStudio parameter no.	MBBG11A pa- rameter no. / Display	Index dec.	Sub- index dec.	Name	Range of values	Factory setting
0__		Display values				
00_		Process values				
000	Display	8318	0	Rotational speed	[min ⁻¹]	
004	-	8321	0	Output current	[%]	
008	26	8325	0	DC link voltage	[V]	
009	Display	8326	0	Output current	[A]	
01_		Status displays				
010	Display	8310	0	Inverter status	[Text]	
011	Display			Operating state	[Text]	
012	Display			Fault status	[Text]	
014	29	8327	0	Heat sink temperature	[°C]	
03_		Binary inputs				
030	90	8334	0	Status DI00	0, 1	
031				Status DI01	0, 1	
032				Status DI02	0, 1	
033				Status DI03	0, 1	
05_		Binary outputs				
-	90	8349	0	Status DO00	0, 1	
051				Status DO01	0, 1	
07_	-	Device data				
070	-	8301	0	Device type	[Text]	
-	-	-	-	Device family	[Text]	
073	-	8300	0	Front option firmware (control unit)	[Text]	
076	-	10546	27	Basic unit firmware	[Text]	
700		10546	42	Operating mode	[Text]	
-	-	8314 8315 8316 8317	0	Signature	[Text]	
-	-	8652	0	Nominal voltage	[V]	
-	-	8640	0	Nominal frequency	[Hz]	
-	-	8642	0	Nominal speed	[min ⁻¹]	

MOVITOOLS® MotionStudio parameter no.	MBBG11A parameter no. / Display	Index dec.	Sub-index dec.	Name	Range of values	Factory setting
0__		Display values				
-	-	10546	13	Nominal power	[kW]	
08_		Fault memory				
080	99	8366	0	Error code T0 ¹⁾	[Code]	
	103	9304	0	Sub-error code T0	[Code]	
	107	8883	0	Internal error T0	[Code]	
081	-	8367	0	Error code T1 ¹⁾	[Code]	
	-	9305	0	Sub-error code T1	[Code]	
	-	8884	0	Internal error T1	[Code]	
082	-	8368	0	Error code T2 ¹⁾	[Code]	
	-	9306	0	Sub-error code T2	[Code]	
	-	8885	0	Internal error T2	[Code]	
083	-	8369	0	Error code T3 ¹⁾	[Code]	
	-	9307	0	Sub-error code T3	[Code]	
	-	8886	0	Internal error T3	[Code]	

1) The MBBG11A operator panel only displays the last error. MOVITOOLS® MotionStudio displays the last 4 errors.

MOVITOOLS® MotionStudio parameter no.	MBBG11A parameter no. / Display	Index dec.	Sub-index dec.	Name	Range of values	Factory setting
1__		Setpoints/ramp generators				
13_		Speed ramps				
130		8807	0	Ramp up	0.125 – 1500 s ¹⁾	1 s
131		8808	0	Ramp down	0.125 – 1500 s ¹⁾	1 s
17_		Fixed setpoints				
170		8489	0	Fixed setpoint n1	-6000 – -15 min ⁻¹ 15 – 6000 min ⁻¹	15 min ⁻¹
171		8490	0	Fixed setpoint n2	-6000 – -15 min ⁻¹ 15 – 6000 min ⁻¹	250 min ⁻¹
172		8491	0	Fixed setpoint n3	-6000 – -15 min ⁻¹ 15 – 6000 min ⁻¹	750 min ⁻¹
173		10096	31	Fixed setpoint n4	-6000 – -15 min ⁻¹ 15 – 6000 min ⁻¹	1500 min ⁻¹

1) The ramp time relates to a setpoint jump of 1500 min⁻¹. Depending on the regenerative energy, the actual ramp time of parameter 131 (Ramp down) may be longer.

MOVITOOLS® MotionStudio parameter no.	MBBG11A pa- rameter no. / Display	Index dec.	Sub- index dec.	Name	Range of values	Factory setting
3__		Motor parameters				
30_		Limits 1				
302		8517	0	Maximum speed	15 – 6000 min ⁻¹	1500 min ⁻¹
303	34	8518	0	Current limit	0 – 150%	150%
32_		Motor adjustment 1				
323	5	8526	0	Premagnetization time 1	The premagnetization time depends on the connected motor. The premagnetization time is limited by a minimum value.	
-	23	10546	23	Boost	0 – 50 V	0 V
33_		Motor startup				
-		10546	41	Startup	EASY PRO	EASY
-		10546	13	Nominal power	90 – 3000 W	250 W
-		8652	0	Nominal voltage	20 – 700 V	230 V
-		8640	0	Nominal frequency	10 – 500 Hz	50 Hz
-		8642	0	Nominal speed	10 – 6000 min ⁻¹	1300 min ⁻¹
08		8648	0	Nominal motor current	0.1 – 300 A	1.195 A
-		8674	0	Cosine Phi	0.5 – 0.95	0.81
-		10546	43	Commence startup	Yes No	No (Complete)
700		10546	42	Operating mode	U/f LVFC	U/f
34_		Motor protection				
-	38	10546	38	UL motor current weighting factor	0 – 100	1.4
MOVITOOLS® MotionStudio parameter no.	MBBG11A pa- rameter no. / Display	Index dec.	Sub- index dec.	Name	Range of values	Factory setting
6__		Terminal assignment				
60_		Terminal configuration				
600	98	10546	98	Terminal configuration	Default mode Alternative mode (→  114)	Default mode

MOVITOOLS® MotionStudio parameter no.	MBBG11A pa- rameter no. / Display	Index dec.	Sub- index dec.	Name	Range of values	Factory setting
7__		Control functions				
70_		Operating modes				
700		10546	42	Operating mode	U/f LVFC	U/f

MOVITOOLS® MotionStudio parameter no.	MBBG11A pa- rameter no. / Display	Index dec.	Sub- index dec.	Name	Range of values	Factory setting
8__		Device functions				
80_		Setup				
802	95	8594	0	Load factory setting	Yes No	No
84_		Reset behavior				
840		8617	0	Manual reset	Yes No	No
86_		Modulation				
860	40	10546	40	PWM frequency	4 kHz 16 kHz	4 kHz
87_		Process data parameter assignment				
870		8304	0	Setpoint description PO1	9: Control word 1	9: Control word 1
871	115	8305	0	Setpoint description PO2	1: Setpoint speed 11: Setpoint speed %	11: Setpoint speed %
872	116	8306	0	Setpoint description PO3	0: No function 8: Ramp	8: Ramp
873		8307	0	Actual value description PI1	6: Status word 1	6: Status word 1
874	118	8308	0	Actual value description PI2	1: Actual speed 2: Output current 8: Actual speed %	2: Output current
875		8309	0	Actual value description PI3	7: Status word 2	7: Status word 2
88_		Serial communication SBus				
881	111	8600	0	SBus address	0 – 63	0
883	112	8602	0	SBus timeout interval	0.01 – 10 s	0.1 s
884	113	8603	0	SBus baud rate	125 kBaud 250 kBaud 500 kBaud 1 MBaud	500 kBaud

6.10.1 Description of inverter parameters

Parameter index 10546.23

Boost

Range of values: **0** – 50 V

A voltage boost when the drive is started increases the breakaway torque of the drive.

Parameter index 10546.38

UL motor current weighting factor

Range of values: 0 – **1.4** – 100

The UP motor protection function fulfills the requirements of standard UL 508C. The motor current that is used in the UL motor protection function is the product of the currently measured actual current and the adjustable parameter index *10546.38 UL motor current evaluation factor*.

Parameter 860

PWM frequency

Range of values: **4 kHz**, 16 kHz

The nominal output of the inverter that is specified in the technical data applies to the pulse width modulation frequency (PWM frequency) of 4 kHz.

The PWM frequency of 16 kHz is not possible at every operating point, and it is particularly dependent on the speed (stator frequency f_s) and the thermal capacity utilization (cooling air temperature) of the inverter.

The stator frequency f_s is an important influential factor for operation with a PWM frequency of 16 kHz. A 4-pole motor with a nominal motor voltage of 400 V and a rated motor frequency of 50 Hz in a 400 V supply system can only be operated with a PWM frequency of 16 kHz from a speed of 780 min⁻¹.

For other motor/network voltage combinations, the required stator frequency f_s from which a PWM frequency of 16 kHz is possible should be calculated using the following formula:

$$f_s = V_{\text{line}} / V_N \times f_N / 2$$

f_s	Stator frequency
V_{line}	Line voltage
V_N	Nominal motor voltage
f_N	Rated motor frequency

6.11 Parameter list for the MOVIFIT® compact motor starter

The following tables show the device-related parameters of the MOVIFIT® motor starter.

MOVITOOLS® MotionStudio parameter no.	MBBG11A / parameter no. Display	Index dec.	Sub- index dec.	Name	Range of values	Factory setting
0__		Display values				
01_		Status displays				
010	Display	8310	0	Starter status	[Text]	—
011	Display			Operating state	[Text]	—
012	Display			Fault status	[Text]	—
03_		Binary inputs				
030	90	8334	0	Status DI00	0, 1	—
031				Status DI01	0, 1	—
032				Status DI02	0, 1	—
033				Status DI03	0, 1	—
05_		Binary outputs				
—	90	8349	0	Status DO00	0, 1	—
051				Status DO01	0, 1	—
07_	—	Device data				
070	—	8301	0	Device type	[Text]	—
—	—	—	—	Device family	[Text]	
073	—	8300	0	Front option firmware (control unit)	[Text]	—
076	—	10546	27	Basic device firmware	[Text]	—
—	—	8314 8315 8316 8317	0	Signature	[Text]	
—	—	10546	201	Start mode drive 1	[Text]	—
—	—	10546	202	Start mode drive 2	[Text]	—
—	—	8648	0	Nominal motor current drive 1	[A]	—
—	—	8649	0	Nominal motor current drive 2	[A]	—
08_		Fault memory				
080	99	8366	0	Error code T0 ¹⁾	[Code]	
	103	9304	0	Sub-error code T0	[Code]	
	107	8883	0	Internal error T0	[Code]	

MOVITOOLS® MotionStudio parameter no.	MBBG11A / parameter no. Display	Index dec.	Sub- index dec.	Name	Range of values	Factory setting
0__		Display values				
081	—	8367	0	Error code T1 ¹⁾	[Code]	
	—	9305	0	Sub-error code T1	[Code]	
	—	8884	0	Internal error T1	[Code]	
082	—	8368	0	Error code T2 ¹⁾	[Code]	
	—	9306	0	Sub-error code T2	[Code]	
	—	8885	0	Internal error T2	[Code]	
083	—	8369	0	Error code T3 ¹⁾	[Code]	
	—	9307	0	Sub-error code T3	[Code]	
	—	8886	0	Internal error T3	[Code]	

1) The MBBG11A operator panel only displays the last error. MOVITOOLS® MotionStudio displays the last 4 errors.

MOVITOOLS® MotionStudio parameter no.	MBBG11A pa- rameter no.	Index dec.	Sub- index dec.	Name	Range of values	Factory setting
1__		Setpoints/ramp generators				
13_		Speed ramps				
130	5	10096	1	Soft start time drive 1	0 – 2 s	1 s
131	6	10096	2	Soft start time drive 2	0 – 2 s	1 s
—	7	10546	207	Braking time drive 1	0 – 2 s	1 s
—	8	10546	208	Braking time drive 2	0 – 2 s	1 s

MOVITOOLS® MotionStudio parameter no.	MBBG11A pa- rameter no.	Index dec.	Sub- index dec.	Name	Range of values	Factory setting
3__		Motor parameters				
30_		Limits 1				
—	13	10546	213	Current limit drive 1	100 – 500%	400%
—	14	10546	214	Current limit drive 2	100 – 500%	400%
32_		Motor adjustment 1				
—	3	8648	0	Nominal motor current drive 1	0.1 – 10 A	5 A
—	4	8649	0	Nominal motor current drive 2	0.1 – 10 A	5 A
—	11	10546	211	Starting voltage drive 1	40 – 80%	50%
—	12	10546	212	Starting voltage drive 2	40 – 80%	50%

MOVITOOLS® MotionStudio parameter no.	MBBG11A pa- rameter no.	Index dec.	Sub- index dec.	Name	Range of values	Factory setting
5__		Control functions				
50_		Start phase monitoring time				
–	9	10546	209	Starting phase monitoring time drive 1	0 – 5 s	3 s
–	10	10546	210	Starting phase monitoring time drive 2	0 – 5 s	3 s

MOVITOOLS® MotionStudio parameter no.	MBBG11A pa- rameter no.	Index dec.	Sub- index dec.	Name	Range of values	Factory setting
6__		Terminal assignment				
60_		Terminal configuration				
600	98	10546	98	Terminal configuration	Default mode Alternative mode (→ 114)	Default mode

MOVITOOLS® MotionStudio parameter no.	MBBG11A pa- rameter no.	Index dec.	Sub- index dec.	Name	Range of values	Factory setting
7__		Control functions				
70_		Operating modes				
–	1	10546	201	Start mode drive 1	0: Voltage limiting 1: Current limiting	0: Voltage limiting
–	2	10546	202	Start mode drive 2	0: Voltage limiting 1: Current limiting	0: Voltage limiting
–	21	10546	221	Increased switching operation drive 1	Off On	Off
–	22	10546	222	Increased switching operation drive 2	Off On	Off
–	15	10546	215	Boost mode drive 1	Off On	Off
–	16	10546	216	Boost mode drive 2	Off On	Off
–	17	10546	217	Boost voltage drive 1	60 – 100%	80%
–	18	10546	218	Boost voltage drive 2	60 – 100%	80%
–	19	10546	219	Boost duration drive 1	0.1 – 2 s	0.5 s
–	20	10546	220	Boost duration drive 2	0.1 – 2 s	0.5 s

MOVITOOLS® MotionStudio parameter no.	MBBG11A/ parameter no. Display	Index dec.	Sub- index dec.	Name	Range of values	Factory setting
8__		Device functions				
80_		Setup				
802	95	8594	0	Load factory setting	Yes No	No
84_		Reset behavior				
840	22	8617	0	Manual reset	Yes No	No
87_		Process data parameter assignment				
870		8304	0	Setpoint description PO1	14: Control word SC	14: Control word SC
871		8305	0	Setpoint description PO2	0: No function	0: No function
872		8306	0	Setpoint description PO3	0: No function	0: No function
873		8307	0	Actual value description PI1	14: Status word drive 1	14: Status word drive 1
874		8308	0	Actual value description PI2	14: Status word drive 2	14: Status word drive 2
875		8309	0	Actual value description PI3	0: No function	0: No function
88_		Serial communication SBus				
881	111	8600	0	SBus address	0 – 63	0
883	112	8602	0	SBus timeout interval	0.01 – 10 s	0.1 s
884	113	8603	0	SBus baud rate	125 kBaud 250 kBaud 500 kBaud 1 MBaud	500 kBaud

6.11.1 Description of motor starter parameters

Parameter 130/131

Soft start time, drive 1/2

Range of values: 0 – 1 – 2 s

This parameter defines the soft start time for limiting the starting current.

Observe the following restrictions:

<i>P130 = 0</i> <i>P131 = 0</i>	<i>P130 > 0</i> <i>P131 > 0</i>		
	Brake BE05 – BE2	Brake BE5	Brake BE11
No limitation	No limitation	Max. braking torque = 28 Nm	Motor with brake BE11 is not permissible.

Parameter index 10546.207/10546.208

Braking time, drive 1/2

Range of values: 0 – 1 – 2 s

This parameter defines the braking time of drive 1/2.

When you cancel the enable, the motor starter reduces the motor voltage along a ramp within the set braking time.

Observe the following restrictions:

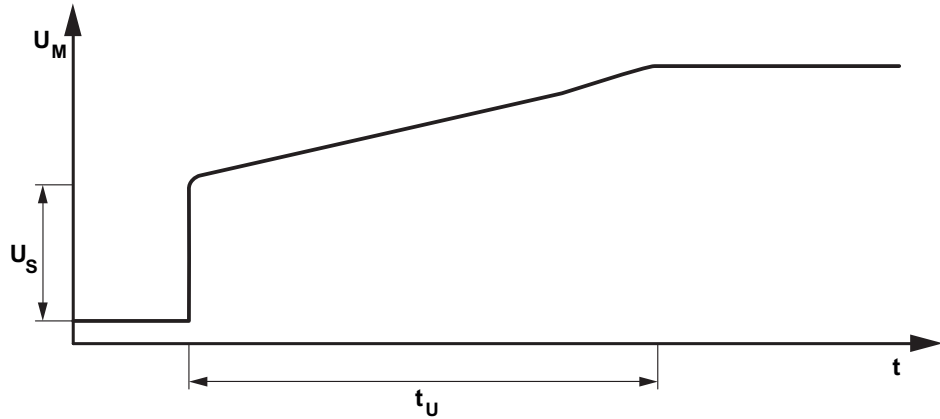
<i>P10546.207 = 0</i> <i>P10546.208 = 0</i>	<i>P10546.207 > 0</i> <i>P10546.208 > 0</i>		
	Brake BE05 – BE2	Brake BE5	Brake BE11
No limitation	No limitation	Max. braking torque = 28 Nm	Motor with brake BE11 is not permissible.

Parameter index 10546.211/10546.212

Drive 1/2 starting voltage

Range of values: 40 – **50** – 80% of nominal motor voltage

If the output is insufficient to start the motor with the preset values, increase the starting voltage U_s of the drive (P10546.211/P10546.212). For example, this may be required for motors or applications with a large mass moment of inertia.



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- U_M Motor voltage
- U_s Starting voltage
- t_U Soft start time

Parameter index 10546.221/10546.222

Increased switching operation drive 1/2

Range of values: **Off**, On

If the *Increased switching operation* parameter index is active, the bypass relays are no longer used.

INFORMATION

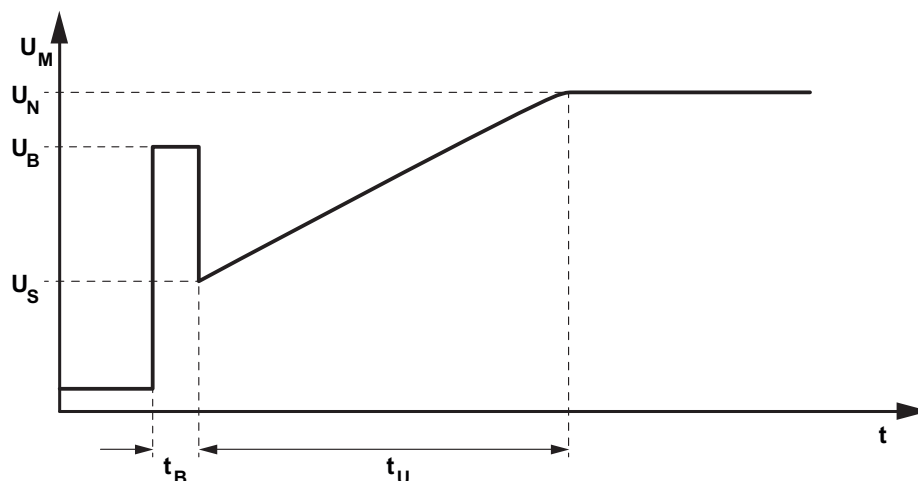
If the *Increased switching operation* parameter index is active, greater thermal losses occur in the unit.

Parameter index 10546.215/10546.216**Boost mode, drive 1/2**

Range of values: **Off**, on

Boost mode can be activated if an increased breakaway torque is required.

If boost mode is activated, the motor is activated with the boost voltage U_B after enabling before the soft start begins. After the boost time t_B has elapsed, the soft start phase commences with the parameterized starting voltage U_S .



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U_M	Motor voltage
U_N	Nominal motor voltage
U_B	Boost voltage
U_S	Starting voltage
t_B	Boost duration
t_U	Soft start time

Parameter index 10546.217/10546.218**Boost voltage, drive 1/2**

Range of values: 60 – **80** – 100% of nominal motor voltage

The boost voltage U_B is the motor voltage increase during the boost time t_B .

Parameter index 10546.219/10546.220**Boost duration drive 1/2**

Range of values: 0.1 – **0.5** – 2 s

The boost duration t_B is the time for which the boost voltage is active.

6.12 Functions of the MOVIFIT® compact with AS-Interface

6.12.1 AS-Interface master → MOVIFIT® compact data transmission

MOVIFIT® compact inverter

The following table shows the 4 data bits that the AS-Interface master transmits to the MOVIFIT® compact inverter and the functions of the drive:

AS-Interface bit				Function
DO03	DO02	DO01	DO00	MOVIFIT® compact inverter
X	X	0	0	Stop
X	X	0	1	Enable CW rotation
X	X	1	0	Enable CCW rotation
X	X	1	1	Stop/reset
0	0	X	X	Setpoint speed = n1
0	1	X	X	Setpoint speed = n2
1	0	X	X	Setpoint speed = n3
1	1	X	X	Setpoint speed = n4

MOVIFIT® compact reversing and dual-motor starter (default mode, $P-600 = 0$)

The following table shows the 3 data bits that the AS-Interface master transmits to the MOVIFIT® compact motor starter and the functions of the drive:

AS-Interface bit ¹⁾			Function	
DO02	DO01	DO00	MOVIFIT® compact reversing starter	MOVIFIT® compact dual-motor starter
0	0	0	Stop	Stop
0	0	1	Enable CW rotation	Enable signal motor 1 at connect X9
0	1	0	Enable CCW rotation	Enable signal motor 2 at connect X8
0	1	1	Stop	Enable signal for motors at X9 + X8
1	X	X	Reset	Reset

MOVIFIT® compact reversing starter (alternative mode, $P-600 = 1$)

The following table shows the 3 data bits that the AS-Interface master transmits to the MOVIFIT® compact reversing starter and the functions of the drive:

AS-Interface bit ¹⁾			Function
DO02	DO01	DO00	MOVIFIT® compact reversing starter
X	0	0	Stop
X	0	1	Enable CW rotation
X	1	0	Enable CCW rotation
X	1	1	Reset

X = any status

1) DO03 is not used with the motor starter and should be = 0 for compatibility reasons.

6.12.2 MOVIFIT® compact → AS-Interface master data transmission (default mode, $P-600 = 0$)

The following table shows the 4 data bits that the MOVIFIT® compact transmits back to the AS-Interface master:

AS-Interface bit				Meaning
DI03	DI02	DI01	DI00	
X	X	X	1 / 0	Ready signal 0: The MOVIFIT® compact drive is not operational. 1: The MOVIFIT® compact drive is operational.
X	X	1 / 0	X	Manual mode 0: MOVIFIT® compact controller via AS-Interface 1: MOVIFIT® compact controller via manual operation
X	1 / 0	X	X	Sensor input 2 0: The signal of sensor 2 = "0" 1: The signal of sensor 2 = "1"
1 / 0	X	X	X	Sensor input 3 0: The signal of sensor 3 = "0" 1: The signal of sensor 3 = "1"

X = any status

6.12.3 MOVIFIT® compact → AS-Interface master data transmission (alternative mode, $P-600 = 1$)

The following table shows the 4 data bits that the MOVIFIT® compact transmits back to the AS-Interface master:

AS-Interface bit				Meaning
DI03	DI02	DI01	DI00	
X	X	X	1 / 0	Manual mode 0: MOVIFIT® compact controller via manual operation 1: MOVIFIT® compact controller via control signals
X	X	1 / 0	X	Ready signal 0: The MOVIFIT® compact drive is not operational. 1: The MOVIFIT® compact drive is operational.
X	1 / 0	X	X	Sensor input 2 0: The signal of sensor 2 = "0" 1: The signal of sensor 2 = "1"
1 / 0	X	X	X	Sensor input 3 0: The signal of sensor 3 = "0" 1: The signal of sensor 3 = "1"

X = any status

6.13 Functions of the MOVIFIT® compact with binary control

6.13.1 PLC → MOVIFIT® compact data transmission

MOVIFIT® compact inverter

The following table shows the control signals that the higher-level controller transmits to the MOVIFIT® compact inverter and the functions of the drive:

Control signals				Function
DI03	DI02	DI01	DI00	MOVIFIT® compact inverter
X	X	0	0	Stop
X	X	0	1	Enable CW rotation
X	X	1	0	Enable CCW rotation
X	X	1	1	Stop/reset
0	0	X	X	Setpoint speed = n1
0	1	X	X	Setpoint speed = n2
1	0	X	X	Setpoint speed = n3
1	1	X	X	Setpoint speed = n4

MOVIFIT® compact reversing and dual-motor starter (default mode, $P-600 = 0$)

The following table shows the control signals that the higher-level controller transmits to the MOVIFIT® compact motor starter and the functions of the drive:

Control signals			Function	
DI02	DI01	DI00	MOVIFIT® compact reversing starter	MOVIFIT® compact dual-motor starter
0	0	0	Stop	Stop
0	0	1	Enable CW rotation	Enable signal motor 1 at connect. X9
0	1	0	Enable CCW rotation	Enable signal motor 2 at connect. X8
0	1	1	Stop	Enable signal motors at X9 + X8
1	X	X	Reset	Reset

MOVIFIT® compact reversing starter (alternative mode, $P-600 = 1$)

The following table shows the control signals that the higher-level controller transmits to the MOVIFIT® compact reversing starter **in alternative mode** ($P-600 = 1$) and the functions of the drive:

Control signals			Function
DI02	DI01	DI00	MOVIFIT® compact reversing starter
X	0	0	Stop
X	0	1	Enable CW rotation
X	1	0	Enable CCW rotation
X	1	1	Reset

X = any status

6.13.2 MOVIFIT® compact → PLC data transmission (default mode, $P-600 = 0$)

The following table shows the binary signals that the MOVIFIT® compact transmits back to the higher-level controller (e.g. PLC):

Binary signals		Meaning
DO01	DO00	
X	1 / 0	Ready signal 0: The MOVIFIT® compact drive is not operational. 1: The MOVIFIT® compact drive is operational.
1 / 0	X	Manual mode 0: MOVIFIT® compact controller via control signals 1: MOVIFIT® compact controller via manual operation

X = any status

6.13.3 MOVIFIT® compact → PLC data transmission (alternative mode, $P-600 = 1$)

The following table shows the binary signals that the MOVIFIT® compact transmits back to the higher-level controller (e.g. PLC) **in alternative mode** ($P-600 = 1$):

Binary signals		Meaning
DO01	DO00	
X	1 / 0	Manual mode 0: MOVIFIT® compact controller via manual operation 1: MOVIFIT® compact controller via control signals
1 / 0	X	Ready signal 0: The MOVIFIT® compact drive is not operational. 1: The MOVIFIT® compact drive is operational.

X = any status

6.14 Functions of the MOVIFIT® compact with SBus

6.14.1 SBus process data assignment

Inverter process data words

The MOVIFIT® compact inverter only supports 3 process data words on the SBus. You can reconfigure individual process data assignments using parameters.

The following table shows the standard assignment of the MOVIFIT® compact inverter:

Process output data from the master		Process input data to the master	
PO	Function	PI	Function
PO1	Control word	PI1	Status word 1
PO2	Setpoint speed	PI2	Output current
PO3	Ramp	PI3	Status word 2

Motor starter process data words

The MOVIFIT® compact motor starter only supports 3 process data words on the SBus. You cannot reconfigure the process data assignments.

The following table shows the assignment of the MOVIFIT® compact motor starter:

Process output data from the master		Process input data to the master	
PO	Function	PI	Function
PO1	Control word	PI1	Status word drive 1
PO2	No function	PI2	Status word drive 2
PO3	No function	PI3	No function

6.14.2 Process data between a MOVIFIT® compact inverter and MOVIFIT® SC/FC

PO1: MOVIFIT® compact inverter control word

The MOVIFIT® compact inverter is controlled via the control word.

The control word of the MOVIFIT® compact inverter is defined as follows:

PO1: MOVIFIT® compact inverter control word		
Bit	Meaning	Coding and function
0 – 2	Enable/stop	0x6 = enable otherwise not enabled, stop along ramp
3 – 5	–	Reserved = 0
6	Fault reset	If there is a fault in the inverter power section, a fault reset is requested by changing this bit from 0 to 1.
7 – 15	–	Reserved = 0

PO2: Setpoint speed coding

- If parameter *P871 set value description PO2* = 11 "Setpoint speed %", process data word PO2 transmits the setpoint speed in %.

The setpoint speed is based on the maximum speed provided in parameter *P302*, Index 8517.

In Easy mode, the maximum speed is factory set to 1500 min⁻¹ as a default.

Coding: $C000_{\text{hex}} = -100\%$ (counterclockwise rotation)

$4000_{\text{hex}} = +100\%$ (clockwise rotation)

1 digit = 0.0061%

Example: 80% n_{max} , counterclockwise direction of rotation

Calculation: $-\frac{80\%}{0.0061} = -13115_{\text{dec}} = \text{CCC5}_{\text{hex}}$

- If parameter *P871 set value description PO2* = 1 "Setpoint speed", process data word PO2 transmits the setpoint speed in min⁻¹.

Coding: 1 digit = 0.2 min⁻¹.

PO3: Coding of the ramp

The process data word PO3 transmits the current integrator ramp (acceleration/deceleration).

The transferred time value refers to a change in speed of 1500 min⁻¹.

Presetting the ramp via process data will deactivate parameters *P130* and *P131*.

Coding: 1 digit = 1 ms

Range: 100 ms – 65 s

Example: 2.0 s = 2000 ms = $2000_{\text{dec}} = 07D0_{\text{hex}}$

PI1: MOVIFIT® compact inverter status word 1

Status word 1 transmits the unit status and, in case of a fault, the fault number.

Status word 1 of the MOVIFIT® compact inverter is defined as follows:

PI1: MOVIFIT® compact inverter status word 1		
Bit	Meaning	Coding and function
0	Output stage enabled	0 = Output stage blocked. 1 = Output stage enabled.
1	Inverter ready	0 = Inverter is not ready for operation. 1 = Inverter is ready for operation.
2	PO data enabled	0 = Process data is blocked. The drive cannot be controlled via SBus. 1 = Process data is enabled. The drive can be controlled via SBus.
3 – 4	–	Reserved = 0
5	Failure	0 = No failure present. 1 = Failure present.
6 – 7	–	Reserved = 0
8 – 15	If no failure is present (bit 5 = 0): Status display of the inverter power section	2 = Not enabled 4 = Enable 18 = Manual mode active. 21 = Inverter not ready.
	If a failure is present (bit 5 = 1): Error number display	Error number

PI2: Output current coding, actual speed

- If parameter *P874 Actual value description PI2* = 2 "Output current" (factory setting), process data word PI2 transmits the output current in %.

The output current is based on the nominal motor current I_N

Coding: 1 digit = 0.1%

Range: Signed 16 bit integer

Example: $0320_{\text{hex}} = 800 \times 0.1\% I_N = 80\% I_N$

- If parameter *P874 Actual value description PI2* = 1 "Actual speed", process data word PI2 transmits the actual speed in min^{-1} .

Coding: 1 digit = 0.2 min^{-1}

- If parameter *P874 Actual value description PI2* = 8 "Actual speed %", process data word PI2 transmits the actual speed in %.

The actual speed is based on the maximum speed provided in parameter *P302*, Index 8517.

Coding: 1 digit = 0.0061%

Range: $0\text{xFFF} - 0\text{xC000} \triangleq 0 - 100\% n_{\text{max}}$ (Index 8517.0)

$0\text{x0000} - 0\text{x4000} \triangleq 0 - 100\% n_{\text{max}}$ (Index 8517.0)

PI3: MOVIFIT® compact inverter status word 2

Status word 2 of the MOVIFIT® compact inverter is defined as follows:

PI3: MOVIFIT® compact inverter status word 2		
Bit	Meaning	Coding and function
0	Output stage enabled	0 = Output stage blocked. 1 = Output stage enabled.
1	Inverter ready	0 = Inverter is not ready for operation. 1 = Inverter is ready for operation.
2	PO data enabled	0 = Process data is blocked. The inverter has been blocked on the operator panel. 1 = Process data is enabled.
3 – 4	–	Reserved = 0
5	Failure	0 = No failure present. 1 = Failure present.
6 – 7	–	Reserved = 0
8	DC 24 V output	0 = DC-24 V output is not switched. 1 = DC-24 V output is switched.
9	Binary input DI02	0 = Binary input DI02 is not set. 1 = Binary input DI02 is set.
10	Binary input DI03	0 = Binary input DI03 is not set. 1 = Binary input DI03 is set.
11 – 15	–	Reserved = 0

6.14.3 Process data between a MOVIFIT® compact motor starter and MOVIFIT® SC/FC

PO1: MOVIFIT® compact motor starter control word

- With the MOVIFIT® compact reversing starter, the control word transmits the control bits for the single-motor operation with direction of rotation switching.
- With the MOVIFIT® compact dual-motor starter, the control word transmits the control bits for the dual-motor operation, each with a direction of rotation.

The control word of the MOVIFIT® compact motor starter is defined as follows:

PO1: MOVIFIT® compact motor starter control word		
Bit	Meaning	Coding and function
0	Enable/stop drive 1	0 = Block drive 1. 1 = Enable drive 1.
1	Enable/stop drive 2	For the reversing starter: Reserved = 0 For the dual-motor starter: 0 = Block drive 2. 1 = Enable drive 2.
2	CW/CCW rotation	For the reversing starter: 0 = CW direction of rotation 1 = CCW direction of rotation For the dual-motor starter: Reserved = 0
3 – 5	–	Reserved = 0
6	Fault reset	If there is a device fault, the fault can be reset by changing this bit from 0 to 1.
7 – 15	–	Reserved = 0

PI1/2: MOVIFIT® compact motor starter status word drive 1/2

- With the reversing starter, the status word PI1 is transmitted for drive 1.
- With the dual-motor starter, a separate status word is transmitted for each drive.
 - The status word PI1 transmits the status for drive 1.
 - The status word PI2 transmits the status for drive 2.

With the reversing starter, the status notification for drive 2 is always "Drive blocked", "Drive not ready".

PI1: Status word
for drive 1

The status word PI1 for drive 1 of the MOVIFIT® compact reversing and dual-motor starter is defined as follows:

PI1: MOVIFIT® compact reversing and dual-motor starter status word drive 1		
Bit	Meaning	Coding and function
0	Drive 1 enabled	0 = Drive 1 is blocked. 1 = Drive 1 is enabled.
1	Drive 1 ready for operation	0 = Drive 1 is not ready. 1 = Drive 1 is ready.
2	PO data enabled	0 = Process data is blocked. Drive 1 cannot be controlled via fieldbus. 1 = Process data is enabled. Drive 1 can be controlled via fieldbus.
3	Binary input DI02	0 = Binary input DI02 is not set. 1 = Binary input DI02 is set.
4	Binary input DI03	0 = Binary input DI03 is not set. 1 = Binary input DI03 is set.
5	Failure	0 = No failure present. 1 = Failure present.
6 – 7	–	Reserved = 0
8 – 15	If no failure is present (bit 5 = 0): Status display of drive 1	2 = Drive 1 is blocked. 4 = Drive 1 is enabled. 18 = Manual mode via operator panel active. 21 = Starter is not ready.
	If a failure is present (bit 5 = 1): Error number display	Error number

PI2: Status word
for drive 2
(only for dual-motor
starter)

The status word PI2 for drive 2 of the MOVIFIT® compact dual-motor starter is defined as follows:

PI2: MOVIFIT® compact dual-motor starter status word drive 2		
Bit	Meaning	Coding and function
0	Drive 2 enabled	0 = Drive 2 is blocked. 1 = Drive 2 is enabled.
1	Drive 2 ready for operation	0 = Drive 2 is not ready. 1 = Drive 2 is ready.
2	PO data enabled	0 = Process data is blocked. Drive 2 cannot be controlled via fieldbus. 1 = Process data is enabled. Drive 2 can be controlled via fieldbus.
3	Binary input DI02	0 = Binary input DI02 is not set. 1 = Binary input DI02 is set.
4	Binary input DI03	0 = Binary input DI03 is not set. 1 = Binary input DI03 is set.
5	Failure	1 = Failure present. 0 = No failure present.
6 – 7	–	Reserved = 0
8 – 15	If no failure is present (bit 5 = 0): Status display of drive 2	2 = Drive 2 is blocked. 4 = Drive 2 is enabled. 18 = Manual mode via operator panel active. 21 = Starter is not ready.
	If a failure is present (bit 5 = 1): Error number display	Error number

6.15 Functions of the MOVIFIT® compact with IO-Link

6.15.1 Process data assignment IO-Link

Process data P_3Words

Process output data PO_Out3Words

Bit length: 48

Data type: 48-bit record

Subindex	Bit offset	Data type	Name
1	32	16-bit UInteger	PO1
2	16	16-bit integer	PO2
3	0	16-bit UInteger	PO3

Octet	0	1	2	3	4	5
Bit offset	47 – 40	39 – 32	31 – 24	23 – 16	15 – 8	7 – 0
Subindex	1	1	2	2	3	3
Element bit	15 – 8	7 – 0	15 – 8	7 – 0	15 – 8	7 – 0

Process input data PI_In3Words

Bit length: 48

Data type: 48-bit record

Subindex	Bit offset	Data type	Name
1	32	16-bit UInteger	PI1
2	16	16-bit integer	PI2
3	0	16-bit UInteger	PI3

Octet	0	1	2	3	4	5
Bit offset	47 – 40	39 – 32	31 – 24	23 – 16	15 – 8	7 – 0
Subindex	1	1	2	2	3	3
Element bit	15 – 8	7 – 0	15 – 8	7 – 0	15 – 8	7 – 0

Inverter process data words

The MOVIFIT® compact inverter supports 3 process data words with IO-Link. You can reconfigure individual process data assignments using parameters.

The following table shows the default assignment of the MOVIFIT® compact inverter:

Process output data from the master		Process input data to the master	
PO	Function	PI	Function
PO1	Control word	PI1	Status word 1
PO2	Setpoint speed	PI2	Output current
PO3	Ramp	PI3	Status word 2

Motor starter process data words

The MOVIFIT® compact motor starter supports 3 process data words with IO-Link. The process data assignments cannot be reconfigured.

The following table shows the default assignment of the MOVIFIT® compact motor starter:

Process output data from the master		Process input data to the master	
PO	Function	PI	Function
PO1	Control word	PI1	Status word drive 1
PO2	No function	PI2	Status word drive 2
PO3	No function	PI3	No function

6.15.2 Process data between a MOVIFIT® compact inverter and IO-Link master

PO1: MOVIFIT® compact inverter control word

The MOVIFIT® compact inverter is controlled via the control word.

The control word of the MOVIFIT® compact inverter is defined as follows:

PO1: MOVIFIT® compact inverter control word		
Bit	Meaning	Coding and function
0 – 2	Enable/stop	0x6 = enable otherwise not enabled, stop along ramp
3 – 5	–	Reserved = 0
6	Fault reset	If there is a fault in the inverter power section, a fault reset is requested by changing this bit from 0 to 1.
7 – 15	–	Reserved = 0

PO2: Setpoint speed coding

- If parameter *P871 set value description PO2* = 11 "Setpoint speed %", process data word PO2 transmits the setpoint speed in %.

The setpoint speed is based on the maximum speed provided in parameter *P302*, Index 8517.

In Easy mode, the maximum speed is factory set to 1500 min⁻¹ as a default.

Coding: C000_{hex} = -100% (counterclockwise rotation)

4000_{hex} = +100% (clockwise rotation)

1 digit = 0.0061%

Example: 80% n_{max}, counterclockwise direction of rotation

Calculation: $-\frac{80\%}{0.0061} = -13115_{dec} = CCC5_{hex}$

- If parameter *P871 set value description PO2* = 1 "Setpoint speed", process data word PO2 transmits the setpoint speed in min⁻¹.

Coding: 1 digit = 0.2 min⁻¹.

PO3: Coding of the ramp

The process data word PO3 transmits the current integrator ramp (acceleration/deceleration).

The transferred time value refers to a change in speed of 1500 min^{-1} .

Presetting the ramp via process data will deactivate parameters *P130* and *P131*.

Coding: 1 digit = 1 ms

Range: 100 ms – 65 s

Example: $2.0 \text{ s} = 2000 \text{ ms} = 2000_{\text{dec}} = 07D0_{\text{hex}}$

PI1: MOVIFIT® compact inverter status word 1

Status word 1 transmits the unit status and, in case of a fault, the fault number.

Status word 1 of the MOVIFIT® compact inverter is defined as follows:

PI1: MOVIFIT® compact inverter status word 1		
Bit	Meaning	Coding and function
0	Output stage enabled	0 = Output stage blocked. 1 = Output stage enabled.
1	Inverter ready	0 = Inverter is not ready for operation. 1 = Inverter is ready for operation.
2	PO data enabled	0 = Process data is blocked. The drive cannot be controlled via SBus. 1 = Process data is enabled. The drive can be controlled via SBus.
3 – 4	–	Reserved = 0
5	Failure	0 = No failure present. 1 = Failure present.
6 – 7	–	Reserved = 0
8 – 15	If no failure is present (bit 5 = 0): Status display of the inverter power section	2 = Not enabled 4 = Enable 18 = Manual mode active. 21 = Inverter not ready.
	If a failure is present (bit 5 = 1): Error number display	Error number

PI2: Output current coding, actual speed

- If parameter *P874 Actual value description PI2* = 2 "Output current" (factory setting), process data word PI2 transmits the output current in %.

The output current is based on the nominal motor current I_N

Coding: 1 digit = 0.1%

Range: Signed 16 bit integer

Example: $0320_{\text{hex}} = 800 \times 0.1\% I_N = 80\% I_N$

- If parameter *P874 Actual value description PI2* = 1 "Actual speed", process data word PI2 transmits the actual speed in min^{-1} .

Coding: 1 digit = 0.2 min^{-1}

- If parameter *P874 Actual value description PI2* = 8 "Actual speed %", process data word PI2 transmits the actual speed in %.

The actual speed is based on the maximum speed provided in parameter *P302*, Index 8517.

Coding: 1 digit = 0.0061%

Range: $0\text{xFFF} - 0\text{xC000} \triangleq 0 - 100\% n_{\text{max}}$ (Index 8517.0)

$0\text{x0000} - 0\text{x4000} \triangleq 0 - 100\% n_{\text{max}}$ (Index 8517.0)

PI3: MOVIFIT® compact inverter status word 2

Status word 2 of the MOVIFIT® compact inverter is defined as follows:

PI3: MOVIFIT® compact inverter status word 2		
Bit	Meaning	Coding and function
0	Output stage enabled	0 = Output stage blocked. 1 = Output stage enabled.
1	Inverter ready for operation	0 = Inverter is not ready for operation. 1 = Inverter is ready for operation.
2	PO data enabled	0 = Process data is blocked. The inverter has been blocked on the operator panel. 1 = Process data is enabled.
3 – 4	–	Reserved = 0
5	Failure	0 = No failure present. 1 = Failure present.
6 – 7	–	Reserved = 0
8	DC 24 V output	0 = DC 24 V output is not switched. 1 = DC 24 V output is switched.
9	Binary input DI02	0 = Binary input DI02 is not set. 1 = Binary input DI02 is set.
10	Binary input DI03	0 = Binary input DI03 is not set. 1 = Binary input DI03 is set.
11	Binary input DI00	0 = Binary input DI00 is not set. 1 = Binary input DI00 is set.
12	Binary input DI01	0 = Binary input DI01 is not set. 1 = Binary input DI01 is set.
13 – 15	–	Reserved = 0

6.15.3 Process data between a MOVIFIT® compact motor starter and IO-Link master**PO1: MOVIFIT® compact motor starter control word**

- With the MOVIFIT® compact reversing starter, the control word transmits the control bits for the single-motor operation with direction of rotation switching.
- With the MOVIFIT® compact dual-motor starter, the control word transmits the control bits for the dual-motor operation, each with a direction of rotation.

The control word of the MOVIFIT® compact motor starter is defined as follows:

PO1: MOVIFIT® compact motor starter control word		
Bit	Meaning	Coding and function
0	Enable/stop drive 1	0 = Block drive 1. 1 = Enable drive 1.
1	Enable/stop drive 2	For the reversing starter: Reserved = 0 For the dual-motor starter: 0 = Block drive 2. 1 = Enable drive 2.
2	CW/CCW rotation	For the reversing starter: 0 = CW direction of rotation 1 = CCW direction of rotation For the dual-motor starter: Reserved = 0
3 – 5	–	Reserved = 0
6	Fault reset	If there is a device fault, the fault can be reset by changing this bit from 0 to 1.
7 – 15	–	Reserved = 0

PI1/2: MOVIFIT® compact motor starter status word drive 1/2

- With the reversing starter, the status word PI1 is transmitted for drive 1.
- With the dual-motor starter, a separate status word is transmitted for each drive.
 - The status word PI1 transmits the status for drive 1.
 - The status word PI2 transmits the status for drive 2.

With the reversing starter, the status notification for drive 2 is always "Drive blocked", "Drive not ready".

PI1: Status word
for drive 1

The status word PI1 for drive 1 of the MOVIFIT® compact reversing and dual-motor starter is defined as follows:

PI1: MOVIFIT® compact reversing and dual-motor starter status word drive 1		
Bit	Meaning	Coding and function
0	Drive 1 enabled	0 = Drive 1 is blocked. 1 = Drive 1 is enabled.
1	Drive 1 ready for operation	0 = Drive 1 is not ready. 1 = Drive 1 is ready.
2	PO data enabled	0 = Process data is blocked. Drive 1 cannot be controlled via fieldbus. 1 = Process data is enabled. Drive 1 can be controlled via fieldbus.
3	Binary input DI02	0 = Binary input DI02 is not set. 1 = Binary input DI02 is set.
4	Binary input DI03	0 = Binary input DI03 is not set. 1 = Binary input DI03 is set.
5	Failure	0 = No failure present. 1 = Failure present.
6	Binary input DI00	0 = Binary input DI00 is not set. 1 = Binary input DI00 is set.
7	Binary input DI01	0 = Binary input DI01 is not set. 1 = Binary input DI01 is set.
8 – 15	If no failure is present (bit 5 = 0): Status display of drive 1	2 = Drive 1 is blocked. 4 = Drive 1 is enabled. 18 = Manual mode via operator panel active. 21 = Starter is not ready.
	If a failure is present (bit 5 = 1): Error number display	Error number

PI2: Status word
for drive 2
(only for dual-motor
starter)

The status word PI2 for drive 2 of the MOVIFIT® compact dual-motor starter is defined as follows:

PI2: MOVIFIT® compact dual-motor starter status word drive 2		
Bit	Meaning	Coding and function
0	Drive 2 enabled	0 = Drive 2 is blocked. 1 = Drive 2 is enabled.
1	Drive 2 ready for operation	0 = Drive 2 is not ready. 1 = Drive 2 is ready.
2	PO data enabled	0 = Process data is blocked. Drive 2 cannot be controlled via fieldbus. 1 = Process data is enabled. Drive 2 can be controlled via fieldbus.
3	Binary input DI02	0 = Binary input DI02 is not set. 1 = Binary input DI02 is set.
4	Binary input DI03	0 = Binary input DI03 is not set. 1 = Binary input DI03 is set.
5	Failure	1 = Failure present. 0 = No failure present.
6	Binary input DI00	0 = Binary input DI00 is not set. 1 = Binary input DI00 is set.
7	Binary input DI01	0 = Binary input DI01 is not set. 1 = Binary input DI01 is set.

PI2: MOVIFIT® compact dual-motor starter status word drive 2		
Bit	Meaning	Coding and function
8 – 15	If no failure is present (bit 5 = 0): Status display of drive 2	2 = Drive 2 is blocked. 4 = Drive 2 is enabled. 18 = Manual mode via operator panel active. 21 = Starter is not ready.
	If a failure is present (bit 5 = 1): Error number display	Error number

6.15.4 Process data validity for MOVIFIT® compact with IO-Link

The drive enable is locked internally in the device if no process data is received from the device (IO-Link timeout) or the PD-out data is invalid due to the IO-Link master command 0x99 (DeviceOperate) having been sent. If the device is still enabled, the speed on the current integrator ramp is reduced to an idle state and the drive is then blocked. Sending of the IO-Link master command 0x98 (ProcessDataOutputOperate) cancels the device-internal interlocking of the drive enable.

7 Operation

7.1 Operating notes

INFORMATION



You must comply with the general safety notes in chapter "Safety Notes" during start-up.



⚠ WARNING

Electric shock can be caused by dangerous voltages at the connections, cables and motor terminals.

When the device is switched on, dangerous voltages are present at the connections as well as at any connected cables and motor terminals. This also applies, even if the device is blocked and the motor is at a standstill.

Severe or fatal injuries.

- Do not switch under load.
- Before performing any work on the device, disconnect it from the voltage supply. Note that dangerous voltages can be present at the terminals and connections for up to 1 minute after the controller is switched off.
- Block the output stage of the inverter before switching at the output of the device.



⚠ WARNING

There is a risk of electric shock from capacitors that have not fully discharged.

Severe or fatal injuries.

- De-energize the MOVIFIT® device. Observe the minimum switch-off time after disconnection from the supply system:
 - **1 minute**



⚠ 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.



⚠ WARNING

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

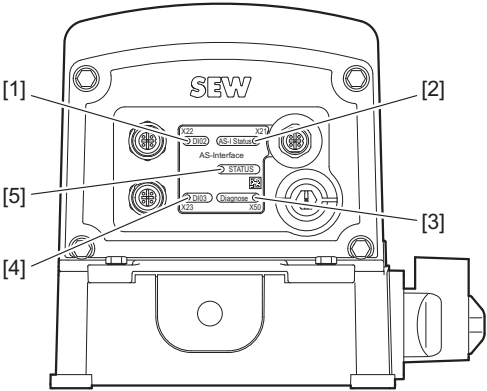
Severe injuries.

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

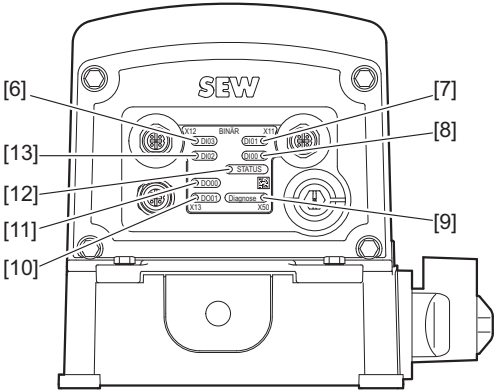
7.2 MOVIFIT® compact operating displays (LEDs)

The following figure shows the LEDs of MOVIFIT® compact:

MOVIFIT® compact with AS-Interface MOVIFIT® compact with binary control

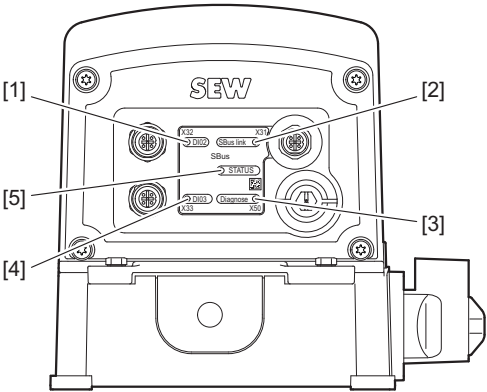


- [1] "DI02" LED
- [2] "AS-I status" LED
- [3] "Diagnostics" LED
- [4] "DI03" LED
- [5] "STATUS" LED



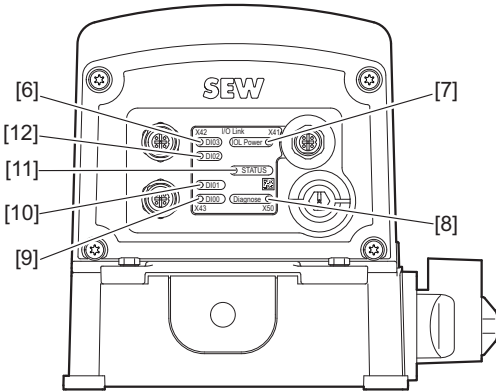
- [6] "DI03" LED
- [7] "DI01" LED
- [8] "DI00" LED
- [9] "Diagnostics" LED
- [10] "DO01" LED
- [11] "DO00" LED
- [12] "STATUS" LED
- [13] "DI02" LED

MOVIFIT® compact with SBus



- [1] "DI02" LED
- [2] "SBus link" LED
- [3] "Diagnostics" LED
- [4] "DI03" LED
- [5] "STATUS" LED

MOVIFIT® compact with IO-Link



- [6] "DI03" LED
- [7] "IOL Power" LED
- [8] "Diagnostics" LED
- [9] "DI00" LED
- [10] "DI01" LED
- [11] "STATUS" LED
- [12] "DI02" LED

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7.2.1 "DI00 – DI03" LEDs

LED	Meaning
Off	Input signal at binary input DI.. open or "0".
Green	Input signal present at binary input DI..

7.2.2 "DO00 – DO01" LEDs

LED	Meaning
Off	DO.. output is logical "0".
Green	DO.. output is switched.

7.2.3 "STATUS" LED

LED	Meaning
Off	No voltage supply.
Green Illuminates	The MOVIFIT® compact drive is enabled.
Yellow Illuminates	The MOVIFIT® compact drive is operational.
Yellow Flashing	The MOVIFIT® compact drive has been locked by the MBBG11A operator panel. The <STOP> key has been pressed. The MOVIFIT® compact drive is not operational.
Yellow Flashes 2x, pause	The MOVIFIT® compact drive is in manual mode with the MBBG11A operator panel. In order to switch to automatic operation, first stop manual operation with the MBBG11A operator panel (see operating instructions > chapter "Manual operation with the MBBG11A operator panel").
Green/yellow Flashing	Internal communication error between control unit and power section.
Red Illuminates or flashes	An error has occurred.

7.2.4 "AS-I status" LED

LED	Meaning
Off	No 24 V supply at AS-Interface connection.
Green Illuminated	Normal operation 24 V supply at AS-Interface connection is OK. Communication established.
Red Illuminated	Communication is interrupted or slave address set to 0.
Red/green Flashing	Communication is interrupted.

7.2.5 "SBus link" LED

LED	Meaning
Off	No communication via SBus.
Green Illuminated	Communication via SBus established.

7.2.6 "Diagnostics" LED

The "Diagnostics" LED function is in preparation.

7.2.7 "IOL Power" LED

LED	Meaning
Off	24 V supply via IO-Link off
Green Illuminated	24 V supply via IO-Link on

7.3 Operating displays of the MBBG11A operator panel

The MBBG11A operator panel has the following operating displays:

StoP	The power stage of the MOVIFIT® is switched off (with inverter).
1 S b Y	The power stage of the MOVIFIT® for motor 1 is switched off (with reversing or dual-motor starter).
2 S b Y	The power stage of the MOVIFIT® for motor 2 is switched off (with dual-motor starter).
	These messages appear if the drive enable has been canceled and no errors are present. MOVIFIT® is ready for normal operation.
SEtUP menu	Opens the motor start-up menu.
ModE	Selects the operating mode. Press the <ENTER> key. Select the operating mode.
PoVEr	Selects power in [kW]. Press the <ENTER> key. Select the motor power.
VoLt	Selects motor voltage in [V]. Press the <ENTER> key. Select the motor voltage.
hErtZ	Selects rated motor frequency in [Hz]. Press the <ENTER> key. Select the rated motor frequency.
rPM	Selects the nominal motor speed in [min ⁻¹]. Press the <ENTER> key. Select the nominal motor speed.
AMPEr	Selects nominal motor current in [Hz]. Press the <ENTER> key. Select the nominal motor current.
CoSPh	Selects power factor cos φ. Press the <ENTER> key. Select the power factor.
COPY	Switches to data backup. Press the <ENTER> key.
rECAL	Data backup MBBG11A → MOVIFIT® is selected. Press the <ENTER> key.
StorE	Data backup MOVIFIT® → MBBG11A is selected. Press the <ENTER> key.
StArt	Start the selected data backup by pressing the <ENTER> key.
2.0	Display of ramp up (acceleration) or ramp down (deceleration). Press the <ENTER> key. Select the ramp time in [s].

n - 2	Display of fixed setpoint number (fixed setpoint menu) Press the <ENTER> key. Select the fixed setpoint in [min ⁻¹].
1500	Display of maximum speed in [min ⁻¹] Press the <ENTER> key. Select the maximum speed.
P- 8	Display of the parameter number (parameter menu) Press the <ENTER> key. Select the parameter value.
A 1.2	Display of the current output current of the MOVIFIT® in [A].
F - 00	Display of the current error code
r - 2	Warning code: Timeout to internal power section
r - 31	Warning code: NV storage error • Error when saving parameters.
r - 32	Warning code: Enable • Parameters can only be written in the “No enable” state. • Manual operation is inhibited when the drive is enabled in automatic operation. • Automatic operation is inhibited when the drive is enabled in manual operation.
r - 34	Warning code: Error in sequence • NV storage error (error when saving parameters) • Communication error • Copy error F 97 still active
r - 38	Warning code: Wrong data set from MBBG11A operator panel • Invalid identifier • CRC error • Data length incorrect

7.4 Manual operation with the MBBG11A operator panel

7.4.1 Manual mode

For manual operation of the MOVIFIT® compact, the MBBG11A operator panel has the following modes:

- **Binary signal specification mode** (for inverters and motor starters)

In binary signal specification mode, you control the MOVIFIT® compact drive by setting/resetting binary signals. The MBBG11A operator panel simulates control via the binary inputs or the AS-Interface.

For the bit assignment, refer to chapter "Functions of the MOVIFIT® compact with AS-Interface" (→  114).

- **Setpoint adjuster mode** (only for inverters)

In setpoint adjuster mode, you control the MOVIFIT® compact drive with the setpoint adjuster (potentiometer) and the <STOP/RESET> key.

7.4.2 Activating manual operation



▲ WARNING

Risk of crushing due to unexpected start-up of the drive. The signals of the MBBG11A operator panel are effective immediately when manual mode is activated. The drive operates at the speed that is specified by the MBBG11A operator panel.

Severe or fatal injuries.

- Ensure that no persons are present in the hazard zone of the drive.
- Before manual operation is activated, the MBBG11A operator panel must be configured to prevent the drive from starting up.

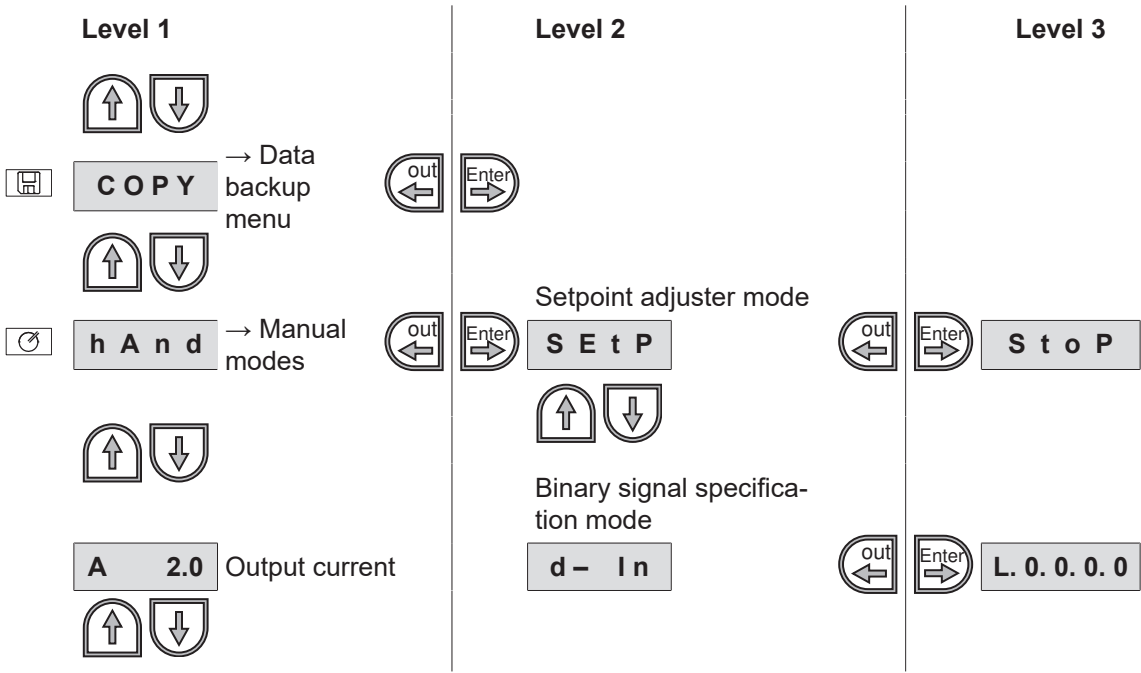


INFORMATION

In order to activate manual operation, the drive must not be enabled and must be at a standstill.

- Stop automatic mode by pressing the <STOP> key.
- Wait until the drive is at a standstill.

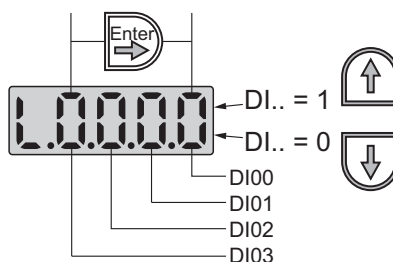
Activate manual mode then as follows:



7.4.3 Manual operation in binary signal specification mode

Control the MOVIFIT® compact drive in binary signal specification mode as follows:

1. Open “Binary signal specification mode” as described in chapter “Activating manual operation”.
 - ⇒ Control in “Binary signal specification mode” is now operational (STOP mode).
 - ⇒ The numbers in the 7-segment display flash.
2. Activate manual operation using the <RUN> key (RUN mode).
 - ⇒ The dots and the segments of the currently selected digital input flash in the display.
3. Control the individual digital inputs as follows:



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Switch between the individual digital inputs using the <ENTER> key. The respective selected digital input flashes.

- Set the selected digital input using the <UP> key.
If “1” flashes in the display, the digital input is set (= 1).
- The selected digital input is reset using the <DOWN> key.
If “0” flashes in the display, the digital input is not set (= 0).

Deactivating manual operation



⚠ WARNING

Risk of crushing due to unexpected start-up of the drive. The signals of the higher-level controller are effective immediately when automatic operation is activated. The drive runs with the speed that is specified by the higher-level controller.

Severe or fatal injuries.

- Ensure that no persons are present in the hazard zone of the drive.
- Before you activate automatic operation with the <RUN> key, you must set the signals of the higher-level controller so that the drive is not enabled.

Deactivate manual mode as follows:

1. Stop the drive with the <STOP/RESET> key.
2. Deactivate manual operation using the <OUT> key.
3. Activate automatic operation using the <RUN> key.

7.4.4 Manual operation in setpoint adjuster mode



▲ WARNING

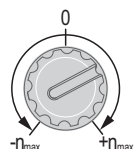
Risk of crushing due to unexpected start-up of the drive. When you activate the controller in setpoint adjuster mode, the drive starts with the setpoint that is set at the setpoint adjuster (potentiometer).

Severe or fatal injuries.

- Ensure that no persons are present in the hazard zone of the drive.
- Ensure that the setpoint adjuster (potentiometer) is set to the neutral position 0.

Control the MOVIFIT® compact drive in setpoint adjuster mode as follows:

1. Open "Setpoint adjuster mode" as described in chapter "Activating manual operation".
 - ⇒ The manual operation controller is now operational.
 - ⇒ The display "S T o P" flashes.
2. Set the setpoint speed at the setpoint adjuster (potentiometer) as follows:



If you turn the setpoint adjuster (potentiometer) to the **left** ($n < 0$), the drive runs counterclockwise.



If the setpoint adjuster (potentiometer) is in the **middle** ($n = 0$), the drive stops.



If you turn the setpoint adjuster (potentiometer) to the **right** ($n > 0$), the drive runs clockwise.

3. The drive is started by pressing the <RUN> key.
4. The drive is stopped by pressing the <STOP/RESET> key.

Deactivating manual operation**▲ WARNING**

Risk of crushing due to unexpected start-up of the drive. The signals of the higher-level controller are effective immediately when automatic operation is activated. The drive runs with the speed that is specified by the higher-level controller.

Severe or fatal injuries.

- Ensure that no persons are present in the hazard zone of the drive.
 - Before you activate automatic operation with the <RUN> key, you must set the signals of the higher-level controller so that the drive is not enabled.
-

Deactivate manual mode as follows:

1. Stop the drive with the <STOP/RESET> key.
2. Deactivate manual operation using the <OUT> key.
3. Activate automatic operation using the <RUN> key.

8 Service

8.1 "STATUS" LED error codes

The "Status" LED signals the following error codes of MOVIFIT® compact:

LED Color Status	Code	Meaning
Red Illuminated	F 50	Error in supply voltage of internal power section (inverter or motor starter)
Red Flashes slowly	-	All errors that are not mentioned in this table.
Red Flashes 2 ×, pause	F 07	DC link voltage too high.
Red Flashes 3 ×, pause	F 01	Overcurrent in output stage
	F 11	Overtemperature in output stage
Red Flashes 4 ×, pause	F 84	Motor overload
Red Flashes 6 ×, pause	F 06	Line phase failure
Green/yel-low Flashes	F 28	Timeout IO-Link
Green/yel-low Flashes	F 43	Internal communication error
Green/yel-low Flashes	F 47	SBus timeout

8.2 MOVIFIT® compact error list

The MBBG11A operator panel displays the error codes that occur at the MOVIFIT® compact.

8.2.1 Error list for MOVIFIT® compact inverter

Code	Subcode	Meaning	Possible cause	Measure
F 01	0	Overcurrent in output stage	Short circuit at inverter output	- Check the connection between the inverter output and the motor. - Check the motor winding for short circuit.
			Sudden overload of motor	Check the motor shaft for blocking.
F 06	0	Phase failure	Failure of one or more line phases	Check the supply system cable for phase failure.
F 07	0	DC link voltage too high	Ramp time too short	Extend the ramp time.
			Non-permissible line voltage range	Ensure that the line voltage is permissible for the unit.
F 09	0	Motor startup error	Error during start-up of motor in the Pro mode	- Check/correct the data that has been entered. - Repeat the motor startup.
F 11	0	Thermal overload of the output stage	Cooling fins soiled	Clean the cooling fins.
			Ambient temperature too high	Reduce the ambient temperature.
			Heat build-up on MOVIFIT® compact device	- Prevent heat build-up on MOVIFIT® compact device. - Check distance from neighboring components.
			Drive load too high	Reduce the drive load.
F 18	13.103	CPU fault	-	- Reset the fault. - If the error persists, contact SEW-EURODRIVE Service.
F 25	5, 7, 8, 203	EEPROM fault	-	Load the factory settings and repeat the startup.
F 28	0	Communication error IO-Link	Connection disrupted	Check connection to master.
F 36	0	MBBG11A timeout error	MBBG11A disconnected during manual operation.	- Plug in the plug connector of the MBBG11A operator panel again. - Reset the fault.
F 37	0	Inverter software runtime error		Contact SEW-EURODRIVE Service.

Code	Subcode	Meaning	Possible cause	Measure
F 43	0	Internal communication error	Communication problem between internal control section and power section. With IO-Link: No supply system switched on, control section is supplied with voltage via IO-Link master.	• Contact SEW-EURODRIVE Service. • With IO-Link: Switch on the supply system.
F 45	0	Initialization error	Current offset measurement out of tolerance.	• Reset the fault. • If the error persists, contact SEW-EURODRIVE Service.
	17, 20	Initialization error, power section assignment	Internal power section not compatible	• Contact SEW-EURODRIVE Service.
F 47	0	Process data timeout error, SBus master	Error during communication via SBus	• Check communication connection between device and SBus master
F 50	0, 7	Supply voltage error in internal power section		• Contact SEW-EURODRIVE Service.
F 84	0	Thermal overload of motor	Ambient temperature at the motor is too high	• Lower the ambient temperature at the motor. • Reset the fault.
			Heat build-up at the motor	• Prevent heat build-up at the motor. • Reset the fault.
			Motor load too high	• Reduce the load of the motor.
			Speed of motor too slow	• Increase the speed. • Reset the fault.
F 94	12	Detected power section does not correspond to the configured power section.	When the internal power section was replaced, a different type than the previous one was installed.	• Contact SEW-EURODRIVE Service.
F 97	0, 1	Copy error	Error during data backup with the MBBG11A operator panel	• Repeat the copying process. • Load the factory settings and re-parametrize the device.
F 98	0	CRC calculation via flash code	-	• Reset the fault. • If the error persists, contact SEW-EURODRIVE Service.

Code	Subcode	Meaning	Possible cause	Measure
F 196	0	Power section collective error, error assignment not possible.	Error detection aborted or sensor signal missing.	- Reset the fault. - If the error persists, contact SEW-EURODRIVE Service.

8.2.2 Error list for MOVIFIT® compact motor starter

Code	Subcode	Meaning	Possible cause	Measure
F 01	3	Overcurrent at motor terminal X9 (Reversing starter/dual-motor starter, motor 1)	Short circuit at starter output	- Check the connection between the starter output and the motor. - Check the motor winding for short circuit.
			Sudden overload of motor	Check the motor shaft for blocking.
	4	Overcurrent at motor terminal X8 (Dual-motor starter, motor 2)	Short circuit at starter output	- Check the connection between the starter output and the motor. - Check the motor winding for short circuit.
			Sudden overload of motor	Check the motor shaft for blocking.
F 06	1, 2	Phase failure during initialization	Failure of one or more line phases	Check the supply system cable for phase failure.
			Motor not connected correctly	Make sure that the motor is connected correctly. For dual-motor starters, both motors must always be connected.
F 18	13.103	CPU fault	-	- Reset the fault. - If the error persists, contact SEW-EURODRIVE Service.
F 25	0, 5, 7, 8, 203	EEPROM fault	-	Load the factory settings and re-parametrize the device.
F 28	0	Communication error IO-Link	Connection disrupted	Check connection to master.
F 34	1	Start time monitoring error (Reversing starter/dual-motor starter, motor 1)	Insufficient acceleration power Load is too large	Check the motor phases. Reduce the load.
	2	Start time monitoring error (Dual-motor starter, motor 2)	Insufficient acceleration power Load is too large	Check the motor phases. Reduce the load.
F 36	0	MBBG11A timeout error	MBBG11A disconnected during manual operation.	- Plug in the plug connector of the MBBG11A operator panel again. - Reset the fault.
F 37	0	Starter software runtime error		Contact SEW-EURODRIVE Service.

Code	Subcode	Meaning	Possible cause	Measure
F 43	0	Internal communication error	Communication problem between internal control section and power section. With IO-Link: No supply system switched on, control section is supplied with voltage via IO-Link master.	• Contact SEW-EURODRIVE Service. • With IO-Link: Switch on the supply system.
F 44	100	Device overload (I^2t)	Device overload (I^2t)	• Reduce the drive load. • Avoid enabling both drives at the same time.
F 45	17, 20	Initialization error, power section assignment	Internal power section not compatible	• Contact SEW-EURODRIVE Service.
F 47	0	Process data timeout error, SBus master	Error during communication via SBus	• Check communication connection between device and SBus master.
F 50	7	Supply voltage error in internal starter module		• Contact SEW-EURODRIVE Service.
F 84	9	Thermal motor overload at X9 (Reversing starter/dual-motor starter, motor 1)	Ambient temperature at the motor is too high	• Lower the ambient temperature at the motor. • Reset the fault.
			Heat build-up at the motor	• Prevent heat build-up at the motor. • Reset the fault.
			Motor load too high	• Reduce the load of the motor.
			Speed of motor too slow	• Increase the speed. • Reset the fault.
	10	Thermal motor overload at X8 (Dual-motor starter, motor 2)	Ambient temperature at the motor is too high	• Lower the ambient temperature at the motor. • Reset the fault.
			Heat build-up at the motor	• Prevent heat build-up at the motor. • Reset the fault.
			Motor load too high	• Reduce the load of the motor.
			Speed of motor too slow	• Reset the fault.
F 94	12	Detected power section does not correspond to the configured power section.	When the power section was replaced, a different type than the previous one was installed.	• Contact SEW-EURODRIVE Service.

Code	Subcode	Meaning	Possible cause	Measure
F 97	0, 1	Copy error	Error during data transmission with the MBBG11A operator panel	• Repeat the copying process. • Load the factory settings and re-parametrize the device.
F 98	0	CRC calculation via flash code	-	• Reset the fault. • If the error persists, contact SEW-EURODRIVE Service.
F 118	8	Power section has detected communication failure	Communication problem between control section and power section.	• Contact SEW-EURODRIVE Service.

8.3 Reset



⚠ WARNING

Electric shock due to dangerous voltages in the ABOX.

Severe or fatal injuries.

- De-energize the MOVIFIT® device. Observe the minimum switch-off time after disconnection from the supply system:
– **1 minute**



⚠ WARNING

Danger if the motor starts up unintentionally.

Fatal or severe injuries and damage to property.

- Before starting the work, switch off the power to the MOVIFIT® device.
- Safeguard the MOVIFIT® device from unintentional activation.

8.3.1 Reset with AS-Interface or binary control

Depending on the current operating mode and the device type of the MOVIFIT® compact device, a manual reset can be performed as follows:

Device type	Manual reset		
	in automatic mode ¹⁾	with the MBBG11A operator panel	with MOVITOOLS® MotionStudio
Frequency inverter MBF07B-.. MBF11B-.. MBF15B-..	Set DI0 and DI1 = 1.	Press the <STOP/RE-SET> key.	Set parameter <i>P840</i> = 1.
Motor starter MBS2RB-.. MBS4RB-.. MBS4DB-..	Set DI2 = 1.	Press the <STOP/RE-SET> key.	Set parameter <i>P840</i> = 1.

1) With binary control or AS-Interface controller

8.3.2 Reset with SBus controller and IO-Link controller via control word PO1

If there is a device fault, reset the fault as follows:

1. Set bit 6 of the control word = 0.
2. Set bit 6 of the control word = 1.

8.4 Inspection/maintenance

8.4.1 MOVIFIT® device

The MOVIFIT® device is maintenance-free. SEW-EURODRIVE does not prescribe any inspection or maintenance work for the MOVIFIT® device.

INFORMATION



Do not open any internal components of the device. Repairs to the device may only be carried out by SEW-EURODRIVE.

8.5 Shutdown

To shut down the MOVIFIT® device, de-energize the device using appropriate measures.



WARNING

Electric shock due to charged capacitors.

Severe or fatal injuries.

- Observe a minimum switch-off time of 1 minute after disconnecting the power supply.
-

8.6 Storage

Observe the following instructions when shutting down or storing MOVIFIT® device:

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

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

8.7 Extended storage

If the device is stored for a long time, connect it to the line voltage for at least 5 minutes every 2 years. Otherwise, the service life of the device may be reduced.

8.8 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.

- 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.

9 Technical data

9.1 Conformity

9.1.1 CE marking

- Low Voltage Directive:

The MOVIFIT® drive system fulfills the regulations of Low Voltage Directive 2014/35/EU.

- Electromagnetic compatibility (EMC):

MOVIFIT® compact devices are designed for use as components for installation in machinery and systems. They comply with the EMC product standard EN 61800-3 "Adjustable-speed electrical drives". Provided that the installation notes are followed, the requirements for CE marking for the entire machine/system that is equipped with these devices are met in accordance with the EMC directive 2014/30/EU. For detailed information on EMC-compliant installation, refer to the "Electromagnetic Compatibility in Drive Technology" documentation from SEW-EURODRIVE.



The CE mark on the nameplate represents conformity with the Low Voltage Directive 2014/35/EU and the EMC Directive 2014/30/EU.

9.1.2 UL approval



UL and cUL approval has been granted for the MOVIFIT® compact inverter.

UL and cUL approval has been granted for the MOVIFIT® compact motor starter.

9.1.3 RCM approval



The RCM approval has been granted for the device series.

The RCM mark on the nameplate certifies the conformity with ACMA (Australian Communication and Media Authority).

9.2 MOVIFIT® compact inverter

MOVIFIT® compact type		MBF07B-..	MBF11B-..	MBF15B-..
Apparent output power at $V_{line} = AC\ 380 - 500\ V$	S_N	1.8 kVA	2.2 kVA	2.8 kVA
Connection voltages	V_{line}	3 × AC 380 V –10% – AC 500 V ±10%		
Line frequency	f_{line}	50 – 60 Hz ±5%		
Nominal line current (with $V_{line} = AC\ 400\ V$)	I_{line}	AC 1.5 A	AC 2.2 A	AC 2.8 A
Unaffected short-circuit current according to EN 61800-5-1		10 kA		
Maximum rated current		20 A		
Minimum switch-off time for line contactor		10 s (360 switches/h)		
Output voltage	V_A	0 – V_{line} (output is short-circuit proof)		
Output frequency	f_A	2 – 100 Hz		
Operating point		3 × AC 400 V at 50 Hz		
Nominal output current	I_N	AC 1.7 A	AC 2.5 A	AC 3.4 A
Motor power S1	P_{Mot}	0.09 – 0.75 kW 0.12 – 1.0 HP	0.09 – 1.1 kW 0.12 – 1.5 HP	0.09 – 1.5 kW 0.12 – 2.0 HP
PWM frequency		4 (factory setting), 16 kHz		
Efficiency		> 96%		
Current limiting	I_{max}	150%, 60 s		130%, 60 s
Maximum motor cable length		3 m unshielded 10 m shielded		
Permitted motors		Asynchronous motors		
Interference immunity		Complies with EN 61800-3		
Interference emission		- Complies with category C3 in accordance with EN 61800-3 (without EMC filter) - Complies with category C2 in accordance with EN 61800-3 (EMC filter MNF21A-MB or MNF21A-MB/CA11 installed)		
Ambient temperature	ϑ_{amb}	-25 °C to +40 °C P_N reduction: by 3% per K up to max. 60 °C		
Climate class		EN 60721-3-3, class 3K3		
Storage temperature ¹⁾		-25 °C to +75 °C (EN 60721-3-3, class 3K3)		
Permissible vibration and impact load		3M7 in accordance with EN 50178		

MOVIFIT® compact type		MBF07B-..	MBF11B-..	MBF15B-..
Degree of protection		IP55 (MOVIFIT® compact housing closed and all plug connections sealed off).		
Degree of pollution		2		
Operating mode		S1 (EN 60034-1)		
Type of cooling (DIN 41751)		Natural cooling		
Installation altitude		$h \leq 1000$ m: no reduction $h > 1000$ m: I_N reduction by 1% per 100 m $h > 2000$ m: V_{line} reduction AC 6 V per 100 m, overvoltage class 2 in accordance with EN 60664-1 $h_{max} = 4000$ m		
Mass		4.5 kg		
Dimensions		See chapter "Dimension drawing"		
Required preventive measures		Grounding the device		
Protection functions		• Shutdown caused by overcurrent due to ground fault, short circuit, overload • Shutdown caused by DC link overvoltage • Shutdown caused by overtemperature • Motor monitoring in accordance with UL function		

1) If the device is stored for a long time, connect it to the line voltage for at least 5 minutes every 2 years. Otherwise, the device's service life may be reduced.

9.3 MOVIFIT® compact reversing starter

MOVIFIT® compact type		MBS2RB-..	MBS4RB-..
Connection voltages	V_{line}	3 × AC 380 V –10% – AC 500 V +10%	
Line frequency	f_{line}	50 – 60 Hz ±5%	
Minimum switch-off time for line contactor		10 s (360 switches/h)	
Output voltage	V_A	V_{line} The motor output is not short-circuit-proof. Notice: Dangerous contact voltages. The motor output is switched using semiconductors.	
Output frequency	f_A	f_{line}	
Nominal output current	I_N	AC 5.0 A	AC 10.0 A
Motor power S1 (with V_{line} = AC 400 V)	P_{Mot}	0.18 – 2.2 kW 0.24 – 3.0 HP	2.2 – 4.0 kW 3.0 – 5.4 HP
Device variant		1	
Utilization category		5A:AC-53b:5-2:10	10A:AC-53b:4-2:16
		According to EN 60947-4-2:2012	
Rated insulation voltage		500 V	
Rated insulation surge voltage		4 kV	
Startup type		Voltage ramp, current limiting, boost	
Starting voltages		40 – 80%	
Current limiting		100 – 500%	
Boost		60 – 100% for 100 – 2000 ms	
Soft start/braking time		0 – 2 s	
Repeat readiness		50 ms	
Switching frequency		Max. 300 switching operations per hour	
Switching frequency (bypass deactivated)		Max. 3000 switching operations per hour	
I^2t power semiconductor		390 A²s	
Efficiency		> 95% With increased switching operation, the efficiency can be < 95%.	
Maximum motor cable length		10 m unshielded	
Permitted motors		Asynchronous motors	
Interference immunity		Fulfills EN 60947-4-2:2012	
Interference emission		Fulfills class B in accordance with EN 60947-4-2:2012	

MOVIFIT® compact type		MBS2RB-..	MBS4RB-..
Ambient temperature	ϑ_{Amb}	-20 °C to +40 °C P_N reduction: by 3% per K up to max. 60 °C	
Climate class		EN 60721-3-3, class 3K3	
Storage temperature ¹⁾		-25 °C to +85 °C (EN 60721-3-3, class 3K3)	
Permissible vibration and impact load		3M5 according to EN 50178	
Degree of protection		IP55 (MOVIFIT® compact housing closed and all plug connections sealed off).	
Degree of pollution		2	
Rated short-circuit current		5 kA	
Operating mode		S1 (EN60034-1)	
Type of cooling (DIN 41751)		Natural cooling	
Installation altitude		h ≤ 1000 m: no reduction h > 1000 m: I_N reduction by 2% per 100 m h > 2000 m: V_{line} up to 480 V $h_{\text{max}} = 4000$ m	
Mass		4.5 kg	
Dimensions		See chapter "Dimension drawing"	
Required preventive measure		Grounding the device	
Protection functions		• Shutdown in the event of overcurrent • Shutdown caused by overtemperature • Motor monitoring as per I^2t model	

1) If the unit undergoes extended storage, connect it to the line voltage for at least 5 minutes every 2 years. Otherwise, the device's service life may be reduced.

9.4 MOVIFIT® compact dual-motor starter

MOVIFIT® compact type		MBS4DB-..
Connection voltages	V_{line}	3 × AC 380 V –10% – AC 500 V +10%
Line frequency	f_{line}	50 – 60 Hz ±5%
Minimum switch-off time for line contactor		10 s (360 switches/h)
Output voltage	V_A	V_{line} The motor outputs are not short-circuit-proof. Notice: Dangerous contact voltages. The motor outputs are switched using semiconductors.
Output frequency	f_A	f_{line}
Nominal output current	I_N	2 × AC 5.0 A
Motor power S1 (with V_{line} = AC 400 V)	P_{Mot}	2 × 0.18 – 2.2 kW 2 × 0.24 – 3.0 HP
Device variant		1
Utilization category		5A:AC-53b:5-2:16 in accordance with EN 60947-4-2:2012
Rated insulation voltage		500 V
Rated insulation surge voltage		4 kV
Startup type		Voltage ramp, current limiting, boost
Starting voltages		40 – 80%
Current limiting		100 – 500%
Boost		60 – 100% for 100 – 2000 ms
Soft start/braking time		0 – 2 s
Repeat readiness		50 ms
Switching frequency		Max. 300 switching operations per hour
Switching frequency (bypass deactivated)		Max. 3000 switching operations per hour
I^2t power semiconductor		390 A ² s
Efficiency		> 95% With increased switching operation, the efficiency can be < 95%.
Maximum motor cable length		10 m unshielded
Permitted motors		Asynchronous motors
Interference immunity		Fulfills EN 60947-4-2:2012
Interference emission		Fulfills class B in accordance with EN 60947-4-2:2012

MOVIFIT® compact type		MBS4DB-..
Ambient temperature	ϑ_{Amb}	-20 °C to +40 °C P_N reduction: by 3% per K up to max. 60 °C
Climate class		EN 60721-3-3, class 3K3
Storage temperature ¹⁾		-25 °C to +85 °C (EN 60721-3-3, class 3K3)
Permissible vibration and impact load		3M5 according to EN 50178
Degree of protection		IP55 (MOVIFIT® compact housing closed and all plug connections sealed off).
Degree of pollution		2
Rated short-circuit current		5 kA
Operating mode		S1 (EN60034-1)
Type of cooling (DIN 41751)		Natural cooling
Installation altitude		$h \leq 1000$ m: no reduction $h > 1000$ m: I_N reduction by 2% per 100 m $h > 2000$ m: V_{line} up to 480 V $h_{\text{max}} = 4000$ m
Mass		4.5 kg
Dimensions		See chapter "Dimension drawing"
Required preventive measure		Grounding the device
Protection functions		• Shutdown in the event of overcurrent • Shutdown caused by overtemperature • Motor monitoring as per I^2t model

1) If the unit undergoes extended storage, connect it to the line voltage for at least 5 minutes every 2 years. Otherwise, the device's service life may be reduced.

9.5 AS-Interface technical data

9.5.1 AS-Interface technical data, standard version

AS-Interface (inverter and motor starter)	
Control input (X21)	Connecting the AS-Interface using M12 plug connector
Control functions	DO00 – DO03 (→ 114)
Signaling functions	DI00 – DI03 (→ 114)
Protocol variant	AS-Interface binary slave with S-7.A.7.7 profile "4I/4O-AB-Slave"
AS-Interface profile	S-7.A.7.7
I/O configuration	7 _{hex}
ID code	A _{hex}
ext. ID code 2	7 _{hex}
ext. ID code 1	7 _{hex}
Address	1A – 31A, 1B – 31B (AB slave), can be modified any number of times
Electronic supply	I _{E AS-Interface} ≤ 40 mA (typical 25 mA with 30 V) ¹⁾

1) The sensors are supplied from the AS-Interface cable. The current increases by the demand of the connected sensors (max 100 mA).

9.5.2 AS-Interface technical data, special design "MBF...-03" and "MBS...-03"

AS-Interface	MBF...-03 (inverter)	MBS...-03 (motor starter)
Control input (X21)	Connecting the AS-Interface using M12 plug connector	
Control functions	DO00 - DO03 (Control function identical to standard design)	DO00 – DO02
Signaling functions	DI00 – DI03 (→ 114) (Signaling function identical to standard design)	
Protocol variant	AS-Interface binary slave with S-7.F profile "Four Bit I/O-Mode Slave"	AS-Interface binary slave with S-7.A.E profile "4 I/3O-AB-Slave"
AS-Interface profile	S-7.F	S-7.A.E
I/O configuration	7 _{hex}	7 _{hex}
ID code	F _{hex}	A _{hex}
ext. ID code 2	E _{hex}	E _{hex}
ext. ID code 1	F _{hex}	7 _{hex}
Address	1 – 31 (Standard slave), can be changed as often as required	1A – 31A, 1B – 31B (AB slave), can be changed as often as required

AS-Interface	MBF...-03 (inverter)	MBS...-03 (motor starter)
Electronic supply	$I_{E \text{ AS-Interface}} \leq 40 \text{ mA}$ (typical 25 mA with 30 V) ¹⁾	

1) The sensors are supplied from the AS-Interface cable. The current increases by the demand of the connected sensors (max 100 mA).

9.6 Binary inputs (AS-Interface)

Binary inputs		
Sensor connections (X22, X23)	DI02 binary input sensor 2 DI03 binary input sensor 3	
Sensor inputs	PLC compatible according to EN 61131-2, sampling time $\leq$ 8 ms R_i approx. 3.0 k Ω I_E approx. 10 mA	
Signal level	+15 – +30 V	"1"
	-3 – +5 V	"0"
Maximum sensor cable length	15 m	

9.7 Binary inputs and outputs (binary control)

9.7.1 Binary inputs (binary control)

Binary inputs		
4 binary inputs (X11, X12)	Isolated via optocoupler; PLC compatible (EN 61131-2) $R_i \approx 3.0$ k Ω , $I_E \approx 10$ mA, sampling cycle $\leq$ 8 ms	
Signal level	+15 – +30 V	"1"
	-3 – +5 V	"0"
Control functions	DI00 – DI03, see chapter "Functions of the MOVIFIT® compact with binary control"	

9.7.2 Binary outputs (binary control)

Binary outputs		
2 binary outputs (X13)	PLC-compatible in accordance with EN 61131-2	
Signal level	+15 – +30 V	"1"
	-3 – +5 V	"0"
Rated current	Max. 20 mA per output / not permanently short-circuit-proof	
Signaling functions	DO00 – DO01, see chapter "Functions of the MOVIFIT® compact with binary control"	
DC 24 V output	Interference-voltage-proof and short-circuit-proof DC 24 V $\pm$ 25% Max. 100 mA minus current load from binary outputs DO00 + DO01	

9.8 Binary inputs (SBus)

Binary inputs	
2 binary inputs (X32, X33)	Isolated via optocoupler; PLC compatible (EN 61131-2) $R_i \approx 3.0 \text{ k}\Omega$, $I_E \approx 10 \text{ mA}$, sampling cycle $\leq 8 \text{ ms}$
Signal level	+15 – +30 V "1"
	-3 – +5 V "0"
Control functions	DI02 – DI03, see chapter "SBus process data assignment"

9.9 Binary inputs and outputs (IO-Link)

Binary inputs	
4 binary inputs (X42, X43)	Isolated via optocoupler; PLC-compatible (EN 61131-2) $R_i \approx 3.0 \text{ k}\Omega$, $I_E \approx 10 \text{ mA}$, sampling cycle $\leq 8 \text{ ms}$
Signal level	+15 – +30 V "1"
	-3 – +5 V "0"
Control functions	DI00 to DI03, see chapter "Process data assignment IO-Link" (→ 124)
Binary outputs	
2 DC 24 V outputs (X42, X43)	Interference-voltage-proof and short-circuit-proof DC 24 V $\pm 25\%$ Both outputs together max. 100 mA

9.10 Interfaces

9.10.1 SBus interface (only with SBus design)

SBus	
SBus interface	Interface to other SBus-capable SEW-EURODRIVE devices CAN bus to CAN specification 2.0, parts A and B
Connection technology	M12 plug connector
Transmission technology	In accordance with ISO 11898
Bus termination	Pluggable 120 Ω terminating resistor (accessories)

9.10.2 RS485 interface

RS485	
RS485 interface	Diagnostic interface, not electrically isolated from MOVIFIT® electronics
Connection technology	RJ10 socket

9.10.3 IO-Link interface (only with IO-Link design)

IO-Link		
IO-Link interface	IO-Link V1.1 Interface to an IO-Link master	IO-Link specification 1.1.3
Connection technology	M12-4 plug connectors	
Max. input current	200 mA	Port class A (type A)
Max. cable length	20 m	Master ↔ Device
Transmission rate	230.4 kbps	COM3
Process data	6 byte input / 6 byte output	
Cycle time	4 ms	

9.11 Motor requirements

The following tables list the basic requirements and restrictions for the assigned motors.

Observe these specifications when ordering the assigned motor.

9.11.1 Motor requirements for MBF.. (Inverter)

Characteristic	Requirements for the assigned AC motor
Permitted motors	4-pole asynchronous motor of the series: • DRN.. • DRE.. • DRS.. • DR2S..
Permitted motor power	MBF07B-...: 0.09 – 0.75 kW MBF11B-...: 0.09 – 1.1 kW MBF15B-...: 0.09 – 1.5 kW
Permitted nominal motor voltage	AC 380 to 500 V
Permitted brakes	No limitations
Permitted brake voltage	In the case of brakemotors, the brake voltage must comply with the voltage of the outer conductor, e.g. 400 V supply system = 400 V brake coil.
Brake rectifier	Always order the assigned motor with BG or BGE brake rectifier .
Permitted motor protection	The electronic motor protection is provided by MOVIFIT®. MOVIFIT® compact can not evaluate the signals of a temperature sensor (TH, TF, ...).

9.11.2 Motor requirements for MBS.. (motor starter)

Characteristic	Requirements for the assigned AC motor
Permitted motors	Asynchronous motors of the series: • DRN.. • DRE.. • DRS.. • DR2S..
Permitted motor power	MBS2RB-...: 0.18 – 2.2 kW MBS4RB-...: 2.2 – 4.0 kW MBS4DB-...: 2 × (0.18 – 2.2 kW)
Permitted nominal motor voltage	AC 380 to 500 V
Permitted brakes	No limitations Note the information in chapter "Motor starter parameter description" when using the following brakes: • Brake BE5 with a braking torque greater than 28 Nm • Or brake BE11.
Permitted brake voltage	In the case of brakemotors, the brake voltage must comply with the voltage of the outer conductor, e.g. 400 V supply system = 400 V brake coil.
Brake rectifier	Always order the assigned motor with BGE brake rectifier or BSR brake control . For applications with regenerative operation, SEW-EURODRIVE recommends the BSR brake control.
Permitted motor protection	The electronic motor protection is provided by MOVIFIT®. MOVIFIT® compact can not evaluate the signals of a temperature sensor (TH, TF, ...).

9.12 Accessories and options

9.12.1 MBBG11A



Type	MBBG11A
Part number	28230809
Function	Keypad With 3 m long connecting cable and plug connector RJ10 for connection to diagnostic interface X50
Degree of protection	IP20 (EN 60529) without mounting
Ambient temperature	0 – +50 °C
Storage temperature	0 – +60 °C

9.12.2 USM21A



Type	USM21A
Part number	28231449
Function	Interface adapter USB – CAN or USB – RS485
Scope of delivery	• USM21A interface adapter • USB cable • Cable with RJ10 – RJ10 plug connector

9.12.3 Accessories for installation

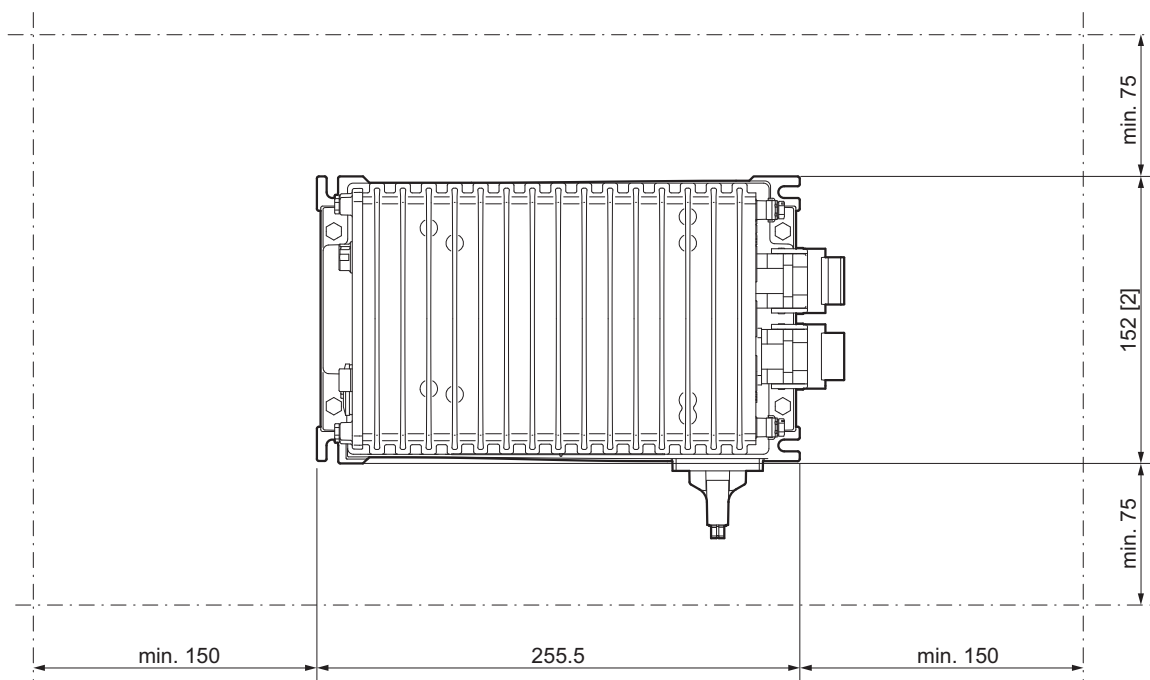
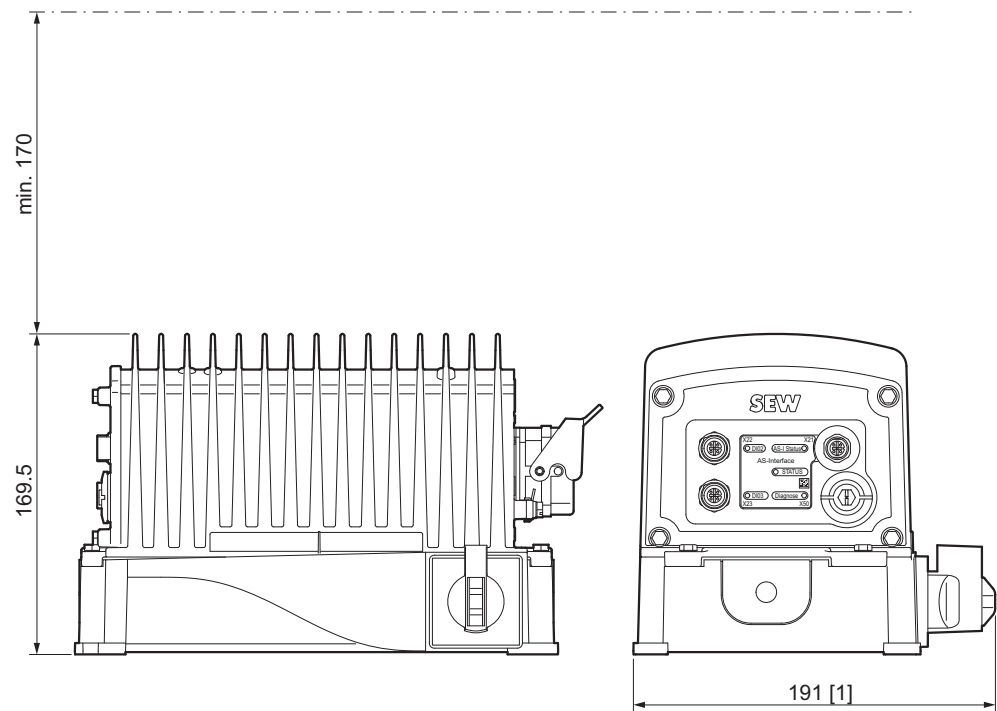
You can order the following accessories for MOVIFIT® compact from the company Weidmüller Interface GmbH & Co. KG (see www.weidmueller.com):

Accessories	Part number (Weidmüller)
Cable seal, for cables with Ø = 7.5 – 9 mm	4329610000
Cable seal, for cables with Ø = 9 – 11 mm	4323210000
Cable seal, for cables with Ø = 11 – 13 mm	4323230000
Cable seal, for cables with Ø = 13 – 15 mm ¹⁾	4323220000
Cable seal, for cables with Ø = 15 – 17 mm	4324010000
Seal (without cable entry)	4323240000

1) 2 of these cable seals are included in the scope of delivery of the MOVIFIT® compact device.

9.13 Dimension drawing

9.13.1 MOVIFIT® compact dimension drawing



18014415449572875

- [1] Width with maintenance switch (option)
- [2] Width without maintenance switch

10 Address list

Argentina			
Assembly Sales	Buenos Aires	SEW EURODRIVE ARGENTINA S.A. Ruta Panamericana Km 37.5, Lote 35 (B1619IEA) Centro Industrial Garín Prov. de Buenos Aires	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 http://www.sew-eurodrive.com.ar sewar@sew-eurodrive.com.ar
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Service Competence Center	Industrial Gears	SEW-EURODRIVE n.v./s.a. Rue du Parc Industriel, 31 6900 Marche-en-Famenne	Tel. +32 84 219-878 Fax +32 84 219-879 http://www.sew-eurodrive.be info@sew.be
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	Xi'An	SEW-EURODRIVE (Xi'An) Co., Ltd. No. 12 Jinye 2nd Road Xi'An High-Technology Industrial Development Zone Xi'An 710065	Tel. +86 29 68686262 Fax +86 29 68686311 xian@sew-eurodrive.cn
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	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 40764 Langenfeld (Düsseldorf)	Tel. +49 2173 8507-10 Fax +49 2173 8507-50 dtc-west@sew-eurodrive.de
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	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
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Greece			
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	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
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	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
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Swaziland

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Assembly Sales Service	Basel	Alfred Imhof AG Jurastrasse 10 CH-4142 Münchenstein bei Basel	Tel. +41 61 417 17 17 http://www.imhof-sew.ch info@imhof-sew.ch
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	Nan Tou	Ting Shou Trading Co., Ltd. No. 55 Kung Yeh N. Road Industrial District Nan Tou 540	Tel. +886 49 255353 Fax +886 49 257878 sewtwn@ms63.hinet.net http://www.tingshou.com.tw

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Thailand

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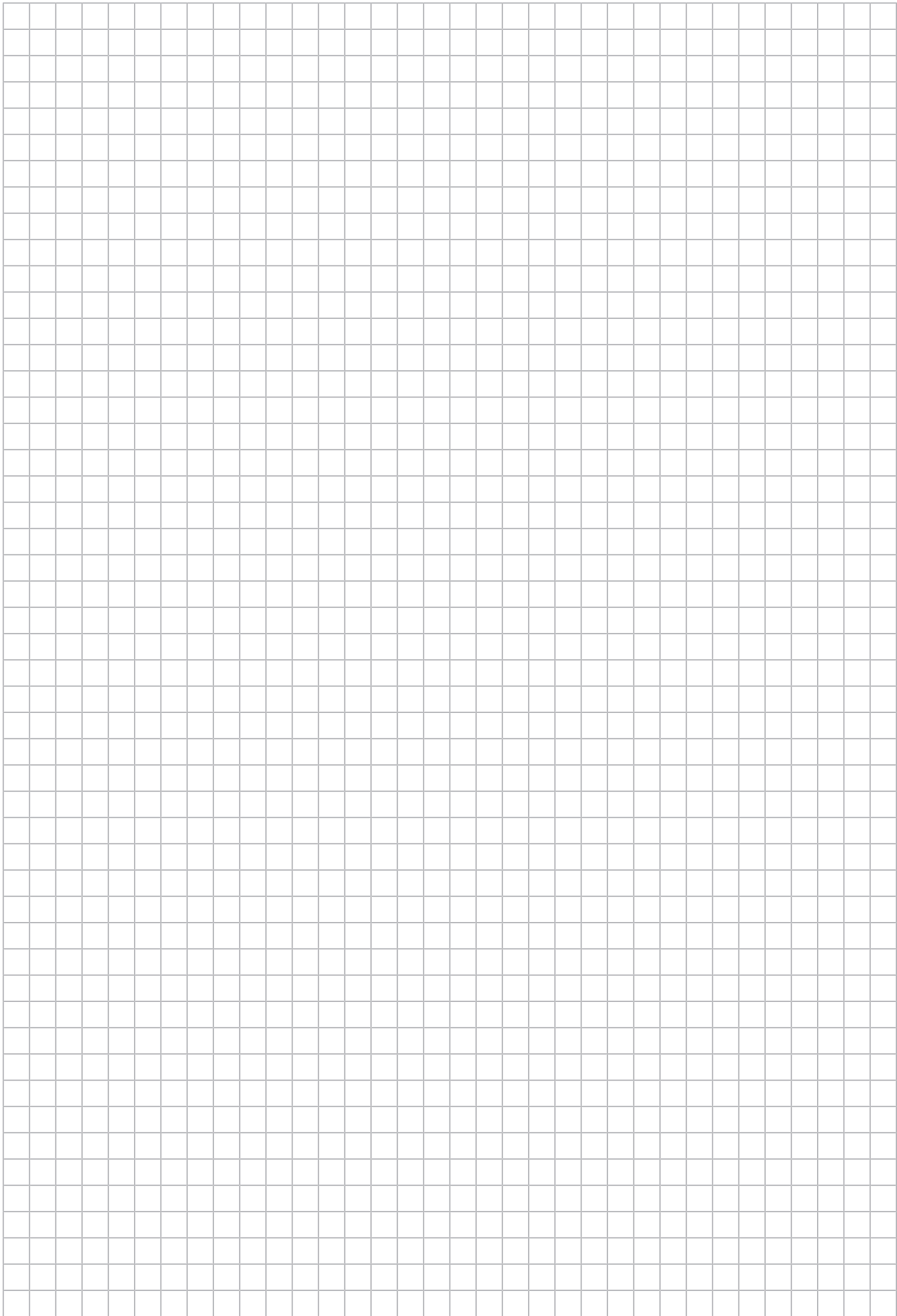
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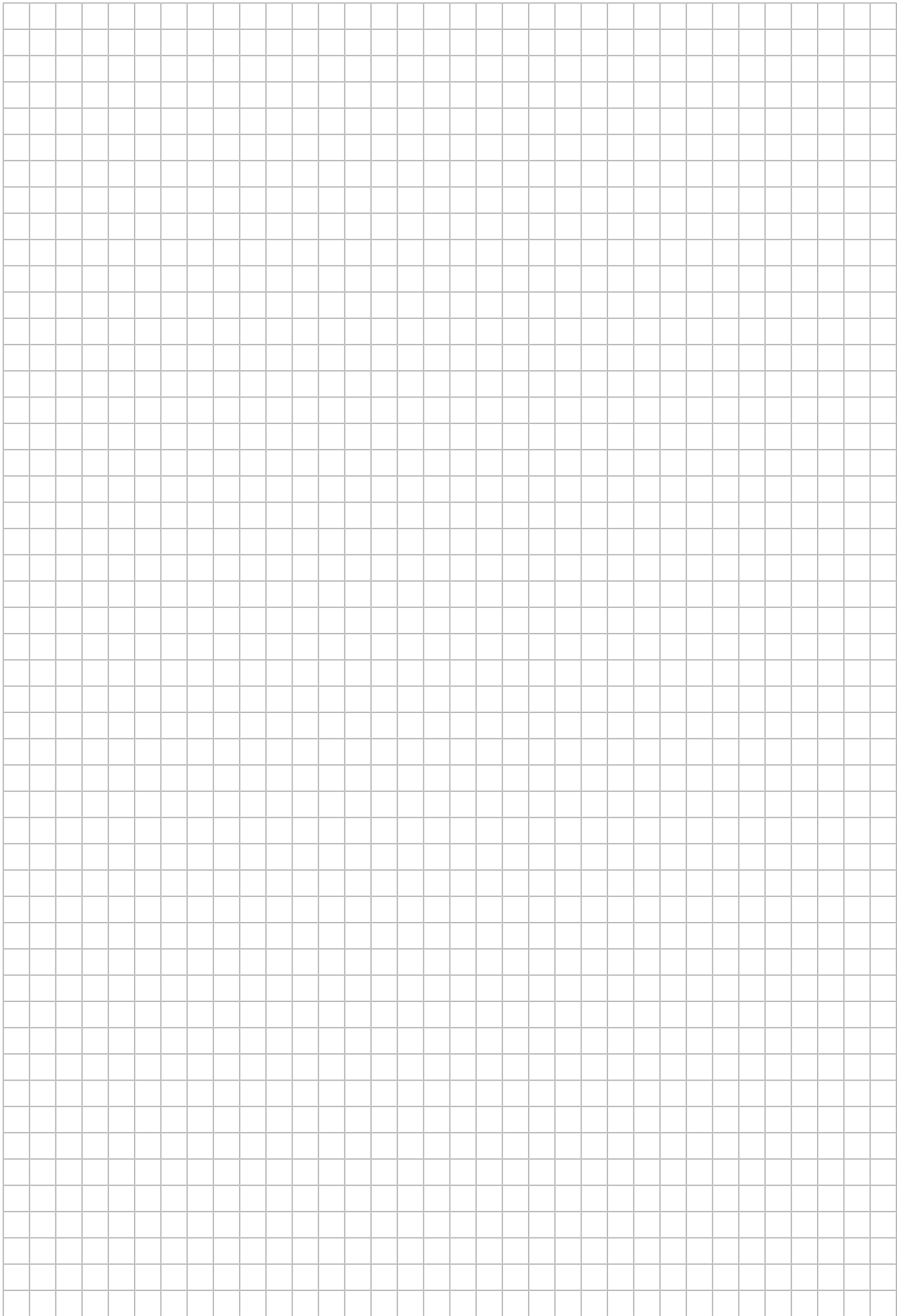
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