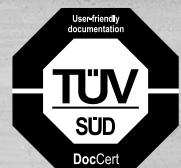
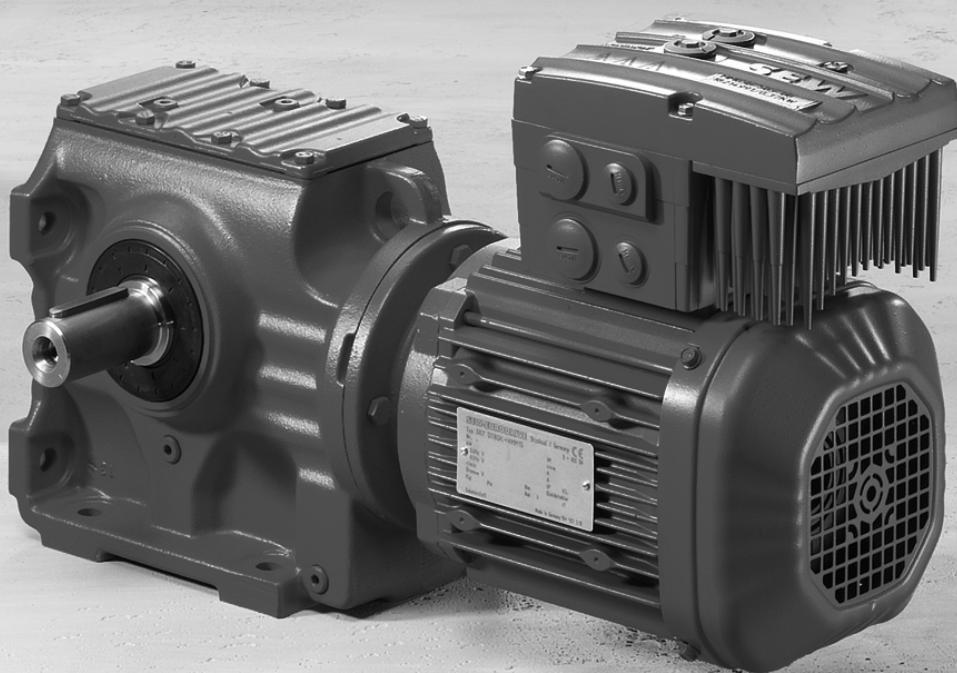




**SEW
EURODRIVE**

Operating Instructions



Decentralized Drive Systems
MOVIMOT® MM..D



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1 General information

1.1 About this documentation

The documentation at hand is the original.

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

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

1.2 Other applicable documentation

Observe the corresponding documentation for all additional components.

1.3 Structure of the safety notes

1.3.1 Meaning of signal words

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

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

1.3.2 Structure of section-related safety notes

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

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



SIGNAL WORD

Type and source of hazard.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the hazard.

Meaning of the hazard symbols

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

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

1.3.3 Structure of embedded safety notes

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

This is the formal structure of an embedded safety note:

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

1.4 Decimal separator in numerical values

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

Example: 30.5 kg

General information

Rights to claim under limited warranty

1.5 Rights to claim under limited warranty

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

1.6 Product names and trademarks

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

1.7 Copyright notice

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2 Safety notes

2.1 Preliminary information

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

2.2 Duties of the user

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

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

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

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

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

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

2.3 Target group

Specialist for mechanical work

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

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

Specialist for electrotechnical work	<p>Any electrotechnical work may be performed only by electrically skilled persons with a suitable education. Electrically skilled persons in the context of this documentation are persons who are familiar with electrical installation, startup, troubleshooting, and maintenance of the product who possess the following qualifications:</p> <ul style="list-style-type: none"> • Qualifications in the field of electrical engineering in accordance with the national regulations • Familiarity with this documentation
Additional qualifications	<p>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.</p> <p>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.</p>
Instructed persons	<p>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.</p>

2.4 Designated use

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

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

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

The 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

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

2.4.2 Hoist applications

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

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

2.5 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 Transportation

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

Observe the following notes when transporting the device:

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

If necessary, use suitable, sufficiently dimensioned handling equipment.

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

The lifting eyebolts are designed to carry only the weight of the motor without gear unit. Tighten installed lifting eyebolts. Mounted gear units have separate suspension attachments, which must be used according to the gear unit operating instructions when lifting the gearmotor. Do not mount any additional loads.

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 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).

2.8.1 Required preventive measure

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

2.8.2 Voltage test

To ensure the insulation is in order, perform voltage tests for the drives according to EN 61800-5-1:2007 prior to startup.

2.9 Protective separation

The product meets all requirements for protective separation of power and electronics connections in accordance with EN 61800-5-1. The connected signal circuits must meet requirements according to SELV (**Safety Extra Low Voltage**) or PELV (**Protective Extra Low Voltage**) 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 EN 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.

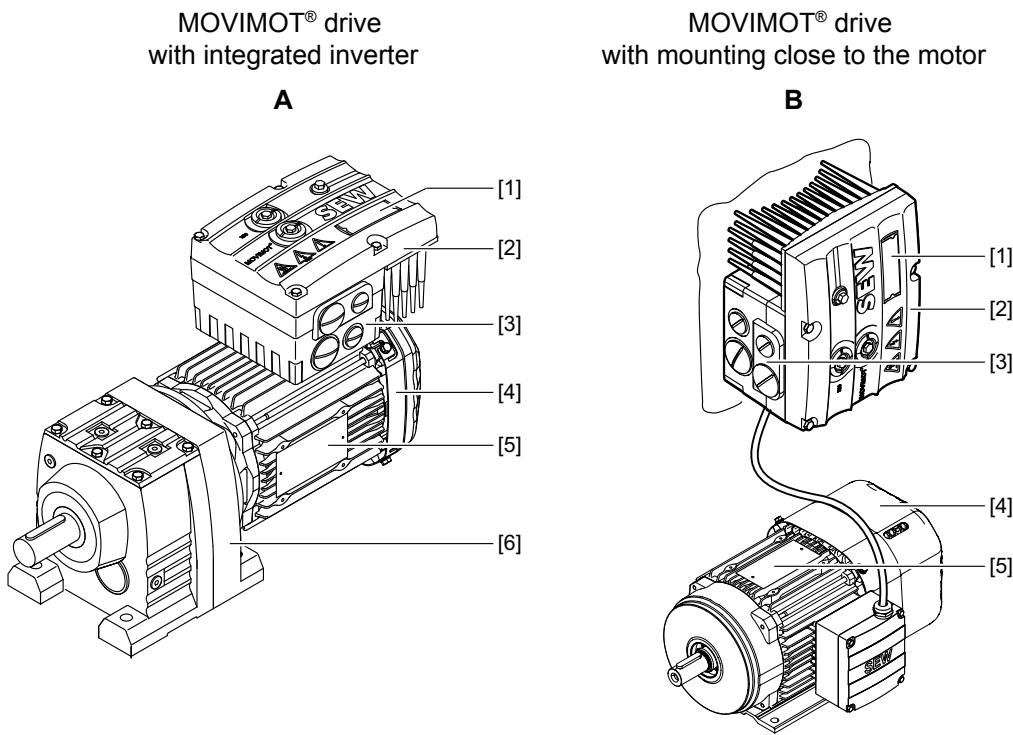
Mechanical blocking or internal protective functions of the product can cause a motor standstill. Eliminating the cause of the problem or performing a reset may result in the drive restarting automatically. If, for safety reasons, this is not permitted for the drive-controlled machine, first disconnect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

3.1 MOVIMOT® drive

The following figure shows the MOVIMOT® drive in different designs:



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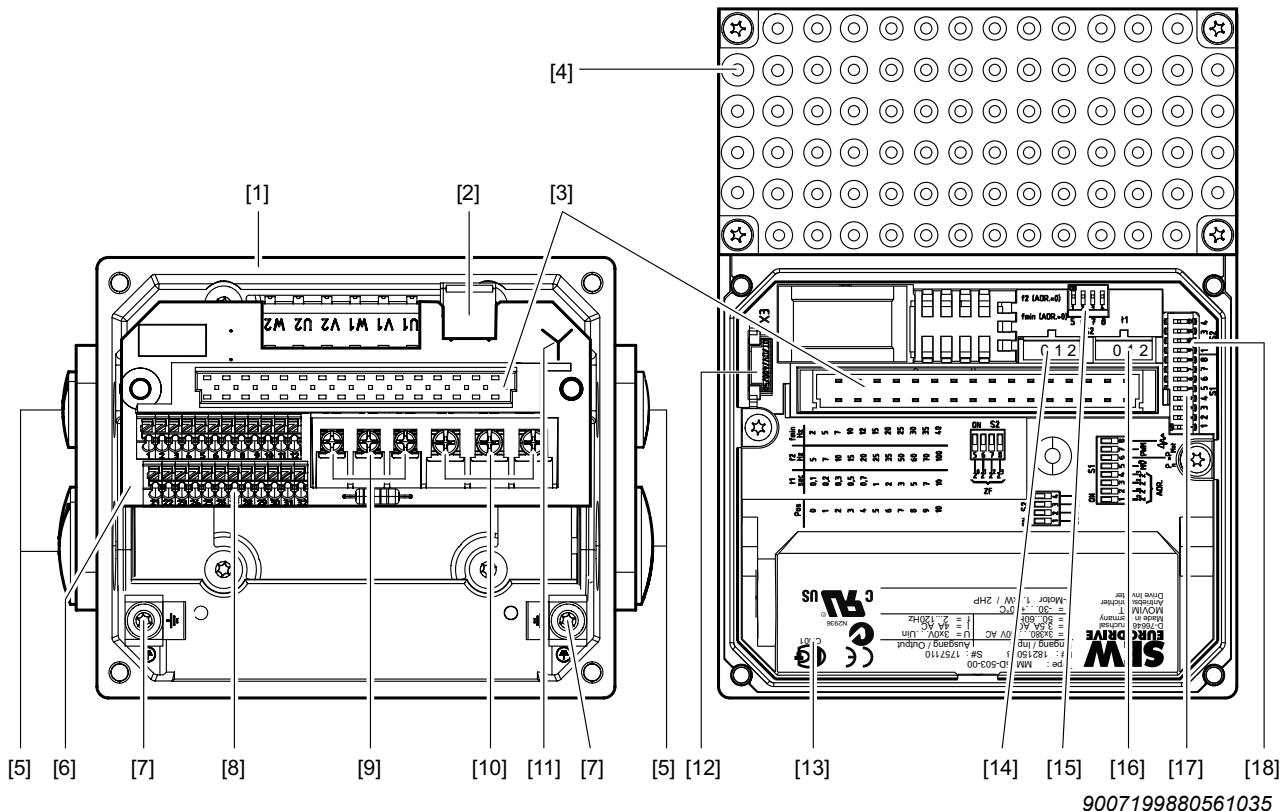
- [1] Unit identification MOVIMOT® inverter
- [2] MOVIMOT® inverter
- [3] Connection box
- [4] Motor
- [5] Drive nameplate
- [6] Helical gear unit

A MOVIMOT® drive is a combination of:

- MOVIMOT® inverter
 - mounted on the motor (**A**)
 - or mounting close to the motor (**B**)
- Motor (see the motor operating instructions)
- Gear unit (optional, see gear unit operating instructions)

3.2 MOVIMOT® inverter

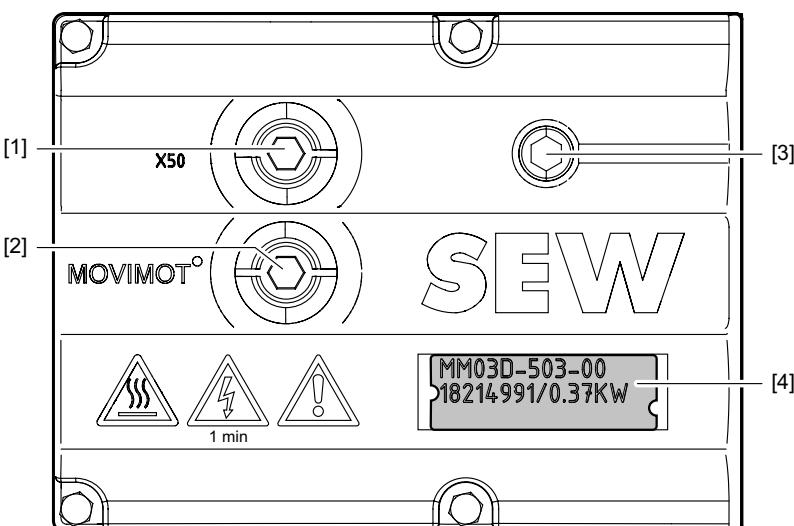
The following figure shows the connection box and the MOVIMOT® inverter:



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- [1] Connection box
- [2] X10: Plug connector for the BEM/BES options
- [3] Connection plug for the MOVIMOT® inverter
- [4] MOVIMOT® inverter with heat sink
- [5] Cable glands
- [6] Connection unit with terminals
- [7] Screw for PE connection \perp
- [8] X5, X6: Electronics terminal strip
- [9] X1: Connection for brake coil (motors with brake) or braking resistor (motors without brake)
- [10] X1: Line connection L1, L2, L3
- [11] Connection type identification
- [12] Drive ID module
- [13] MOVIMOT® inverter nameplate
- [14] Setpoint switch f2 (green)
- [15] DIP switches S2/5 – S2/8
- [16] Switch t1 for integrator ramp (white)
- [17] DIP switches S1/1 – S1/8
- [18] DIP switches S2/1 – S2/4

The following figure shows the top of the MOVIMOT® inverter:



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- [1] X50: Diagnostics interface with screw plug
- [2] Setpoint potentiometer f1 with screw plug
- [3] Status LED
- [4] Device identification

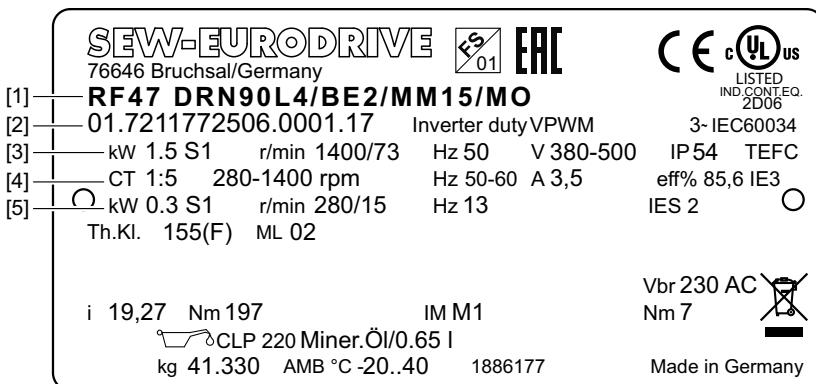
3.2.1 MOVIMOT® device properties

- Frequency inverter with vector-oriented motor control mode
- power range: 0.37 – 4.0 kW (0.37 – 2.2 kW)
- Voltage range: 3 × 380 – 500 V (3 × 200 – 240 V)
- Application-specific parameterization is possible
- Pluggable parameter memory for data backup (drive ID module)
- Comprehensive protection and monitoring functions
- Low-noise thanks to PWM clock frequency 16 kHz
- Status LED for fast diagnostics
- Diagnostic interface with plug connector as a standard feature
- Diagnostics and manual operation using MOVITOOLS® MotionStudio
- 4Q operation as standard
- Integrated brake management:
 - For motors with a mechanical brake, the brake coil is used as the braking resistor.
 - For motors without a brake, MOVIMOT® is supplied with an internal braking resistor as standard.
- The units are controlled either via binary signals, via the serial interface RS485, or optionally with AS-Interface or one of the common fieldbus interfaces (PROFIBUS, PROFINET IO, EtherNET/IP™, EtherCAT®).
- MOVIMOT® can be supplied with UL approval (UL listed) on request.

3.3 MOVIMOT® drive type designation

3.3.1 Nameplate

The following figure shows an example of a MOVIMOT® drive nameplate. The nameplate is located on the motor.



9007219363471115

	Value	Meaning
[1]	RF47 DRN90L4..	Type designation
[2]	01.412153807..	Serial number
	Inverter duty VPWM	Suitability for inverter operation
	3~IEC60034	Number of phases and applied rated and power standards
[3]	kW 1.5 S1	Rated power of the drive unit/operating mode according to EN 60034-1
	r/min 1400/73	Rated speed of the drive unit, motor/gear unit
	Hz 50	Rated motor frequency
	V 380-500	Nominal input voltage of the drive unit
	IP54	Degree of protection according to IEC 60034-5
	TEFC	Type of motor cooling according to EN 60034-6
[4]	CT 1:5	Speed setting range at constant torque
	280 – 1400 rpm	Speed range of the drive unit at constant torque
	Hz 50-60	Drive unit input frequency
	A 3.5	Nominal input current of the drive unit
	eff% 85.6	Rated efficiency for the motor at line operation included in the validity of the IEC 60034-30-1 standard
	IE3	IE class of the motor at line operation according to IEC 60034-30-1
[5]	kW 0.3 S1	Power rating of the drive unit at lower limit speed/operating mode according to EN 60034-1
	r/min 280/15	Lower limit speed of the drive unit
	Hz 13	Motor frequency at lower limit speed
	IES 2	System efficiency class according to EN 50598-2



35286149515



Product label with QR code. The QR code can be scanned. You will be redirected to the digital services of SEW-EURODRIVE. There, you have access to product-specific data, documents, and additional services.

FS logo



The markings on the top edge of the nameplate are only shown if

- The motor has been manufactured accordingly
- And contains one or more safety-related components.

The FS logo on the nameplate is based on the combination of safety-related components that is installed.

3.3.2 Type designation

The following table shows an example of the type designation of the MOVIMOT® drive **RF47 DRN90L4BE2/MM15/MO**:

RF	Gear unit series
47	Gear unit size
DRN..	Motor series (DR2S, DRS.., DRN..)
90L	Motor size
4	Number of motor poles
BE2	Additional motor feature (brake)
/	
MM15	MOVIMOT® inverter
/	
MO	Additional feature: inverter ¹⁾

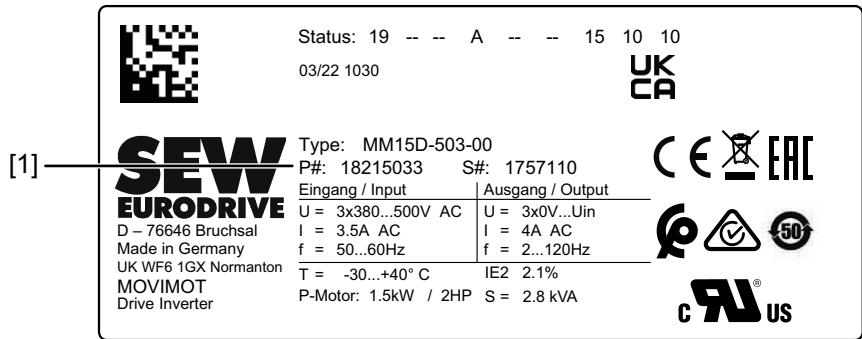
1) The nameplate only displays options installed at the factory.

The available designs can be found in the "MOVIMOT® gearmotors" catalog.

3.4 MOVIMOT® inverter type designation

3.4.1 Nameplate

The following figure provides an example of a MOVIMOT® inverter nameplate:



[1] Part number

3.4.2 Type designation

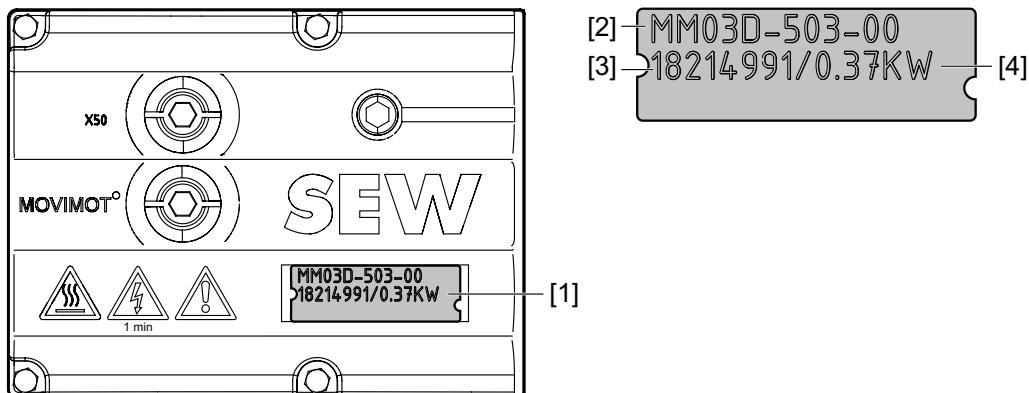
The following table shows an example of the type designation of the MOVIMOT® inverter **MM15D-503-00**:

MM	Series	MM = MOVIMOT®
15	Motor power	15 = 1.5 kW
D	Version D	
-		
50	Connection voltage	50 = AC 380 – 500 V 23 = AC 200 – 240 V
3	Connection type	3 = 3-phase
-		
00	Design	00 = Standard

The available designs can be found in the "MOVIMOT® gearmotors" catalog.

3.4.3 Unit identification

The unit identification [1] on the top of the MOVIMOT® inverter provides information about the inverter type [2], inverter part number [3], unit power [4].



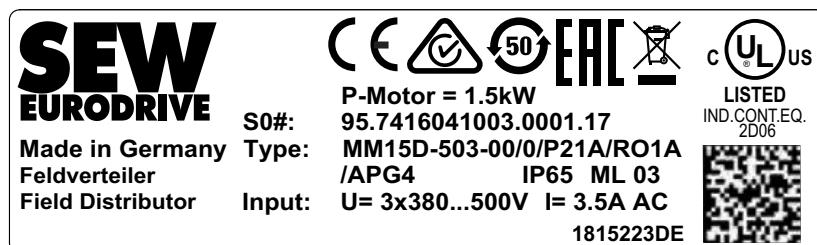
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3.5 Type designation of the "mounted close to the motor" design

3.5.1 Nameplate

Order-specific nameplate

The following figure provides an example of an order-specific nameplate of the MOVIMOT® inverter for mounting close to the motor:



General nameplate

The following figure provides an example of a general nameplate of the MOVIMOT® inverter for mounting close to the motor:

Input:	Output to next Field Distributor:
U= 3x200...500V Imax= -	U= - Imax= -
Input:	Output to drive:
U= 3x200...500V Imax= 1,3...3,5A AC f= 50...60Hz	U= 3x0...Uiinput Imax= 1,6...4,0A AC P-Motor= 0,25...1,5kW

3.5.2 Type designation

The following table shows the type designation for the MOVIMOT® inverter **MM15D-503-00/0/P21/RO1A/APG4** with mounting close to the motor:

MM15D-503-00	MOVIMOT® inverter
/	
0	Connection type 0 = λ 1 = Δ
/	
P21A	Adapter for mounting close to the motor
/	
RO1A	Connection box design
/	
APG4	Plug connector for connection to motor

3.6 Year of manufacture

The year of manufacture is part of the serial number which is indicated on the system nameplate.

01.	1234567890	0001.	21
Sales Organization	Order number (10-digit)	Sequence number of the quantity (4-digit)	Final digits of the year of manufacture (2-digit)

For the case shown, the year of manufacture is 2021.

4 Mechanical installation

4.1 Installation notes

INFORMATION



Observe the general safety notes.



⚠ WARNING

Improper installation/disassembly of MOVIMOT® drives and mount-on components.

Risk of injury.

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



⚠ WARNING

Risk of injury if the drive starts up unintentionally and danger of electrical voltage.

Dangerous voltages may still be present for up to 1 minute after disconnection from the power supply.

- Disconnect the MOVIMOT® drive from the power supply before you start working on the unit and secure it against unintentional reconnection to the voltage supply.
- Secure the output shaft against rotation.
- Wait for at least 1 minute before removing the MOVIMOT® inverter.

- Comply with all instructions referring to the technical data and the permissible conditions where the unit is operated.
- Only use the provided attachment options when mounting the MOVIMOT® drive.
- Use only mounting and locking elements that fit into the existing bores, threads and countersinks.

4.2 Tools required

- Set of wrenches
- Socket wrench, SW8
- Torque wrench
- Screwdriver set
- Compensation elements (washers and spacing rings), if necessary

4.3 Installation requirements

Check that the following requirements are met before you start installing the unit:

- The data on the nameplate of the drive matches the voltage supply system.
- The drive is undamaged (no damage caused by transportation or storage)

- The ambient temperature corresponds to the specifications in chapter "Technical data" of the operating instructions. Note that the temperature range of the gear unit may also be restricted, see gear unit operating instructions.
- The MOVIMOT® drive must **not** be installed under the following harmful ambient conditions:
 - In potentially explosive atmospheres
 - Oils
 - Acids
 - Gases
 - Vapors
 - Radiation
 - etc.
- When the drive is installed in abrasive ambient conditions, protect the output end oil seals against wear.

4.4 Installation of MOVIMOT® gearmotor

4.4.1 Installation tolerances

The following table shows the permitted tolerances of the shaft ends and flanges of the MOVIMOT® drive.

Shaft end	Flange
<p>Diameter tolerance according to EN 50347</p> <ul style="list-style-type: none"> • ISO j6 with $\varnothing \leq 26$ mm • ISO k6 with $\varnothing \geq 38$ mm up to ≤ 48 mm • ISO m6 at $\varnothing > 55$ mm • Centering bore in accordance with DIN 332, shape DR.. 	<p>Centering shoulder tolerance in accordance with EN 50347</p> <ul style="list-style-type: none"> • ISO j6 with $\varnothing \leq 250$ mm • ISO h6 with $\varnothing > 300$ mm

4.4.2 Installing MOVIMOT®

NOTICE

Loss of guaranteed degree of protection if the MOVIMOT® inverter is installed incorrectly or not at all.

Damage to the MOVIMOT® inverter.

- When removing the MOVIMOT® inverter from the connection box, it must be protected from dust and moisture.

Observe the following information and regulations for mounting the MOVIMOT® drive:

- Only install the MOVIMOT® drive on a level, low-vibration, and torsionally rigid support structure.
- Observe the permitted mounting position on the drive nameplate.
- Thoroughly remove any anti-corrosion agent from the shaft end. Use a commercially available solvent. Do not allow the solvent to penetrate the bearings and sealing rings (damage to the material).
- Align the motor carefully to avoid placing any unacceptable strain on the motor shafts. Observe the permitted overhung and axial loads specified in the "MOVIMOT® gearmotors" catalog!
- Do not jolt or hammer the shaft end.
- Use an appropriate cover to prevent objects or fluids from entering motors in vertical mounting positions.
- Ensure sufficient clearance around the unit to allow for adequate cooling air supply. Ensure that exhaust air warmed by other devices cannot be drawn in.
- Balance components that were subsequently mounted to the shaft with a half key (output shafts are balanced with a half key).
- The condensation drain holes are sealed with plastic plugs. Unplug them only if necessary.

Open condensation drain holes are not permitted. If condensation drain holes are open, higher degrees of protection are no longer possible.

4.4.3 Installation in damp locations or in the open

Observe the following notes for mounting the MOVIMOT® drive in damp areas or in the open:

- Use suitable cable glands for the incoming cables. Use reducing adapters if necessary.
- Coat the threads of the cable glands and screw plugs with sealing compound and tighten them properly. Then coat the cable glands again.
- Seal the cable entry properly.
- Thoroughly clean the sealing surfaces of the MOVIMOT® inverter before re-assembly.
- If the corrosion protection coating is damaged, restore the coating.
- Check whether the degree of protection specified on the nameplate is permitted in the ambient conditions on site.

4.5 Installation of MOVIMOT® options

4.5.1 Installing options MLU11A/MLU12A/MLG..A

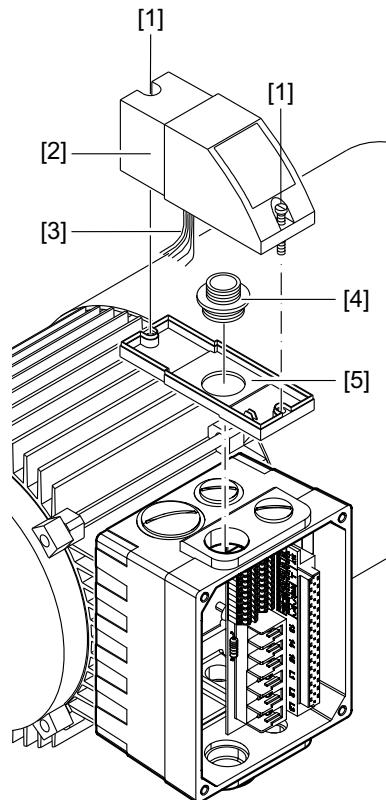
Scope of delivery

- MLU11A / MLU21A / MLG..A upper part [2]
- 2 screws [1]
- Transit bolt [4]
- MLU11A / MLU21A / MLG..A lower part [5]

Assembly

1. Remove a screw plug on the MOVIMOT® connection box.
2. Fix the lower part [5] on the MOVIMOT® connection box. Secure it with a transit bolt [4] (tightening torque 2.5 Nm).
3. Route the connection cable [3] through the transit bolt [4] into the inside of the MOVIMOT® connection box.
4. Fit the upper part [2] onto the lower part [5] and secure it with two screws [1] (tightening torque 0.9 to 1.1 Nm).

Only install the option in the following position:



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For information on connecting the MLU11A / MLU21A option, refer to chapter "Connection of MLU11A/MLU21A option" (→ 53).

For information on connecting the MLG..A option, refer to chapter "Connection of MLG..A option" (→ 54).

4.5.2 Installation of MLU13A option

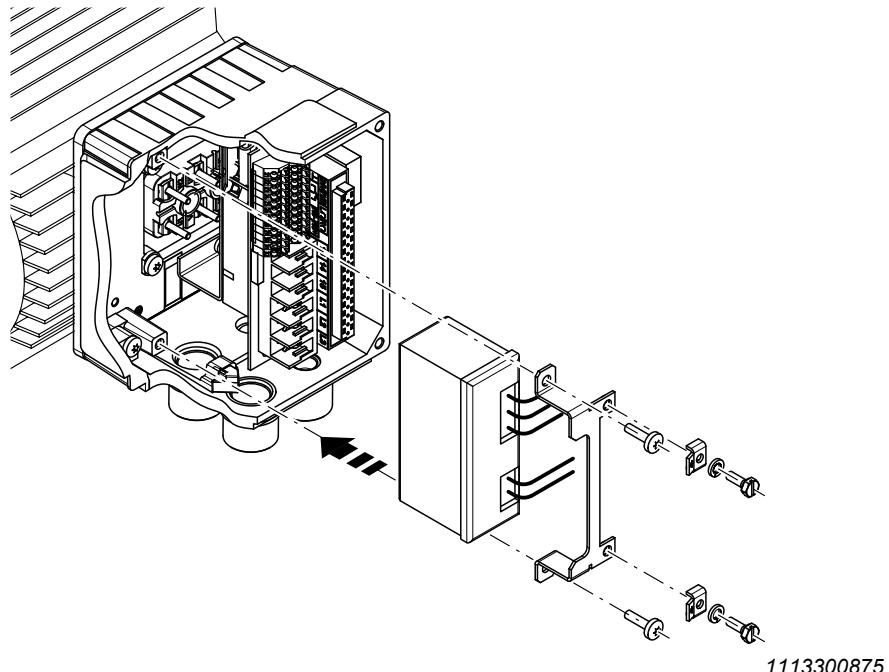
Option MLU13A is installed in the modular connection box at the factory. If you have any questions about retrofitting the option, contact the SEW-EURODRIVE service.

INFORMATION



Installation is only permitted in combination with the modular connection box of MOVIMOT® MM03D-503-00 – MM40D-503-00.

The following figure depicts an installation example. The installation depends on the used connection box and on other installed options, if there are any.



For information on connecting the MLU13A option, refer to chapter "Connection of MLU13A option" (→ 53).

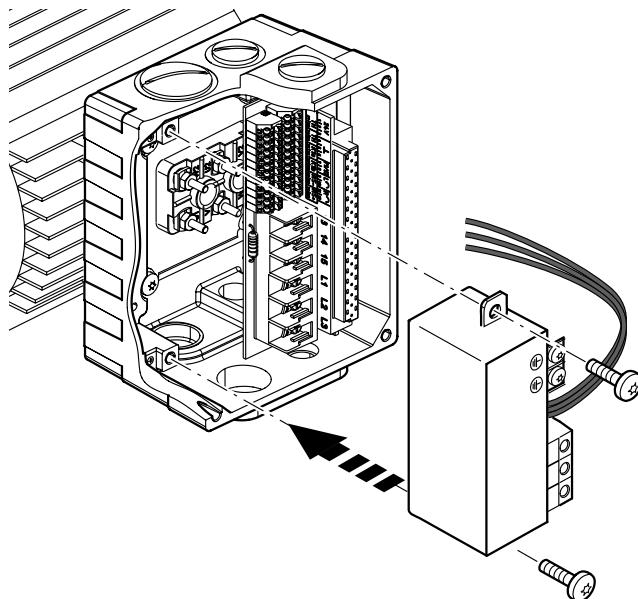
4.5.3 Installation of MNF21A option

The MNF21A option is installed in the modular connection box at the factory. If you have any questions about retrofitting the option, do not hesitate to contact the SEW-EURODRIVE service.

INFORMATION

Only install this option in combination with the modular connection box of MOVIMOT® MM03D-503-00 to MM15D-503-00.

The following figure depicts an installation example. The installation depends on the used connection box and on other installed options, if there are any.



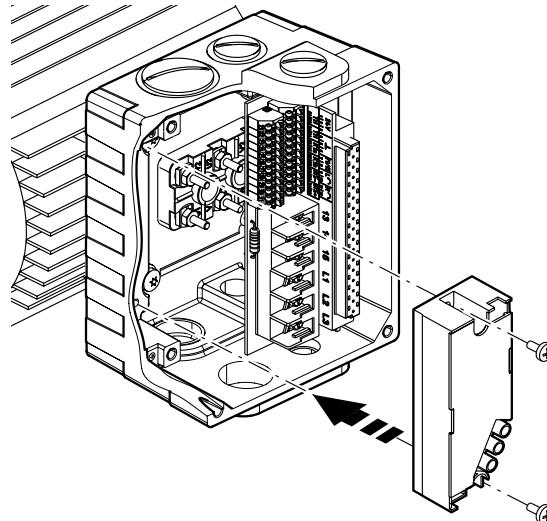
9007202007925643

For information on connecting the MNF21A option, refer to chapter "Connection of MNF21A option" (→ 55).

4.5.4 Installation of URM / BEM / BES options

The URM, BEM and BES options are installed in the connection box at the factory. If you have any questions about retrofitting URM, BEM or BES options, do not hesitate to contact the SEW-EURODRIVE service.

The following figure depicts an installation example. The installation depends on the used connection box and on other installed options, if there are any.



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For information on connecting the URM option, refer to chapter "Connection of URM option" (→ 56).

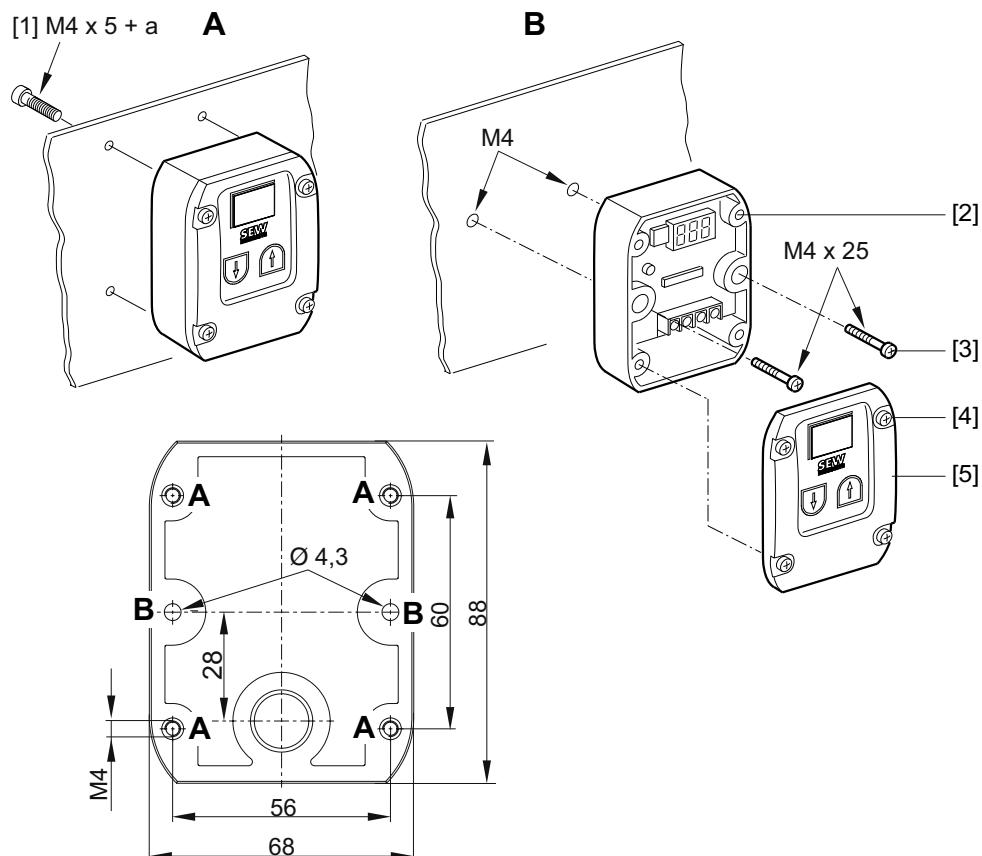
For information on connecting the BEM option, refer to chapter "Connection of BEM option" (→ 57).

For information on connecting the BES option, refer to chapter "Connection of BES option" (→ 58).

4.5.5 Installation of MBG11A option

There are two ways to mount option MBG11A to a wall:

- A:** Mounting from the rear using 4 tapped holes.
(tightening torque of retaining screw [1]: 1.6 – 2.0 Nm)
- B:** Mounting from the front using 2 mounting holes
(tightening torque of retaining screw [3]: 1.6 – 2.0 Nm)



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[1] a = Wall thickness

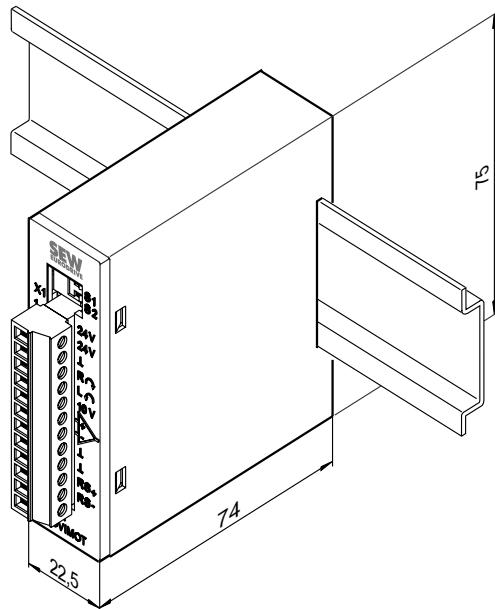
Screws are **not** included in the scope of delivery!

Fit the upper part [5] onto the lower part [2] and secure it with two screws [4] (tightening torque 0.3 Nm).

For information on connecting the MBG11A option, refer to chapter "Connection of MBG11A option" (→ 59).

4.5.6 Installation of MWA21A option

Install MWA21A option in the control cabinet on a mounting rail according to EN 50022:

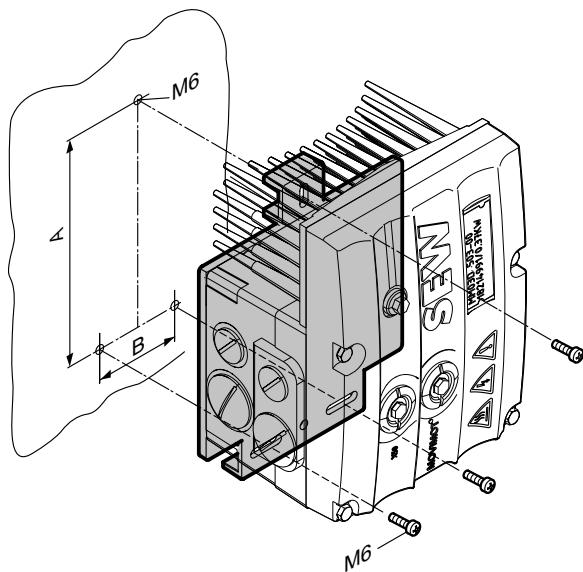


9007199577152907

For information on connecting the MWA21A option, refer to chapter "Connection of MWA21A option" (→ 60).

4.6 Mounting MOVIMOT® inverter close to the motor

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



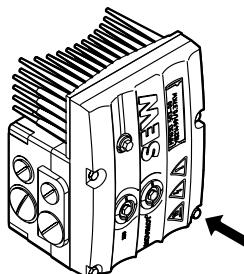
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Size	Type	A	B
1	MM03D503-00 – MM15D-503-00 MM03D233-00 – MM07D-233-00	140 mm	65 mm
2/2L	MM22D503-00 – MM40D-503-00 MM11D233-00 – MM22D-233-00	170 mm	65 mm

4.7 Tightening torques

4.7.1 MOVIMOT® inverter

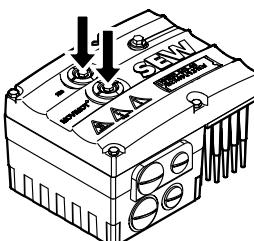
Tighten the retaining screws of the MOVIMOT® inverter to 3.0 Nm in diametrically opposite sequence.



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4.7.2 Screw plugs

Tighten the screw plugs of potentiometer f1 and connection X50 with 2.5 Nm.

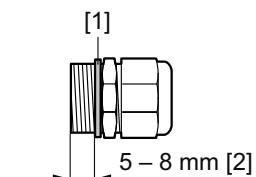


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4.7.3 Cable glands

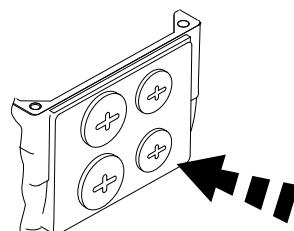
Observe the manufacturer's specifications and the following information for cable glands.

- Pay attention to the O-ring on the thread [1].
- The thread must be 5 – 8 mm long [2].



4.7.4 Screw plugs for cable entries

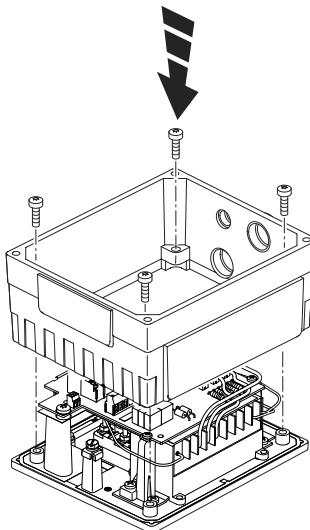
Tighten screw plugs with 2.5 Nm.



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4.7.5 Modular connection box

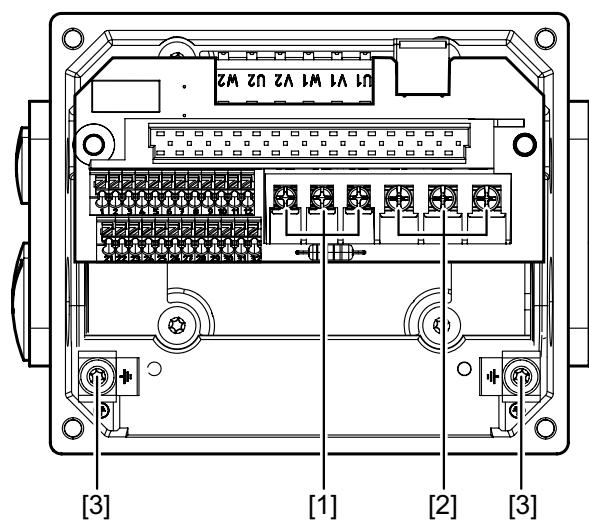
Tighten the retaining screws of the connection box on the mounting plate to 3.3 Nm.



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4.7.6 Tightening torques for terminals

Use the following tightening torques for terminals during installation:



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- [1] 0.8 – 1.5 Nm
- [2] 1.2 – 1.6 Nm
- [3] 2.0 – 2.4 Nm

5 Electrical installation

5.1 Installation notes

Observe the following information on electrical installation:

- Observe the general safety notes.
- Comply with all instructions referring to the technical data and the permissible conditions where the unit is operated.
- Use suitable screw fittings for the cables (use reducing adapters if necessary). With connector plug variants, you must use a suitable mating connector.
- Seal open cable entries with screw plugs.
- Use protective caps to seal plug connectors not in use.

5.2 Installation instructions

5.2.1 Connecting power supply cables

- Nominal voltage and frequency of the MOVIMOT® inverter must match the data of the supply system.
- Install safety features F11/F12/F13 for line fuses at the beginning of the power supply cable behind the supply bus junction, see chapter "Connecting MOVIMOT® drive".

The following safety features are permitted for F11/F12/F13:

- 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.

- SEW-EURODRIVE recommends using insulation monitors with pulse code measurement in voltage supply systems with a non-grounded star point (IT systems). Using such devices prevents false tripping of the insulation monitor due to the earth capacitance of the inverter.
- Size the cable cross section according to the input current I_{grid} for rated power (see operating instructions, "Technical data" chapter).
- For ensuring the isolation and the effectiveness of preventive measures, you have to perform the checks of the valid and applicable standards (e.g. EN 60204-1 or EN 61800-5) after any wiring work for installation, conversion, repair, etc.
- When using a regenerative power supply in the system, SEW-EURODRIVE recommends a line choke in the supply line of the MOVIMOT® drive unit.

5.2.2 Permitted cable cross section of the MOVIMOT® terminals

Power terminals

Observe the permitted cable cross sections for installation:

Power terminals	
Cable cross section	1.0 mm ² – 4.0 mm ² (2 x 4.0 mm ²)
Conductor end sleeves	<ul style="list-style-type: none"> For single assignment: Connect only single-wire conductors or flexible conductors with conductor end sleeves (DIN 46228, material E-CU) with or without plastic collars. For double assignment: Connect only flexible conductors with conductor end sleeve (DIN 46228 - 1, material E-CU) without plastic collar. Permitted length of the conductor end sleeve: at least 8 mm

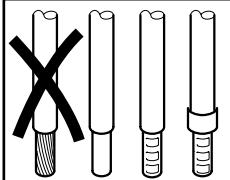
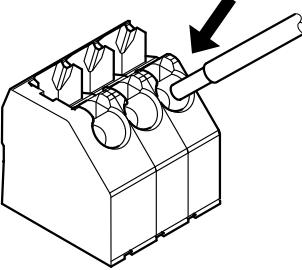
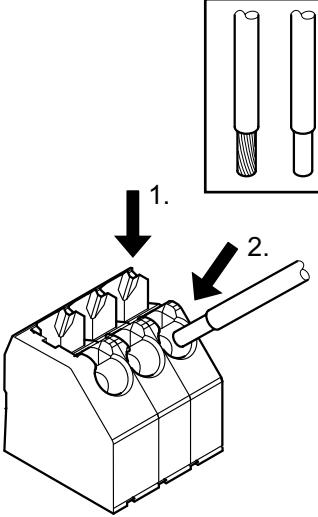
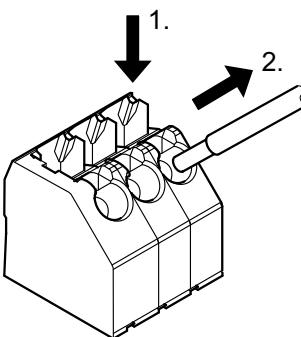
Control terminals

Observe the permitted cable cross sections for installation:

Control terminals	
Cable cross section	0.5 mm ² – 1.0 mm ²
<ul style="list-style-type: none"> Single-wire conductor (bare wire) Flexible conductor (bare litz wire) Conductor end sleeve without plastic collar 	
Conductor end sleeve with plastic collar	0.5 mm ² – 0.75 mm ²
Conductor end sleeves	<ul style="list-style-type: none"> Connect only single-wire conductors or flexible wire conductors with or without conductor end sleeve (DIN 46228, material E-CU). Permitted length of the conductor end sleeve: at least 8 mm

5.2.3 Using the control terminals X5 – X6

Note the following information for actuating the control terminal clamps:

Connect conductor without pressing the activation button.	Connect conductor after pressing the activation button.
  9007199919965835	 9007200623153931
<p>The following conductors can be installed directly (without tools) up to two cross section sizes below the nominal cross section:</p> <ul style="list-style-type: none"> • Single-wire conductors • Flexible conductors with end sleeves 	<p>When connecting the following conductors, you must press the actuation button on top to open the clamping spring:</p> <ul style="list-style-type: none"> • Untreated, flexible conductors • Conductors with small cross sections that cannot be plugged in directly
Removing the conductor. First press the activation button.	
	

Before removing the conductor, first press the activation button on top.

5.2.4 Residual current device**⚠ WARNING**

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

Severe or fatal injuries.

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

5.2.5 Line contactor**NOTICE**

Damage to the MOVIMOT® inverter when using the line contactor for jog mode.

Damage to the MOVIMOT® inverter.

- Do not use the line contactor for jog mode, but only for switching the inverter on and off.
 - Observe a minimum switch-off time of 2 s for the line contactor.
-
- Use only a contactor of utilization category AC3 (EN 60947-4-1) as a line contactor.

Recommendation when using an external 24 V supply: To avoid transient issues when switching on, there should be at least 2 seconds between activation of the 24 V supply and grid.

5.2.6 Information on PE connection

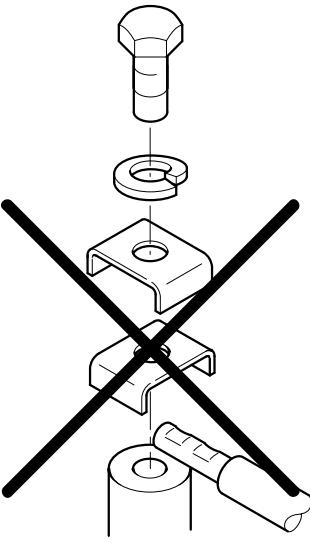
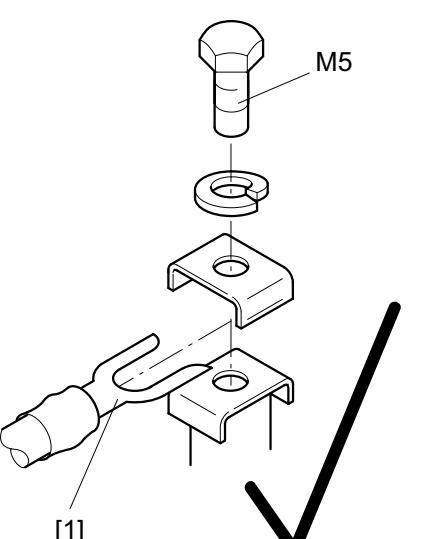
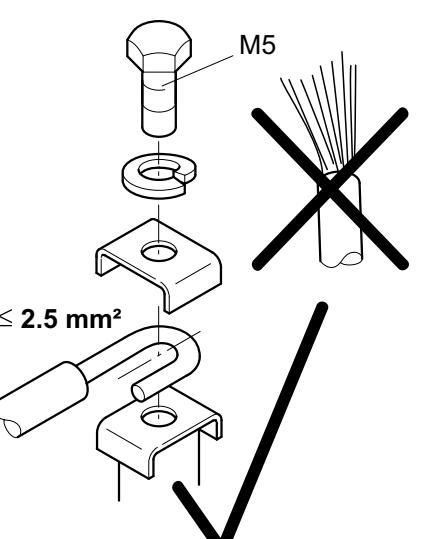
⚠ WARNING



Improperly connecting the PE can cause an electric shock.

Severe or fatal injuries.

- The permitted tightening torque for the screw is 2.0 to 2.4 Nm.
- Observe the following information regarding PE connection.

Impermissible assembly	Recommendation: Assembly with forked cable lug Permitted for all cross sections	Assembly with solid connecting wire Permitted for cross sections up to max. 2.5 mm ²
	 <p>[1]</p> <p>9007199577775243</p>	 <p>M5</p> <p>≤ 2.5 mm²</p> <p>9007199577779339</p>

[1] Forked cable lug suitable for M5 PE screws

Earth-leakage currents ≥ 3.5 mA can develop during normal operation. In order to fulfill EN 61800-5-1, observe the following information:

- The protective earth (PE) ground connection must meet the requirements for systems with high leakage currents.
- This usually means
 - installing a PE connection cable with a minimum cross section of 10 mm²
 - or installing a second PE connection cable in parallel with the original PE connection.

5.2.7 EMC-compliant installation**INFORMATION**

This drive system is not designed for operation on a public low voltage grid 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 suitable measures.

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

5.2.8 Installation above 1000 m amsl

MOVIMOT® drives with line voltages of 200 – 240 V or 380 – 500 V can also be operated at an altitude of 1000 – 3800 m above sea level. Therefore, 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 3800 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.

5.2.9 Connecting the 24 V supply

Power the MOVIMOT® inverter either via an external DC 24 V supply or the MLU..A or MLG..A options.

5.2.10 Binary control

Connect the required control cables

Always use shielded cables as control cables. Route the control cables separately from the power supply cables.

5.2.11 Control via RS485 interface

The MOVIMOT® drive is controlled via the RS485 interface by one of the following controllers:

- MOVIFIT® MC
- MF..or MQ.. fieldbus interfaces
- PLC bus master
- MLG..A option
- MBG11A option
- MWA21A option

INFORMATION



- Only connect one bus master to the MOVIMOT® drive.
- Use twisted pair shielded cables as control cables.
- Route the control cables separately from supply system cables.

5.2.12 Protection devices

MOVIMOT® drives have integrated protection devices against overloads. External overload devices are not necessary.

5.2.13 UL-compliant installation

INFORMATION



Due to UL requirements, the following chapter is always printed in English independent of the language of the documentation.

INFORMATION



The UL label must be attached to the device or in close proximity to the device.

Field wiring power terminals

Z.3 – Z.8:

- Use 60/75 °C copper wire only
- Tighten terminals to 13.3 in-lbs

Z.9:

- Use 75 °C copper wire only
- Tighten terminals to 5 – 7 in-lbs

Short circuit current rating

Suitable for use on a circuit capable of delivering not more than 200,000 rms symmetrical amperes when protected as follows:

For 240 V systems:

250 V minimum, 25 A maximum non-semiconductor fuses or
250 V minimum, 25 A maximum inverse time circuit breakers

The max. voltage is limited to 240 V.

For 500 V systems:

500 V minimum, 25 A maximum, non-semiconductor fuses or
500 V minimum, 25 A maximum, inverse time circuit breakers

The max. voltage is limited to 500 V.

Group installation

For 240 V systems:

Suitable for group installation on a circuit capable of delivering not more than 18,000 rms symmetrical amperes when protected by 25 A maximum nonsemiconductor fuses, Class RK5 and delivering not more than 5,000 rms symmetrical amperes when protected by 25 A maximum inverse time circuit breakers.

For 500 V systems:

Suitable for group installation on a circuit capable of delivering not more than 18,000 rms symmetrical amperes when protected by 25 A maximum nonsemiconductor fuses, Class RK5 and delivering not more than 5,000 rms symmetrical amperes when protected by 25 A maximum inverse time circuit breakers.

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.

For maximum branch circuit protection see table below.

Series	non-semiconductor fuses	inverse time circuit breaker
Field Distributors with attached MOVIMOT® MM..D	250 V / 500 V minimum, 25 A maximum	250 V / 500 V minimum, 25 A maximum

Motor overload protection

Motor overload protection is provided by MOVIMOT® MM..D.

MOVIMOT® MM..D 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

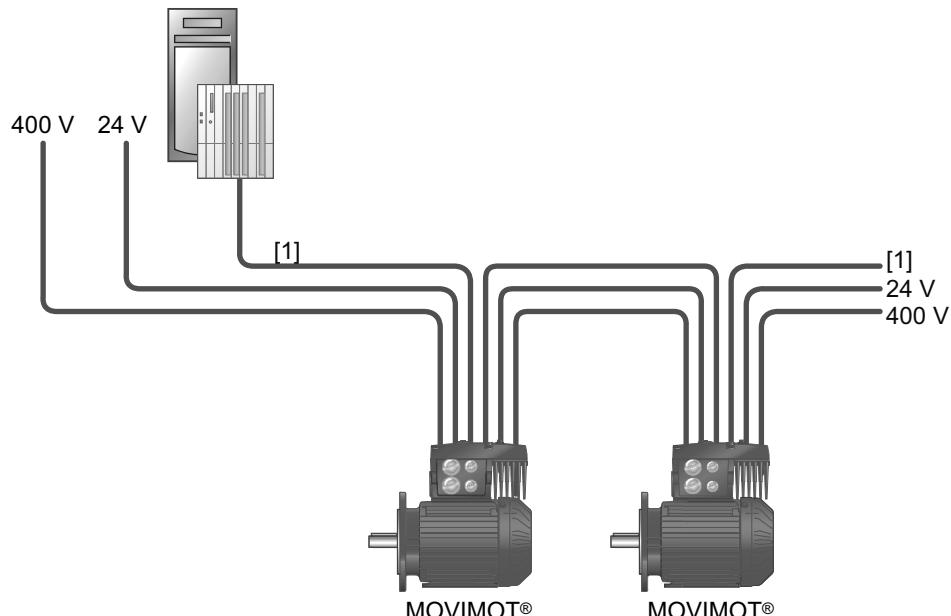
The devices are suitable for an ambient temperature of 40 °C, max. 60 °C respectively 55 °C (Z.9 only) with derated output current. To determine the output current rating at higher than 40 °C, the output current should be derated 3.0 % per °C between 40 °C and 60 °C respectively 55°C (Z.9 only).

- Only use certified units with a limited output voltage ($V_{max} = DC\ 30\ V$) and limited output current ($I \leq 8\ A$) as an external DC 24 V voltage source.
- The UL certification only applies for the operation on voltage supply systems with voltages to ground of max. 300 V. The UL-certification does not apply to operation on voltage supply systems with a non-grounded star point (IT systems).

5.3 Installation topology

5.3.1 Installation topology for MOVIMOT® drive with integrated inverter

The following figure shows the basic installation topology of the MOVIMOT® drive with integrated inverter:

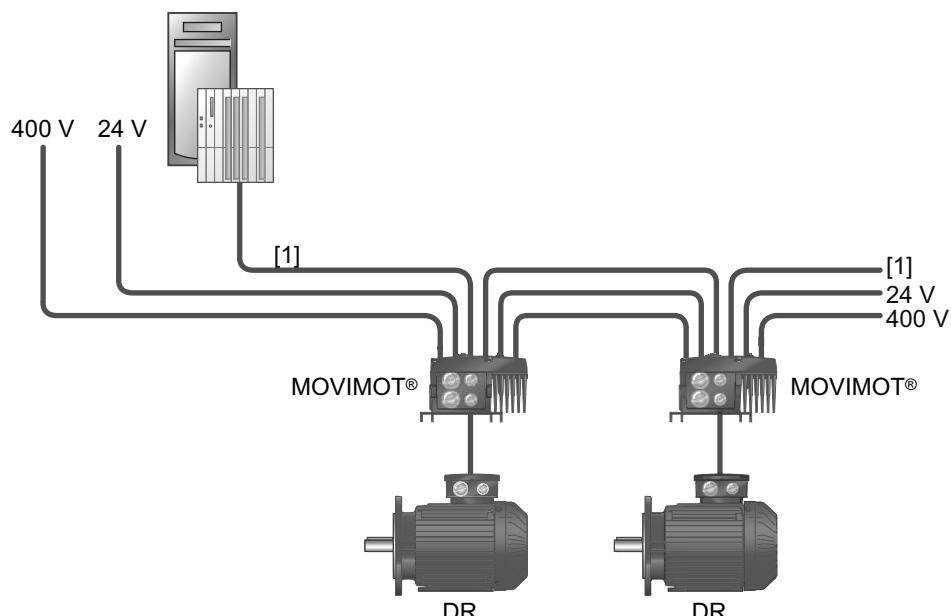


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[1] Control

5.3.2 Installation topology of MOVIMOT®, mounted close to the motor

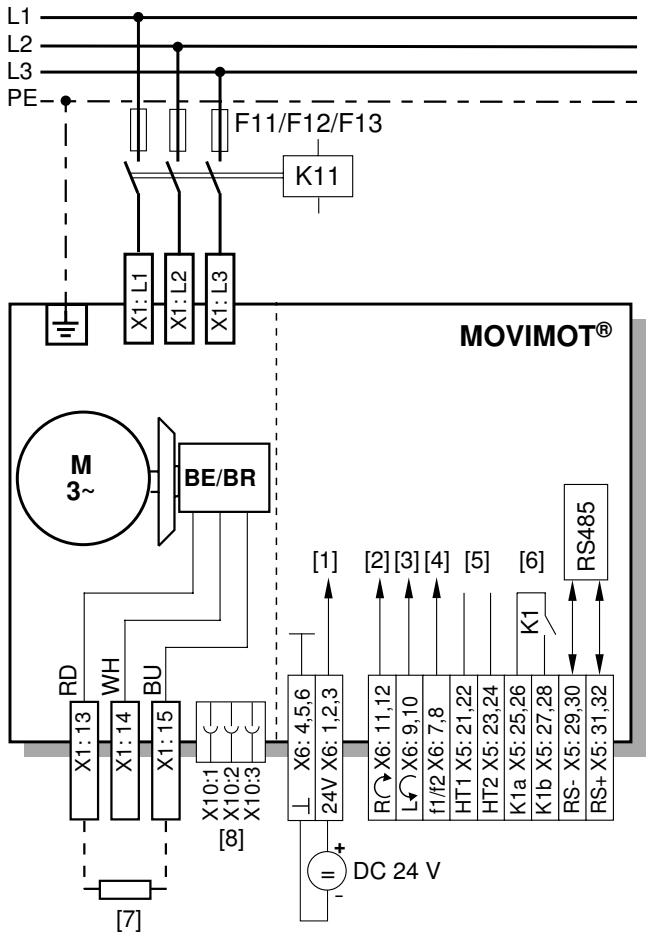
The following figure shows the basic installation topology of the MOVIMOT® drive with installation close to the motor:



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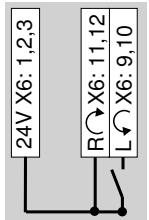
[1] Control

5.4 Connection of MOVIMOT® drive

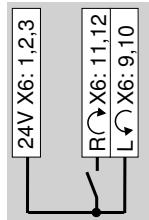


- [1] DC 24 V supply
(external or MLU..A/MLG..A options)
- [2] CW/stop (digital input)
- [3] CCW/stop (digital input)
- [4] Setpoint changeover f1 / f2 (digital input)
- [5] HT1/HT2: Intermediate terminal for specific wiring diagrams
- [6] Ready signal
(contact closed = ready for operation)
- [7] BW.. braking resistor (only for MOVIMOT® drives without mechanical brake)
- [8] Plug connector for connecting the BEM or BES option

Functions of the CW/stop and CCW/stop terminals in binary control mode:

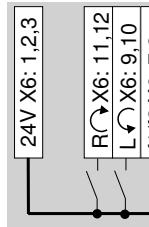
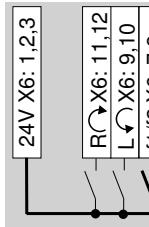


Direction of rotation **CW** active

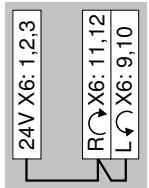


Direction of rotation **CCW** active

Functions of terminals f1/f2:



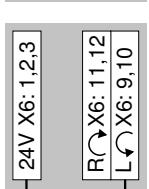
Functions of the CW/stop and CCW/stop terminals with control via RS485 interface/fieldbus:



Both directions of rotation are enabled.

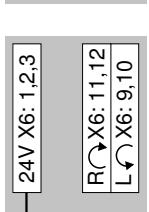
Only **CW** direction of rotation is enabled.

Setpoint specifications for CCW direction of rotation cause the drive to stop.



Only **CCW** direction of rotation is enabled.

Setpoint specifications for CW direction of rotation cause the drive to stop.



Drive is blocked or brought to a stop.

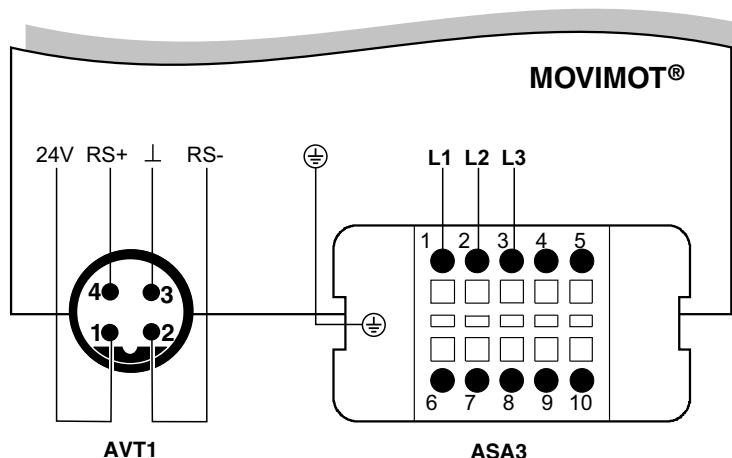
5.5 MOVIMOT® plug connector

5.5.1 AVT1, ASA3 plug connectors

The following figure shows the assignment of the optional AVT1 and ASA3 plug connectors.

Available variants:

- MM../ASA3
- MM../AVT1
- MM../ASA3/AVT1



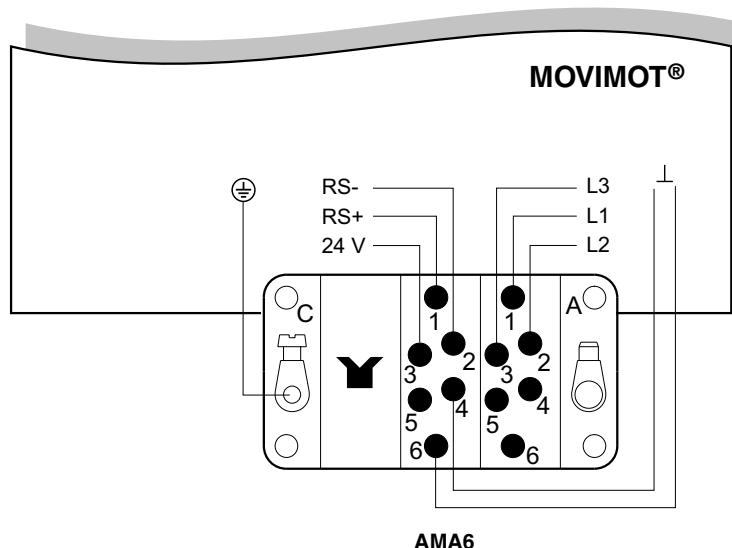
9007199578571147

5.5.2 AMA6 plug connector

The following figure shows the assignment of the optional AMA6 plug connector.

Possible design:

- MM../AMA6



18014398833361547

For designs with plug connectors, both directions of rotation are enabled as standard.
If only one direction of rotation is required, please note chapter "Connecting MOVIMOT® drive".

5.6 Connection between MOVIMOT® and motor when mounted close to the motor

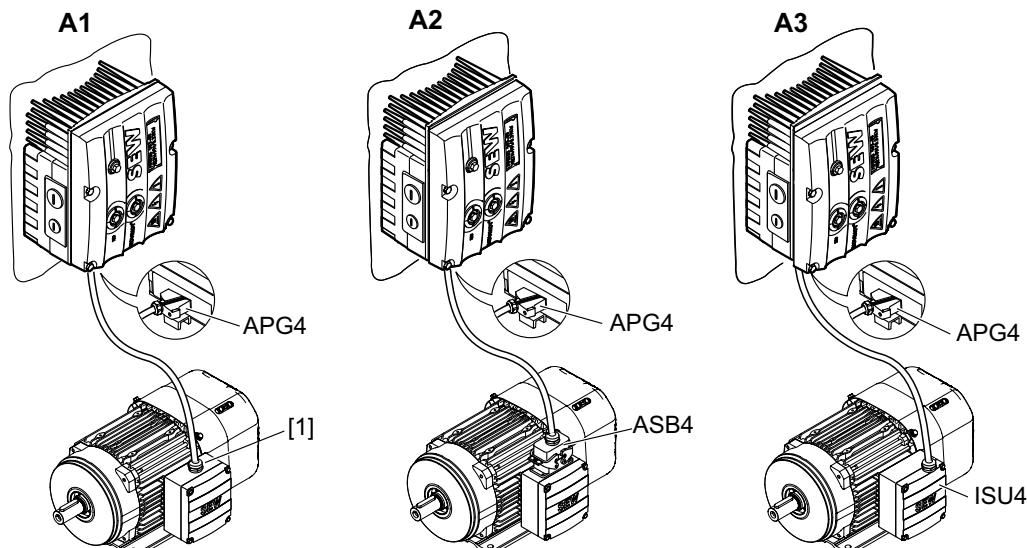
If the MOVIMOT® inverter is mounted close to the motor, the connection to the motor is realized with a pre-fabricated hybrid cable.

Only use hybrid cables from SEW-EURODRIVE for the connection between the MOVIMOT® inverter and the motor.

5.6.1 MOVIMOT® with APG4 plug connector

The APG4 design results in the following connection options to the motor, depending upon the hybrid cable used:

Design	A1	A2	A3
MOVIMOT®	APG4	APG4	APG4
Motor	Cable gland/terminals	ASB4	ISU4
Hybrid cable	01867423	05930766	08163251 △ for DR.63 0816326X △ for DR.71 – DR.132 05932785 ↘ for DR.63 05937558 ↘ for DR.71 – DR.132



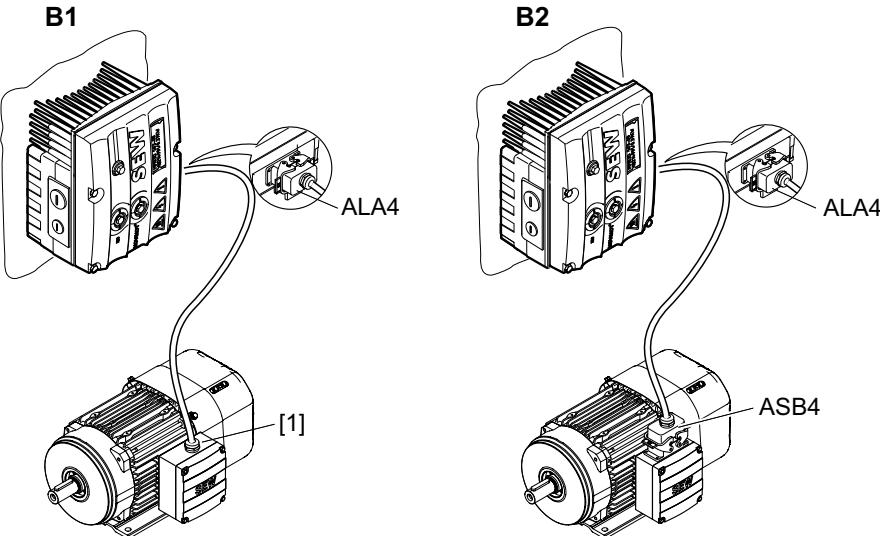
9007199713407627

[1] Connection via terminals

5.6.2 MOVIMOT® with ALA4 plug connector

The ALA4 design results in the following connection options to the motor, dependent upon the hybrid cable used:

Design	B1	B2
MOVIMOT®	ALA4	ALA4
Motor	Cable gland/terminals	ASB4
Hybrid cable	08179484	08162085

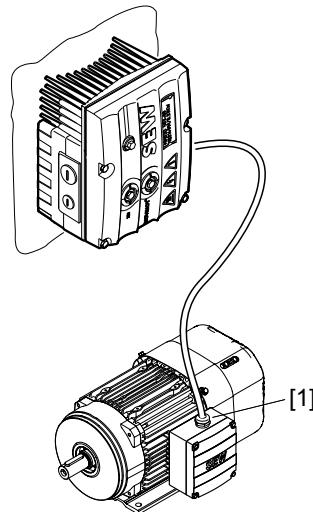


9007199713429131

[1] Connection via terminals

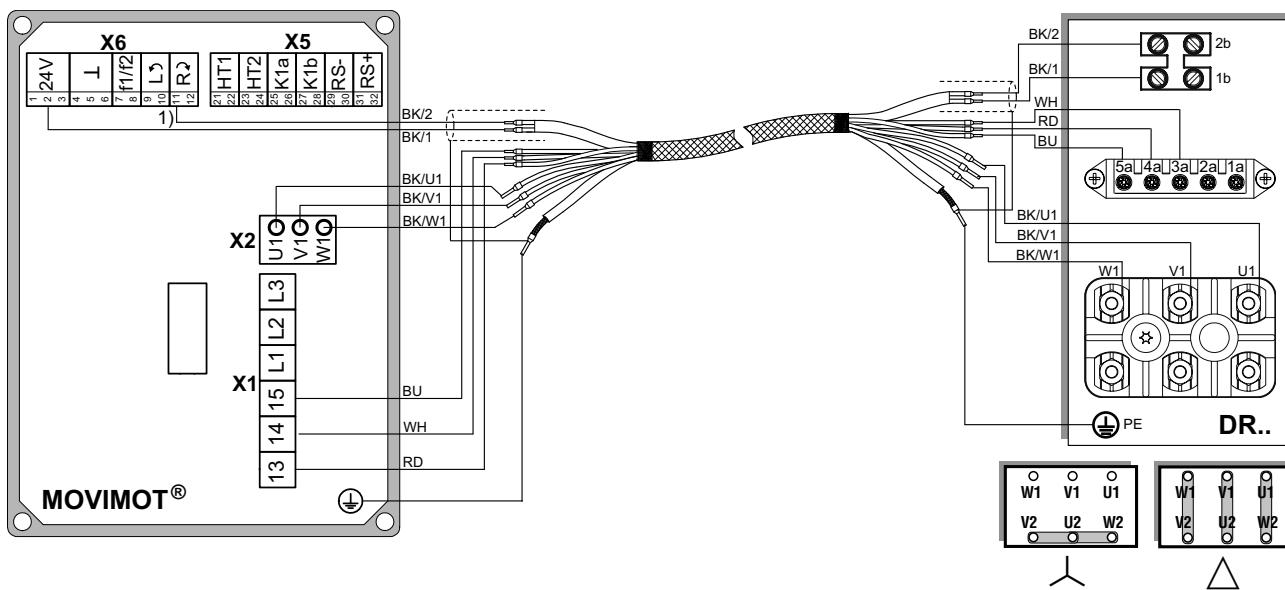
5.6.3 Connecting without plug connector

In the design without plug connector, the motor is connected directly via the terminals of the MOVIMOT®.



34607895691

[1] Connection via terminals



418902229

MOVIMOT® Terminal		Hybrid cable Core color/designation	DR.. motor Terminal
X2	U1	Black/U1	U1
	V1	Black/V1	V1
	W1	Black/W1	W1
X1	13	Red/13	4a
	14	White/14	3a
	15	Blue/15	5a

5

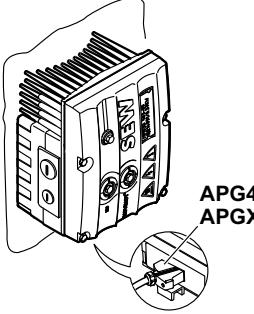
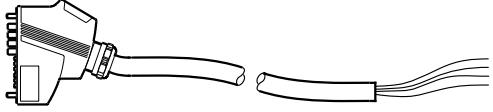
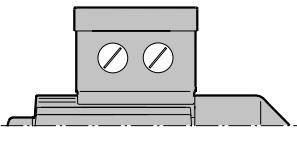
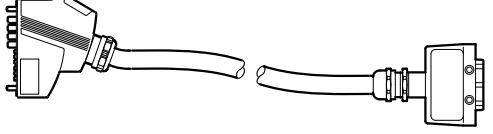
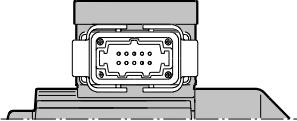
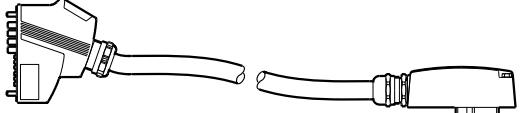
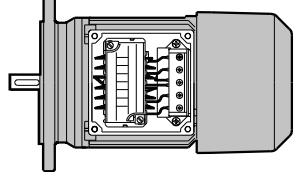
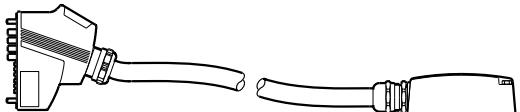
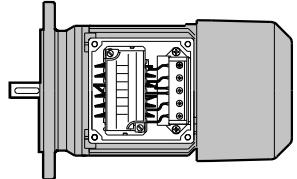
Electrical installation

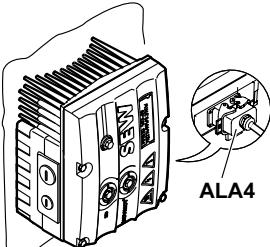
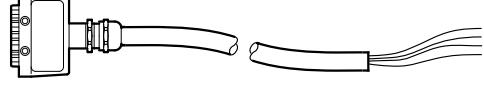
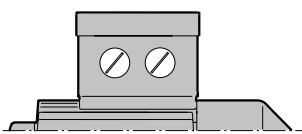
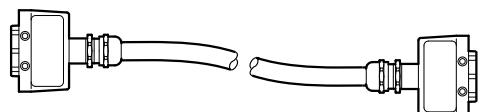
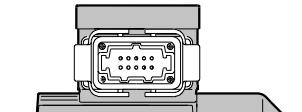
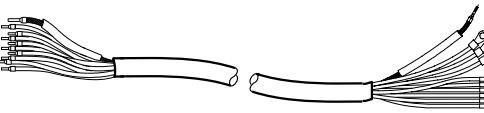
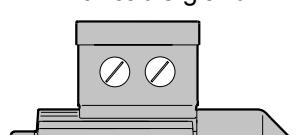
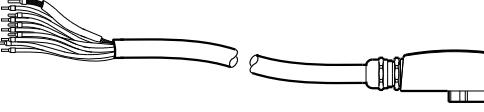
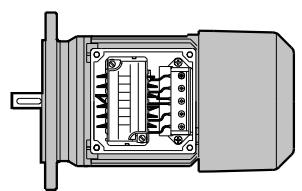
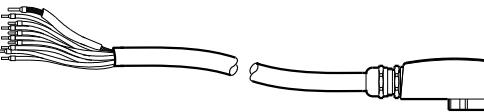
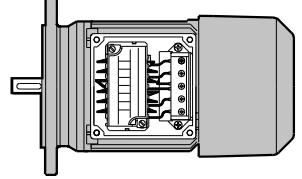
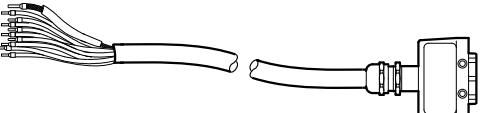
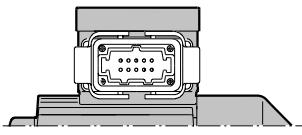
Connection between MOVIMOT® and motor when mounted close to the motor

MOVIMOT® Terminal	Hybrid cable Core color/designation	DR.. motor Terminal
X6 24 V	Black/1	1b
R or L ¹⁾	Black/2	2b
PE connection	Green/yellow + shield end (inner shield)	PE connection

1) Connect the TH cable to terminal "R" (=> CW rotation) or "L" (=> CCW rotation) depending on the required direction of rotation.

5.6.4 Overview of connection between MOVIMOT® and motor for mounting close to the motor

MOVIMOT® inverter	Connection cable	Drive
MM..P2.A/RO.A/APG4 	Part number DR.71 – DR.100: 01867423 Part number DR.112 – DR.132: 18116620 	AC motors with cable gland 
	Part number: 05930766 	AC motors with ASB4 plug connector 
	Part number: 05932785 (⊖) Part number: 08163251 (△) 	AC motors with ISU4 plug connector size DR.63 
	Part number: 05937558 (⊖) Part number: 0816326X (△) 	AC motors with ISU4 plug connector size DR.71 – 132 

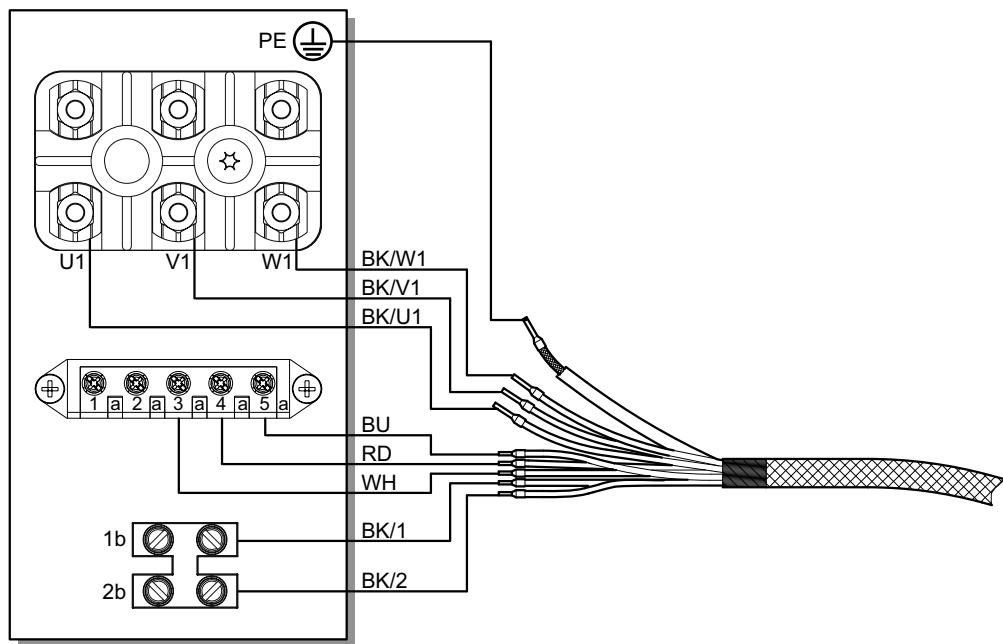
MOVIMOT® inverter	Connection cable	Drive
MM..P2.A/RE.A/ALA4 	Part number: 08179484 	AC motors with cable gland 
	Part number: 08162085 	AC motors with ASB4 plug connector 
MM..P2.A/.. 	Part number: 08184380 	AC motors with cable gland 
	Part number: 08187843 (↙) Part number: 08165262 (△) 	AC motors with ISU4 plug connector size DR.63 
	Part number: 08185336 (↙) Part number: 08178178 (△) 	AC motors with ISU4 plug connector size DR.71 – 132 
	Part number: 05931142 	AC motors with ASB4 plug connector 

5.6.5 Hybrid cable connection

The following table shows the conductor assignment of the hybrid cables with part numbers 01867423 and 08179484 and the corresponding motor terminals of the DR.. motor:

Motor terminal DR.. motor	Wire color/hybrid cable designation
U1	Black/U1
V1	Black/V1
W1	Black/W1
4a	Red/13
3a	White/14
5a	Blue/15
1b	Black/1
2b	Black/2
PE connection	Green/yellow + shield end (inner shield)

The following figure shows how to connect the hybrid cable to the terminal box of the DR.. motor.



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INFORMATION



Do not install an external brake rectifier with brakemotors

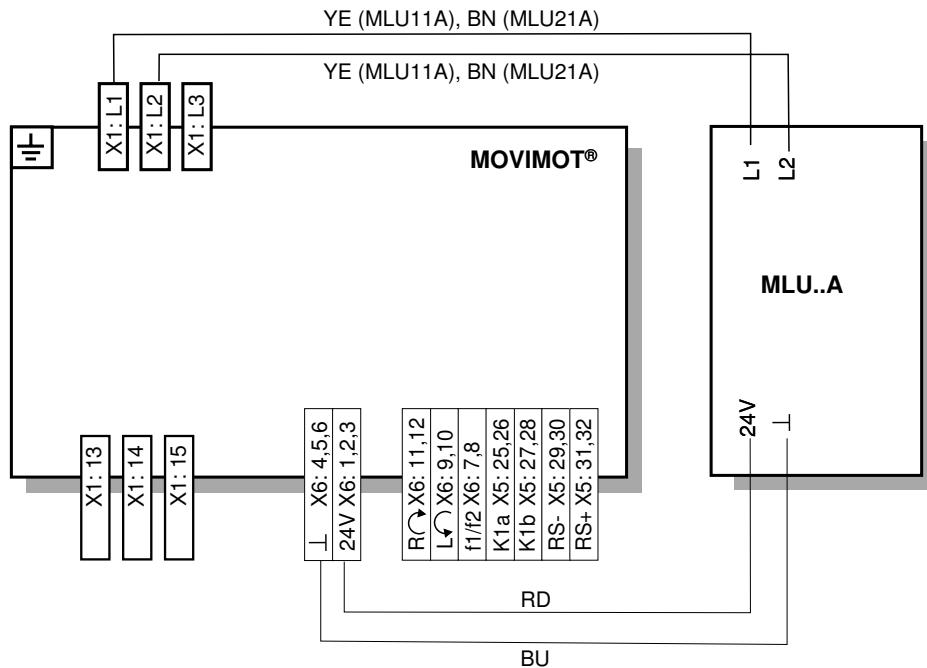
With brakemotors, the MOVIMOT® inverter controls the brake directly

5.7 Connection of MOVIMOT® options

5.7.1 Connection of MLU11A/MLU21A option

For information on installing the MLU11A and MLU21A options, refer to chapter "Installing options MLU11A/MLU12A/MLG..A" (→ 26).

The following figure shows how to connect the MLU11A and MLU21A options:



640436235

5.7.2 Connection of MLU13A option

INFORMATION

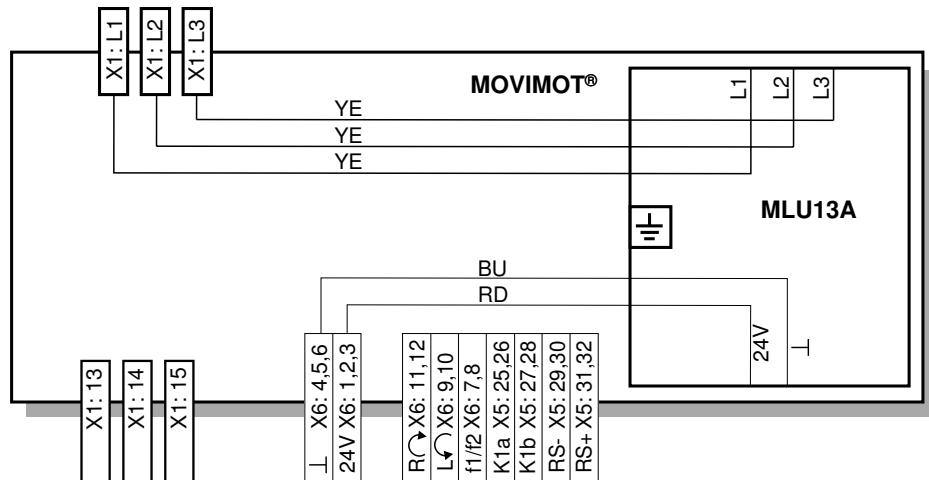


Do not connect PE conductor of power supply cable at bottom in connection box.

Connect PE conductor of power supply cable directly to the MLU13A option, see following figure.

For information about installing the MLU13A option, refer to chapter "Installing options MLU11A/MLU12A/MLG..A" (→ 26).

The following figure shows how to connect the MLU13A option:

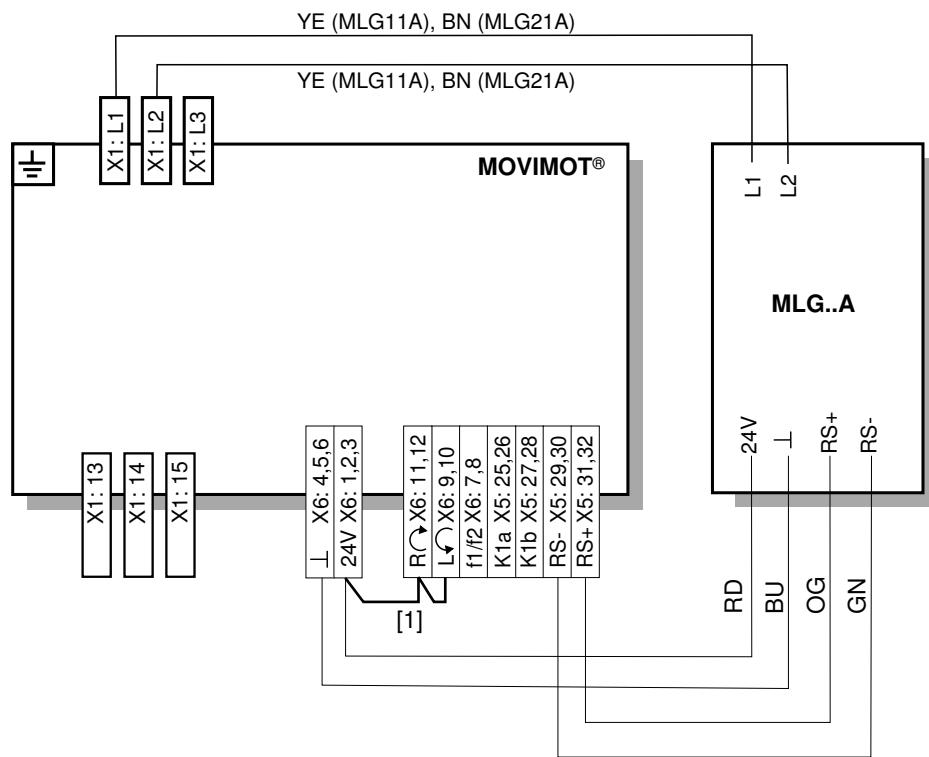


9007199578708363

5.7.3 Connection of MLG..A option

For information about installing the MLG..A option, refer to chapter "Installing options MLU11A/MLU12A/MLG..A" (→ 26).

The following figure shows how to connect the MLG..A option:



641925899

- [1] Note the enabled direction of rotation.

See chapter "Connection of MOVIMOT® drive" (→ 44),

Functions of the CW/Stop and CCW/Stop terminals with control via RS485 interface

5.7.4 Connection of MNF21A option

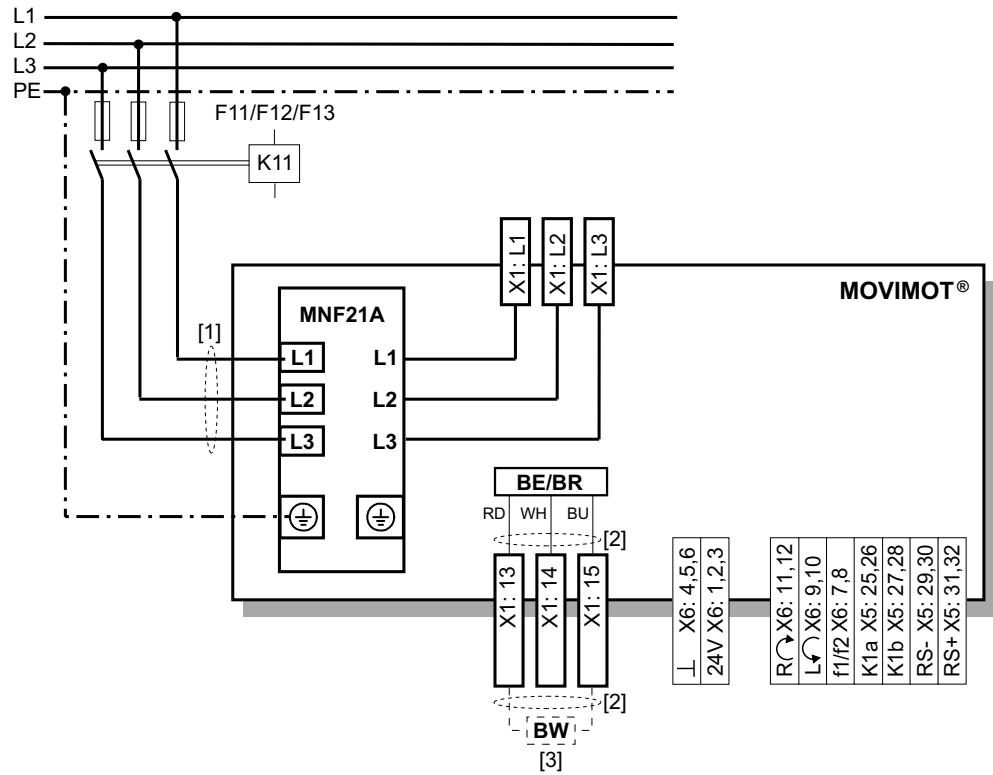
INFORMATION



Installation is only permitted in combination with the modular connection box of MOVIMOT® MM03D-503-00 – MM15D-503-00.

For information about installing the MNF21A option, refer to chapter "Installation of MNF21A option" (→ 28).

The following figure shows how to connect the MNF21A option:



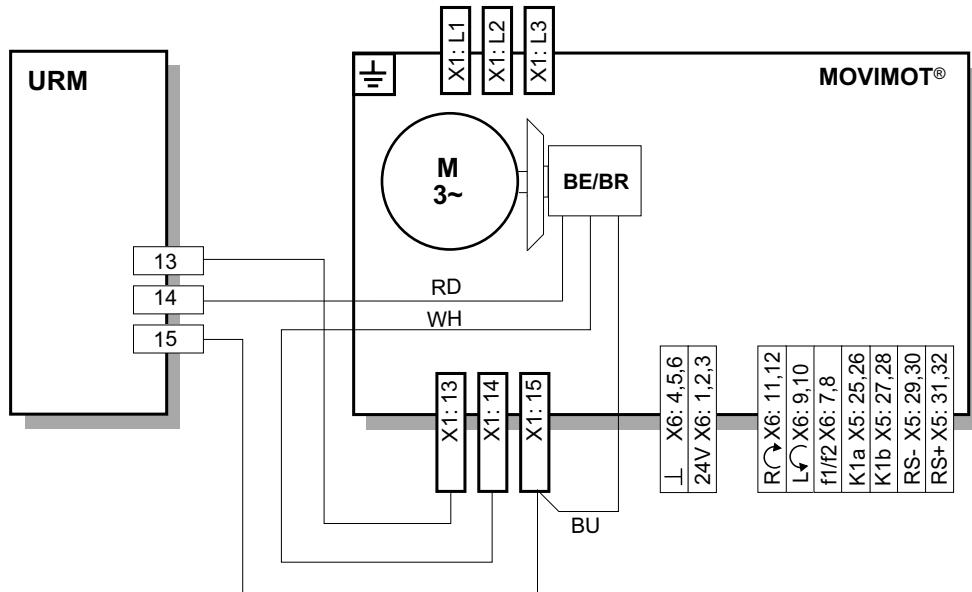
18014400263933707

- [1] Keep the cable length for the power supply as short as possible!
- [2] Keep the length of the brake cables as short as possible!
Do not route the brake cables in parallel, but as far away from the power supply cables as possible!
- [3] BW braking resistor (only in MOVIMOT® without mechanical brake)

5.7.5 Connection of URM option

For information about installing the URM option, refer to chapter "Installation of URM / BEM / BES options" (→ 29).

The following figure shows how to connect the URM option:

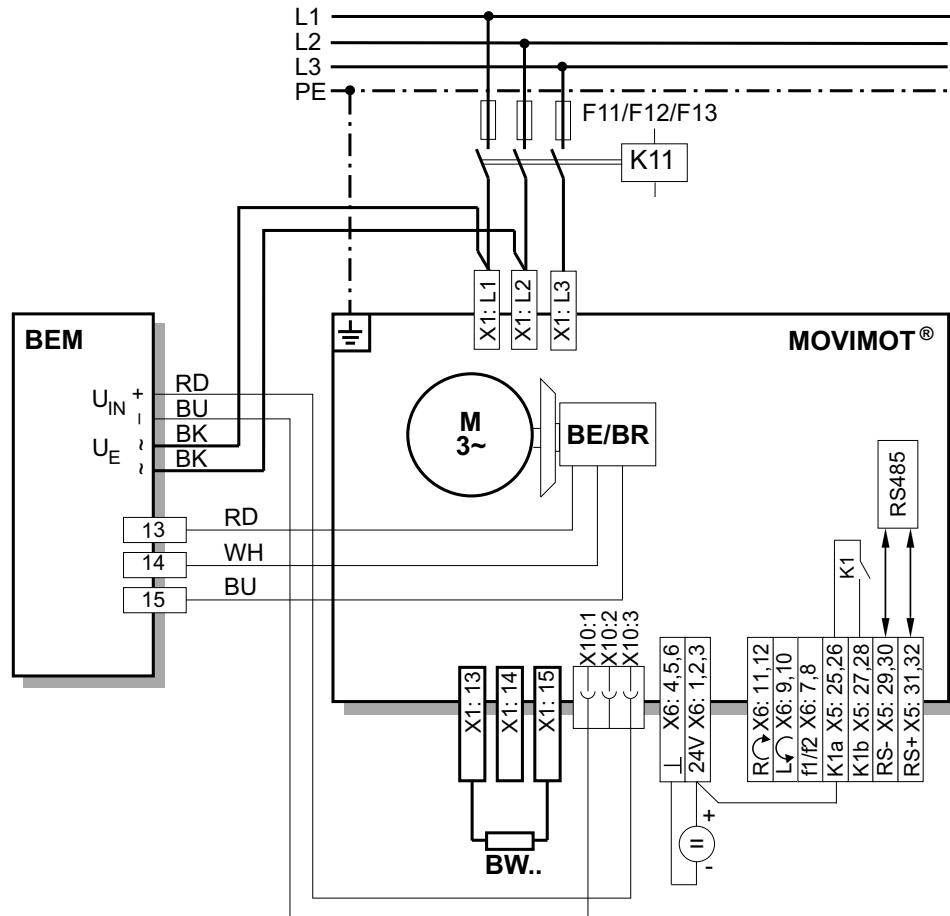


324118411

5.7.6 Connection of BEM option

For information about installing the BEM option, refer to chapter "Installation of URM / BEM / BES options" (→ 29).

The following figure shows how to connect the BEM option:



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5.7.7 Connection of BES option

NOTICE

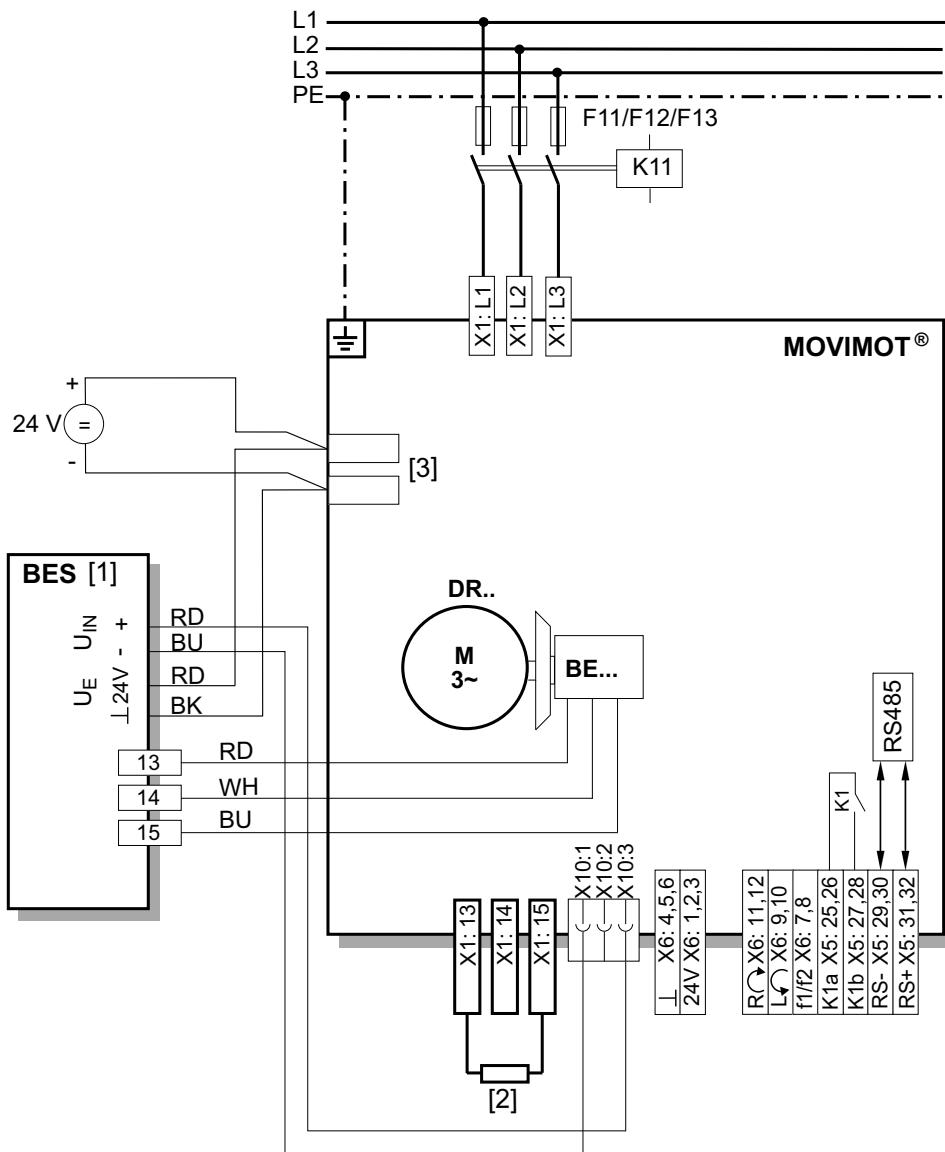
If the connection voltage is too high, the BES option or the brake coil connected to it can be damaged.

Damage to the BES option of the brake coil.

- Select a brake with a DC 24 V brake coil.

For information about installing the BES option, refer to chapter "Installation of URM / BEM / BES options" (→ 29).

The following figure shows how to connect the BES option:



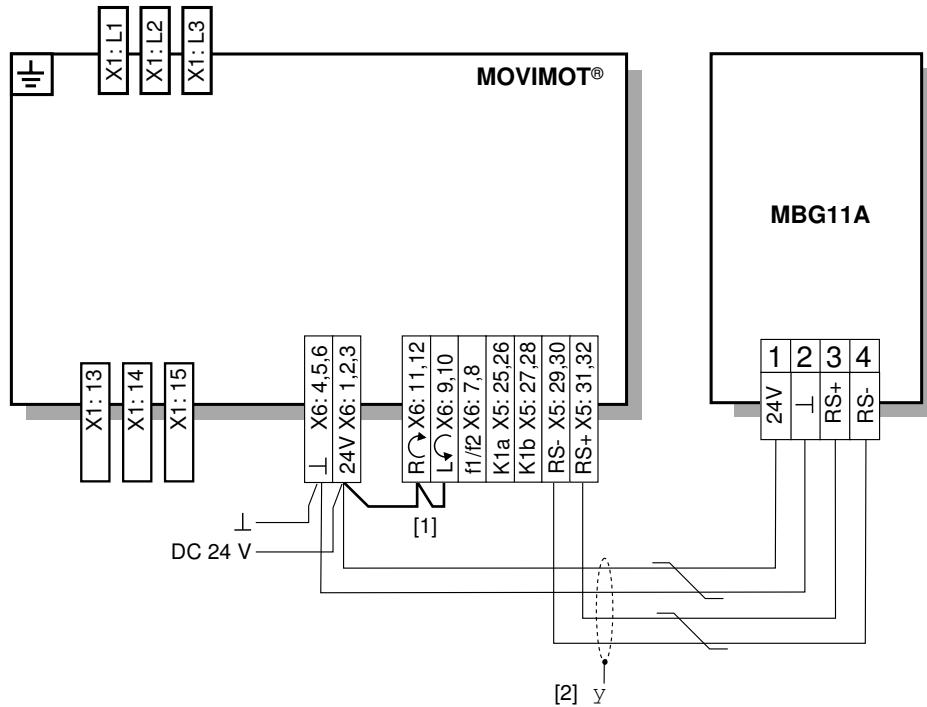
9007200966343307

- [1] BES brake control mounted in the connection box
- [2] External BW braking resistor
- [3] Additional terminals for DC 24 V brake supply

5.7.8 Connection of MBG11A option

For information about installing the MBG11A option, refer to chapter "Installation of MBG11A option" (→ 30).

The following figure shows how to connect the MBG11A option:



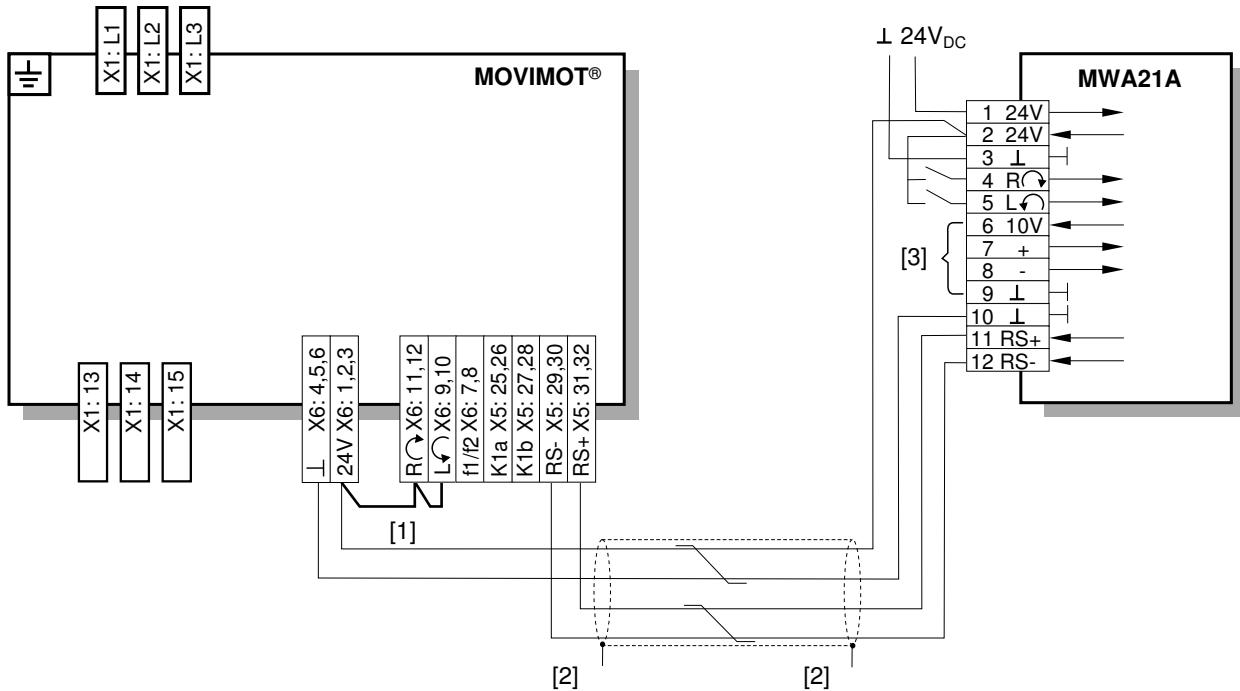
18014398833528715

- [1] Note the enabled direction of rotation.
See chapter "Connection of MOVIMOT® drive" (→ 44),
Functions of the CW/Stop and CCW/Stop terminals with control via RS485 interface
- [2] EMC metal cable gland

5.7.9 Connection of MWA21A option

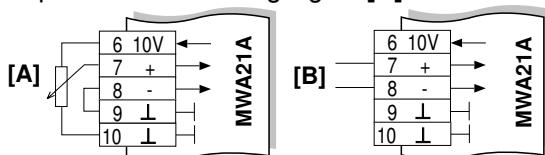
For information about installing the MWA21A option, refer to chapter "Installation of MWA21A option" (→ 31).

The following figure shows how to connect the MWA21A option:



324061323

- [1] Note the enabled direction of rotation.
See chapter "Connection of MOVIMOT® drive" (→ 44),
Functions of the CW/Stop and CCW/Stop terminals with control via RS485 interface
- [2] EMC metal cable gland
- [3] Potentiometer using the 10 V reference voltage [A]
or potential-free analog signal [B]



5.7.10 Connection of forced cooling fan V

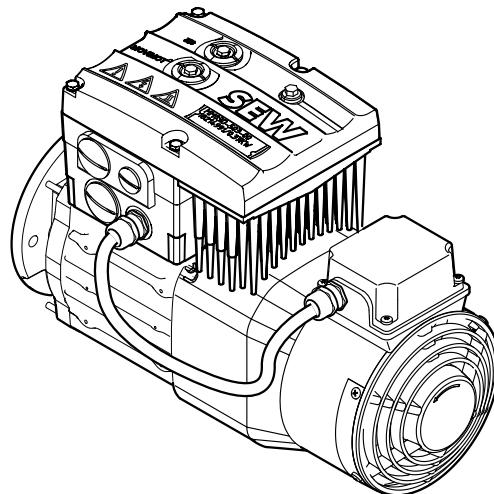
The AC motors in the DR.. series are also available with the forced cooling fan V. Using the forced cooling fan V extends the setting range of the setpoint speed. This means that speeds from 150 min^{-1} (5 Hz) can be realized continuously.

INFORMATION



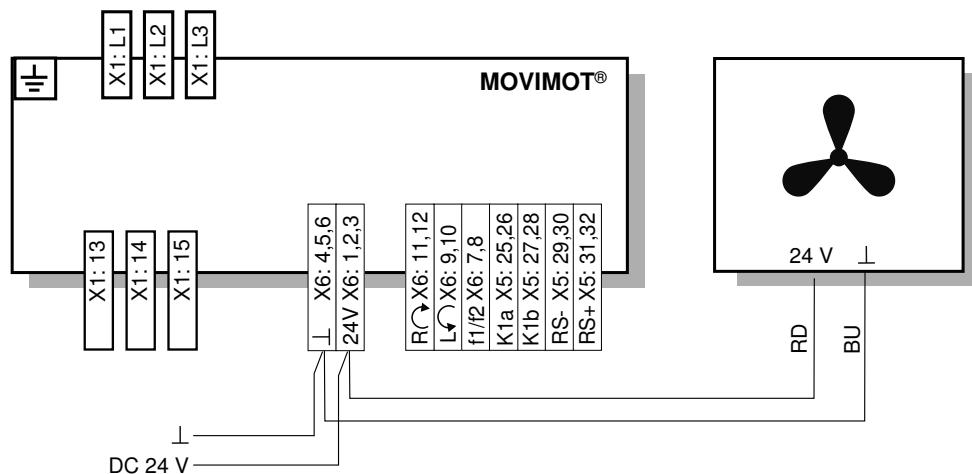
- For motors with V forced cooling fans, the *P341 type of cooling* parameter must be set to "forced air cooling".
- When using MOVIMOT® drives with functional safety (STO), do not connect the forced cooling fan to the connection box. Instead, use an external DC 24 V supply to supply the forced cooling fan with power.

The following figure shows the cable routing of the forced cooling fan cable for MOVIMOT® drives (without functional safety):



18014401679145483

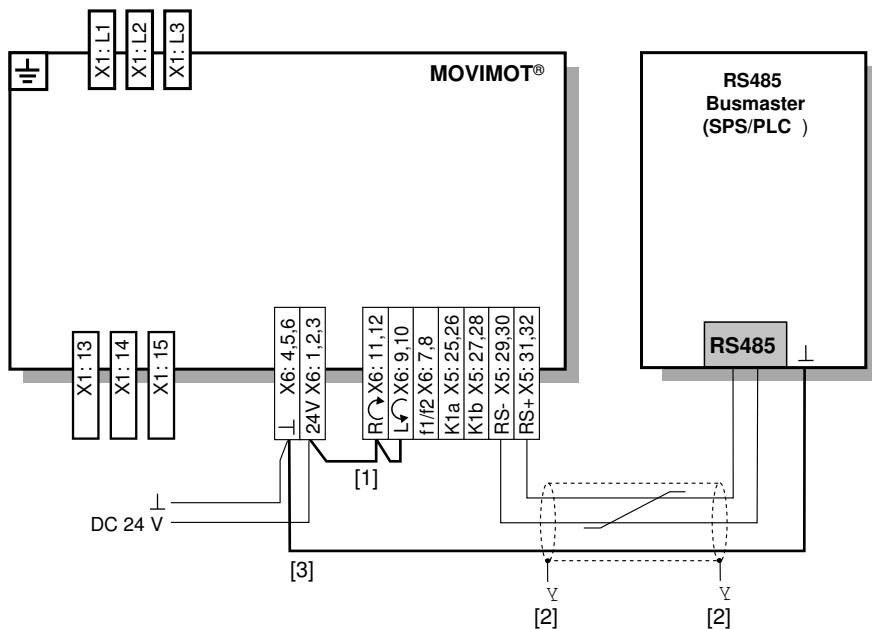
The following figure shows an example connection for the V forced cooling fan (only for MOVIMOT® drives without functional safety):



9007202436852107

5.8 Connection of the RS485 bus master

The following figure shows how to connect an RS485 bus master:



27021598088512523

- [1] Note the enabled direction of rotation.
See chapter "Connection of MOVIMOT® drive" (→ 44), Functions of the CW/stop and CCW/stop terminals with control via RS485 interface
- [2] EMC metal cable gland
- [3] MOVIMOT®/RS485 master equipotential bonding

5.9 Connection of DBG keypad

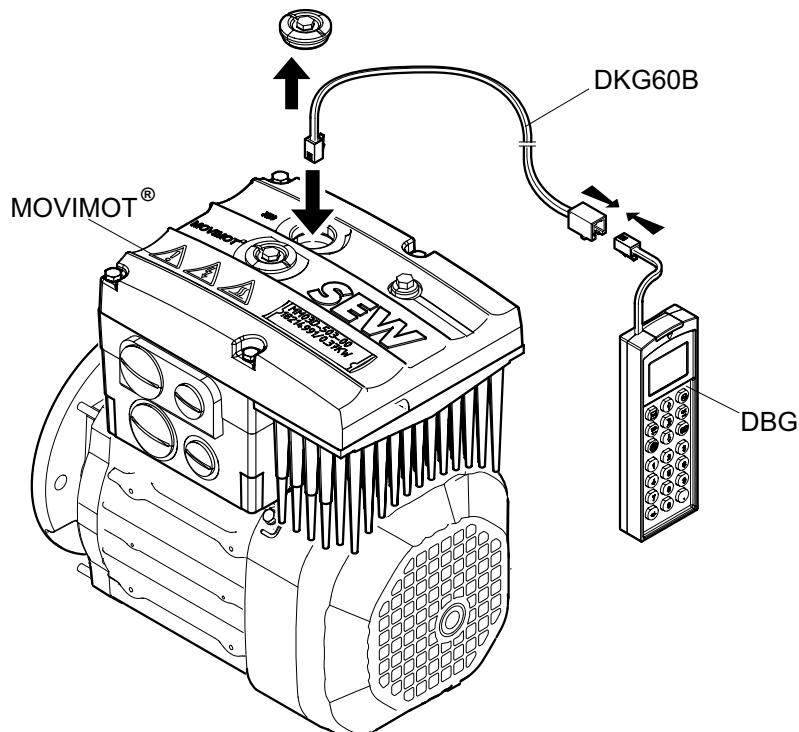
MOVIMOT® drives are equipped with an X50 diagnostic interface (RJ10 plug connector) for startup, parameterization and service.

The X50 diagnostic interface is located underneath the screw plug on top of the MOVIMOT® inverter.

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

⚠ WARNING! Risk of burns due to hot surfaces of the MOVIMOT® drive (especially the heat sink). Serious injuries.

Wait for the MOVIMOT® drive to cool down sufficiently before touching it.



18014399653617291

You can also connect the DBG keypad to the MOVIMOT® drive using option DKG60B (5 m extension cable).

Extension cable	Description (= scope of delivery)	Part number
DKG60B	<ul style="list-style-type: none"> • Length 5 m • 4-core, shielded cable (AWG26) 	08175837

5.10 PC/laptop connection

MOVIMOT® drives are equipped with an X50 diagnostic interface (RJ10 plug connector) for startup, parameterization and service.

The diagnostic interface [1] is located underneath the screw plug on top of the MOVIMOT® inverter.

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

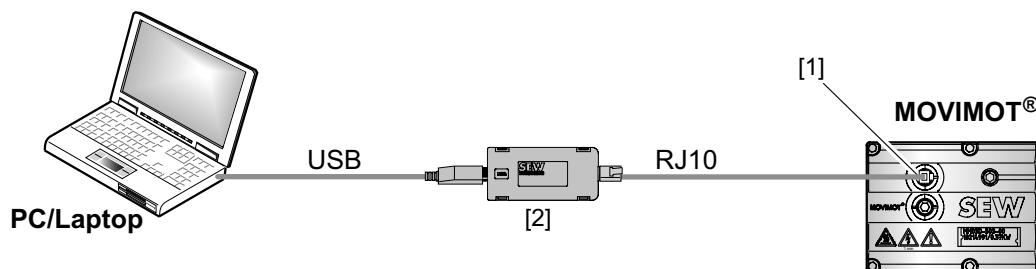
⚠ CAUTION! The ensured degree of protection will be lost if the screw plug of the diagnostic interface X50 is not installed. Damage to the MOVIMOT® drive.

If a screw plug is not screwed into the diagnostic interface, you must ensure that no moisture or dust can penetrate the MOVIMOT® drive.

⚠ WARNING! Risk of burns due to hot surfaces of the MOVIMOT® drive (especially the heat sink). Severe injuries.

Wait for the MOVIMOT® drive to cool down sufficiently before touching it.

The diagnostic interface is connected to a commercially available PC/laptop with one of the following interface adapters [2] with a USB interface



18014398968268043

[1] Diagnostic interface

[2] Interface adapter

Scope of delivery:

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

The following interface adapters are available:

Designation	Part number
USM21A	28231449
USB11A	08248311

6 Easy startup

6.1 Overview

You can select one of the following modes for starting up MOVIMOT® drives:

- When you select **Easy mode**, MOVIMOT® is started up quickly and easily using DIP switches S1, S2 and switches f2, t1.
- An extended scope of parameters is available for startup in **Expert mode**. You can use the MOVITOOLS® MotionStudio software or the DGB hand-held terminal to adjust the parameters to the application.

For more information on startup in Expert mode, refer to chapter "Expert startup with parameter function" (→ 134).

6.2 General information concerning startup

INFORMATION



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



⚠ WARNING

Risk of crushing due to missing or defective protective covers.

Severe or fatal injuries.

- Install the protective covers of the plant according to the instructions, see the operating instructions of the gear unit.
- Never start the unit if the protective covers are not installed.



⚠ WARNING

Electric shock from capacitors that have not been fully discharged.

Severe or fatal injuries.

- Disconnect the inverter from the power. Observe the minimum switch-off time after disconnection from the supply system:
 - **1 minute**



⚠ WARNING

Device malfunction due to incorrect device setting.

Severe or fatal injuries.

- Comply with the startup instructions.
- The installation must be carried out by qualified personnel only.
- Always use the appropriate functional settings.



⚠ WARNING

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

Serious injuries.

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



INFORMATION

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



INFORMATION

- Remove status LED paint protection cap before startup. Remove paint protection film from the nameplates before startup.
- Observe a minimum switch-off time of 2 seconds for the K11 line contactor.

6.3 Requirements

The following conditions apply to the startup:

- The MOVIMOT® drive must be installed correctly both mechanically and electrically.
- 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.

6.4 Description of the control elements

6.4.1 Setpoint potentiometer f1

NOTICE

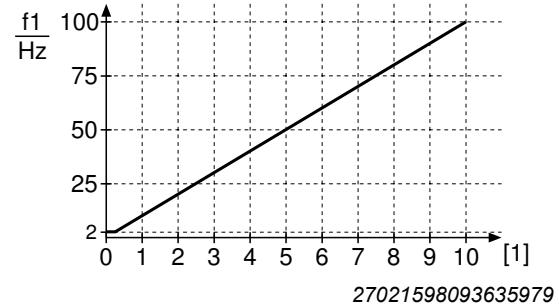
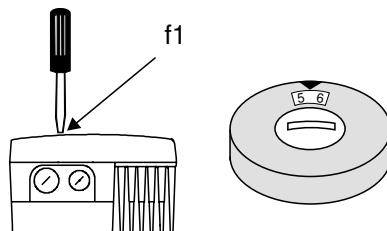
Loss of guaranteed degree of protection if the screw plugs on the f1 setpoint potentiometer and diagnostic interface are not installed or not installed correctly.

Damage to the MOVIMOT® inverter can occur.

- After setting the setpoint, make sure the screw plug of the setpoint potentiometer has a seal and screw it in.

The potentiometer f1 has different functions depending on the operating mode:

- Binary control: Setting setpoint f1
(f1 selected via terminal f1/f2 X6:7,8 = "0")
- Control via RS485: Setting maximum frequency f_{\max}



[1] Potentiometer setting

6.4.2 Switch f2

The switch f2 has different functions depending on the operating mode:

- Binary control: Setting setpoint f2
(f2 is selected via terminal f1/f2 X6:7,8 = "1")
- Control via RS485: Minimum frequency setting f_{\min}



Switch f2											
Detent setting	0	1	2	3	4	5	6	7	8	9	10
Setpoint f2 Hz	5	7	10	15	20	25	35	50	60	70	100
Minimum frequency Hz	2	5	7	10	12	15	20	25	30	35	40

6.4.3 Switch t1

Use switch t1 to set the acceleration of the MOVIMOT® drive. The ramp time is based on a setpoint step change of 1500 min^{-1} (50 Hz).



Switch t1											
Detent setting	0	1	2	3	4	5	6	7	8	9	10
Ramp time t1 s	0.1	0.2	0.3	0.5	0.7	1	2	3	5	7	10

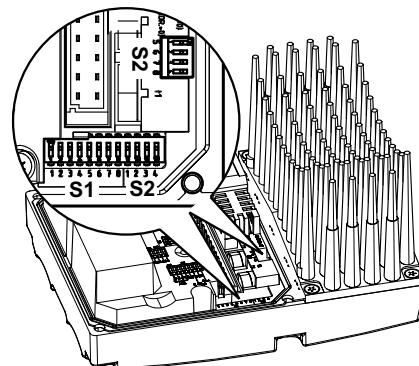
6.4.4 DIP switches S1 and S2

NOTICE

Damage to the DIP switches caused by unsuitable tools.

Damage to the DIP switches.

- Set the DIP switches only using suitable tools, such as a slotted screwdriver with a blade width of ≤ 3 mm.
- The force used for setting the DIP switches must not exceed 5 N.



9007199881389579

DIP switch S1:

S1 Meaning	1	2	3	4	5	6	7	8
	Binary coding RS485 unit address				Motor pro- tection	Motor perfor- mance level	PWM frequency	No load damping
	2^0	2^1	2^2	2^3				
ON	1	1	1	1	Off	Motor one stage smaller	Variable (16, 8, 4 kHz)	On
OFF	0	0	0	0	On	Motor adjusted	4 kHz	Off

DIP switch S2:

S2 Meaning	1	2	3	4	5	6	7	8
	Brake type	Brake released without enable	Operating mode	Speed moni- toring	Binary encoding additional functions			
	2^0	2^1	2^2	2^3				
ON	Optional brake	On	V/f	On	1	1	1	1
OFF	Standard brake	Off	VFC	Off	0	0	0	0

6.5 Description of the DIP switches S1

6.5.1 DIP switches S1/1 – S1/4

Selecting the RS485 address of the MOVIMOT® drive via binary coding

Decimal address	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
S1/1	–	X	–	X	–	X	–	X	–	X	–	X	–	X	–	X
S1/2	–	–	X	X	–	–	X	X	–	–	X	X	–	–	X	X
S1/3	–	–	–	–	X	X	X	X	–	–	–	–	X	X	X	X
S1/4	–	–	–	–	–	–	–	–	X	X	X	X	X	X	X	X

X = ON

– = OFF

Set the following addresses depending on how the MOVIMOT® inverter is controlled:

Control	RS485 address
Binary control	0
Via keypad (MLG..A, MBG..A)	1
Via fieldbus interface (MF..)	1
Via MOVIFIT® MC (MTM..)	1
Via fieldbus interface with integrated minicontroller (MQ..)	1 – 15
Via RS485 master	1 – 15
Via MWF11A setpoint converter	1 – 15

6.5.2 DIP switch S1/5

Motor protection switched on / switched off

When the MOVIMOT® inverter is installed (close to) the motor, the motor protection must be deactivated.

To ensure motor protection, a TH (bimetallic thermostat) must be installed. The TH opens the sensor circuit when the nominal response temperature is reached (see field distributor manual).

6.5.3 DIP switch S1/6

Lower motor power rating

- When activated, the DIP switch S1/6 allows the MOVIMOT® inverter to be assigned to a motor with a lower motor power rating. The rated unit power is not affected.
- When using a motor with a lower power rating, the MOVIMOT® inverter is a power level higher from the motor's perspective. The overload capacity of the drive may be increased as a result. A higher current can be provided briefly, leading to higher torque ratings.
- The aim of the DIP switch S1/6 is to achieve short-term utilization of the motor's peak torque. The unit's current limit remains the same regardless of the switch setting. The motor protection function is adjusted depending on the switch setting.
- Stall protection for the motor is not possible in this operating mode (S1/6 = "ON").
- The necessary setting for the DIP switch S1/6 depends on the motor type and therefore also on the drive ID module in the MOVIMOT® inverter.

First, check the drive ID module type in the MOVIMOT® inverter. Set the DIP switch S1/6 according to the following table.

Motor with operating point 400 V/50 Hz**Applies to MOVIMOT® with the following drive ID modules:**

Drive ID module			Motor	
Identification	Identification color	Part number	Line voltage V	Line frequency Hz
DR2S/400/50	Light gray/white striped	28249720	230/400	50
DRS/400/50	White	18214371	230/400	50
DRE/400/50	Orange	18214398	230/400	50
DRP/230/400	Brown	18217907	230/400	50
DRN/400/50	Light blue	28222040	230/400	50

Setting of DIP switch S1/6:

Power rating kW	Motor type	MOVIMOT® inverter MM..D-503-00			
		Motor in λ connection S1/6 = OFF	S1/6 = ON	Motor in Δ connection S1/6 = OFF	S1/6 = ON
0.25	DR2S63M4/.. DR63L4/.. DRE80S4/.. DRN71MS4	–	MM03D..	MM03D..	MM05D..
0.37	DR2S71MS4/.. DRS71S4/.. DRE80S4/.. DRN71M4	MM03D..	MM05D..	MM05D..	MM07D..
0.55	DR2S71M4/.. DRS71M4/.. DRE80M4/.. DRN80MK4	MM05D..	MM07D..	MM07D..	MM11D..
0.75	DR2S80MK4/.. DRS80S4/.. DRE80M4/.. DRP90M4/.. DRN80M4/..	MM07D..	MM11D..	MM11D..	MM15D..
1.1	DR2S80M4/.. DRS80M4/.. DRE90M4/.. DRP90L4/.. DRN90S4/..	MM11D..	MM15D..	MM15D..	MM22D..
1.5	DR2S90S4/.. DRS90M4/.. DRE90L4/.. DRP100M4/.. DRN90L4/..	MM15D..	MM22D..	MM22D..	MM30D..
2.2	DR2S90L4/.. DRS90L4/.. DRE100M4/.. DRP100L4/.. DRN100LS4/..	MM22D..	MM30D..	MM30D..	MM40D..
3.0	DR2S100LS4/.. DRS100M4/.. DRE100LC4/.. DRP112M4/.. DRN100L4/..	MM30D..	MM40D..	MM40D..	–
4.0	DR2S100L4/.. DRS100LC4/.. DRE132S4/.. DRN112M4/..	MM40D..	–	–	–

Motor with operating point 460 V/60 Hz**Applies to MOVIMOT® with the following drive ID modules:**

Drive ID module			Motor	
Identification	Identification color	Part number	Line voltage V	Line frequency Hz
DR2S/460/60	Yellow/white striped	28249739	266/460	60
DRS/460/60	Yellow	18214401	266/460	60
DRE/460/60	Green	18214428	266/460	60
DRP/266/460	Beige	18217915	266/460	60
DRN/460/60	Blue/white striped	28241819	266/460	60

Setting of DIP switch S1/6:

Power rating kW	Motor type	MOVIMOT® inverter MM..D-503-00			
		Motor in λ connection		Motor in Δ connection	
S1/6 = OFF	S1/6 = ON	S1/6 = OFF	S1/6 = ON	S1/6 = OFF	S1/6 = ON
0.25	DR2S63M4/.. DRN71MS4/..	—	MM03D..	MM03D..	MM05D..
0.37	DR2S71MS4/.. DRS71S4/.. DRN71M4/..	MM03D..	MM05D..	MM05D..	MM07D..
0.55	DR2S71M4/.. DRS71M4/.. DRN80MK4/..	MM05D..	MM07D..	MM07D..	MM11D..
0.75	DR2S80MK4/.. DRS80S4/.. DRE80M4/.. DRP90M4/.. DRN80M4/..	MM07D..	MM11D..	MM11D..	MM15D..
1.1	DR2S80M4/.. DRS80M4/.. DRE90M4/.. DRP90L4/.. DRN90S4/..	MM11D..	MM15D..	MM15D..	MM22D..
1.5	DR2S90S4/.. DRS90M4/.. DRE90L4/.. DRP90L4/.. DRN90L4/..	MM15D..	MM22D..	MM22D..	MM30D..
2.2	DR2S90L4/.. DRS90L4/.. DRE100L4/.. DRP112M4/.. DRN100L4/..	MM22D..	MM30D..	MM30D..	MM40D..
3.7	DR2S100LS4/.. DRS100M4/.. DRE100LC4/.. DRP132S4/.. DRN100L4/..	MM30D..	MM40D..	—	—
4.0	DR2S100L4/.. DRS100LC4/.. DRE132S4/.. DRN112M4/..	MM40D..	—	—	—

Motor with 50/60 Hz voltage range

Applies to MOVIMOT® with the following drive ID modules:

Drive ID module			Motor	
Identification	Identification color	Part number	Line voltage V	Line frequency Hz
DRS/DRE/50/60	Violet	18214444	220 – 240/ 380 – 415	50
			254 – 277/ 440 – 480	60
DRS/DRN/50/60	Pastel green	28241827	220 – 230/ 380 – 400	50
			266/460	60
			220 – 230/ 380 – 400	50
DRN/50/60	Purple/white striped	28249747	266/460	60

Setting of DIP switch S1/6:

Power rating kW	Motor type	MOVIMOT® MM..D-503-00 inverter			
		Motor in λ connection		Motor in Δ connection	
S1/6 = OFF	S1/6 = ON	S1/6 = OFF	S1/6 = ON	S1/6 = OFF	S1/6 = ON
0.25	DR63L4/.. DRN71MS4/..	–	MM03D..	MM03D..	MM05D..
0.37	DRS71S4/.. DRN71M4/..	MM03D..	MM05D..	MM05D..	MM07D..
0.55	DRS71M4/.. DRN80MK4/..	MM05D..	MM07D..	MM07D..	MM11D..
0.75	DRE80M4/.. DRN80M4/..	MM07D..	MM11D..	MM11D..	MM15D..
1.1	DRE90M4/.. DRN90S4/..	MM11D..	MM15D..	MM15D..	MM22D..
1.5	DRE90L4/.. DRN90L4/..	MM15D..	MM22D..	MM22D..	MM30D..
2.2	DRE100L4/.. DRN100LM4/..	MM22D..	MM30D..	MM30D..	MM40D..
3.0	DRE100LC4/.. DRN100L4/..	MM30D..	MM40D..	MM40D..	–
4.0	DRE132S4/.. DRN112M4/..	MM40D..	–	–	–

Motor with operating point 380 V/60 Hz (ABNT regulation for Brazil)

Applies to MOVIMOT® with the following drive ID modules:

Drive ID module			Motor	
Identification	Identification color	Part number	Line voltage V	Line frequency Hz
DRS/DRE/380/60	Red	18234933	220/380	60
DRN/380/60	Red/white striped	28240227	220/380	60

Setting of DIP switch S1/6:

Power rating kW	Motor type	MOVIMOT® inverter MM..D-503-00			
		Motor in λ connection		Motor in Δ connection	
		S1/6 = OFF	S1/6 = ON	S1/6 = OFF	S1/6 = ON
0.25	DRN71MS4/..	–	MM03D..	MM03D..	MM05D..
0.37	DRS71S4/.. DRN71M4/..	MM03D..	MM05D..	MM05D..	MM07D..
0.55	DRS71M4/.. DRN80MK4/..	MM05D..	MM07D..	MM07D..	MM11D..
0.75	DRE80S4/.. DRN80M4/..	MM07D..	MM11D..	MM11D..	MM15D..
1.1	DRE80M4/.. DRN90S4/..	MM11D..	MM15D..	MM15D..	MM22D..
1.5	DRE90M4/.. DRN90L4/..	MM15D..	MM22D..	MM22D..	MM30D..
2.2	DRE90L4/.. DRN100LM4/..	MM22D..	MM30D..	MM30D..	MM40D..
3.0	DRE100M4/.. DRN100L4/..	MM30D..	MM40D..	MM40D..	–
4.0	DRE100L4/.. DRN100L4/..	MM40D..	–	–	–

Motor with operating point 400 V/50 Hz and LSPM technology**Applies to MOVIMOT® with the following drive ID module:**

Drive ID module			Motor	
Identification	Identification color	Part number	Line voltage V	Line frequency Hz
DRU...J/400/50	Gray	28203194	230/400	50

Setting of DIP switch S1/6:

Power rating kW	Motor type	MOVIMOT® inverter MM..D-503-00			
		Motor in λ connection		Motor in Δ connection	
		S1/6 = OFF	S1/6 = ON	S1/6 = OFF	S1/6 = ON
0.25	DRU71SJ/..	–	MM03D..	MM03D..	MM05D..
0.37	DRU71MJ4/..	MM03D..	MM05D..	MM05D..	MM07D..
0.55	DRU80SJ4/..	MM05D..	MM07D..	MM07D..	MM11D..
0.75	DRU80MJ4/..	MM07D..	MM11D..	MM11D..	MM15D..
1.1	DRU90MJ4/..	MM11D..	MM15D..	MM15D..	MM22D..
1.5	DRU90LJ4/..	MM15D..	MM22D..	MM22D..	MM30D..
2.2	DRU100MJ4/..	MM22D..	MM30D..	MM30D..	MM40D..
3.0	DRU100LJ4/..	MM30D..	MM40D..	MM40D..	–

6.5.4 DIP switch S1/7**Setting the maximum PWM frequency**

- When DIP switch S1/7 is set to "OFF", the MOVIMOT® works with the PWM frequency of 4 kHz.
- When DIP switch S1/7 is set to "ON", the MOVIMOT® works with the PWM frequency of 16 kHz (low-noise). MOVIMOT® incrementally switches back to lower clock frequencies depending on the heat sink temperature and the load on the inverter.

6.5.5 DIP switch S1/8**No-load vibration damping**

When setting DIP switch S1/8 to "ON", this function reduces resonance vibrations when in no-load operation.

6.6 Description of the DIP switches S2

6.6.1 DIP switch S2/1

Brake type

- When using the standard brake, the DIP switch S2/1 must be set to "OFF".
- When using the optional brake, the DIP switch S2/1 must be set to "ON".

Motor		Standard brake [type] S2/1 = OFF	Optional brake [type] S2/1 = ON		
400 V/50 Hz 460 V/60 Hz 50/60 Hz voltage range	380 V/60 Hz ABNT Brazil	400 V/50 Hz LSPM Technology			
DR63L4			BR03		
DR2S63M4			BE03		
	DRN71MS4	DRN71MS4	BE03		
DRS71S4 DRE80S4	DR2S71MS4 DRN71M4 DRN71MK4	DRS71S4 DRN71M4	DRE71SJ4 DRU71SJ4 DRU71MJ4	BE05	BE1
DRS71M4 DRS80S4 DRE80M4	DR2S71M4 DR2S80MK4 DRN80MK4 DRN80M4	DRS71M4 DRE80S4 DRN80MK4 DRN80M4	DRE71MJ4 DRU80SJ4	BE1	BE05
DRP90M4		DRU80MJ4	BE1	BE2	
DRS80M4 DRE90M4 DRP90L4	DR2S80M4 DRN90S4	DRE80M4 DRN90S4	DRE80SJ4 DRU90MJ4	BE2	BE1
DRS90M4 DRE90L4	DR2S90S4 DRN90L4	DRE90M4 DRN90L4	DRE80MJ4	BE2	BE1
DRP100M4		DRU90LJ4	BE2	BE5	
DRS90L4 DRE100M4 DRE100L4 DRP100L4	DR2S90L4 DRN100LS4	DRE90L4	DRE90MJ4 DRE90LJ4 DRU100MJ4	BE5	BE2
DRS100M4 DRS100L4 DRS100LC4 DRE100LC4	DR2S100LS4 DR2S100L4 DRN100L4 DRN100LM4	DRE100M4 DRE100L4 DRN100L4 DRN100LM4	DRE100MJ4 DRU100LJ4	BE5	BE2
DRP112M4 DRE132S4 DRP112S4	DRN112M4			BE5	BE11

Preferred brake voltage

MOVIMOT® type (inverter)	Preferred brake voltage
MOVIMOT® MM..D-503, size 1	(MM03.. – MM15..) 230 V
MOVIMOT® MM..D-503, size 2	(MM22.. – MM40..)
MOVIMOT® MM..D-233, sizes 1 and 2	(MM03.. – MM22..) 120 V

6.6.2 DIP switch S2/2

Brake release without enable

When setting DIP switch S2/2 to "ON", it is possible to release the brake even if there is no drive enabled.

Binary control functions

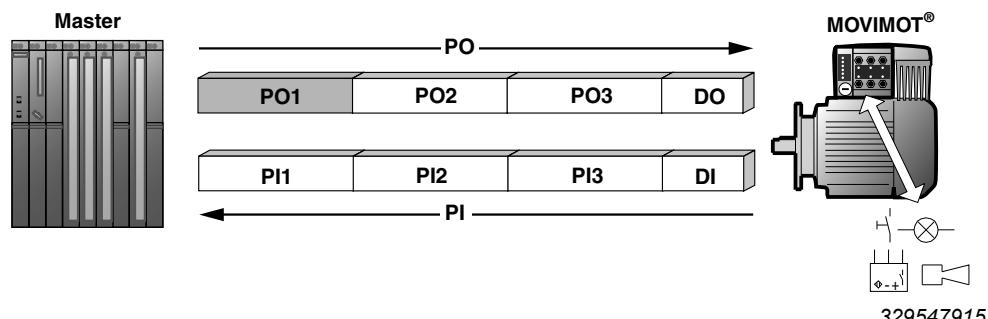
In binary control, you are able to release the brake by setting the signal at terminal f1/f2 X6:7,8 subject to the following preconditions:

Terminal status			Enable status	Error status	Brake function
R ↗ X6:11,12	L ↗ X6:9,10	f1/f2 X6:7,8			
"1" "0"	"0" "1"	"0"	Unit enabled	No unit error	The MOVIMOT® inverter con-trols the brake. Setpoint f1
"1" "0"	"0" "1"	"1"	Unit enabled	No unit error	The MOVIMOT® inverter con-trols the brake. Setpoint f2
"1" "0"	"1" "0"	"0"	Unit not en-abled	No unit error	Brake is applied.
"1"	"1"	"1"	Unit not en-abled	No unit error	Brake is applied.
"0"	"0"	"1"	Unit not en-abled	No unit error	Brake is released for manual movement.¹⁾
All states possible			Unit not en-abled	Unit er-rors	Brake is applied.

1) In Expert mode the parameter P600 (terminal configuration) must be set to "0" (default) => "setpoint changeover, CCW/stop, CW/stop".

Functions with control via RS485

With control via RS485, the brake is released via the control word:



PO = Process output data

PO1 = Control word

PO2 = Speed [%]

PO3 = Ramp

DO = Digital outputs

PI = Process input data

PI1 = Status word 1

PI2 = Output current

PI3 = Status word 2

DI = Digital inputs

By setting bit 8 in the control word, the brake can be released if the following conditions are met:

Basic control block															
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Control word															
Not assigned ¹⁾	Bit "9"	Bit "8"	Not as-signed ¹⁾	"1" = Reset	Not assigned ¹⁾	"1 1 0" = Enable, otherwise stop									
Virtual terminals for releasing the brake without drive enable								Virtual terminal for applying brake and inhibiting output stage "Stop" control command							

1) Recommendation for all bits that are not assigned = "0"

Enable status	Error status	Status of bit 8 in control word	Brake function
Unit enabled	No unit error/ no communication timeout	"0"	The MOVIMOT® inverter controls the brake.
Unit enabled	No unit error/ no communication timeout	"1"	The MOVIMOT® inverter controls the brake.
Unit not enabled	No unit error/ no communication timeout	"0"	Brake is applied.
Unit not enabled	No unit error/ no communication timeout	"1"	Brake is released for manual movement.
Unit not enabled	Unit error/ communication timeout	"1" or "0"	Brake is applied.

Setpoint selection for binary control

Setpoint selection for binary control depending on the status of terminal f1/f2 X6: 7,8:

Enable status	Terminal f1/f2 X6:7,8	Active setpoint
Unit enabled	Terminal f1/f2 X6:7,8 = "0"	Setpoint potentiometer f1 active
Unit enabled	Terminal f1/f2 X6:7,8 = "1"	Setpoint potentiometer f2 active

Behavior if unit not ready

If the unit is not ready, the brake is always applied irrespective of the status of terminal f1/f2 X6:7,8 or bit 8 in the control word.

LED display

The status LED flashes periodically at a fast rate ($t_{on} : t_{off} = 100 \text{ ms} : 300 \text{ ms}$) if the brake has been released for manual movement. This applies both for binary control and for control via RS485.

6.6.3 DIP switch S2/3**Operating mode**

- DIP switch S2/3 = "OFF": VFC operation for 4-pole motors
- DIP switch S2/3 = "ON": V/f operation reserved for special cases

6.6.4 DIP switch S2/4**Speed monitoring**

Speed monitoring (S2/4 = "ON") protects the drive when it is blocked.

If the drive is operated at the current limit for longer than 1 second when speed monitoring is active (S2/4 = "ON"), the MOVIMOT® inverter trips the speed monitoring fault. The status LED of the MOVIMOT® inverter signals the error by slowly flashing red (error code 08). This error only occurs when the current limit has been reached for the duration of the deceleration time.

6.6.5 DIP switches S2/5 – S2/8**Additional functions**

The binary coding of the DIP switches S2/5 – S2/8 allows for the activation of additional functions. Proceed as follows to activate possible additional functions:

Decimal value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
S2/5	–	X	–	X	–	X	–	X	–	X	–	X	–	X	–	X
S2/6	–	–	X	X	–	–	X	X	–	–	X	X	–	–	X	X
S2/7	–	–	–	–	X	X	X	X	–	–	–	–	X	X	X	X
S2/8	–	–	–	–	–	–	–	–	X	X	X	X	X	X	X	X

X = ON

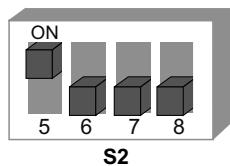
– = OFF

6.7 Selectable additional functions MM..D-503-00

6.7.1 Overview of the available additional functions

You can activate the following additional functions at the DIP switches S2/5 – S2/8:

Decimal value	Brief description	Operating mode		Description
		Control via RS485	Binary control	
0	Basic functionality, no additional function active	X	X	–
1	MOVIMOT® with increased ramp times	X	X	"" (→ 82)
2	MOVIMOT® with adjustable current limitation (error if exceeded)	X	X	"" (→ 83)
3	MOVIMOT® with adjustable current limitation (can be changed using the terminal f1/f2 X6:7,8)	X	X	"" (→ 83)
4	MOVIMOT® with bus parameterization	X	–	"" (→ 86)
5	MOVIMOT® with motor protection via TH	X	–	"" (→ 88)
6	MOVIMOT® with maximum 8 kHz PWM frequency	X	X	"" (→ 89)
7	MOVIMOT® with rapid start/stop	X	X	"" (→ 90)
8	MOVIMOT® with minimum frequency 0 Hz	X	X	"" (→ 92)
9	MOVIMOT® for lifting applications	X	X	"" (→ 93)
10	MOVIMOT® with minimum frequency 0 Hz and reduced torque at low frequencies	X	X	"" (→ 96)
11	Monitoring of supply-phase error deactivated	X	X	"" (→ 97)
12	MOVIMOT® with rapid start/stop and motor protection via TH	X	X	"" (→ 98)
13	MOVIMOT® with extended speed monitoring	X	X	"" (→ 101)
14	MOVIMOT® with deactivated slip compensation	X	X	"" (→ 105)
15	Not assigned	–	–	–

6.7.2 Additional function 1**MOVIMOT® with increased ramp times**

329690891

Functional description

It is possible to set ramp times of up to 40 s.

With control via RS485, a ramp time of max. 40 s can be transmitted when using 3 process data units.

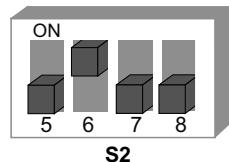
Changed ramp times

Switch t1											
Detent position	0	1	2	3	4	5	6	7	8	9	10
Ramp time t1 [s]	0.1	0.2	0.3	0.5	0.7	1	20	25	30	35	40

= corresponds to standard setting
 = changed ramp times

6.7.3 Additional function 2

MOVIMOT® with adjustable current limitation (error if exceeded)



329877131

Functional description

The current limit can be set on switch f2.

The setpoint f2 (for binary control) and the minimum frequency (with control via RS485) are permanently set to the following values:

Setpoint f2: 5 Hz

Minimum frequency: 2 Hz

The monitoring function comes into effect above 15 Hz. If the drive operates at the current limit for longer than 500 ms, the unit generates an error (error 44). This is indicated by the status LED flashing red quickly.

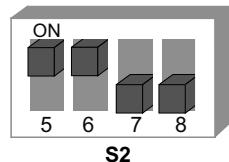
Adjustable current limits



Switch f2											
Detent position	0	1	2	3	4	5	6	7	8	9	10
I _{max} [%] of I _N	90	95	100	105	110	115	120	130	140	150	160

6.7.4 Additional function 3

MOVIMOT® with adjustable current limitation (can be changed using terminal f1/f2 X6:7,8), the frequency is reduced when exceeded



329910539

Functional description

The current limitation can be set using switch f2. Digital input terminal f1/f2 can be used to switch between the maximum current limit and the current limit set.

Response upon reaching the current limit

When the current limit is reached, the unit reduces the frequency and stops the ramp. This prevents the current from increasing.

If the unit is operating at the current limit, the status LED indicates this status by flashing green quickly.

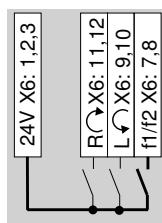
System internal values for setpoint f2 / minimum frequency

The following functions are no longer possible:

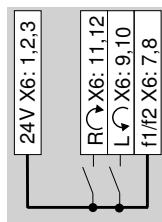
- In binary control mode, it is no longer possible to switch between setpoint f1 and setpoint f2 via terminal f1/f2.
- With control via RS485 it is not possible to set the minimum frequency. The minimum frequency is set to 2 Hz.

Adjustable current limits

Switch f2											
Detent position	0	1	2	3	4	5	6	7	8	9	10
I _{max} [%] of I _N	60	70	80	90	100	110	120	130	140	150	160

Selecting the current limits via digital input terminal f1 / f2

f1/f2 = "0" The default current limit is active.



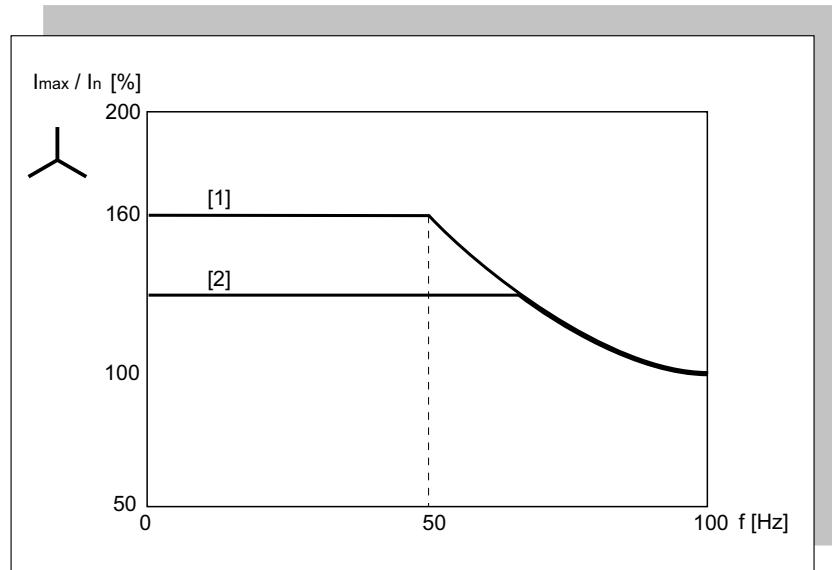
f1/f2 = "1" The current limitation set via switch f2 is active.

The selection can also be made when the unit is enabled.

Influencing the current characteristic curve

The current limit curve is calculated with a constant factor by selecting a lower current limit.

Motor with star connection

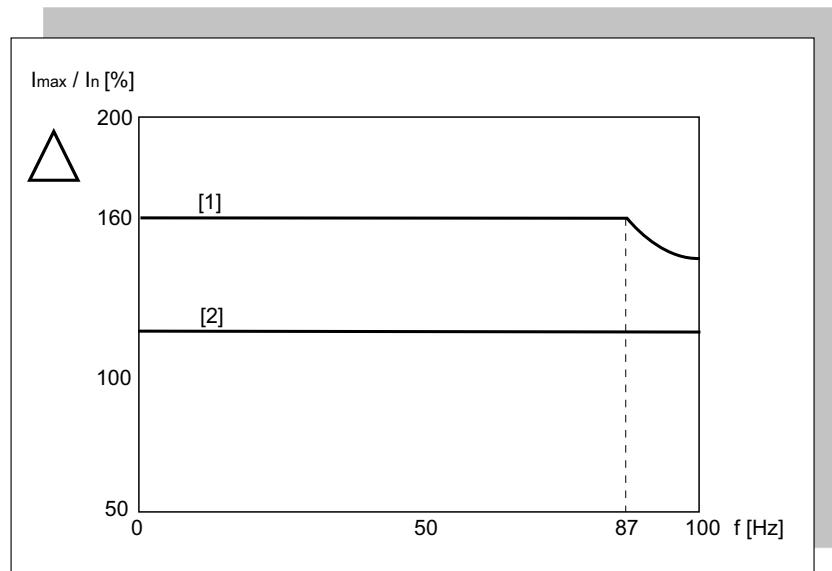


331979659

[1] Current limit characteristic curve of standard function

[2] Reduced current limit for additional function 3 and terminals f1/f2 X6:7,8 = "1"

Motor with delta connection



332087051

[1] Current limit characteristic curve of standard function

[2] Reduced current limit for additional function 3 and terminals f1/f2 X6:7,8 = "1"

6.7.5 Additional function 4

MOVIMOT® with bus parameterization



329944715

INFORMATION



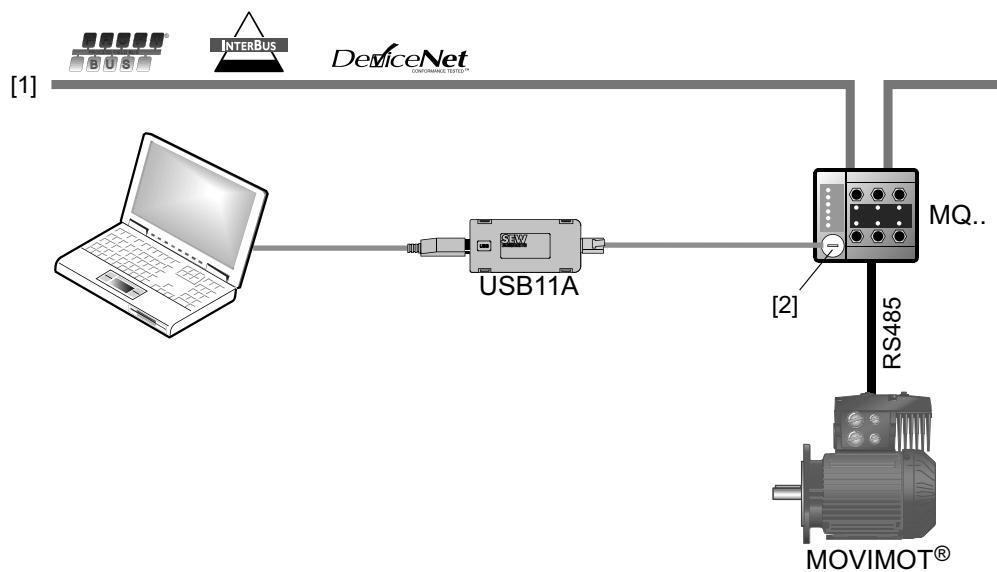
When activating additional function 4, only a limited number of parameters is available. If you want to adjust more parameters, SEW-EURODRIVE recommends "Expert startup with parameter function" (→ 137).

Additional function 4 is only designed for RS485 control in combination with the MQ.. fieldbus interfaces with integrated minicontroller.

Functional description

The potentiometer f1 and switches f2 and t1 are deactivated. The MOVIMOT® inverter ignores the settings of the potentiometers and the switches. The MOVIMOT® inverter continues to read the setting of the DIP switches. Functions changed using the DIP switch cannot be changed via bus.

Block diagram



18014398841614091

[1] Fieldbus

[2] Diagnostic interface

Changing parameters in MOVITOOLS® MotionStudio

After opening MOVITOOLS® "MotionStudio" > "startup" > "parameter tree", the following parameters are accessible. These parameters can be changed and saved in the unit.

Name	Section	Index	Pa-ram-e-ter	Step width
Ramp up	0.1 – 1 – 2000 [s]	8807	P130	0.1 s – 1 s: 0.01
Ramp down	0.1 – 1 – 2000 [s]	8808	P131	1 s – 10 s: 0.1 10 s – 100 s: 1 10 s – 2000 s: 10
Minimum frequency	2 – 100 [Hz]	8899	P305	0.1 Hz
Maximum frequency¹⁾	2 – 100 [Hz]	8900	P306	0.1 Hz
Current limit	60 – 160 [%]	8518	P303	1%
Pre-magnetization time	0 – 0.4 – 2 [s]	8526	P323	0.001 s
Post-magnetization time	0 – 0.2 – 2 [s]	8585	P732	0.001 s
Parameter lock	0: Off 1: On	8595	P803	–
Factory setting	0: No 2: Delivery state	8594	P802	–
Speed monitoring delay time	0.1 – 1 – 10.0 [s]	8558	P501	0.1 s
Brake release time	0 – 2 [s]	8749	P731	0.001 s
Slip compensation²⁾	0 – 500 [rpm]	8527	P324	0.2 rpm

Factory setting = **bold**

1) Example: Maximum frequency = 60 Hz

Bus setpoint = 10%

Frequency setpoint = 6 Hz

2) The value will be set to the rated motor slip when there is a change in the additional function setting.

The factory setting is activated as soon as additional function 4 is activated via DIP switches. If the additional function which was selected via DIP switches remains unchanged after the 24 V operating voltage is switched off, the last valid values from EEPROM will be used after reactivation.

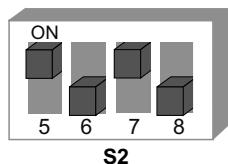
The start frequency is set to 0.5 Hz.

If the set setpoint or maximum frequency is lower than the set minimum frequency, the minimum frequency becomes active.

The parameters are only evaluated with this additional function.

6.7.6 Additional function 5

MOVIMOT® motor protection via TH



329992459

INFORMATION



The additional function is only designed for RS485 control when the MOVIMOT® inverter is installed close to the motor.

Functional description

Functions in connection with fieldbus interfaces MF.. and MQ..:

- When the MOVIMOT® inverter is mounted close to the motor, the TH sets the terminals "R" and "L" to "0" if the maximum motor temperature is exceeded.
- Additional function 5 generates error 84 (motor over temperature) when terminals "L" and "R" are opened.
- Error 84 is indicated by the flashing status LED of the MOVIMOT® inverter.
- The generated error 84 is also transmitted via fieldbus.

Functions in combination with fieldbus interface MQ..:

- MOVIMOT® bus configuration according to "additional function 4" (→ 86).

Functions in combination with fieldbus interface MF..:

- The potentiometer f1 and switches f2 and t1 are deactivated. The following values apply:

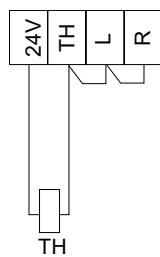
Name	Value
Ramp up	1 s
Ramp down	1 s
Minimum frequency	2 Hz
Maximum frequency	100 Hz
Current limit	Default current limit
Pre-magnetization time	0.4 s
Post-magnetization time	0.2 s
Speed monitoring delay time	1 s
Brake release time	0 s
Slip compensation	Rated motor slip

Tripping conditions for error 84

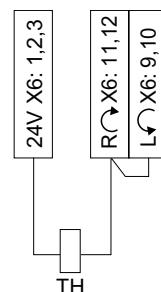
Error 84 "Motor overtemperature" is triggered when **all** the following conditions are fulfilled:

- The standard MOVIMOT® motor protection function is deactivated when DIP switch S1/5 is set to "ON".
- The terminals for direction of rotation are connected to 24 V via a TH as in the following figure.

For field distributors:



For mounting close to the motor with option P2.A:



- The TH tripped due to motor overtemperature. The enable signal for the two direction of rotation terminals is canceled.
- Supply voltage is connected.

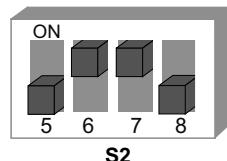
INFORMATION



If only the DC 24 V supply voltage is present at the MOVIMOT® inverter, the error is not tripped.

6.7.7 Additional function 6

MOVIMOT® with maximum 8 kHz PWM frequency



330028171

Functional description

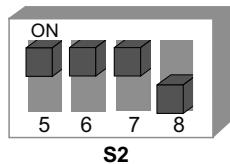
The additional function reduces the PWM frequency of 16 kHz to 8 kHz.

When DIP switch S1/7 is set to "ON", the unit operates with an 8 kHz PWM frequency and switches back to 4 kHz depending on the heat sink temperature.

	S1/7 without additional function 6	S1/7 with additional function 6
ON	PWM frequency variable 16, 8, 4 kHz	PWM frequency variable 8, 4 kHz
OFF	PWM frequency 4 kHz	PWM frequency 4 kHz

6.7.8 Additional function 7

MOVIMOT® with rapid start/stop



330064651

Functional description

"Rapid start" sub-function (with control via RS485 + binary control)

- The pre-magnetization time is set to 0 s.
- Pre-magnetization is not performed after the drive is enabled. This is necessary to start acceleration along the setpoint ramp as quickly as possible.

If additional function 7 is activated, the calibration function and the thermal memory of the UL protective function is inactive. When using according to UL approval, please note that the start temperature of the motor protection function is not the same as the motor temperature.

"Rapid stop" sub-function (only with control via RS485)

- The "rapid stop" function (apply brake during downward ramp) is introduced for control via RS485. This function is assigned to bit 9 in the control word as virtual terminal in line with the MOVILINK® profile.

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Not assigned ¹⁾		Bit "9"	Bit "8"	Not as- signed ₁₎	"1" = Reset	Not assigned ₁₎	"1 1 0" = Enable, otherwise stop								

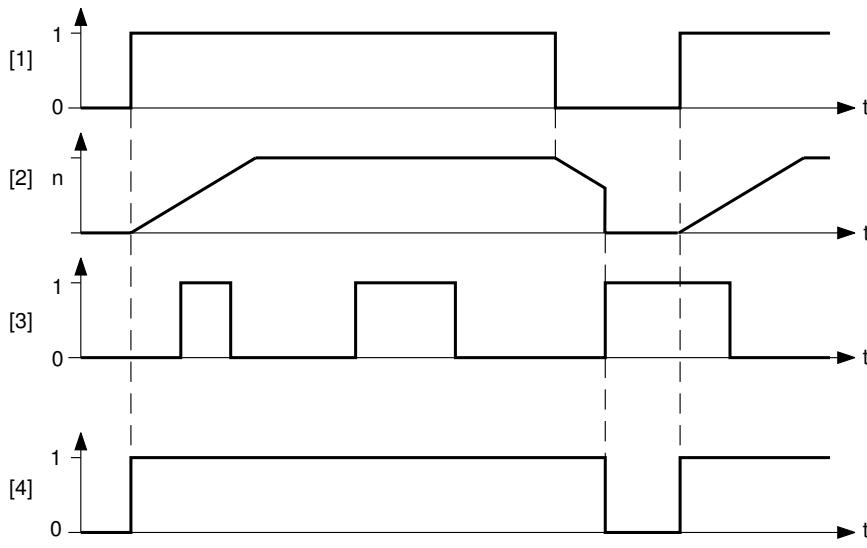
Release brake without enable.

Virtual terminal for "Applying brake when downward ramp is activated"

1) Recommendation for all bits that are not assigned = "0"

- When bit 9 is set during the downward ramp, the MOVIMOT® inverter applies the brake (directly via the brake output or via the MOVIMOT® signal relay output) and blocks the output stage.
- If the motor frequency is lower than the stop frequency, the brake is applied regardless of the state of bit 9.
- After activation of the rapid stop, the enable must only be granted again once the drive has reached a standstill.

Flow diagram for brake control with "rapid stop" sub-function (control via RS485):



333149963

- [1] Enable terminals / control word
- [2] Speed
- [3] Bit 9
- [4] Brake control signal: 1 = released, 0 = applied

Brake control (control via RS485 + binary control)

Mechanical brake controlled by MOVIMOT® inverter:

- The terminals X1:13, X1:14 and X1:15 in the MOVIMOT® connection box are assigned to the brake coil of the mechanical brake. You must not connect an additional braking resistor to terminals X1:13 and X1:15.
- The relay is switched as a ready relay (standard function).

Mechanical brake controlled by the relay output or the BEM/BES option:

⚠ WARNING



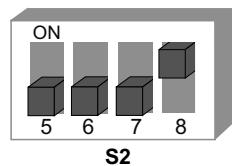
Risk of crushing due to unintentional startup of the drive caused by incorrect settings of the DIP switches S2/5 – S2/8. Failure to comply with "chapter "Use of the relay output for additional functions 7, 9, 12 and 13"" (→ 106) can result in the brakes releasing.

Severe or fatal injuries.

- Observe the information in "chapter "Use of the relay output for additional functions 7, 9, 12 and 13"" (→ 106).
- A braking resistor (BW..) must be connected to terminals X1:13 and X1:15 in the MOVIMOT® connection box. Terminal X1:14 is not assigned.
- The K1 relay works as a brake control relay. This means that the ready signal function is no longer available.

6.7.9 Additional function 8

MOVIMOT® with minimum frequency 0 Hz



S2

330101899

Functional description

Control via RS485: In detent position 0 of switch f2, the minimum frequency with the activated additional function is 0 Hz. All other values that can be set remain unchanged.

Switch f2											
Detent position	0	1	2	3	4	5	6	7	8	9	10
Minimum frequency [Hz] with activated additional function	0	5	7	10	12	15	20	25	30	35	40
Minimum frequency [Hz] without additional function	2	5	7	10	12	15	20	25	30	35	40

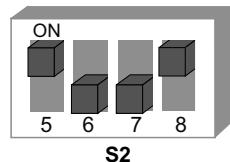
Binary control:

In detent position 0 of switch f2, the setpoint f2 with the activated additional function is 0 Hz. All other values that can be set remain unchanged.

Switch f2											
Detent position	0	1	2	3	4	5	6	7	8	9	10
Setpoint f2 [Hz] with activated additional function	0	7	10	15	20	25	35	50	60	70	100
Setpoint f2 [Hz] without additional function	5	7	10	15	20	25	35	50	60	70	100

6.7.10 Additional function 9

MOVIMOT® for lifting applications



330140427



⚠ WARNING

Danger of fatal injury if the hoist falls.

Severe or fatal injuries.

- The MOVIMOT® drive may not be used as a safety device in lifting applications.
- Use monitoring systems or mechanical protection devices to ensure safety.

NOTICE

System overload due to operation of the MOVIMOT® drive at the current limit.

Damage to the inverter.

- Activate speed monitoring. If the MOVIMOT® drive is operated at the current limit for longer than 1 s, it will trigger the error message F08 "speed monitoring".

Requirements

The MOVIMOT® can only be used in hoist applications if the following prerequisites are met:

- Additional function 9 is only possible in conjunction with brake motors.
- Make sure that the DIP switch S2/3 is set to "OFF" (VFC operation).
- It is mandatory to use a brake controller in connection with an external braking resistor.
- Activate the ""speed monitoring" function" (→ 80) (DIP switch S2/4 = "ON").

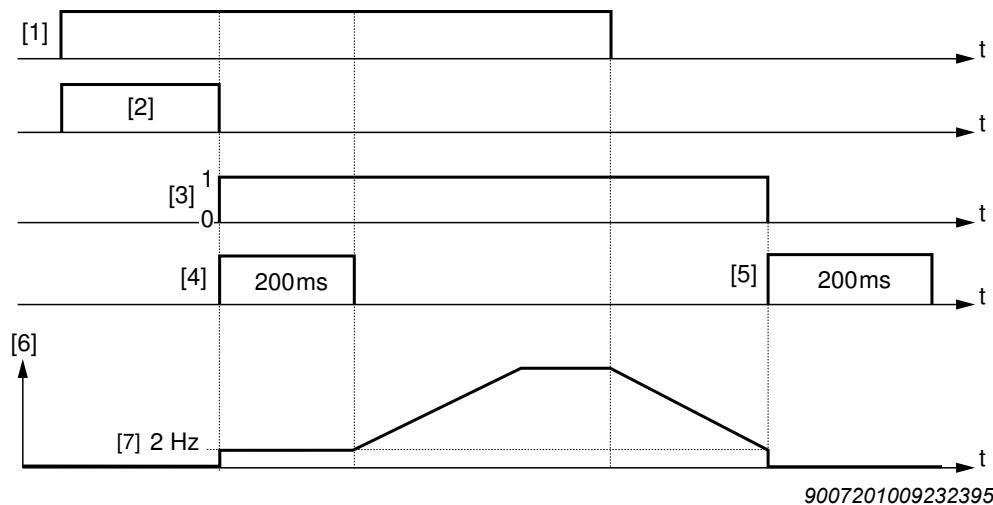
Functional description

- The start frequency for binary control mode and RS485 control mode is 2 Hz. If the function is not activated, the start frequency is 0.5 Hz.
- The brake release time is set to 200 ms (standard = 0 ms). This setting prevents the motor from working against the brake.
- The brake application time (post-magnetization time) is set to 200 ms. This setting ensures that the brake is applied as soon as the motor stops generating torque.
- The K1 relay is assigned the "Brake released" function.

When the K1 relay is open, the brake stops the motor.

When the K1 relay is closed, the brake is released.

Overview of brake control with additional function 9 (control via RS485 + binary control):



- | | | | |
|-----|--|-----|--|
| [1] | Enable | [5] | Brake application time (post-magnetization time) |
| [2] | Pre-magnetization time | [6] | Frequency |
| [3] | Brake control signal "1" = released, "0" = applied | [7] | Stop frequency = start / minimum frequency |
| [4] | Brake release time | | |

Mechanical brake is controlled by the relay output or the BEM/BES option.

⚠ WARNING



Risk of crushing due to unintentional startup of the drive caused by incorrect settings of the DIP switches S2/5 – S2/8. Failure to comply with "chapter "Use of the relay output for additional functions 7, 9, 12 and 13"" (→ 106) can result in the brakes releasing.

Severe or fatal injuries.

- Observe the information in "chapter "Use of the relay output for additional functions 7, 9, 12 and 13"" (→ 106).
- A braking resistor (BW..) must be connected to terminals X1:13 and X1:15 in the MOVIMOT® connection box. Terminal X1:14 is not assigned.
- The K1 relay works as a brake control relay. This means that the ready signal function is no longer available.

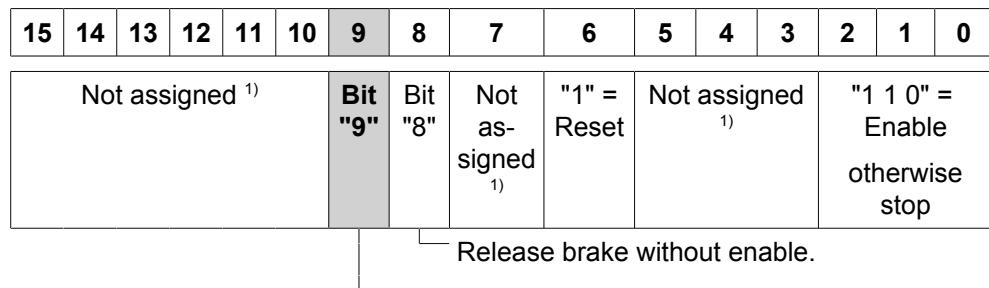
INFORMATION



"Brake release without enable" is not available in hoist operation.

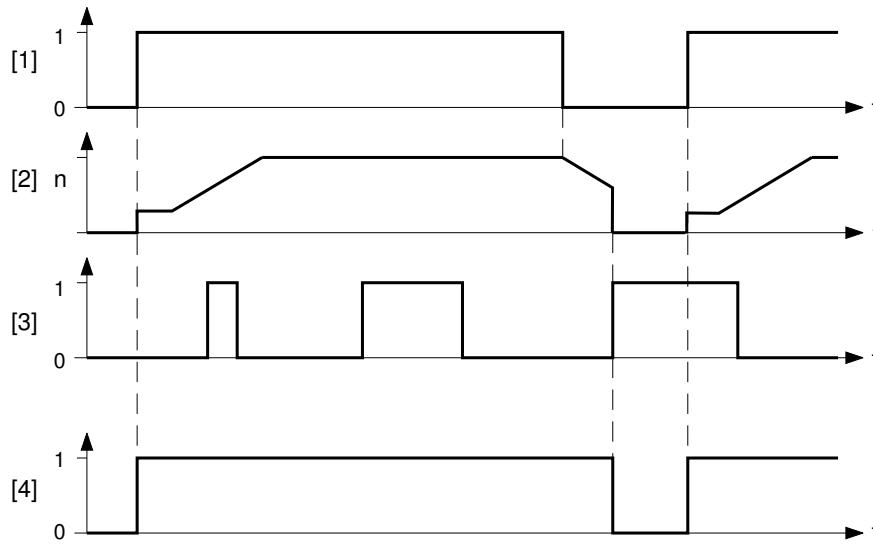
"Rapid stop" sub-function (only with control via RS485)

- The "rapid stop" function (apply brake during downward ramp) is introduced for control via RS485. This function is assigned to bit 9 in the control word as virtual terminal in line with MOVILINK® profile.

**Virtual terminal for "Applying brake when downward ramp is activated"**

1) Recommendation for all bits that are not assigned = "0"

- When bit 9 is set during the downward ramp, the MOVIMOT® inverter applies the brake (directly via the brake output or via the MOVIMOT® signal relay output) and blocks the output stage.
- If the motor frequency is lower than the stop frequency, the brake is applied regardless of the state of bit 9.
- After activation of the rapid stop, the enable must only be granted again once the drive has reached a standstill.

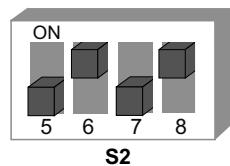
Flow diagram for brake control with "rapid stop" sub-function (control via RS485):

9007199589234187

- [1] Enable terminals / control word
- [2] Speed
- [3] Bit 9
- [4] Brake control signal: "1" = released, "0" = applied

6.7.11 Additional function 10

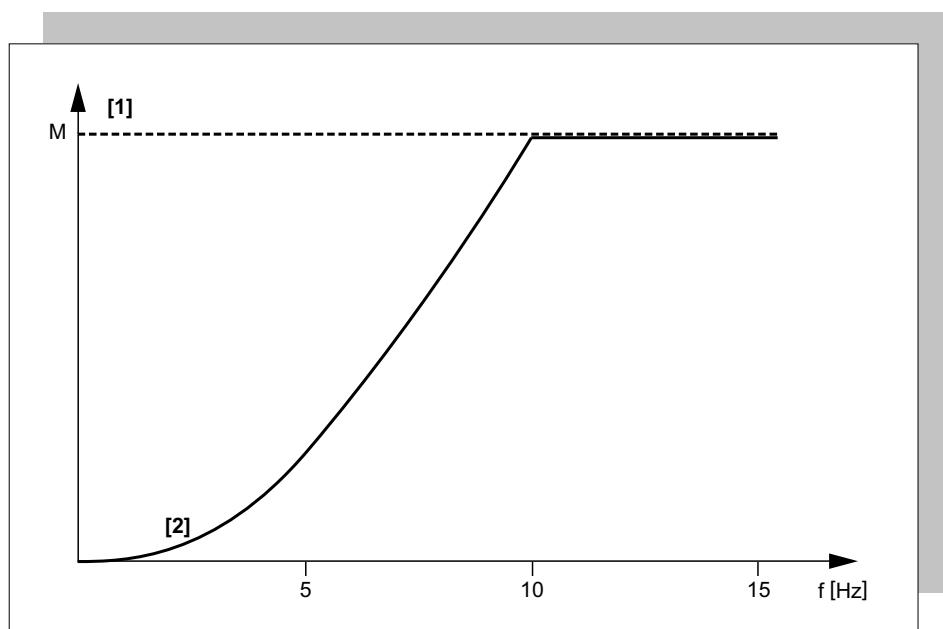
MOVIMOT® with reduced torque at low frequencies



330179211

Functional description

- Through reducing the slip compensation and active current at low speeds, the drive only develops a reduced torque (see the figure which follows):
- Minimum frequency = 0 Hz, see "additional function 8" (→ 92).



334866315

[1] Maximum torque in VFC mode

[2] Maximum torque when additional function 10 is activated

6.7.12 Additional function 11

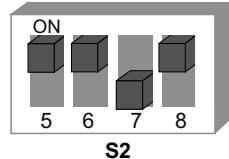
Deactivating the line phase failure monitoring

NOTICE

Deactivating the line phase failure monitoring can damage the unit if conditions are unfavorable.

Damage to the inverter.

- Deactivate the line phase failure check with short-term asymmetries of the line voltage.
- Make sure that the MOVIMOT® drive is always supplied with all 3 phases of the line voltage.



S2

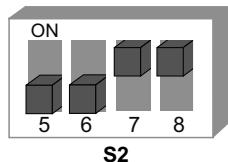
330218763

Functional description

- When the additional function is activated, the phases are not monitored.
- It is a good idea to deactivate this function for power supplies with short-term asymmetries, for example.

6.7.13 Additional function 12

MOVIMOT® with rapid start/stop and motor protection via TH



330259595

Functional description

- The additional function includes the following functions when the MOVIMOT® inverter is mounted close to the motor:
 - Motor protection via indirect TH evaluation via direction of rotation terminals
 - Rapid start and stop function

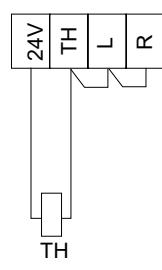
Sub-function "Motor protection via TH evaluation"

This function is only active with control via RS485. This additional function causes a tripping of error 84 "Motor overtemperature".

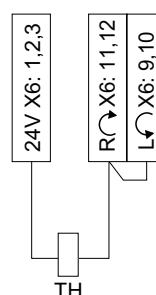
The error is triggered when **all** the following conditions are fulfilled:

- The standard MOVIMOT® motor protection function is deactivated when the DIP switch S1/5 is set to "ON".
- The terminals for direction of rotation are connected to 24 V via a TH as in the following figure.

For field distributors:



For mounting close to the motor with option P2.A:



- The TH tripped due to motor overtemperature. The enable signal for the two direction of rotation terminals is canceled.
- Supply voltage is connected.

INFORMATION



You can deactivate the "motor protection function using TH evaluation" by setting the DIP switch S1/5 to "OFF". In this case, the motor protection in the MOVIMOT® unit, realized via a motor model, is in effect.

"Rapid start" sub-function (control via RS485 + binary control)

- The pre-magnetization time is set to 0 s.
- Pre-magnetization is not performed after the drive is enabled. This is necessary to start acceleration along the setpoint ramp as quickly as possible.

"Rapid stop" sub-function (only with control via RS485)

- With control via RS485, the "apply brake during downward ramp" function is introduced. This functionality is assigned to bit 9 in the control word as virtual terminal in line with MOVILINK® profile.

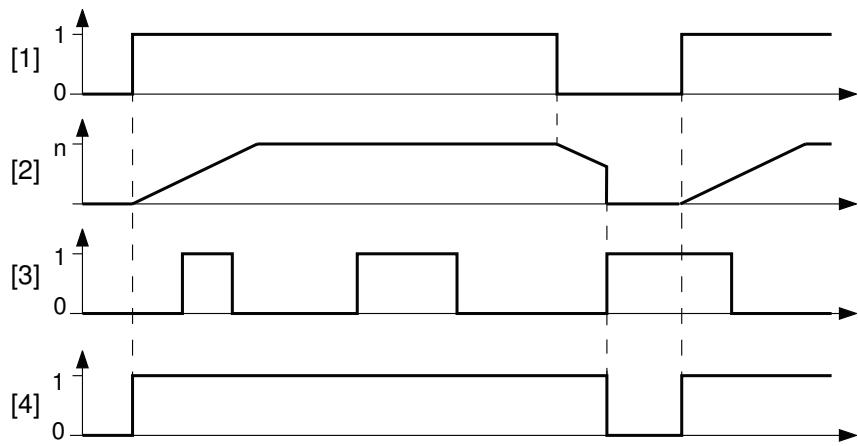
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Not assigned ¹⁾		Bit "9"	Bit "8"	Not assigned ¹⁾	"1" = Reset	Not assigned ¹⁾	"1 1 0" = Enable otherwise stop								

Release brake without enable.

Virtual terminal for "Applying brake when downward ramp is activated"

1) Recommendation for all bits that are not assigned = "0"

- When bit 9 is set during the downward ramp, the MOVIMOT® inverter applies the brake (directly via the brake output or via the MOVIMOT® signal relay output) and blocks the output stage.
- If the motor frequency is lower than the stop frequency, the brake is applied regardless of the state of bit 9 during the downward ramp.
- After activation of the rapid stop, the enable must only be granted again once the drive has reached a standstill.

Brake control flow diagram with the sub-function "rapid stop" (control via RS485):

9007199589659275

- [1] Enable terminals / control word
- [2] Speed
- [3] Bit 9
- [4] Brake control signal: "1" = released, "0" = applied

*Brake control (control via RS485 + binary control)***Mechanical brake controlled by MOVIMOT® inverter:**

- The terminals X1:13, X1:14 and X1:15 in the MOVIMOT® connection box are assigned to the brake coil of the mechanical brake. You must not connect an additional braking resistor to terminals X1:13 and X1:15.
- The relay is switched as a ready relay (standard function).

Mechanical brake controlled by the relay output or the BEM/BES option:

⚠ WARNING

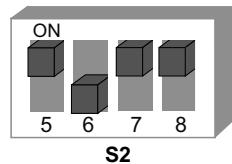
Risk of crushing due to unintentional startup of the drive caused by incorrect settings of the DIP switches S2/5 – S2/8. Failure to comply with "chapter "Use of the relay output for additional functions 7, 9, 12 and 13"" (→ 106) can result in the brakes releasing.

Severe or fatal injuries.

- Observe the information in "chapter "Use of the relay output for additional functions 7, 9, 12 and 13"" (→ 106).
- A braking resistor (BW..) must be connected to terminals X1:13 and X1:15 in the MOVIMOT® connection box. Terminal X1:14 is not assigned.
- The K1 relay works as a brake control relay. This means that the ready signal function is no longer available.

6.7.14 Additional function 13

MOVIMOT® with extended speed monitoring



330300683

⚠ WARNING



Risk of fatal injury if the hoist falls.

Severe or fatal injuries.

- The MOVIMOT® drive may not be used as a safety device in hoist applications.
- Use monitoring systems or mechanical protection devices to ensure safety.

Requirements

The MOVIMOT® can only be used in hoist applications if the following prerequisites are met:

- Additional function 13 is only possible in conjunction with brake motors.
- Make sure that the DIP switch S2/3 is set to "OFF" (VFC operation).
- It is mandatory to use a brake controller in connection with an external braking resistor.
- Please note the descriptions and information for "additional function 9" (→ 93).

Functional description

Additional function 13 includes the following functions:

- Additional function 9, MOVIMOT® for lifting applications"" (→ 93)
- Speed monitoring with adjustable monitoring time

Once the additional function 13 is activated, speed monitoring is always on, regardless of the setting of DIP switch S2/4.

After activating additional function 13, the DIP switch S2/4 has the following functions depending on the set RS485 address:

Binary control

The RS485 address set at DIP switches S1/1 – S1/4 is 0.

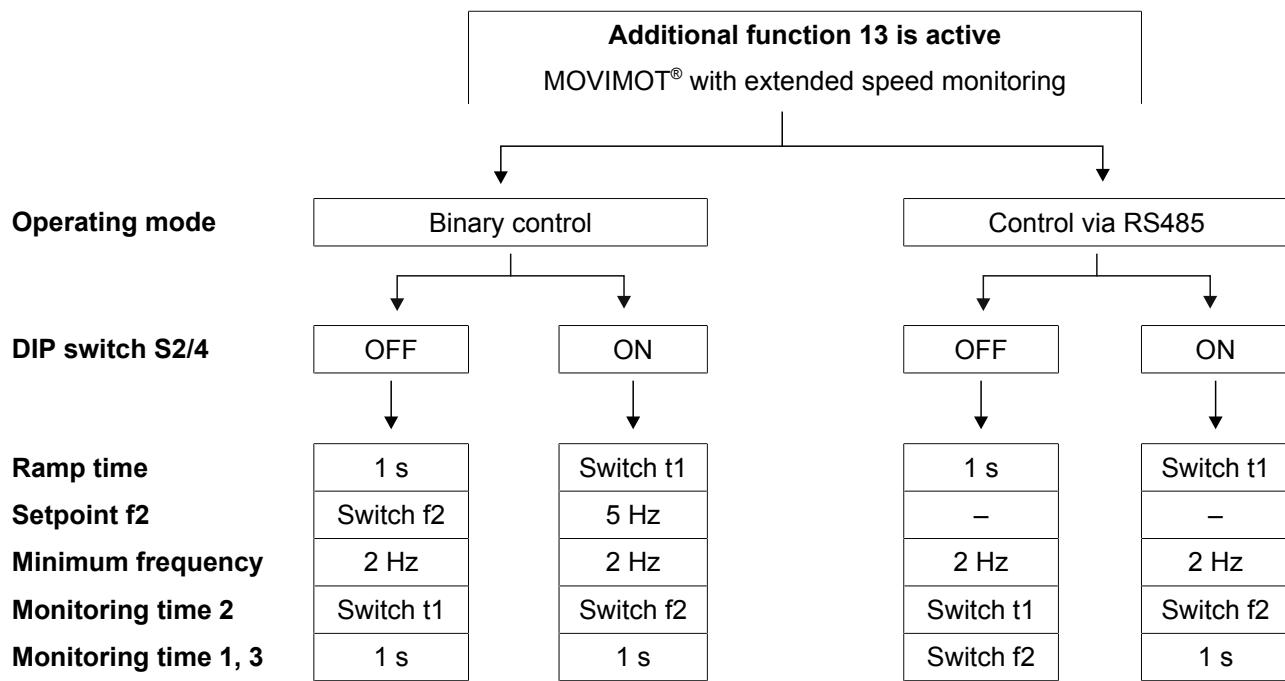
- S2/4 = "OFF"
 - The speed monitoring time 2 is set at switch t1.
 - The speed monitoring times 1 and 3 are fixed to 1 s.
 - The ramp time is set to 1 s.
 - Setpoint f2 is set as switch f2.
- S2/4 = "ON"
 - The speed monitoring time 2 is set at switch f2.
 - The speed monitoring times 1 and 3 are fixed to 1 s.
 - The setpoint is set to 5 Hz.
 - The ramp time is set at switch t1.

Control via RS485

The RS485 address set at DIP switches S1/1 – S1/4 is not 0.

- S2/4 = "OFF"
 - The speed monitoring time 2 is set at switch t1.
 - The speed monitoring times 1 and 3 are set at switch f2.
 - The ramp time is set to 1 s.
 - The minimum frequency is set to 2 Hz.
- S2/4 = "ON"
 - The speed monitoring time 2 is set at switch f2.
 - The speed monitoring times 1 and 3 are fixed to 1 s.
 - The ramp time is set at switch t1.
 - The minimum frequency is set to 2 Hz.

Setting options for additional function 13

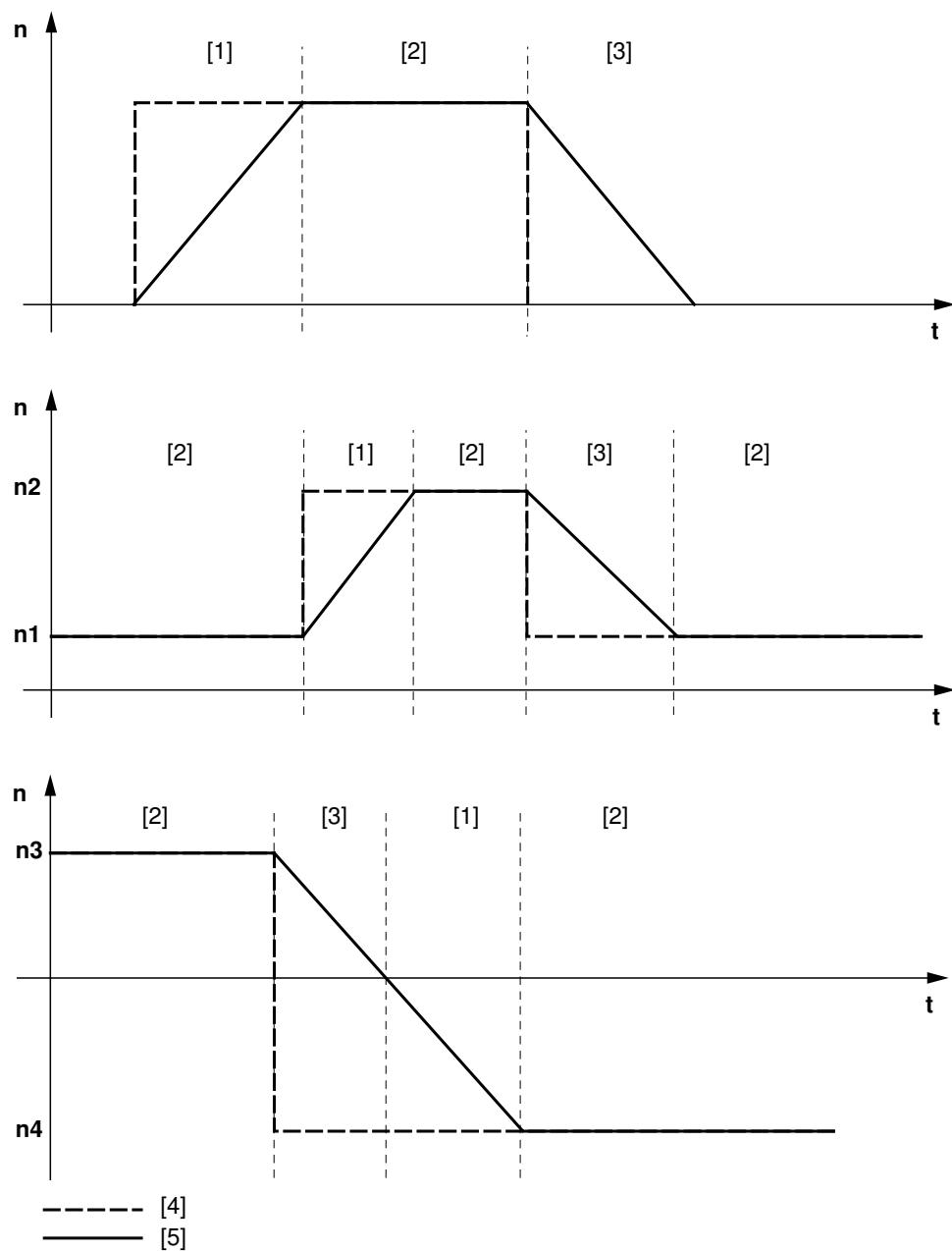


Setting the speed monitoring times

When additional function 13 is active, the following values may be set as monitoring times on switches t1 and f2:



Switch t1 or f2 (see above)											
Detent position	0	1	2	3	4	5	6	7	8	9	10
Monitoring time 2 [s]	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.5
Monitoring times 1 and 3 [s]	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.5

Validity of the speed monitoring times

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- [1] Validity of monitoring time 1
- [2] Validity of monitoring time 2
- [3] Validity of monitoring time 3

- [4] Speed setpoint
- [5] Speed output (actual value)

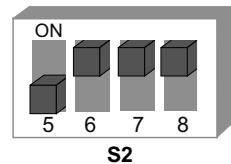
Monitoring time 1 is valid when the actual speed increases after a setpoint change.

The validity range of monitoring time 2 begins when the setpoint is reached.

The validity range of monitoring time 3 applies when the actual speed decreases after a setpoint change.

6.7.15 Additional function 14

MOVIMOT® with deactivated slip compensation



330342539

Functional description

Slip compensation is deactivated.

Deactivating slip compensation can reduce the speed accuracy of the motor.

6.7.16 Using the relay output for additional functions 7, 9, 12 and 13

⚠ WARNING

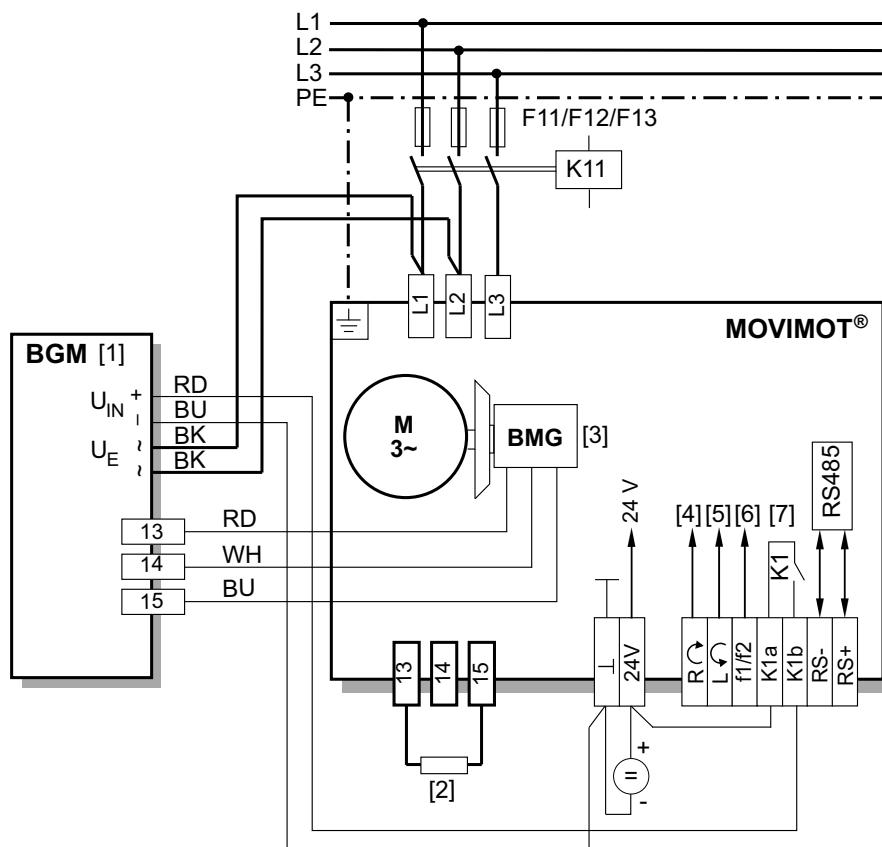


Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- The brake coil must correspond to the line voltage (e.g. 400 V).
- Do not assign port X1:14.
- The additional functions 7, 9 or 13 must be activated as otherwise the brake is released permanently. Please ensure this is the case with replacing the MOVIMOT® inverter. If none of the functions referred to are activated, the K1 relay contact acts as a ready contact. This means that the brake is released even without enable when using the BGM option.

The following figure shows the use of the K1 relay contact for controlling the mechanical brake with the BGM brake rectifier.



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- [1] BGM brake control mounted in the connection box
- [2] External braking resistor BW (for assignment see "Technical data" chapter)
- [3] DC 24 V supply
- [4] CW/Stop
- [5] Observe enabled CCW/Stop direction of rotation, see "chapter "Connection of MOVIMOT® drive"" (→ 44)
- [6] Setpoint changeover f1 / f2
- [7] Brake relay

6.8 Startup with binary control

⚠ WARNING

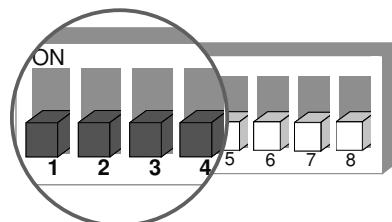


Electric shock from capacitors that have not been fully discharged.

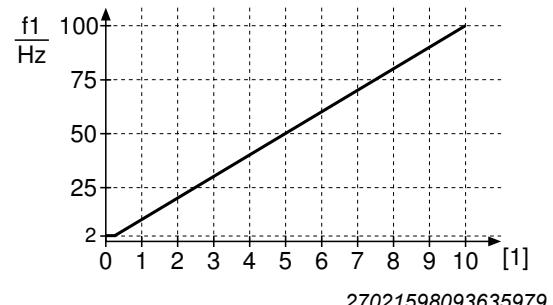
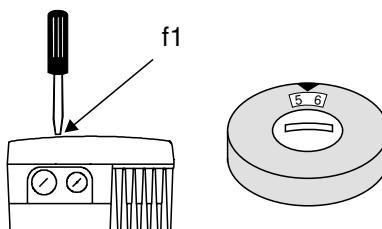
Severe or fatal injuries.

- Disconnect the inverter from the power. Observe the minimum switch-off time after disconnection from the supply system:
 - **1 minute**

1. Remove the MOVIMOT® inverter from the connection box.
2. Check whether the MOVIMOT® drive is installed correctly both mechanically and electrically.
Refer to chapters "Mechanical installation" and "Electrical installation".
3. Make sure that the DIP switches S1/1 – S1/4 are set to "OFF" (address = 0). This means MOVIMOT® is controlled binary via terminals.



4. Set the first speed at the setpoint potentiometer f1 (active when terminals f1/f2 X6:7,8 = "0") factory setting: about 50 Hz (1500 rpm).



[1] Potentiometer setting

5. NOTICE!

Loss of warranted degree of protection if the screw plugs of the f1 setpoint potentiometer or the X50 diagnostic interface are installed incorrectly or not at all.

Damage to the MOVIMOT® inverter.

- Make sure the screw plug of the setpoint potentiometer has a seal and screw it in.

6. Set the second speed at switch f2 (active when terminals f1/f2 X6,7,8 = "1").



Switch f2											
Detent position	0	1	2	3	4	5	6	7	8	9	10
Setpoint f2 [Hz]	5	7	10	15	20	25	35	50	60	70	100

INFORMATION



The first speed is infinitely variable during operation using the setpoint potentiometer f1, which is accessible from the outside.

Speeds f1 and f2 can be set independently of each other.

- Set the ramp time at the switch t1.

The ramp time is based on a setpoint step change of 1500 rpm (50 Hz).



Switch t1											
Detent position	0	1	2	3	4	5	6	7	8	9	10
Ramp time t1 [s]	0.1	0.2	0.3	0.5	0.7	1	2	3	5	7	10

- Place the MOVIMOT® inverter onto the connection box and screw it on tightly.

- Switch on the DC 24 V control voltage and the line voltage.

6.8.1 Inverter behavior depending on terminal signal level

The following table shows the behavior of the MOVIMOT® inverter depending on the level at the control terminals:

Inverter behavior	Terminal signal level					Status LED
	Supply system X1:L1 – L3	24 V X6:1,2,3	f1/f2 X6:7,8	CW/Stop X6:11,12	CCW/Stop X6:9,10	
Inverter off	0	0	X	X	X	Off
Inverter off	1	0	X	X	X	Off
Stop, no supply system	0	1	X	X	X	Flashing yellow
Stop	1	1	X	0	0	Yellow
CW rotation with f1	1	1	0	1	0	Green
CCW rotation with f1	1	1	0	0	1	Green
CW rotation with f2	1	1	1	1	0	Green
CCW rotation with f2	1	1	1	0	1	Green
Stop	1	1	X	1	1	Yellow

Key:

0 = No voltage

1 = Voltage

X = Any

6.9 Startup with options MBG11A or MLG..A



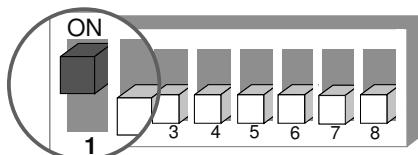
⚠ WARNING

Electric shock from capacitors that have not been fully discharged.

Severe or fatal injuries.

- Disconnect the inverter from the power. Observe the minimum switch-off time after disconnection from the supply system:
 - **1 minute**

1. Remove the MOVIMOT® inverter from the connection box.
2. Check whether the MOVIMOT® drive is installed correctly both mechanically and electrically.
Refer to chapters "Mechanical installation" and "Electrical installation".
3. Set the MOVIMOT® DIP switch S1/1to ON (= address 1).



4. Set minimum frequency f_{\min} with switch f2.



Switch f2

Detent position	0	1	2	3	4	5	6	7	8	9	10
Minimum frequency f_{\min} [Hz]	2	5	7	10	12	15	20	25	30	35	40

5. Set the ramp time at the switch t1.

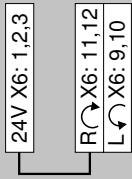
The ramp time is based on a setpoint step change of 1500 rpm (50 Hz).

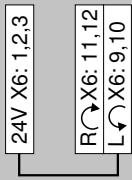
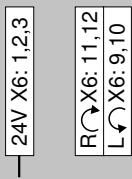


Switch t1

Detent position	0	1	2	3	4	5	6	7	8	9	10
Ramp time t1 [s]	0.1	0.2	0.3	0.5	0.7	1	2	3	5	7	10

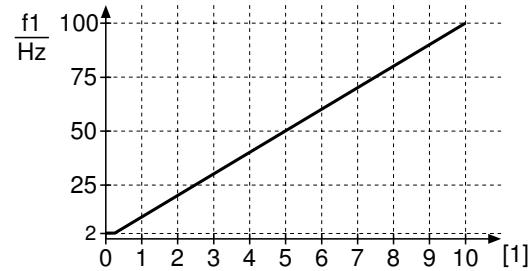
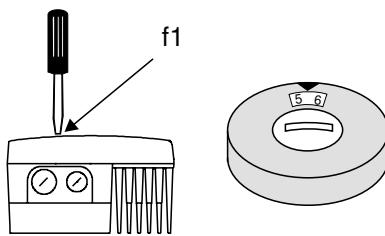
6. Check to see if the requested direction of rotation has been enabled.

CW/Stop	CCW/Stop	Meaning
Activated	Activated	<ul style="list-style-type: none"> • Both directions of rotation are enabled. 
Activated	Not activated	<ul style="list-style-type: none"> • Only CW rotation is enabled. • Setpoint selections for CCW direction of rotation cause the drive to stop. 

CW/Stop	CCW/Stop	Meaning
Not activated	Activated	<ul style="list-style-type: none"> Only CCW rotation is enabled Setpoint selections for CW direction of rotation cause the drive to stop. 
Not activated	Not activated	<ul style="list-style-type: none"> Unit is inhibited or drive brought to a stop 

7. Place the MOVIMOT® inverter onto the connection box and screw it on tightly.

8. Set the required maximum speed using setpoint potentiometer f1.



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[1] Potentiometer setting

9. **NOTICE!**

Loss of warranted degree of protection if the screw plugs of the f1 setpoint potentiometer or the X50 diagnostics interface are installed incorrectly or not at all.

Damage to the MOVIMOT® inverter.

- Make sure the screw plug of the setpoint potentiometer has a seal and screw it in.

10. Switch on the DC 24 V control voltage and the supply voltage.

INFORMATION



For notes on operation with the MBG11A or MLG..A options, refer to "sec. "MBG11A and MLG..A keypad"" (→ 182).

6.10 Startup with MWA21A option

⚠ WARNING

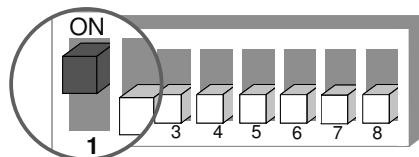


Electric shock from capacitors that have not been fully discharged.

Severe or fatal injuries.

- Disconnect the inverter from the power. Observe the minimum switch-off time after disconnection from the supply system:
 - **1 minute**

1. Remove the MOVIMOT® inverter from the connection box.
2. Check whether the MOVIMOT® drive is installed correctly both mechanically and electrically.
Refer to chapters "Mechanical installation" and "Electrical installation".
3. Set the DIP switch S1/1 of the MOVIMOT® inverter to "ON" (= address 1).



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4. Set minimum frequency f_{\min} with switch f2.



Switch f2

Detent position	0	1	2	3	4	5	6	7	8	9	10
Minimum frequency f_{\min} [Hz]	2	5	7	10	12	15	20	25	30	35	40

5. Set the ramp time at the switch t1.

The ramp time is based on a setpoint step change of 1500 rpm (50 Hz).



Switch t1

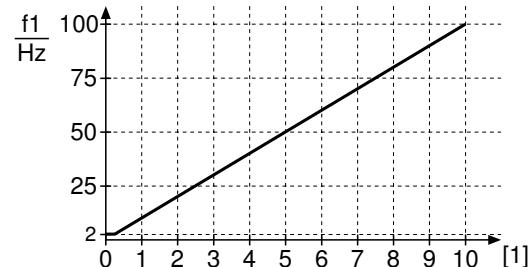
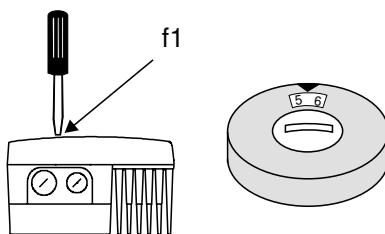
Detent position	0	1	2	3	4	5	6	7	8	9	10
Ramp time t1 [s]	0.1	0.2	0.3	0.5	0.7	1	2	3	5	7	10

6. Check to see if the requested direction of rotation has been enabled.

CW/Stop	CCW/Stop	Meaning
Activated	Activated	<ul style="list-style-type: none"> • Both directions of rotation are enabled.
24V X6: 1,2,3	R X6: 11,12 L X6: 9,10	

CW/Stop	CCW/Stop	Meaning
Activated	Not activated	<ul style="list-style-type: none"> Only CW rotation is enabled. Setpoint selections for CCW direction of rotation cause the drive to stop.
Not activated	Activated	<ul style="list-style-type: none"> Only CCW rotation is enabled Setpoint selections for CW direction of rotation cause the drive to stop.
Not activated	Not activated	<ul style="list-style-type: none"> Unit is inhibited or drive brought to a stop

- Place the MOVIMOT® inverter onto the connection box and screw it on tightly.
- Set the maximum speed required using setpoint potentiometer f1 of the MOVIMOT® inverter.



[1] Potentiometer setting

9. NOTICE!

Loss of warranted degree of protection if the screw plugs of the f1 setpoint potentiometer or the X50 diagnostics interface are installed incorrectly or not at all.

Damage to the MOVIMOT® inverter.

- Make sure the screw plug of the setpoint potentiometer has a seal and screw it in.

- Select the signal type for the analog input (terminals 7 and 8) of the MWA21A option using switches S1 and S2.

	S1	S2	Setpoint stop function
U signal = 0 – 10 V	OFF	OFF	No
I signal = 0 – 20 mA	ON	OFF	

	S1	S2	Setpoint stop function
I signal = 4 – 20 mA	ON	ON	yes
U signal = 2 – 10 V	OFF	ON	

11. Switch on the DC 24 V control voltage and the supply voltage.
12. Enable the MOVIMOT® drive. This means applying 24 V to terminal 4 (CW rotation) or terminal 5 of the MWA21A option.

INFORMATION



For notes on operation with the MWA21A option, refer to chapter ""MWA21A setpoint converter"" (→ 183).

6.11 Supplementary notes for installation close to the motor

When the MOVIMOT® inverter is installed close to the motor, observe the following notes:

6.11.1 Checking the connection type for the connected motor

Make sure that the selected connection type of MOVIMOT® inverter corresponds to that of the connected motor according to the figure below.



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For brakemotors: Do not install brake rectifiers inside the terminal box of the motor!

6.11.2 Motor with Option /MI

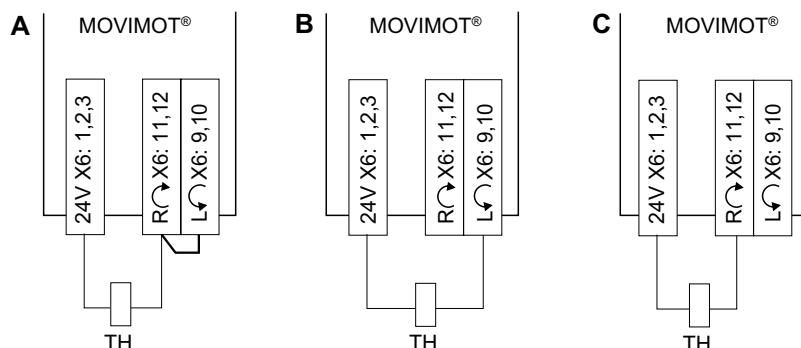
Make sure a drive ID module suitable to the energy efficiency class of the motor is plugged into the MOVIMOT® inverter.

When a motor/brakemotor (without MOVIMOT® inverter) is ordered with the option /MI, the drive ID module can be found in the terminal box of the motor.

6.11.3 Motor protection and direction of rotation enable

The connected motor must be equipped with a TH.

- For control via RS485, the TH must be wired as follows:

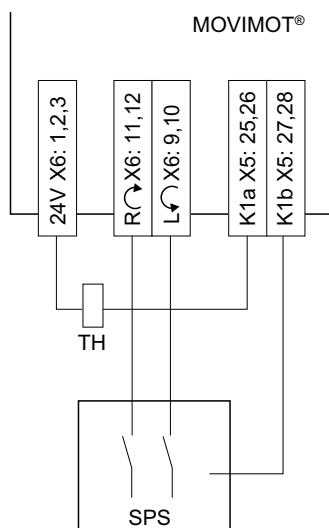


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- [A] Both directions of rotation are enabled.
- [B] Only **CCW** direction of rotation is enabled.
- [C] Only **CW** direction of rotation is enabled.

- For control via binary signals, SEW-EURODRIVE recommends that you connect the TH in series with the "Ready signal" relay (see the following figure).
 - The ready signal must be monitored by an external controller.

- As soon as the ready signal is no longer present, the drive must be switched off (terminals R ↗ X6:11,12 and L ↗ X6:9,10 = "0").



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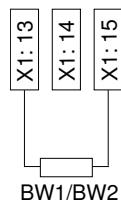
6.11.4 DIP switch

When the MOVIMOT® inverter is installed close to the motor, the DIP switch S1/5 must be changed from the factory setting to "ON":

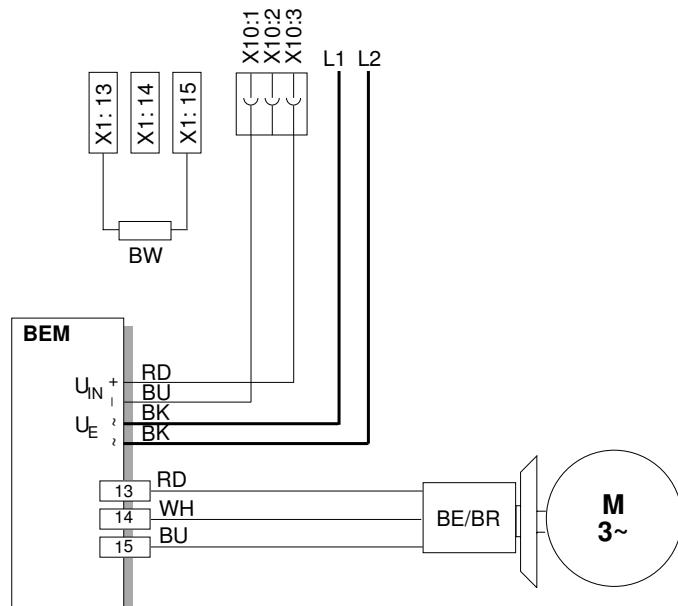
S1 Meaning	1	2	3	4	5	6	7	8
	Binary coding RS485 unit address				Motor pro- tection	Motor perfor- mance level	PWM frequency	No-load damping
2 ⁰	2 ¹	2 ²	2 ³					
ON	1	1	1	1	Off	Motor one stage smaller	Variable (16, 8, 4 kHz)	On
OFF	0	0	0	0	On	Adjusted	4 kHz	Off

6.11.5 Braking resistor

- For **motors without brake**, a braking resistor must be connected in the MOVIMOT® connection box.



- For **brakemotors without BEM option**, no braking resistor may be connected to the MOVIMOT®.
- For **brakemotors with BEM option** and external braking resistor, the external braking resistor and the brake must be connected as follows:



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6.11.6 Mounting the MOVIMOT® inverter in the field distributor

Follow the instructions in the corresponding fieldbus manuals when mounting the MOVIMOT® inverter close to the motor in the field distributor.

7 Easy startup with RS485 interface/fieldbus

7.1 General information concerning startup

INFORMATION



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

⚠ WARNING



Risk of crushing due to missing or defective protective covers.

Severe or fatal injuries.

- Install the protective covers of the plant according to the instructions, see the operating instructions of the gear unit.
- Never start the unit if the protective covers are not installed.

⚠ WARNING



Electric shock from capacitors that have not been fully discharged.

Severe or fatal injuries.

- Disconnect the inverter from the power. Observe the minimum switch-off time after disconnection from the supply system:
 - 1 minute

⚠ WARNING



Device malfunction due to incorrect device setting.

Severe or fatal injuries.

- Comply with the startup instructions.
- The installation must be carried out by qualified personnel only.
- Always use the appropriate functional settings.

⚠ WARNING



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

Serious injuries.

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

INFORMATION



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

INFORMATION



- Remove status LED paint protection cap before startup. Remove paint protection film from the nameplates before startup.
- Observe a minimum switch-off time of 2 seconds for the K11 line contactor.

7.2 Requirements

The following conditions apply to the startup:

- The MOVIMOT® drive must be installed correctly both mechanically and electrical-ly.
- 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.

7.3 Startup procedure

⚠ WARNING



Electric shock caused by dangerous voltages in the connection box. Dangerous voltages may still be present for up to 1 minute after disconnection from the power supply.

Severe or fatal injuries.

- De-energize the unit using a suitable disconnection device.
- Protect it against unintentional reconnection to the voltage supply.
- Wait for at least 1 minute before disassembling the device.

1. Remove the MOVIMOT® inverter from the connection box.
2. Check whether the MOVIMOT® drive is installed correctly both mechanically and electrically. See chapters "Mechanical installation" and "Electrical installation".
3. Set the correct RS485 address on DIP switches S1/1 – S1/4.

In conjunction with SEW fieldbus interfaces (MF..../MQ..) or with MOVIFIT®, always set address "1".

Decimal address	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
S1/1	–	X	–	X	–	X	–	X	–	X	–	X	–	X	–	X
S1/2	–	–	X	X	–	–	X	X	–	–	X	X	–	–	X	X
S1/3	–	–	–	–	X	X	X	X	–	–	–	–	X	X	X	X
S1/4	–	–	–	–	–	–	–	–	X	X	X	X	X	X	X	X

X = ON

– = OFF

4. Set minimum frequency f_{\min} with switch f2.



Switch f2

Detent setting	0	1	2	3	4	5	6	7	8	9	10
Minimum frequency f_{\min} Hz	2	5	7	10	12	15	20	25	30	35	40

5. If the ramp time is not specified via the fieldbus, set the ramp time at switch t1.

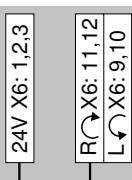
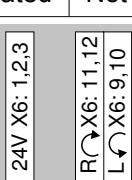
The ramp time is based on a setpoint step change of 1500 min^{-1} (50 Hz).



Switch t1

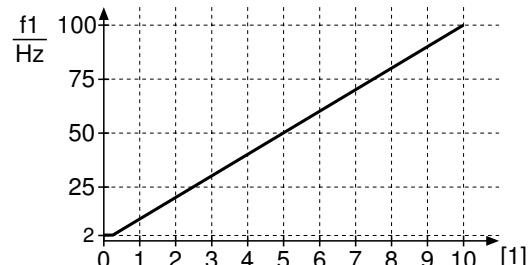
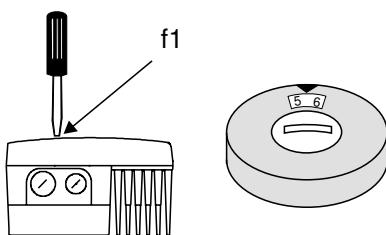
Detent setting	0	1	2	3	4	5	6	7	8	9	10
Ramp time t1 s	0.1	0.2	0.3	0.5	0.7	1	2	3	5	7	10

6. Check to see if the requested direction of rotation has been enabled.

CW/stop	CCW/stop	Meaning
Activated	Activated	<ul style="list-style-type: none"> Both directions of rotation are enabled. 
Activated	Not activated	<ul style="list-style-type: none"> Only CW rotation is enabled. Setpoint inputs for CCW rotation will stop the drive. 
Not activated	Activated	<ul style="list-style-type: none"> Only CCW rotation is enabled. Setpoint inputs for CW rotation will stop the drive. 
Not activated	Not activated	<ul style="list-style-type: none"> The device is inhibited or the drive is stopped. 

7. Place the MOVIMOT® inverter on the connection box and screw it tight.

8. Set the required maximum speed using setpoint potentiometer f1.



[1] Potentiometer setting

9. NOTICE!

Loss of warranted degree of protection if the screw plugs of the f1 setpoint potentiometer or the X50 diagnostic interface are installed incorrectly or not at all.

Damage to the MOVIMOT® inverter can occur.

- Make sure the screw plug of the setpoint potentiometer has a seal and screw it in again.

10. Switch on the DC 24 V control voltage and the line voltage.

For information on the function in conjunction with RS485 master, refer to chapter "Function with RS485 master" (→ 129) in the operating instructions.

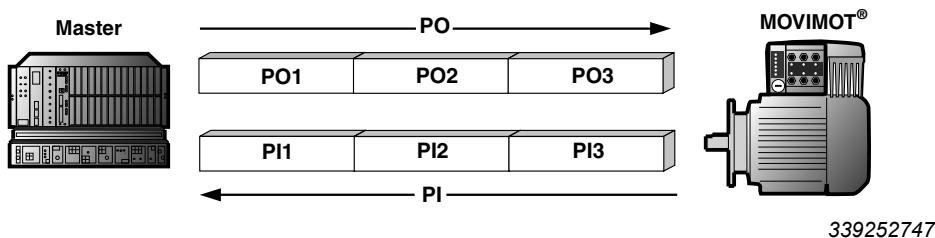
For further information on the function in connection with fieldbus interfaces, refer to the relevant fieldbus manuals.

7.4 Coding of process data

The same process data information is used for control and setpoint selection in all fieldbus systems. The coding of the process data takes place according to the uniform MOVILINK® profile for SEW drive inverters.

MOVIMOT® is available in the following variants:

- 2 process data words (2 PD)
- 3 process data words (3 PD)



PO = Process output data

PI = Process input data

PO1 = Control word

PI1 = Status word 1

PO2 = Speed [%]

PI2 = Output current

PO3 = Ramp

PI3 = Status word 2

7.4.1 2 process data words

For controlling the MOVIMOT® drive via 2 process data words, the higher-level controller sends the process output data "Control word" and "Speed [%]" to the MOVIMOT® inverter. The MOVIMOT® inverter sends the process input data "Status word 1" and "Output current" to the higher-level controller.

7.4.2 3 process data words

For control with 3 process data words, the "ramp" is sent as an additional process data output word and "Status word 2" is sent as the third process data input word.

7.4.3 Process output data

Process output data is sent from the higher-level controller to the MOVIMOT® inverter (control information and setpoints). However, they only become effective in the MOVIMOT® inverter if the RS485 address in MOVIMOT® (DIP switches S1/1 to S1/4) is set to a value other than 0.

The higher-level controller controls the MOVIMOT® drive using the following process output data:

- PO1: Control word
- PO2: Speed [%] (setpoint)
- PO3: Ramp (only for 3-word protocol)

	Virtual terminal for applying brake and inhibiting output stage in case of "Stop" control command																	
	Virtual terminals for releasing the brake without drive enable, only when DIP switch S2/2 is set to "ON"																	
Basic control block																		
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0		
PO1: Control word	Not assigned ¹⁾ Reserved for additional functions					Bit "9"	Bit "8"	Not assigned ¹⁾	"1" = Reset	Not assigned ¹⁾			"1 1 0" = Enable, otherwise stop					
PO2: Setpoint	Signed percentage value / 0.0061% Example: -80%/0.0061 = -13115 = CCC5 _{hex}																	
PO3: Ramp (only for 3-word protocol)	Time from 0 to 50 Hz in ms (range: 100 – 10,000 ms) Example: 2.0 s = 2000 ms = 07D0 _{hex}																	

1) Recommendation for all bits that are not assigned = "0"

Control word, bit 0 – 2

The "Enable" control command is specified with bits 0 – 2 by entering the control word = 0006_{hex}. To enable the MOVIMOT® inverter, you must also switch terminal R ↗ X6:11,12 and/or L ↗ X6:9,10 to +24 V (jumper with terminal 24V X6:1,2,3).

The "Stop" control command is issued by resetting bit 2 = "0." Use the stop command 0002_{hex} to ensure compatibility with other SEW inverter series. If bit 2 = "0", the MOVIMOT® inverter stops the drive with the current ramp.

Control word, bit 6 = reset

In the event of a malfunction, the error can be acknowledged by setting bit 6 = "1" (Reset). For reasons of compatibility , set any control bits not assigned to "0".

Control word, bit 8 = release brake without drive enable

If DIP switch S2/2 is set to "ON", you are able to release the brake without drive enable by setting bit 8.

Control word, bit 9 = apply brake when control command "Stop" is issued

If bit 9 is set after activating the control command "Stop", the MOVIMOT® inverter applies the brake and inhibits the output stage.

INFORMATION

Note that this function is only available in conjunction with an activated additional function 8 or 12.

Speed [%]

The speed setpoint is given as a percentage and refers to the maximum speed which you set on the setpoint potentiometer f1.

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

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

→ 1 digit = 0.0061%

Example: 80% f_{max}, CCW rotation

Calculation: -80%/0.0061 % = -13115_{dec} = CCC5_{hex}

Ramp

The current integrator in the process output data word PO3 is transferred if the process data are exchanged using three process data words. The integrator ramp set with switch t1 is used if MOVIMOT® is controlled by two process data items.

Coding: → 1 digit = 1 ms

Range: 100 – 10000 ms

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

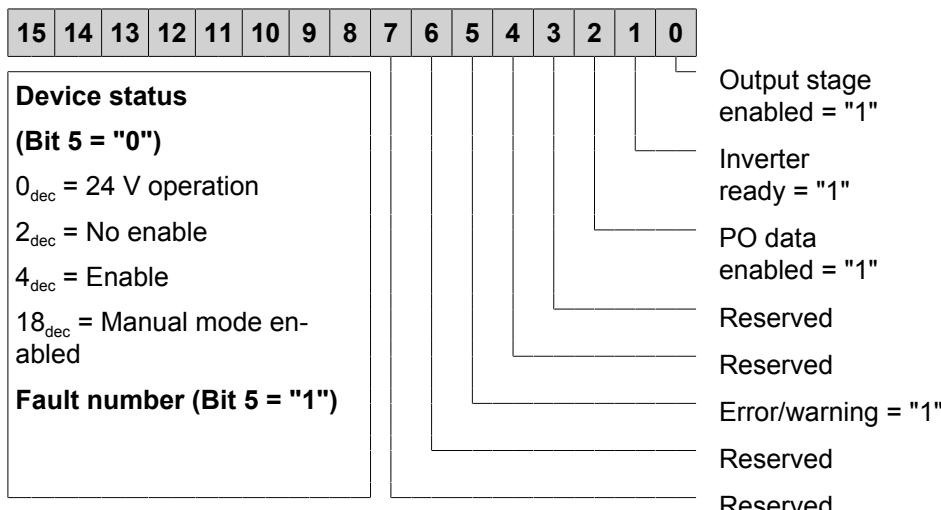
7.4.4 Process input data

The MOVIMOT® inverter sends back process input data to the higher-level controller. The process input data consists of status and actual value information.

The MOVIMOT® inverter supports the following process input data:

- PI1: Status word 1
- PI2: DC link voltage + output current
- PI3: Motor model temperature + speed

PI1: Status word 1

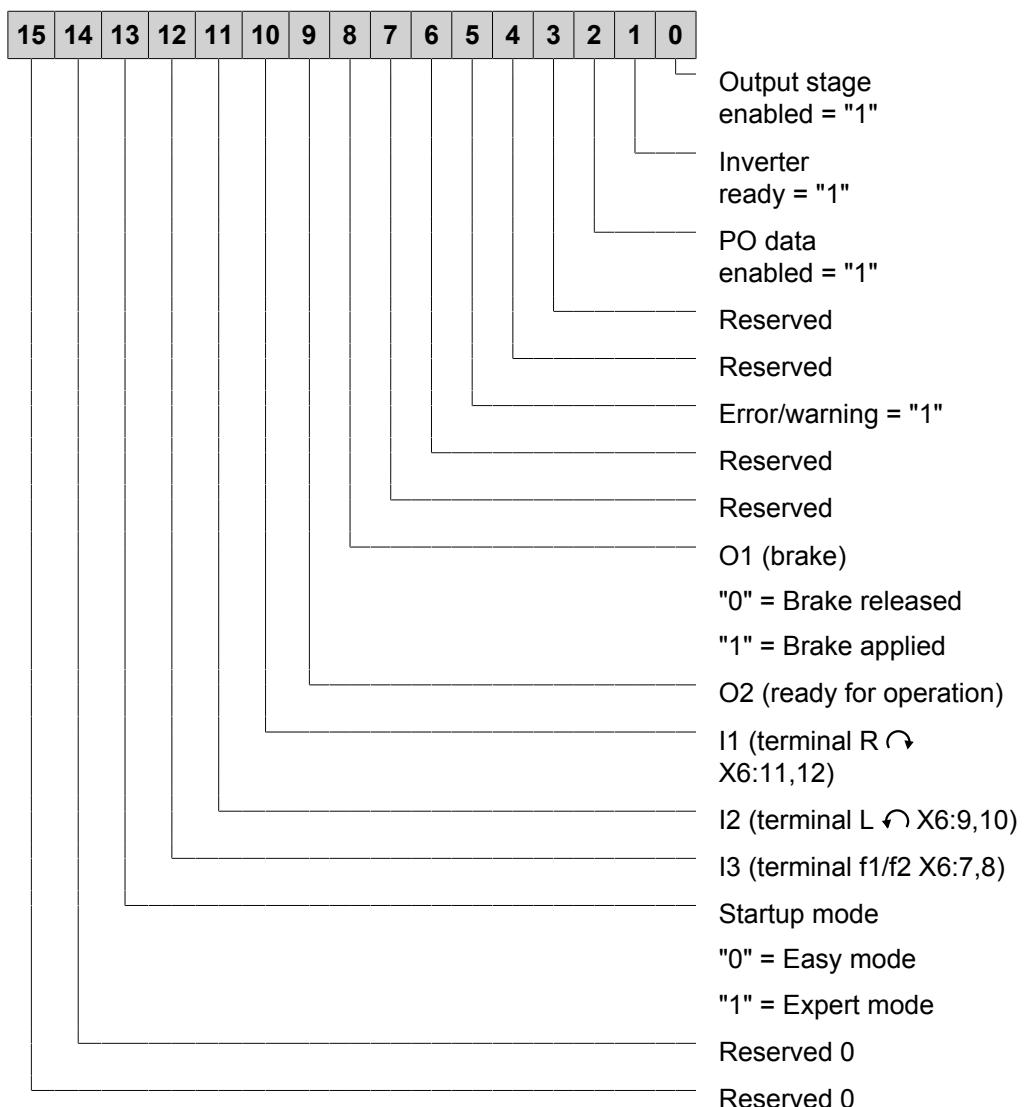


PI2: Current actual value

16 bit integer with sign x 0.1% I_N

Example: 0320_{hex} = 800 × 0.1% I_N = 80% I_N

PI3: Status word 2 (only for 3-word protocol)



Assignment status word 1

Bit	Meaning	Explanation
0	Output stage enabled	1: MOVIMOT® drive is enabled. 0: MOVIMOT® drive is not enabled.
1		1: MOVIMOT® drive is ready for operation. 0: MOVIMOT® drive is not ready for operation.
2	PO data enabled	1: Process data is enabled. Drive can be controlled via fieldbus. 0: Process data is inhibited. Drive cannot be controlled via fieldbus.
3		Reserved = 0
4	Reserved	Reserved = 0
5	Error/warning	1: Error/warning present. 0: No error/warning present.
6		Reserved = 0
7	Reserved	Reserved = 0
8–15	Bit 5 = 0: Device status 0 _{dec} : 24 V operation 2 _{dec} : No enable 4 _{dec} : Enable 18 _{dec} : Manual operation active Bit 5 = 1: Fault number	If there is no error/warning (bit 5 = 0), the operating/enable status of the inverter power section is displayed in this byte. If there is an error/warning (bit 5 = 1), the fault number is displayed in this byte.

Assignment of status word 2

Bit	Meaning	Explanation
0	Output stage enabled	1: MOVIMOT® drive is enabled. 0: MOVIMOT® drive is not enabled.
1		1: MOVIMOT® drive is ready for operation. 0: MOVIMOT® drive is not ready for operation.
2	PO data enabled	1: Process data is enabled. Drive can be controlled via fieldbus. 0: Process data is inhibited. Drive cannot be controlled via fieldbus.
3		Reserved = 0
4	Reserved	Reserved = 0
5	Error/warning	1: Error/warning present. 0: No error/warning present.
6		Reserved = 0
7	Reserved	Reserved = 0
8	O1 brake	1: Brake applied 0: Brake released
9		1: MOVIMOT® drive is ready for operation. 0: MOVIMOT® drive is not ready for operation.
10	I1 (R X6:11,12)	1: Digital input is set. 0: Digital input is not set
11	I2 (L X6:9,10)	
12	I3 (f1/f2 X6:7,8)	
13	Startup mode	1: Expert startup mode 0: Easy startup mode
14	Reserved	Reserved = 0
15	Reserved	Reserved = 0

7.5 Function with RS485 master

- The higher-level controller (e.g. PLC) is the master, the MOVIMOT® inverter is the slave.
- 1 start bit, 1 stop bit and 1 parity bit (even parity) will be used.
- Transmission complies with the SEW MOVILINK® protocol (see chapter "Coding of process data") with a fixed transfer rate of 9600 baud.

7.5.1 Telegram structure

⚠ WARNING

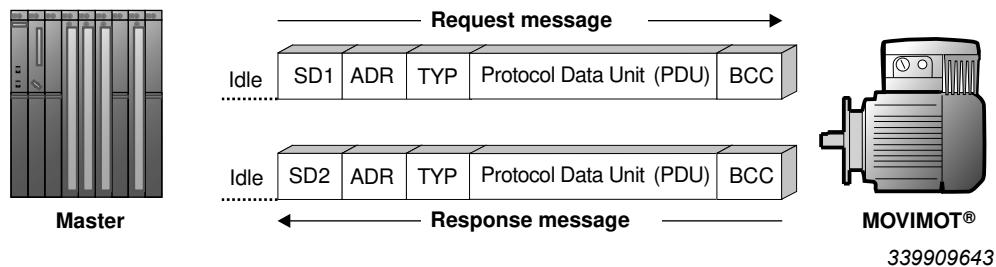


Danger of fatal injury due to uncontrolled operation.

There is no timeout monitoring when "acyclic" messages (type = "acyclic") are sent. The drive can continue to operate uncontrolled when the bus connection is interrupted.

- Run the bus connection between master and MOVIMOT® inverter only with "cyclic" transmission.

The following figure shows the message structure between the RS485 master and the MOVIMOT® inverter:



Idle = Idle period of at least 3.44 ms

SD1 = Start delimiter 1: Master → MOVIMOT®: 02_{hex}

SD2 = Start delimiter 2: MOVIMOT® → master: 1D_{hex}

ADR = Address 1 – 15

Group address 101 – 115

254 = Point-to-point

255 = Broadcast

TYPE = User data type

PDU = User data

BCC = Block check character: XOR all bytes

INFORMATION



When "cyclic" messages (type = "cyclic") are sent, the MOVIMOT® inverter expects the next bus activity after a maximum time of one second (master protocol). If the MOVIMOT® inverter does not detect this bus activity, the MOVIMOT® inverter automatically stops the drive (timeout monitoring).

7.5.2 Idle and start delimiter

The MOVIMOT® inverter detects the start of a request message by means of an idle period lasting at least 3.44 ms, followed by the character 02_{hex} (start delimiter 1). In the event that the transmission of a valid request message is canceled by the master, a new request message may not be sent until at least twice the idle period (approx. 6.88 ms) has elapsed.

7.5.3 Address (ADR)

The MOVIMOT® inverter supports the address range from 0 to 15 as well as access via the point-to-point address (254) or via the broadcast address (255).

It is only possible to read the current process input data (status word, output current) via address 0. The process output data sent by the master does not come into effect because PO data processing is not active when the address setting is 0.

7.5.4 Group address

Furthermore, ADR = 101 – 115 makes it possible to group several MOVIMOT® inverters. When this is done, all MOVIMOT® inverters in one group are set to the same RS485 address (e.g. group 1: ADR = 1, group 2: ADR = 2).

The master can now assign new setpoints to these groups by using ADR = 101 (setpoints to inverters in group 1) and ADR = 102 (setpoints for group 2). The inverters will not send a reply in this addressing version. The master must observe a min. rest time of 25 ms between two broadcast or group messages.

7.5.5 User data type (TYPE)

As a rule, MOVIMOT® inverter supports four different PDU (Protocol Data Unit) types. These types are principally determined by the process data length and transmission variant.

Type	Transfer variant	Process data length	User data
03 _{hex}	Cyclical	2 words	Control word, speed [%], status word 1, output current
83 _{hex}	Acyclical	2 words	
05 _{hex}	Cyclical	3 words	Control word, speed [%], ramp, status word 1, output current, status word 2
85 _{hex}	Acyclical	3 words	

7.5.6 Timeout monitoring

In the "cyclical" transmission variant, the MOVIMOT® inverter expects the next bus activity (request message of types named above) after a maximum of one second. If this bus activity is not detected, the drive automatically decelerates with the most recently valid ramp (timeout monitoring). The "ready signal" relay drops out. There is no timeout monitoring if the "acyclical" transmission variant is selected.

7.5.7 Block check character BCC

The block check character (BCC) is used in conjunction with even parity formation to ensure reliable data transfer. The block check character is formed by means of an XOR logic operation of all message characters. The result is transmitted at the end of the telegram in the BCC.

Example

The following figure gives an example of how a block check character is created for an acyclical message of type PDU 85_{hex} with 3 process data items. The XOR logic operation on the characters SD1 – PO3_{low} results in the value 13_{hex} as the block check character BCC. This BCC will be sent as the last character of the message. The recipient checks the character parity after having received the individual characters. Following this, the block check character is created from the received characters SD1 – PO3_{low} in accordance with the procedure below. The message has been correctly transmitted if the calculated and received BCCs are identical and there is no character parity error. Otherwise, a transmission error has occurred. The message may have to be repeated.

PO

Idle	02 _{hex}	01 _{hex}	85 _{hex}	00 _{hex}	06 _{hex}	20 _{hex}	00 _{hex}	0B _{hex}	B8 _{hex}	13 _{hex}
	SD1	ADR	TYP	PO1 _{high}	PO1 _{low}	PO2 _{high}	PO2 _{low}	PO3 _{high}	PO3 _{low}	BCC

	Stop	Parity									Start
SD1 : 02 _{hex}	1	0	0	0	0	0	0	1	0		XOR
ADR : 01 _{hex}	1	0	0	0	0	0	0	0	1		XOR
TYP : 85 _{hex}	1	1	0	0	0	1	0	0	1		XOR
PO1 _{high} : 00 _{hex}	0	0	0	0	0	0	0	0	0	0	XOR
PO1 _{low} : 06 _{hex}	0	0	0	0	0	1	0	1	0		XOR
PO2 _{high} : 20 _{hex}	1	0	0	1	0	0	0	0	0		XOR
PO2 _{low} : 00 _{hex}	0	0	0	0	0	0	0	0	0		XOR
PO3 _{high} : 0B _{hex}	1	0	0	0	0	1	1	1	1		XOR
PO3 _{low} : B8 _{hex}	0	1	0	1	1	0	1	0	0		XOR
BCC : 13_{hex}	1	0	0	0	1	0	0	1	1		

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7.5.8 Message processing in the MOVILINK® master

The following algorithm must be used for sending and receiving MOVILINK® messages in any programmable controllers, in order to ensure correct data transmission.

a) Send request message

Example: Sending setpoints to the MOVIMOT® inverter.

1. Wait for expiration of idle period (at least 3.44 ms, at least 25 ms with group or broadcast messages).
2. Send request message to inverter.

b) Receive response message

(Acknowledgment signal + actual values from MOVIMOT® inverter)

1. The response message must be received within approx. 100 ms, otherwise, for example, it is sent again.
2. Calculated block check character (BCC) of the response message = received BCC?
3. Start delimiter of response message = 1D_{hex}?
4. Response address = Request address?
5. Response PDU type = Request PDU type?
6. All criteria satisfied: => transfer OK! Process data valid.
7. The next request message can now be sent (continue from point a).

All criteria satisfied: => transfer OK! Process data valid. The next request message can now be sent (continue from point a).

7.5.9 Sample message

This example deals with the control of a MOVIMOT® drive using three process data words of PDU type 85_{hex} (3 PD acyclical). The RS458 master sends three process output data words (PO) to the MOVIMOT® inverter. The MOVIMOT® inverter replies by sending three process input data words (PI).

Request message from RS458 master to MOVIMOT®

- PO1: 0006_{hex}** Control word 1 = Enable
- PO2: 2000_{hex}** Speed [%] setpoint = 50% (of f_{max}¹⁾)
- PO3: 0BB8_{hex}** Ramp = 3 s

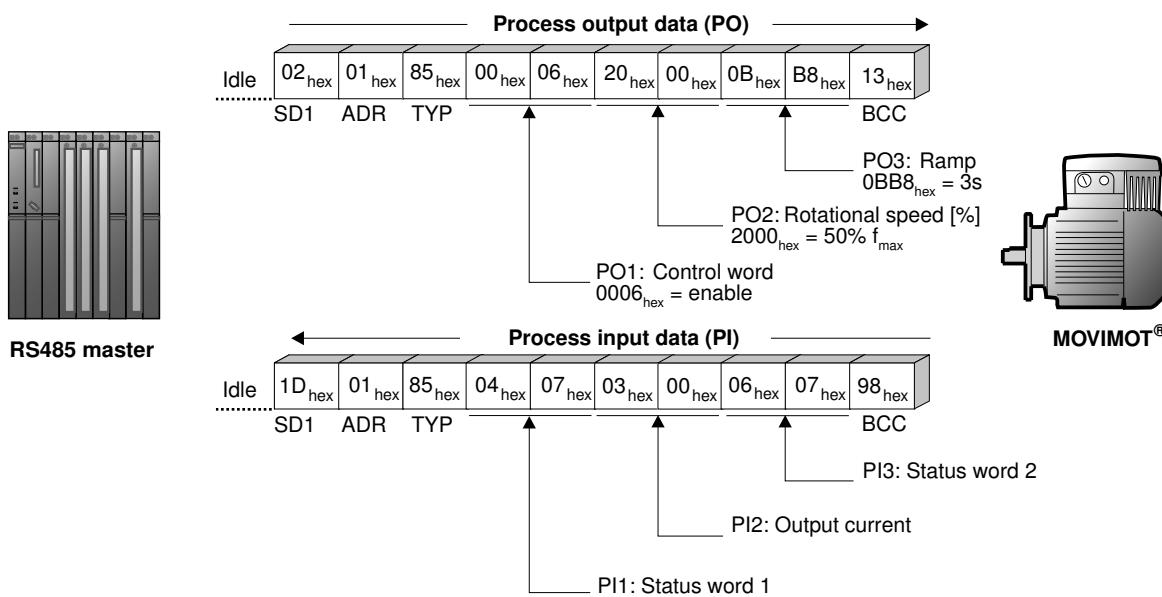
1) fmax is specified on setpoint potentiometer f1.

Response message from MOVIMOT® to RS458 master

- PI1: 0406_{hex}** Status word 1
- PI2: 0300_{hex}** Output current [% I_N]
- PI3: 0607_{hex}** Status word 2

For information on the coding of process data, refer to chapter "Coding of process data" (→ 122).

Sample message "3 PD acyclical"



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This example shows the acyclical transmission variant. The timeout monitoring in the MOVIMOT® inverter is deactivated. The cyclical transmission variant can be implemented with the entry TYPE = 05_{hex}. In this case, the MOVIMOT® inverter expects the next bus activity (request message of types named above) after a maximum of 1 second. Otherwise, the MOVIMOT® inverter automatically stops the drive (timeout monitoring).

8 Expert startup with parameter function

INFORMATION



Startup in Expert mode is only required if you want to set parameters during startup.

Startup in Expert mode is only possible if:

- No additional function is activated (DIP switch S2/5 - S2/8 is set to "OFF")
- The Drive ID module is plugged in
- And parameter *P805 Startup mode* is set to "Expert mode".

8.1 General information concerning startup

INFORMATION



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

⚠ WARNING



Risk of crushing due to missing or defective protective covers.

Severe or fatal injuries.

- Install the protective covers of the plant according to the instructions, see the operating instructions of the gear unit.
- Never start the unit if the protective covers are not installed.

⚠ WARNING



Electric shock from capacitors that have not been fully discharged.

Severe or fatal injuries.

- Disconnect the inverter from the power. Observe the minimum switch-off time after disconnection from the supply system:
 - 1 minute

⚠ WARNING



Device malfunction due to incorrect device setting.

Severe or fatal injuries.

- Comply with the startup instructions.
- The installation must be carried out by qualified personnel only.
- Always use the appropriate functional settings.

⚠ WARNING



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

Serious injuries.

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

INFORMATION



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

INFORMATION



- Remove status LED paint protection cap before startup. Remove paint protection film from the nameplates before startup.
- Observe a minimum switch-off time of 2 seconds for the K11 line contactor.

8.2 Requirements

The following conditions apply to startup:

- The MOVIMOT® drive must be installed correctly both mechanically and electrically.
- 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 is required for startup:

- PC or laptop, see chapter "PC/laptop connection" (→ 64).

The following software is required on the PC or laptop for startup:

- MOVITOOLS® MotionStudio

8.3 MOVITOOLS® MotionStudio

"MOVITOOLS® MotionStudio" is the SEW-EURODRIVE engineering tool that you can use to access all SEW-EURODRIVE drive units. For the MOVIMOT® inverter, you can use MOVITOOLS® MotionStudio to perform diagnostics with simple applications. For more demanding applications, you can use the simple wizards available to startup and configure MOVIMOT® inverter. The scope function in MOVITOOLS® MotionStudio can be used for visualizing process values.

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

MOVITOOLS® MotionStudio can communicate with the drive units via a wide range of communication and fieldbus systems.

The following section describes the most straightforward application, a connection between a PC / laptop and a MOVIMOT® inverter via the diagnostics interface X50 (point-to-point connection).

8.3.1 Integrating MOVIMOT® into the MOVITOOLS® MotionStudio

INFORMATION



For a detailed description of the following steps please refer to the comprehensive online help in MOVITOOLS® MotionStudio.

1. Start MOVITOOLS® MotionStudio.
2. Create a project and network.

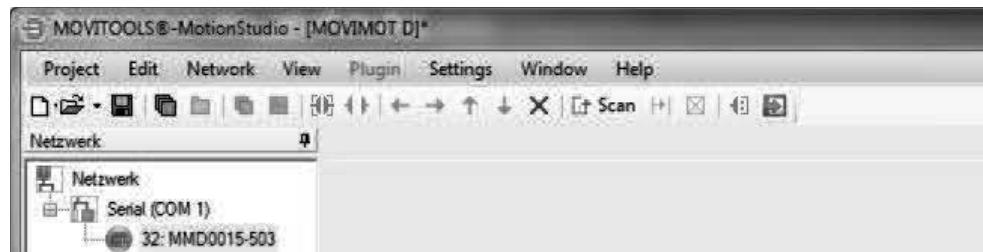
3. Configure the communication channel on the PC/laptop.
4. Make sure that the 24 V supply of the MOVIMOT® inverter is connected.
5. Perform an online scan.

Check the set scanning range in MOVITOOLS® MotionStudio.

INFORMATION



- The diagnostic interface is always assigned **address 32**. Adapt the scanning range in MOVITOOLS® MotionStudio so that address 32 is also scanned.
 - The baud rate is 9.6 kBaud.
 - The online scan can take some time.
-
6. MOVIMOT® is displayed in the MOVITOOLS® MotionStudio as shown in the example below:



7. Right-click on "32: MMD0015-5A3" to have access to MOVIMOT® startup and diagnostics tools in the context menu.

8.4 Startup and function expansion with individual parameters

The basic functionality of the MOVIMOT® drive can be expanded by using individual parameters.

INFORMATION



Startup in Expert mode is only possible if:

- No additional function is activated (DIP switch S2/5 - S2/8 is set to "OFF")
- The Drive ID module is plugged in
- Parameter *P805 Startup mode* is set to Expert mode.

1. Perform Easy startup according to section 6.

2. Connect the PC/laptop or the DBG keypad to the MOVIMOT® inverter.

See chapter "PC connection" (→ 64) or chapter "DBG keypad connection" (→ 63).

3. Connect the 24 V supply of the MOVIMOT® inverter.

4. When using a PC/laptop, start MOVITOOLS® MotionStudio and integrate the MOVIMOT® inverter.

See chapter "Integrating MOVIMOT® in MOVITOOLS® MotionStudio" (→ 135).

5. Set parameter *P805 Startup mode* to "Expert".

6. Specify the parameters which you want to change.

7. Check whether these parameters depend on mechanical controls.

See section "Parameters that depend on mechanical controls" (→ 176).

8. Deactivate the respective controls by adjusting the bit-coded selection box of parameter *P102*.

See chapter "Parameter 102" (→ 159).

9. Change the selected parameters.

For information on parameter setting with the DBG keypad, refer to chapter "Parameter mode" (→ 193).

10. Check the functionality of the MOVIMOT® drive.

Optimize the parameters, if required.

11. Disconnect the PC/laptop or the DBG operator terminal from the MOVIMOT® inverter.

12. NOTICE!

Loss of warranted degree of protection if the screw plugs of the f1 setpoint potentiometer or the X50 diagnostics interface are installed incorrectly or not at all.

Damage to the MOVIMOT® inverter.

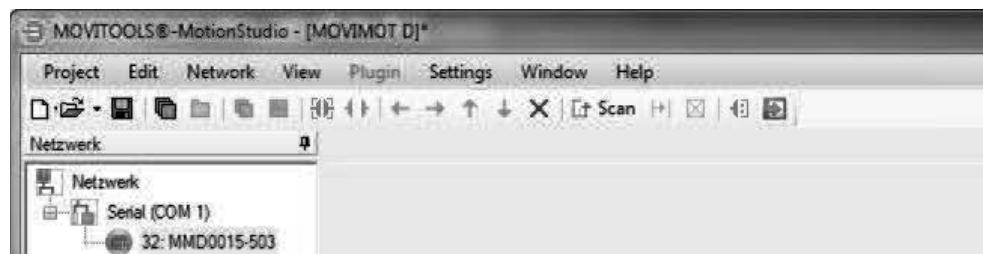
- Make sure the screw plug of the setpoint potentiometer has a seal and screw it in.

8.4.1 Example

Fine adjustment of setpoint f2 using MOVITOOLS® MotionStudio

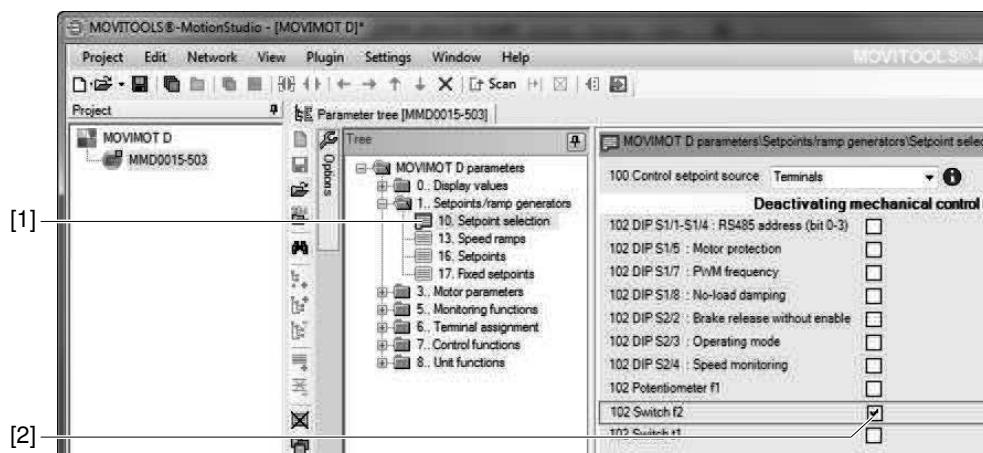
1. Perform Easy startup using switch f2 for rough adjustment, e.g. setting 5 (25 Hz = 750 rpm).
2. Connect the PC/laptop to the MOVIMOT® inverter.

3. Connect the 24 V supply of the MOVIMOT® inverter.
4. Start MOVITOOLS® MotionStudio.
5. Create a project and network.
6. Configure the communication channel on the PC/laptop.
7. Perform an online scan.



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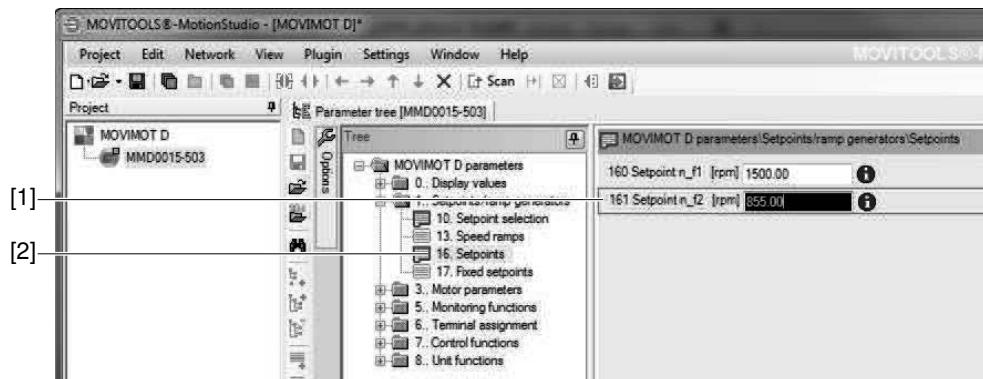
8. Open the context menu by clicking the right mouse button and select the menu item "Startup" > "Parameter tree".
9. Set parameter *P805 Startup mode* to "Expert".



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10. Open the folder "Setpoint selection" [1].

Deactivate switch f2 by setting the check box of parameter *P102 Deactivating mechanical controls* [2] (parameter *P102:14 = "1" => P102 = "0100 0000 0000 0000"*).



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11. Open the folder "Setpoints" [2].

Adjust parameter *P161 Setpoint n_f2* [1] until the application is working optimally.

E.g. parameter *P161 = 855 rpm (= 28.5 Hz)*

12. Disconnect the PC/laptop from the MOVIMOT® inverter.

13. **NOTICE!**

Loss of warranted degree of protection if the screw plugs of the f1 setpoint potentiometer or the X50 diagnostics interface are installed incorrectly or not at all.

Damage to the MOVIMOT® inverter.

- Make sure the screw plug of the setpoint potentiometer has a seal and screw it in.

8.5 Startup and configuration with a central controller and MQP/MFE

You can use a central controller to startup and configure the MOVIMOT® drive via the fieldbus interface MQP.. (PROFIBUS-DPV1) or MFE...

INFORMATION



Startup in Expert mode is only possible if:

- No additional function is activated (DIP switch S2/5 - S2/8 is set to "OFF")
- The Drive ID module is plugged in
- Parameter *P805 Startup mode* is set to "Expert" mode.

-
1. Check the MOVIMOT® inverter.

See section "Electrical installation".

2. Connect the 24 V supply of the MOVIMOT® inverter.

3. Establish communication between the higher-level controller and the MOVIMOT® inverter.

Connection and communication with the higher-level controller depends on the type of the higher-level controller.

For information about connecting the higher-level controller to the MOVIMOT® inverter, refer to the fieldbus interface manual, e.g the "PROFIBUS Interfaces, Field Distributors" manual.

4. Set parameter *P805 Startup mode* to "Expert".

5. Deactivate all mechanical controls by overwriting the bit-coded selection box of parameter *P102* with "FFFFhex" (*P102* = "1111 1111 1111 1111").

6. Set the control setpoint source to RS485 by setting the parameter *P100 Control setpoint source* to "1".

7. Set the required parameters.

8. Check the functionality of the MOVIMOT® drive.

Optimize the parameters, if required.

8.6 Startup by transferring the set of parameters

You can startup several MOVIMOT® drives with the same parameter set.

Parameters can only be transferred between two identical MOVIMOT® drives (same inverter and same motor).

INFORMATION



The parameter set can only be transferred if:

- No additional function is activated (DIP switch S2/5 - S2/8 = "OFF"),
- The Drive ID module is plugged in
- And a parameter set from one MOVIMOT® reference unit already exists.

8.6.1 Transferring the parameter set using MOVITOOLS® or the DBG keypad

1. Remove the MOVIMOT® inverter from the connection box.
2. Check the connection of the MOVIMOT® inverter.
⇒ See chapter "Electrical Installation".
3. Set all controls identical with those of the reference unit.
4. Place the MOVIMOT® inverter onto the connection box and screw it on tightly.
5. Connect the PC/laptop or the DBG keypad to the MOVIMOT® inverter.
⇒ See chapter "PC/laptop connection" (→ 64) or "Connection of DBG keypad" (→ 63).
6. Connect the 24 V supply of the MOVIMOT® inverter.
7. When using a PC/laptop, start MOVITOOLS® MotionStudio and integrate the MOVIMOT® inverter in MOVIMOT®.
⇒ See chapter "Integrating MOVIMOT® into the MOVITOOLS MotionStudio" (→ 135).
8. Transfer the entire parameter set of the MOVIMOT® reference unit to the MOVIMOT® inverter.
⇒ For information on transferring the parameter set with the DBG keypad, refer to chapter "Copy function of the DBG keypad" (→ 197).
9. Check the functionality of the MOVIMOT® drive.
10. Disconnect the PC/laptop or the DBG keypad from the MOVIMOT® inverter.
11. **NOTICE!** Loss of warranted degree of protection if the screw plugs of the f1 set-point potentiometer or the X50 diagnostic interface are installed incorrectly or not at all. Damage to the MOVIMOT® inverter.
Make sure the screw plug of the setpoint potentiometer has a seal and screw it in.

8.6.2 Transferring parameters using a central controller and MQP

Parameters can only be transferred between two identical MOVIMOT® drives (same inverter and same motor).

1. Remove the MOVIMOT® inverter from the connection box.
2. Check the MOVIMOT® inverter.
See section "Electrical Installation".
3. Set all controls identical with those of the reference unit.
4. Place the MOVIMOT® inverter onto the connection box and screw it on tightly.
5. Connect the 24 V supply of the MOVIMOT® inverter.
6. Establish communication between the higher-level controller and the MOVIMOT® inverter.

Connection and communication with the higher-level controller depends on the type of the higher-level controller.

For information about connecting the higher-level controller to the MOVIMOT® inverter, refer to the "PROFIBUS Interfaces, Field Distributors" manual.

7. Transfer all MOVIMOT® reference unit parameters to the MOVIMOT® inverter.

INFORMATION



Parameter *P805 Startup mode* must be the first value to be transferred.

The transfer procedure depends on the type of higher-level controller.

8. Check the functionality of the MOVIMOT® drive.

8.7 Parameter list

No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (Range / factory setting)	MOVILINK® scaling
0_	Display values				
00_	Process values				
000	8318	0	Speed (signed)	[min ⁻¹]	1 digit = 0.001 min ⁻¹
002	8319	0	Frequency (signed)	[Hz]	1 digit = 0.001 Hz
004	8321	0	Output current (amount)	[%I _N]	1 digit = 0.001% I _N
005	8322	0	Active current (signed)	[%I _N]	1 digit = 0.001% I _N
006	8323	0	Motor utilization	[%]	1 digit = 0.001%
008	8325	0	DC link voltage	[V]	1 digit = 0.001 V
009	8326	0	Output current	[A]	1 digit = 0.001 A
01_	Status displays				
010	8310	0	Inverter status	[Text]	
011	8310	0	Operating state	[Text]	
012	8310	0	Fault status	[Text]	
013	10095	1	Startup mode	[Text]	
014	8327	0	Heat sink temperature	[°C]	1 digit = 1 °C
015	8328	0	Power-applied hours	[h]	1 digit= 1 min
016	8329	0	Drive running hours	[h]	1 digit= 1 min
017	10087	135	DIP switch setting S1, S2	[Bit field]	
018	10096	27	Setting of switch f2	0,1,2, – 10	
019	10096	29	Setting of switch t1	0,1,2, – 10	
02_	Analog setpoints				
020	10096	28	Setting of setpoint potentiometer f1	0 – 10	1 digit = 0.001
03_	Binary inputs				
031	8334 bit 1	0	Setting binary input X6:11,12	[Bit field]	
	8335	0	Assignment of binary input X6:11,12	CW/stop (factory setting)	
032	8334 bit 2	0	Setting binary input X6:9,10	[Bit field]	
	8336	0	Assignment of binary input X6:9,10	CCW/stop (factory setting)	
033	8334 bit 3	0	Setting binary input X6:7,8	[Bit field]	
	8337	0	Assignment of binary input X6:7,8	Setpoint changeover (factory setting)	

No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (Range / factory setting)	MOVILINK® scaling
05_ Binary outputs					
050	8349 bit 0	0	Setting signal relay K1	[Bit field]	
	8350	0	Assignment signal relay K1	Readiness for operation (factory setting)	
051	8349 bit 1	0	Setting output X10	[Bit field]	
	8351	0	Assignment output X10	Brake released	
07_ Device data					
070	8301	0	Device type	[Text]	
071	8361	0	Nominal output current	[A]	1 digit = 0.001 A
072	10461	3	Drive ID module slot option	[Text]	
072	10461	1	DIM data set option	[Text]	
072	10461	2	DIM data set version option	[Text]	
076	8300	0	Basic device firmware	[Part number and version]	
100	10096	33	Control setpoint source	(Display value)	
102	10096	30	Deactivation of mechanical control elements	(Display value)	
700	8574	0	Operating mode	[Text]	
08_ Fault memory					
080	Fault t-0		Background information for faults that occurred in the past when t-0		
	8366	0	Fault code	Fault code	
	9304	0	Error subcode		
	8883	0	Internal fault		
	8371	0	Binary input connection	[Bit field bit 0, bit 1, bit 2]	
	8381	0	Binary output status K1, X10	[Bit field bit 0, bit 1]	
	8391	0	Inverter status	[Text]	
	8396	0	Heat sink temperature	[°C]	1 digit = 1 °C
	8401	0	Speed	[min ⁻¹]	1 digit = 0.001 min ⁻¹
	8406	0	Output current	[% I _N]	1 digit = 0.001% I _N
	8411	0	Active current	[% I _N]	1 digit = 0.001% I _N
	8416	0	Device utilization	[% I _N]	1 digit = 0.001% I _N
	8421	0	DC link voltage	[V]	1 digit = 0.001 V
	8426	0	Power-applied hours	[h]	1 digit = 1 min.
	8431	0	Drive running hours	[h]	1 digit = 1 min.

No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (Range / factory setting)	MOVILINK® scaling	
081	Fault t-1		Background information for faults that occurred in the past when t-1			
	8367	0	Fault code	Fault code		
	9305	0	Error subcode			
	8884	0	Internal fault			
	8372	0	Binary input connection	[Bit field bit 0, bit 1, bit 2]		
	8382	0	Binary output status K1, X10	[Bit field bit 0, bit 1]		
	8392	0	Inverter status	[Text]		
	8397	0	Heat sink temperature	[°C]	1 digit = 1 °C	
	8402	0	Speed	[min ⁻¹]	1 digit = 0.001 min ⁻¹	
	8407	0	Output current	[%I _N]	1 digit = 0.001% I _N	
	8412	0	Active current	[%I _N]	1 digit = 0.001% I _N	
	8417	0	Device utilization	[%]	1 digit = 0.001% I _N	
	8422	0	DC link voltage	[V]	1 digit = 0.001 V	
	8427	0	Power-applied hours	[h]	1 digit = 1 min.	
	8432	0	Drive running hours	[h]	1 digit = 1 min.	
082	Fault t-2		Background information for faults that occurred in the past when t-2			
	8368	0	Fault code	Fault code		
	9306	0	Error subcode			
	8885	0	Internal fault			
	8373	0	Binary input connection	[Bit field bit 0, bit 1, bit 2]		
	8383	0	Binary output status K1, X10	[Bit field bit 0, bit 1]		
	8393	0	Inverter status	[Text]		
	8398	0	Heat sink temperature	[°C]	1 digit = 1 °C	
	8403	0	Speed	[min ⁻¹]	1 digit = 0.001 min ⁻¹	
	8408	0	Output current	[%I _N]	1 digit = 0.001% I _N	
	8413	0	Active current	[%I _N]	1 digit = 0.001% I _N	
	8418	0	Device utilization	[%]	1 digit = 0.001% I _N	
	8423	0	DC link voltage	[V]	1 digit = 0.001 V	
	8428	0	Power-applied hours	[h]	1 digit = 1 min.	
	8433	0	Drive running hours	[h]	1 digit = 1 min.	

No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (Range / factory setting)	MOVILINK® scaling	
083	Fault t-3		Background information for faults that occurred in the past when t-3			
	8369	0	Fault code	Fault code		
	9307	0	Error subcode			
	8886	0	Internal fault			
	8374	0	Binary input connection	[Bit field bit 0, bit 1, bit 2]		
	8384	0	Binary output status K1, X10	[Bit field bit 0, bit 1]		
	8394	0	Inverter status	[Text]		
	8399	0	Heat sink temperature	[°C]	1 digit = 1 °C	
	8404	0	Speed	[min ⁻¹]	1 digit = 0.001 min ⁻¹	
	8409	0	Output current	[%I _N]	1 digit = 0.001% I _N	
	8414	0	Active current	[%I _N]	1 digit = 0.001% I _N	
	8419	0	Device utilization	[%]	1 digit = 0.001% I _N	
	8424	0	DC link voltage	[V]	1 digit = 0.001 V	
	8429	0	Power-applied hours	[h]	1 digit = 1 min.	
	8434	0	Drive running hours	[h]	1 digit = 1 min.	
084	Fault t-4		Background information for faults that occurred in the past when t-4			
	8370	0	Fault code	Fault code		
	9308	0	Error subcode			
	8887	0	Internal fault			
	8375	0	Binary input connection	[Bit field bit 0, bit 1, bit 2]		
	8385	0	Binary output status K1, X10	[Bit field bit 0, bit 1]		
	8395	0	Inverter status			
	8400	0	Heat sink temperature	[°C]	1 digit = 1 °C	
	8405	0	Speed	[min ⁻¹]	1 digit = 0.001 min ⁻¹	
	8410	0	Output current	[%I _N]	1 digit = 0.001% I _N	
	8415	0	Active current	[%I _N]	1 digit = 0.001% I _N	
	8420	0	Device utilization	[%]	1 digit = 0.001% I _N	
	8425	0	DC link voltage	[V]	1 digit = 0.001 V	
	8430	0	Power-applied hours	[h]	1 digit = 1 min.	
	8435	0	Drive running hours	[h]	1 digit = 1 min.	
09_	Bus diagnostics					
094	8455	0	PO 1 setpoint	[hex]		
095	8456	0	PO 2 setpoint	[hex]		
096	8457	0	PO 3 setpoint	[hex]		
097	8458	0	PI 1 actual value	[hex]		
098	8459	0	PI 2 actual value	[hex]		

No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (Range / factory setting)	MOVILINK® scaling
099	8460	0	PI 3 actual value	[hex]	
1_	Setpoints/ramp generators				
10_	Setpoint preselection				
100	10096	33	Control setpoint source	0: Binary 1: RS485 (DIP switches S1/1 – S1/4) ¹⁾	
102	10096	30	Deactivation of mechanical control elements	[Bit field] Default: 0000 0000 0000 0000	
13_	Speed ramps				
130	8807	0	Ramp t11 up	0.1 – 1 – 2000 [s] (Switch t1) ¹⁾	1 digit = 0.001 s
131	8808	0	Ramp t11 down	0.1 – 1 – 2000 [s] (Switch t1) ¹⁾	1 digit = 0.001 s
134	8474	0	Ramp t12 up = down	0.1 – 10 – 2000 [s]	1 digit = 0.001 s
135	8475	0	S pattern t12	0: OFF 1: Level 1 2: Level 2 3: Level 3	
136	8476	0	Stop ramp t13	0.1 – 0.2 – 2000 [s]	1 digit = 0.001 s
16_	Setpoints				
160	10096	35	Setpoint n_f1	0 – 1500 – 3600 [min ⁻¹]	1 digit = 0.001 min ⁻¹
161	10096	36	Setpoint n_f2	0 – 150 – 3600 [min ⁻¹]	1 digit = 0.001 min ⁻¹
17_	Fixed setpoints				
170	8489	0	Fixed setpoint n0	-3600 – 150 – 3600 [min ⁻¹]	1 digit = 0.001 min ⁻¹
171	8490	0	Fixed setpoint n1	-3600 – 750 – 3600 [min ⁻¹]	1 digit = 0.001 min ⁻¹
172	8491	0	Fixed setpoint n2	-3600 – 1500 – 3600 [min ⁻¹]	1 digit = 0.001 min ⁻¹
173	10096	31	Fixed setpoint n3	-3600 – 2500 – 3600 [min ⁻¹]	1 digit = 0.001 min ⁻¹
3_	Motor parameters				
30_	Limit values				
300	8515	0	Start/stop speed	0 – 15 – 150 [min ⁻¹]	1 digit = 0.001 min ⁻¹
301	8516	0	Minimum speed	0 – 60 – 3600 [min ⁻¹]	1 digit = 0.001 min ⁻¹
302	8517	0	Maximum speed	0 – 3000 – 3600 [min ⁻¹]	1 digit = 0.001 min ⁻¹
303	8518	0	Current limit	0 – 160 [% I _N]	1 digit = 0.001% I _N
32_	Motor adjustment				
320	8523	0	Automatic adjustment	0: OFF 1: ON	

No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (Range / factory setting)	MOVILINK® scaling
321	8524	0	Boost	0 – 100 [%]	1 digit = 0.001%
322	8525	0	IxR adjustment	0 – 100 [%]	1 digit = 0.001%
323	8526	0	Premagnetization	0 – 2 [s]	1 digit = 0.001 s
324	8527	0	Slip compensation	0 – 500 [min ⁻¹]	1 digit = 0.001 min ⁻¹
325	8834	0	No-load vibration damping	0: OFF 1: ON (DIP switch S1/8) ¹⁾	
34_ Motor protection					
340	8533	0	Motor protection	0: OFF 1: ON (DIP switch S1/5) ¹⁾	
341	8534	0	Type of cooling	0: Fan cooled 1: Forced air cooling	
347	10096	32	Motor cable length	0 – 15 [m]	1 digit = 1 m
348	9706	10	Output phase failure check	0: OFF 1: ON	
5_ Control functions					
50_ Speed monitoring					
500	8557	0	Speed monitoring	0: OFF 3: Motor/generator mode (DIP switch S2/4) ¹⁾	
501	8558	0	Delay time	0.1 – 1 – 10 [s]	1 digit = 0.001 s
52_ Power off monitoring					
522	8927	0	Line phase failure monitoring Deactivating the line phase failure monitoring in unfavorable operating conditions can damage the unit.	0: OFF 1: ON	
523	10096	26	Mains off check	0: Operation on three-phase mains supply 1: Operation with MOVITRANS®	
590	10537	1	Localization	0: OFF 1: ON	
6_ Terminal assignment					
60_ Binary inputs					
600	10096	34	Terminal configuration	0: Setpoint changeover, CCW/stop - CW/stop 1: Fixed setpoint 2 - Fixed setpoint 1- Enable/stop 2: Setpoint changeover - /Ext. error - Enable/stop 5: Prioritized fixed setpoint control	
62_ Binary outputs					

No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (Range / factory setting)	MOVILINK® scaling
620	8350	0	Signal output K1	0: No function 2: Ready for operation 3: Output stage on 4: Rotating field on 5: Brake released 6: Brake applied	
7_	Control functions				
70_	Operating modes				
700	8574	0	Operating mode	0: VFC 2: VFC hoist 3: VFC DC braking 21: V/f characteristic 22: V/f + DC braking (DIP switch S2/3) ¹⁾	
71_	Standstill current				
710	8576	0	Standstill current	0 – 50% I_{Mot}	1 digit = 0.001% I _{Mot}
72_	Stop by setpoint function				
720	8578	0	Stop by setpoint function	0: OFF 1: ON	
721	8579	0	Stop setpoint	0 – 30 – 500 [min⁻¹]	1 digit = 0.001 min ⁻¹
722	8580	0	Start offset	0 – 30 – 500 [min⁻¹]	1 digit = 0.001 min ⁻¹
73_	Brake function				
731	8749	0	Brake release time	0 – 2 [s]	1 digit = 0.001 s
732	8585	0	Brake application time	0 – 0.2 – 2 [s]	1 digit = 0.001 s
738	8893	0	Activation of brake release without drive enable	0: OFF 1: ON (DIP switch S2/2) ¹⁾	
–	10501	1	Brake chopper	0: OFF 1: ON 2: Raised level (920 V ON, 870 V OFF)	
77_	Energy-saving function				
770	8925	0	Energy-saving function	0: OFF 1: ON	
8_	Device functions				
80_	Setup				

No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (Range / factory setting)	MOVILINK® scaling
802	8594	0	Factory setting	0: No factory setting 2: Delivery state	
803	8595	0	Parameter lock	0: OFF 1: ON	
805	10095	1	Startup mode	0: Easy 1: Expert	
81_ Serial communication					
810	8597	0	RS485 address	0 – 31 (DIP switches S1/1 S1/4) ¹⁾	
811	8598	0	RS485 group address	100 – 131 (DIP switches S1/1 – S1/4) ¹⁾	
812	8599	0	RS485 timeout interval	0 – 1 – 650 [s]	1 digit = 0.001 s
83_ Fault responses					
830	8609	0	External fault	0: No response 1: Display error 2: Immediate stop/error 4: Rapid stop/error 5: Immediate stop/warning 7: Rapid stop/warning 11: Normal stop/warning 12: Normal stop/error	
832	8611	0	Motor overload error	0: No response 1: Display error 2: Immediate stop/error 4: Rapid stop/error 12: Normal stop/error	
84_ Reset behavior					
840	8617	0	Manual reset	0: No 1: Yes	
86_ Modulation					
860	8620	0	PWM frequency	0: 4 kHz 1: 8 kHz 3: 16 kHz (DIP switch S1/7) ¹⁾	
87_ Process data assignment					
870	8304	0	Setpoint description PO 1	Control word (only display)	
871	8305	0	Setpoint description PO 2	1: Setpoint speed 11: Setpoint speed [%]	

No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (Range / factory setting)	MOVILINK® scaling
872	8306	0	Setpoint description PO 3	Ramp (only display)	
873	8307	0	Actual value description PI 1	Status word 1 = (display only)	
874	8308	0	Actual value description PI 2	1: Actual speed 2: Output current 3: Active current 8: Actual speed [%]	
875	8309	0	Actual value description PI 3	Status word 2 = (display only)	
876	8622	0	PO data enable	0: YES 1: NO	

1) When deactivating the control element (e.g. switch) using parameter P102, the initialization value of the parameter is the same as the most recent value set.

8.8 Parameter description

8.8.1 Display values

Parameter 000

Speed (signed)

The displayed speed is the calculated actual speed.

Parameter 002

Frequency (signed)

Output frequency of the inverter

Parameter 004

Output current (amount)

Apparent current in the range 0 – 200% of the rated unit current.

Parameter 005

Active current (signed)

Active current in the range -200% – +200% of the nominal unit current

The sign of the active current depends on the direction of rotation and the type of load:

Direction of rotation	load	Speed	Active current
Clockwise rotation	Motor	Positive ($n > 0$)	Positive ($I_w > 0$)
Counterclockwise rotation	Motor	Negative ($n < 0$)	Negative ($I_w < 0$)
Clockwise rotation	Regenerative	Positive ($n > 0$)	Negative ($I_w < 0$)
Counterclockwise rotation	Regenerative	Negative ($n < 0$)	Positive ($I_w > 0$)

Parameter 006

Motor utilization

Motor utilization in [%], calculated using a motor temperature model

Parameter 008

DC link voltage

Voltage in V measured in the DC link

Parameter 009

Output current (value)

Apparent current in A

Parameter 010**Inverter status**

Inverter statuses

- INHIBITED
- ENABLED

Parameter 011**Operating status**

The following operating statuses are available:

- 24 V OPERATION
- CONTROLLER INHIBIT
- NO ENABLE
- STANDSTILL CURRENT
- ENABLE
- FACTORY SETTING
- ERROR
- TIMEOUT

Parameter 012**Error status**

Error status in text form

Parameter 013**Startup mode**

Startup mode "Easy" or "Expert"

Parameter 014**Heat sink temperature**

Heat sink temperature of the inverter

Parameter 015**Power-applied hours**

Sum of hours in which the inverter was connected to the external DC 24 V supply.

After a time of approx. 50 000 hours, this counter is no longer updated.

Parameter 016**Drive running hours**

Sum of hours in which the output stage of the inverter was enabled.

After a time of approx. 50 000 hours, this counter is no longer updated.

Parameter 017**DIP switch setting S1 and S2**

Display of DIP switch settings for S1 and S2:

DIP switches	Bit in index 10087.135	Functionality	
S1/1	Bit 0	Unit address	Unit address bit 2 ⁰
S1/2	Bit 1		Unit address bit 2 ¹
S1/3	Bit 2		Unit address bit 2 ²
S1/4	Bit 3		Unit address bit 2 ³
S1/5	Bit 11	Motor protection	0: Motor protection on 1: Motor protection off
S1/6	Bit 9	Increased short-time torque	0: Motor adjusted 1: Motor power rating one stage smaller
S1/7	Bit 12	PWM cycle frequency	0: 4 kHz 1: Variable (16, 8, 4 kHz)
S1/8	Bit 13	No-load damping	0: Off 1: On
S2/1	Bit 7	Brake type	0: Standard brake 1: Optional brake
S2/2	Bit 15	Brake release without drive enable	0: Off 1: On
S2/3	Bit 6	Control modes	0: VFC control 1: V/f control
S2/4	Bit 16	Speed monitoring	0: Off 1: On
S2/5	Bit 17	Additional function	Additional function setting bit 2 ⁰
S2/6	Bit 18		Additional function setting bit 2 ¹
S2/7	Bit 19		Additional function setting bit 2 ²
S2/8	Bit 20		Additional function setting bit 2 ³

The display of the DIP switch setting is independent of whether the DIP switch function is activated or deactivated.

Parameter 018**Setting switch f2**

Display of switch f2 setting

The display of the DIP switch setting is independent of whether the DIP switch function is activated or deactivated.

Parameter 019**Setting of switch t1**

Displays the setting of switch t1

The display is independent of whether the switch function is activated or deactivated.

Parameter 020**Setting of setpoint potentiometer f1**

Displays the setting of setpoint potentiometer f1

The display is independent of whether the switch function is activated or deactivated.

Parameter 031**Setting/assignment of digital input, terminal X6:11,12**

Displays the status of the digital input at terminal CW ↗ X6:11,12

Parameter 032**Setting/assignment of digital input, terminal X6:9,10**

Displays the status of the digital input at terminal CCW ↙ X6:9,10

Parameter 033**Setting/assignment of digital input, terminal X6:7,8**

Displays the status of the digital input at terminal f1/f2 X6:7,8

Parameter 050**Setting / assignment of signal relay K1**

Displays the status of the signal relay K1

Parameter 051**Setting output X10**

Displays the status of the output for controlling the BEM option

Parameter 070**Device type**

The unit type is displayed

Parameter 071**Nominal output current**

The rated unit current is displayed in [A]

Parameter 072**Drive ID module slot option**

Displays the drive ID module type which is used in the drive ID module slot X3

Parameter value	Type of drive ID module
0	No drive ID module
1 – 9	Reserved
10	DT/DV/400/50
11	Drive ID module special design
12	DRS/400/50
13	DRE400/50
14	DRS/460/60
15	DRE/460/60
16	DRS/DRE/380/60 (ABNT)
17	DRS/DRE/400/50/60 (50/60 Hz voltage range)
18	Reserved
19	DRP/230/400/50
20	DRP/266/460/50
21	EDRE/3D/400/50
22	DT56L4/BMG02
23	DRE..J/400/50
24	DRU..J/400/50
25	DRN/400/50
26	DRN/460/60
27	DRS/DRN/50/60
28	DRN/380/60 (ABNT)
29	DR2S/400/50
30	DR2S/460/60
31	DRN/50/60
32	EDRN/3D/400/50
33	DR2S-S3/400/50

Display of the part number and the data set version on the drive ID module

Parameter 076**Firmware basic unit**

Displays the part number and version of the unit firmware

Parameter 700**Operating mode**

The selected operating mode is displayed

Parameter 080 – 084**Error t-0 – t-4**

The unit saves diagnostic data when an error occurs. The last five errors are displayed in the error memory.

Parameter 094**PO 1 Setpoint (display value)**

Process data output word 1

Parameter 095**PO 2 Setpoint (display value)**

Process data output word 2

Parameter 096**PO 3 Setpoint (display value)**

Process data output word 3

Parameter 097**PI 1 Actual value (display value)**

Process data input word 1

Parameter 098**PI 2 Actual value (display value)**

Process data input word 2

Parameter 099**PI 3 Actual value (display value)**

Process data input word 3

8.8.2 Setpoints/ramp generators**Parameter 100****INFORMATION**

Parameter *P100* can only be changed if

- All digital inputs are set to "0"
- and DIP switches S1/1 – S1/4 are deactivated by parameter *P102*

Control setpoint source

- When selecting "Binary", the drive is controlled via the digital input terminals.
 - If the mechanical controls f1 and f2 are **not** deactivated (see parameter *P102*), the setpoints are specified with setpoint potentiometer f1 and switch f2.

- If the mechanical controls f1 and f2 are deactivated (see parameter *P102*), the setpoints are specified by selecting setpoints n_f1 or n_f2 (conditions see parameters *P160/P161*).
- When selecting "RS485", the drive is controlled via the digital input terminals and the bus control word. The setpoint is selected via the system bus.

Parameter 102**Deactivating mechanical controls**

Use this bit-coded selection box to deactivate the mechanical controls of the MOVIMOT® inverter. The value of the parameter set at the factory enables all mechanical controls.

Bit	Meaning	NOTE	
0	Reserved		
1	Deactivation of the DIP switch S1/1 – S1/4 (RS485 address)	Bit not set:	DIP switches S1/1 – S1/4 active
		Bit set:	DIP switches S1/1 – S1/4 not active Setting the RS485 address, RS485 group address and control / setpoint source using parameters <i>P810</i> , <i>P811</i> and <i>P100</i>
2 – 4	Reserved		
5	Deactivation of DIP switch S1/5 (motor protection)	Bit not set:	DIP switch S1/5 active
		Bit set:	DIP switch S1/5 not active: Switching the motor protection function on / off using the parameter <i>P340</i> .
6	Reserved		
7	Deactivation of DIP switch S1/7 (PWM cycle frequency)	Bit not set:	DIP switch S1/7 active
		Bit set:	DIP switch S1/7 not active Setting the PWM cycle frequency using parameter <i>P860</i>
8	Deactivation of DIP switch S1/8 (no-load damping)	Bit not set:	DIP switch S1/8 active
		Bit set:	DIP switch S1/8 not active Activation / deactivation of no-load damping using parameter <i>P325</i>
9	Reserved		
10	Deactivation of DIP switch S2/2 (brake release)	Bit not set:	DIP switch S2/2 active
		Bit set:	DIP switch S2/2 not active Activation / deactivation of brake release without drive enable using parameter <i>P738</i>
11	Deactivation of DIP switch S2/3 (operating mode)	Bit not set:	DIP switch S2/3 active
		Bit set:	DIP switch S2/3 not active Selection of operating mode using parameter <i>P700</i>

Bit	Meaning	NOTE	
12	Deactivation of DIP switch S2/4 (speed monitoring)	Bit not set:	DIP switch S2/4 active
		Bit set:	DIP switch S2/4 not active Activation / deactivation of speed monitoring using parameter <i>P500</i>
13	Deactivating the setpoint potentiometer f1	Bit not set:	Setpoint potentiometer f1 active
		Bit set:	Setpoint potentiometer f1 not active Setting the setpoint and the maximum speed using parameter <i>P160</i> and <i>P302</i>
14	Deactivating switch f2	Bit not set:	Switch f2 active
		Bit set:	Switch f2 not active Setting the setpoint and the maximum speed using parameter <i>P161</i> and <i>P301</i>
15	Deactivating switch t1	Bit not set:	Switch t1 active Acceleration ramp time = deceleration ramp time
		Bit set:	Switch t1 not active Setting the ramp times using parameter <i>P130</i> and <i>P131</i>

Parameter 130**Ramp t11 up**

- When using MOVIMOT® with binary control, the acceleration ramp t11 up only applies if
 - switch t1 is deactivated, i.e. if $P102:15 = "1"$.
- When using MOVIMOT® with RS485 control, the acceleration ramp t11 up only applies if
 - switch t1 is deactivated, i.e. if $P102:15 = "1"$
 - and the drive is running in 2 PD mode.

The ramp time is based on a setpoint step change of 1500 rpm (50 Hz).

Parameter 131**Ramp t11 down**

- When using MOVIMOT® with binary control, the deceleration ramp t11 down only applies if
 - switch t1 is deactivated, i.e. if $P102:15 = "1"$.
- When using MOVIMOT® with RS485 control, the deceleration ramp t11 down only applies if
 - switch t1 is deactivated, i.e. if $P102:15 = "1"$
 - and the drive is running in 2 PD mode.

The ramp time is based on a setpoint step change of 1500 min^{-1} (50 Hz).

Parameter 134**Ramp t12 up = down**

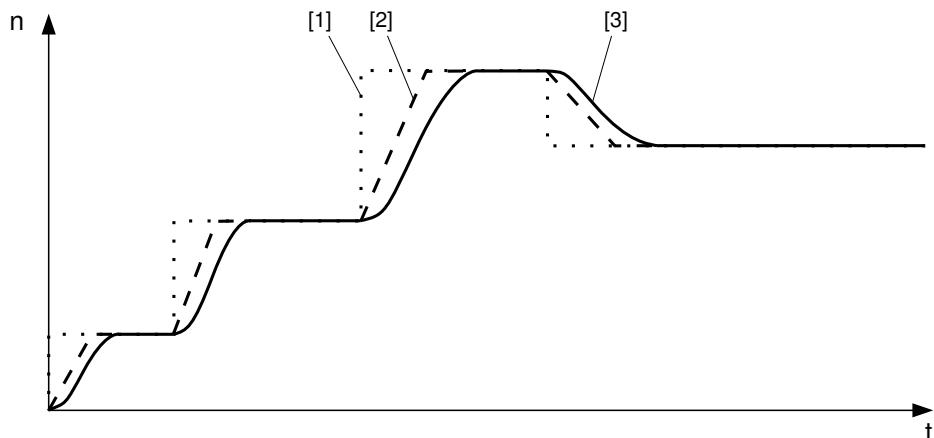
Acceleration and deceleration ramp at S pattern

The ramp time is based on a setpoint step change of 1500 min^{-1} (50 Hz).

The ramp time sets the acceleration and deceleration if parameter $P135S$ pattern t12 has been set to grade 1, grade 2 or grade 3.

Parameter 135**S pattern t12**

This parameter determines the pattern grade (1 = low, 2 = medium, 3 = high) of the ramp. The S pattern is used for rounding off the ramp and allows for a soft acceleration of the drive in the event of a setpoint change. The following figure shows the effect of the S pattern:



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- [1] Setpoint input
- [2] Speed profile without S pattern
- [3] Speed profile with S pattern

INFORMATION

Once started, an S pattern phase is interrupted if an error occurs with the stop ramp t13.

If the setpoint is reduced or the enable signal is revoked, the started S pattern phase is completed. Thus the drive can accelerate until the end of the S pattern phase despite the setpoint reduction.

The S pattern can only be used with binary control and communication via 2PD. An S pattern is not possible when using communication with 3PD.

Parameter 136**Stop ramp t13**

The stop ramp is the deceleration ramp when an internal error occurs.

The ramp time is based on a setpoint step change of 1500 min^{-1} (50 Hz).

Parameter 160**Setpoint n_f1**

The setpoint n_f1 is valid if

- The setpoint potentiometer f1 is deactivated, i.e. when parameter P102:13 is set to "1".
- Parameter *P600 Digital inputs* is set to "0".
- The signal "0" is present at terminal f1/f2 X6: 7,8.

Parameter 161**Setpoint n_f2**

The setpoint n_f2 is valid if

- The switch f2 is deactivated, i.e. when parameter *P102:14* is set to "1",
- Parameter *P600 Digital inputs* is set to "0".
- The signal "1" is present at terminal f1/f2 X6: 7,8.

Parameter 170 – 173**Fixed setpoint n0 – n3**

The fixed setpoints n0 – n3 are valid if parameter *P600 terminal configuration* at "1" = terminal configuration 2 (selection of fixed setpoints).

You can then select fixed setpoints n0 – n3 using the programmed functionality of the input terminals.

The sign of the fixed setpoint determines the direction of rotation of the motor.

Parameter	Active setpoint	Status	
		Terminal L ↗ X6:9,10	Terminal f1/f2 X6:7,8
<i>P170</i>	n0	OFF	OFF
<i>P171</i>	n1	ON	OFF
<i>P172</i>	n2	OFF	ON
<i>P173</i>	n3	ON	ON

8.8.3 Motor parameters**Parameter 300****Start/stop speed**

This parameter defines the smallest speed request which the inverter sends to the motor when enabled. The transition to the speed determined in the setpoint selection is made using the active acceleration ramp. Upon revoking the enable function, the parameter will be set as to the frequency at which the MOVIMOT® inverter will detect a motor standstill and start to apply the brakes.

Parameter 301**Minimal speed (when switch f2 is deactivated)**

This parameter defines the minimum speed n_{min} of the drive.

The drive does not fall below this speed value even when the setpoint specification is slower than the minimum speed (exception: direction of rotation reversal or drive stop).

Parameter 302**Maximum speed** (when switch f1 is deactivated)

This parameter defines the maximum speed n_{\max} of the drive.

The drive does not exceed this speed value even when the setpoint specification is higher than the maximum speed.

If you set $n_{\min} > n_{\max}$, then the value set in n_{\min} applies to the minimum speed and the maximum speed.

Parameter 303**Current limit**

The internal current limitation is based on the apparent output current. In order to implement stall protection for the connected motor, the inverter automatically decreases the current limit internally in the field weakening range.

Parameter 320**Automatic adjustment**

When adjustment is activated, the motor is calibrated each time the operating status changes to ENABLE.

If adjustment is deactivated, the calibration function and the thermal memory of the UL protective function is inactive.

When using according to UL approval, you must leave the parameter *P320* set to "ON".

Parameter 321**Boost**

If parameter *P320 Automatic adjustment* = "ON", the inverter sets parameter *P321 BOOST* automatically. This parameter does not usually need to be set manually.

In exceptional cases, manual setting may be necessary to increase the breakaway torque.

Parameter 322**IxR compensation**

If parameter *P320 Automatic adjustment* = "ON", the inverter sets parameter *P322 IxR adjustment* automatically. Only specialists are permitted to change this parameter manually to optimize the settings.

Parameter 323**Pre-magnetization**

The pre-magnetization time allows a magnetic field to be built up in the motor after the inverter is enabled.

Parameter 324**Slip compensation**

Slip compensation increases the speed accuracy of the motor. Enter the nominal slip of the connected motor as a manual entry.

The slip compensation is designed for a ratio of load mass moment of inertia to motor moment of inertia of smaller than 10. If control starts oscillating, you must reduce the slip compensation or set it to 0, if required.

Parameter 325**No-load vibration damping** (when DIP switch S1/8 is deactivated)

No-load vibration damping can be activated when the motor tends to be unstable under no load conditions.

Parameter 340**Motor protection** (when DIP switch S1/5 is deactivated)

Activation/deactivation of the thermal protection model for MOVIMOT®

When this function is activated, MOVIMOT® takes over the thermal protection of the drive by electronic means.

Parameter 341**Type of cooling**

This parameter is used for defining the cooling type (fan cooled or forced cooling) that is the basis for calculating the motor temperature.

Parameter 347**Motor cable length**

This parameter is used for defining the motor cable length (= length of hybrid cable from SEW-EURODRIVE between MOVIMOT® and motor) that is the basis for calculating the motor temperature. This parameter must only be changed if the unit is installed close to the motor.

Parameter 348**Output phase failure check**

The output phase failure check can be used to deactivate monitoring of the minimum output phase current. Deactivation of monitoring may be useful with LSPM motors if only small load torques occur.

8.8.4 Monitoring functions

Parameter 500

Speed monitoring (when DIP switch S2/4 is deactivated)

MOVIMOT® performs speed monitoring by evaluating operations at the current limit. Speed monitoring is triggered when the current limit is maintained for the duration of the set deceleration time (parameter P501).

Parameter 501

Deceleration time

The set current limit can be reached during acceleration, deceleration, or load peaks.

The deceleration time prevents speed monitoring from responding too sensitively. The current limit must be maintained for the duration of the set deceleration time before monitoring responds.

Parameter 522

Line phase failure check

NOTICE

Deactivating the line phase failure monitoring can damage the inverter if conditions are unfavorable.

Damage to the inverter.

- Deactivate the line phase failure check with short-term asymmetries of the line voltage.
- Make sure that the MOVIMOT® drive is always supplied with all 3 phases of the line voltage.

This monitoring system must be deactivated in order to prevent the line phase failure check from triggering with asymmetrical supply systems.

Parameter 523

Power off monitoring

Use this parameter to adjust the power off monitoring function of the inverter for operation with MOVITRANS®.

Parameter 590

Localization

This parameter can be used to activate the localization function in order to localize the MOVIMOT® drive in the system. If the localization function is active, the status LED on the MOVIMOT® inverter flashes green/red/green. After 5 min, the MOVIMOT® inverter automatically deactivates the localization function again.

8.8.5 Terminal assignment

Parameter 600

Terminal configuration

Parameter *P600* can only be changed if all digital inputs are set to "0".

Use this parameter to select the configuration of digital input terminals.

The following tables show the functions of the digital input terminals in relation to the control setpoint source and the terminal configuration:

Control / setpoint source "Binary"				
Terminal configuration		Digital input terminals		
		f1/f2 X6:7,8	L ↗ X6:9,10	R ↗ X6:11,12
0:	Terminal configuration 1	Setpoint switch mode "0" signal: Setpoint f1 "1" signal: Setpoint f2	CCW/Stop "0" signal: Stop "1" signal: Counter-clockwise rotation	CW/Stop "0" signal: Stop "1" signal: Clockwise rotation
1:	Terminal configuration 2	Selection of fixed setpoints Fixed setpoint n0: signal "0", "0" param. <i>P170</i> Fixed setpoint n1: signal "0", "1" param. <i>P171</i> Fixed setpoint n2: signal "1", "0" param. <i>P172</i> Fixed setpoint n3: signal "1", "1" param. <i>P173</i>		
2:	Terminal configuration 3	Setpoint switch mode "0" signal: Setpoint f1 "1" signal: Setpoint f2	/external error "0" signal: Ext. Error "1" signal: No Ext. Error	Enable/stop "0" signal: Stop "1" signal: Enable

Control setpoint source "RS485"					
Terminal-configuration		Digital input terminals			
		f1/f2 X6:7,8	L ↗ X6:9,10	R ↗ X6:11,12	
0:	Terminal configuration 1	No function	CCW/Stop "0" signal: Stop "1" signal: Enable CCW	CW/Stop "0" signal: Stop "1" signal: Enable CW	
1:	Terminal configuration 2	No function	No function "0" signal: Stop "1" signal: Enable CW and CCW operation		
2:	Terminal configuration 3	No function	/external error "0" signal: Ext. Error "1" signal: No ext. Error	Enable/stop "0" signal: Stop "1" signal: Enable CW and CCW operation	

Parameter 620**Function of the signal relay K1****⚠ WARNING**

Risk of injury if the drive starts up unexpectedly when the signal relay K1 is used for controlling the brake.

Severe or fatal injuries

- If you are using the signal relay K1 to control the brake, the parameter *P620* must be set to 5 "Brake released".
- Before using the signal relay K1 for controlling the brake, check the parameter setting.

Use this parameter to select the function of the signal relay K1.

Effect at	"0" signal	"1" signal
0: No function	–	–
2: Ready	Not ready	Ready
3: Output stage on	Device inhibited	Unit is enabled. Motor is energized.
4: Rotating field on	No rotating field ⚠ WARNING! There may still be dangerous voltages present on the MOVIMOT® inverter output side.	Rotating field
5: Brake released	Brake applied	Brake released
6: Brake applied	Brake released	Brake applied

8.8.6 Control functions

Parameter 700

Operating mode (when DIP switch S2/3 is deactivated)

This parameter is used to set the basic operating mode of the inverter.

Default setting for asynchronous motors.

This setting is suitable for general applications such as conveyor belts, trolleys, etc.

VFC /
V/f characteristic
curve

VFC hoist

The hoisting function automatically provides all functions required for operating a simple hoist application.

⚠ WARNING



Risk of injury if the drive starts up unexpectedly when the signal relay K1 is used for controlling the brake.

Severe or fatal injuries

- If the signal relay K1 is used to control the brake, do not change the parameters that define the function of the signal relay.
- Before changing parameter *P700*, check whether the signal relay is used for controlling the brake.

For the hoisting function to be performed correctly, the motor brake must be controlled using the inverter.

The VFC hoist operating mode affects the following parameters:

No.	Index dec.	Sub-index dec.	Name	Value
<i>P300</i>	8515	0	Start/stop speed	= 60 rpm If the start/stop speed is set to less than 60 rpm.
<i>P301</i>	8516	0	Minimum speed	= 60 rpm If the minimum speed is set to less than 60 rpm.
<i>P303</i>	8518	0	Current limit	= Rated motor current If the current limit is set to a lower value than the rated motor current
<i>P323</i>	8526	0	Pre-magnetization	= 20 ms If pre-magnetization is set to a lower value than 20 ms
<i>P500</i>	8557	0	Speed monitoring	= 3: Motor/regenerative
<i>P620</i>	8350	0	Signal output K1	= 5: Brake released
<i>P731</i>	8749	0	Brake release time	= 200 ms If the brake release time is set to a lower value than 200 ms
<i>P732</i>	8585	0	Brake application time	= 200 ms If the brake application time is set to a lower value than 200 ms

No.	Index dec.	Sub-index dec.	Name	Value
P738	8893	0	Activation of brake release without drive enable	= 0: OFF

In VFC hoist operating mode, the MOVIMOT® inverter checks whether the values of these parameters are permitted.

The speed monitoring function cannot be deactivated in VFC hoist operating mode.

The function "Brake release without drive enable" cannot be activated in VFC hoist operating mode.

The function of the signal relay output can be parameterized.

This setting means the asynchronous motor brakes by using current injection. The motor brakes without a braking resistor on the inverter.



⚠ WARNING

Risk from uncontrolled braking. With DC braking, guided stops are not possible and certain ramp values cannot be observed.

Severe or fatal injuries

- Use a different operating mode if required.

Parameter 710

Standstill current



⚠ WARNING

Electric shock caused by voltages in the connection box. A communication timeout does not interrupt the standstill current.

Severe or fatal injuries

- Disconnect the inverter from the supply system and wait at least for the specified amount of time:
 - **1 minute**

When the standstill current function is activated, the inverter injects a current into the motor at standstill.

The standstill current fulfills the following functions:

- When the ambient temperature of the motor is low, the standstill current prevents the risk of condensation and freezing of the brake. Set the current level in such a way that the motor will not overheat.
- If you have activated the standstill current, you can enable the motor without pre-magnetization.

When the standstill function is activated, the output stage remains enabled even in the "NO ENABLE" status to inject the motor standstill current. In the event of an error, the current supply of the motor is interrupted depending on the respective error response.

Parameter 720 – 722

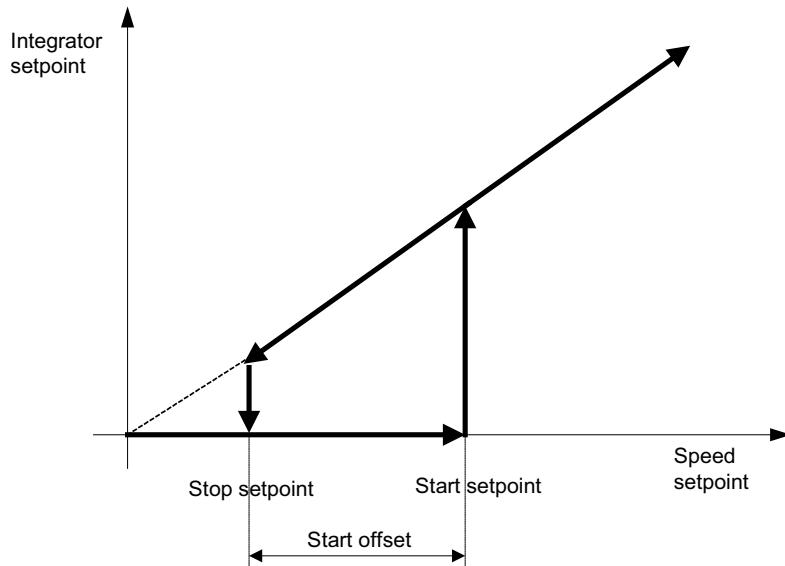
Setpoint stop function

Stop setpoint

Start offset

If the setpoint stop function is activated, the inverter is enabled when the speed setpoint is larger than the stop setpoint + start offset.

Inverter enable is revoked when the speed setpoint falls below the stop setpoint.



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Parameter 731**Brake release time**

This parameter is used for defining how long the motor is to run at minimum speed after pre-magnetization ends. This time is necessary for opening the brake completely

Parameter 732**Brake application time**

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

Parameter 738**Activation of brake release without drive enable**

(when DIP switch S2/2 is deactivated)

If this parameter is set to the value "ON", the brake can be released even if the drive is not enabled.

This functionality is only available when the motor brake is being controlled by the inverter.

The brake is always applied when the unit is not ready.

The brake cannot be released when the drive is not enabled in conjunction with the hoisting function.

Parameter index 10501.1**Brake chopper**

The MOVIMOT® drive is equipped with a brake chopper. The brake chopper can be used to transfer regenerative energy to either a braking resistor or a brake coil. The braking resistor can be connected to terminals X1:13 and X1:15. The brake coil can be connected to terminals X1:13, X1:14 and X1:15. The brake chopper level is 850 V. If the MOVIMOT® drive is operated in conjunction with other frequency inverters on a common DC voltage grid, you can deactivate the function of the brake chopper or select a raised brake chopper level of 920 V.

Parameter 770**Energy saving function**

If this parameter is set to "ON", the inverter reduces the no-load current.

8.8.7 Unit functions**Parameter 802****Factory setting**

If you set this parameter to "Delivery state", all parameters

- That have a factory setting
 - And **cannot** be set using DIP switches S1/S2 or switches t1/f2
- are set to this factory setting value.

For those parameters that are set at the DIP switches S1/S2 or at switches t1/f1, the setting of the mechanical setting element becomes active when the factory setting "Delivery state" is selected.

Parameter 803**Parameter lock**

If this parameter is set to "ON", you cannot change any of the parameters except the parameter lock. It is a good idea to use this setting once you have finished starting up the unit and optimizing the parameters. You can only change the parameters again when this parameter is set to "OFF".

Parameter 805**Startup mode**

Parameterization of the startup mode

- **Easy mode**

The MOVIMOT® is started up quickly and easily in Easy mode using DIP switches S1, S2 and switches f2, t1.

- **Expert mode**

In Expert mode additional parameters are available.

Parameter 810**RS485 address** (when DIP switches S1/1 – S1/4 are deactivated)

Use this parameter to set the RS485 address of the MOVIMOT® inverter.

Parameter 811**RS485 group address** (when DIP switches S1/1 – S1/4 are deactivated)

Use this parameter to set the RS485 group address of the MOVIMOT® inverter.

Parameter 812**RS485 timeout interval**

Use this parameter to set the timeout monitoring interval of the RS485 interface. To deactivate the RS485 timeout monitoring, set a value of "0" for the timeout monitoring time.

Parameter 830**Error response for an external error**

This parameter is used to define the error response that is revoked when the signal at terminal X6: 9, 10 (error code 26) is triggered, see parameter *P600* "terminal configuration 3".

Parameter 832**Motor overload error response**

Use this parameter to determine the error response that is performed in the event of a motor overload (error code 84).

Parameter 840**Manual reset**

If an error is present at the MOVIMOT® inverter, you can acknowledge the error by setting this parameter to "ON". Once the error has been reset, the parameter is set automatically to "OFF" again. If the power section does not indicate an error, setting the parameter to "ON" has no effect.

Parameters 860**PWM frequency** (when DIP switch S1/7 is deactivated)

You can use this parameter to set the maximum cycle frequency at the inverter output. The cycle frequency can change automatically depending on the unit utilization.

Parameter 870**Setpoint description PO 1**

Displays the assignment of the process data output word PO 1

Parameter 871**Setpoint description PO 2**

Displays the assignment of the process data output word PO 2

The following assignments are available:

Setpoint speed: The setpoint speed is set absolutely.

Coding: 1 digit = 0.2 rpm

Example 1: CW rotation with 400 rpm

Calculation: $400/0.2 = 2000_{\text{dec}} = 07D0_{\text{hex}}$

Example 2: CCW rotation with 750 rpm

Calculation: $-750/0.2 = -3750_{\text{dec}} = F15A_{\text{hex}}$

Setpoint speed [%]: The speed setpoint is given as a relative value in percentage and refers to maximum speed set using the setpoint potentiometer f1.

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

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

1 digit = 0.0061%

Example: $80\% f_{\text{max}}$, CCW rotation

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

Parameter 872**Setpoint description PO 3**

Displays the assignment of the process data output word PO 3

Parameter 873**Actual value description PI 1**

Displays the assignment of the process data input word PI 1

Parameter 874**Actual value description PI 2**

Displays the assignment of the process data input word PI 2

The following assignments are available:

Actual speed:	Current speed actual value of the drive in 1/min
	Coding: 1 digit = 0.2 1/min
Output current:	Instantaneous output current of the unit in % of I_N
	Coding: 1 digit = 0.1% I_N
Active current:	Current active current of the unit in % of I_N
	Coding: 1 digit = 0.1% I_N
Actual speed [%]:	Current speed actual value of the drive in % of setpoint potentiometer f1 or of n_{max}
	Coding: 1 digit = 0.0061%
	-100% – +100% = 0xC000 – 0x4000

Parameter 875**Actual value description PI 3**

(see chapter "Process output data" (→ 125))

Displays the assignment of the process data input word PI 3

Parameter 876**PO data enable**

YES: The process output data that was sent from the fieldbus control become effective immediately.

NO: The last valid process output data remain in effect.

INFORMATION

If the assignment of the process data output word PO2 is changed, the PO data is inhibited. It must be re-enabled in parameter P876.

8.8.8 Parameters that depend on mechanical controls

The following mechanical control elements influence the user parameters:

- DIP switch S1
- DIP switch S2
- Setpoint potentiometer f1
- Switch f2
- Switch t1

INFORMATION



Parameter *P100* can only be changed if

- All digital inputs are set to "0"
- And DIP switches S1/1 – S1/4 are deactivated by parameter *P102*

Control element	Influenced parameter	Effect of parameter <i>P102</i>	
		Bit	
DIP switches S1/1 – S1/4	<i>P810</i> <i>RS485 address</i>	1	Bit not set: Setting RS485 address, RS485 group address and setpoint source at DIP switch S1/1 – S1/4
	<i>P811</i> <i>RS485 group address</i>		Bit set: Setting RS485 address, RS485 group address and control setpoint source using parameters
DIP switch S1/5	<i>P340</i> <i>Motor protection</i>	5	Bit not set: Activation/deactivation of the motor protection function at DIP switch S1/5
			Bit set: Activation/deactivation of motor protection function using parameters
DIP switch S1/7	<i>P860</i> <i>PWM frequency</i>	7	Bit not set: Selection of the PWM frequency at DIP switch S1/7
			Bit set: Selection of the PWM frequency using parameters
DIP switch S1/8	<i>P325</i> <i>No-load vibration damping</i>	8	Bit not set: Activation/deactivation of the no-load vibration damping function at DIP switch S1/8
			Bit set: Activation/deactivation of no-load vibration damping using parameters

Control element	Influenced parameter	Effect of parameter P102	
Bit			
DIP switch S2/2	<i>P738</i> <i>Brake release without drive enable</i>	10	Bit not set: Activation/deactivation of the function "Brake release without drive enable" at DIP switch S2/2
			Bit set: Activation/deactivation of the function "Brake release without drive enable" using parameters
DIP switch S2/3	<i>P700</i> <i>Operating mode</i>	11	Bit not set: Selection of the operating mode at DIP switch S2/3
			Bit set: Selection of the operating mode using parameters
DIP switch S2/4	<i>P500</i> <i>Speed monitoring</i>	12	Bit not set: Activation/deactivation of the speed monitoring function at DIP switch S2/4
			Bit set: Activation/deactivation of no-load vibration damping using parameters
Setpoint potentiometer f1	<i>P302</i> <i>Maximum speed</i>	13	Bit not set: Setting maximum speed at setpoint potentiometer f1
			Bit set: Setting maximum speed using parameters
Switch f2	<i>P301</i> <i>Minimum speed</i>	14	Bit not set: Setting minimum speed at switch f2
			Bit set: Setting minimum speed using parameters
Switch t1	<i>P130</i> <i>Acceleration ramp</i> <i>P131</i> <i>Deceleration ramp</i>	15	Bit not set: Setting the ramps at switch t1
			Bit set: Setting the ramps using parameters

9 Operation

9.1 Operating notes

⚠ WARNING



Electric shock 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 when the device is inhibited and the motor is at 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 occur 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



Electric shock from capacitors that have not been fully discharged.

Severe or fatal injuries.

- Disconnect the inverter from the power. Observe the minimum switch-off time after disconnection from the supply system:
 - 1 minute

⚠ WARNING



Risk of crushing if the motor starts up unintentionally.

Severe or fatal injuries

- Observe the startup instructions.
- Deactivate all control signals.

⚠ WARNING



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

Serious injuries.

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

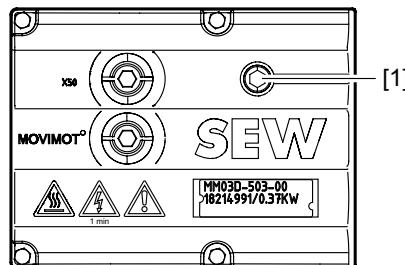
INFORMATION



- The maximum output frequency in any operating mode is 120 Hz.
- If the maximum output frequency is exceeded, the status LED of the MOVIMOT® inverter flashes slowly red (error 08 "speed monitoring").

9.2 Operating display

The status LED is located on the top of the MOVIMOT® inverter.



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[1] MOVIMOT® status LED

9.2.1 Meaning of the status LED states

The 3-color status LED indicates the operating and error states of the MOVIMOT® inverter.

LED color status	Meaning of operating state	Possible cause
Off	Not ready	No 24 V power supply.
Yellow Flashing steadily	Not ready	Self-test phase active or 24 V power supply present but line voltage is not OK.
Yellow Flashing evenly, fast	Ready	Releasing the brake without drive enable active (only with S2/2 = "ON").
Yellow Steady light	Ready but unit inhibited	24 V supply and line voltage OK, but no enable signal. If drive does not run when enable signal is present, check startup.
Yellow 2 x flashing, pause	Ready, manual mode without unit enable	24 V power supply and line voltage OK. Stop manual mode to activate automatic mode.
Yellow/green Flashing with alternating colors	Ready for operation, but timeout	Communication is interrupted during cyclical data exchange.
Green Steady light	Unit enabled	Motor is in operation.
Green Flashing evenly, fast	Current limit active	Drive operating at current limit.
Green Flashing steadily	Ready	Standstill current function active.
Green/Red/Green Flashing with alternating colors, pause	Localization function active	Localization function was activated. See parameter 590.

LED color status	Meaning of operating state	Possible cause
Red Steady light	Not ready	Check 24 V supply. A smoothed DC voltage with a maximum residual ripple of 13% must be present.

Blink codes of the status LED

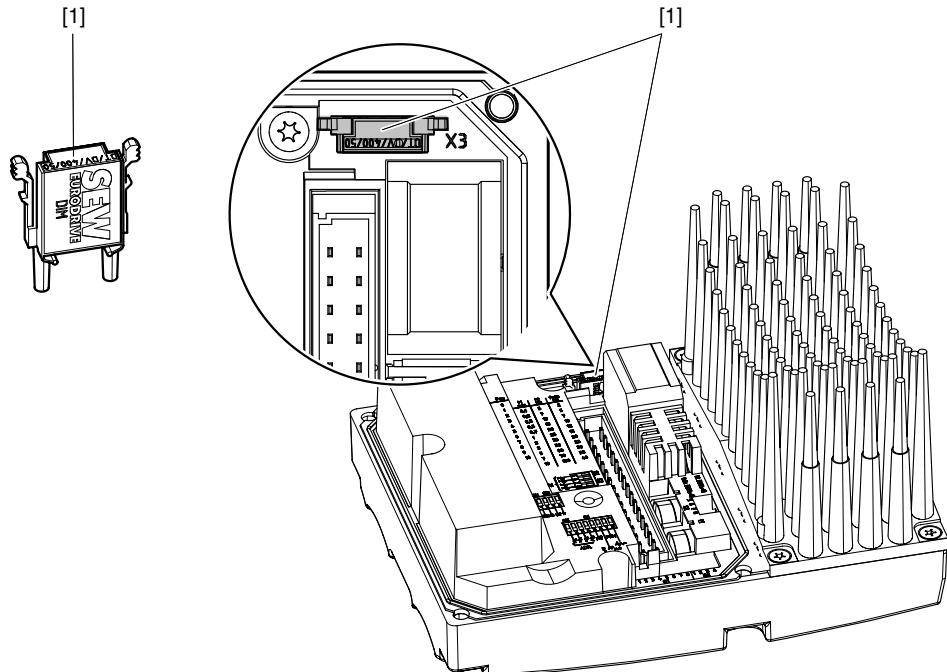
- | | |
|--|---|
| Flashing steadily: | LED 600 ms on, 600 ms off |
| Flashing steadily, fast: | LED 100 ms on, 300 ms off |
| Flashing with alternating colors: | LED 600 ms green, 600 ms yellow |
| Flashing with alternating colors, pause: | LED 100 ms green, 100 ms red,
100 ms green, 300 ms pause |

Refer to chapter "Meaning of the status LED" (→ 198) for a detailed description of the fault states.

9.3 Drive ID module

The pluggable Drive ID module is installed in the basic unit.

The following figure shows the Drive ID module and its position in the MOVIMOT® inverter.



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[1] Drive ID module

The Drive ID module receives a memory module on which the following information is stored:

- Motor data
- Brake data
- User parameter

If a MOVIMOT® inverter has to be replaced, you can re-startup the system by simply re-plugging the Drive ID module without a PC/laptop or data backup.

If, during a device replacement

- The DIP switch setting is not transmitted correctly,
- Or a MOVIMOT® inverter with a different part number is used (e.g. with a different device power,)

the MOVIMOT® inverter detects a change in configuration. This may reinitialize certain startup parameters.

This is why the MOVIMOT® inverter must only be replaced with a MOVIMOT® inverter with the same part number.

For information regarding device replacement, refer to chapter "Unit replacement" (→ 206).

9.4 MBG11A and MLG..A keypad

INFORMATION



For notes on startup with the MBG11A or MLG..A options, refer to "sec. "Startup with the MBG11A or MLG..A options"" (→ 109).

The following MOVIMOT® functions can be executed with the MBG11A and MBG..A keypads:

Function	Explanation
Display	<p>Negative display value, for example = CCW rotation</p> <p>Positive display value; e.g., = CW operation</p> <p>The display value is based on the speed set using the setpoint potentiometer f1. Example: Display "50" = 50% of the speed set with the setpoint potentiometer.</p> <p>NOTICE! If the display is "0," the drive is rotating at f_{min}.</p>
Increase speed	<p>For CW rotation: </p> <p>For CCW rotation: </p>
Reducing the speed	<p>For CW rotation: </p> <p>For CCW rotation: </p>
Stop MOVIMOT® drive	<p>Pressing both keys at the same time: Display = </p>
Start MOVIMOT® drive	<p></p> <p>NOTICE! After enable, the MOVIMOT® drive accelerates to the value and direction of rotation saved last.</p>
Change direction of rotation from CW to CCW	<p>1. Until display = </p> <p>2. Press again to change the direction of rotation from CW to CCW.</p>
Change direction of rotation from CCW to CW	<p>1. until display = </p> <p>2. Press again to change the direction of rotation from CCW to CW.</p>
Memory function	<p>When the line voltage is switched off and then on again, the value set last is saved if the 24 V supply has been present for at least 4 seconds after the last setpoint change.</p>

9.5 MWA21A setpoint converter

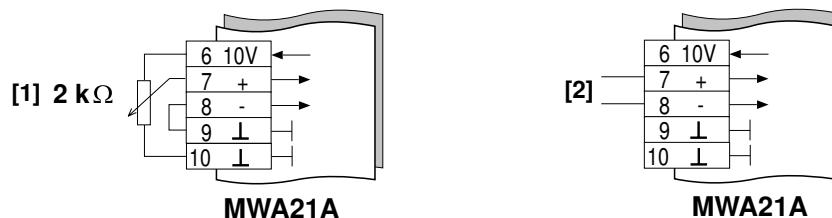
INFORMATION



- For notes on connecting the MWA21A option, refer to "sec. "Connection of option MWA21A"" (→ 60).
- For notes on startup of the MWA21A option, refer to "sec. "Startup with option MWA21A"" (→ 111).

9.5.1 Control

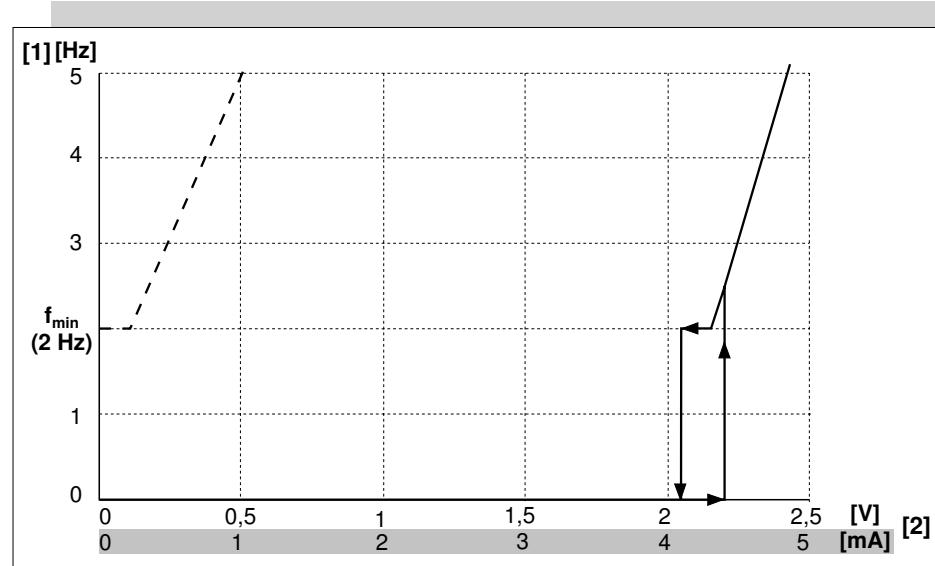
The analog signal at terminals 7 and 8 of the MWA21A option is used for controlling the speed of the MOVIMOT® drive from f_{\min} to f_{\max} .



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- [1] Potentiometer using the 10 V reference voltage (alternative 5 kΩ)
[2] Potential-free analog signal

9.5.2 Setpoint stop function



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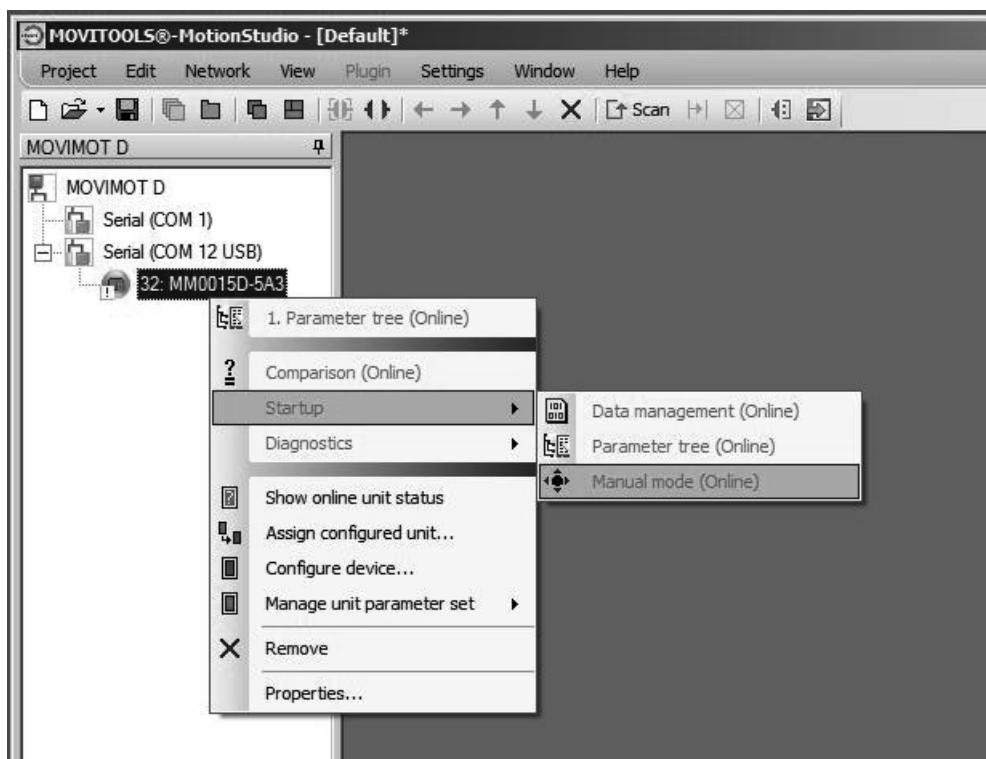
Setting: 0...10 V / 0...20 mA 2...10 V / 4...20 mA [1] Output frequency
[2] Setpoint

9.6 MOVIMOT® manual mode with MOVITOOLS® MotionStudio

MOVIMOT® drives are equipped with an X50 diagnostic interface for startup and service. It can be used for diagnostics, manual operation and parameterization.

For manual operation of the MOVIMOT® drive, you can use the manual mode function of the MOVITOOLS® MotionStudio software.

1. Firstly connect the PC/laptop to the MOVIMOT® inverter.
See chapter "PC/laptop connection" (→ 64).
2. Start the software MOVITOOLS® MotionStudio and integrate the MOVIMOT® inverter in MOVITOOLS® MotionStudio.
See chapter "MOVITOOLS® MotionStudio" (→ 135).
3. Once the MOVIMOT® inverter is successfully integrated, open the context menu by clicking on the right mouse button and select the menu item "Startup" > "Manual mode".



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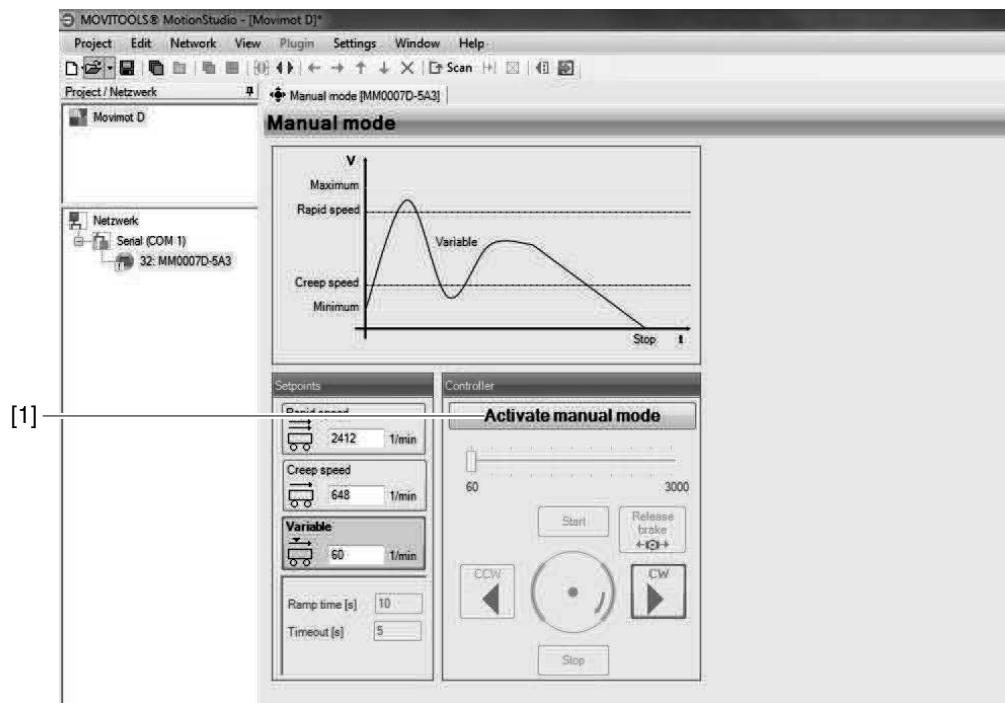
9.6.1 Activating / deactivating manual mode

Activation

Manual mode can only be activated if the MOVIMOT® drive is inhibited.

It can **not** be activated if

- The brake is released without drive enable
- Or if the inverter output stage is enabled to supply a standstill current.



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To activate manual operation, click on the button [Activate manual mode] [1].

The parameter *P097 PI 1 Actual value (display value)* signals to the higher-level controller that manual operation has been activated.

Manual operation remains active even after an error reset or after the 24 V supply has been switched off.

Deactivate manual operation before you disconnect the PC/laptop from the MOVIMOT® inverter.

Deactivation

⚠ WARNING



Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Before deactivating manual mode, reset the signals at the digital inputs and revoke drive enable via process data.
- Take additional safety precautions depending on the application to avoid injury to people and damage to machinery.

Manual operation is deactivated:

- When you click on the [Deactivate manual operation] button
- Or when you close the "Manual operation" window

INFORMATION

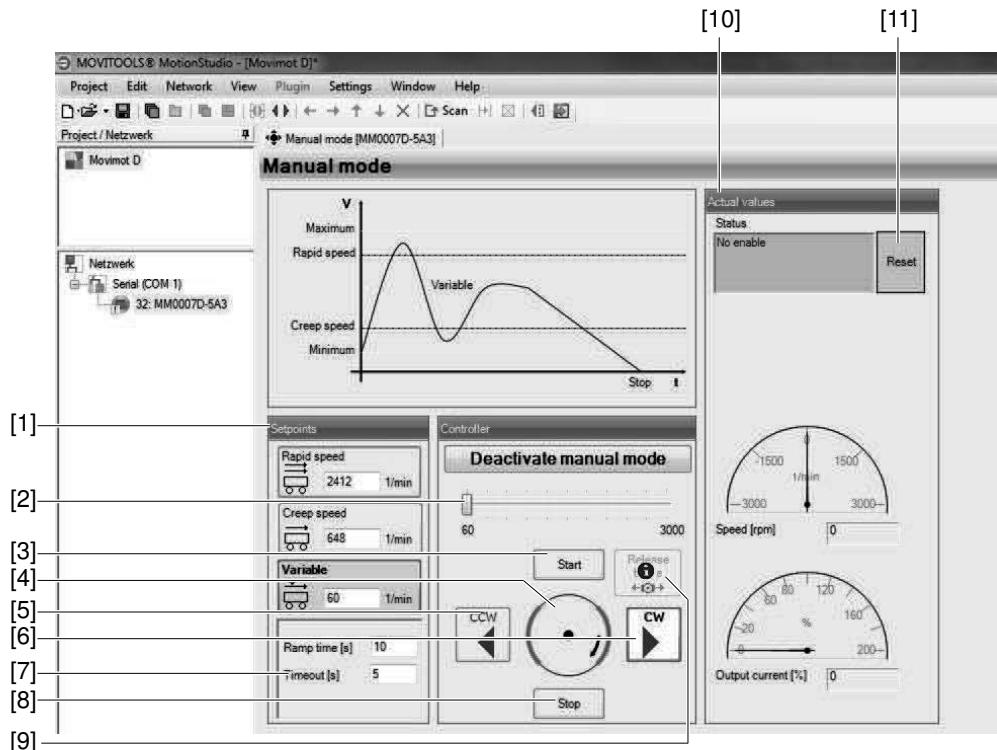


If you deactivate manual operation,

- The signals at the digital inputs become effective in binary control mode.
 - The signals at the digital inputs and the process data become effective in RS485 control mode.
-

9.6.2 Control in manual mode

Once manual operation has been successfully activated, you can control the MOVIMOT® drive using the controls in the "Manual operation" window of MOVITOOLS® MotionStudio.



9007199789314827

1. Set the variable setpoint speed with the slide control [2] in the "Controller" group.
2. Use the buttons [CW] [6] or [CCW] [5] to determine the direction of rotation.
3. Click on the [Start] button [3] to enable the MOVIMOT® drive.

The motor axis [4] displayed in the "Control" group symbolizes the direction of rotation and the speed of the motor.

4. Use the [Stop] button [8] to stop the drive.

As an alternative, you can enter the setpoints for rapid and creep speed or the variable speed setpoint directly in the "Setpoints" group [1].

The direction of rotation is determined by the sign (positive = CW operation, negative = CCW operation).

Enter the respective setpoints. Press <ENTER> and click on the button that contains the setpoint input field to enable the MOVIMOT® drive.

The group "Actual values" [10] displays the following actual values of the MOVIMOT® drive:

- MOVIMOT® inverter status
- Motor speed in [rpm]
- Output current of the MOVIMOT® inverter in [%] of I_N

On MOVIMOT® drives with a brake, you can release the brake even without drive enable by activating the "Brake release" checkbox [9].

INFORMATION



The brake can only be released without drive enable if:

- DIP switch S2/2 = "ON"
- or this function is enabled via parameter *P738*

9.6.3 Reset in manual mode

If an error occurs at the MOVIMOT® inverter, you can reset the error by clicking on the [Reset] button [11].

9.6.4 Timeout monitoring in manual mode

Timeout monitoring is active during manual operation to prevent uncontrolled operation of the MOVIMOT® drive in case of communication problems.

The timeout interval can be specified in the "Timeout" input field [7].

If communication between MOVITOOLS® MotionStudio and MOVIMOT® inverter is interrupted longer than this timeout interval,

- The enable signal for the MOVIMOT® drive unit is withdrawn
- And the brake is applied.

Manual operation remains active.

9.7 DBG keypad

9.7.1 Description

Function

You can use the DBG keypad for parameterization and manual operation of MOVIMOT® drives. In addition to that, the keypad displays important information about the state of the MOVIMOT® drive.

Features

- Illuminated plain text display, up to 7 languages can be set
- Keypad with 21 keys
- Can be connected via extension cable DKG60B (5 m)

Overview

Keypad	Language
	DBG60B-01 DE, EN, FR, IT, ES, PT, NL (German, English, French, Italian, Spanish, Portuguese, Dutch)
	DBG60B-02 DE, EN, FR, FI, SV, DA, TR (German, English, French, Finnish, Swedish, Danish, Turkish)
	DBG60B-03 DE, EN, FR, RU, PL, CS (German, English, French, Russian, Polish, Czech)
	DBG60B-04 DE, EN, FR, ZH (German, English, French, Chinese)

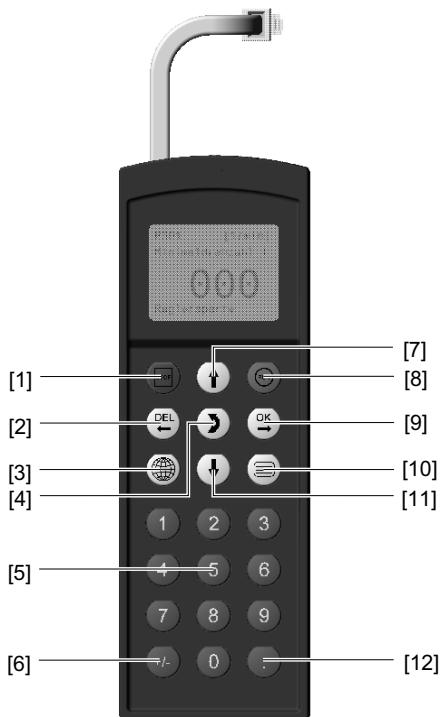
For notes on connecting the DBG keypad, refer to chapter "Connection of DBG keypad" (→ 63).

NOTICE! Loss of warranted degree of protection if the screw plugs of the f1 setpoint potentiometer or the X50 diagnostic interface are installed incorrectly or not at all. Damage to the MOVIMOT® inverter.

Screw the screw plug back on with the seal after performing parameterization, diagnostics or manual operation.

Key assignment DBG

The following figure shows the key assignment of the DBG keypad:



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[1]	Button		Stop
[2]	Button		Delete previous entry
[3]	Button		Select the required language
[4]	Button		Change the menu
[5]	Button	<0> – <9>	Digits 0 – 9
[6]	Button		Changes signs
[7]	Button		Up arrow, moves up to the next menu item
[8]	Button		Start
[9]	Button		OK, confirms the entry
[10]	Button		Calls up the context menu
[11]	Button		Down arrow, moves down to the next menu item
[12]	Button		Decimal point

9.7.2 Operation

Selecting a language

1. The following text appears on the display for a few sections when the DBG keypad is switched on for the first time or after activating the delivery status:



The symbol for language selection then appears on the display.



2. Press the key until the desired language appears.

Press the key to confirm your selection.



The DBG keypad searches for the connected units and displays them in the unit selection list.

Context menu

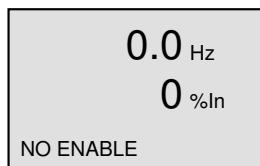
Use the key to go to the context menu.

For the MOVIMOT® MM..D inverter, the following menu items are available in the context menu of the DBG keypad:

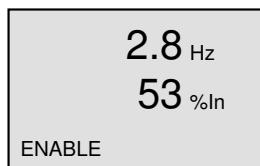
- "BASIC VIEW"
- "PARAMETER MODE"
- "MANUAL MODE"
- "COPY TO DBG"
- "COPY IN MM"
- "DBG DELIVERY ST."
- "UNIT SETTINGS"
- "SIGNATURE"
- "EXIT"

Basic display

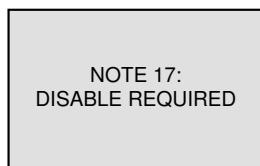
The menu "BASIC DISPLAY" represents important characteristic values.



Display for inhibited MOVIMOT® inverter



Display for enabled MOVIMOT® inverter



Information message



Error display

Parameter mode

In the menu "PARAMETER MODE", you can check and change parameter settings.

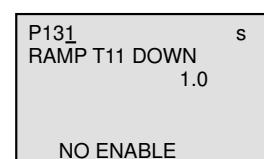
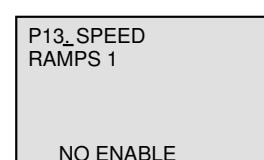
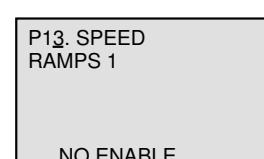
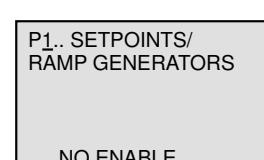
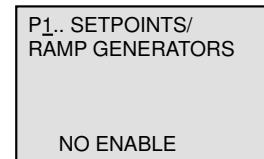
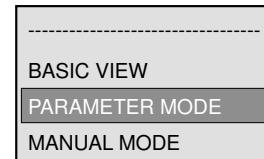
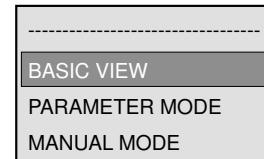
INFORMATION

Parameters can only be changed if

- A Drive ID module is plugged into the MOVIMOT® inverter
- And no additional function is activated.

To change parameters in the parameter mode, proceed as follows:

1. Use the key to call up the context menu. The second menu item is "PARAMETER MODE".
2. Press the key to select "PARAMETER MODE".
3. Press the key to select "PARAMETER MODE". The first display parameter P000 "SPEED" appears.
Use the or key to select main parameter groups 0 – 9.
4. Press the key to activate the parameter subgroup selection in the required main parameter group. The flashing cursor moves one position to the right.
5. Use the or key to select the desired parameter subgroup. The flashing cursor is positioned under the number of the parameter subgroup.
6. Press the key to activate the parameter selection in the required parameter subgroup. The flashing cursor moves one position to the right.
7. Use the or key to select the desired parameter. The flashing cursor is positioned under the third digit of the parameter number.



8. Use the  key to activate the setting mode for the selected parameter. The cursor is positioned under the parameter value.
9. Use the  or  key to set the required parameter value.
10. Press the  key to confirm the setting. To exit the setting mode, press the  key. The flashing cursor is positioned again under the third digit of the parameter number.
11. Use the  or  key to select another parameter, or press the  key to switch to the menu of the parameter subgroups.
12. Use the  or  key to select another parameter subgroup or press the  key to switch to the menu of the main parameter groups.
13. Use the  key to return to the context menu.

```
P131          s
RAMP T11 DOWN
1.0_
NO ENABLE
```

```
P131          s
RAMP T11 DOWN
1.3_
NO ENABLE
```

```
P131          s
RAMP T11 DOWN
1.3
NO ENABLE
```

Manual mode*Activation***⚠ WARNING**

Risk of crushing if the drive starts up unintentionally.

When deactivating the manual mode, the binary signals (binary control) or the process data of the master (control via RS485) become active. If the enable signal is present via the binary signals or process data, the MOVIMOT® drive can start up unintentionally when deactivating manual operation.

- Before deactivating the manual mode, set the binary signals or the process data in such way that the MOVIMOT® drive is not enabled.
- The binary signals or process data must only be changed again after deactivating manual operation.

Proceed as follows to change to manual mode:

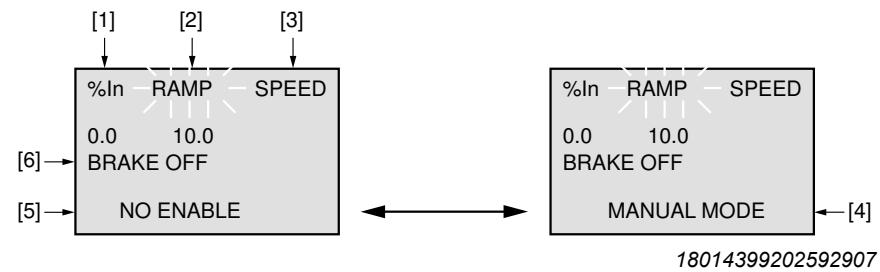
1. Use the key to switch to the context menu.
 2. Use the or key to select "MANUAL MODE".
- Press the key to confirm your selection.

The keypad is now in manual mode.

INFORMATION

If the drive is enabled or the brake is released, you cannot change to manual mode.

The message "NOTE 17: INV. ENABLED" is displayed for 2 seconds. The keypad switches to the context menu.

Display in manual mode

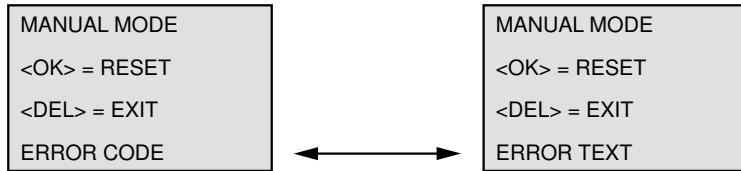
Display alternates every 2 s

- [1] Output current in [%] of I_N
- [2] Acceleration (speed ramps in [s] in relation to setpoint step change of 50 Hz)
- [3] Speed in [rpm]
- [4] Manual operation display
- [5] Inverter status
- [6] Brake status

Operation

The following MOVIMOT® function can be executed in the "MANUAL MODE" menu:

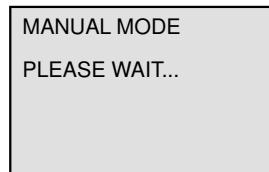
- | | |
|-------------------------------------|---|
| Setting the ramp time | Press the  key. |
| | Use the  or  key to set the required ramp time. |
| | Press the  key to confirm your entry. |
| Changing parameters. | Use the  key to switch between parameters "RAMP", "SPEED" and "BRAKE". |
| | Go to the "SPEED" parameter. |
| | The keypad shows the currently set "SPEED" parameter as flashing. |
| Enter speed. | Enter the desired speed for manual operation using the digit keys <0> – <9>. |
| | The sign determines the direction of rotation of the drive. |
| | Press the  key to confirm your entry. |
| Starting the drive. | Use the  key to start the MOVIMOT® drive. |
| | During operation, the keypad displays the current motor current in [%] of the rated motor current I_N . |
| Stop drive. | Use the  key to stop the MOVIMOT® drive. |
| Release brake without drive enable. | Press the  key to switch to the "BRAKE" menu item. |
| | Use the  key or the  key to release or engage the brake without drive enable. |
| | Press the  key to confirm your selection. |
| Reset error. | If an error occurs during manual operation, the display shows the following message: |



Display alternates
every 2 s

Press the  key to have the DBG keypad reset the error.

During the error reset, the following message is displayed:



After the error reset, manual operation remains active.

The display shows the manual mode display again.

Deactivation



⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

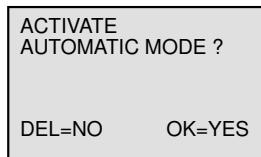
When deactivating the manual mode, the binary signals (binary control) or process data of the master (control via RS485) become active. If the enable signal is present via the binary signals or the process data, the drive can start up unintentionally when deactivating manual operation.

- Before deactivating the manual mode, set the binary signals or process data in such way that the MOVIMOT® drive is not enabled.
- The binary signals or process data must only be changed again after deactivating manual operation.

Deactivating manual operation

Use the or key to deactivate the manual mode.

The following query appears:



- Press the key to return to manual mode.
- Press the key to deactivate manual mode. The context menu appears.

Copy function of the DBG keypad

You can use the DBG keypad to copy the complete parameter set from one MOVIMOT® inverter to other MOVIMOT® inverters as follows:

Parameters can only be transferred between two identical MOVIMOT® drives (same inverter and same motor).

1. In the context menu, select the menu item "COPY TO DBG". Press the key to confirm your selection.
2. After the copying process, connect the DBG keypad to another MOVIMOT® inverter.
3. In the context menu, select the menu item "COPY TO MM". Press the key to confirm your selection.

10 Service

10.1 Status and error display

10.1.1 Meaning of the status LED

The status LED is located on the top of the MOVIMOT® inverter.

The 3-color status LED indicates the operating and error states of the MOVIMOT® inverter.

LED Color Status	Meaning Operating state Error code	Possible cause
Off	Not ready	No 24 V power supply.
Yellow Flashing steadily	Not ready	Self-test phase active or 24 V power supply present but line voltage is not OK.
Yellow Flashing steadily fast	Ready for operation	Releasing the brake without drive enable active (only with S2/2 = "ON").
Yellow steady light	Ready but unit inhibited	24 V power supply and line voltage is OK, but no enable signal. If the drive does not run when enable signal is present, check startup!
Yellow 2x flashing, pause	Ready for operation, but manual mode without unit enable	24 V power supply and line voltage OK. Stop manual mode to activate automatic mode.
	Ready for operation, Prioritized fixed setpoint control	Terminals R ↗ and L ↗ are supplied with 24 V. To activate RS485 operation, remove the bridges installed in the factory. See chapter "Electrical installation".
Yellow/green Flashing with alternating colors	Ready, but timeout	Communication is interrupted during cyclical data exchange.
Green steady light	Device enabled	Motor is in operation.
Green Flashing steadily fast	Current limit active	Drive operating at current limit.
Green Flashing steadily	Ready for operation	Standstill current function active.
Green 2x flashing, pause	Device enabled	MOVIMOT® drive is operating. Prioritized fixed setpoint control is active. See chapter "Parameter description" > "Parameter 600".

LED Color Status	Meaning Operating state Error code	Possible cause
Green/Red/Green Flashing with alternating colors, pause	Localization function active	Localization function was activated. See parameter 590.
Red 2x flashing, pause	Fault 07	DC link voltage too high.
Red Flashing slowly	Fault 08	Speed monitoring error (only when S2/4 = "ON") or additional function 13 is active.
	Fault 09	Startup fault Additional functions 4, 5, 12 (DIP switches S2/5 – S2/8) are not permitted. Firmware does not support MLK..A option (only for MOVIMOT® with AS-Interface).
	Fault 15	24 V supply error
	Faults 17 – 24, 37	CPU error
	Faults 25, 94	EEPROM error
	Faults 38, 45	Unit/motor data error
	Fault 44	The current limit was exceeded for more than 500 ms. (only with additional function 2)
	Fault 90	Incorrect motor/inverter assignment.
	Fault 97	Error while transmitting a parameter set
Red 3x flashing, pause	Fault 01	Overcurrent in output stage
	Fault 11	Overtemperature in output stage
Red 4x flashing, pause	Fault 84	Motor overload
Red 5x flashing, pause	Fault 4	Brake chopper fault
	Fault 89	Brake overtemperature Incorrect motor – frequency inverter assignment. At terminals X1:13– X1:15, both brake and braking resistor are connected. This is not permitted.
Red 6x flashing, pause	Fault 06	Line phase failure
	Fault 81	Start condition
	Fault 82	Output phases are interrupted.
Red steady light	Not ready	Check 24 V supply. A smoothed DC voltage with a maximum residual ripple of 13% must be present.

Status LED flash codes

Flashing steadily: LED 600 ms on, 600 ms off

Flashing steadily, fast: LED 100 ms on, 300 ms off

Flashing with alternating colors:	LED 600 ms green, 600 ms yellow
Flashing with alternating colors, pause:	LED 100 ms green, 100 ms red, 100 ms green, 300 ms pause
N x flashing, pause:	LED N x (600 ms red, 300 ms off), then LED off for 1 s

10.2 Error list

The following table helps you with troubleshooting:

Code	Error	Possible cause	Measure
-	Communication timeout (motor stops, without error code)	Missing connection \perp , RS+, RS- between MOVIMOT® and RS485 master	Check and establish the connection, especially ground.
		EMC influence	Check the shielding of signal cables and improve, if necessary.
		Incorrect type (cyclical) for acyclical data traffic, the protocol period between the individual messages is longer than the set timeout interval.	Check the number of MOVIMOT® drives connected to the master. If the timeout interval is 1 s, for example, you can connect a maximum of 8 MOVIMOT® drives as slaves for cyclical communication. Reduce message cycle, increase timeout interval, or select message type "acyclic".
-	Supply voltage not present (motor stops, without error code)	DC link voltage too low, Power off has been detected.	Check supply system cables and line voltage for interruption.
-	24 V supply not present (motor stops, without error code)	24 V supply voltage not present.	Check 24 V supply voltage for interruption. Check 24 V supply voltage. Permitted voltage: DC 24 V \pm 25%, EN 61131-2, residual ripple max. 13% Motor restarts automatically as soon as the voltage reaches normal values.
		AUX power supply voltage not available. (only for MOVIMOT® with AS-Interface)	Check AUX power supply voltage for interruption. Check AUX power supply voltage. Permitted voltage: DC 24 V \pm 25%, EN 61131-2, residual ripple max. 13% Motor restarts automatically as soon as the voltage reaches normal values.
01	Overcurrent in output stage	Short circuit on inverter output	Check the connection between the inverter output and the motor as well as the motor winding for short circuits. Reset the error. ¹⁾
04	Brake chopper	Overcurrent in brake output, resistor damaged, resistance too low	Check the connection of the resistor/replace it.
		Short circuit in brake coil	Replace brake.
06	Phase failure (The error can only be detected when the drive is under load)	Phase failure	Check the supply system cable for phase failure. Reset the fault ¹⁾ .

Code	Error	Possible cause	Measure
07	DC link voltage too high	Ramp time too short.	Extend the ramp time. Reset the fault ¹⁾ .
		Faulty connection between brake coil/braking resistor	Check the braking resistor/brake coil connection. Correct, if necessary. Reset the fault ¹⁾ .
		Incorrect internal resistance of brake coil/braking resistor	Check internal resistance of brake coil/braking resistor (see operating instructions, chapter "Technical data"). Reset the fault ¹⁾ .
		Thermal overload in braking resistor, wrong size of braking resistor selected	Dimension the braking resistor correctly. Reset the fault ¹⁾ .
		Invalid voltage range of supply input voltage	Check supply input voltage for permitted voltage range. Reset the fault ¹⁾ .
08	Speed monitoring	Speed deviation due to operation at the current limit	Reduce the load on the drive. Reset the fault ¹⁾ .
09	Startup	Improper drive ID module for MOVIMOT® with 230 V supply	For MOVIMOT® with 230 V supply, not all drive ID modules are permitted (see operating instructions, chapter "Assignment of the drive ID module"). Check/correct the drive ID module.
		The additional functions 4, 5, 12 are not permitted for MOVIMOT® MM..D with AS-Interface.	Correct the settings of DIP switches S2/5 – S2/8.
		Firmware does not support MLK..A option (only for MOVIMOT® with AS-Interface).	Contact SEW-EURODRIVE Service.
11	Thermal overload of the output stage or internal unit error	Heat sink is dirty.	Clean the heat sink. Reset the fault ¹⁾ .
		Ambient temperature too high.	Lower the ambient temperature. Reset the fault ¹⁾ .
		Heat build-up at MOVIMOT® drive.	Prevent heat build-up. Reset the fault ¹⁾ .
		Drive load too high.	Reduce the load on the drive. Reset the fault ¹⁾ .
15	24 V monitoring	Voltage dip in the 24 V supply	Check the 24 V supply. Reset the fault ¹⁾ .

Code	Error	Possible cause	Measure
17 - 24 37	CPU error	CPU error	Reset the fault ¹⁾ . Contact SEW-EURODRIVE Service if the error re-occurs.
25	EEPROM error	Error while accessing EEPROM	Set parameter <i>P802</i> to "Delivery state". Reset the fault ¹⁾ . Re-parameterize MOVIMOT® inverter. Contact SEW-EURODRIVE Service if the error re-occurs.
26	External terminal	External signal at terminal X6: 9,10 not present.	Correct/reset external error.
38	System software error	Internal fault	Contact SEW-EURODRIVE Service.
43	Communication timeout	Communication timeout during cyclical communication via RS485. If this error occurs, the drive is decelerated and stopped along the set ramp.	Check/re-establish the communication link between the RS485 master and the MOVIMOT® inverter. NOTICE! The drive is enabled again after communication has been re-established.
		Internal communication error (at MOVIMOT® MM..D with AS-Interface)	Check the number of slaves connected to the RS485 master. If the timeout interval of the MOVIMOT® inverter is set to 1 s, you can connect a maximum of 8 MOVIMOT® inverters (slaves) to the RS485 master for cyclical communication.
44	Current limit exceeded	The set current limit was exceeded for more than 500 ms. This error is only active with additional function 2. The status LED flashes red.	Reduce load or increase current limit at switch f2 (only with additional function 2).
81	Start condition error	The motor could not be supplied with the correct amount of current during the premagnetization time. Rated motor power too small in relation to rated inverter power.	Check connection between MOVIMOT® inverter and motor.
82	Output open error	2 or all output phases interrupted.	Check connection between MOVIMOT® inverter and motor.
		Rated motor power too small in relation to rated inverter power.	Check the combination of motor and MOVIMOT® inverter.

Code	Error	Possible cause	Measure
84	Thermal overload of motor	When the MOVIMOT® inverter is installed close to the motor, motor protection active.	Set DIP switch S1/5 to "ON". Reset the fault ¹⁾ .
		The performance level is set incorrectly for the combination of MOVIMOT® inverter and motor.	Check the setting of DIP switch S1/6. Reset the fault ¹⁾ .
		Ambient temperature too high.	Lower the ambient temperature. Reset the fault ¹⁾ .
		Heat build-up at MOVIMOT® drive.	Prevent heat build-up. Reset the fault ¹⁾ .
		Motor load too high.	Reduce the load on the motor. Reset the fault ¹⁾ .
		Speed too low.	Increase speed. Reset the fault ¹⁾ .
		If the error is signaled just after the first enable signal.	Check the combination of motor and MOVIMOT® inverter. Reset the fault ¹⁾ .
89	Brake overtemperature	The temperature monitoring in the motor (TH winding thermostat) has tripped when using a MOVIMOT® inverter with the selected additional function 5.	Reduce the load on the motor. Reset the fault ¹⁾ .
		Thermal overload of brake coil	Extend the ramp time. Reset the fault ¹⁾ .
		Brake coil is defective.	Contact SEW-EURODRIVE Service.
		Brake coil and braking resistor connected.	Connect either brake or braking resistor to drive.
		Brake coil incorrectly connected	See chapters "Connection of MOVIMOT® drive" (→ 44) and "Connecting without plug connector" (→ 49)
		Inverter does not match the motor. (only if error occurs after first enable)	Check the combination of motor (brake coil) and MOVIMOT® inverter. Check/correct the settings of DIP switches S1/6 and S2/1. Reset the fault ¹⁾ .

Code	Error	Possible cause	Measure
90	Output stage detection	The inverter/motor combination is not permitted.	Check/correct the settings of DIP switches S1/6 and S2/1.
			Check/correct the connection type of the motor.
			Check whether the drive ID module fits the motor and is plugged in correctly.
			Use a MOVIMOT® inverter or motor with another power rating.
91	Communication timeout bus module – MOVIMOT®	Timeout between the fieldbus interface and the MOVIMOT® inverter.	Check/re-establish the communication link between the fieldbus interface and the MOVIMOT® inverter. The fieldbus interface reports the error only to the higher-level controller.
94	EEPROM checksum error	Defective EEPROM.	Contact SEW-EURODRIVE Service.
97	Copy error	DBG keypad or PC/laptop disconnected during the copy process.	Before acknowledging the error, load the factory setting or the complete data set from the DBG keypad or the MOVITOOLS® MotionStudio software.
		Switching the 24 V voltage supply off and on during the copying process.	Before acknowledging the error, load the factory setting or the complete data set from the DBG keypad or the MOVITOOLS® MotionStudio software.

- 1) In the case of standard MOVIMOT® units, reset the fault by switching off the 24 V supply voltage or by performing a fault reset. In the case of MOVIMOT® units with AS-Interface, reset the fault via the AS-Interface signals or by performing a fault reset via the diagnostics socket.

10.3 Inspection and maintenance

10.3.1 MOVIMOT® inverter

The MOVIMOT® inverter is maintenance-free. SEW-EURODRIVE does not prescribe any inspection or maintenance work for the MOVIMOT® inverter and the fieldbus interface.

Exception: In case of extended storage times, observe the notes in chapter "Extended storage".

10.3.2 Motor

The motor requires regular inspection and maintenance work.

Observe the notes and instructions in chapter "Inspection/Maintenance" of the motor operating instructions.

10.3.3 Gear unit (only for MOVIMOT® gearmotors)

The gear unit requires regular inspection and maintenance work.

Observe the notes and instructions in chapter "Inspection/Maintenance" of the gear unit operating instructions.

10.4 Unit replacement



⚠ WARNING

Electric shock from capacitors that have not been fully discharged.

Severe or fatal injuries.

- Disconnect the inverter from the power. Observe the minimum switch-off time after disconnection from the supply system:
 - **1 minute**

1. Remove the screws and take off the MOVIMOT® inverter from the connection box.
2. Compare the data on the nameplate of the previous MOVIMOT® inverter with the data on the nameplate of the new MOVIMOT® inverter.

INFORMATION



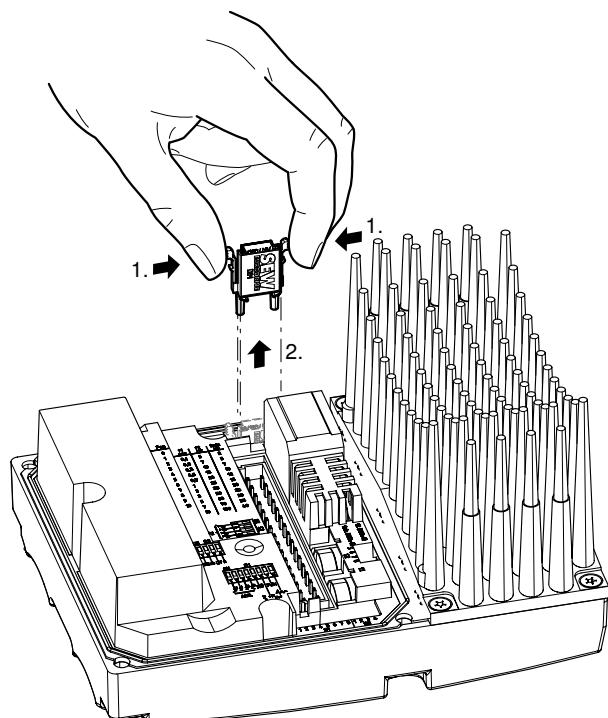
The MOVIMOT® inverter must only be replaced with a MOVIMOT® inverter with the same part number.

3. Set all control elements

- DIP switch S1
- DIP switch S2
- Setpoint potentiometer f1
- Switch f2
- Switch t1

on the new MOVIMOT® inverter analogously to the control elements of the previous MOVIMOT® inverter.

4. Unlock the drive ID module of the new MOVIMOT® inverter and pull it out carefully.



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5. Unlock the drive ID module of the previous MOVIMOT® inverter as well and pull it out carefully.

Insert this drive ID module into the new MOVIMOT® inverter.

Make sure that the drive ID module locks in place.

6. Place the new MOVIMOT® inverter onto the connection box and screw it on.
7. Supply voltage to the MOVIMOT® inverter.

INFORMATION



When switching on the new inverter the first time after a unit replacement, the 24 V supply must be connected for at least 10 seconds without interruptions.

After the unit replacement, it can take up to 6 s before the MOVIMOT® inverter signals the ready signal.

8. Check whether the new MOVIMOT® inverter is functioning properly.

10.5 Rotating the connection box

SEW-EURODRIVE always recommends purchasing the pre-fabricated MOVIMOT® drive with the correct position of cable entries. In exceptional cases, the position of the cable entries can be rotated to the opposite side (only for units with a modular connection box).

⚠ WARNING

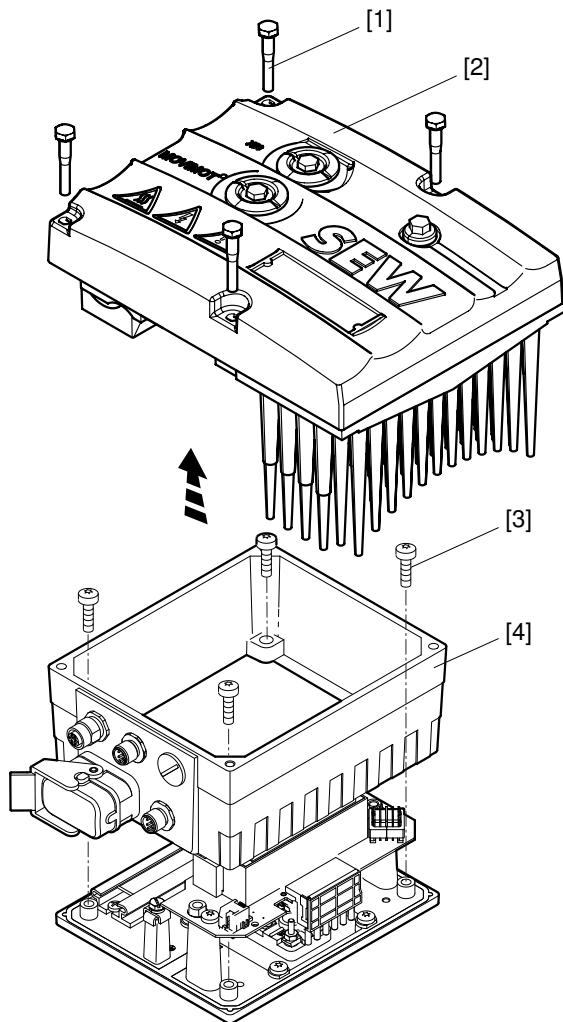


Electric shock from capacitors that have not been fully discharged.

Severe or fatal injuries.

- Disconnect the inverter from the power. Observe the minimum switch-off time after disconnection from the supply system:
 - **1 minute**

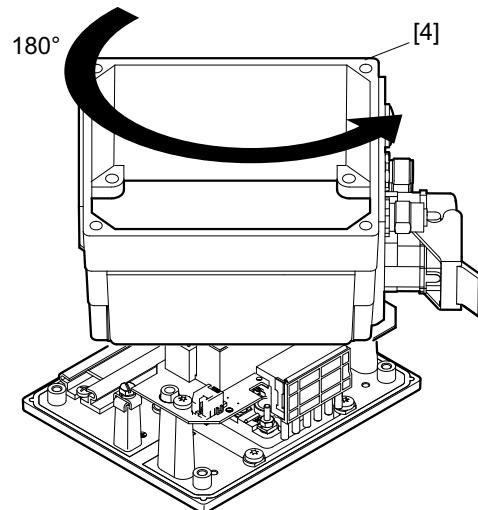
1. Label the connections of the MOVIMOT® inverter before disconnecting them for later re-installation.
2. Disconnect the supply system, control and sensor connections.
3. Remove the screws [1] and take off the MOVIMOT® inverter [2] from the terminal box.
4. Loosen the screws [3] and remove the connection box [4].



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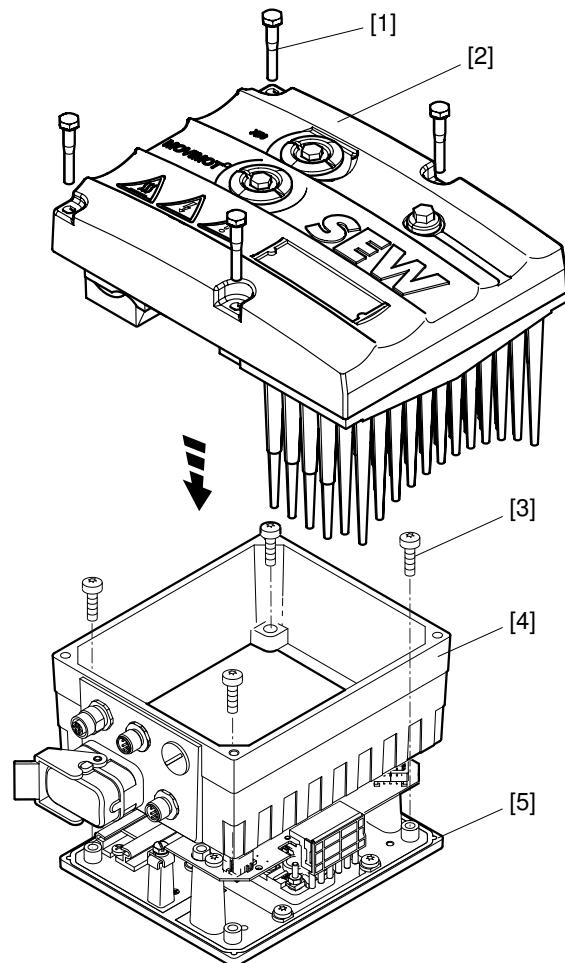
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5. Rotate the connection box [4] by 180°.



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6. Place the connection box [4] on the mounting plate [5] and secure it using 4 screws [3].
7. Re-install the connections.
8. Place the MOVIMOT® inverter [2] onto the connection box and secure it using 4 screws [1].



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10.6 SEW-EURODRIVE Service

10.6.1 Sending in a device for repair

If a fault cannot be repaired, please contact SEW-EURODRIVE Service (see "Address list").

Please always specify the digits of the status label when you contact the SEW electronics service so our Service personnel can assist you more effectively.

Provide the following information when sending the device in for repair:

- Serial number (see nameplate)
- Type designation
- Unit design
- Short description of the application (application, control type, etc.)
- Nature of the fault
- Accompanying circumstances
- Your own presumptions as to what has happened
- Any unusual events preceding the problem, etc.

10.7 Shutdown

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

⚠ WARNING



Electric shock from capacitors that have not been fully discharged.

Severe or fatal injuries.

- Disconnect the inverter from the power. Observe the minimum switch-off time after disconnection from the supply system:
 - **1 minute**

10.8 Storage

Observe the following instructions when shutting down or storing MOVIMOT® drive:

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

Observe the guidelines on storage temperature in the "Technical data" section.

10.9 Extended storage

If the unit is stored for a long time, connect it to the power supply for at least 5 minutes every 2 years. Otherwise, the unit's service life may be reduced.

10.9.1 Procedure when maintenance has been neglected

Electrolytic capacitors are used in the inverters. They are subject to aging effects when deenergized. This effect can damage the capacitors if the unit is connected directly to the nominal voltage after a longer period of storage.

If you have not performed maintenance regularly, SEW-EURODRIVE recommends that you increase the line voltage slowly up to the maximum voltage. This can be done, for example, by using a variable transformer for which the output voltage has been set according to the following overview. After you have completed the regeneration process, the unit can be used immediately or stored again for an extended period with maintenance.

The following stages are recommended:

AC 400 / 500 V units:

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

10.10 Waste disposal

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

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

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

- Oil and grease

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

- Screens
- Capacitors

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.

11 Technical data

11.1 Motor with operating point 400 V/50 Hz or 400 V/100 Hz

MOVIMOT® type		MM 03D- 503-00	MM 05D- 503-00	MM 07D- 503-00	MM 11D- 503-00	MM 15D- 503-00	MM 22D- 503-00	MM 30D- 503-00	MM 40D- 503-00				
Part number		1821 49 91	1821 50 09	1821 50 17	1821 50 25	1821 50 33	1821 50 41	1821 50 68	1821 50 76				
Size				1				2	2L				
Apparent output power at V_{line} = AC 380 – 500 V	S_N	1.1 kVA	1.4 kVA	1.8 kVA	2.2 kVA	2.8 kVA	3.8 kVA	5.1 kVA	6.7 kVA				
Connection voltages	V_{line}	AC 3 x 380 V/ 400 V /415 V/460 V/500 V											
Permitted range		$V_{\text{line}} = \text{AC } 380 \text{ V} -10\% \text{ to AC } 500 \text{ V} +10\%$											
Line frequency	f_{line}	50 – 60 Hz $\pm 10\%$											
Nominal line current at $V_{\text{line}} = \text{AC } 400 \text{ V}$	I_{line}	AC 1.3 A	AC 1.6 A	AC 1.9 A	AC 2.4 A	AC 3.5 A	AC 5.0 A	AC 6.7 A	AC 7.3 A				
Power factor	$\cos \varphi$	0.99											
Output voltage	V_{out}	0 – V_{line}											
Output frequency	f_A	2 to 120 Hz											
Resolution		0.01 Hz											
Operating point		400 V at 50/100 Hz											
Nominal output current	I_N	AC 1.6 A	AC 2.0 A	AC 2.5 A	AC 3.2 A	AC 4.0 A	AC 5.5 A	AC 7.3 A	AC 8.7 A				
Motor power S1	P_{Mot}	0.37 kW 0.5 HP	0.55 kW 0.75 HP	0.75 kW 1.0 HP	1.1 kW 1.5 HP	1.5 kW 2.0 HP	2.2 kW 3.0 HP	3.0 kW 4.0 HP	4.0 kW 5.4 HP				
PWM frequency		4 (factory setting)/8/16 kHz ¹⁾											
Current limiting	I_{max}	Motor mode: 160% with \swarrow and \triangle Generator mode: 160% with \swarrow and \triangle											
Maximum motor cable length		15 m when MOVIMOT® inverter is mounted close to the motor (with SEW-EURODRIVE hybrid cable)											
External braking resistor	R_{min}	150 Ω				68 Ω							
Interference immunity		Meets EN 61800-3											
Interference emission		Complies with category C2 according to EN 61800-3 (limit class A to EN 55011 and EN 55014)											
Ambient temperature	ϑ_{Amb}	-25 (-30) – +40 °C depending on the motor P_N reduction: 3% I_N per K up to max. 60 °C											
Climate class		EN 60721-3-3, class 3K22											

Technical data

Motor with operating point 400 V/50 Hz or 400 V/100 Hz

MOVIMOT® type	MM 03D- 503-00	MM 05D- 503-00	MM 07D- 503-00	MM 11D- 503-00	MM 15D- 503-00	MM 22D- 503-00	MM 30D- 503-00	MM 40D- 503-00
Part number	1821 49 91	1821 50 09	1821 50 17	1821 50 25	1821 50 33	1821 50 41	1821 50 68	1821 50 76
Size			1				2	2L
Storage temperature ²⁾		-30 to +85 °C (EN 60721-3-3, class 3K22)						
Maximum permitted vibration and shock load		3M7 according to DIN EN 60721-3-3 According to DIN EN 61800-5-1 and EN 60068-2-6						
Degree of protection (depending on the motor)		IP54, IP55, IP65, IP66 (options, specify when ordering) (Connection box closed and all cable bushings sealed, the degree of protection of the MOVIMOT® drive decreases with a lower degree of protection of the motor)						
Operating mode		S1, S3 max. cycle duration 10 minutes (EN 60034-1)						
Type of cooling		Natural cooling (DIN 41751)						
Installation altitude		$h \leq 1000 \text{ m}$: No reduction $h > 1000 \text{ m}$: I_N reduction by 1% per 100 m $h > 2000 \text{ m}$: I_N reduction by 1% per 100 m, overvoltage category II $h_{\max} = 3800 \text{ m}$ Also see chapter ""Installation altitudes above 1000 m above sea level"" (→ 40)						
Mass		See "MOVIMOT® gearmotors" catalog						
Dimensions, dimension drawings								
Output torques								
Required preventive measures		Grounding the device						

- 1) 16 kHz PWM frequency (low-noise): When DIP SWITCH S1/7 is set to ON, the devices operate at a PWM frequency of 16 kHz (low noise) and switch back in steps to lower clock frequencies depending on the heat sink temperature and the load.
- 2) If the device is put into extended storage, connect it to the line voltage for at least 5 minutes every 2 years. Otherwise, the service life of the device will be reduced.

11.2 Motor with operating point 460 V/60 Hz

MOVIMOT® type		MM 03D- 503-00	MM 05D- 503-00	MM 07D- 503-00	MM 11D- 503-00	MM 15D- 503-00	MM 22D- 503-00	MM 30D- 503-00	MM 40D- 503-00			
Part number		1821 49 91	1821 50 09	1821 50 17	1821 50 25	1821 50 33	1821 50 41	1821 50 68	1821 50 76			
Size				1				2	2L			
Apparent output power at V_{line} = AC 380 – 500 V	S_N	1.1 kVA	1.4 kVA	1.8 kVA	2.2 kVA	2.8 kVA	3.8 kVA	5.1 kVA	6.7 kVA			
Connection voltages	V_{line}	AC 3 x 380 V/400 V/415 V/ 460 V /500 V										
Permitted range		V_{line} = AC 380 V -10% – AC 500 V +10%										
Line frequency	f_{line}	50 – 60 Hz ±10%										
Nominal line current at V_{line} = AC 460 V	I_{line}	AC 1.1 A	AC 1.4 A	AC 1.7 A	AC 2.1 A	AC 3.0 A	AC 4.3 A	AC 5.8 A	AC 6.9 A			
Power factor	$\cos \varphi$	0.99										
Output voltage	V_{out}	0 – V_{line}										
Output frequency	f_A	2 to 120 Hz										
Resolution		0.01 Hz										
Operating point		460 V at 60 Hz										
Nominal output current	I_N	AC 1.6 A	AC 2.0 A	AC 2.5 A	AC 3.2 A	AC 4.0 A	AC 5.5 A	AC 7.3 A	AC 8.7 A			
Motor power	P_{Mot}	0.37 kW 0.5 HP	0.55 kW 0.75 HP	0.75 kW 1.0 HP	1.1 kW 1.5 HP	1.5 kW 2.0 HP	2.2 kW 3.0 HP	3.7 kW 5.0 HP	4 kW 5.4 HP			
PWM frequency		4 (factory setting)/8/16 kHz ¹⁾										
Current limiting	I_{max}	Motor mode: 160% with \leftarrow and \triangle Generator mode: 160% with \leftarrow and \triangle										
Maximum motor cable length		15 m when MOVIMOT® inverter is mounted close to the motor (with SEW-EURODRIVE hybrid cable)										
External braking resistor	R_{min}	150 Ω					68 Ω					
Interference immunity		Complies with EN 61800-3										
Interference emission		Complies with category C2 according to EN 61800-3 (limit class A to EN 55011 and EN 55014)										
Ambient temperature	ϑ_{Amb}	-25 (-30) – +40 °C depending on the motor P_N reduction: 3% I_N per K up to max. 60 °C										
Climate class		EN 60721-3-3, class 3K22										
Storage temperature ²⁾		-30 to +85 °C (EN 60721-3-3, class 3K22)										

Technical data

Motor with operating point 460 V/60 Hz

MOVIMOT® type	MM 03D- 503-00	MM 05D- 503-00	MM 07D- 503-00	MM 11D- 503-00	MM 15D- 503-00	MM 22D- 503-00	MM 30D- 503-00	MM 40D- 503-00
Part number	1821 49 91	1821 50 09	1821 50 17	1821 50 25	1821 50 33	1821 50 41	1821 50 68	1821 50 76
Size			1				2	2L
Maximum permitted vibration and shock load		3M7 according to DIN EN 60721-3-3 According to DIN EN 61800-5-1 and EN 60068-2-6						
Degree of protection (depending on the motor)		IP54, IP55, IP65, IP66 (options, specify when ordering) (Connection box closed and all cable bushings sealed, the degree of protection of the MOVIMOT® drive decreases with a lower degree of protection of the motor)						
Operating mode		S1, S3 max. cycle duration 10 minutes (EN 60034-1)						
Type of cooling		Natural cooling (DIN 41751)						
Installation altitude		$h \leq 1000 \text{ m}$: No reduction $h > 1000 \text{ m}$: I_N reduction by 1% per 100 m $h > 2000 \text{ m}$: I_N reduction by 1% per 100 m, overvoltage category II $h_{\max} = 3800 \text{ m}$ Also see chapter ""Installation altitudes above 1000 m above sea level"" (→ 40)						
Mass		See "MOVIMOT® gearmotors" catalog						
Dimensions, dimension drawings								
Output torques								
Required preventive measures		Grounding the device						

- 1) 16 kHz PWM frequency (low-noise): When DIP SWITCH S1/7 is set to ON, the devices operate at a PWM frequency of 16 kHz (low noise) and switch back in steps to lower clock frequencies depending on the heat sink temperature and the load.
- 2) If the device is put into extended storage, connect it to the line voltage for at least 5 minutes every 2 years. Otherwise, the service life of the device will be reduced.

11.3 Motor with operating point 230 V/60 Hz

MOVIMOT® type		MM 03D-233-00	MM 05D-233-00	MM 07D-233-00	MM 11D-233-00	MM 15D-233-00	MM 22D-233-00			
Part number		18215084	18215092	18215106	18215114	18215122	18215130			
Size		1			2					
Apparent output power at $V_{\text{line}} = \text{AC } 200 - 240 \text{ V}$	S_N	1.0 kVA	1.3 kVA	1.7 kVA	2.0 kVA	2.9 kVA	3.4 kVA			
Connection voltages	V_{line}	AC 3 x 200 V/ 230 V /240 V								
Permitted range		$V_{\text{line}} = \text{AC } 200 \text{ V} -10\% \text{ to AC } 240 \text{ V} +10\%$								
Line frequency	f_{line}	50 – 60 Hz \pm 10%								
Nominal line current at $V_{\text{line}} = \text{AC } 230 \text{ V}$	I_{line}	AC 1.9 A	AC 2.4 A	AC 3.5 A	AC 5.0 A	AC 6.7 A	AC 7.3 A			
Power factor	$\cos \varphi$	0.99								
Output voltage	V_{out}	0 – V_{line}								
Output frequency	f_A	2 to 120 Hz								
Resolution		0.01 Hz								
Operating point		230 V at 60 Hz								
Nominal output current	I_N	AC 2.5 A	AC 3.2 A	AC 4.0 A	AC 5.5 A	AC 7.3 A	AC 8.7 A			
Motor power S1	P_{Mot}	0.37 kW 0.5 HP	0.55 kW 0.75 HP	0.75 kW 1.0 HP	1.1 kW 1.5 HP	1.5 kW 2.0 HP	2.2 kW 3.0 HP			
PWM frequency		4 (factory setting)/8/16 kHz ¹⁾								
Current limiting	I_{max}	Motor mode: 160% with \nwarrow and \triangle Generator mode: 160% with \nwarrow and \triangle								
Maximum motor cable length		15 m when mounting close to the motor or the MOVIMOT® frequency inverter (with SEW-EURODRIVE hybrid cable)								
External braking resistor	R_{min}	150 Ω			68 Ω					
Interference immunity		Meets EN 61800-3								
Interference emission		Complies with category C2 according to EN 61800-3 (limit value class A to EN 55011 and EN 55014)								
Ambient temperature	ϑ_{Amb}	-25 (-30) – +40 °C depending on the motor P_N reduction: 3% I_N per K up to max. 60 °C								
Climate class		EN 60721-3-3, class 3K22								
Storage temperature ²⁾		-30 to +85 °C (EN 60721-3-3, class 3K22)								
Maximum permitted vibration and shock load		3M7 according to DIN EN 60721-3-3 According to DIN EN 61800-5-1 and EN 60068-2-6								

Technical data

Motor with operating point 230 V/60 Hz

MOVIMOT® type	MM 03D-233-00	MM 05D-233-00	MM 07D-233-00	MM 11D-233-00	MM 15D-233-00	MM 22D-233-00			
Part number	18215084	18215092	18215106	18215114	18215122	18215130			
Size	1			2					
Degree of protection (depending on the motor)	IP54, IP55, IP65, IP66 (options, specify when ordering) (Connection box closed and all cable bushings sealed, the degree of protection of the MOVIMOT® drive decreases with a lower degree of protection of the motor)								
Operating mode	S1, S3 max. cycle duration 10 minutes (EN 60034-1)								
Type of cooling	Natural cooling (DIN 41751)								
Installation altitude	<p>$h \leq 1000 \text{ m}$: No reduction</p> <p>$h > 1000 \text{ m}$: I_N reduction by 1% per 100 m</p> <p>$h > 2000 \text{ m}$: I_N reduction by 1% per 100 m, overvoltage category II</p> <p>$h_{\max} = 3800 \text{ m}$</p> <p>Also see chapter ""Installation altitudes above 1000 m above sea level"" (→ 40)</p>								
Mass									
Dimensions, dimension drawings	See "MOVIMOT® gearmotors" catalog								
Output torques									
Required preventive measures	Grounding the device								

- 1) 16 kHz PWM frequency (low-noise): When DIP SWITCH S1/7 is set to ON, the devices operate at a PWM frequency of 16 kHz (low noise) and switch back in steps to lower clock frequencies depending on the heat sink temperature and the load.
- 2) If the device is put into extended storage, connect it to the line voltage for at least 5 minutes every 2 years. Otherwise, the service life of the device will be reduced.

11.4 Inverter data

11.4.1 Content of the chapter

This document contains a list of points stipulated by the EU Ecodesign Regulation 2019/1781 and by the UK Ecodesign Regulations (S.I. 2010 No. 2617 and S.I. 2021 No. 745) for the inverter series.

These points are:

(1)	Power loss in % of the apparent output power S_N Standby losses (W, %)
(2)	Efficiency level according to IEC 61800-9-2
(3)	Manufacturer's name or trademark, commercial registration number, and address
(4)	Model identifier of the product
(5)	Apparent output power or range of apparent output power (kVA)
(6)	Indicative motor rated output power P_N (kW)
(7)	Nominal output current (A)
(8)	Maximum operating temperature ($^{\circ}$ C)
(9)	Rated supply frequency (Hz)
(10)	Nominal input voltage or range of nominal input voltage (V)

Point 1 first lists the power losses in percent of the rated apparent output power at the 8 operating points specified by the regulation, and second, standby losses for each device.

The operating points are indicated in the regulation with 2 numbers separated by a semicolon, such as "0;50". The first number is the relative motor stator frequency, the second number indicates the relative torque-producing current.

11.4.2 Connection voltage 380 V – 500 V

MOVIMOT® MM..D - MM03 - 15D..3-00

Model identifier	MOVIMOT® MM..D					
Type	MM03 - 15D..3-00					
Performance class	03	05	07	11	15	
(1) Power loss in % of the apparent output power	0;25	2.24	1.73	1.50	1.31	1.21
	0;50	2.26	1.87	1.65	1.46	1.38
	0;100	2.49	2.22	2.01	1.83	1.78
	50;25	2.29	1.77	1.54	1.35	1.26
	50;50	2.34	1.95	1.73	1.54	1.46
	50;100	2.63	2.37	2.17	2.00	1.95
	90;50	2.41	2.02	1.80	1.62	1.54
	90;100	2.76	2.51	2.31	2.15	2.12
(1) Power loss in standby	W	3.0	3.0	3.0	3.0	3.0
	%	0.3	0.2	0.2	0.1	0.1
(2) Efficiency level according to IEC 61800-9-2		IE2				
(3) Manufacturer	SEW-EURODRIVE GmbH & Co KG RG Mannheim, HRB 230207 D-76646 Bruchsal					
	(5) Apparent output power	kVA	1.11	1.39	1.73	2.22
	(6) Indicative motor rated power output	kW	0.37	0.55	0.75	1.10
(7) Rated output current	A	1.60	2.00	2.50	3.20	4.00
(8) Maximum operating temperature	°C	40				
(9) Rated supply frequency	Hz	50 – 60 ±10 %				
(10) Range of rated supply voltage	V	3 × 380 – 500 ±10 %				

MOVIMOT® MM..D - MM22 - 30D..3-00

Model identifier		MOVIMOT® MM..D	
Type	MM22 – 30D..3-00		
Performance class		22	30
(1) Power loss in % of the apparent output power	0;25	0.89	0.84
	0;50	1.10	1.04
	0;100	1.61	1.51
	50;25	0.93	0.88
	50;50	1.18	1.12
	50;100	1.77	1.68
	90;50	1.26	1.20
	90;100	1.93	1.84
(1) Power loss in standby	W	3.0	3.0
	%	0.1	0.1
(2) Efficiency level according to IEC 61800-9-2	IE2		
(3) Manufacturer	SEW-EURODRIVE GmbH & Co KG RG Mannheim, HRB 230207 D-76646 Bruchsal		
(5) Apparent output power	kVA	3.81	5.06
(6) Indicative motor rated power output	kW	2.20	3.00
(7) Rated output current	A	5.50	7.30
(8) Maximum operating temperature	°C	40	
(9) Rated supply frequency	Hz	50 – 60 ±10 %	
(10) Range of rated supply voltage	V	3 × 380 – 500 ±10 %	

MOVIMOT® MM..D - MM40D-..3-00

Model identifier		MOVIMOT® MM..D
Type		MM40D-..3-00
Performance class		40
(1) Power loss in % of the apparent output power	0;25	0.84
	0;50	1.04
	0;100	1.53
	50;25	0.88
	50;50	1.13
	50;100	1.70
	90;50	1.21
	90;100	1.87
(1) Power loss in standby	W	3.0
	%	0.1
(2) Efficiency level according to IEC 61800-9-2		IE2
(3) Manufacturer		SEW-EURODRIVE GmbH & Co KG RG Mannheim, HRB 230207 D-76646 Bruchsal
(5) Apparent output power	kVA	6.03
(6) Indicative motor rated power output	kW	4.00
(7) Rated output current	A	8.70
(8) Maximum operating temperature	°C	40
(9) Rated supply frequency	Hz	50 – 60 ±10 %
(10) Range of rated supply voltage	V	3 × 380 – 500 ±10 %

11.4.3 Connection voltage 200 V – 240 V

MOVIMOT® MM..D - MM03 - 07D..3-00

Model identifier		MOVIMOT® MM..D		
Type		MM03 - 07D..3-00		
Performance class		03	05	07
(1) Power loss in % of the apparent output power	0;25	2.21	2.01	1.50
	0;50	2.24	2.04	1.73
	0;100	2.59	2.42	2.32
	50;25	2.30	2.10	1.57
	50;50	2.38	2.19	1.88
	50;100	2.85	2.68	2.62
	90;50	2.50	2.31	2.02
	90;100	3.08	2.93	2.91
(1) Power loss in standby	W	3.0	3.0	3.0
	%	0.3	0.2	0.2
(2) Efficiency level according to IEC 61800-9-2		IE2		
(3) Manufacturer		SEW-EURODRIVE GmbH & Co KG RG Mannheim, HRB 230207 D-76646 Bruchsal		
(5) Apparent output power	kVA	1.00	1.27	1.59
(6) Indicative motor rated power output	kW	0.37	0.55	0.75
(7) Rated output current	A	2.50	3.20	4.00
(8) Maximum operating temperature	°C	40		
(9) Rated supply frequency	Hz	50 – 60 ±10 %		
(10) Range of rated supply voltage	V	3 × 200 – 240 ±10 %		

MOVIMOT® MM..D - MM11 - 22D..3-00

Model identifier		MOVIMOT® MM..D		
Type		MM11 - 22D..3-00		
Performance class		11	15	22
(1) Power loss in % of the apparent output power	0;25	1.19	1.12	1.12
	0;50	1.48	1.39	1.39
	0;100	2.20	2.04	2.08
	50;25	1.26	1.19	1.19
	50;50	1.62	1.53	1.54
	50;100	2.48	2.33	2.37
	90;50	1.75	1.67	1.68
	90;100	2.74	2.62	2.67
(1) Power loss in standby	W	3.0	3.0	3.0
	%	0.1	0.1	0.1
(2) Efficiency level according to IEC 61800-9-2		IE2		
(3) Manufacturer		SEW-EURODRIVE GmbH & Co KG RG Mannheim, HRB 230207 D-76646 Bruchsal		
(5) Apparent output power	kVA	2.19	2.91	3.47
(6) Indicative motor rated power output	kW	1.10	1.50	2.20
(7) Rated output current	A	5.50	7.30	8.70
(8) Maximum operating temperature	°C	40		
(9) Rated supply frequency	Hz	50 – 60 ±10 %		
(10) Range of rated supply voltage	V	3 × 200 – 240 ±10 %		

11.5 Electronics data

Electronics data	Terminal	
External electronics supply	24 V X6:1, 2, 3	V = +24 V ± 25%, EN 61131-2, residual ripple max. 13% $I_E \leq 250 \text{ mA}$ (typically 120 mA at 24 V) Input capacitance 120 μF
Three digital inputs		Isolated via optocoupler; PLC compatible (EN 61131-2) $R_i \approx 3.0 \text{ k}\Omega$, $I_E \approx 10 \text{ mA}$, sampling cycle $\leq 5 \text{ ms}$
Signal level		+13 – +30 V = "1" = Contact closed -3 – +5 V = "0" = Contact open
Control functions	R ↗ X6:11, 12	CW/Stop
	L ↗ X6:9, 10	CCW/Stop
	f1/f2 X6:7, 8	"0" = setpoint 1 "1" = setpoint 2
Output relay Contact information	K1a X5:25, 26	Response time $\leq 15 \text{ ms}$ DC 24 V/0.6 A/DC 12 according to IEC 60947-5-1 (only SELV or PELV circuits)
Signaling function		NO contact for ready signal Contact closed: <ul style="list-style-type: none">• With voltage present (24 V + power supply)• If no error was detected• At the end of self-testing phase (after power on)
Serial interface	RS+ X5:29, 30	RS485
	RS- X5:31, 32	

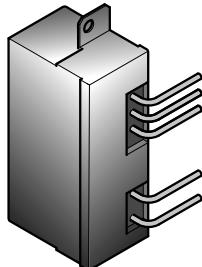
11.6 Technical data of options and accessories

11.6.1 MLU11A/MLU21A



Option	MLU11A	MLU21A
Part number	08233837	0823387X
Function	24 V voltage supply	
Input voltage	AC 380 – 500 V ± 10% (50/60 Hz)	AC 200 – 240 V ± 10% (50/60 Hz)
Output voltage	DC 24 V ± 25%	
Output power	max. 6 W	
Degree of protection	IP65	
Ambient temperature	-25 – +60°C	
Storage temperature	-25 – +85°C	

11.6.2 MLU13A



Option	MLU13A
Part number	18205968
Function	24 V voltage supply
Input voltage	AC 380 – 500 V ± 10% (50/60 Hz)
Output voltage	DC 24 V ± 25%
Output power	max. 8 W
Degree of protection	IP20
Ambient temperature	-25 – +85°C
Storage temperature	-25 – +85°C

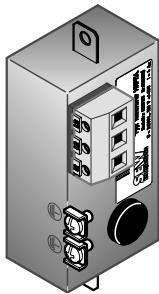
11.6.3 MLG11A/MLG21A



Option	MLG11A	MLG21A
Part number	08233845	08233888
Function	Setpoint adjuster and 24 V voltage supply	
Input voltage	AC 380 – 500 V ± 10% (50/60 Hz)	AC 200 – 240 V ± 10% (50/60 Hz)
Output voltage	DC 24 V ± 25%	
Output power	max. 6 W	
Setpoint resolution	1%	
Serial interface¹⁾	RS485 for connecting a MOVIMOT® inverter	
Degree of protection	IP65	
Ambient temperature	-15 – +60°C	
Storage temperature	-25 – +85°C	

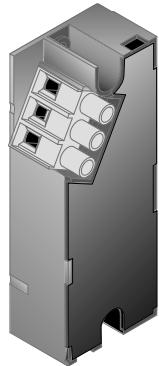
1) with integrated dynamic terminating resistor

11.6.4 MNF21A



Option	MNF21A (only for MM03D-503-00 – MM15D-503-00)
Part number	08042659
Function	3-phase line filter (allows for category C1 to EN 61800-3)
Input voltage	V = 3x AC 380 V – 500 V ±10% (50/60 Hz)
Input current	4 A
Degree of protection	IP20
Ambient temperature	-25 – +60 °C
Storage temperature	-25 – +85 °C

11.6.5 URM



Option	URM
Part number	08276013
Function	Voltage relay, ensures quick application of the mechanical brake
Rated voltage V_N	DC 36 – 167 V (Brake coil AC 88 – 400 V)
Braking current I_N	0.75 A
Degree of protection	IP20
Ambient temperature	-25 – +60°C
Storage temperature	-25 – +85°C
Disconnection time t_{off}	Approx. 40 ms (without URM option: 100 ms) (cut-off in the DC circuit)

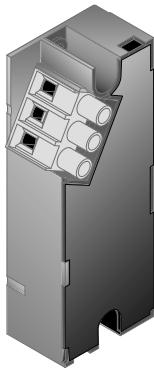
11.6.6 BEM

NOTICE

If the connection voltage is too high, the BEM brake rectifier or the brake coil connected to it can be damaged.

Damage to the BEM brake rectifier or the brake coil.

- Select a brake with rated brake voltage that matches the nominal line voltage!



Option	BEM
Part number	08296111
Function	Brake rectifier ensures the rapid switching (release and application) of the mechanical brake.
Rated supply voltage	AC 230 V – AC 500 V + 10%/- 15% 50 – 60 Hz ±5% Black connection wires
Control voltage	DC 0 – 5 V MOVIMOT® connection: PCB connector X10
Braking current	max. DC 0.8 A Brake connection 13, 14, 15
Degree of protection	IP20
Ambient temperature	-25 – +60 °C
Storage temperature	-25 – +85 °C
Disconnection time t_{off}	10 – 20 ms

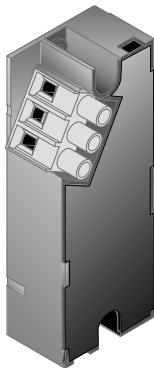
11.6.7 BES (for 24 V brake coil)

NOTICE

If the connection voltage is too high, the BES brake rectifier or the brake coil connected to it can be damaged.

Damage to the BES brake rectifier or the brake coil.

- Select a brake with a DC 24 V brake coil.



Option	BES
Part number	08298475
Function	Brake rectifier ensures the rapid switching (release and application) of the mechanical brake.
Supply voltage	DC 24 V +10 %/-15%
Control voltage	DC 0 – 5 V MOVIMOT® connection: PCB connector X10
Braking current	max. DC 3.0 A
Degree of protection	IP20
Ambient temperature	-25 – +60 °C
Storage temperature	-25 – +85 °C
Disconnection time t_{off}	10 – 20 ms

11.6.8 MBG11A



Option	MBG11A
Part number	08225478
Function	Setpoint adjuster
Input voltage	DC 24 V ± 25%
Current consumption	approx. 70 mA
Setpoint resolution	1%
Serial interface¹⁾	RS485 for connecting a maximum of 31 MOVIMOT® inverters (max. 200 m, 9600 baud)
Degree of protection	IP65
Ambient temperature	-15 – +60°C
Storage temperature	-25 – +85°C

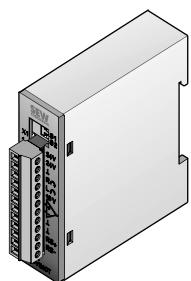
1) with integrated terminating resistor

11.6.9 DBG



Option	DBG60B-01	DBG60B-02	DBG60B-03	DBG60B-04
Part number	18204031	18204058	18204066	18208509
Function	Keypad			
Connection	RJ10 connector For connection to the X50 diagnostic interface			
Degree of protection	IP40 (EN 60529)			
Ambient temperature	0 – +40 °C			
Storage temperature	-20 – +80 °C			

11.6.10 MWA21A



Option	MWA21A
Part number	08230064
Function	Setpoint converter
Input voltage	DC 24 V ± 25%
Current consumption	approx. 70 mA
Serial interface¹⁾	RS485 for connecting max. 31 MOVIMOT® inverters (max. 200 m) max. 9600 Baud Unidirectional communication Cycle time: 100 ms
Analog input	0 – 10 V/2 – 10 V, $R_i \approx 12 \text{ k}\Omega$ 0 – 20 mA/4 – 20 mA, $R_i \approx 22 \Omega$
Setpoint resolution analog input	8 Bit (± 1 Bit)
Signal level digital inputs	+13 – +30 V = "1" -3 – +5 V = "0"
Degree of protection	IP20
Ambient temperature	-15 – +60°C
Storage temperature	-25 – +85°C

1) with integrated terminating resistor

11.6.11 Forced cooling fan V

Option for motor size DR..	V forced cooling fan				
	71	80	90	100	112/132
Input voltage	DC 24 V				
Current consumption	0.35 A	0.5 A	0.75 A	0.75/ 1.1 A	1.64 A
Power demand	10 W	12 W	14 W	14/19 W	29 W
Air discharge rate	60 m ³ /h	170 m ³ /h	210 m ³ /h	295 m ³ /h	
Connection	Terminal strip				
Max. cable cross section	3 x 1.5 mm ²				
Cable gland	M16 x 1.5				
Degree of protection	IP66				
Ambient temperature	-20 – +60°C				

11.7 Integrated RS485 interface

RS485 interface	
Standard	RS485 to EIA standard (with integrated dynamic terminating resistor)
Baud rate	9.6 kbaud 31.25 kBaud (in connection with MF.., MQ.., MOVIFIT® MC)
Start bits	1 start bit
Stop bits	1 stop bit
Data bits	8 data bits
Parity	1 parity bit, completing for even parity (even parity)
Data direction	Bidirectional
Operating mode	Aynchronous, semi-duplex
Timeout time	1 s
Line length	max. 200 m in RS485 operation with 9600 Baud max. 30 m at transmission rate: 31250 Baud ¹⁾
Number of participants	<ul style="list-style-type: none"> • max. 32 stations (1 bus master ²⁾ + 31 MOVIMOT®) broadcast and group addresses possible • 15 MOVIMOT® can be addressed individually

1) Transmission rate of 31,250 Bd will be detected automatically in case of operation with MF.. fieldbus interface.

2) Ext. control or option MBG11A, MWA21A or MLG..A.

11.8 Diagnostic interface

Diagnostic interface X50	
Standard	RS485 to EIA standard (with integrated dynamic terminating resistor)
Baud rate	9.6 kbaud
Start bits	1 start bit
Stop bits	1 stop bit
Data bits	8 data bits
Parity	1 parity bit, completing for even parity (even parity)
Data direction	Bidirectional
Operating mode	Aynchronous, semi-duplex
Connection	RJ10 socket

11.9 Work done, working air gap, braking torque of brake

Brake type	Work done until maintenance [10 ⁶ J]	Working air gap [mm]		Brake lining carrier [mm] min.	Braking torque [Nm]	Braking torque settings			
		min. ¹⁾	max.			Type and number of brake springs	Normal	Blue	Order numbers for brake springs
BE03	200	0.25	0.65	- ²⁾	3.4 2.7 2.1 1.7 1.3 0.9	-	-	- ²⁾	-
BE05	120	0.25	0.6	9.0	5.0 3.5 2.5 1.8	2 2 -	4 2 6 3	0135017X	13741373
BE1	120	0.25	0.6	9.0	10 7.0 5.0	6 4 2	- 2 4	0135017X	13741373
BE2	165	0.25	0.6	9.0	20 14 10 7.0	6 2 2 -	- 4 2 4	13740245	13740520
BE5	260	0.25	0.9	9.0	55 40 28 20	6 2 2 -	- 4 2 4	13740709	13740717
BE11	640	0.3	1.2	10.0	110 80 55 40	6 2 2 -	- 4 2 4	13741837	13741847

1) When checking the working air gap, note: Parallelism tolerances on the brake lining carrier may give rise to deviations of ± 0.15 mm after a test run.

2) The brake lining carrier and the brake springs cannot be replaced. When the minimum brake lining carrier thickness/maximum working air gap is reached, the brake must be replaced.

11.10 Braking torque assignment

Motor type	Brake type	Braking torque steps [Nm]									
DR.71	BE03	0.9	1.3	1.7	2.1	2.7	3.4				
	BE05	1.8	2.5	3.5	5.0						
	BE1				5.0	7.0	10				
DR.80	BE05	1.8	2.5	3.5	5.0						
	BE1				5.0	7.0	10				
	BE2					7.0	10	14	20		
DR.90	BE1				5.0	7.0	10				
	BE2					7.0	10	14	20		
	BE5							20	28	40	55
DR.100	BE2					7.0	10	14	20		
	BE5							20	28	40	55
DR.112	BE5								28	40	55
	BE11									40	55
DR.132	BE5								28	40	55
	BE11									40	55
Preferred brake voltage											

Preferred brake voltage

MOVIMOT® type	Preferred brake voltage
MOVIMOT® MM..D-503, size 1 (MM03.. to MM15..)	230 V
MOVIMOT® MM..D-503, size 2 (MM22.. to MM40..)	120 V
MOVIMOT® MM..D-233 ¹⁾ , sizes 1 and 2 (MM03.. to MM40..)	120 V

1) In connection with MOVIMOT® MM..D-233, only the brakes with a nominal voltage of 120 V are permitted.

11.11 Assignment of internal braking resistors

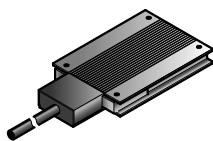
MOVIMOT® type	Braking resistor	Part number
MM03D-503-00 – MM15D-503-00	BW1	08228973 ¹⁾
MM03D-233-00 – MM07D-233-00		
MM22D-503-00 – MM40D-503-00	BW2	08231362 ¹⁾
MM11D-233-00 – MM22D-233-00		

1) 2 screws M4 x 8, included in scope of delivery.

11.12 Assignment of external braking resistors

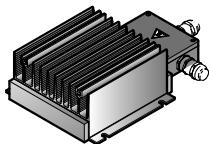
MOVIMOT® type	Braking resistor	Part no.	Protective grid
MM03D-503-00 – MM15D-503-00 MM03D-233-00 – MM07D-233-00	BW200-003/K-1.5	08282919	0813152X
	BW200-005/K-1.5	08282838	–
	BW150-006/T	17969565	–
MM22D-503-00 – MM40D-503-00 MM11D-233-00 – MM22D-233-00	BW100-003/K-1.5	08282935	0813152X
	BW100-005/K-1.5	08282862	–
	BW068-006/T	17970008	–
	BW068-012/T	17970016	–

11.12.1 BW100.. BW200..



	BW100-003/ K-1.5	BW100-005/ K-1.5	BW200-003/ K-1.5	BW200-005/ K-1.5
Part number	08282935	08282862	08282919	08282838
Function	Dissipating the regenerative energy			
Degree of protection	IP65			
Resistance	100 Ω	100 Ω	200 Ω	200 Ω
Power in S1, 100% cdf	100 W	200 W	100 W	200 W
Dimensions W x H x D	146 x 15 x 80 mm	252 x 15 x 80 mm	146 x 15 x 80 mm	252 x 15 x 80 mm
Line length	1.5 m			

11.12.2 BW150.. BW068..



	BW150-006-T	BW68-006-T	BW68-012-T
Part number	17969565	17970008	17970016
Function	Dissipating the regenerative energy		
Degree of protection	IP66		
Resistance	150 Ω	68 Ω	68 Ω
Power according to UL in S1, 100% cdf	600 W	600 W	1200 W
Power according to CE in S1, 100% cdf	900 W	900 W	1800 W
Dimensions W x H x D	285 x 75 x 174 mm	285 x 75 x 174 mm	635 x 75 x 174 mm
Maximum permitted cable length	15 m		

INFORMATION



Generally speaking, the application does not need the temperature sensor of the braking resistor. The higher-level controller can evaluate the temperature sensor's signal and switch off the supply voltage of the drive when necessary.

11.13 Resistance and assignment of the brake coil

Brake	Resistance of the brake coil¹⁾		
	120 V	230 V	400 V
BE03	76 Ω	378 Ω	1197 Ω
BE05	78 Ω	312 Ω	985 Ω
BE1	78 Ω	312 Ω	985 Ω
BE2	58 Ω	232 Ω	732 Ω
BE5	51 Ω	200 Ω	640 Ω
BE11	33 Ω	130 Ω	412 Ω

1) Nominal value measured between the red connection (terminal 13) and the blue connection (terminal 15) at 20°C, temperature-dependent fluctuations in the range -25% / +40% are possible.

11.14 Assignment of the drive ID module

Type	Motor		Drive ID module		
	Line voltage V	Line frequency Hz	Identification	Identifica- tion color	Part number
DR2S..	230/400	50	DR2S/400/50	Light gray/ white striped	28249720
DR2S..	266/460	60	DR2S/460/60 ¹⁾	Yellow/ white striped	28249739
DRS..	230/400	50	DRS/400/50	White	18214371
DRE..	230/400	50	DRE/400/50	Orange	18214398
DRS..	266/460	60	DRS/460/60 ¹⁾	Yellow	18214401
DRE..	266/460	60	DRE/460/60 ¹⁾	Green	18214428
DRS../DRE..	220/380	60	DRS/DRE/380/60 ¹⁾	Red	18234933
DRS../DRE..	220 – 240/380 – 415 254 – 277/440 – 480	50 60	DRS/DRE/50/60	Violet	18214444
DRE...J..	230/400	50	DRE...J/400/50	Orange	28203816
DRU...J..	230/400	50	DRU...J/400/50	Gray	28203194
DRN..	220/380	60	DRN/380/60 ¹⁾	Red/white striped	28240227
DRN..	230/400	50	DRN/400/50	Light blue	28222040
DRN..	266/460	60	DRN/460/60 ¹⁾	Blue/white striped	28241819
DRS../DRN..	220 – 230/380 – 400 266/460	50 60	DRS/DRN/50/60	Green/ white striped	28241827
DRN..	220 – 230/380 – 400 266/460	50 60	DRN/50/60	Violet/ white striped	28249747

1) This drive ID module can also be combined with MOVIMOT® MM..D-233.

12 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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Australia

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

Austria

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

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

Sales	Minsk	Foreign unitary production enterprise SEW-EURODRIVE Novodvorskij village council 145 223016, Minsk region	Tel. +375 17 319 47 56 / +375 17 378 47 58 Fax +375 17 378 47 54 http://www.sew-eurodrive.by sew@sew-eurodrive.by
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Belgium

Assembly Sales Service	Brussels	SEW-EURODRIVE n.v./s.a. Researchpark Haasrode 1060 Evenementenlaan 7 3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.be info@sew-eurodrive.be
Service Competence Center	Industrial Gears	SEW-EURODRIVE n.v./s.a. Rue 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

Brazil

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

Bulgaria

Sales	Sofia	BEVER-DRIVE GmbH Bogdanovetz Str.1 1606 Sofia	Tel. +359 2 9151160 Fax +359 2 9151166 bever@bever.bg
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Cameroon

Sales	Douala	SEW-EURODRIVE SARLU Ancienne Route Bonabéri P.O. Box B.P 8674 Douala-Cameroun	Tel. +237 233 39 12 35 Fax +237 233 39 02 10 www.sew-eurodrive.ci/ info@sew-eurodrive.cm
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Canada

Assembly Sales Service	Toronto	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, ON L6T 3W1	Tel. +1 905 791-1553 Fax +1 905 791-2999 http://www.sew-eurodrive.ca l.watson@sew-eurodrive.ca
	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. Tilbury Industrial Park 7188 Honeyman Street Delta, BC V4G 1G1	Tel. +1 604 946-5535 Fax +1 604 946-2513 b.wake@sew-eurodrive.ca
	Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2001 Ch. de l'Aviation Dorval Quebec H9P 2X6	Tel. +1 514 367-1124 Fax +1 514 367-3677 n.paradis@sew-eurodrive.ca

Chile

Assembly Sales Service	Santiago de Chile	SEW-EURODRIVE CHILE LTDA Las Encinas 1295 Parque Industrial Valle Grande LAMPA Santiago de Chile P.O. Box Casilla 23 Correo Quilicura - Santiago - Chile	Tel. +56 2 2757 7000 Fax +56 2 2757 7001 http://www.sew-eurodrive.cl ventas@sew-eurodrive.cl
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China

Production Assembly Sales Service	Tianjin	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 78, 13th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25323273 http://www.sew-eurodrive.cn info@sew-eurodrive.cn
Assembly Sales Service	Suzhou	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew-eurodrive.cn
	Guangzhou	SEW-EURODRIVE (Guangzhou) Co., Ltd. No. 9, JunDa Road East Section of GETDD Guangzhou 510530	Tel. +86 20 82267890 Fax +86 20 82267922 guangzhou@sew-eurodrive.cn
	Shenyang	SEW-EURODRIVE (Shenyang) Co., Ltd. 10A-2, 6th Road Shenyang Economic Technological Development Area Shenyang, 110141	Tel. +86 24 25382538 Fax +86 24 25382580 shenyang@sew-eurodrive.cn
	Taiyuan	SEW-EURODRIVE (Taiyuan) Co., Ltd. No.3, HuaZhang Street, TaiYuan Economic & Technical Development Zone ShanXi, 030032	Tel. +86-351-7117520 Fax +86-351-7117522 taiyuan@sew-eurodrive.cn
	Wuhan	SEW-EURODRIVE (Wuhan) Co., Ltd. 10A-2, 6th Road No. 59, the 4th Quanli Road, WEDA 430056 Wuhan	Tel. +86 27 84478388 Fax +86 27 84478389 wuhan@sew-eurodrive.cn
	Xi'An	SEW-EURODRIVE (Xi'An) Co., Ltd. No. 12 Jinye 2nd Road Xi'An High-Technology Industrial Development Zone Xi'An 710065	Tel. +86 29 68686262 Fax +86 29 68686311 xian@sew-eurodrive.cn
Sales Service	Hong Kong	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. +852 36902200 Fax +852 36902211 contact@sew-eurodrive.hk

Colombia

Assembly	Bogota	SEW-EURODRIVE COLOMBIA LTDA. Calle 17 No. 132-18 Interior 2 Bodega 6, Manzana B Santafé de Bogotá	Tel. +57 1 54750-50 Fax +57 1 54750-44 http://www.sew-eurodrive.com.co sew@sew-eurodrive.com.co
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Croatia

Sales	Zagreb	KOMPEKS d. o. o. Zeleni dol 10 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@inet.hr
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Czech Republic

Assembly	Hostivice	SEW-EURODRIVE CZ s.r.o. Floriánova 2459 253 01 Hostivice	Tel. +420 255 709 601 Fax +420 235 350 613 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz
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Denmark

Assembly	Copenhagen	SEW-EURODRIVE A/S Geminivej 28-30 2670 Greve	Tel. +45 43 95 8500 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk
Service	Vejle	SEW-EURODRIVE A/S Bødkervej 2 7100 Vejle	Tel. +45 43 9585 00 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk

Egypt

Representation: United Arab Emirates

Estonia

Sales	Tallin	ALAS-KUUL AS Loomäe tee 1, Lehmja küla 75306 Rae vald Harjumaa	Tel. +372 6593230 Fax +372 6593231 http://www.alas-kuul.ee info@alas-kuul.ee
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Finland

Assembly	Hollola	SEW-EURODRIVE OY Vesimäentie 4 15860 Hollola	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
Service	Hollola	SEW-EURODRIVE OY Keskikankaantie 21 15860 Hollola	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
	Tornio	SEW-EURODRIVE Oy Lossirannankatu 5 95420 Tornio	Tel. +358 201 589 300 Fax +358 3 780 6211 http://www.sew-eurodrive.fi sew@sew.fi
Production Assembly	Karkkila	SEW Industrial Gears Oy Santasalonkatu 6, PL 8 03620 Karkkila, 03601 Karkkila	Tel. +358 201 589-300 Fax +358 201 589-310 http://www.sew-eurodrive.fi sew@sew.fi

France

Production Sales	Hagenau	SEW USOCOME 48-54 route de Soufflenheim B. P. 20185 67506 Haguenau Cedex	Tel. +33 3 88 73 67 00 http://www.usocome.com sew@usocome.com
Production	Forbach	SEW USOCOME Zone industrielle Technopôle Forbach Sud B. P. 30269 57604 Forbach Cedex	Tel. +33 3 87 29 38 00
	Brumath	SEW USOCOME 1 Rue de Bruxelles 67670 Mommenheim Cedex	Tel. +33 3 88 37 48 00

France

Assembly	Bordeaux	SEW USOCOME Parc d'activités de Magellan 62 avenue de Magellan – B. P. 182 33607 Pessac Cedex	Tel. +33 5 57 26 39 00 dtcbordeaux@usocome.com
Sales	Haguenau	SEW USOCOME 48-54 route de Soufflenheim B. P. 20185 67506 Haguenau Cedex	Tel. +33 3 88 73 67 00 dtchaguenau@usocome.com
Service	Lyon	SEW USOCOME 75 rue Antoine Condorcet 38090 Vaulx-Milieu	Tel. +33 4 74 99 60 00 dtclyon@usocome.com
	Nantes	SEW USOCOME Parc d'activités de la forêt 4 rue des Fontenelles 44140 Le Bignon	Tel. +33 2 40 78 42 00 dtcnantes@usocome.com
	Paris	SEW USOCOME Zone industrielle 2 rue Denis Papin 77390 Verneuil l'Étang	Tel. +33 1 64 42 40 80 dtcparis@usocome.com

Gabon

Representation: Cameroon

Germany

Headquarters	Bruchsal	SEW-EURODRIVE GmbH & Co KG Ernst-Bickle-Straße 42 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
Production / Industrial Gears	Bruchsal	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Str. 10 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-2970
Production / Precision Gear Units	Bruchsal	SEW-EURODRIVE GmbH & Co KG Ernst-Bickle-Straße 42 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 sew@sew-eurodrive.de
Production	Graben	SEW-EURODRIVE GmbH & Co KG Ernst-Bickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-0 Fax +49 7251-2970
Service Competence Center	Mechanics / Mechatronics	SEW-EURODRIVE GmbH & Co KG Ernst-Bickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 scc-mechanik@sew-eurodrive.de
	Electronics	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Straße 12 76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 scc-elektronik@sew-eurodrive.de
	MAXOLUTION® Factory Automation	SEW-EURODRIVE GmbH & Co KG Eisenbahnstraße 11 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 sew@sew-eurodrive.de
Drive Technology Center	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 43 30823 Garbsen (Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 dtc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg 1 08393 Meerane (Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-20 dtc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 85551 Kirchheim (München)	Tel. +49 89 909551-21 Fax +49 89 909551-50 dtc-sued@sew-eurodrive.de
	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
Drive Center	Berlin	SEW-EURODRIVE GmbH & Co KG Alexander-Meißner-Straße 44 12526 Berlin	Tel. +49 306331131-30 Fax +49 306331131-36 dc-berlin@sew-eurodrive.de
	Bremen	SEW-EURODRIVE GmbH & Co KG Allerkai 4 28309 Bremen	Tel. +49 421 33918-10 Fax +49 421 33918-22 tb-bremen@sew-eurodrive.de

Germany

Hamburg	SEW-EURODRIVE GmbH & Co KG Hasselbinnen 11 22869 Schenefeld	Tel. +49 40298109-60 Fax +49 40298109-70 dc-hamburg@sew-eurodrive.de
Saarland	SEW-EURODRIVE GmbH & Co KG Gottlieb-Daimler-Straße 4 66773 Schwalbach Saar – Hülzweiler	Tel. +49 6831 48946 10 Fax +49 6831 48946 13 dc-saarland@sew-eurodrive.de
Ulm	SEW-EURODRIVE GmbH & Co KG Dieselstraße 18 89160 Dornstadt	Tel. +49 7348 9885-0 Fax +49 7348 9885-90 dc-ulm@sew-eurodrive.de
Würzburg	SEW-EURODRIVE GmbH & Co KG Nürnbergerstraße 118 97076 Würzburg-Lengfeld	Tel. +49 931 27886-60 Fax +49 931 27886-66 dc-wuerzburg@sew-eurodrive.de

Drive Service Hotline / 24 Hour Service

0 800 SEWHELP

0 800 7394357

Great Britain

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

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

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

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

Registered Office Assembly Sales Service	Vadodara	SEW-EURODRIVE India Private Limited 302, NOTUS IT PARK, Sarabhai Campus, Beside Notus Pride, Genda Circle, Vadodara 390023 Gujarat	Tel. +91 265 3045200 Fax +91 265 3045300 http://www.seweurodriveindia.com salesvadodara@seweurodriveindia.com
Assembly Sales Service	Chennai	SEW-EURODRIVE India Private Limited Plot No. K3/1, Sipcot Industrial Park Phase II Mambakkam Village Sriperumbudur - 602105 Kancheepuram Dist, Tamil Nadu	Tel. +91 44 37188888 Fax +91 44 37188811 saleschennai@seweurodriveindia.com
	Pune	SEW-EURODRIVE India Private Limited Plant: Plot No. D236/1, Chakan Industrial Area Phase- II, Warale, Tal- Khed, Pune-410501, Maharashtra	Tel. +91 21 35 628700 Fax +91 21 35 628715 salespune@seweurodriveindia.com
Sales Service	Gurgaon	SEW-EURODRIVE India Private Limited Drive Center Gurugram Plot no 395, Phase-IV, UdyogVihar Gurugram , 122016 Haryana	Tel. +91 99588 78855 salesgurgaon@seweurodriveindia.com

Indonesia

Sales	Medan	PT. Serumpun Indah Lestari Jl.Pulau Solor no. 8, Kawasan Industri Medan II Medan 20252	Tel. +62 61 687 1221 Fax +62 61 6871429 / +62 61 6871458 / +62 61 30008041 sil@serumpunindah.com serumpunindah@yahoo.com http://www.serumpunindah.com
	Jakarta	PT. Cahaya Sukses Abadi Komplek Rukan Puri Mutiara Blok A no 99, Sunter Jakarta 14350	Tel. +62 21 65310599 Fax +62 21 65310600 cjakt@cbn.net.id
	Jakarta	PT. Agrindo Putra Lestari JL.Pantai Indah Selatan, Komplek Sentra Industri Terpadu, Pantai indah Kapuk Tahap III, Blok E No. 27 Jakarta 14470	Tel. +62 21 2921-8899 Fax +62 21 2921-8988 aplindo@indosat.net.id http://www.aplindo.com
	Surabaya	PT. TRIAGRI JAYA ABADI Jl. Sukosemolo No. 63, Galaxi Bumi Permai G6 No. 11 Surabaya 60111	Tel. +62 31 5990128 Fax +62 31 5962666 sales@triagri.co.id http://www.triagri.co.id
	Surabaya	CV. Multi Mas Jl. Raden Saleh 43A Kav. 18 Surabaya 60174	Tel. +62 31 5458589 Fax +62 31 5317220 sianhwa@sby.centrin.net.id http://www.cvmultimas.com

Ireland

Sales Service	Dublin	Alperton Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458 http://www.alperton.ie info@alperton.ie
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Israel

Sales	Tel Aviv	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 http://www.liraz-handasa.co.il office@liraz-handasa.co.il
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Italy

Assembly Sales Service	Milan	SEW-EURODRIVE S.a.s. di SEW S.r.l. & Co. Via Bernini,12 20033 Solaro (Milano)	Tel. +39 02 96 980229 Fax +39 02 96 980 999 http://www.sew-eurodrive.it milano@sew-eurodrive.it
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Ivory Coast

Sales	Abidjan	SEW-EURODRIVE SARL Ivory Coast Rue des Pêcheurs, Zone 3 26 BP 916 Abidjan 26	Tel. +225 27 21 21 81 05 Fax +225 27 21 25 30 47 info@sew-eurodrive.ci http://www.sew-eurodrive.ci
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Japan

Assembly Sales Service	Iwata	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373814 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp
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Kazakhstan

Sales Service	Almaty	SEW-EURODRIVE LLP 291-291A, Tole bi street 050031, Almaty	Tel. +7 (727) 350 5156 Fax +7 (727) 350 5156 http://www.sew-eurodrive.com kazakhstan@sew-eurodrive.com
	Tashkent	Representative Office SEW-EURODRIVE Representative office in Uzbekistan 95A Amir Temur ave, office 401/3 100084 Tashkent	Tel. +998 97 134 01 99 http://www.sew-eurodrive.uz sew@sew-eurodrive.uz
	Ulaanbaatar	IM Trading LLC Olympic street 28B/3 Sukhbaatar district, Ulaanbaatar 14230, MN	Tel. +976-77109997 Fax +976-77109997 imt@imt.mn

Latvia

Sales	Riga	SIA Alas-Kuul Katlakalna 11C 1073 Riga	Tel. +371 6 7139253 Fax +371 6 7139386 http://www.alas-kuul.lv info@alas-kuul.com
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Lebanon

Sales (Lebanon)	Beirut	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 510 532 Fax +961 1 494 971 ssacar@inco.com.lb
Sales (Jordan, Kuwait , Beirut Saudi Arabia, Syria)		Middle East Drives S.A.L. (offshore) Sin El Fil. B. P. 55-378 Beirut	Tel. +961 1 494 786 Fax +961 1 494 971 http://www.medrives.com info@medrives.com

Lithuania

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

Representation: Belgium

Macedonia

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

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

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

Mongolia

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

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

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

Assembly Sales Service	Rotterdam	SEW-EURODRIVE B.V. Industrieweg 175 3044 AS Rotterdam Postbus 10085 3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 Service: 0800-SEWHELP http://www.sew-eurodrive.nl info@sew-eurodrive.nl
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New Zealand

Assembly Sales Service	Auckland	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 30 Lodestar Avenue, Wigram Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz

Nigeria

Sales	Lagos	Greenpeg Nig. Ltd 64C Toyin Street Opebi-Allen Ikeja Lagos-Nigeria	Tel. +234-701-821-9200-1 http://www.greenpegltd.com sales@greenpegltd.com
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Norway

Assembly Sales Service	Moss	SEW-EURODRIVE A/S Solgaard skog 71 1599 Moss	Tel. +47 69 24 10 20 Fax +47 69 24 10 40 http://www.sew-eurodrive.no sew@sew-eurodrive.no
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Pakistan

Sales	Karachi	Industrial Power Drives Al-Fatah Chamber A/3, 1st Floor Central Commercial Area, Sultan Ahmed Shah Road, Block 7/8, Karachi	Tel. +92 21 452 9369 Fax +92-21-454 7365 seweurodrive@cyber.net.pk
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Paraguay

Sales	Fernando de la Mora	SEW-EURODRIVE PARAGUAY S.R.L Nu Guazu No. 642 casi Campo Esperanza Santisima Trinidad Asuncion	Tel. +595 991 519695 Fax +595 21 3285539 sewpy@sew-eurodrive.com.py
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Peru

Assembly Sales Service	Lima	SEW EURODRIVE DEL PERU S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe
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Philippines

Sales	Makati	P.T. Cerna Corporation 4137 Ponte St., Brgy. Sta. Cruz Makati City 1205	Tel. +63 2 519 6214 Fax +63 2 890 2802 mech_drive_sys@ptcerna.com http://www.ptcerna.com
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Poland

Assembly Sales Service	Łódź	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 92-518 Łódź	Tel. +48 42 293 00 00 Fax +48 42 293 00 49 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
	Service	Tel. +48 42 293 0030 Fax +48 42 293 0043	24 Hour Service Tel. +48 602 739 739 (+48 602 SEW SEW) serwis@sew-eurodrive.pl

Portugal

Assembly Sales Service	Coimbra	SEW-EURODRIVE, LDA. Av. da Fonte Nova, n.º 86 3050-379 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt
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Romania

Sales Service Bucharest Sialco Trading SRL
str. Brazilia nr. 36
011783 Bucuresti Tel. +40 21 230-1328
Fax +40 21 230-7170
<http://www.sialco.ro>
sialco@sialco.ro

Russia

Assembly Sales Service St. Petersburg 3AO «СЕВ-ЕВРОДРАЙФ»
188660, Russia, Leningrad Region, Vsevolozhsky District, Korabselki, Aleksandra Nevskogo str.
building 4, block 1
P.O. Box 36
195220 St. Petersburg Tel. +7 812 3332522 / +7 812 5357142
Fax +7 812 3332523
<http://www.sew-eurodrive.ru>
sew@sew-eurodrive.ru

Senegal

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

Serbia

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Representation: South Africa

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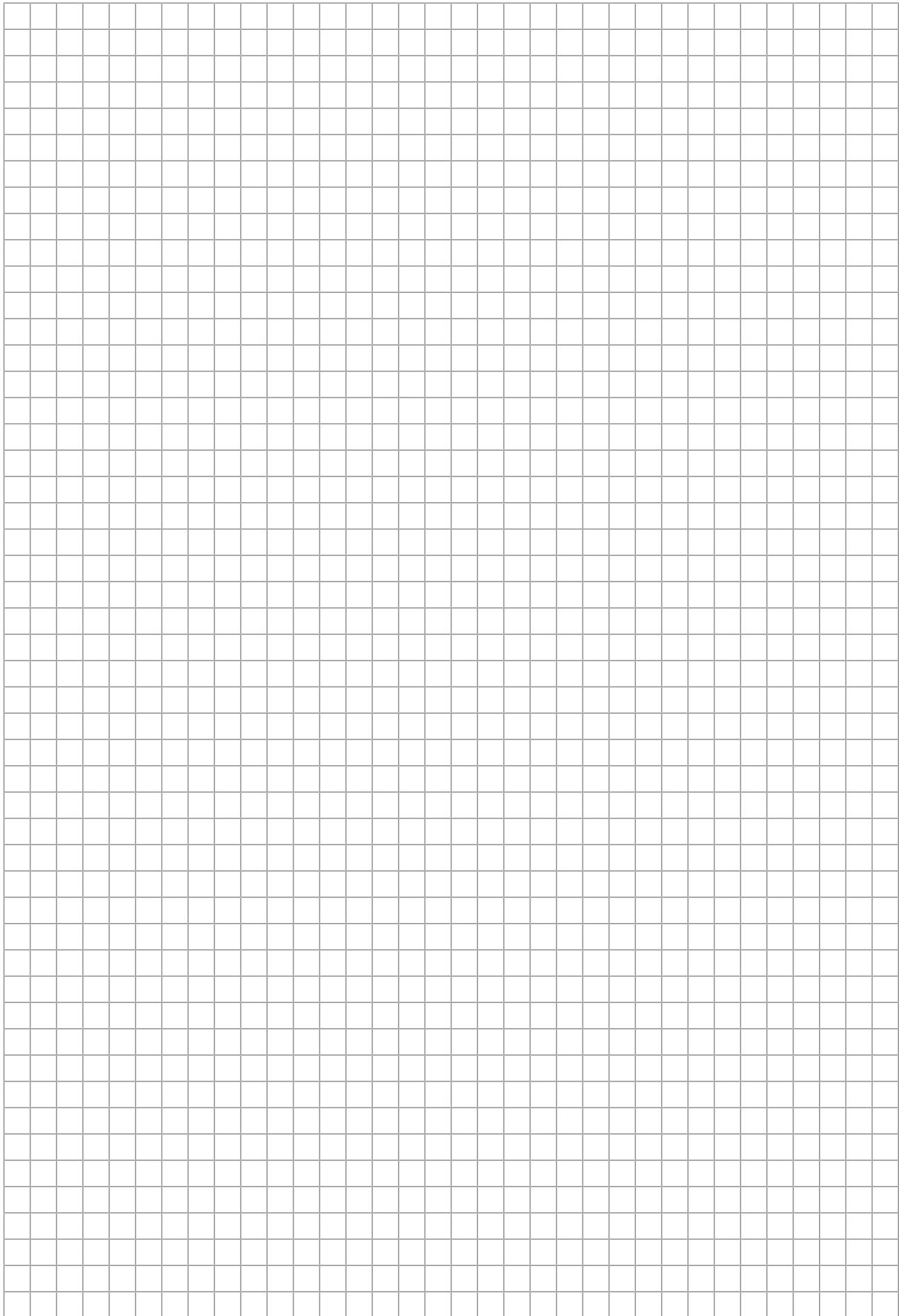
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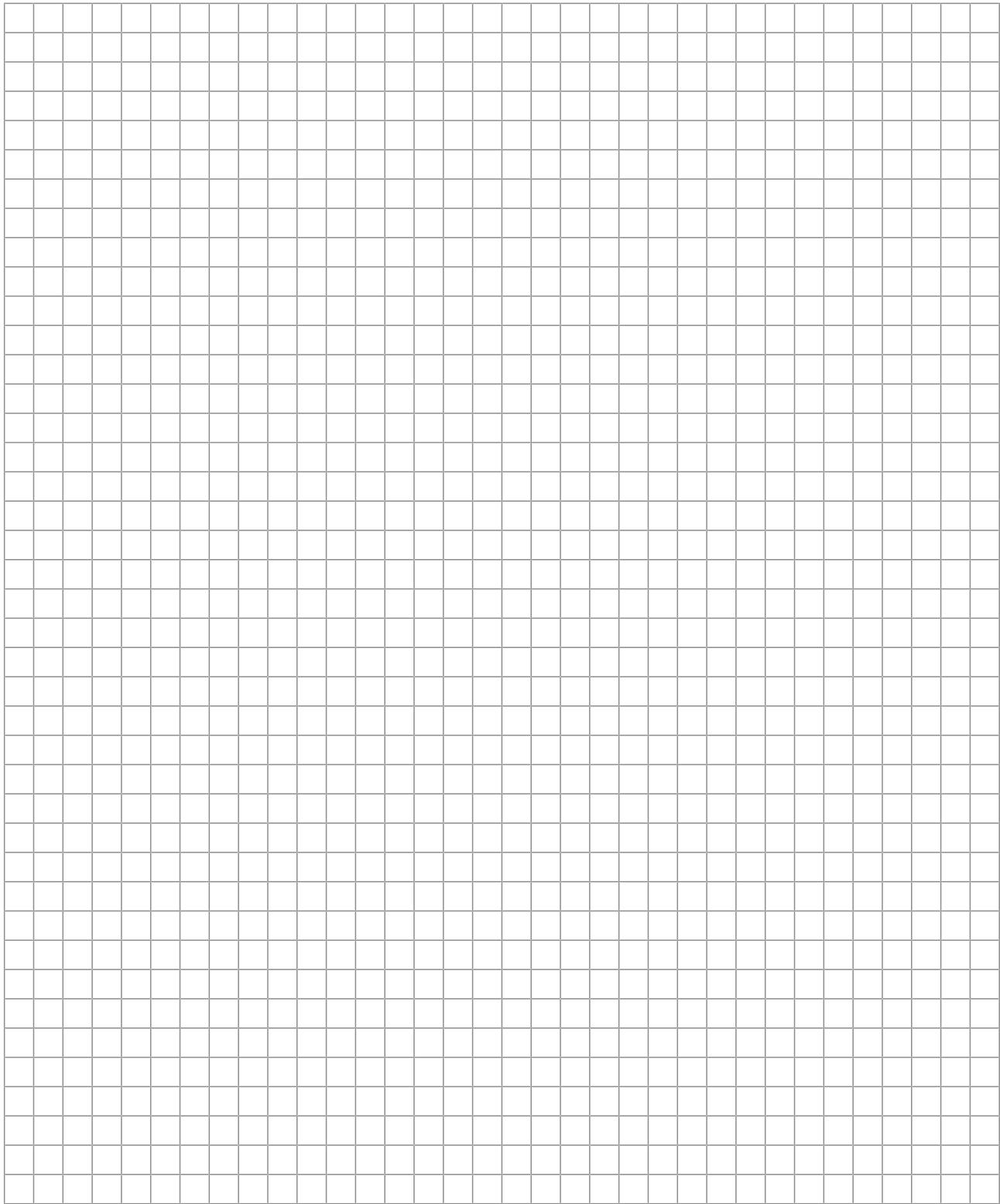
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