



**SEW**  
**EURODRIVE**

## Operating Instructions



**MOVIMOT<sup>®</sup> MM..D**  
With DT/DV Series AC Motor





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# 1 General Information

## 1.1 How to use the operating instructions

The operating instructions are an integral part of the product and contain important information for operation and service. The operating instructions are written for all employees who assemble, install, startup, and service this product.

The operating instructions must be legible and accessible at all times. Make sure that staff responsible for the plant and its operation, as well as persons who work independently on the unit, have read the operating instructions carefully and understood them. If you are unclear about any of the information in this documentation, or if you require further information, contact SEW-EURODRIVE.

## 1.2 Structure of the safety notes

The safety notes in these operating instructions are designed as follows:

<b>Pictogram</b>  	<b>SIGNAL WORD</b>		
	Type and source of danger. Possible consequence(s) if disregarded. <ul style="list-style-type: none"> <li>• Measure(s) to prevent the danger.</li> </ul>		
Pictogram	Signal word	Meaning	Consequences if disregarded
Example:   General danger	<b>DANGER</b>	Imminent danger	Severe or fatal injuries
 General danger	<b>WARNING</b>	Possible dangerous situation	Severe or fatal injuries
 Specific danger, e.g. electric shock	<b>CAUTION</b>	Possible dangerous situation	Minor injuries
	<b>STOP</b>	Possible damage to property	Damage to the drive system or its environment
	<b>INFORMATION</b>	Useful information or tip. Simplifies the handling of the drive system.	



### **1.3 Right to claim under limited warranty**

A requirement of fault-free operation and fulfillment of any rights to claim under limited warranty is that you adhere to the information in the operating instructions. Therefore, read the operating instructions before you start working with the unit.

Make sure that the operating instructions are available to persons responsible for the plant and its operation, as well as to person who work independently on the unit. You must also ensure that the documentation is legible.

### **1.4 Exclusion of liability**

You must comply with the information contained in these operating instructions to ensure safe operation of the MOVIMOT<sup>®</sup> MM..D inverter and to achieve the specified product characteristics and performance requirements. SEW-EURODRIVE does not assume liability for injury to persons or damage to equipment or property resulting from non-observance of these operating instructions. In such cases, any liability for defects is excluded.

### **1.5 Copyright notice**

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Unauthorized reproduction, copying, distribution or any other use of the whole or any part of this documentation is strictly prohibited.



## 2 Safety Notes

The following basic safety notes must be read carefully to prevent injury to persons and damage to property. The operator must ensure that the basic safety notes are read and observed. Make sure that persons responsible for the plant and its operation, as well as persons who work independently on the unit, have read through the operating instructions carefully and understood them. If you are unclear about any of the information in this documentation, please contact SEW-EURODRIVE.

### 2.1 General information

Never install or start up damaged products. Submit a complaint to the shipping company immediately in the event of damage.

During operation, MOVIMOT® drives can have live, bare and movable or rotating parts as well as hot surfaces, depending on their enclosure.

Removing covers without authorization, improper use as well as incorrect installation or operation may result in severe injuries to persons or damage to property. Refer to the documentation for additional information.

### 2.2 Target group

**Only qualified electricians** are authorized to install, startup or service the units or correct unit faults (observing IEC 60364 or CENELEC HD 384 or DIN VDE 0100 and IEC 60664 or DIN VDE 0110 as well as national accident prevention guidelines).

Qualified electricians in the context of these basic safety notes are persons familiar with installation, assembly, startup and operation of the product who possess the required qualifications.

Any activities regarding transportation, storage, operation, and disposal must be carried out by persons who have been instructed appropriately.

### 2.3 Designated use

MOVIMOT® inverters are components intended for installation in electrical systems or machines.

In case of installation in machines, startup of the MOVIMOT® inverters (i.e. start of designated operation) is prohibited until it is determined that the machine meets the requirements stipulated in the EC Directive 98/37/EC (machine guideline).

Startup (i.e. the start of designated use) is only permitted under observance of the EMC directive 2004/108/EC.

MOVIMOT® inverters comply with the regulations of the Low Voltage Directive 2006/95/EC. The standards given in the declaration of conformity are used for the MOVIMOT® inverter.

You must observe the technical data and information on the connection requirements as provided on the nameplate and in the documentation.

#### 2.3.1 Safety functions

The MOVIMOT® inverter may not perform safety functions unless these functions are described and expressly permitted.



### 2.3.2 Hoist applications

MOVIMOT<sup>®</sup> inverters are suitable for hoist applications to a limited degree only, see sec. "Additional function 9" (see page 62).

MOVIMOT<sup>®</sup> inverters may not be used as a safety device in hoist applications.

## 2.4 Other applicable documentation

Note also the following documentation:

- "DR/DV/DT/DTE/DVE AC Motors, CT/CV Asynchronous Servomotors" operating instructions

## 2.5 Transportation, storage

Observe the notes on transportation, storage and proper handling. Comply with the requirements for climatic conditions stated in section "Technical Data". Tighten installed eyebolts securely. They are designed for the weight of the MOVIMOT<sup>®</sup> drive. Do not attach any additional loads. Use suitable, sufficiently rated handling equipment (e.g. rope guides) if required.

## 2.6 Installation

The units must be installed and cooled according to the regulations and specifications in the corresponding documentation.

Protect the MOVIMOT<sup>®</sup> inverters from improper strain.

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

- Use in potentially explosive atmospheres.
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc.
- Use in non-stationary applications with strong mechanical oscillation and impact loads; see section "Technical Data".





## 2.7 Electrical Connection

Observe the applicable national accident prevention guidelines when working on live MOVIMOT<sup>®</sup> drive inverters (e.g. BGV A3).

Perform electrical installation according to the pertinent regulations (e.g. cable cross sections, fusing, protective conductor connection). For any additional information, refer to the applicable documentation.

You will find notes on EMC-compliant installation, such as shielding, grounding, arrangement of filters and routing of lines, in the documentation of the MOVIMOT<sup>®</sup> inverter. The manufacturer of the system or machine is responsible for maintaining the limits established by EMC legislation.

Protective measures and protection devices must comply with the regulations in force (e.g. EN 60204 or EN 61800-5-1).

A voltage test according to EN 61800-5-1:2007 chapter 5.2.3.2 is required for the MOVIMOT<sup>®</sup> drives prior to startup in order to ensure the insulation.

## 2.8 Safe disconnection

MOVIMOT<sup>®</sup> inverters meet all requirements for safe disconnection of power and electronic connections in accordance with EN 61800-5-1. All connected circuits must also satisfy the requirements for safe disconnection.

## 2.9 Operation

Systems with integrated MOVIMOT<sup>®</sup> inverters must be equipped with additional monitoring and protection devices according to the applicable safety guidelines, such as the law governing technical equipment, accident prevention regulations, etc. Additional protective measures may be necessary for applications with increased potential risk. Changes to the MOVIMOT<sup>®</sup> inverter using the operating software are permitted.

Do not touch live components and power connections immediately after separation of the MOVIMOT<sup>®</sup> inverter from the supply voltage because there may still be some charged capacitors. Wait at least for 1 minute after having switched off the supply voltage.

As soon as supply voltages are present at the MOVIMOT<sup>®</sup> inverter, the terminal box must be closed (i.e. the MOVIMOT<sup>®</sup> inverter must be bolted on).

The fact that the status LED and other display elements are no longer illuminated does not indicate that the unit has been disconnected from the supply system and no longer carries any voltage.

Mechanical blocking or internal safety functions of the unit 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 driven machine, disconnect the unit from the supply system before correcting the error.

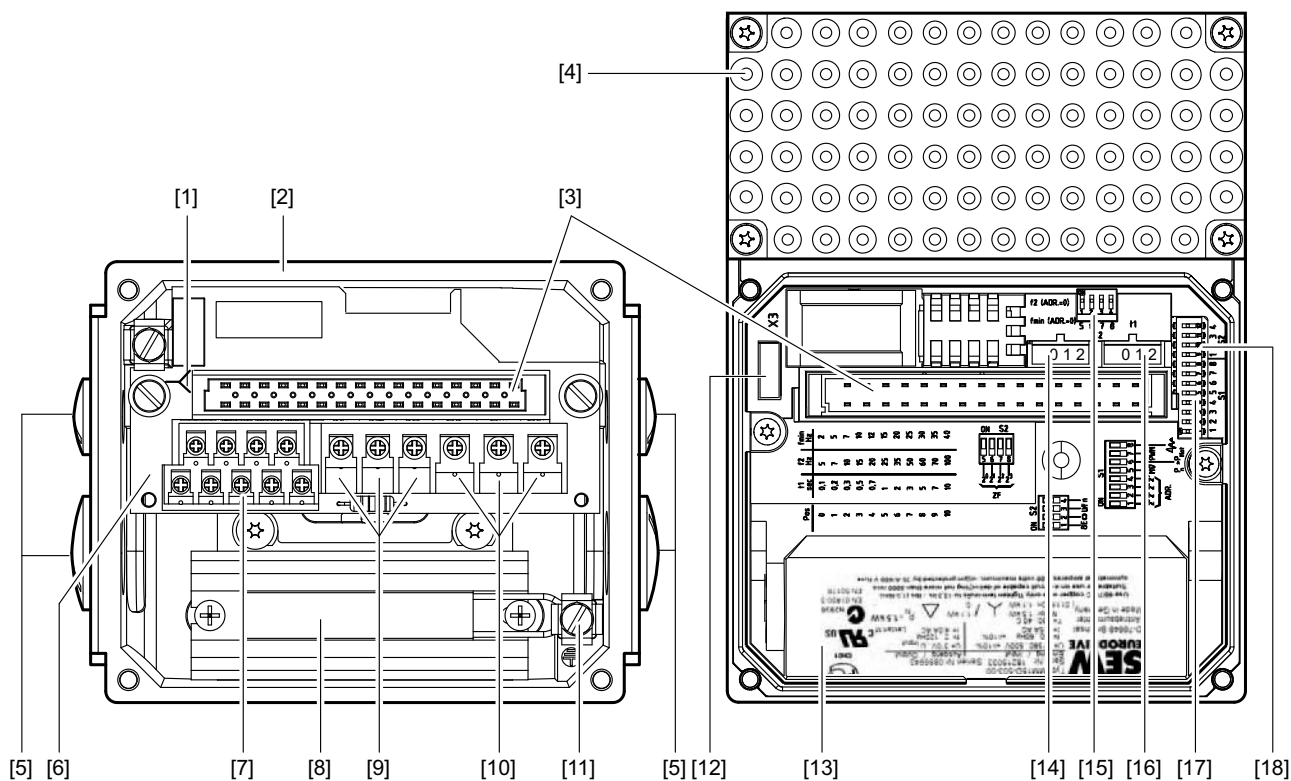
Caution: Danger of burns: The surface temperature of the MOVIMOT<sup>®</sup> drive and of external options, e.g. the heat sink of the braking resistor, can exceed 60 °C during operation!



## 3 Unit Structure

### 3.1 MOVIMOT<sup>®</sup> inverter

The following figure shows the terminal box and the bottom of the MOVIMOT<sup>®</sup> inverter:

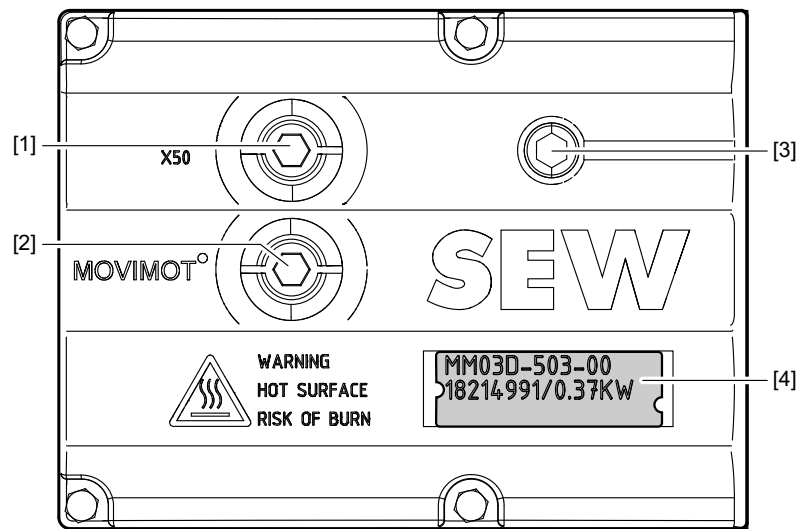


1995798923

- [1] Connection type identification
- [2] Connection box
- [3] Plug connector connection unit for MOVIMOT<sup>®</sup> inverter
- [4] MOVIMOT<sup>®</sup> inverter with heat sink
- [5] Cable glands
- [6] Connection unit with terminals
- [7] X2: Electronics terminal strip
- [8] Internal braking resistor BW (standard for motors without brake)
- [9] Connection for brake coil (motors with brake) or braking resistor (motors without brake)
- [10] Mains connection L1, L2, L3
- [11] Screw for PE connection ⊥
- [12] Slot for Drive-ID module  
It is not permitted to plug in Drive-ID modules for DR motor types into MOVIMOT<sup>®</sup> with DT/DV motors.
- [13] 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] Unit identification



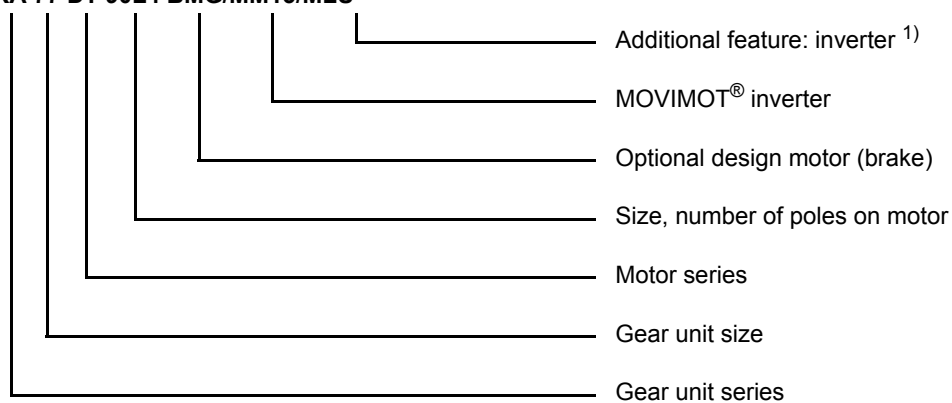
### 3.2 Unit designations

#### 3.2.1 Sample motor nameplate

<b>SEW -EURODRIVE</b>		Bruchsal / Germany		
Typ	KA77 DT90L4/BMG/MM15/MLU	3~	IEC 34	
Nr.	3009818304.0001.99	IM	B3	
KW	1,5 / 50 HZ	cos	0,99	
○50Hz	V 380-500	A	3,50	○
60Hz	V 380-500	A	3,50	
r/min	22/1400	IP	54 KI	F
Bremse	V 230	Nm 20	Gleichrichter	
kg 73	Ma 665	Nm	i 64,75 :1	
Schmierstoff		Made in Germany 184103 3.14		

1996182283

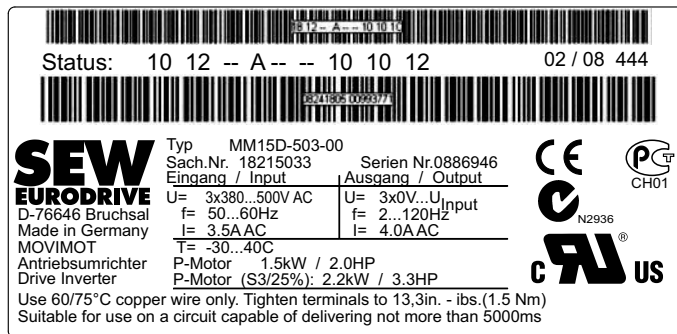
#### KA 77 DT 90L4 BMG/MM15/MLU



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

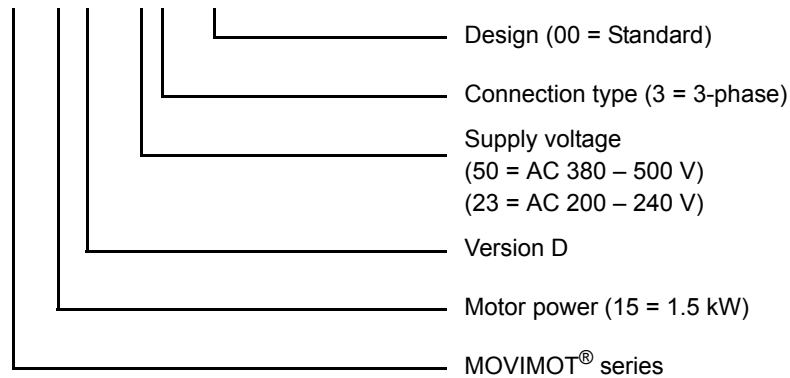


### 3.2.2 Sample inverter nameplate



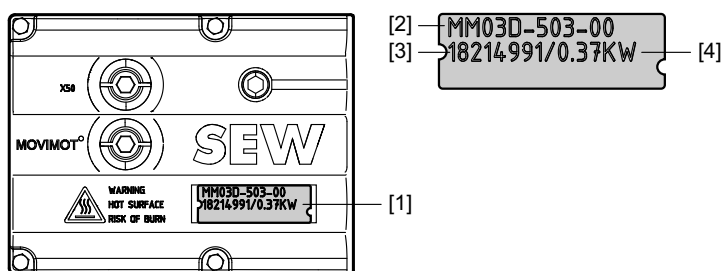
1957927307

#### MM 15 D – 503 – 00



### 3.2.3 Unit identification

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

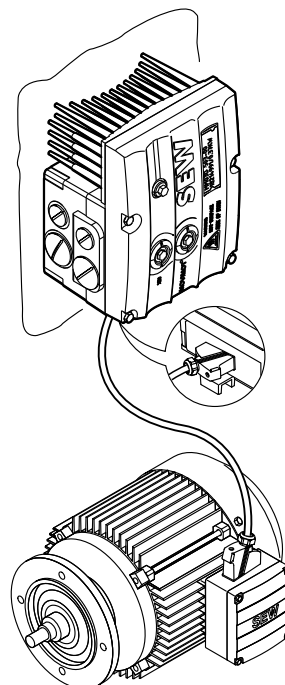


457916555



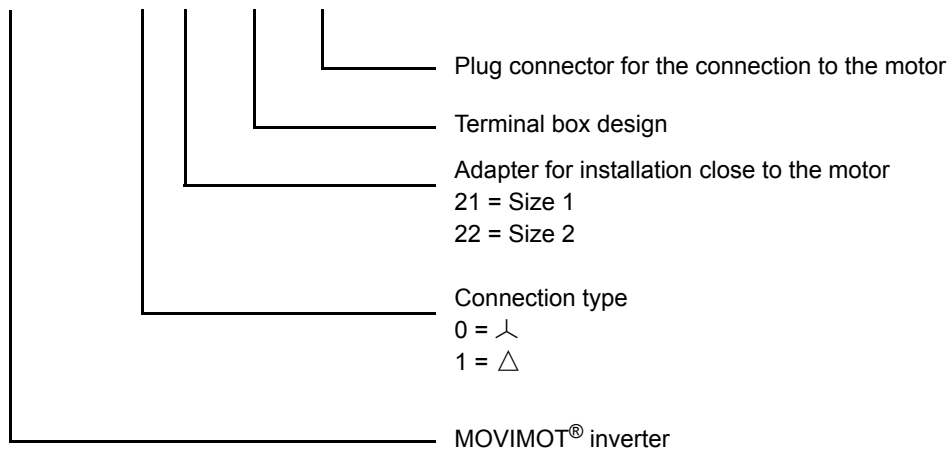
**3.2.4 "Mounting close to the motor" design**

The following illustration shows an example of the MOVIMOT® inverter mounted close to the motor with corresponding nameplate and unit designation:



457921547

**MM15D-503-00/0/P21A/RO1A/APG4**





## 4 Mechanical Installation

### 4.1 MOVIMOT® gearmotor

#### 4.1.1 Before you start

Only install the MOVIMOT® drive if:

- The entries on the nameplate of the drive match the voltage supply system.
- the drive is undamaged (no damage caused by transportation or storage).
- you are certain that the following requirements have been fulfilled:
  - Ambient temperature corresponds to the specifications in section "Technical Data". Note that the temperature range of the gear unit may also be restricted (see gear unit operating instructions).
  - No oil, acid, gas, vapors, radiation, etc.

#### Installation tolerances

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


shaft end	Flanges
Diameter tolerance according to EN 50347 <ul style="list-style-type: none"> <li>• ISO j6 with <math>\varnothing \leq 26</math> mm</li> <li>• ISO k6 with <math>\varnothing \leq 38</math> mm up to <math>\leq 48</math> mm</li> <li>• ISO m6 at <math>\varnothing &gt; 55</math> mm</li> <li>• Center bore in accordance with DIN 332, shape DR..</li> </ul>	Centering shoulder tolerance in accordance with EN 50347 <ul style="list-style-type: none"> <li>• ISO j6 with <math>\varnothing \leq 250</math> mm</li> <li>• ISO h6 with <math>\varnothing &gt; 300</math> mm</li> </ul>



#### 4.1.2 Installing MOVIMOT®

Observe the following notes for mounting the MOVIMOT® drive:

- Install/mount the MOVIMOT® drive only in the mounting position specified on the motor nameplate on a level, vibration-free, and torsionally rigid support structure.
- Clean the output shafts thoroughly to ensure they are free of anti-corrosion agents (use a commercially available solvent). Do not allow the solvent to penetrate the bearings and shaft seals – this could damage the material.
- Carefully align the MOVIMOT® inverter and the motor, to avoid placing any unacceptable strain on the motor shafts (observe permissible overhung load and axial load data!).
- Do not butt or hammer the shaft end.
- Use an appropriate cover to prevent objects or fluids from entering motors in vertical mounting positions.
- Ensure there is sufficient clearance around the unit to allow for adequate cooling. Furthermore, the unit must be positioned in such a way that it does not reuse the air warmed by other devices.
- Balance components for subsequent mounting on the shaft with a half key (output shafts are balanced with a half key).
- Existing condensation drain holes must be sealed with plastic plugs. They must not be opened unless needed.
- Open condensation drain holes are not permitted. If condensation drain holes are open, higher enclosures are no longer possible.

	<b>STOP</b>
	<p>The degree of protection specified in the technical data only applies if the MOVIMOT® inverter is properly installed.</p> <p>When the MOVIMOT® inverter is removed from the connection box, it might be damaged by humidity or dust.</p> <ul style="list-style-type: none"> <li>• Protect the MOVIMOT® inverter when it is removed from the connection box.</li> </ul>

#### 4.1.3 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 supply leads (use reducing adapters if necessary).
- Coat the threads of cable glands and filler plugs with sealing compound and tighten them well; then coat them again.
- Seal the cable entries well.
- Clean the sealing faces of the MOVIMOT® inverter well before re-assembly.
- If the corrosion protection coating is damaged, restore the coating.
- Check enclosure according to nameplate.





## 4.2 MLU11A / MLU21A / MLG..A option

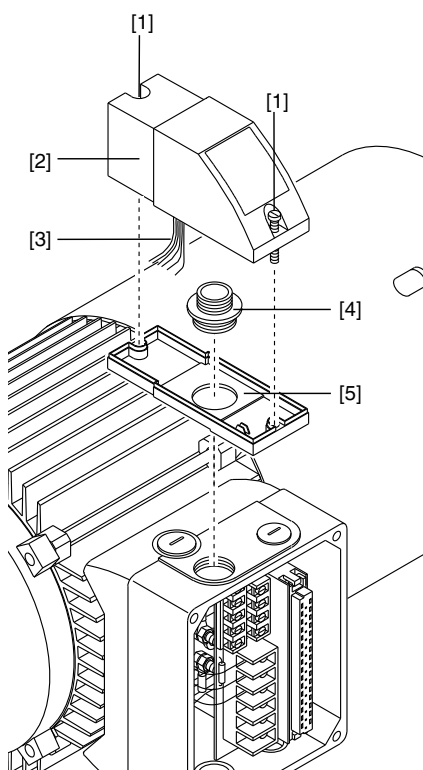
### 4.2.1 Scope of delivery

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

### 4.2.2 Assembly

1. Remove a screw plug on the MOVIMOT® terminal box.
2. Fix the lower part [5] on the MOVIMOT® terminal box and fasten it with a transit bolt [4] (tightening torque 2.5 Nm / 22 lb.in).
3. Route the connection cable [3] through the transit bolt [4] into the inside of the MOVIMOT® terminal box.
4. Fit the upper part [2] onto the lower part [5] and fasten it with two screws [1] (tightening torque 0.9 – 1.1 Nm / 8 – 10 lb.in).

	<b>STOP</b>
	Install the option only in the position shown in the following figure!



1996319371

For more information about connecting the MLU11A/MLU21A option, refer to sec. "Connection of option MLU11A/MLU21A" (see page 36).

For more information about connecting the MLG..A option, refer to sec. "Connection of option MLG..A" (see page 37).



#### 4.3 MLU13A option

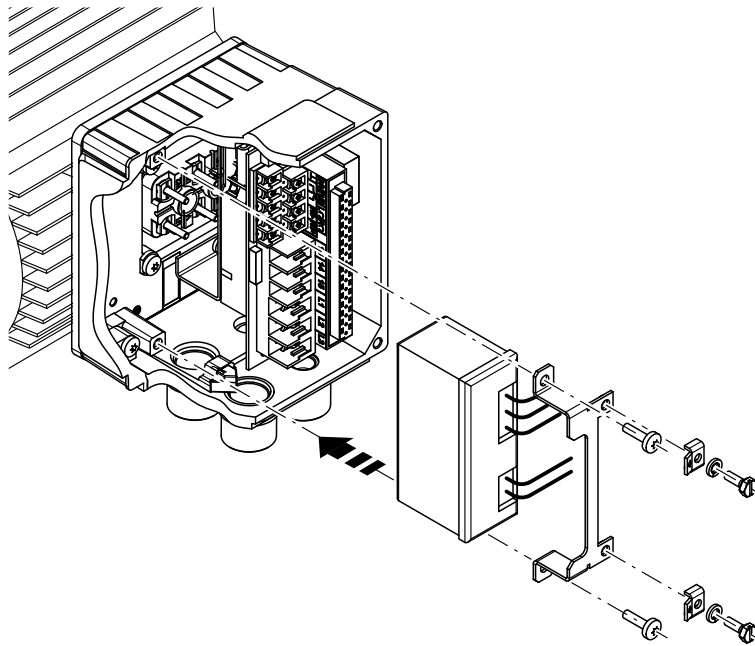
Option MLU13A is generally installed in the modular terminal box at the factory. If you have any questions about retrofitting the option, do not hesitate to contact the SEW-EURODRIVE service.



#### STOP

Only install this option in combination with the modular terminal box of MOVIMOT® MM03D-503-00 – MM40D-503-00.

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



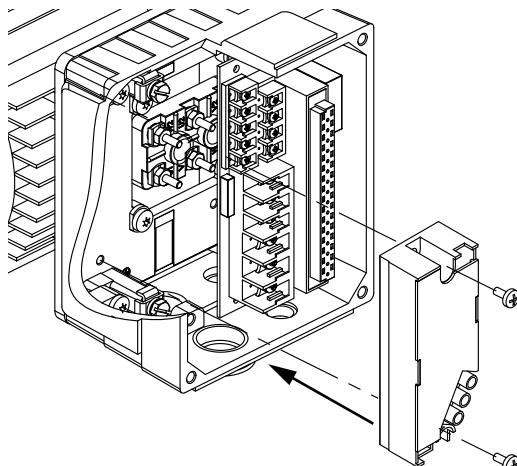
626311051

For more information about connecting the MLU13A option, refer to section "Connection of option MLU13A" (see page 36).



#### 4.4 URM/BGM option

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



1999901067

For more information about connecting the URM option, refer to section "Connection of option URM" (see page 38).

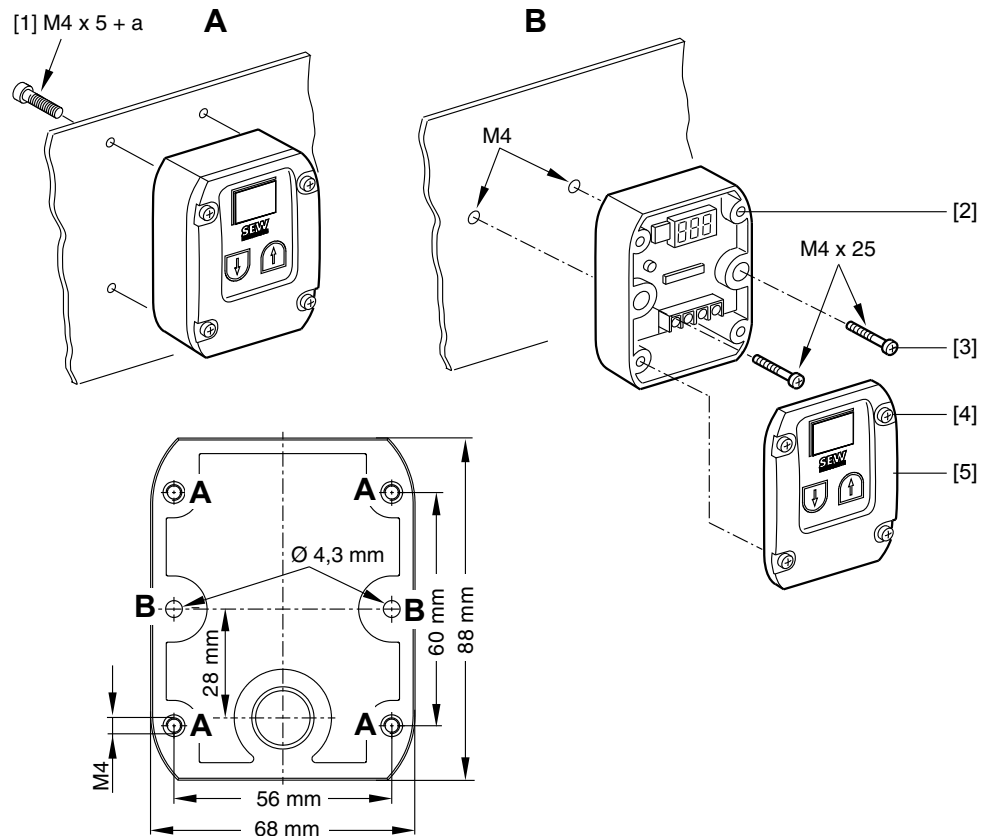
For more information about connecting the BGM option, refer to section "Connection of option BGM" (see page 39).



#### 4.5 Installation MBG11A

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

- **A:** Mounting from the rear using 4 tapped holes.  
(Tightening torque for retaining screw [1] 1.6 – 2.0 Nm / 14 – 18 lb.in)
- **B:** Mounting from the front using 2 retaining holes  
(Tightening torque for retaining screw [3] 1.6 – 2.0 Nm / 14 – 18 lb.in)



322404747

a = Wall thickness

Screws are not included in the scope of delivery!

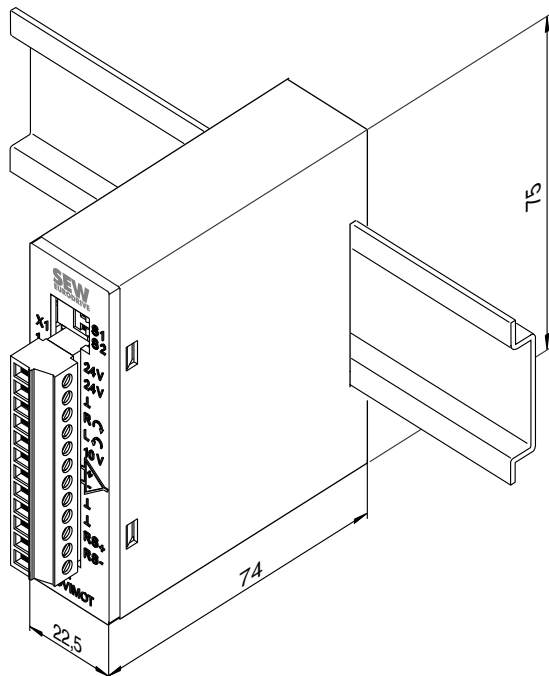
Fit the upper part [5] onto the lower part [2] and fasten it with two screws [4] (tightening torque 0.3 Nm / 2.6 lb.in).

For more information about connecting the MBG11A option, refer to sec. "Connection of option MBG11A" (see page 40).



#### 4.6 MWA21A option

Install option MWA21A in the control cabinet on a mounting rail (EN 50022):



322411915

For more information about connecting the MWA21A option, refer to sec. "Connection of option MWA21A" (see page 41).

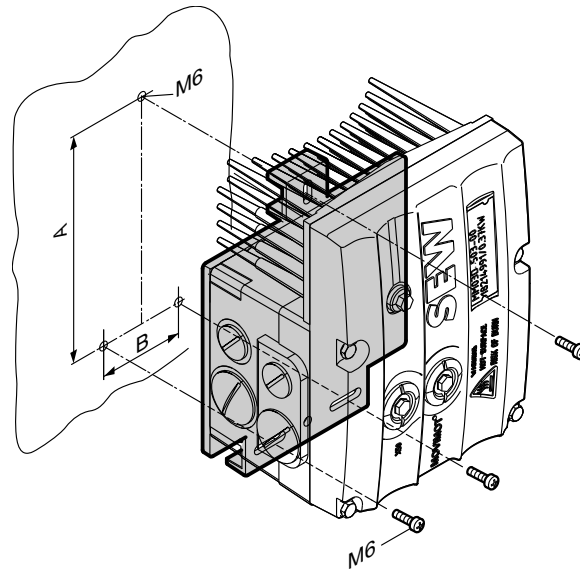


## Mechanical Installation

Installing the MOVIMOT<sup>®</sup> inverter close to the motor

### 4.7 Installing the MOVIMOT<sup>®</sup> inverter close to the motor

The following figure shows the mounting dimensions for installing the MOVIMOT<sup>®</sup> inverter close to the motor:



458277771

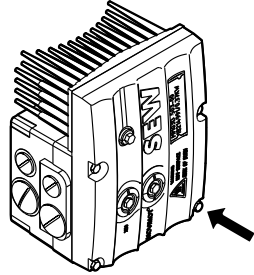
	A	B
MM03D503-00 – MM15D-503-00 MM03D233-00 – MM07D-233-00	140 mm	65 mm
MM22D503-00 – MM40D-503-00 MM11D233-00 – MM22D-233-00	170 mm	65 mm



## 4.8 Tightening torques

### 4.8.1 MOVIMOT® inverter

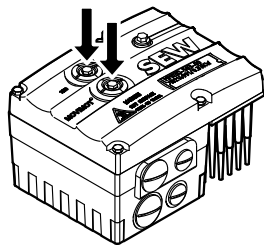
Tighten the screws on the MOVIMOT® inverter using 3.0 Nm (27 lb.in) working diagonally across.



458577931

### 4.8.2 Screw plugs

Tighten screw plugs of potentiometer f1 and connection X50 using 2.5 Nm (22 lb.in).



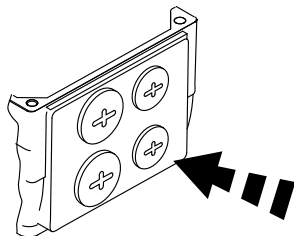
458570379

### 4.8.3 Cable glands

It is essential to observe the manufacturer's specifications for the cable glands.

### 4.8.4 Screw plugs for cable entries

Tighten screw plugs with 2.5 Nm (22 lb.in).



32277611

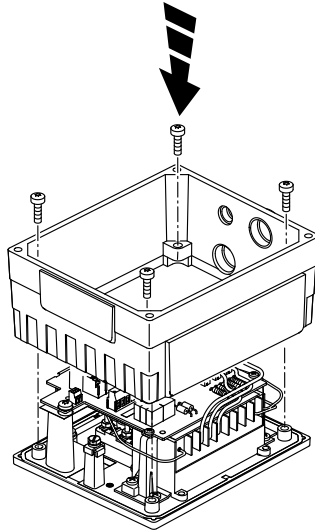


## Mechanical Installation

### Tightening torques

#### 4.8.5 Modular terminal box

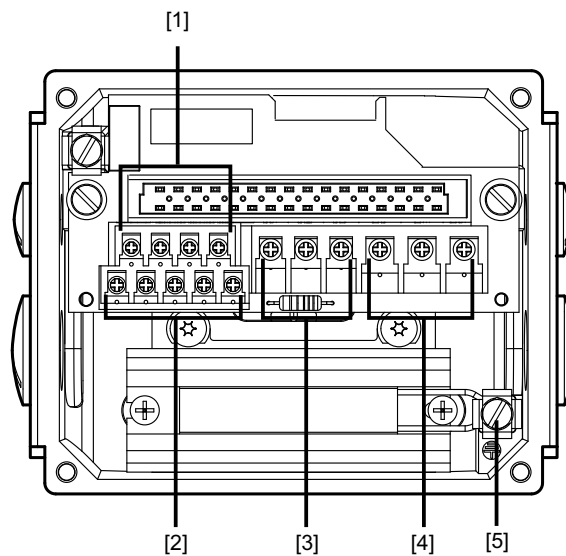
For fastening the terminal box on the mounting plate, tighten screws using 3.3 Nm (29 lb.in).



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#### 4.8.6 Tightening torques for terminals

Use the following tightening torques for terminals during installation:



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- [1] 0.5 – 0.7 Nm (4 – 6 lb.in)
- [2] 0.5 – 0.7 Nm (4 – 6 lb.in)
- [3] 0.8 – 1.5 Nm (7 – 10 lb.in)
- [4] 1.2 – 1.6 Nm (11 – 14 lb.in)
- [5] 2.0 – 2.4 Nm (18 – 21 lb.in)

#### 4.8.7 URM/BGM option

For installing options URM and BGM in the terminal box, tighten screws using 2.0 (18 lb.in).





## 5 Electrical Installation

### 5.1 Installation instructions

#### 5.1.1 Connecting supply system leads

- The rated voltage and frequency of the MOVIMOT<sup>®</sup> inverter must correspond to the data for the power supply system.
- Cable cross section: according to input current  $I_{\text{mains}}$  for rated power (see section "Technical Data").
- Permitted cable cross section of MOVIMOT<sup>®</sup> terminals (does not apply to field distributors):

Power terminals
1.0 mm <sup>2</sup> - 4.0 mm <sup>2</sup> (2 x 4.0 mm <sup>2</sup> )
AWG17 – AWG10 (2 x AWG10)

Control terminals			
Single-wire conductor (bare wire)	Flexible conductor (bare litz wire)	Conductor with Conductor end sleeve without insulating shrouds	Conductor with Conductor end sleeve with insulating shrouds
0.5 mm <sup>2</sup> – 1.0 mm <sup>2</sup>			0.5 mm <sup>2</sup> – 0.75 mm <sup>2</sup>
AWG20 – AWG17			AWG20 – AWG19
Only connect single-wire conductors or flexible conductors with or without conductor end sleeve (DIN 46228 part 1, material E-CU)			

- Permitted length of the conductor end sleeve: At least 8 mm
- Use conductor end sleeves without insulating shrouds (DIN 46228 part 1, material E-CU).
- Install line fuses at the beginning of the power supply cable behind supply bus junction (see the section "Connection of MOVIMOT<sup>®</sup> basic unit"). Use only D, D0 or NH melting fuses or circuit breakers for F11/F12/F13. Select the fuse size according to the cable cross section.
- SEW recommends using earth-leakage monitors with pulse code measuring in voltage supply systems with a non-earthed star point (IT systems). Using such devices prevents the earth-leakage monitor mis-tripping due to the ground capacitance of the inverter.



#### 5.1.2 Earth-leakage circuit breakers

- Do not use a conventional earth-leakage circuit breaker as a protective device. Universal current-sensitive earth leakage circuit-breakers (tripping current 300 mA) are permitted as a protective device. During normal operation of MOVIMOT<sup>®</sup> inverter, earth-leakage currents of > 3.5 mA can occur.
- SEW-EURODRIVE recommends that you do not use earth-leakage circuit breakers. However, if an earth-leakage circuit breaker is stipulated for direct or indirect protection against contact, observe the following note in accordance with EN 61800-5-1:

	<b>⚠ WARNING</b>
	<p>Wrong type of earth-leakage circuit breaker installed.</p> <p>Severe or fatal injuries.</p> <p>MOVIMOT<sup>®</sup> can cause direct current in the protective earth. In cases where an earth-leakage circuit breaker is used for protection against direct or indirect contact, only install a type B earth-leakage circuit breaker on the power supply end of the MOVIMOT<sup>®</sup> inverter.</p>

#### 5.1.3 Input contactor

- Only use a contactor of utilization category AC3 (EN 60947-4-1) as an input contactor.

	<b>STOP</b>
	<ul style="list-style-type: none"> <li>• Do not use the K11 input contactor (see wiring diagram (see page 30)) for jog mode, but only for switching the inverter on and off. For jog mode, use the the commands "CW / Stop" or "CCW / Stop".</li> <li>• Observe a minimum switch-off time of 2 s for the supply system contactor K11.</li> </ul>



5.1.4 Notes on PE connection

	<b>DANGER</b>
	<p>Incorrect connection of PE.</p> <p>Death, severe injuries or damage to property from electric shock.</p> <ul style="list-style-type: none"> <li>• The permitted tightening torque for the screw fitting is 2.0 - 2.4 Nm (18 - 21 lb.in).</li> <li>• Observe the following notes regarding PE connection.</li> </ul>

Prohibited assembly sequence	Recommendation: Assembly with forked cable lug Permitted for all cross sections	Assembly with thick solid wire Permitted for cross sections up to max. 2.5 mm <sup>2</sup>
<p>323042443</p>	<p>323034251</p>	<p>323038347</p>

[1] Forked cable lug suitable for M5 PE screws

Earth-leakage currents  $\geq 3.5$  mA may occur during normal operation. To meet the requirements of EN 61800-5-1 observe the following note:

- Route a second PE conductor with the cross section of the supply system lead in parallel to the protective earth via separate terminals or use a copper protective earth conductor with a cross section of 10 mm<sup>2</sup>.



#### 5.1.5 EMC-compliant installation

	<b>⚠ WARNING</b>
	<p>This drive system is not designed for operation on a public low voltage supply system that supplies residential areas.</p>

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.

	<b>INFORMATION</b>
	<ul style="list-style-type: none"> <li>• This is a product with restricted availability in accordance with IEC 61800-3. It may cause EMC interference. In this case, it may be recommended for the operator to carry out suitable measures.</li> <li>• For detailed information on EMC compliant installation, refer to the publication "Electromagnetic Compatibility in Drive Engineering" from SEW-EURODRIVE.</li> </ul>

#### 5.1.6 Installation altitude above 1000 m above sea level

MOVIMOT<sup>®</sup> drives with supply voltages of 200 to 240 V or 380 to 500 V can be used at altitudes above 1,000 msl up to 4,000 msl under the following conditions<sup>1)</sup>.

- The rated continuous power is reduced based on the reduced cooling above 1000 m (see section "Technical Data").
- Above 2,000 msl, the air and creeping distances are only sufficient for overvoltage class 2. If the installation calls for overvoltage class 3, you will have to install additional external overvoltage protection to limit overvoltage peaks to 2.5 kV phase-to-phase and phase-to-ground.
- If safe electrical disconnection is required, it must be implemented outside the device at altitudes of 2,000 msl (safe electrical disconnection in accordance with EN 61800-5-1).
- In installation altitudes between 2,000 m to 4,000 msl, the permitted rated power supply voltages are reduced as follows:
  - By 6 V per 100 m for MM..D-503-00
  - By 3 V per 100 m for MM..D-233-00

#### 5.1.7 Connecting 24 V supply

- Power the MOVIMOT<sup>®</sup> inverter either via an external 24 V supply or the MLU..A or MLG..A options.

#### 5.1.8 Binary control

- Connect the required control leads.
- Use shielded cables as control cables and route them separately from supply system cables.


1) The maximum altitude is limited by creeping distances and flameproof components such as electrolytic capacitors.



### 5.1.9 Control via RS-485 interface

The MOVIMOT<sup>®</sup> drive is controlled via the RS-485 interface by one of the following controllers:

- MOVIFIT<sup>®</sup>-MC
- Fieldbus interfaces MF../MQ..
- PLC bus master
- MLG..A option
- MBG11A option
- MWA21A option

	<b>INFORMATION</b>
	Only ever connect one bus master.


- Use twisted pair shielded cables as control leads and route them separately from supply system leads.

### 5.1.10 Protection devices

- MOVIMOT<sup>®</sup> drives are equipped with integrated protection devices against overload. External overload devices are not necessary.

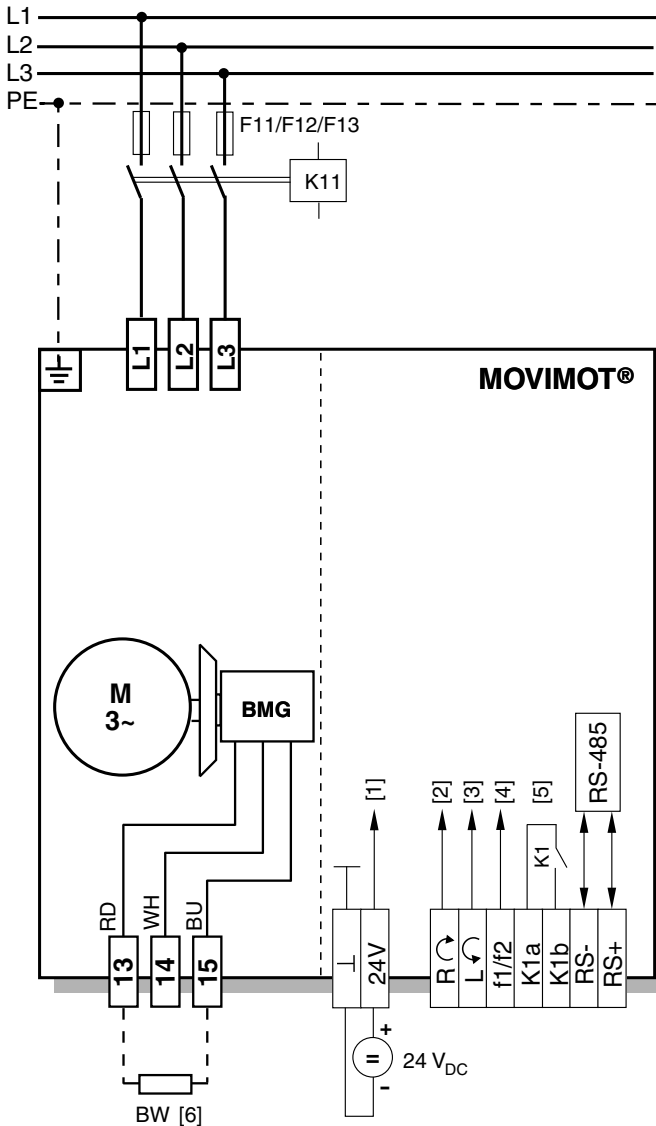
### 5.1.11 UL-compliant installation

- Use only copper cables for temperature range 60/75 °C as connection lead.
- The permitted tightening torques for MOVIMOT<sup>®</sup> power terminals are: 1.5 Nm (13 lb.in).
- The permitted supply system voltage is 500 V (400/500 V inverter) or 240 V (230 V inverter). Information about the max. permitted short-circuit currents of the supply system and the fuse is listed on the nameplate of the MOVIMOT<sup>®</sup> inverter.

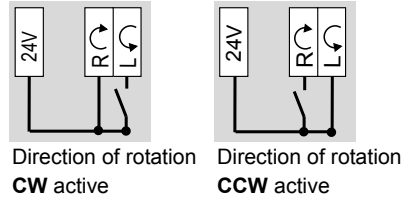
	<b>INFORMATION</b>
	<ul style="list-style-type: none"> <li>• Only use certified units with a limited output voltage (<math>U_{max} = DC\ 30\ V</math>) and limited power (<math>P \leq 100\ VA</math>) as an external DC 24 V voltage source.</li> <li>• The UL certification only applies for the operation on voltage supply systems with voltages to ground of max. 300 V. The UL-certification does not apply for the operation on voltage supply systems with a non-grounded star point (IT systems).</li> </ul>



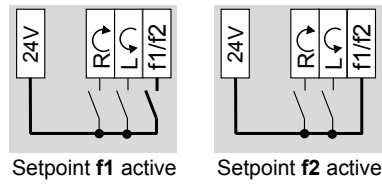
**5.2 Connection of MOVIMOT®**



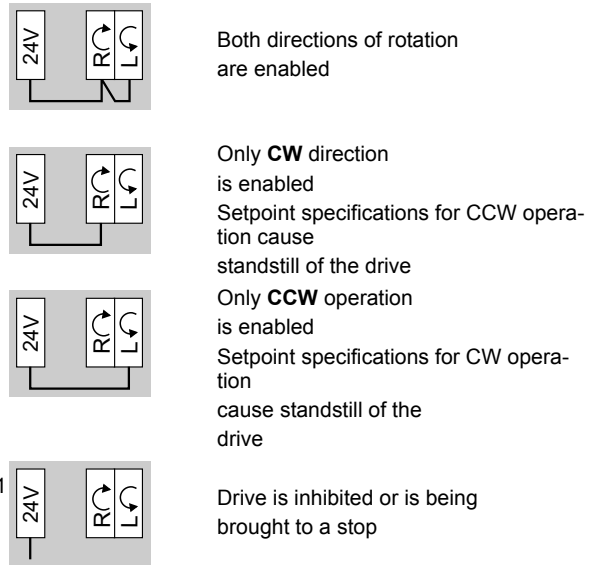
**Functions of the CW / Stop and CCW / Stop terminals for binary control:**



**Functions of terminals f1/f2:**



**Functions of the CW / Stop and CCW / Stop terminals for control via RS-485 interface / fieldbus:**



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- [1] DC 24 V supply (external or MLU..A/MLG..A options)
- [2] CW / stop
- [3] CCW / stop
- [4] Setpoint changeover f1/f2
- [5] Ready signal (contact closed = ready for operation)
- [6] BW.. braking resistor  
(only for MOVIMOT® drives without mechanical brake)



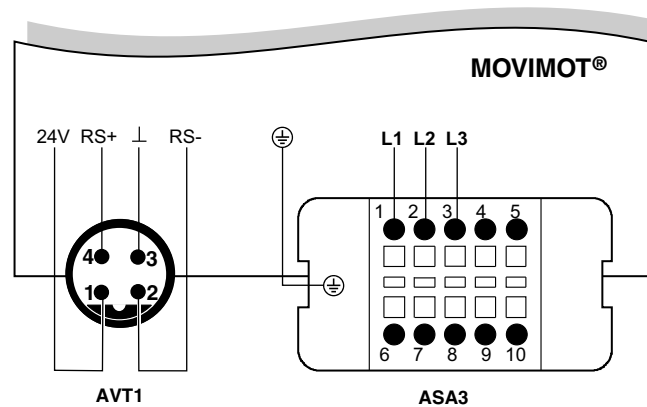
### 5.3 MOVIMOT® plug connectors

#### 5.3.1 Plug connectors AVT1, ASA3

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

**Available versions:**

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



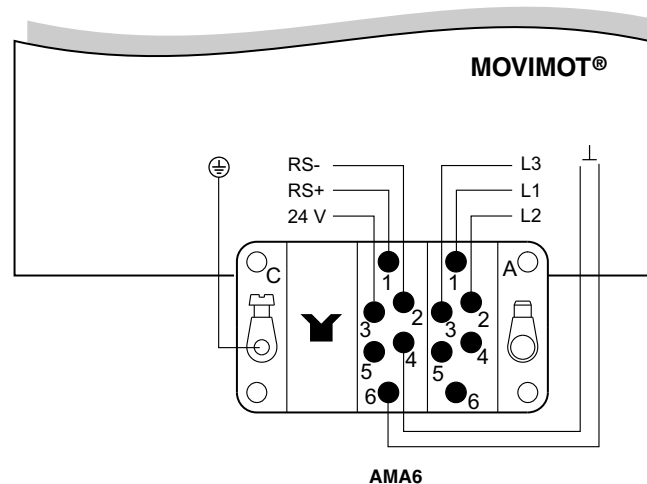
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#### 5.3.2 AMA6 plug connector

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

**Possible design:**

- MM.../AMA6



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	<p><b>INFORMATION</b></p> <p>For designs with plug connectors, both directions of rotation are enabled as standard. If only one direction of rotation is required, please observe sec. "Connection of MOVIMOT® basic unit, functions of the terminals CW / Stop, CCW / Stop for connection via RS-485 interface".</p>
--	---



#### 5.4 MOVIMOT®/motor connection – Mounting 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 cable (hybrid cable).

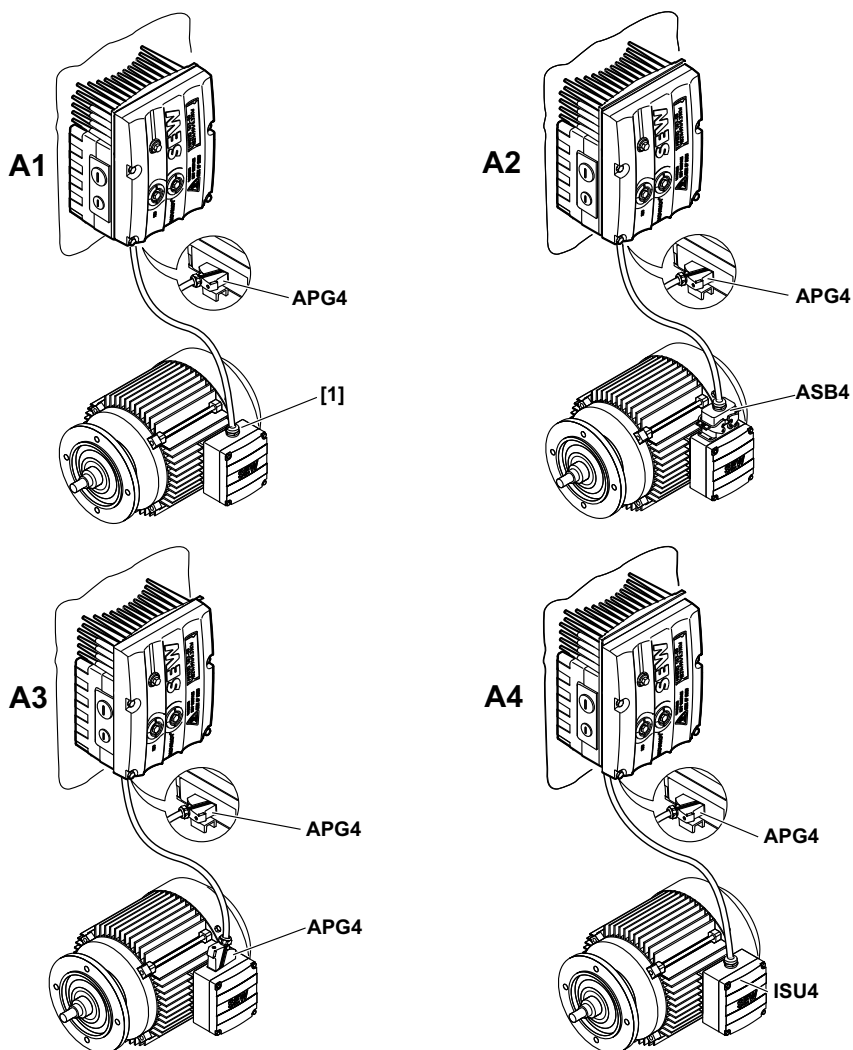
Use only hybrid cables from SEW-EURODRIVE to connect the MOVIMOT® inverter with the motor.

The following designs are possible on the MOVIMOT® side:

- A: MM../P2.A/RO.A/**APG4**
- B: MM../P2.A/RE.A/**ALA4**

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

Variant	A1	A2	A3	A4
MOVIMOT®	APG4	APG4	APG4	APG4
Motor	Cable gland/terminals	ASB4	APG4	IS
Hybrid cables See chapter "Overview of MOVIMOT®-motor connection" (see page 34)	0 186 742 3	0 593 076 6	0 186 741 5	0 816 325 1 △ 0 816 326 X △ 0 593 278 5 人 0 593 755 8 人



[1] Connection via terminals

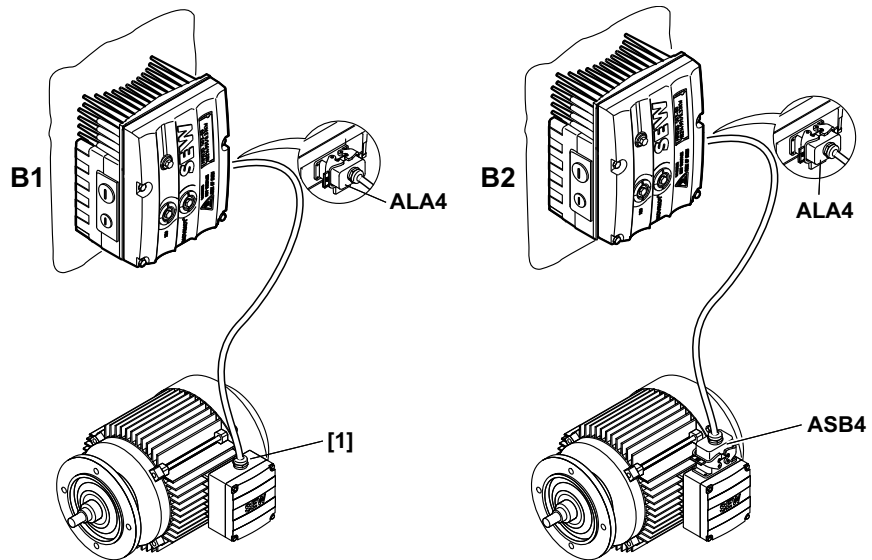
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The APG4 design results in the following connection options to the motor, dependent upon the hybrid cable used:

Variant	B1	B2
MOVIMOT®	ALA4	ALA4
Motor	Cable gland/terminals	ASB4
Hybrid cables	0 817 948 4	0 816 208 5

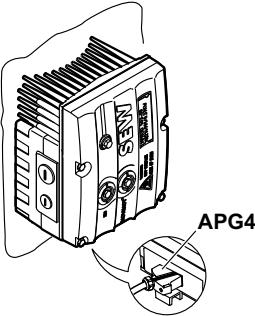
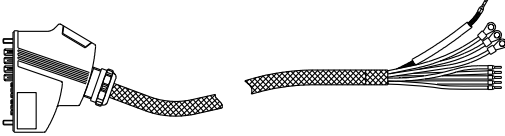
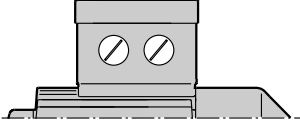
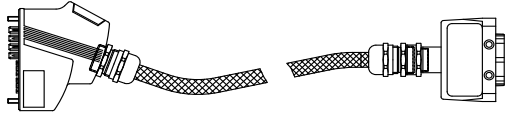
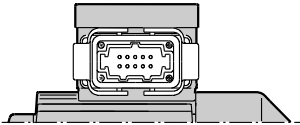
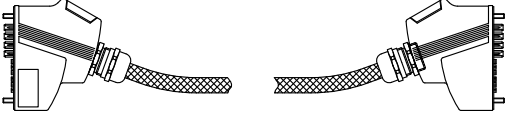
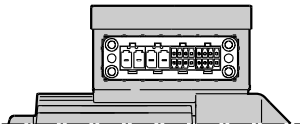
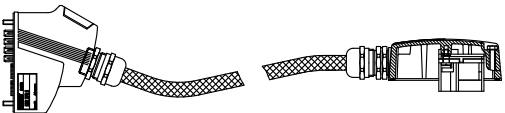
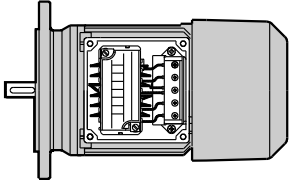
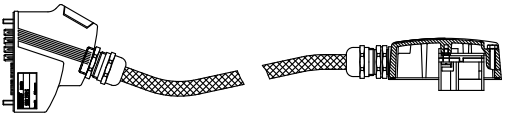
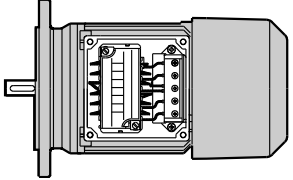
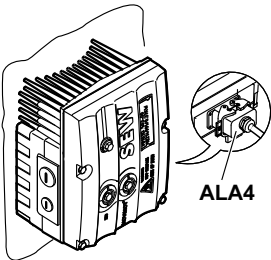
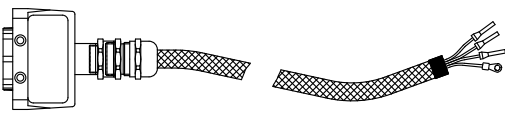
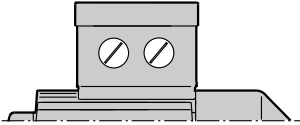
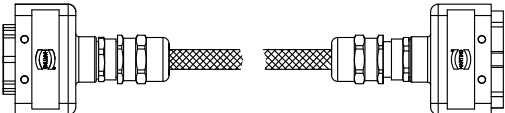
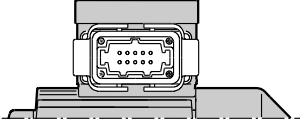


[1] Connection via terminals

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## 5.4.1 Overview of connections between MOVIMOT® and motor when mounted close to the motor

MOVIMOT® inverter	Version	Hybrid cables	Drive
 <p>MM../P2.A/RO.A/PG4</p>	A1	Part number: 0 186 742 3 	AC motors with cable gland 
	A2	Part number: 0 593 076 6 	AC motors with ASB4 plug connector 
	A3	Part number: 0 186 741 5 	AC motors with APG4 plug connector 
	A4	Part number: 0 593 278 5 (S, S, S, S, S) Part number: 0 816 325 1 (Δ) 	AC motors with plug connector ISU4 Size DT71 – DT90 
	A4	Part number: 0 593 755 8 (S, S, S, S, S) Part number: 0 816 326 X (Δ) 	AC motors with plug connector ISU4 Size DV100 
 <p>MM../P2.A/RE.A/ALA4</p>	B1	Part number: 0 817 948 4 	AC motors with cable gland 
	B2	Part number: 0 816 208 5 	AC motors with ASB4 plug connector 

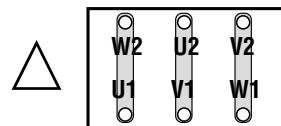
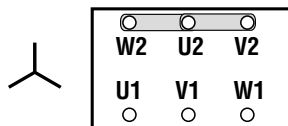
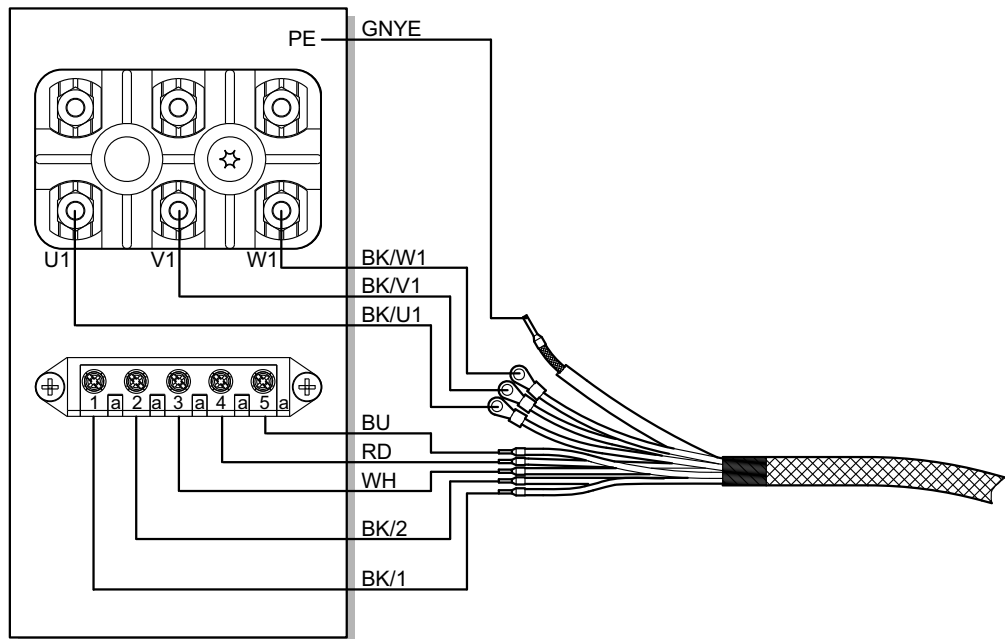


5.4.2 Hybrid cable connection

The following tables shows the conductor assignment in hybrid cables with part no. 0 186 742 3 and 0 817 948 4 and the corresponding motor terminals of the DT/DV motor:

Motor terminal of DT/DV motors	Wire color/hybrid cable designation
U1	Black/U1
V1	Black/V1
W1	Black/W1
4a	Red/13
3a	White/14
5a	Blue/15
1a	Black/1
2a	Black/2
PE connection	Green/yellow + shield end (internal shield)

The following figure shows the connection of the hybrid cable to the terminal box of the DT/DV motor.



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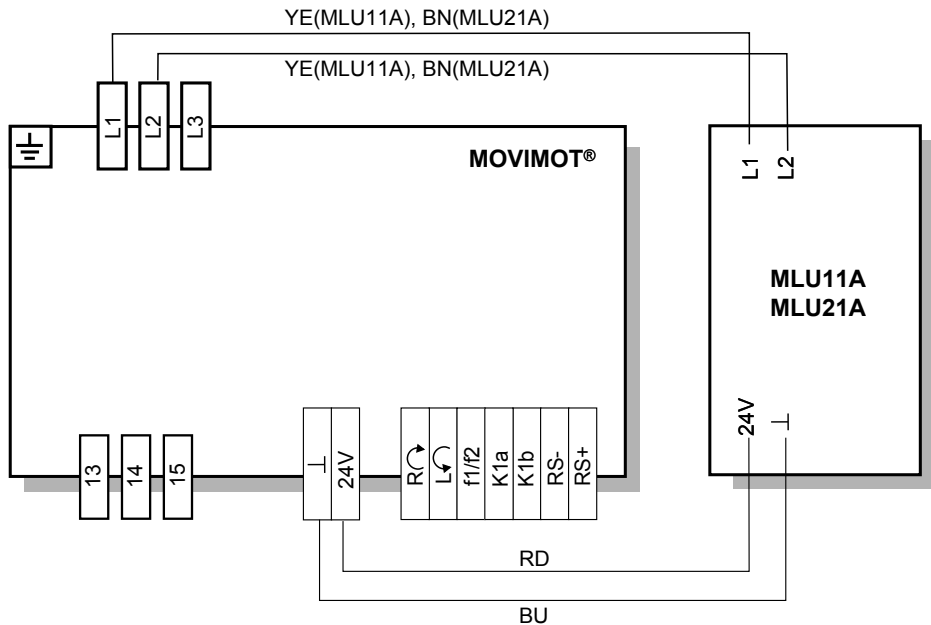


**5.5 Connecting the MOVIMOT® options**

**5.5.1 Connecting the MLU11A/MLU21A option**

For more information about connecting the MLU11A and MLU21A options, refer to sec. "Connection of option MLU11A/MLU21A/MLG..A" (see page 17).

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

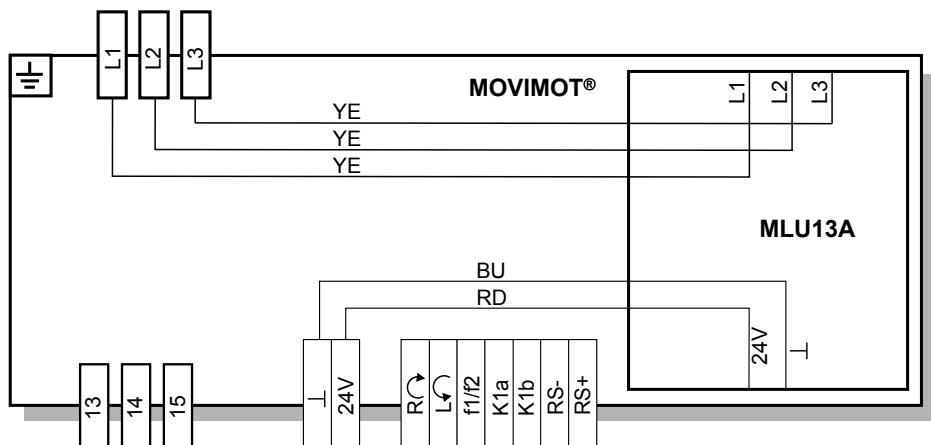


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**5.5.2 Connection of MLU13A option**

For more information about mounting the MLU13A option, refer to section "MLU13A option" (see page 18).

The following figure shows how to connect the MLU13A option:



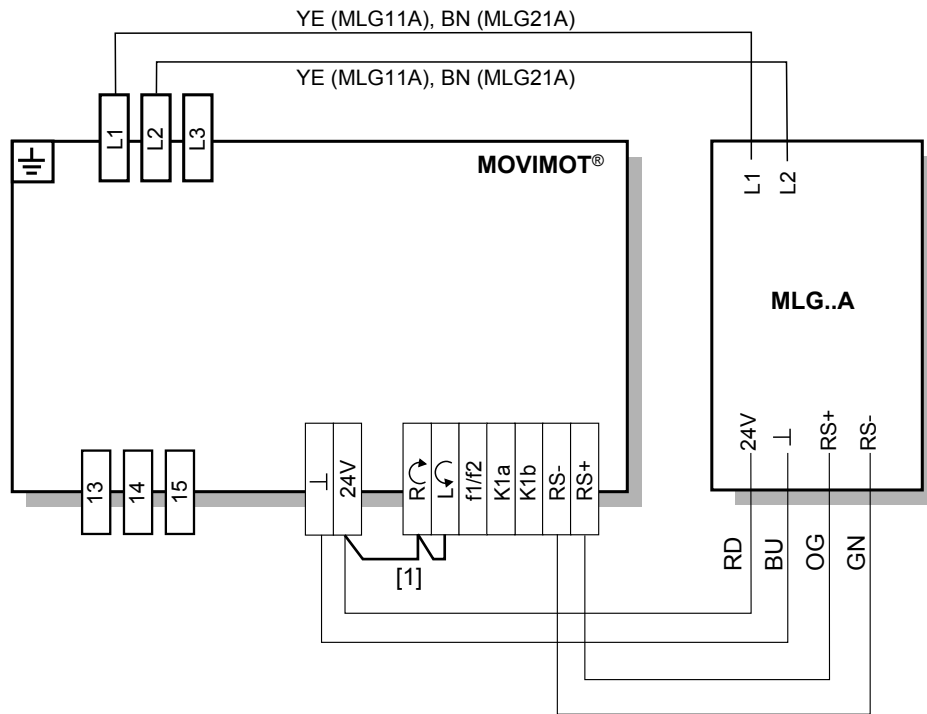
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### 5.5.3 Connection of option MLG..A

For more information about mounting the MLG..A option, refer to sec. "MLU11A/MLU21A/MLG..A option" (see page 17).

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



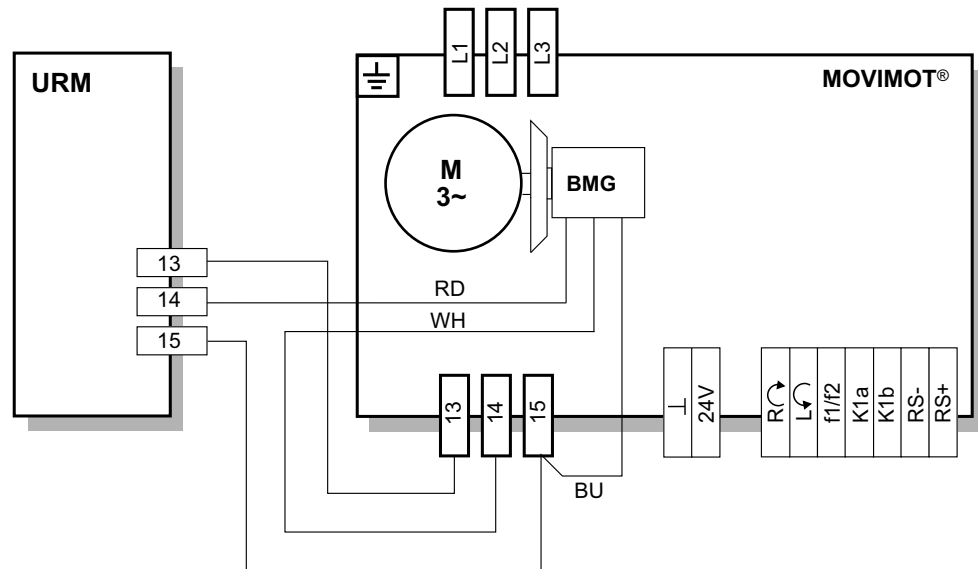
2001083915

- [1] Note the enabled direction of rotation.  
See sec. "Connection of MOVIMOT® basic unit" (see page 30),  
Functions of the CW/Stop and CCW/Stop terminals using control via RS-485 interface



#### 5.5.4 Connection of URM option

The following figure shows how to connect the URM option:

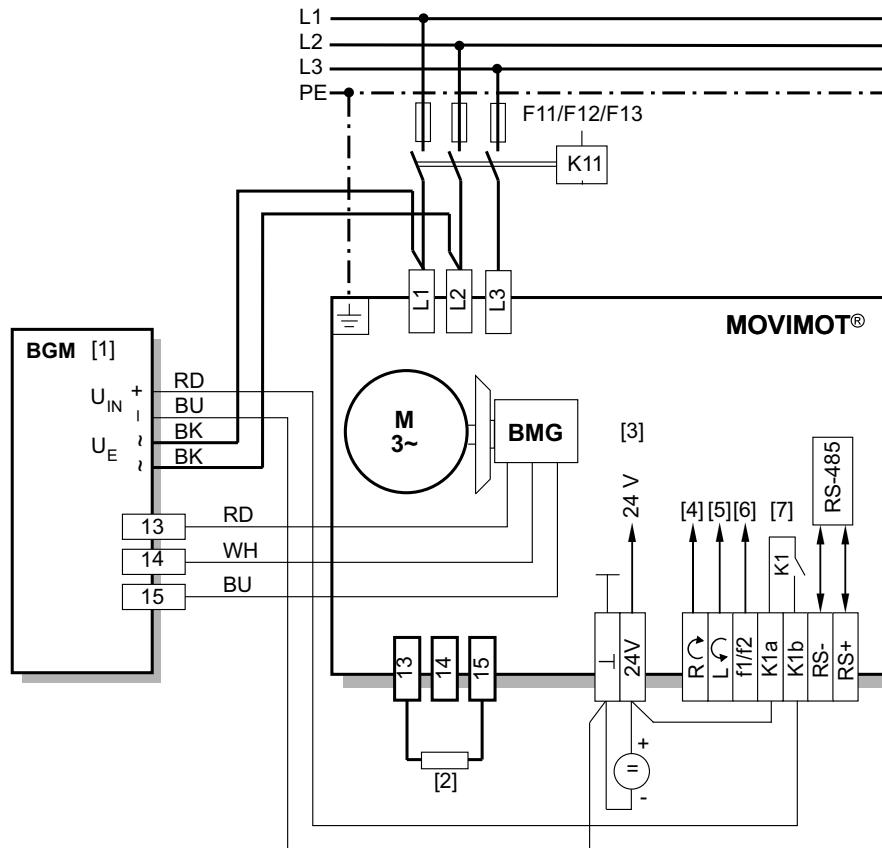


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### 5.5.5 Connection of BGM option

The following figure shows how to connect the BGM option:



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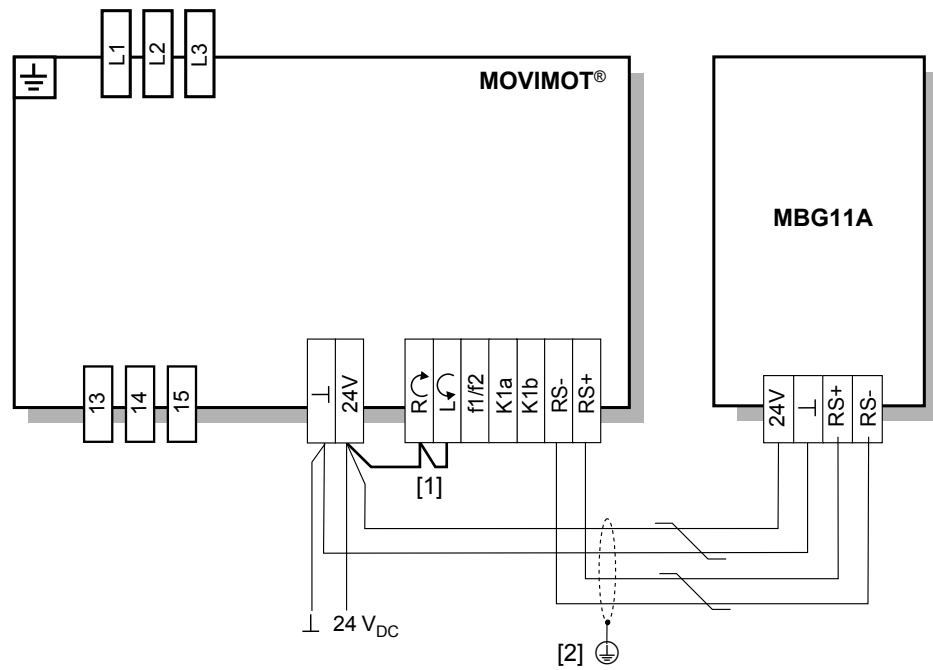
- [1] BGM brake control mounted in the terminal box
  - [2] External BW braking resistor (for assignment, see sec. "Technical Data")
  - [3] DC 24 V supply
  - [4] CW/stop
  - [5] CCW/stop
- Note the enabled direction of rotation.  
See sec. "Connection of MOVIMOT® basic unit" (see page 30)  
Functions of the CW / Stop and CCW / Stop terminals using control via RS-485 interface
- [6] Setpoint changeover f1 / f2
  - [7] Brake relay



#### 5.5.6 Connecting the MBG11A option

For more information about mounting the MBG11A option, refer to sec. "MBG11A option" (see page 20).

The following figure shows how to connect the MBG11A option:



2034454283

[1] Note the enabled direction of rotation.

See sec. "Connection of MOVIMOT® basic unit" (see page 30),

Functions of the CW/Stop and CCW/Stop terminals using control via RS-485 interface

[2] EMC metal cable gland

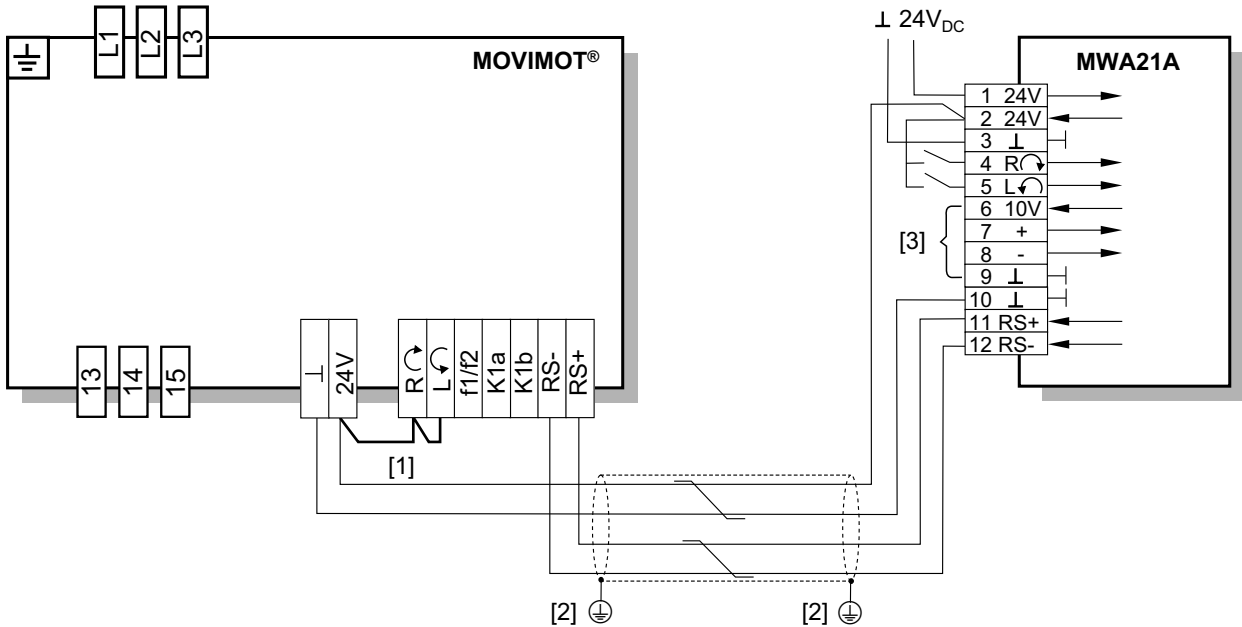




### 5.5.7 Connection of MWA21A option

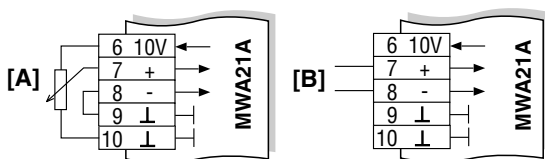
For more information about mounting the MWA21A option, refer to sec. "MWA21A option" (see page 21).

The following figure shows how to connect the MWA21A option:



2034475403

- [1] Note the enabled direction of rotation.  
See sec. "Connection of MOVIMOT® basic unit" (see page 30),  
Functions of the CW/Stop and CCW/Stop terminals using control via RS-485 interface
- [2] EMC metal cable gland
- [3] Potentiometer using the 10 V reference voltage **[A]**  
or potential-free analog signal **[B]**

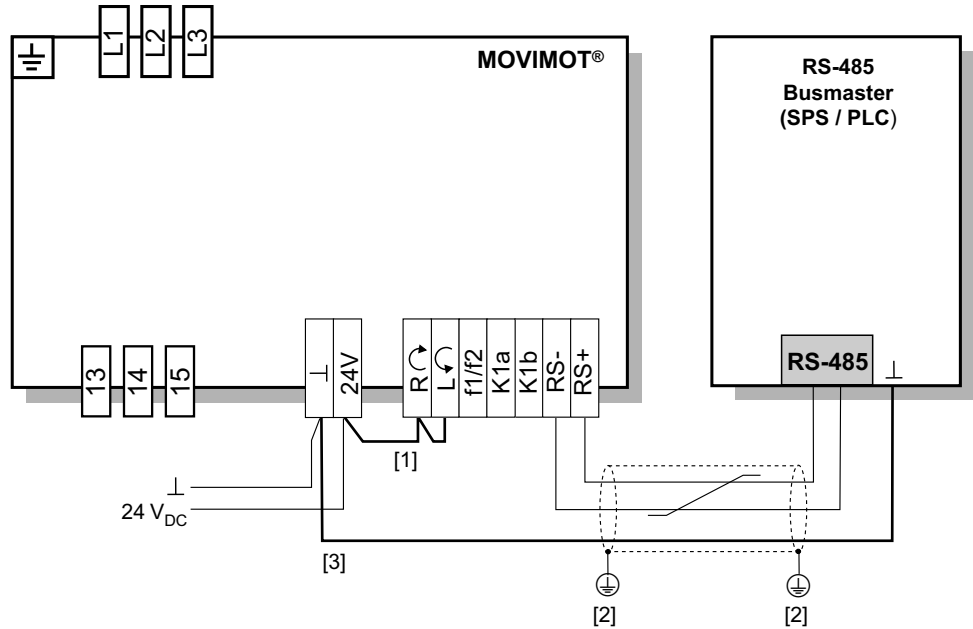


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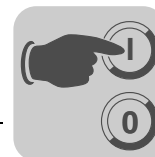
#### 5.6 Connection of RS-485 bus master

The following illustration shows how to connect an RS-485 bus master:






2034551691

- [1] Note the enabled direction of rotation.  
See sec. "Connection of MOVIMOT® basic unit" (see page 30),  
Functions of the CW/Stop and CCW/Stop terminals using control via RS-485 interface
- [2] EMC metal cable gland
- [3] Equipotential bonding MOVIMOT®/RS-485 master



## 6 Startup

### 6.1 Important notes on startup

	<p><b>⚠ DANGER</b></p> <p>Before removing / fitting the MOVIMOT<sup>®</sup> inverter, you must disconnect it from the supply system. Dangerous voltages may still be present for up to one minute after disconnection from the power supply.</p> <p>Severe or fatal injuries from electric shock.</p> <ul style="list-style-type: none"> <li>• Disconnect the MOVIMOT<sup>®</sup> drive from the power supply using an appropriate external disconnecting device and secure it against unintentional reconnection to the voltage supply.</li> <li>• Then wait at least for 1 minute.</li> </ul>
	<p><b>⚠ WARNING</b></p> <p>The surfaces of MOVIMOT<sup>®</sup> and external options, e.g. braking resistor (especially the heat sink), can become very hot during operation.</p> <p>Danger of burns.</p> <ul style="list-style-type: none"> <li>• Do not touch the MOVIMOT<sup>®</sup> drive and external options until they have cooled down sufficiently.</li> </ul>
	<p><b>INFORMATION</b></p> <ul style="list-style-type: none"> <li>• Remove paint protection cap from the status LED before startup.</li> <li>• Remove paint protection film from the nameplates before startup.</li> <li>• Check that all protective covers are installed correctly.</li> <li>• Observe a minimum switch-off time of 2 seconds for the mains contactor K11.</li> </ul>

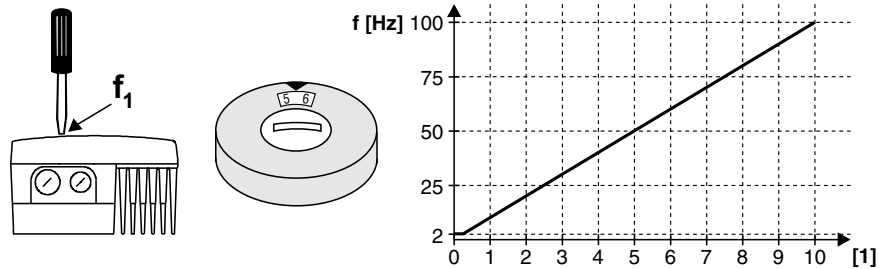


## 6.2 Description of the controls

### 6.2.1 Setpoint potentiometer f1

Depending on the operating mode of the MOVIMOT<sup>®</sup> inverter, the potentiometer f1 has different functions:

- Binary control: Setting setpoint f1  
(selected via terminal f1/f2 = "0")
- Control via RS-485: Setting maximum frequency  $f_{max}$



[1] Potentiometer setting

329413003



### STOP

The enclosure specified in section Technical Data only applies if the screw plugs of the setpoint potentiometer and the X50 diagnostic interface are installed correctly.

Missing or incorrectly installed screw plugs can cause damage to the MOVIMOT<sup>®</sup> inverter.

- Make sure the screw plug of the setpoint potentiometer f1 has a seal and screw it in.

### 6.2.2 Switch f2

Depending on the operating mode of the MOVIMOT<sup>®</sup> inverter, switch f2 has different functions:

- Binary control: Setting setpoint f2  
(selected via terminal f1/f2 = "1")
- Control via RS-485: Setting minimum frequency  $f_{min}$

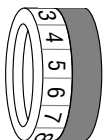


Switch f2											
Detent setting	0	1	2	3	4	5	6	7	8	9	10
Setpoint f2 [Hz]	5	7	10	15	20	25	35	50	60	70	100
Minimum frequency [Hz]	2	5	7	10	12	15	20	25	30	35	40

### 6.2.3 Switch t1

Use switch t1 to set the acceleration of the MOVIMOT<sup>®</sup> drive.

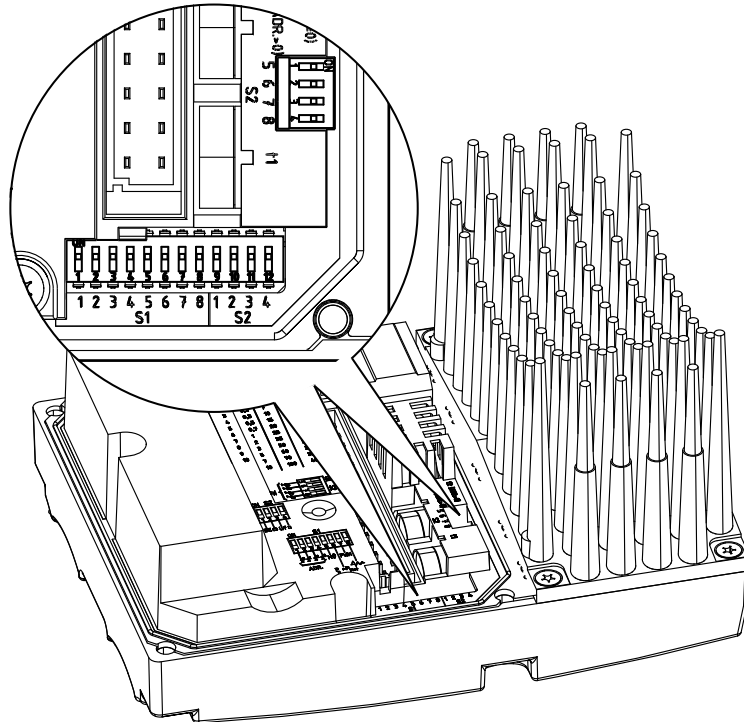
The ramp times are based on a setpoint step change of 1500 rpm (50 Hz).



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



6.2.4 DIP switches S1 and S2



626648587


DIP switch S1:

S1 Meaning	1	2	3	4	5 Motor protection	6 Motor Power rating	7 PWM Frequency	8 No-load damping
	Binary encoding RS-485 unit address							
	2 <sup>0</sup>	2 <sup>1</sup>	2 <sup>2</sup>	2 <sup>3</sup>				
ON	1	1	1	1	Off	Motor one size 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	Binary encoding additional functions			
	Motor type	Release brake None Enable	Duty cycle	Speed monitoring	2 <sup>0</sup>	2 <sup>1</sup>	2 <sup>2</sup>	2 <sup>3</sup>
ON	SEW-DZ motor <sup>1)</sup>	On	V/f	On	1	1	1	1
OFF	IEC motor	Off	VFC	Off	0	0	0	0

1) only available in Brazil

	<b>STOP</b>
	Set the DIP switches using suitable tools, e.g. a flat tip screwdriver with a blade width ≤ 3 mm.
	The force used for setting the DIP switches must not exceed 5 N.



### 6.3 Description of the DIP switches S1

#### 6.3.1 DIP switches S1/1 – S1/4

Selecting the RS-485 address of MOVIMOT® 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:

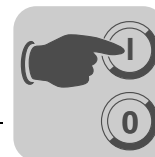
Control	RS-485 address
Binary control	0
Via keypad (MLG..A, MBG..A)	1
Via fieldbus interface (MF..)	1
Via MOVIFIT® MC (MTM..)	1
Via intelligent fieldbus interface (MQ..)	1 to 15
Via RS-485 master	1 to 15

#### 6.3.2 DIP switch S1/5

##### Motor protection switched on/off

When MOVIMOT® is installed close to the motor, the motor protection function must be deactivated.

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



### 6.3.3 DIP switch S1/6

#### Lower motor power rating

- When activated, this DIP switch enables MOVIMOT® to be assigned to a motor with a lower power rating. The rated unit power is not affected.
- When a motor with a lower power rating is used, the overload capacity of the drive can be increased because, from the perspective of the motor, MOVIMOT® is one power rating too big. A higher current can be provided briefly, leading to higher torque ratings.
- The aim of this 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").

MOVIMOT® Inverter MM..D-503-00	Assigned motor			
	230/400 V, 50 Hz		266/460 V, 60 Hz	
	S1/6 = OFF		S1/6 = ON	
380 – 500 V	⋈	△	⋈	△
MM03D-503-00	DT71D4	DR63L4 <sup>1)</sup>	DR63L4 <sup>1)</sup>	–
MM05D-503-00	DT80K4	DT71D4	DT71D4	DFR63L4 <sup>1)</sup>
MM07D-503-00	DT80N4	DT80K4	DT80K4	DT71D4
MM11D-503-00	DT90S4	DT80N4	DT80N4	DT80K4
MM15D-503-00	DT90L4	DT90S4	DT90S4	DT80N4
MM22D-503-00	DV100M4	DT90L4	DT90L4	DT90S4
MM30D-503-00	DV100L4	DV100M4	DV100M4	DT90L4
MM40D-503-00	–	DV100L4	DV100L4	DV100M4

MOVIMOT® Inverter MM..D-233-00	Assigned motor	
	230/460 V, 60 Hz ⋈ / ⋈ / ⋈	
	S1/6 = OFF	S1/6 = ON
200 – 240 V	⋈ ⋈	⋈ ⋈
MM03D-233-00	DT71D4	DR63L4 <sup>1)</sup>
MM05D-233-00	DT80K4	DT71D4
MM07D-233-00	DT80N4	DT80K4
MM11D-233-00	DT90S4	DT80N4
MM15D-233-00	DT90L4	DT90S4
MM22D-233-00	DV100M4	DT90L4

1) Only possible with installation close to the motor



#### 6.3.4 DIP switch S1/7

##### Setting the maximum PWM- frequency

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

#### 6.3.5 DIP switch S1/8

##### No load vibration damping (S1/8 = "ON")

When setting DIP switch S1/8, this function reduces resonance during no-load operation.

## 6.4 Description of DIP switches S2

#### 6.4.1 DIP switch S2/1

##### Motor type

- For IEC and NEMA motors, DIP switch S2/1 must always be set to "OFF".
- For DZ motors with nominal voltages of 220/380 V, 60 Hz (only available in Brazil), the DIP switch must always be set to "ON".

#### 6.4.2 DIP switch S2/2



##### Brake release without enable

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

This function is not available in hoist operation.

##### Binary control functions

In binary control, the brake can be released by setting the signal at terminal f1/f2 subject to the following preconditions:

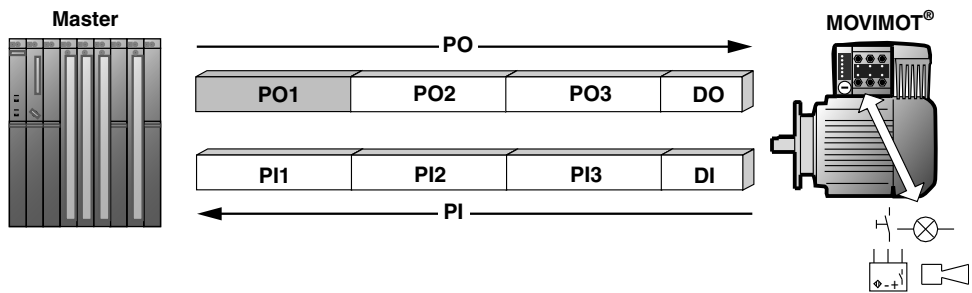
Terminal status		f1 / f2	Enable status	Fault status	Brake function
R 	L 				
"1"	"0"	"0"	Unit enabled	No unit fault	Brake is controlled by MOVIMOT®, Setpoint f1
"0"	"1"	"1"	Unit enabled	No unit fault	Brake is controlled by MOVIMOT®, setpoint f2
"1"	"0"	"1"	Unit not enabled	No unit fault	Brake applied
"0"	"1"	"0"	Unit not enabled	No unit fault	Brake applied
"1"	"1"	"0"	Unit not enabled	No unit fault	Brake applied
"1"	"1"	"1"	Unit not enabled	No unit fault	Brake applied
"0"	"0"	"1"	<b>Unit not enabled</b>	<b>No unit fault</b>	<b>Brake is released for manual movement</b>
All statuses possible			Unit not enabled	unit fault	Brake applied





RS-485 control functions

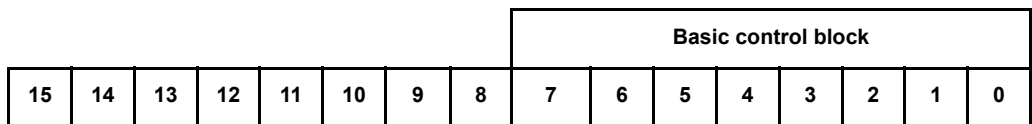
In RS-485 control, the brake is released via the control word:



329547915

- 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:



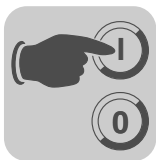
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Not connected <sup>1)</sup>								Bit "9"	Bit "8"	Not assigned <sup>1)</sup>	"1" = Reset	Not assigned <sup>1)</sup>			"1 1 0" = Enable otherwise stop

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	Fault status	Status of bit 8 in control word	Brake function
Unit enabled	No unit fault / no communication timeout	"0"	Brake is controlled by MOVIMOT®
Unit enabled	No unit fault / no communication timeout	"1"	Brake is controlled by MOVIMOT®
Unit not enabled	No unit fault / no communication timeout	"0"	Brake applied
<b>Unit not enabled</b>	<b>No unit fault / no communication timeout</b>	<b>"1"</b>	<b>Brake is released for manual movement</b>
Unit not enabled	Unit fault / Communication timeout	"1" or "0"	Brake applied



## Startup

### Description of DIP switches S2

#### Setpoint selection for binary control

Setpoint selection in binary control depending on the status of terminal f1/f2:

Enable status	Terminal f1 / f2	Active setpoint
Unit enabled	Terminal f1/f2 = "0"	Setpoint potentiometer f1 active
Unit enabled	Terminal f1/f2 = "1"	Setpoint potentiometer f2 active

#### Behavior if unit not ready

If the unit is not ready, the brake is always applied irrespective of the setting of terminal f1/f2 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 RS-485.

### 6.4.3 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

### 6.4.4 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<sup>®</sup> inverter trips the speed monitoring. The status LED of the MOVIMOT<sup>®</sup> inverter signalizes the error by slowly flashing red ( $t_{on} : t_{off} = 600 \text{ ms} : 600 \text{ ms}$ , fault code 08). This error only occurs when the current limit has been reached for the duration of the deceleration time.

### 6.4.5 DIP switches S2/5 – S2/8

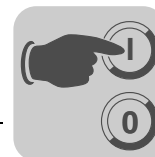
#### Additional functions

- 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

- For an overview of additional functions, refer to section "Selectable additional functions" (see page 51).



## 6.5 Selectable additional functions of MM..D-503-00

### 6.5.1 Overview of the additional functions

Decimal value	Brief description	Operating mode		Description
		Control via RS-485	Binary control	
0	Basic functions, no additional function selected	X	X	–
1	MOVIMOT® with increased ramp times	X	X	(see page 52)
2	MOVIMOT® with adjustable current limitation (Fault if exceeded)	X	X	(see page 52)
3	MOVIMOT® with adjustable current limitation (can be changed using terminal f1/f2)	X	X	(see page 53)
4	MOVIMOT® with bus configuration	X	–	(see page 55)
5	MOVIMOT® with motor protection via TH	X	–	(see page 57)
6	MOVIMOT® with maximum PWM frequency of 8 kHz	X	X	(see page 58)
7	MOVIMOT® with rapid start / stop	X	X	(see page 59)
8	MOVIMOT® with minimum frequency 0 Hz	X	X	(see page 61)
9	MOVIMOT® for hoist applications	X	X	(see page 62)
10	MOVIMOT® with minimum frequency 0 Hz and reduced torque at low frequencies	X	X	(see page 65)
11	Monitoring of supply-phase failure deactivated	X	X	(see page 66)
12	MOVIMOT® with rapid start/stop and motor protection via TH	X	X	(see page 66)
13	MOVIMOT® with extended speed monitoring function	X	X	(see page 69)
14	MOVIMOT® with deactivated slip compensation	X	X	(see page 73)
15	Not assigned	–	–	–

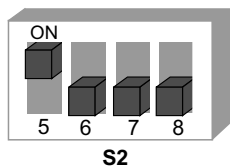


## Startup

### Selectable additional functions of MM..D-503-00

#### 6.5.2 Additional function 1

##### MOVIMOT® with increased ramp times



329690891

#### Functional description

- It is possible to set ramp times of up to 40 s.
- In RS-485 control mode, a ramp time of max. 40 s can be transmitted when using 3 process data units.

#### Changed ramp times

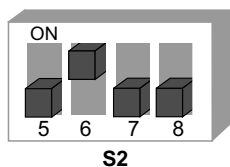


Switch t1											
Detent setting	0	1	2	3	4	5	6	7	8	9	10
Ramp time t1 [s]	0,1	0,2	0,3	0,5	0,7	1	20	25	30	35	40

- = corresponds to standard setting  
 = changed ramp times

#### 6.5.3 Additional function 2

##### MOVIMOT® with adjustable current limitation (error if exceeded)



329877131

#### Functional description

- The current limit can be set using switch f2.
- The setpoint f2 (for binary control) and the minimum frequency (for control via RS-485) 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 setting	0	1	2	3	4	5	6	7	8	9	10
I <sub>max</sub> [%] of I <sub>N</sub>	90	95	100	105	110	115	120	130	140	150	160



6.5.4 Additional function 3

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



329910539

*Functional description*

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

*Response upon reaching the current limit*

- When the current limit is reached, the unit reduces the frequency via the current limitation function. If necessary, the ramp is stopped to prevent 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*

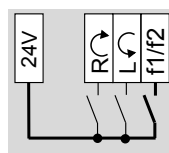
- It is no longer possible to switch via terminals between setpoint f1 and setpoint f2 in binary control mode or to set the minimum frequency in RS-485 control mode.
- The minimum frequency in RS-485 control mode has a fixed minimum frequency of 2 Hz.

*Adjustable current limits*

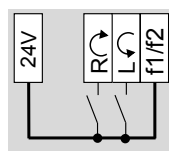


Switch f2											
Detent setting	0	1	2	3	4	5	6	7	8	9	10
I <sub>max</sub> [%] of I <sub>N</sub>	60	70	80	90	100	110	120	130	140	150	160

*Selecting the current limits via binary input terminal f1/f2*



**f1/f2 = "0"** 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.



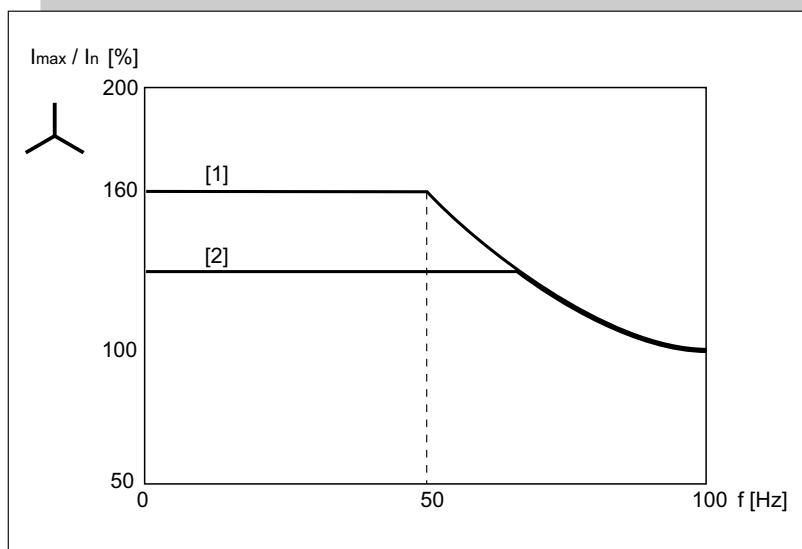
## Startup

### Selectable additional functions of MM..D-503-00

*Influencing the current characteristic curve*

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

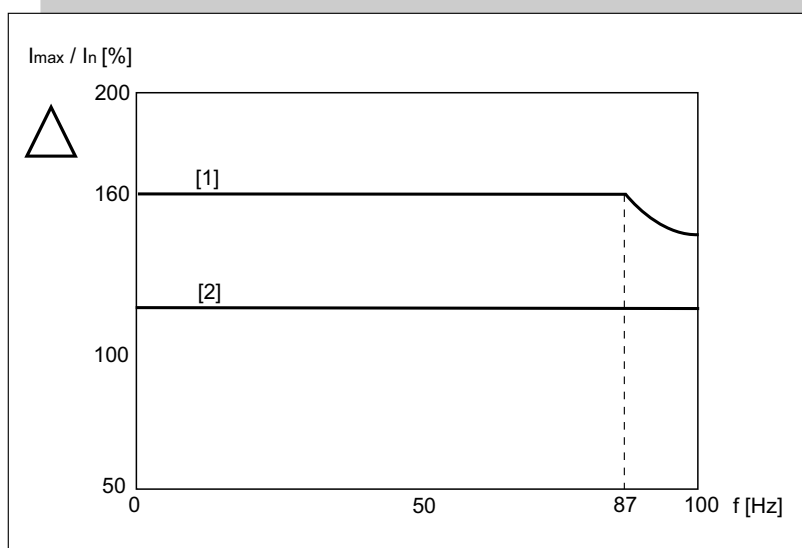
#### Motor with star connection



331979659

- [1] Current limit characteristic curve of standard function  
 [2] Reduced current limit for additional function 3 and terminals f1/f2 = "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 = "1"



6.5.5 Additional function 4

MOVIMOT® with bus configuration



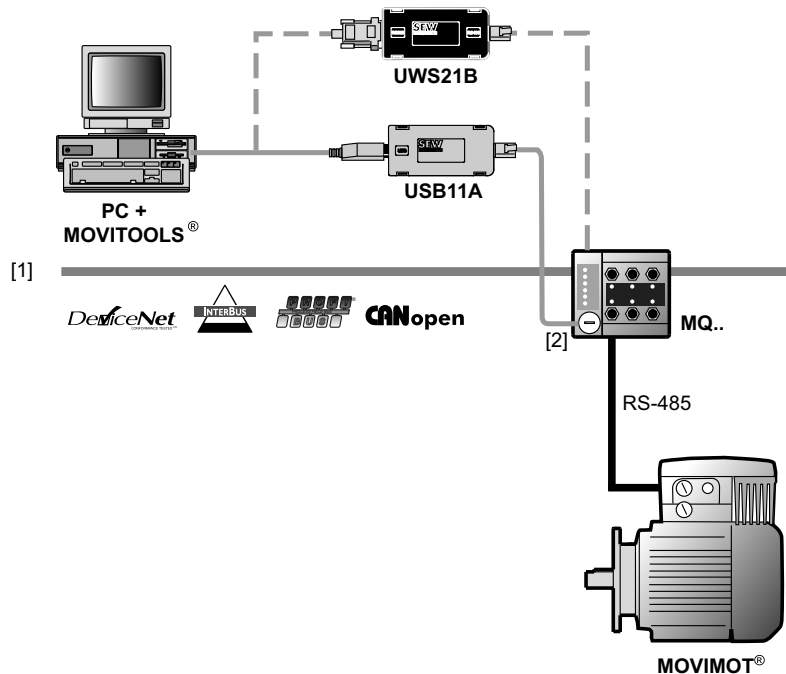
329944715

	<b>INFORMATION</b>
	<p>When activating additional function 4, only a limited number of parameters is available. Additional function 4 is only designed for RS-485 control in combination with the MQ.. fieldbus interfaces with integrated minicontroller.</p> <p>For more information, refer to the following SEW-EURODRIVE manuals:</p> <ul style="list-style-type: none"> <li>• PROFIBUS Interfaces, Field Distributors</li> <li>• Interbus Interfaces, Field Distributors</li> <li>• DeviceNet/CANopen Interfaces, Field Distributors</li> </ul>

Functional description

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

Block diagram



332132107

- [1] Fieldbus
- [2] Diagnostic interface



Changing  
parameters in  
MOVITOOLS®  
MotionStudio

After opening MOVITOOLS®/Shell, the following parameters are accessible. They can be changed and saved in the unit.

Name	Area	Index	Parameter number	Step width
Ramp up	0.1 – 1 – 2000 [s]	8807	130	0.1 s – 1 s: 0,01 1 s – 10 s: 0,1 10 s – 100 s: 1 100 s – 2000 s: 10
Ramp down	0.1 – 1 – 2000 [s]	8808	131	
Minimum frequency	<b>2</b> – 100 [Hz]	8899	305	0.1
Maximum frequency <sup>1)</sup>	2 – <b>100</b> [Hz]	8900	306	0.1
Current limit	60 – 160 [%]	8518	303	1
Pre-magnetization time	0 – <b>0.4</b> – 2 [s]	8526	323	0.001
Post-magnetization time	0 – <b>0.2</b> – 2 [s]	8585	732	0.001
Parameter lock	On/off	8595	803	–
Factory setting	<b>0</b> / 2	8594	802	–
Delay time Speed monitoring	0.1 – 1 – 10.0 [s]	8558	501	0.1
Brake release time	<b>0</b> – 2 [s]	8749	731	0.001
Slip compensation <sup>2)</sup>	0 – 500 [min <sup>-1</sup> ]	8527	324	0.2

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.

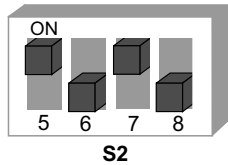
- The factory setting is activated as soon as additional function 4 is activated via DIP switches. If the additional function which was selected via DIP switches remains unchanged after the 24 V operating voltage is switched off, the last valid values from EEPROM will be used after reactivation.
- The start frequency is fixed at 0.5 Hz, the stop frequency at 3 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.





6.5.6 Additional function 5

MOVIMOT® motor protection via TH



329992459

	<b>INFORMATION</b>
	<p>The additional function is only designed for RS-485 control when the MOVIMOT® inverter is installed close to the motor.</p>

Functional description

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

- Additional function 5 generates error 84 (motor over temperature) when both terminals for the direction of rotation are open.
- When the MOVIMOT® inverter is mounted close to the motor, the direction terminals are set to "0" by the TH during over temperatures in the motor.
- Error 84 is indicated by the flashing status LED of the MOVIMOT®.
- The generated error 84 is also transmitted via fieldbus.

**Functions in combination with fieldbus interface MQ..:**

- MOVIMOT® bus configuration according to additional function 4 (see page 55).

**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



## Startup

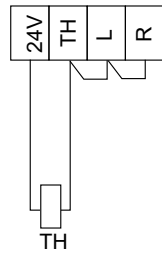
### Selectable additional functions of MM..D-503-00

#### Tripping conditions for error S84

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

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

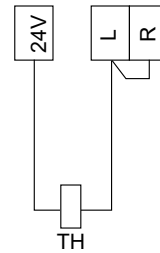
For field distributors:



332178315

For mounting close to the motor

With option P2.A:



482161291

- The TH has triggered due to excessive heat in the motor? (The enable for both terminals for the direction of rotation is revoked).
- Supply voltage is connected.



#### INFORMATION

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

#### 6.5.7 Additional function 6

##### MOVIMOT® with maximum 8 kHz PWM frequency



330028171

#### Functional description

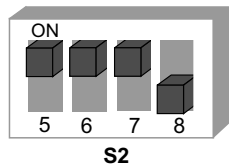
- The additional function reduces the maximum PWM frequency that can be set using DIP switch S1/7 from 16kHz to 8kHz.
- When DIP switch S1/7 is set to "ON", the unit operates with an 8 kHz PWM frequency and switches back to 4 kHz depending on the heat sink temperature.

	S1/7 <u>without</u> additional function 6	S1/7 <u>with</u> 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



6.5.8 Additional function 7

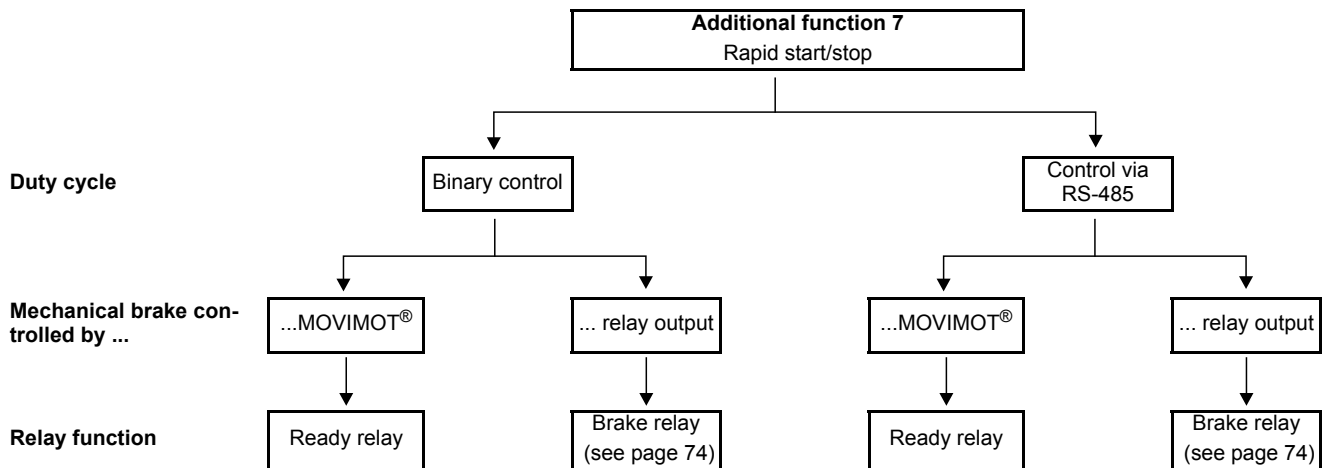
MOVIMOT® with rapid start / stop



330064651

Functional description

- 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.
- The behavior of MOVIMOT® now depends on the duty type and on whether a mechanical brake is connected.



Control via RS-485 Mechanical brake controlled by MOVIMOT®:

- The terminals 13, 14, and 15 are assigned to the brake coil of the mechanical brake on the MOVIMOT® wiring board.
- The new function "Applying brake when downward ramp is activated" is introduced. This function is assigned to bit 9 in the control word as virtual terminal in line with the MOVILINK® profile.
- Upon setting bit 9 during the downward ramp, MOVIMOT® applies the brake and inhibits the output stage.
- If the motor frequency is lower than the stop frequency, the brake is applied regardless of the state of bit 9.
- The relay is switched as a ready relay (standard function).



### Mechanical brake controlled by the relay output:

- A braking resistor (BW..) must be connected to terminals 13 and 15 of the MOVIMOT® wiring board. Terminal 14 is not assigned.
- Relay K1 acts as brake control relay. This means that the ready signal function is no longer available.

It is essential that you observe chapter "Using the relay output for additional functions 7, 9, 12 and 13" (see page 74).



### ! DANGER

The brake can be released if DIP switches S2/5 – S2/8 are set incorrectly.

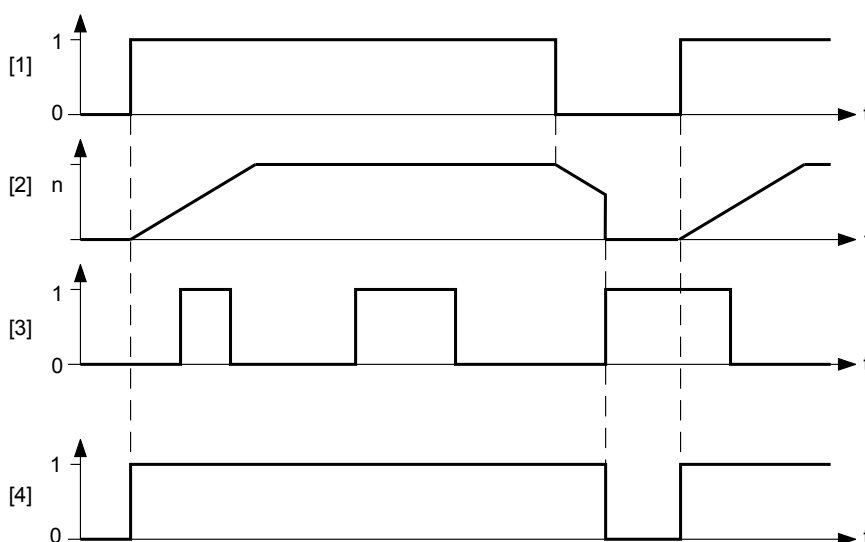
Nonobservance of the chapter "Using the relay output for additional functions 7, 9, 12 and 13" (see page 74) leads to a risk of crushing due to unintentional startup of the drive.

Severe or fatal injuries.

- Observe the information in chapter "Using the relay output for additional functions 7, 9, 12 and 13" (see page 74).

- The new function "Applying brake when downward ramp is activated" is introduced. This function is assigned to bit 9 in the control word as virtual terminal in line with the MOVILINK® profile.
- Upon setting bit 9 during the downward ramp, MOVIMOT® applies the brake and inhibits the output stage.
- If the motor frequency is lower than the stop frequency, the brake is applied regardless of the state of bit 9.

### Flow diagram "Brake control in RS-485 control mode":



333149963

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



Binary control

**Mechanical brake controlled by MOVIMOT®:**

- The terminals 13, 14, and 15 are assigned to the brake coil of the mechanical brake on the MOVIMOT® wiring board.
- The mechanical brake cannot be influenced by the terminals. The brake works like a unit without additional function.
- The relay is switched as a ready relay (standard function).

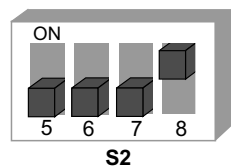
**Mechanical brake controlled by the relay output**

- A braking resistor (BW..) must be connected to terminals 13 and 15 of the MOVIMOT® wiring board. Terminal 14 is not assigned.
- Relay K1 acts as brake control relay; this means that the ready signal function is no longer available. It is essential that you observe chapter "Using the relay output for additional functions 7, 9, 12 and 13" (see page 74).
- After activating rapid stop, do not enable the drive until it has reached standstill.

	<b>INFORMATION</b>
	The rapid stop function cannot be used in binary control mode!

6.5.9 Additional function 8

**MOVIMOT® with minimum frequency 0 Hz**



330101899

Functional description

**Control via RS-485:**

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	0	1	2	3	4	5	6	7	8	9	10
Detent setting	0	1	2	3	4	5	6	7	8	9	10
Minimum frequency [Hz] with additional function activated	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	0	1	2	3	4	5	6	7	8	9	10
Detent setting	0	1	2	3	4	5	6	7	8	9	10
Setpoint f2 [Hz] with add. function activated	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

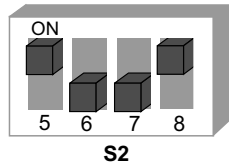


## Startup

### Selectable additional functions of MM..D-503-00

#### 6.5.10 Additional function 9

##### MOVIMOT® for hoist applications



330140427

	<b>DANGER</b>
	<p>Risk of fatal injury if the hoist falls.</p> <p>Severe or fatal injuries or damage to property.</p> <ul style="list-style-type: none"> <li>• MOVIMOT® may not be used as a safety device in hoist applications.</li> <li>• Use monitoring systems or mechanical protection devices to ensure safety.</li> </ul>

	<b>STOP</b>
	<p>In order to avoid a system overload, the MOVIMOT® drive may not be operated at the current limit.</p> <ul style="list-style-type: none"> <li>• Activate speed monitoring, which means when the MOVIMOT® drive is operated at the current limit for longer than 1 s, it will trigger the error message F08 "speed monitoring".</li> </ul>

#### Requirements

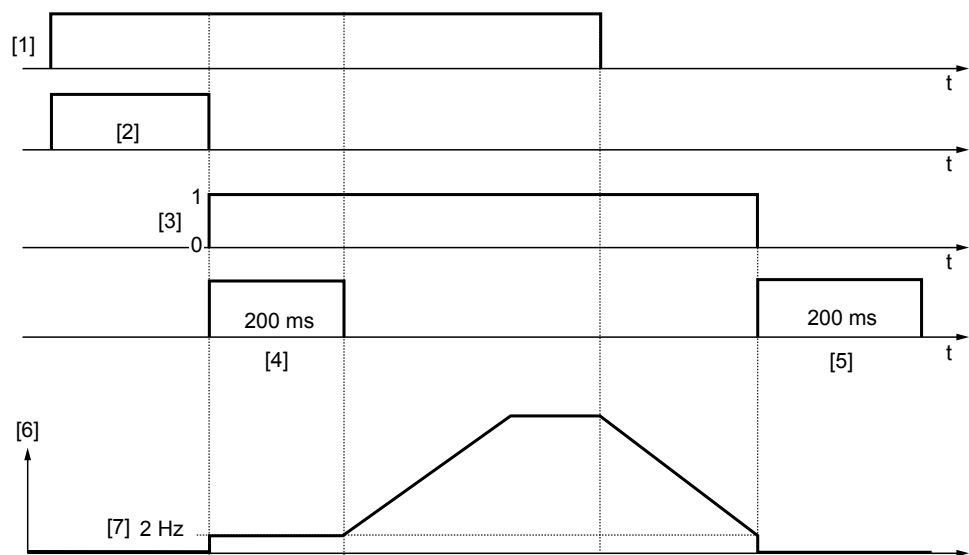
	<b>STOP</b>
	<p>MOVIMOT® can only be used in hoist applications if the following prerequisites are met:</p> <ul style="list-style-type: none"> <li>• Additional function 9 is only possible in conjunction with brakemotors.</li> <li>• Make sure that the DIP switch S2/3 is set to "OFF" (VFC operation).</li> <li>• The BGM brake controller must be used with an external braking resistor.</li> <li>• Activate the "speed monitoring (see page 50)" function (DIP switch S2/4 = "ON").</li> </ul>



*Functional description*

- The start frequency for binary control mode and RS-485 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 fixed to 200 ms. This setting ensures that the brake is applied as soon as the motor stops generating torque.
- If a brake resistor is connected to terminals X1:13, X1:15, the SEW brake is controlled via output X10 and option BGM.
- The behavior of MOVIMOT® now depends on the duty type.

**Overview of brake control with additional function 9:**



1754491403

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



**INFORMATION**

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



## Startup

### Selectable additional functions of MM..D-503-00

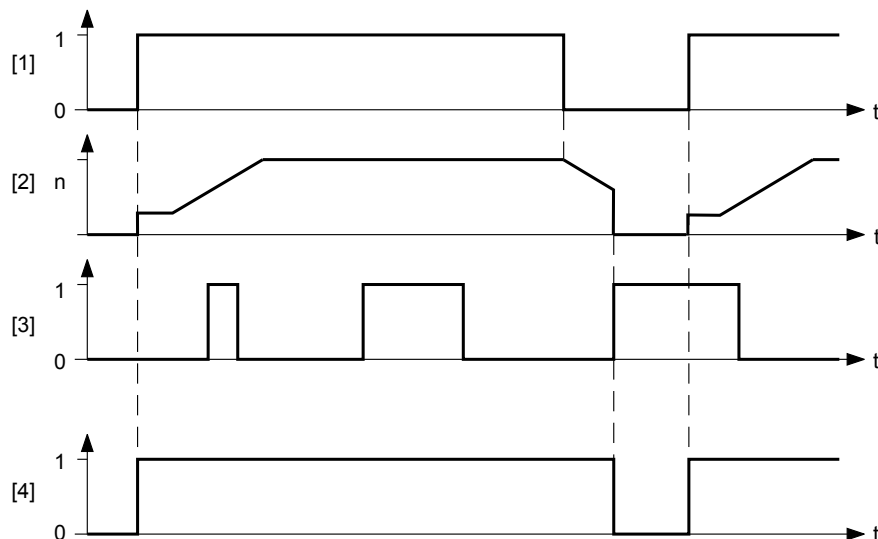
#### Control via RS-485

- **The mechanical brake is controlled by the relay output.**
- A braking resistor (BW..) must be connected to terminals 13 and 15 of the MOVIMOT® wiring board. Terminal 14 is not assigned.
- Relay K1 acts as brake control relay. This means that the ready signal function is no longer available

It is essential that you observe chapter "Using the relay output for additional functions 7, 9, 12 and 13" (see page 74).

	<b>! DANGER</b>
	<p>The brake can be released if DIP switches S2/5 – S2/8 are set incorrectly.</p> <p>Nonobservance of the chapter "Using the relay output for additional functions 7, 9, 12 and 13" (see page 74) leads to a risk of crushing due to unintentional startup of the drive.</p> <p>Severe or fatal injuries.</p> <ul style="list-style-type: none"> <li>• Observe the information in chapter "Using the relay output for additional functions 7, 9, 12 and 13" (see page 74).</li> </ul>

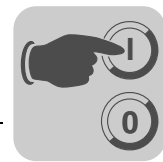
- The new function "Applying brake when downward ramp is activated" is introduced. This function is assigned to bit 9 in the control word as virtual terminal in line with the MOVILINK® profile.
- Upon setting bit 9 during the downward ramp, MOVIMOT® applies the brake and inhibits the output stage.
- If the motor frequency is lower than the stop frequency, the brake is applied regardless of the state of bit 9.
- After having activated rapid stop, do not enable the drive until it has reached standstill.



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

334493195





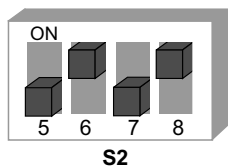
Binary control

- **The mechanical brake is controlled by the relay output.**
- A braking resistor (BW..) must be connected to terminals 13 and 15 of the MOVIMOT® wiring board. Terminal 14 is not assigned.
- The relay acts as brake control relay; this means that the ready signal function is no longer available.

	<b>INFORMATION</b>
	In binary control mode, the brake cannot be applied using bit 9.

6.5.11 Additional function 10

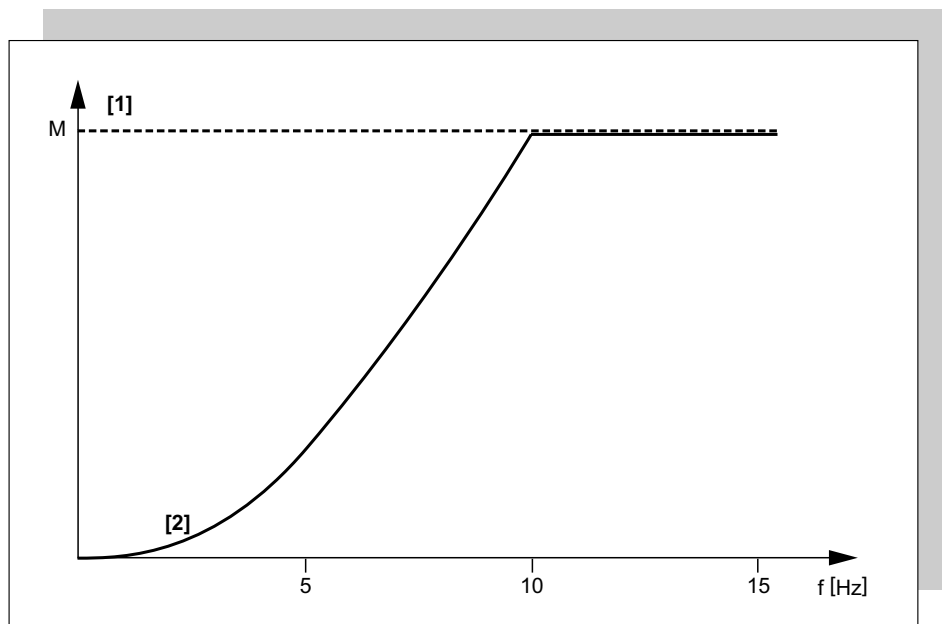
**MOVIMOT® with reduced torque at low frequencies**



330179211

Functional description

- Through reducing the slip compensation and active current at low speeds, the drive only develops a reduced torque (see the illustration which follows):
- Minimum frequency = 0 Hz, see additional function 8 (see page 61).



334866315

[1] Maximum torque in VFC mode

[2] **Maximum torque when additional function 10 is activated**




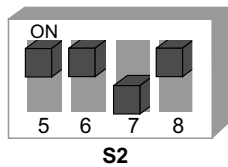
## Startup

### Selectable additional functions of MM..D-503-00

#### 6.5.12 Additional function 11

##### Deactivating the mains phase failure monitoring

	<b>STOP</b>
	Deactivating the mains phase failure monitoring can damage the unit if conditions are unfavorable.



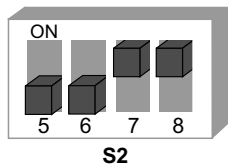
330218763

#### 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.

#### 6.5.13 Additional function 12

##### MOVIMOT<sup>®</sup> with rapid start / stop and motor protection via TH



330259595

#### Functional description

- The additional function is active in binary and RS-485 control mode, but there are differences with respect to the usable functional scope.
- When the MOVIMOT<sup>®</sup> inverter is installed close to the motor, the additional function includes the following features:
  - Motor protection via indirect TH evaluation via direction of rotation terminals
  - Rapid start and stop function



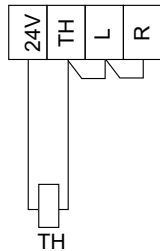
*Sub-function  
"Motor protection  
via TH evaluation"*

This function is only active in RS-485 control mode. This additional function causes a tripping of error 84 "Motor overtemperature".

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

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

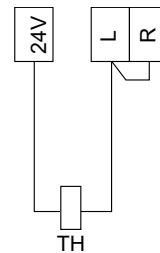
**For field distributors:**



332178315

**For mounting close to the motor**

**With option P2.A:**



482161291

- The TH has triggered due to excessive heat in the motor? (The enable for both terminals for the direction of rotation is revoked).
- Supply voltage is connected.



**INFORMATION**

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

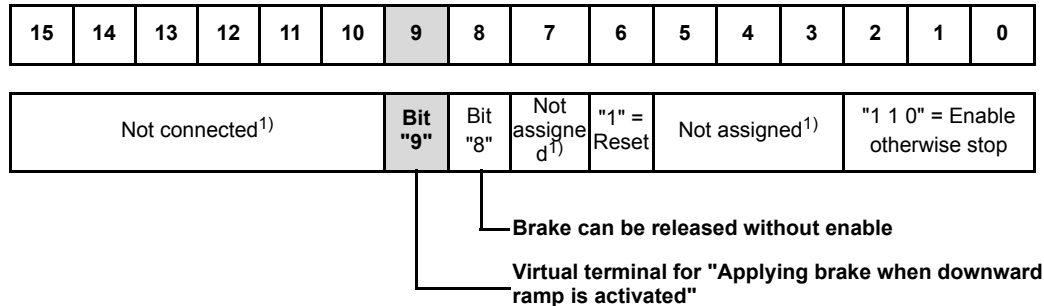
*Sub-function  
"Rapid start"*

- 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.



*Sub-function  
"Rapid stop"*

The function "Applying brake when downward ramp is activated" is introduced for control via RS-485. Bit 9 is assigned this function in the control word as virtual terminal.



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

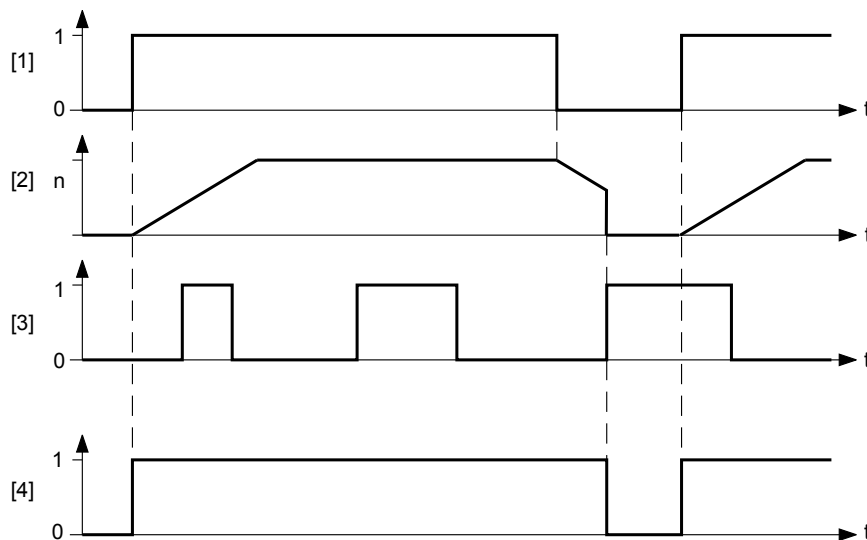
As soon as bit 9 is set during the downwards ramp, MOVIMOT<sup>®</sup> applies the brake directly (brake control via MOVIMOT<sup>®</sup>) or using the MOVIMOT<sup>®</sup> signal relay output (brake control via relay output) and inhibits the output stage.

If the motor frequency is less than the stop frequency (3 Hz), the brake is applied at the downwards ramp regardless of the status of bit 9.

After having activated rapid stop, do not enable the drive until it has reached standstill.

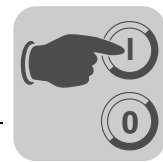
Control via RS-485

**Flow diagram "Brake control in RS-485 control mode":**



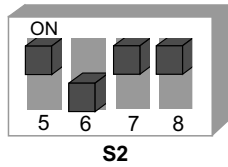
334918283

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



6.5.14 Additional function 13

MOVIMOT® with extended speed monitoring function



330300683

	<b>DANGER</b>
	<p>Risk of fatal injury if the hoist falls.</p> <p>Severe or fatal injuries or damage to property.</p> <ul style="list-style-type: none"> <li>• MOVIMOT® may not be used as a safety device in hoist applications.</li> <li>• Use only monitoring systems or mechanical protection devices to ensure safety.</li> </ul>

Requirements

	<b>STOP</b>
	<p>MOVIMOT® can only be used in hoist applications if the following prerequisites are met:</p> <ul style="list-style-type: none"> <li>• Additional function 13 is only possible in conjunction with brakemotors.</li> <li>• Make sure that the DIP switch S2/3 is set to "OFF" (VFC operation).</li> <li>• The BGM brake controller must be used with an external braking resistor.</li> </ul>



### Functional description

Additional function 13 includes the following functions:

- Additional function 9, MOVIMOT® for hoist applications
- Speed monitoring with adjustable monitoring time

Once 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 had the following functions depending on the set RS-485 address:

### Binary control

**The RS-485 address set at DIP switches S1/1 to 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 fixed 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 fixed at 5 Hz.
  - The ramp time is set at switch t1.

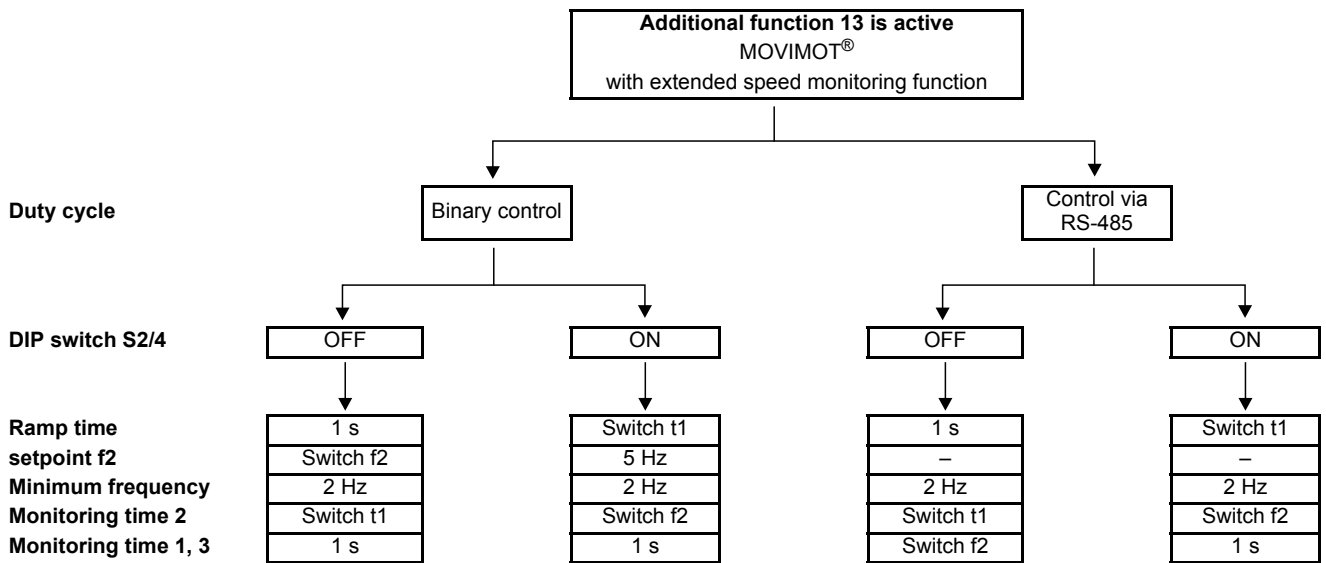
### Control via RS-485

**The RS-485 address set at DIP switches S1/1 to 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 fixed to 1 s.
  - The minimum frequency is fixed at 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 fixed at 2 Hz.



Setting options of additional function 13



Setting the speed monitoring times

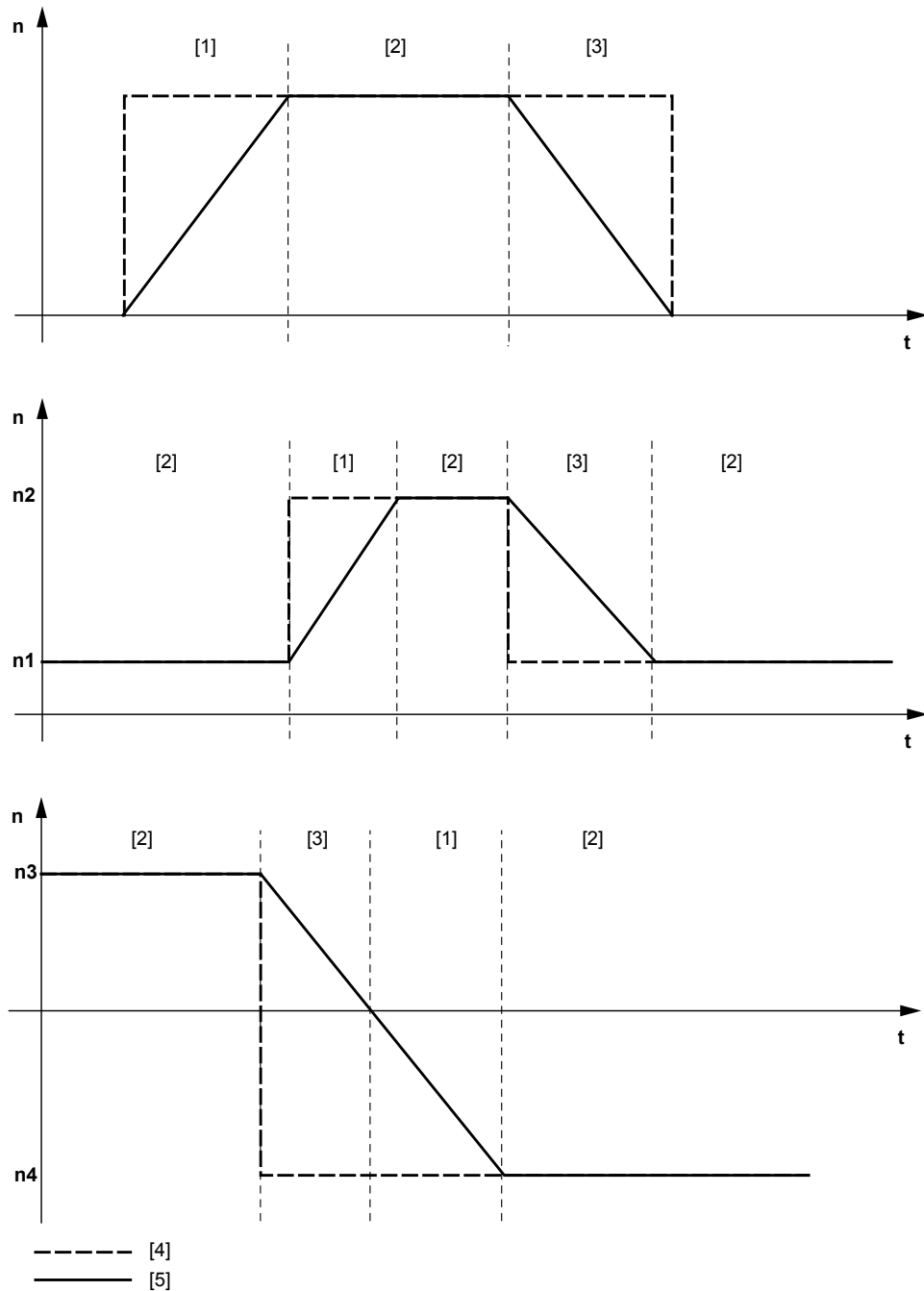
When additional function 13 is active, the following values may be set as monitoring times on switches t1 and f2:



Switch t1 or f2 (see above)											
<b>Detent setting</b>	0	1	2	3	4	5	6	7	8	9	10
<b>Monitoring time 2 [s]</b>	0,1	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1,0	1,5
<b>Monitoring times 1 and 3 [s]</b>	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



337056267

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

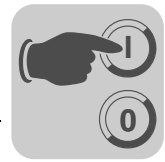
- [4] Speed setpoint
- [5] Speed output (actual value)

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.





### 6.5.15 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.



## Startup

### Selectable additional functions of MM..D-503-00

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



### ! DANGER

Risk of crushing if the drive starts up unintentionally.

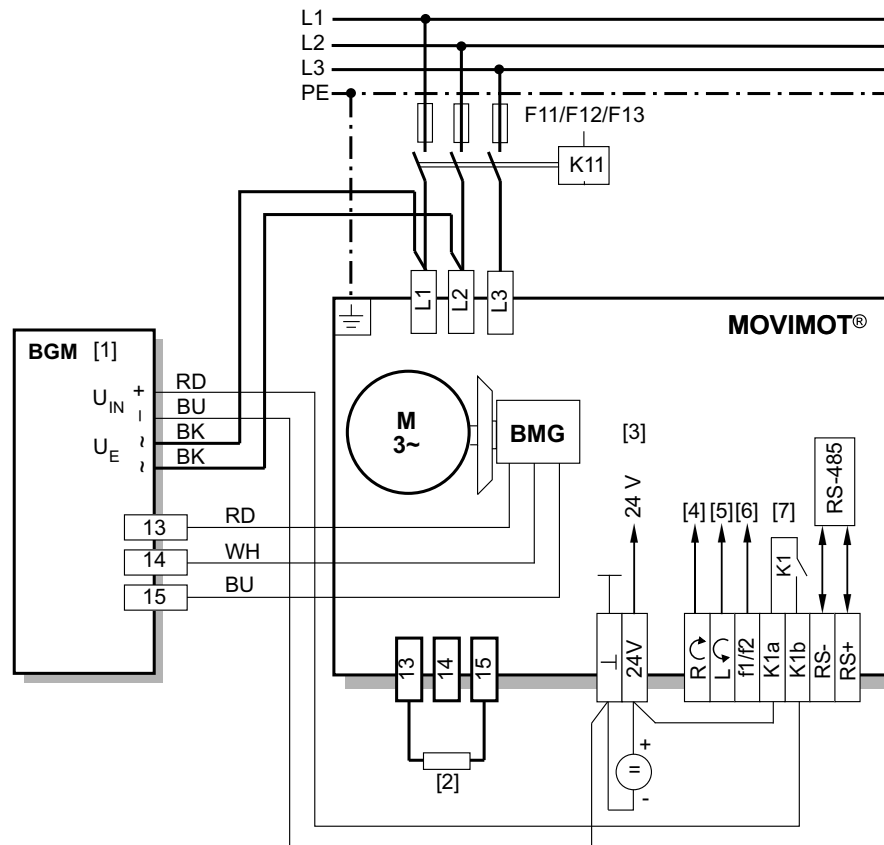
Severe or fatal injuries.

Note the following points before performing startup with brake controller BGM:

- The brake coil must correspond with the supply voltage (e.g. 400 V).
- One of the additional functions 7, 9, 12 or 13 must be activated as otherwise the brake is released permanently. This must be considered also when replacing the MOVIMOT® inverter.

If none of these functions is activated, the relay contact K1 acts as ready signal contact. This means that the brake is released without enable signal if the BGM is connected without permission.

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



2001188491

[1] BGM brake control mounted in the terminal box

[2] External BW braking resistor (for assignment, see sec. "Technical Data")

[3] DC 24 V supply

[4] CW/stop

[5] CCW/stop

Observe enabled direction of rotation (→ section "Connection of MOVIMOT® basic unit" (see page 30)


Functions of the CW / Stop and CCW / Stop terminals using control via RS-485 interface

[6] Setpoint changeover f1/f2

[7] Brake relay

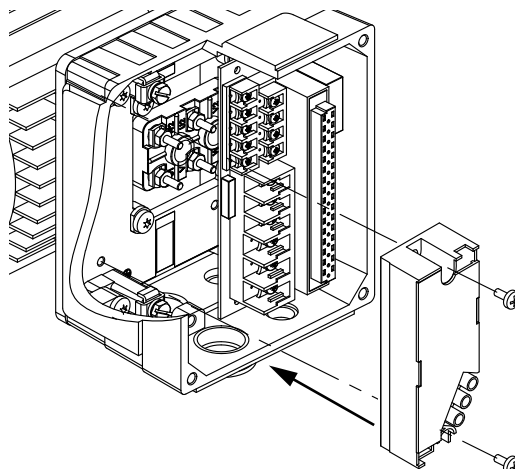


Retrofitting the brake rectifier

	<b>STOP</b>
	<p>Installation is only permitted in combination with the modular terminal box.</p> <p>The following figure depicts an installation example. In general, the installation depends on the used terminal box and on other installed options, if there are any.</p>

If the BGM brake rectifier has not been ordered as installed option, you must retrofit it as follows:

1. Replace the brake coil.  
The brake coil must correspond with the supply system voltage.
2. Install the BGM brake controller in the connection box with 2 screws according to the following figure (tightening torque 2.0 Nm/18 lb.in).




1999901067

3. Connect the BGM option and the external braking resistor according to the wiring diagram on the previous page. For assignment of the braking resistor, refer to section "Technical Data".

Relay K1 acts as brake control relay. This means that the ready signal function is no longer available.

It is essential that you observe the information at the start of this chapter.

	<b>! DANGER</b>
	<p>The brake can be released if DIP switches S2/5 – S2/8 are set incorrectly.</p> <p>Nonobservance of this chapter leads to a risk of crushing due to unintentional startup of the drive.</p> <p>Severe or fatal injuries.</p> <ul style="list-style-type: none"> <li>• Heed the information in this chapter.</li> </ul>



#### 6.6 Startup with binary control



#### ⚠ DANGER

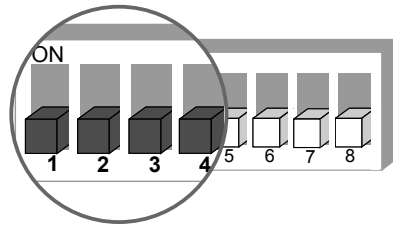
When working on the unit, dangerous voltage levels may still be present up to one minute after the mains is disconnected.

Severe or fatal injuries from electric shock.

- Disconnect the MOVIMOT® drive from the power supply using an appropriate external disconnecting device and secure it against unintentional reconnection to the voltage supply.
- Then wait at least for 1 minute.

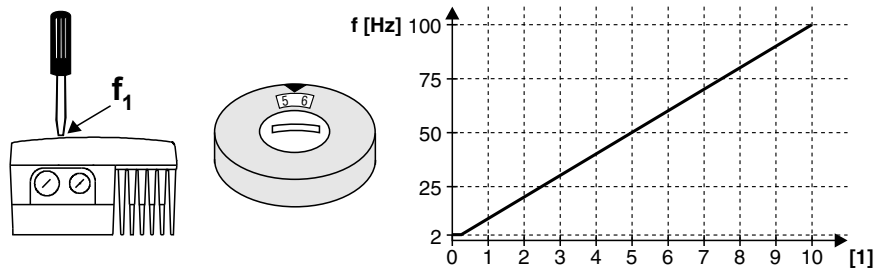
1. Check the connection of the MOVIMOT® inverter.  
See section "Electrical Installation".

2. Make sure that the DIP switches S1/1 – S1/4 are set to "OFF" (address = 0).  
This means MOVIMOT® is controlled binary via terminals.



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



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[1] Potentiometer setting

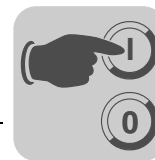
4. Make sure the screw plug of the setpoint potentiometer f1 has a seal and screw it in.



#### STOP

The enclosure specified in section Technical Data only applies if the screw plugs of the setpoint potentiometer and the X50 diagnostic interface are installed correctly.

A missing or incorrectly installed screw plug can cause damage to the MOVIMOT® inverter.



5. Set the 2nd speed at switch f2 (active when terminal f1/f2 = "1").



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



### INFORMATION

The first speed can be changed 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.

6. Set the ramp time at the switch t1.



The ramp times are based on a setpoint step change of 1500 rpm (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

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

8. Switch on the DC 24 V and the supply system voltage.

#### 6.6.1 Inverter behavior depending on terminal level

Inverter behavior	Supply system	24V	f1/f2	CW/stop	CCW/stop	Status LED
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 operation with f1	1	1	0	1	0	Green
CCW operation with f1	1	1	0	0	1	Green
CW operation with f2	1	1	1	1	0	Green
CCW operation with f2	1	1	1	0	1	Green
Stop	1	1	x	1	1	Yellow

#### Key

0 = No voltage

1 = Voltage

x = any



## Startup

Startup with options MBG11A or MLG..A

### 6.7 Startup with options MBG11A or MLG..A



#### **⚠ DANGER**

When working on the unit, dangerous voltage levels may still be present up to one minute after the mains is disconnected.

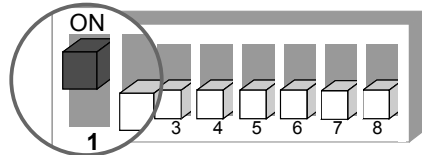
Severe or fatal injuries from electric shock.

- Disconnect the MOVIMOT® drive from the power supply using an appropriate external disconnecting device and secure it against unintentional reconnection to the voltage supply.
- Then wait at least for 1 minute.

1. Check the connection of the MOVIMOT® inverter.

See section "Electrical Installation".

2. Set DIP switch S1/1 of the MOVIMOT® to "ON" (= address 1).



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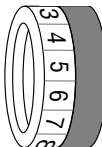
3. Set minimum frequency  $f_{\min}$  with switch f2.



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

4. Set the ramp time at the switch t1.

The ramp times are based on a setpoint step change of 1500 rpm (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

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

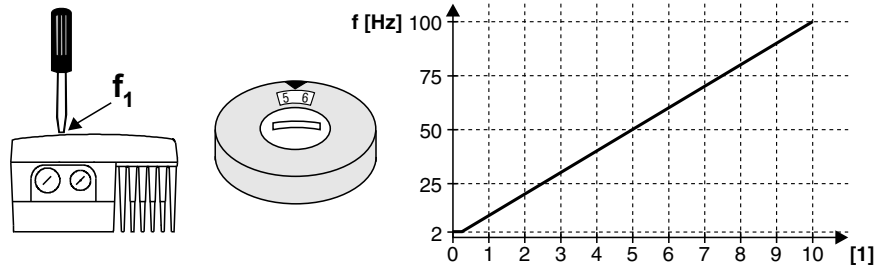
CW/stop	CCW/stop	Meaning
Activated	Activated	<ul style="list-style-type: none"> <li>• Both directions of rotation are enabled</li> </ul>
		<ul style="list-style-type: none"> <li>• Only CW operation enabled</li> <li>• Pre-selected setpoints for CCW rotation result in standstill of drive</li> </ul>
Activated	Not activated	



CW/stop	CCW/stop	Meaning
Not activated	Activated	<ul style="list-style-type: none"> <li>Only CCW operation enabled</li> <li>Pre-selected setpoints for CW rotation result in standstill of drive</li> </ul>
Not activated	Not activated	<ul style="list-style-type: none"> <li>Unit is blocked or drive brought to a stop</li> </ul>

6. Place the MOVIMOT® inverter onto the terminal box and screw it on.

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



329413003

[1] Potentiometer setting

8. Make sure the screw plug of the setpoint potentiometer f1 has a seal and screw it in.

	<p><b>STOP</b></p>
	<p>The enclosure specified in section Technical Data only applies if the screw plugs of the setpoint potentiometer and the X50 diagnostic interface are installed correctly.</p> <p>A missing or incorrectly installed screw plug can cause damage to the MOVIMOT® inverter.</p>

9. Switch on the DC 24 V control voltage / supply system voltage.

	<p><b>INFORMATION</b></p>
	<p>For notes on operation with the MBG11A or MLG..A options, refer to sec. "Keypads MBG11A and MLG..A" (see page 101).</p>



## Startup

### Startup with option MWA21A (speed control module)

#### 6.8 Startup with option MWA21A (speed control module)



#### **⚠ DANGER**

When working on the unit, dangerous voltage levels may still be present up to one minute after the mains is disconnected.

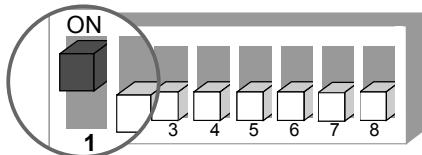
Severe or fatal injuries from electric shock.

- Disconnect the MOVIMOT<sup>®</sup> drive from the power supply using an appropriate external disconnecting device and secure it against unintentional reconnection to the voltage supply.
- Then wait at least for 1 minute.

1. Check the connection of the MOVIMOT<sup>®</sup> inverter.

See section "Electrical Installation".

2. Set DIP switch S1/1 of the MOVIMOT<sup>®</sup> to "ON" (= address 1).



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3. 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

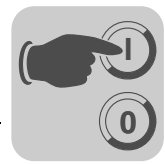
4. Set the ramp time at the switch t1.

The ramp times are based on a setpoint step change of 1500 rpm (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



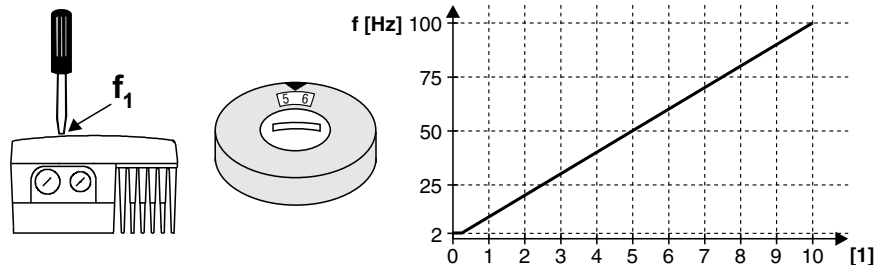


5. Check to see if requested direction of rotation has been enabled.

CW/stop	CCW/stop	Meaning
Activated	Activated	<ul style="list-style-type: none"> <li>Both directions of rotation are enabled</li> </ul>
Activated	Not activated	<ul style="list-style-type: none"> <li>Only CW operation enabled</li> <li>Pre-selected setpoints for CCW rotation result in standstill of drive</li> </ul>
Not activated	Activated	<ul style="list-style-type: none"> <li>Only CCW operation enabled</li> <li>Pre-selected setpoints for CW rotation result in standstill of drive</li> </ul>
Not activated	Not activated	<ul style="list-style-type: none"> <li>Unit is blocked or drive brought to a stop</li> </ul>

6. Place the MOVIMOT® inverter onto the terminal box and screw it on.

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



329413003


[1] Potentiometer setting



## Startup

### Startup with option MWA21A (speed control module)

8. Make sure the screw plug of the setpoint potentiometer f1 has a seal and screw it in.

	<b>STOP</b>
	<p>The enclosure specified in section Technical Data only applies if the screw plugs of the setpoint potentiometer and the X50 diagnostic interface are installed correctly.</p> <p>A missing or incorrectly installed screw plug can cause damage to the MOVIMOT® inverter.</p>


9. 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	
I signal 4 – 20 mA	ON	ON	yes
U signal 2 – 10 V	OFF	ON	

10. Switch on the DC 24 V control voltage / supply system voltage.

11. Enable the MOVIMOT® drive.

by applying 24 V to terminal 4 (CW rotation) or terminal 5 (CCW rotation) of the MWA21A option.

	<b>INFORMATION</b>
	<p>For notes on operating the MWA21A option, refer to sec. "Speed control module MWA21A" (see page 102).</p>



## 6.9 Supplementary notes for installation close to the motor

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

### 6.9.1 Checking the connection type of the connected motor

Use the following figure to check that the selected connection type is identical for the MOVIMOT® and the connected motor.



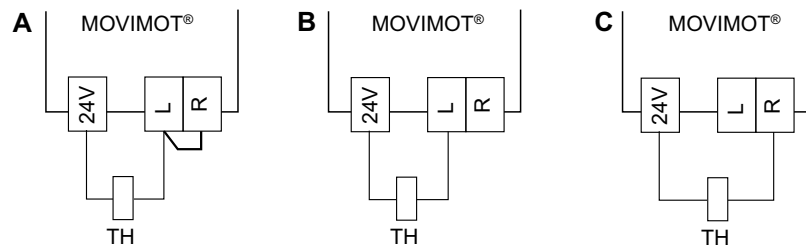
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**Important: For brake motors: Do not install brake rectifiers inside the terminal box of the motor!**

### 6.9.2 Motor protection and direction of rotation enable

The connected motor must be equipped with a TH.

- For control via RS-485, the TH must be wired as follows:



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[A] Both directions of rotation are enabled

[B] Only **CCW** operation is enabled

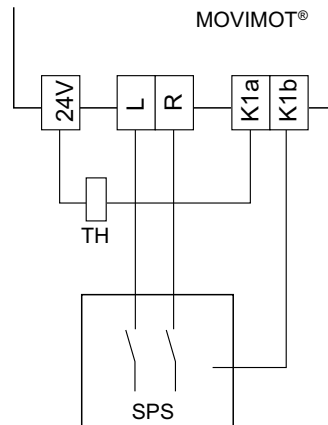
[C] Only **CW** operation is enabled



## Startup

### Supplementary notes for installation close to the motor

- For control via binary signals, SEW-EURODRIVE recommends that you connect the TH in series with the "Ready signal" relay (see the following illustration).
  - The ready signal must be monitored by an external controller.
  - As soon as the ready signal is no longer applied, the drive must be switched off (terminals CW  $\curvearrowright$  and CCW  $\curvearrowleft$  = "0").



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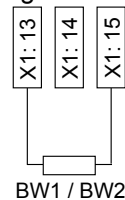
#### 6.9.3 DIP switch

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

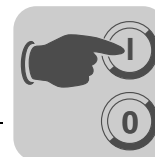
S1 Meaning	1	2	3	4	5 Motor protection	6 Motor Power rating	7 PWM Frequency	8 No-load damping
	Binary encoding RS-485 unit address							
	2 <sup>0</sup>	2 <sup>1</sup>	2 <sup>2</sup>	2 <sup>3</sup>				
ON	1	1	1	1	Off	Motor one size smaller	Variable (16,8,4 kHz)	On
OFF	0	0	0	0	On	Adjusted	4 kHz	Off

#### 6.9.4 Braking resistor

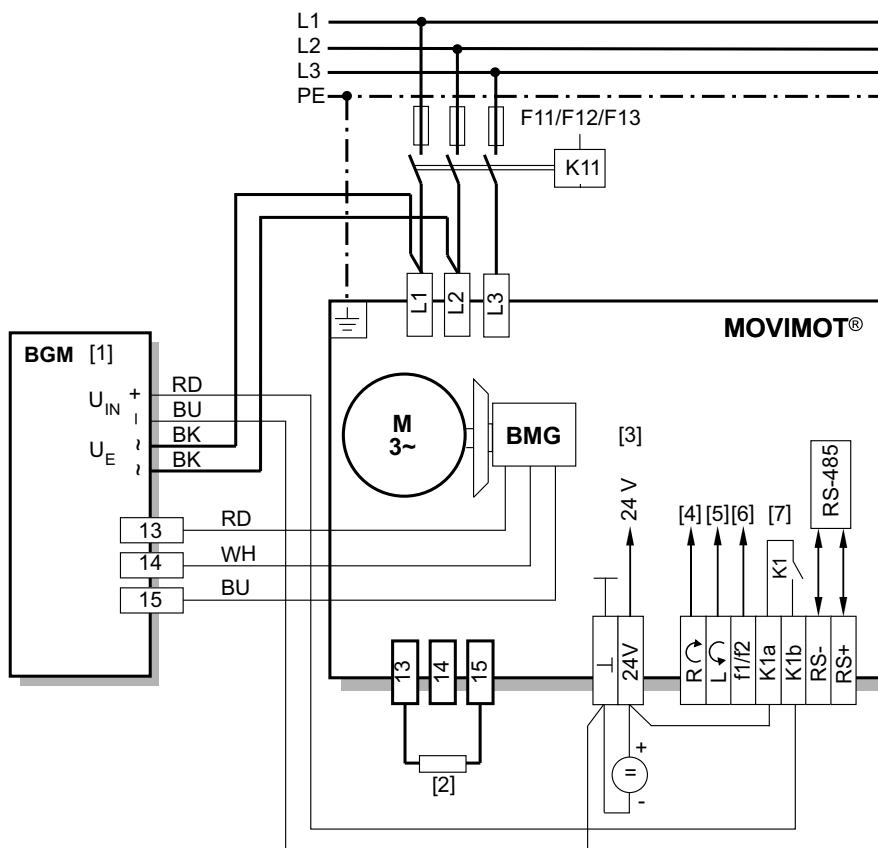
- For **motors without brake**, a braking resistor must be connected to the MOVIMOT®.



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



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- [1] BGM brake control mounted in the terminal box
- [2] External BW braking resistor (for assignment, see sec. "Technical Data")
- [3] DC 24 V supply
- [4] CW/stop
- [5] CCW/stop
- [6] Setpoint changeover f1/f2
- [7] Brake relay

### 6.9.5 Mounting the MOVIMOT® inverter in the field distributor

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

- PROFIBUS Interfaces, Field Distributors
- Interbus Interfaces, Field Distributors
- DeviceNet/CANopen Interfaces, Field Distributors
- AS-interface Interfaces, Field Distributors



## 7 Startup with RS-485 Interface/Fieldbus

### 7.1 Important notes on startup

	<p><b>⚠ DANGER</b></p> <p>Before removing / fitting the MOVIMOT<sup>®</sup> inverter, you must disconnect it from the supply system. Dangerous voltages may still be present for up to one minute after disconnection from the power supply.</p> <p>Severe or fatal injuries from electric shock.</p> <ul style="list-style-type: none"> <li>• Disconnect the MOVIMOT<sup>®</sup> drive from the power supply using an appropriate external disconnecting device and secure it against unintentional reconnection to the voltage supply.</li> <li>• Then wait at least for 1 minute.</li> </ul>
	<p><b>⚠ WARNING</b></p> <p>The surfaces of MOVIMOT<sup>®</sup> and external options, e.g. braking resistor (especially the heat sink), can become very hot during operation.</p> <p>Danger of burns.</p> <ul style="list-style-type: none"> <li>• Do not touch the MOVIMOT<sup>®</sup> drive and external options until they have cooled down sufficiently.</li> </ul>
	<p><b>INFORMATION</b></p> <ul style="list-style-type: none"> <li>• Remove paint protection cap from the status LED before startup.</li> <li>• Remove paint protection film from the nameplates before startup.</li> <li>• Check that all protective covers are installed correctly.</li> <li>• Observe a minimum switch-off time of 2 seconds for the mains contactor K11.</li> </ul>

### 7.2 Startup procedure

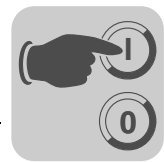
1. Check the connection of the MOVIMOT<sup>®</sup> inverter.  
See section "Electrical Installation".

2. Set the correct RS-485 address on DIP switches S1/1 – S1/4.

**Always set address "1" in conjunction with SEW fieldbus interfaces (MF../MQ..) or with MOVIFIT<sup>®</sup>.**

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



3. 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

4. If the ramp is not specified via fieldbus (operation with 2 PD), set the ramp time at switch t1.



The ramp times are based on a setpoint step change of 1500 rpm (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

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

CW/stop	CCW/stop	Meaning
Activated	Activated	<ul style="list-style-type: none"> <li>Both directions of rotation are enabled</li> </ul>
Activated	Not activated	<ul style="list-style-type: none"> <li>Only CW operation enabled</li> <li>Pre-selected setpoints for CCW rotation result in standstill of drive</li> </ul>
Not activated	Activated	<ul style="list-style-type: none"> <li>Only CCW operation enabled</li> <li>Pre-selected setpoints for CW rotation result in standstill of drive</li> </ul>
Not activated	Not activated	<ul style="list-style-type: none"> <li>Unit is blocked or drive brought to a stop</li> </ul>

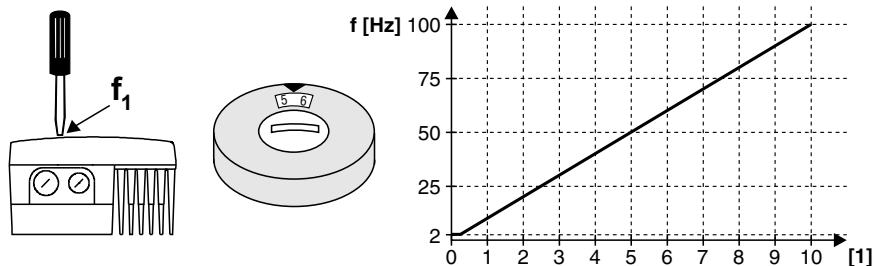
6. Place the MOVIMOT® inverter onto the terminal box and screw it on.



## Startup with RS-485 Interface/Fieldbus

### Startup procedure

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



329413003

[1] Potentiometer setting

8. Make sure the screw plug of the setpoint potentiometer f1 has a seal and screw it in.



### STOP

The enclosure specified in section Technical Data only applies if the screw plugs of the setpoint potentiometer and the X50 diagnostic interface are installed correctly.

A missing or incorrectly installed screw plug can cause damage to the MOVIMOT® inverter.

9. Switch on the DC 24 V control voltage / supply system voltage.



### INFORMATION

For further information on the function in connection to the RS-485 master, refer to sec. "Function with RS-485 master" (see page 94).

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

- PROFIBUS Interfaces, Field Distributors
- Interbus Interfaces, Field Distributors
- DeviceNet/CANopen Interfaces, Field Distributors
- AS-interface Interfaces, Field Distributors



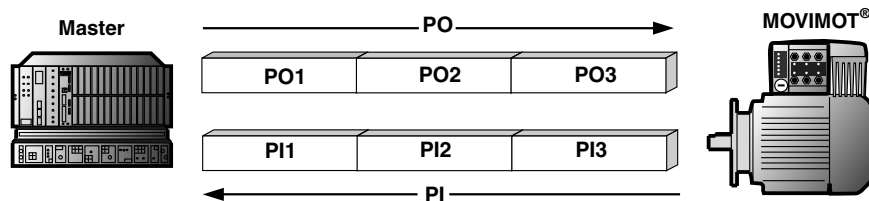


### 7.3 Coding of process data

The same process data information is used for control and setpoint selection in all field-bus systems. The process data is coded according to the standard MOVILINK<sup>®</sup> profile for SEW drive inverters.

MOVIMOT<sup>®</sup> offers the following variants:

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



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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

#### 7.3.1 2 process data words

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

#### 7.3.2 3 process data words

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

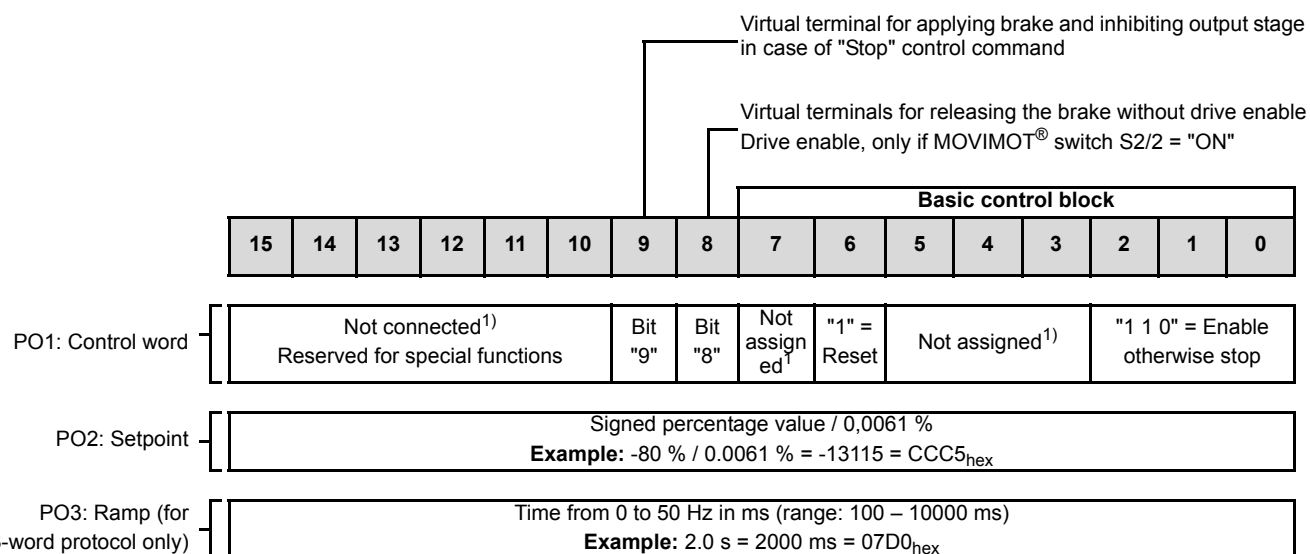


#### 7.3.3 Process output data

Process output data is sent from the higher-level controller to the MOVIMOT® inverter (control information and setpoints). However, they only come into effect in MOVIMOT® if the RS-485 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® inverter using the following process output data:

- PO1: Control word
- PO2: Speed [%] (setpoint)
- PO3: Ramp



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<sub>hex</sub>. For enabling the MOVIMOT® inverter, input terminal R (↻) and/or CCW (↻) must be switched to +24 V (jumpered with terminal 24V).

The "Stop" control command is issued by resetting bit 2 = "0." Use the stop command 0002<sub>hex</sub> to enable compatibility with other SEW inverter series. MOVIMOT® always triggers a stop at the current ramp whenever bit 2 = "0," regardless of the status of bit 0 and bit 1.

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

**Control word, bit 8 = Release brake without drive enable** If DIP switch S2/2 = "ON", the brake can be released without drive enable by setting bit 8 (not in hoist operation).

**Control word, bit 9 = Apply brake when control command "Stop" is issued** When bit 9 is set after activating the control command "Stop", MOVIMOT® applies the brake and inhibits the output stage.



**Speed [%]** The speed setpoint is given as a relative value in percentage and refers to maximum speed set using the setpoint potentiometer f1.

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

$4000_{\text{hex}} = +100\%$  (CW operation)

-> 1 digit = 0.0061 %

Example: 80 %  $f_{\text{max}}$ , CCW rotation:

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

**Ramp** The current integrator in the process output data word PO3 is transferred if the process data exchange takes place using three process data words. The integrator ramp set with switch t1 is used if the MOVIMOT<sup>®</sup> inverter is controlled via two process data items.

Coding: 1 digit = 1 ms

Range: 100 – 10000 ms

Example: 2.0 s = 2000 ms<sup>1)</sup> = 2000<sub>dec</sub> = 07D0<sub>hex</sub>

#### 7.3.4 Process input data

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

The MOVIMOT<sup>®</sup> inverter supports the following process input data:

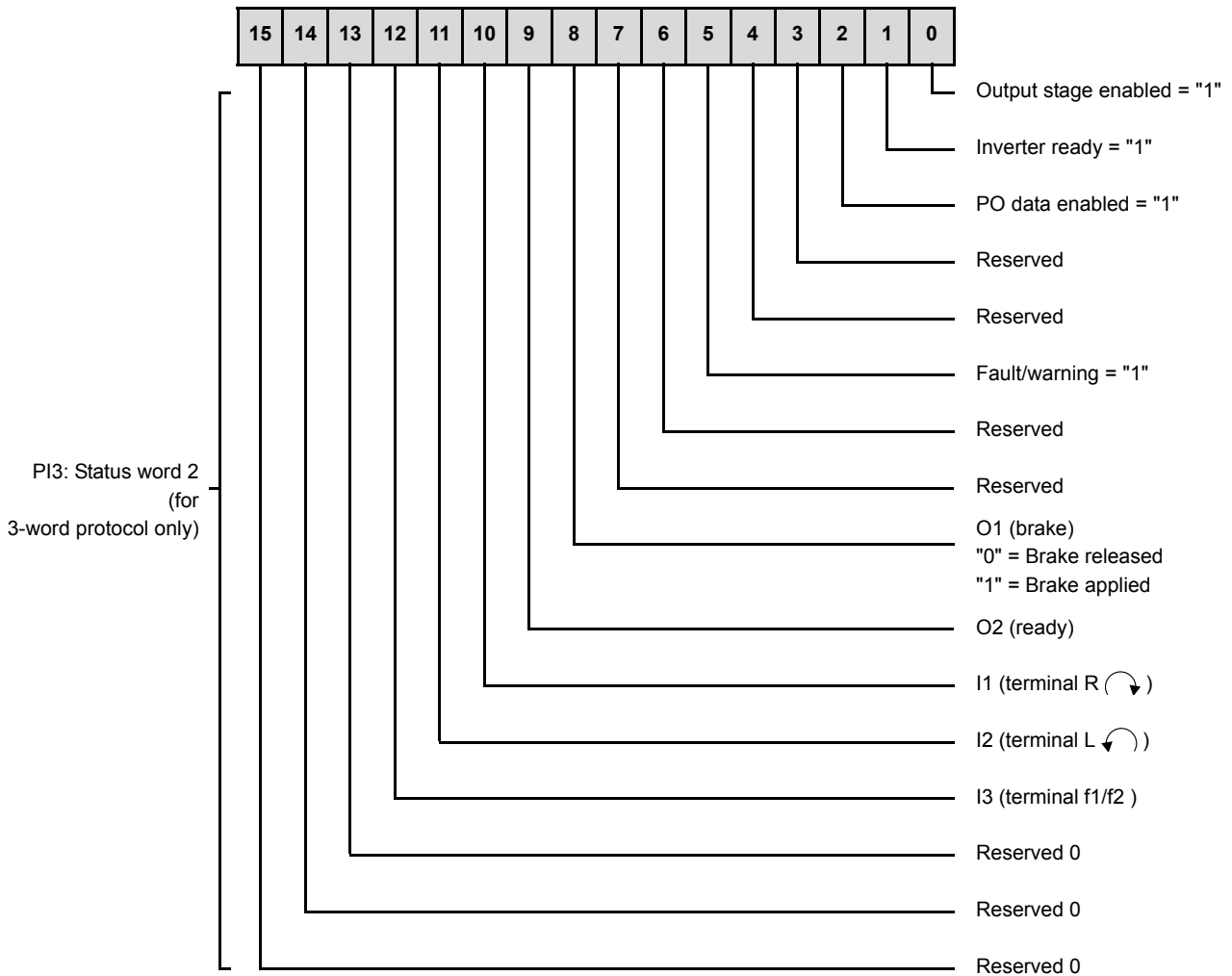
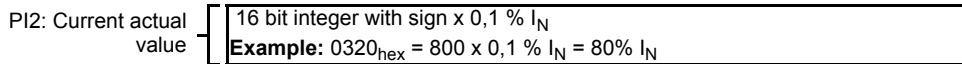
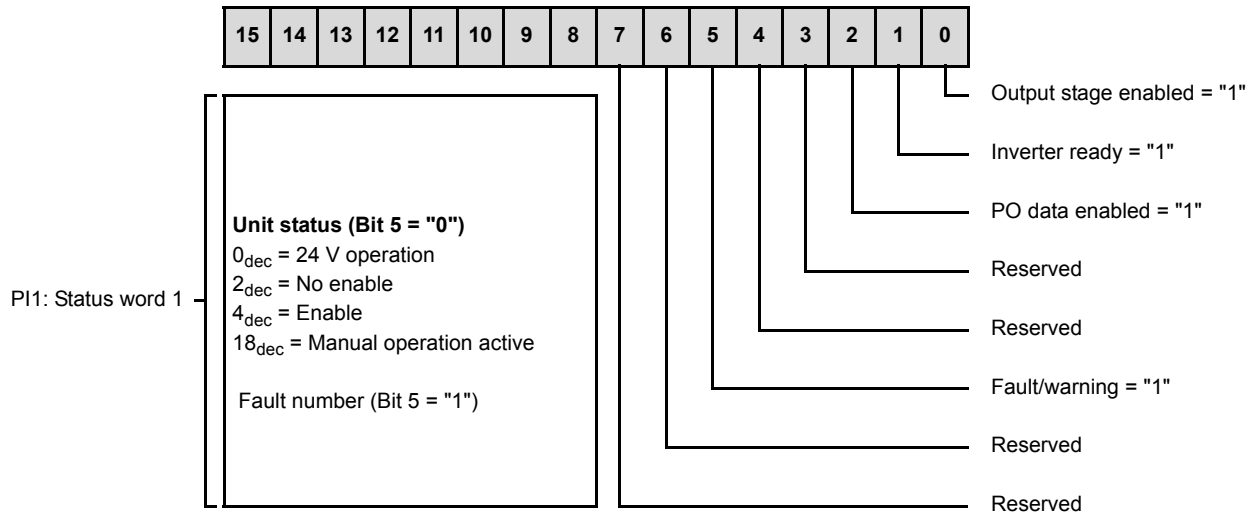
- P11: Status word 1
- P12: Output current
- P13: Status word 2

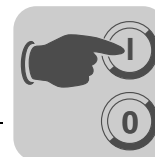
1) The ramp times are based on a setpoint step change of 1500 rpm (50 Hz).



## Startup with RS-485 Interface/Fieldbus

### Coding of process data





The following table shows the assignment of status word 1:

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

The following table shows the assignment of status word 2:

Bit	Meaning	Explanation
0	<b>Output stage enabled</b>	1: MOVIMOT® is enabled 0: MOVIMOT® is not enabled
1	<b>Inverter ready</b>	1: MOVIMOT® is ready 0: MOVIMOT® is not ready
2	<b>PO data enabled</b>	1: Process data is enabled; Drive can be controlled via fieldbus 0: Process data is inhibited; Drive cannot be controlled via fieldbus
3	Reserved	Reserved = 0
4	Reserved	Reserved = 0
5	<b>Fault/warning</b>	1: Fault/warning present 0: No fault/warning
6	Reserved	Reserved = 0
7	Reserved	Reserved = 0
8	<b>O1 brake</b>	1: Brake applied 0: Brake released
9	<b>O2 ready</b>	1: MOVIMOT® is ready 0: MOVIMOT® is not ready
10	<b>I1 (CW)</b>	1: Binary input is set 0: Binary input is not set
11	<b>I2 (CCW)</b>	
12	<b>I3 (f1/f2 )</b>	
13	Reserved	Reserved = 0
14	Reserved	Reserved = 0
15	Reserved	Reserved = 0

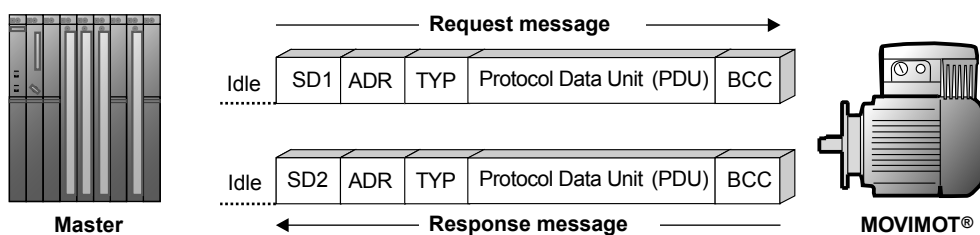


### 7.4 Function with RS-485 master

- The higher-level controller (e.g. PLC) is the master, the MOVIMOT<sup>®</sup> 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<sup>®</sup> protocol (see section "Coding of process data" (see page 89)) with a fixed transfer rate of 9600 baud.

#### 7.4.1 Message structure

The following figure shows the message structure between the RS-485 master and the MOVIMOT<sup>®</sup> inverter:



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Idle = Idle period of at least 3.44 ms

SD1 = Start delimiter (start character) 1: Master -> MOVIMOT<sup>®</sup>: 02<sub>hex</sub>

SD2 = Start delimiter (start character) 2: MOVIMOT<sup>®</sup> -> master: 1D<sub>hex</sub>

ADR = Address 1 – 15

Group address 101 – 115

254 = Point-to-point

255 = Broadcast

TYP = User data type

PDU = User data

BCC = Block check character: XOR all bytes



#### INFORMATION

If the type "cyclic" is selected, MOVIMOT<sup>®</sup> expects the next bus activity after a maximum wait of one second (master protocol). If this bus activity is not detected, MOVIMOT<sup>®</sup> rests automatically (timeout monitoring).



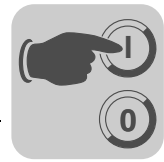
#### WARNING

There is no timeout monitoring if the type "acyclical" is selected.

The drive can continue to operate uncontrolled when the bus connection is interrupted.

Death or severe injuries from uncontrolled operation.

- Run the bus connection between master and MOVIMOT<sup>®</sup> inverter only with "cyclical" transmission.



#### 7.4.2 Idle and start delimiter

MOVIMOT<sup>®</sup> detects the start of a request message by means of an idle period lasting at least 3.44 ms, followed by the character 02<sub>hex</sub> (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.

#### 7.4.3 Address (ADR)

MOVIMOT<sup>®</sup> 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.

#### 7.4.4 Group address

Furthermore, ADR = 101 – 115 makes it possible to group several MOVIMOT<sup>®</sup> inverters. When this is done, all MOVIMOT<sup>®</sup> inverters in one group are set to the same RS-485 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!

#### 7.4.5 User data type (TYP)

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

Type	Transmission variant	Process data length	User data
03 <sub>hex</sub>	Cyclical	2 words	Control word / speed [%] / status word 1 / output current
83 <sub>hex</sub>	Acyclical	2 words	
05 <sub>hex</sub>	Cyclical	3 words	Control word / speed [%] / ramp / status word 1 / output current / status word 2
85 <sub>hex</sub>	Acyclical	3 words	

#### 7.4.6 Timeout monitoring

In the "cyclical" transmission variant, the MOVIMOT<sup>®</sup> 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.

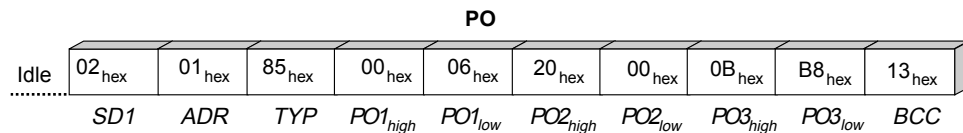


#### 7.4.7 Block check character BCC

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 entered in the BCC at the end of the message.

#### Example

The following figure gives an example of how a block check character is created for an acyclical message of type PDU  $85_{\text{hex}}$  with 3 process data items. The XOR logic operation on the characters SD1 –  $PO3_{\text{low}}$  results in the value  $13_{\text{hex}}$  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 –  $PO3_{\text{low}}$  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. Any other result will be displayed as a transmission error. The message may have to be repeated.



	Stop	Parity									Start
SD1 : $02_{\text{hex}}$	1	0	0	0	0	0	0	0	1	0	—
ADR : $01_{\text{hex}}$	1	0	0	0	0	0	0	0	0	1	XOR
TYP : $85_{\text{hex}}$	1	1	0	0	0	1	0	0	1	1	XOR
$PO1_{\text{high}}$ : $00_{\text{hex}}$	0	0	0	0	0	0	0	0	0	0	XOR
$PO1_{\text{low}}$ : $06_{\text{hex}}$	0	0	0	0	0	1	0	1	0	0	XOR
$PO2_{\text{high}}$ : $20_{\text{hex}}$	1	0	0	1	0	0	0	0	0	0	XOR
$PO2_{\text{low}}$ : $00_{\text{hex}}$	0	0	0	0	0	0	0	0	0	0	XOR
$PO3_{\text{high}}$ : $0B_{\text{hex}}$	1	0	0	0	0	0	1	1	1	1	XOR
$PO3_{\text{low}}$ : $B8_{\text{hex}}$	0	1	0	1	1	0	1	0	0	0	XOR
<b>BCC : <math>13_{\text{hex}}</math></b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	

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#### 7.4.8 Message processing in the MOVILINK® master

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

*a) Sending a request message*

(E.g. sending setpoints to 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) Receiving a response message*

(Acknowledgement 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<sub>hex</sub>?
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).**



#### 7.4.9 Sample message

This example deals with the control of a MOVIMOT® AC motor using three process data words of PDU type 85<sub>hex</sub> (3 PD acyclical). The RS-485 master sends three process output data words (PO) to the MOVIMOT® AC motor. The MOVIMOT® inverter replies by sending three process input data words (PI).

*Request message from the RS-485 master to MOVIMOT®*

**PO1: 0006<sub>hex</sub>** Control word 1 = Enable  
**PO2: 2000<sub>hex</sub>** Speed [%] setpoint = 50 % (of  $f_{max}$ <sup>1)</sup>)  
**PO3: 0BB8<sub>hex</sub>** Ramp = 3 s

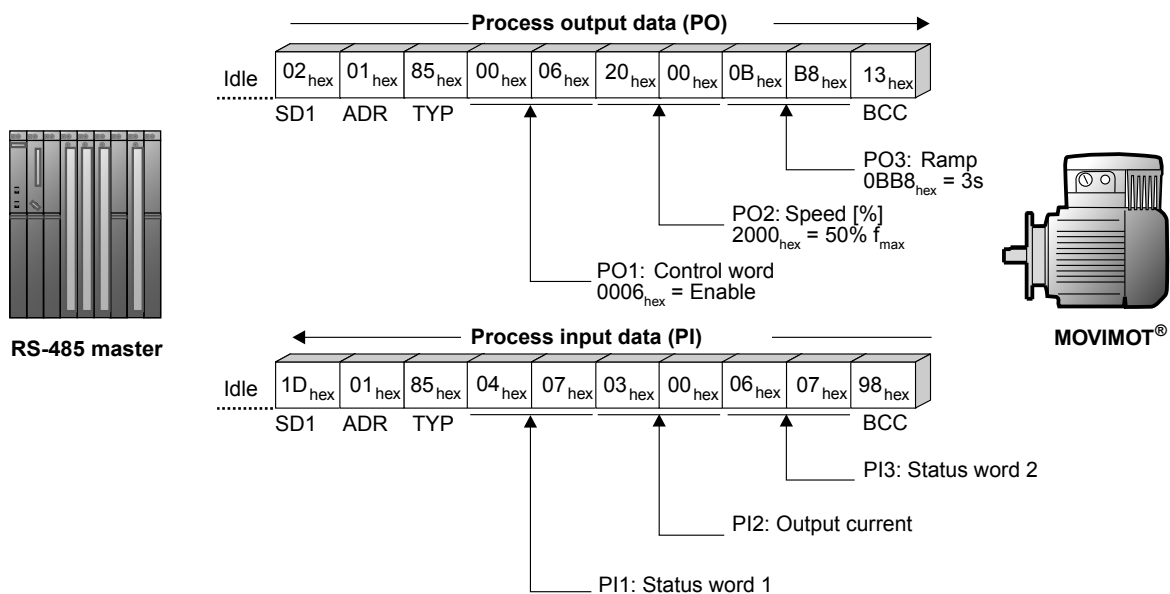
1)  $f_{max}$  is specified on setpoint potentiometer f1

*Response message from MOVIMOT® to the RS-485 master*

**PI1: 0406<sub>hex</sub>** Status word 1  
**PI2: 0300<sub>hex</sub>** Output current [%  $I_N$ ]  
**PI3: 0607<sub>hex</sub>** Status word 2

For more information on the coding of the process data, refer to sec. "Coding process data" (see page 89).

*Sample message "3 PD acyclical"*



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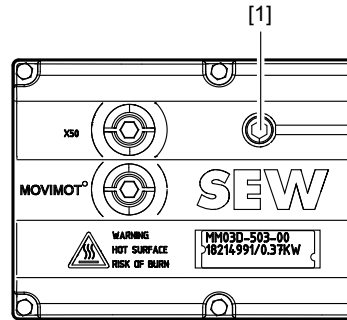
This example shows the acyclical transmission variant, i.e. no timeout monitoring is active in the MOVIMOT® inverter. The cyclical transmission variant can be implemented with the entry TYPE = 05<sub>hex</sub>. In this case, the MOVIMOT® inverter expects the next bus activity (request message of the aforementioned types) within one second at the latest, otherwise the MOVIMOT® inverter stops automatically (timeout monitoring).



## 8 Operation

### 8.1 Operating display

The status LED is located on the top of the MOVIMOT® inverter (see following figure).



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[1] MOVIMOT® status LED

#### 8.1.1 Meaning of the status LED states

The three-color status LED indicates the operating and error statuses of the MOVIMOT® inverter.

LED color	LED status	Operating state	Description
–	Off	Not ready	No 24 V power supply
Yellow	Flashes steadily	Not ready	Self-test phase active or 24 V power supply present but supply voltage not OK
Yellow	Flashing evenly, fast	Ready	Brake release without drive enable active (only with S2/2 = "ON")
Yellow	Steady light	Ready, but unit inhibited	24 V power supply and supply voltage OK, but no enable signal If drive does not run when enable signal is present - check startup!
Green / yellow	Flashing with alternating colors	Ready, but timeout	Faulty communication with cyclical data exchange
Green	Steady light	Unit enabled	Motor in operation
Green	Flashing evenly, fast	Current limit active	Drive operating at current limit
Red	Steady light	Not ready	Check the 24 V supply. Make sure that there is a smoothed DC voltage with low ripple (residual ripple max. 13%) present


#### Status LED flash codes

Flashing steadily:	LED 600 ms on, 600 ms off
Flashing evenly, fast:	LED 100 ms on, 300 ms off
Flashing with alternating colors:	LED 600 ms green, 600 ms yellow

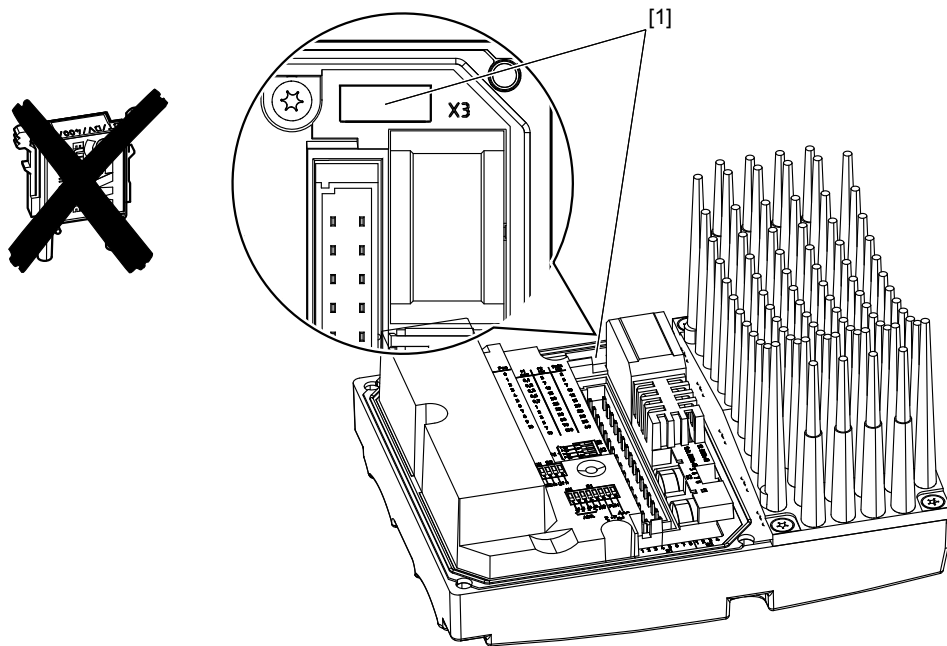
For a description of the error statuses, refer to section "Status and error display" (see page 103).



#### 8.2 Drive-ID module

	<b>INFORMATION</b>
	<p>It is <u>not permitted to plug in Drive-ID modules for DR motor types</u> into MOVIMOT<sup>®</sup> MM..D drives with DT/DV/DZ motors.</p>

The motor and brake data for DT/DV/DZ motors are stored in the MOVIMOT<sup>®</sup> inverter without Drive-ID module. For this reason, the slot for the Drive-ID module remains empty.



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[1] Slot for Drive-ID module



### 8.3 Keypads MBG11A and MLG..A

	<p><b>INFORMATION</b></p> <p>For notes on startup with the MBG11A or MLG..A options, refer to sec. "Startup with the MBG11A or MLG..A options" (see page 78).</p>
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The following MOVIMOT® functions can be executed with the MBG11A and MBG..A keypads:

Function	Explanation
<b>Display</b>	<p>Negative display value, e.g.  = counterclockwise</p> <p>Positive display value, e.g.  = clockwise</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. <b>Important: If the display is "0," the drive is rotating at <math>f_{min}</math>.</b></p>
<b>Increase the speed</b>	<p>For CW direction: </p> <p>For CCW direction: </p>
<b>Reducing the speed</b>	<p>For CW direction: </p> <p>For CCW direction: </p>
<b>Stopping the MOVIMOT® drive</b>	<p>Pressing both keys at the same time:  Display = </p>
<b>Starting the MOVIMOT® drive</b>	<p> or </p> <p><b>Important: After enable, the MOVIMOT® drive accelerates to the value and direction of rotation saved last.</b></p>
<b>Change direction of rotation from CW to CCW</b>	<p>1.  Until display = </p> <p>2. Pressing  again changes direction of rotation from CW to CCW.</p>
<b>Change direction of rotation from CCW to CW</b>	<p>1.  Until display = </p> <p>2. Pressing  again changes direction of rotation from CCW to CW.</p>
<b>Memory function</b>	<p>When the mains 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 Service

### 9.1 Status and error display

#### 9.1.1 Status LED

The status LED is located on the top of the MOVIMOT® inverter.

#### Meaning of the status LED states

The three-color status LED indicates the operating and error statuses of the MOVIMOT® inverter.

LED color	LED status	Fault code	Description
–	Off	Not ready	No 24 V power supply
Yellow	Flashes steadily	Not ready	Self-test phase active or 24 V power supply present but supply voltage not OK
Yellow	Flashing evenly, fast	Ready	Brake release without drive enable active (only with S2/2 = "ON")
Yellow	Steady light	Ready, but unit inhibited	24 V power supply and supply voltage OK, but no enable signal If drive does not run when enable signal is present - check startup!
Green / yellow	Flashing with alternating colors	Ready, but timeout	Faulty communication with cyclical data exchange
Green	Steady light	Unit enabled	Motor in operation
Green	Flashing evenly, fast	Current limit active	Drive operating at current limit
Red	Steady light	Not ready	Check the 24 V supply. Make sure that there is a smoothed DC voltage with low ripple (residual ripple max. 13%) present
Red	2x flashing, break	Fault 07	DC link voltage too high
Red	Flashing slowly	Fault 08	Speed monitoring fault (only with S2/4 = "ON") or additional function 13 is active
		Fault 90	Incorrect motor/inverter assignment
		Faults 17 to 24, 37	CPU fault
		Faults 25, 94	EEPROM fault
Red	3x flashing, break	Fault 01	Overcurrent in output stage
		Fault 11	Overtemperature in output stage
Red	4x flashing, break	Fault 84	Overload in motor
Red	5x flashing, break	Fault 89	Overtemperature in brake Assignment of motor to frequency inverter incorrect
Red	6x flashing, break	Fault 06	Mains phase failure
		Fault 81	Start condition <sup>1)</sup>
		Fault 82	Output phases interrupted <sup>1)</sup>

1) Only for hoist applications

#### Status LED flash codes

Flashing steadily:	LED 600 ms on, 600 ms off
Flashing evenly, fast:	LED 100 ms on, 300 ms off
Flashing with alternating colors:	LED 600 ms green, 600 ms yellow
N x flashing, pause:	LED N x (600 ms red, 300 ms off), then LED off for 1 s

The faults are described on the next page.



#### 9.1.2 Fault list

Fault	Cause / solution
<b>Communication timeout</b> (motor stops, without fault code)	<ul style="list-style-type: none"> <li>Missing connection <math>\perp</math>, RS+, RS- between MOVIMOT® and RS-485 master. Check and establish connection, especially earth.</li> <li>EMC influence Check shielding of data lines and improve, if necessary.</li> <li>Incorrect type (cyclical) in acyclical data transfer, protocol time between the individual message is longer than 1 s (timeout interval). Check the number of MOVIMOT® units connected to the master (a maximum of 8 MOVIMOT® units can be connected as slaves for cyclic communication). Reduce message cycle or select message type "acyclic".</li> </ul>
<b>DC link voltage too low, supply system off was detected</b> (motor stops, without fault code)	<p>Check supply system leads, supply voltage and 24 V electronics supply voltage for interruption. Check the value of the 24 V electronics supply voltage (permitted voltage range 24 V <math>\pm</math> 25%, EN 61131-2 residual ripple max. 13 %)</p> <p>In case of cyclical communication, the motor restarts automatically as soon as the voltage reaches normal values.</p>
<b>Fault code 01</b> <b>Overcurrent in output stage</b>	<p>Short circuit on inverter output.</p> <p>Check the connection between the inverter output and the motor as well as the motor winding for short circuits.</p> <p>Reset the fault by switching off the DC 24 V supply voltage or resetting the error.</p>
<b>Fault code 06</b> <b>Phase failure</b> (The fault can only be detected when the drive is at load)	<p>Check the supply system cable for phase failure.</p> <p>Reset the fault by switching off the DC 24 V supply voltage or resetting the error.</p>
<b>Fault code 07</b> <b>DC link voltage too high</b>	<ul style="list-style-type: none"> <li>Ramp time too short → Increase ramp time.</li> <li>Faulty connection between brake coil/braking resistor → Check the connection between braking resistor and brake coil. Correct, if necessary.</li> <li>Incorrect internal resistance of brake coil/braking resistor → Check internal resistance of brake coil/braking resistor (see sec. "Technical Data").</li> <li>Thermal overload in braking resistor → Wrong size of braking resistor selected.</li> <li>Invalid voltage range of the supply input voltage → Check supply input voltage for valid voltage range</li> </ul> <p>Reset the fault by switching off the DC 24 V supply voltage or resetting the error.</p>
<b>Fault code 08</b> <b>Speed monitoring</b>	<p>Speed monitoring has triggered, load on the drive is too high</p> <p>Reduce the load on the drive</p> <p>Reset the fault by switching off the DC 24 V supply voltage or resetting the error.</p>
<b>Fault code 11</b> <b>Thermal overload of the output stage or internal unit error</b>	<ul style="list-style-type: none"> <li>Clean the heat sink</li> <li>Lower ambient temperature</li> <li>Prevent heat build-up</li> <li>Reduce the load on the drive</li> </ul> <p>Reset the fault by switching off the DC 24 V supply voltage or resetting the error.</p>
<b>Fault codes 17 to 24, 37</b> <b>CPU fault</b>	<p>Reset the error by switching off the 24 V power supply or via error reset.</p> <p>Consult the SEW Service if the error reoccurs.</p>
<b>Fault code 25</b> <b>EEPROM error</b>	<p>Fault while accessing EEPROM</p> <p>Reset the error by switching off the 24 V power supply or via error reset.</p> <p>Consult the SEW Service if the error reoccurs.</p>
<b>Fault code 43</b> <b>Communication timeout</b>	<p>Communication timeout during cyclical communication via RS-485</p> <p>If this error occurs, the drive is decelerated and stopped along the set ramp.</p> <ul style="list-style-type: none"> <li>Check/establish communication link between RS-485 master and MOVIMOT®.</li> <li>Check the number of slaves connected to the RS-485 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 RS-485 master for cyclical communication.</li> </ul> <p><b>Caution:</b> The drive is enabled again after communication has been re-established.</p>





Fault	Cause / solution
<b>Fault code 81</b> <b>Start condition error</b>	The motor could not be supplied with the correct amount of current during the pre-magnetizing time. <ul style="list-style-type: none"> <li>• Rated motor power too small in relation to rated inverter power</li> <li>• Motor cable cross section too small</li> </ul> Check connection between MOVIMOT® inverter and motor.
<b>Fault code 82</b> <b>Output open fault</b>	<ul style="list-style-type: none"> <li>• 2 or all output phases interrupted</li> <li>• Rated motor power too small in relation to rated inverter power</li> </ul> Check connection between MOVIMOT® inverter and motor.
<b>Fault code 84</b> <b>Thermal overload of motor</b>	<ul style="list-style-type: none"> <li>• When the MOVIMOT® inverter is installed close to the motor, set DIP switch S1/5 to "ON".</li> <li>• For combinations of "MOVIMOT® and motor with one lower power rating", check the setting of DIP switch S1/6.</li> <li>• Lower ambient temperature</li> <li>• Prevent heat build-up</li> <li>• Reduce the load on the motor</li> <li>• Increase the speed</li> <li>• Check the combination of the drive and MOVIMOT® inverter if the fault is signaled shortly after the first enable.</li> <li>• The temperature monitoring in the motor (TH winding thermostat) has tripped when using MOVIMOT® with the selected extra function 5 → Reduce load on the motor.</li> </ul> Reset the fault by switching off the DC 24 V supply voltage or resetting the error.
<b>Fault code 89</b> <b>Thermal overload of brake coil or brake coil defective, brake coil connected incorrectly</b>	<ul style="list-style-type: none"> <li>• Increase the set ramp time</li> <li>• Brake inspection (see "DR/DV/DT/DTE/DVE Series AC Motors" operating instructions")</li> <li>• Check brake coil connection</li> <li>• Contact SEW Service</li> <li>• Check the combination of the drive (brake coil) and MOVIMOT® inverter if the fault is signaled shortly after the first enable.</li> <li>• For combinations of "MOVIMOT® and motor with one lower power rating", check the setting of DIP switch S1/6.</li> </ul> Reset the fault by switching off the DC 24 V supply voltage or resetting the error.
<b>Fault code 94</b> <b>EEPROM checksum error</b>	<ul style="list-style-type: none"> <li>• Defective EEPROM</li> </ul> Contact SEW Service.



#### 9.2 Replacing units



#### DANGER

When working on the unit, dangerous voltage levels may still be present up to one minute after the mains is disconnected.

Severe or fatal injuries from electric shock.

- Disconnect the MOVIMOT<sup>®</sup> drive from the supply system and secure it against unintentional reconnection to the voltage supply.
- Then wait at least for 1 minute.

1. Remove the screws and take off the MOVIMOT<sup>®</sup> inverter from the terminal box.
2. Compare the data on the nameplate of the previous MOVIMOT<sup>®</sup> inverter with the data on the nameplate of the new MOVIMOT<sup>®</sup> inverter.



#### STOP

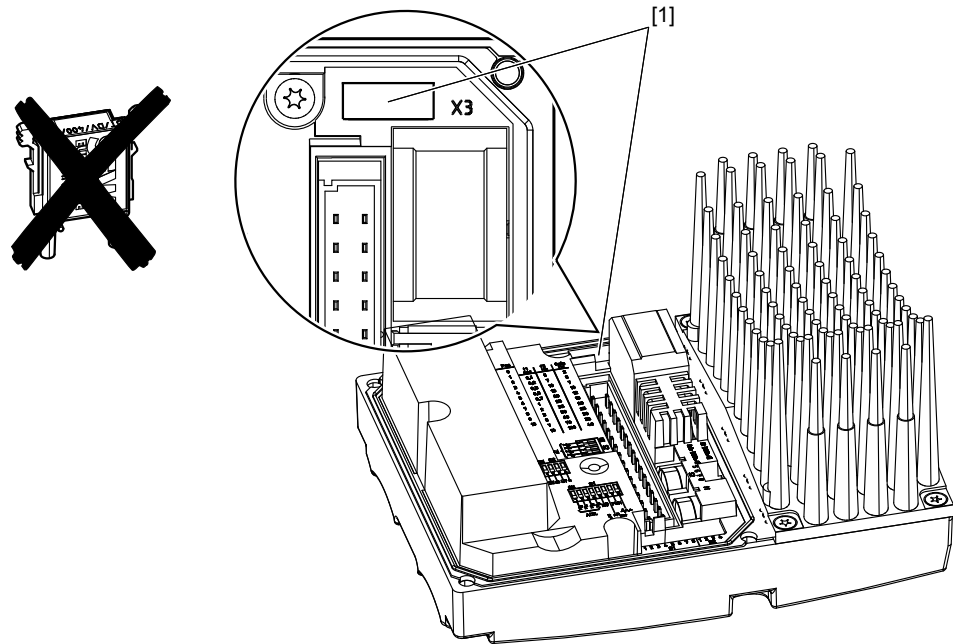
The previous MOVIMOT<sup>®</sup> inverter can only be replaced by a MOVIMOT<sup>®</sup> inverter with the same power rating and the same input voltage.

3. Set all controls
  - DIP switch S1
  - DIP switch S2
  - Setpoint potentiometer f1
  - Switch f2
  - Switch t1

on the new MOVIMOT<sup>®</sup> inverter analogously to the controls of the previous MOVIMOT<sup>®</sup> inverter.



4. Make sure that no Drive-ID module for DR motor types is plugged into the MOVIMOT® inverter



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[1] Slot for Drive-ID module

5. Place the new MOVIMOT® inverter onto the terminal box and screw it on.
6. Supply voltage to the MOVIMOT® inverter.  
Check whether the new MOVIMOT® inverter is functioning properly.



### 9.3 Turning the modular terminal box

We recommend purchasing pre-fabricated MOVIMOT® units 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 terminal box).



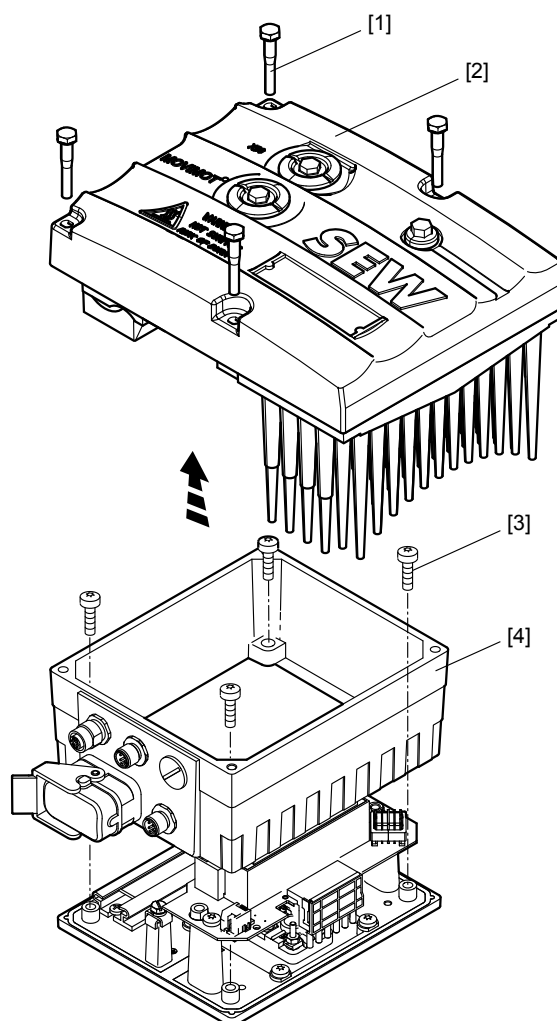
#### ! DANGER

When working on the unit, dangerous voltage levels may still be present up to one minute after the mains is disconnected.

Severe or fatal injuries from electric shock.

- Disconnect the MOVIMOT® drive from the supply system and secure it against unintentional reconnection to the voltage supply.
- Then wait at least for 1 minute.

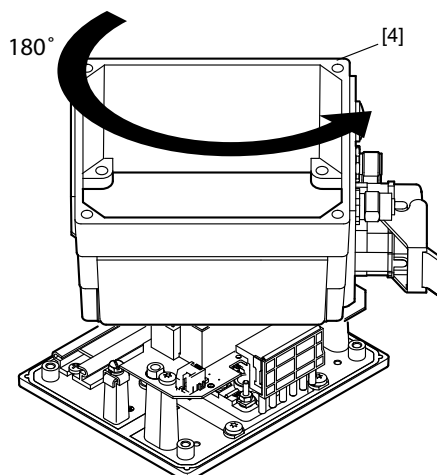
1. Label the connections of the MOVIMOT® inverter before disconnecting them for later re-installation.
2. Disconnect the supply system, control and sensor connections.
3. Remove the screws [1] and take off the MOVIMOT® inverter [2] from the terminal box.
4. Loosen the screws [3] and remove the terminal box [4].



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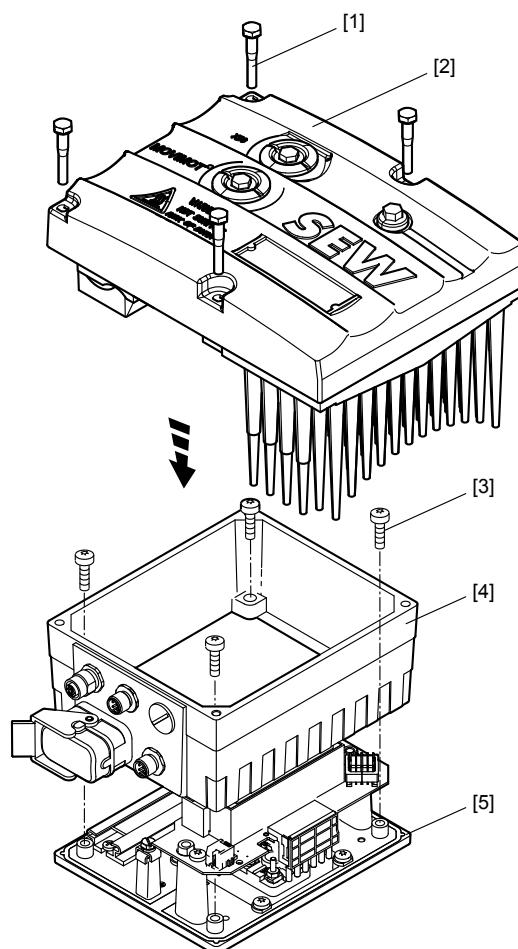


5. Rotate the terminal box [4] by 180°.



322383883

6. Place the terminal box [4] on the mounting plate [5] and fasten it with screws [3].
7. Re-install the connections.
8. Place the MOVIMOT® inverter [2] onto the terminal box and fasten it with 4 screws [1].










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


## 9.4 SEW Service

If a fault cannot be remedied, please contact SEW Service (see "Address List"). Please have the following information at hand when you consult the SEW Service:

- Service code [1]
- Unit designation on inverter nameplate [2]
- Part number [3]
- Serial number [4]
- Type designation on motor nameplate [5]
- Serial number [6]
- Short description of application (application, control via terminals or serial)
- Nature of the fault
- Accompanying circumstances (e.g. initial startup)
- Your own assumptions
- Any unusual events preceding the problem, etc.

[1]	 Status: 10 12 -- A -- -- 10 10 12 02 / 08 444 		
[2]			
[3]	Typ MM15D-503-00 Sach.Nr. 18215033 Eingang / Input	Serien Nr.0886946 Ausgang / Output	[4]
	U= 3x380...500V AC f= 50...60Hz I= 3.5AAC T= -30...40C Antriebsumrichter Drive Inverter	U= 3x0V...U <sub>input</sub> f= 2...120Hz I= 4.0AAC P-Motor 1.5kW / 2.0HP P-Motor (S3/25%): 2.2kW / 3.3HP	  CH01  
	Use 60/75°C copper wire only. Tighten terminals to 13,3in. - ibs.(1.5 Nm) Suitable for use on a circuit capable of delivering not more than 5000ms		

	<b>SEW-EURODRIVE</b> Bruchsal / Germany 	
[5]	Typ KA77 DT90L4/BMG/MM15/MLU	3 ~ IEC 34
[6]	Nr. 3009818304.0001.99	IM B3
	KW 1,5 / 50 HZ	cosφ 0,99
	○ 50Hz V 380-500	A 3,50
	○ 60Hz V 380-500	A 3,50
	r/min 22/1400	IP 54 KI F
	Bremse V 230	Nm 20 Gleichrichter
	kg 73 Ma 665	Nm i 64,75 :1
	Schmierstoff	Made in Germany 184103 3.14

2037711371



## 9.5 *Extended storage*

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

### 9.5.1 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 using the rated 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:

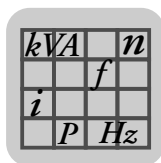
- Stage 1: AC 0 V to AC 350 V within a few seconds
- Stage 2: AC 350 V for 15 minutes
- Stage 3: AC 420 V for 15 minutes
- Stage 4: AC 500 V for 1 hour

## 9.6 *Disposal*

**This product consists of:**

- Iron
- Aluminum
- Copper
- Plastic
- Electronic components

**Dispose of all components in accordance with applicable regulations!**



## Technical Data

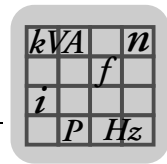
Motor with operating point 400 V / 50 Hz or 400 V / 100 Hz

## 10 Technical Data

### 10.1 Motor with operating point 400 V / 50 Hz or 400 V / 100 Hz

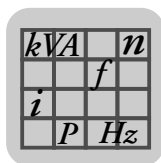
MOVIMOT® type		MM 03D-503-00	MM 05D-503-00	MM 07D-503-00	MM 11D-503-00	MM 15D-503-00	MM 22D-503-00	MM 30D-503-00	MM 40D-503-00	
Part number		18214991	18215009	18215017	18215025	18215033	18215041	18215068	18215076	
		Size 1					Size 2		Size 2L	
Apparent output power at $V_{\text{supply}} = \text{AC } 380 - 500 \text{ V}$	$S_N$	1.1 kVA	1.4 kVA	1.8 kVA	2.2 kVA	2.8 kVA	3.8 kVA	5.1 kVA	6.7 kVA	
Supply voltages Permitted range	$V_{\text{supply}}$	AC 3 x 380 V/400 V/415 V/460 V/500 V $V_{\text{supply}} = \text{AC } 380 \text{ V} -10\% - \text{AC } 500 \text{ V} +10\%$								
Supply system frequency	$f_{\text{line}}$	50 – 60 Hz $\pm 10\%$								
Nominal supply system current (at $V_{\text{supply}} = \text{AC } 400 \text{ V}$ )	$I_{\text{supply}}$	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	
Output voltage	$V_O$	0 – $V_{\text{supply}}$								
Output frequency Resolution Operating point	$f_A$	2 – 120 Hz 0.01 Hz 400 V at 50 Hz /100 Hz								
Rated 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	$P_{\text{Mot}}$	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 <sup>1</sup> ) kHz								
Current limitation	$I_{\text{max}}$	motor: 160% at $\lambda$ and $\Delta$ regenerative: 160% at $\lambda$ and $\Delta$								
Maximum motor cable length		15 m when the MOVIMOT® inverter is installed close to the motor								
External braking resistor	$R_{\text{min}}$	150 $\Omega$					68 $\Omega$			
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	$\vartheta_A$	–25 (–30) – +40 °C depending on the motor $P_N$ reduction: 3% $I_N$ per K to max. 60 °C								
Climate class		EN 60721-3-3, class 3K3								
Storage temperature <sup>2)</sup>		–30 to +85 °C (EN 60721-3-3, class 3K3)								
Maximum permitted vibration and shock load		According to EN 50178								
Degree of protection (motor-dependent)		IP54, IP55, IP65, IP66 (options, specify when ordering) IP67 (only possible for inverter with terminal box)								
Duty cycle		S1 (EN 60149-1-1 and 1-3), S3 max. cycle duration 10 minutes								
Cooling type (DIN 41751)		Self-cooling								
Installation altitude		h $\leq$ 1,000 m: No reduction h > 1000 m: $I_N$ reduction by 1% per 100 m h > 2000 m: $V_{\text{supply}}$ reduction by AC 6 V per 100 m, overvoltage class 2 according to DIN 0110-1 h <sub>max</sub> = 4,000 m See section "Installation altitudes above 1000 m msl" (see page 28)								
Required preventive measures		Ground the unit								





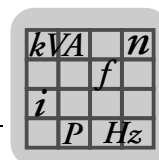
MOVIMOT® type	MM 03D-503-00	MM 05D-503-00	MM 07D-503-00	MM 11D-503-00	MM 15D-503-00	MM 22D-503-00	MM 30D-503-00	MM 40D-503-00	
Part number	18214991	18215009	18215017	18215025	18215033	18215041	18215068	18215076	
	Size 1					Size 2		Size 2L	
<b>External electronics supply</b>	TI. 24 V	V = +24 V ± 25 %, EN 61131-2, residual ripple max. 13 % I <sub>E</sub> ≤ 250 mA (typ. 120 mA at 24 V) Input capacitance 120 µF							
<b>3 binary inputs</b>		Isolated via optocoupler; PLC compatible (EN 61131-2) R <sub>i</sub> ≈ 3.0 kΩ, I <sub>E</sub> ≈ 10 mA, sampling interval ≤ 5 ms							
Signal level		+13 – +30 V = "1" => contact closed –3 – +5 V = "0" => contact open							
Control functions	TI. R	CW/stop							
	TI. L	CCW/stop							
	TI. f1/f2	"0" = setpoint 1 "1" = setpoint 2							
<b>Output relay</b> Contact information	TI. K1a	Response time ≤ 15 ms							
	TI. K1b	DC 24 V / 0.6 A / DC 12 to IEC 60947-5-1 (only SELV or PELV circuits)							
Signaling function		NO contact for ready signal				Contact closed: – with voltage present (24 V system) – in case no fault was detected – at end of self-testing phase (when unit is turned on)			
<b>Serial interface</b>	TI. RS+	RS-485							
	TI. RS-								

- 1) 16 kHz PWM frequency (low-noise): When DIP SWITCH S1/7 = ON, the units operate with a 16 kHz PWM frequency (low noise) and switch back in steps to lower switching frequencies depending on the heat sink temperature and the load.
- 2) If the unit is stored for a long time, connect it to the mains voltage for at least 5 minutes every 2 years. Otherwise, the unit's service life may be reduced.



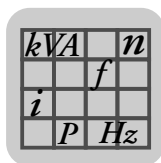
## 10.2 Motor with operating point 460 V / 60 Hz

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		18214991	18215009	18215017	18215025	18215033	18215041	18215068	18215076	
		Size 1					Size 2		Size 2L	
Apparent output power at $V_{\text{supply}} = \text{AC } 380 - 500 \text{ V}$	$S_N$	1.1 kVA	1.4 kVA	1.8 kVA	2.2 kVA	2.8 kVA	3.8 kVA	5.1 kVA	6.7 kVA	
Supply voltages Permitted range	$V_{\text{supply}}$	AC 3 x 380 V / 400 V / 415 V / <b>460 V</b> / 500 V $V_{\text{supply}} = \text{AC } 380 \text{ V} - 10\% - \text{AC } 500 \text{ V} + 10\%$								
Supply system frequency	$f_{\text{line}}$	50 – 60 Hz $\pm 10\%$								
Nominal supply system current (at $V_{\text{supply}} = \text{AC } 460 \text{ V}$ )	$I_{\text{supply}}$	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	
Output voltage	$V_O$	0 – $V_{\text{supply}}$								
Output frequency Resolution Operating point	$f_A$	2 – 120 Hz 0.01 Hz 460 V at 60 Hz								
Rated 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	$P_{\text{Mot}}$	<b>0.37 kW</b> 0.5 HP	<b>0.55 kW</b> 0.75 HP	<b>0.75 kW</b> 1.0 HP	<b>1.1 kW</b> 1.5 HP	<b>1.5 kW</b> 2 HP	<b>2.2 kW</b> 3.0 HP	<b>3.7 kW</b> 5 HP	<b>4 kW</b> 5.4 HP	
PWM frequency		4 (factory setting) / 8 / 16 <sup>1</sup> ) kHz								
Current limitation	$I_{\text{max}}$	motor: 160% at $\downarrow$ regenerative: 160% at $\uparrow$								
Maximum motor cable length		15 m when the MOVIMOT® inverter is installed close to the motor								
External braking resistor	$R_{\text{min}}$	150 $\Omega$					68 $\Omega$			
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	$\vartheta_A$	–25 (–30) – +40 °C depending on the motor $P_N$ reduction: 3% $I_N$ per K to max. 60 °C								
Climate class		EN 60721-3-3, class 3K3								
Storage temperature <sup>2)</sup>		–30 to +85 °C (EN 60721-3-3, class 3K3)								
Maximum permitted vibration and shock load		According to EN 50178								
Degree of protection (motor-dependent)		IP54, IP55, IP65, IP66 (options, specify when ordering) IP67 (only possible for inverter with terminal box)								
Duty cycle		S1 (EN 60149-1-1 and 1-3), S3 max. cycle duration 10 minutes								
Cooling type (DIN 41751)		Self-cooling								
Installation altitude		h $\leq$ 1,000 m: No reduction h > 1000 m: $I_N$ reduction by 1% per 100 m h > 2000 m: $V_{\text{supply}}$ reduction by AC 6 V per 100 m, overvoltage class 2 according to DIN 0110-1 $h_{\text{max}} = 4,000 \text{ m}$ See section "Installation altitudes above 1000 m msl" (see page 28)								
Required preventive measures		Ground the unit								





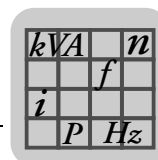
MOVIMOT® type	MM 03D-503-00	MM 05D-503-00	MM 07D-503-00	MM 11D-503-00	MM 15D-503-00	MM 22D-503-00	MM 30D-503-00	MM 40D-503-00	
Part number	18214991	18215009	18215017	18215025	18215033	18215041	18215068	18215076	
	Size 1					Size 2		Size 2L	
<b>External electronics supply</b>	TI. 24 V	V = +24 V ± 25 %, EN 61131-2, residual ripple max. 13 % I <sub>E</sub> ≤ 250 mA (typ. 120 mA at 24 V) Input capacitance 120 µF							
<b>3 binary inputs</b>		Isolated via optocoupler; PLC compatible (EN 61131-2) R <sub>i</sub> ≈ 3.0 kΩ , I <sub>E</sub> ≈ 10 mA, sampling interval ≤ 5 ms							
Signal level		+13 – +30 V = "1" => contact closed –3 – +5 V = "0" => contact open							
Control functions	TI. R	CW/stop							
	TI. L	CCW/stop							
	TI. f1/f2	"0" = setpoint 1 "1" = setpoint 2							
<b>Output relay</b> Contact information	TI. K1a	Response time ≤ 15 ms							
	TI. K1b	DC 24 V / 0.6 A / DC 12 to IEC 60947-5-1 (only SELV or PELV circuits)							
Signaling function		NO contact for ready signal				Contact closed: – with voltage present (24 V system) – in case no fault was detected – at end of self-testing phase (when unit is turned on)			
<b>Serial interface</b>	TI. RS+	RS-485							
	TI. RS-								

- 1) 16 kHz PWM frequency (low-noise): When DIP SWITCH S1/7 = ON, the units operate with a 16 kHz PWM frequency (low noise) and switch back in steps to lower switching frequencies depending on the heat sink temperature and the load.
- 2) If the unit is stored for a long time, connect it to the mains voltage for at least 5 minutes every 2 years. Otherwise, the unit's service life may be reduced.



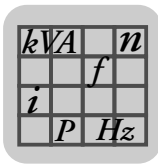
### 10.3 Motor with operating point 230 V / 50 Hz

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			Size 2		
Apparent output power at $V_{\text{supply}} = \text{AC } 200 - 240 \text{ V}$	$S_N$	1.0 kVA	1.3 kVA	1.7 kVA	2.0 kVA	2.9 kVA	3.4 kVA
Supply voltages Permitted range	$V_{\text{supply}}$	AC 3 x 200 V/230 V/240 V $V_{\text{supply}} = \text{AC } 200 \text{ V } -10 \% - \text{AC } 240 \text{ V } +10 \%$					
Supply system frequency	$f_{\text{line}}$	50 – 60 Hz $\pm 10 \%$					
Nominal supply system current (at $V_{\text{supply}} = \text{AC } 230 \text{ V}$ )	$I_{\text{supply}}$	AC 1.9 A	AC 2.4 A	AC 3.5 A	AC 5.0 A	AC 6.7 A	AC 7.3 A
Output voltage	$V_O$	0 – $V_{\text{supply}}$					
Output frequency Resolution Operating point	$f_A$	2 – 120 Hz 0.01 Hz 230 V at 60 Hz					
Rated 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	$P_{\text{Mot}}$	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 <sup>1</sup> ) kHz					
Current limitation	$I_{\text{max}}$	motor: 160% at  regenerative: 160% at 					
Maximum motor cable length		15 m when the MOVIMOT® inverter is installed close to the motor					
External braking resistor	$R_{\text{min}}$	150 $\Omega$			68 $\Omega$		
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	$\vartheta_A$	–25 (–30) – +40 °C depending on the motor $P_N$ reduction: 3% $I_N$ per K to max. 60 °C					
Climate class		EN 60721-3-3, class 3K3					
Storage temperature <sup>2)</sup>		–30 to +85 °C (EN 60721-3-3, class 3K3)					
Maximum permitted vibration and shock load		According to EN 50178					
Degree of protection (motor-dependent)		IP54, IP55, IP65, IP66 (options, specify when ordering) IP67 (only possible for inverter with terminal box)					
Duty cycle		S1 (EN 60149-1-1 and 1-3), S3 max. cycle duration 10 minutes					
Cooling type (DIN 41751)		Self-cooling					
Installation altitude		h $\leq$ 1,000 m: No reduction h > 1000 m: $I_N$ reduction by 1% per 100 m h > 2000 m: $V_{\text{supply}}$ reduction by AC 3 V per 100 m, overvoltage class 2 according to DIN 0110-1 $h_{\text{max}} = 4,000 \text{ m}$ See section "Installation altitudes above 1000 m msl" (see page 28)					
Required preventive measures		Ground the unit					



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			Size 2		
<b>External electronics supply</b>	TI. 24 V	V = +24 V ± 25 %, EN 61131-2, residual ripple max. 13 % I <sub>E</sub> ≤ 250 mA (typ. 120 mA at 24 V) Input capacitance 120 µF					
<b>3 binary inputs</b>		Isolated via optocoupler; PLC compatible (EN 61131-2) R <sub>i</sub> ≈ 3.0 kΩ , I <sub>E</sub> ≈ 10 mA, sampling interval ≤ 5 ms					
Signal level		+13 – +30 V => "1" = contact closed –3 – +5 V => "0" = contact open					
Control functions	TI. R	CW/stop					
	TI. L	CCW/stop					
	TI. f1/f2	"0" = setpoint 1 "1" = setpoint 2					
<b>Output relay</b> Contact information	TI. K1a	Response time ≤ 15 ms					
	TI. K1b	DC 24 V / 0.6 A / DC 12 to IEC 60947-5-1 (only SELV or PELV circuits)					
Signaling function		NO contact for ready signal			Contact closed: – with voltage present (24 V + mains) – in case no fault was detected – at end of self-testing phase (when unit is turned on)		
<b>Serial interface</b>	TI. RS+	RS-485					
	TI. RS-						

- 1) 16 kHz PWM frequency (low-noise): When DIP SWITCH S1/7 = ON, the units operate with a 16 kHz PWM frequency (low noise) and switch back in steps to lower switching frequencies depending on the heat sink temperature and the load.
- 2) If the unit is stored for a long time, connect it to the mains voltage for at least 5 minutes every 2 years. Otherwise, the unit's service life may be reduced.



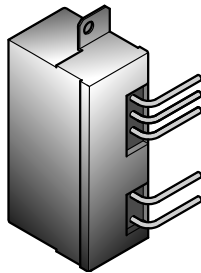
### 10.4 Technical data of options

#### 10.4.1 MLU11A/MLU21A



Option	MLU11A	MLU21A
Part number	0 823 383 7	0 823 387 X
Function	24 V voltage supply	
Input voltage	AC 380 – 500 V $\pm$ 10 % (50/60 Hz)	AC 200 – 240 V $\pm$ 10 % (50/60 Hz)
Output voltage	DC 24 V $\pm$ 25%	
Output power	max. 6 W	
Degree of protection	IP65	
Ambient temperature	–25 – +60 °C	
Storage temperature	–25 – +85 °C	

#### 10.4.2 MLU13A



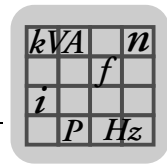
Option	MLU13A
Part number	1 820 596 8
Function	24 V voltage supply
Input voltage	AC 380 – 500 V $\pm$ 10 % (50/60 Hz)
Output voltage	DC 24 V $\pm$ 25%
Output power	max. 8 W
Degree of protection	IP20
Ambient temperature	–25 – +85 °C
Storage temperature	–25 – +85 °C

#### 10.4.3 MLG11A/MLG21A

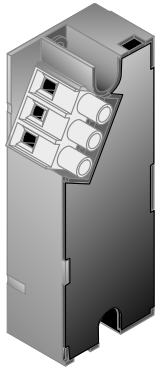


Option	MLG11A	MLG21A
Part number	0 823 384 5	0 823 388 8
Function	Setpoint generator and 24 V voltage supply	
Input voltage	AC 380 – 500 V $\pm$ 10 % (50/60 Hz)	AC 200 – 240 V $\pm$ 10 % (50/60 Hz)
Output voltage	DC 24 V $\pm$ 25%	
Output power	max. 6 W	
Setpoint resolution	1 %	
Serial interface <sup>1)</sup>	RS-485 for connecting a MOVIMOT <sup>®</sup> inverter	
Degree of protection	IP65	
Ambient temperature	–15 – +60 °C	
Storage temperature	–25 – +85 °C	

1) with integrated dynamic terminating resistor



10.4.4 URM

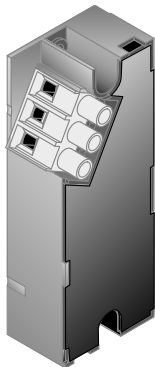


Option	URM
Part number	0 827 601 3
Function	Voltage relay, ensures quick application of the mechanical brake
Rated voltage $V_N$	DC 36 – 167 V (Brake coil AC 88 – 167 V)
Braking current $I_N$	0.75 A
Degree of protection	IP20
Ambient temperature	-25 – +60 °C
Storage temperature	-25 – +85 °C
Disconnection time $t_{off}$	approx. 40 ms (cut-off in the DC circuit)

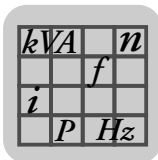
10.4.5 BGM



STOP
<p>If the connection voltage is too high, the brake rectifier or the brake coil connected to it can be damaged.</p> <p>The brake coil must correspond to the connection voltage!</p>



Option	BGM
Part number	0 827 602 1
Function	Brake rectifier
Nominal supply voltage	AC 230 V – AC 500 V +10 % / -15 % 50 – 60 Hz ±5 % Black connection wires
Control voltage	+13 V – +30 V = "1" -3 V – +5 V = "0" Red/blue connecting wires
Braking current	max. DC 0.8 A Brake connection tl. 13, 14, 15
Degree of protection	IP20
Ambient temperature	-25 – +60 °C
Storage temperature	-25 – +85 °C



## Technical Data

### Technical data of options

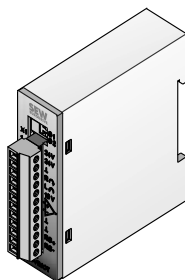
#### 10.4.6 MBG11A



Option	MBG11A
Part number	0 822 547 8
Function	Keypad
Input voltage	DC 24 V $\pm$ 25%
Current consumption	approx. 70 mA
Setpoint resolution	1 %
Serial interface <sup>1)</sup>	RS-485 for connecting max. 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 dynamic terminating resistor

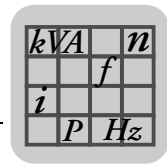
#### 10.4.7 MWA21A



Option	MWA21A
Part number	0 823 006 4
Function	Setpoint control module
Input voltage	DC 24 V $\pm$ 25%
Current consumption	approx. 70 mA
Serial interface <sup>1)</sup>	RS-485 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 of the analog input	8 bits ( $\pm 1$ bit)
Signal level binary 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 dynamic terminating resistor





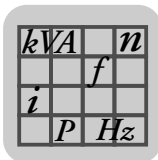
## 10.5 Integrated RS-485 interface

RS-485 interface	
<b>Standard</b>	RS-485 to EIA standard (with integrated dynamic terminating resistor)
<b>Baud rate</b>	9.6 kBd 31.25 kBaud (in connection with MF., MQ., MOVIFIT® MC fieldbus interfaces)
<b>Start bits</b>	1 start bit
<b>Stop bits</b>	1 stop bit
<b>Data bits</b>	8 data bits
<b>Parity</b>	1 parity bit, completing for even parity (even parity)
<b>Data direction</b>	Bi-directional
<b>Duty cycle</b>	Asynchronous, semi-duplex
<b>Timeout interval</b>	1 s
<b>Cable length</b>	max. 200 m in RS-485 operation with 9,600 Baud max. 30 m at transmission rate: 31250 baud <sup>1)</sup>
<b>Number of stations</b>	<ul style="list-style-type: none"> <li>Max. 32 stations (1 bus master<sup>2)</sup> + 31 MOVIMOT®) broadcast and group addresses possible</li> <li>15 MOVIMOT® can be addressed individually</li> </ul>

- 1) Transmission rate of 31,250 Baud will be detected automatically in case of operation with MF.. fieldbus interface.
- 2) ext. control or options MBG11A, MWA21A or MLG..A

## 10.6 Diagnostics interface

Diagnostic interface X50	
<b>Standard</b>	RS-485 to EIA standard (with integrated dynamic terminating resistor)
<b>Baud rate</b>	9.6 kBd
<b>Start bits</b>	1 start bit
<b>Stop bits</b>	1 stop bit
<b>Data bits</b>	8 data bits
<b>Parity</b>	1 parity bit, completing for even parity (even parity)
<b>Data direction</b>	Bi-directional
<b>Duty cycle</b>	asynchronous, semi-duplex
<b>Connection</b>	RJ10 socket (point-to-point connection, without process data)



### 10.7 Working air gap, braking torque of brake

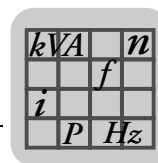
Brake	Motor	Working air gap mm		Braking torque [Nm]	Braking torque settings			
		min. <sup>1)</sup>	max.		Type and number of springs		Order numbers of springs	
					Normal	Red	Normal	Red
BMG05	DT 71	0,25	0,6	5,0	3	-	135 017 X	135 018 8
				4,0	2	2		
				2,5	-	6		
				1,6	-	4		
				1,2	-	3		
BMG1	DT 80			10	6	-		
				7,5	4	2		
				6,0	3	3		
				5,0	3	-		
				4,0	2	2		
BMG2	DT 90			2,5	-	6		
				20	3	-		
				16	2	2		
				10	-	6		
				6,6	-	4		
BMG4	DV 100	5,0	-	3				
		40	6	-				
		30	4	2				
		24	3	3				
		20	3	-				
		16	2	2				

1) When checking the working air gap, note: Parallelism tolerances on the brake disk may give rise to deviations of +/- 0.15 mm after a test run.

### 10.8 Resistance and assignment of the brake coil

Motor	Brake	Resistance of the brake coil <sup>1)</sup>	
		MOVIMOT® MM..D-503-00 (380 – 500 V)	MOVIMOT® MM..D-233-00 (200 – 240 V)
DT71	BMG05	277 Ω (230 V)	69.6 Ω (110 V)
DT80	BMG1	248 Ω (230 V)	62.2 Ω (110 V)
DT90	BMG2	216 Ω (230 V) / 54.2 Ω (110 V)	54.2 Ω (110 V)
DV100	BMG4	43.5 Ω (110 V)	27.3 Ω (88 V)

1) Rated 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.



## 10.9 Assignment of internal braking resistors

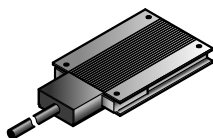
MOVIMOT® type	Braking resistor	Part number
MM03D-503-00 – MM15D-503-00 MM03D-233-00 – MM07D-233-00	BW1	0 822 897 3 <sup>1)</sup>
MM22D-503-00 – MM40D-503-00 MM11D-233-00 – MM22D-233-00	BW2	0 823 136 2 <sup>1)</sup>

1) Two screws M4 x 8, included in scope of delivery

## 10.10 Assignment of external braking resistors

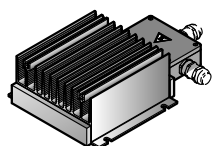
MOVIMOT® type	Braking resistor	Part number	Protective grid
MM03D-503-00 – MM15D-503-00 MM03D-233-00 – MM07D-233-00	BW200-003/K-1.5	0 828 291 9	0 813 152 X
	BW200-005/K-1.5	0 828 283 8	–
	BW150-010	0 802 285 2	–
MM22D-503-00 – MM40D-503-00 MM11D-233-00 – MM22D-233-00	BW100-003/K-1.5	0 828 293 5	0 813 152 X
	BW100-005/K-1.5	0 828 286 2	–
	BW068-010	0 802 287 9	–
	BW068-020	0 802 286 0	–

### 10.10.1 BW100.. BW200..



	BW100-003/ K -1.5	BW100-005/ K -1.5	BW200-003/ K -1.5	BW200-005/ K -1.5
Part number	0 828 293 5	0 828 286 2	0 828 291 9	0 828 283 8
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 mm	146 x 15 x 80	252 x 15 x 80	146 x 15 x 80	252 x 15 x 80
Cable length	1.5 m			

### 10.10.2 BW150.. BW068..



	BW150-010	BW068-010	BW068-020
Part number	0 802 285 2	0 802 287 9	0 802 286 0
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 mm	260 x 75 x 174	260 x 75 x 174	610 x 75 x 174
Maximum permitted cable length	15 m		



## 11 Address List

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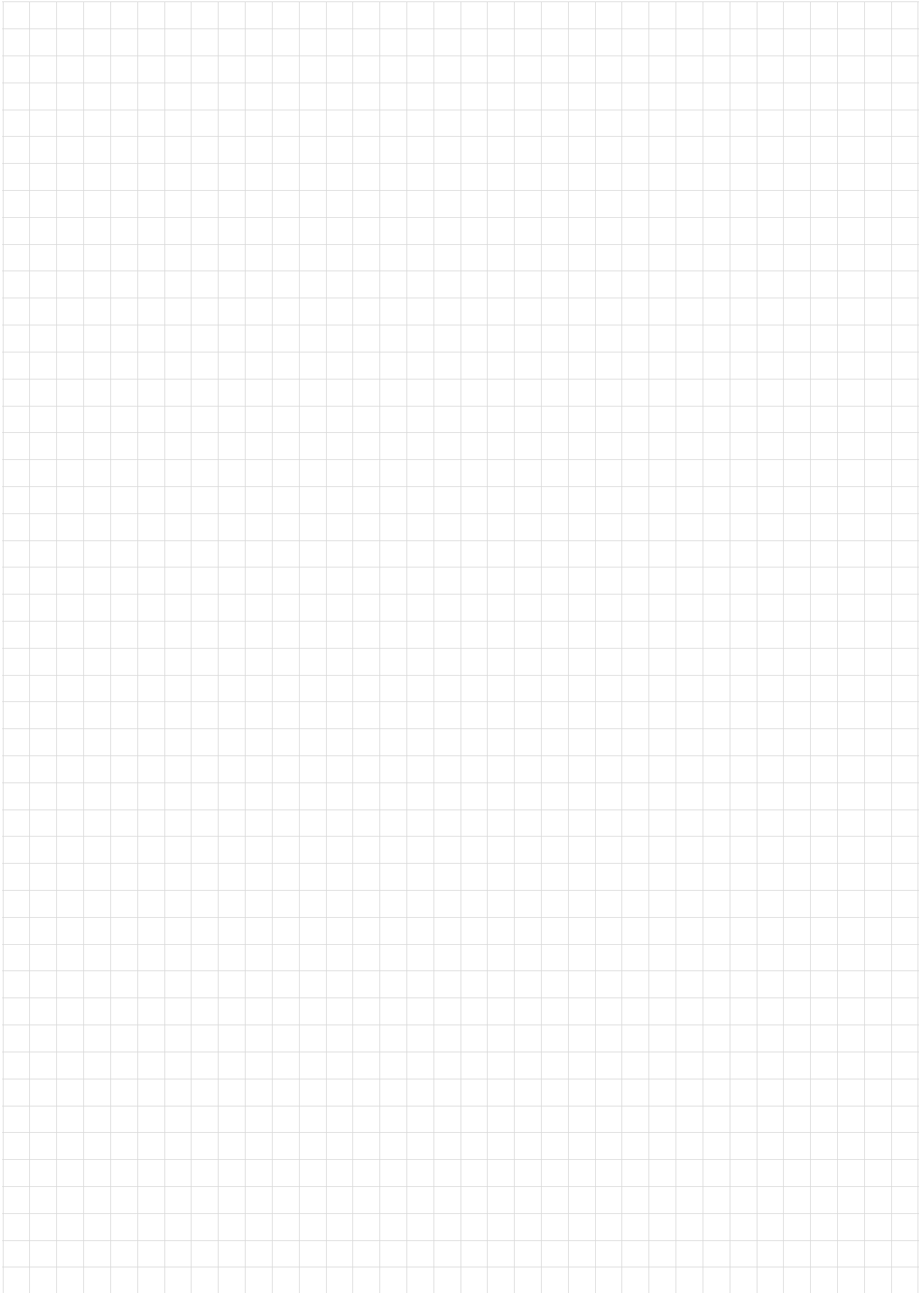


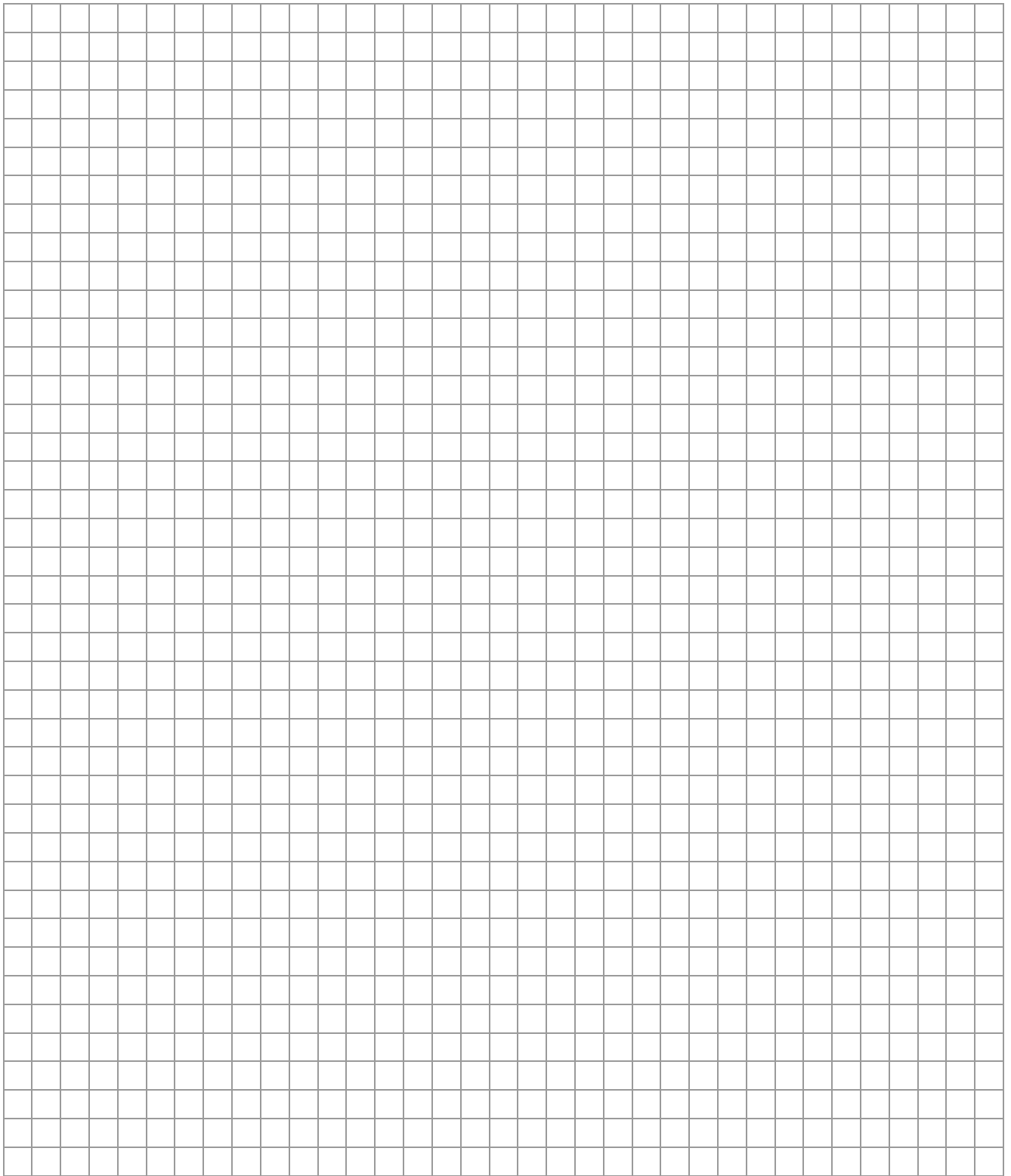
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