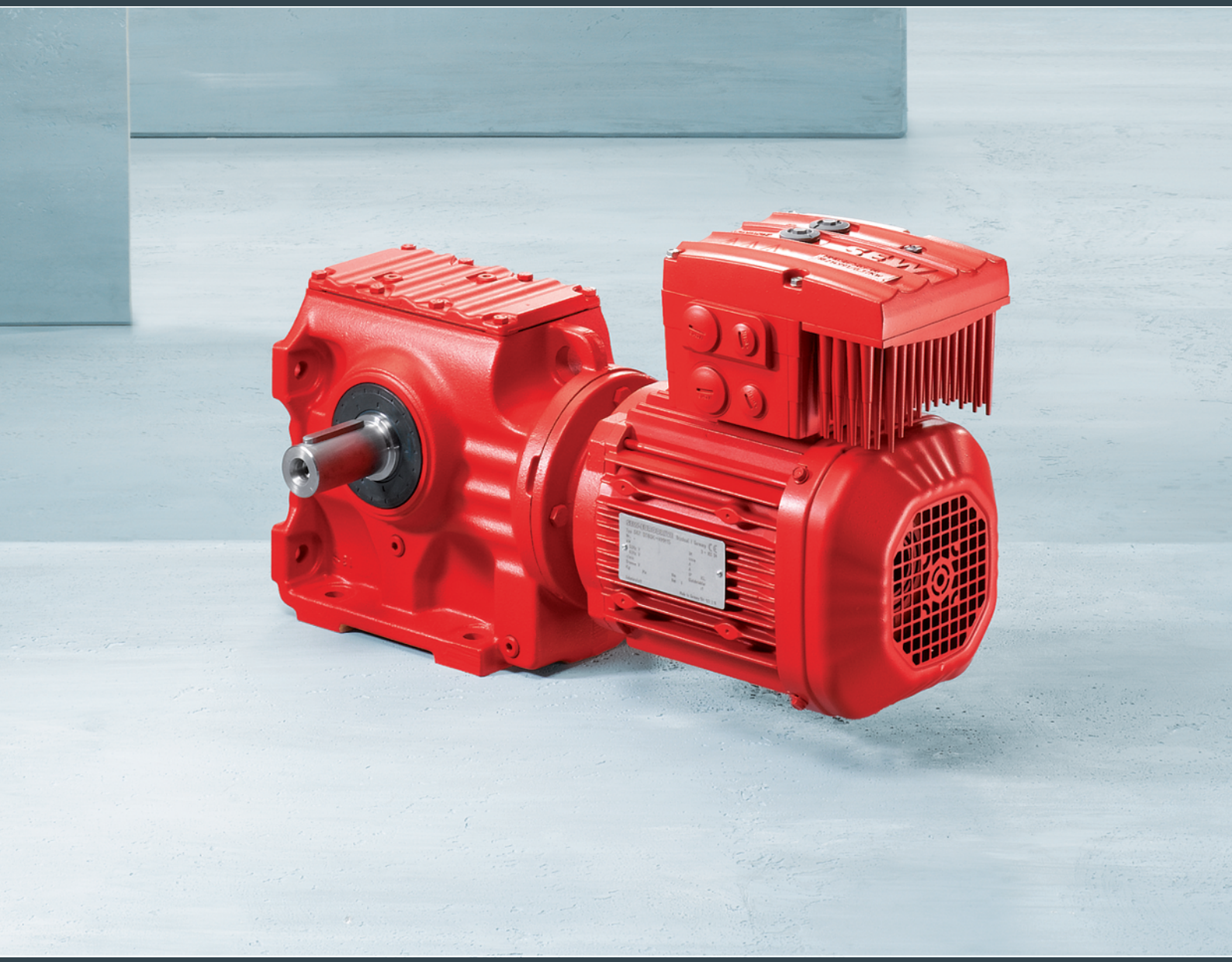
SEW EURODRIVE

Product manual



Decentralized Drive Systems

MOVIMOT® MM..D

Edition 04/2026

33953961/EN



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1 General information

1.1 Structure of the safety notes

1.1.1 Meaning of signal words

The following table shows the graduation and meaning of the signal words in the safety notes.

Signal word	Meaning	Consequences if not observed
⚠ **DANGER**	Imminent danger	Death or severe injuries
⚠ **WARNING**	Possibly dangerous situation	Death or severe injuries
⚠ **CAUTION**	Possibly dangerous situation	Minor injuries
NOTICE	Possible damage to property	Damage to the product or its environment

1.1.2 Structure of section-related safety notes

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

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



SIGNAL WORD

Type and source of hazard.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the hazard.

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1.1.3 Meaning of the hazard symbols

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

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

1.1.4 Structure of embedded safety notes

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

This is the formal structure of an embedded safety note:

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

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1.2 Decimal separator in numerical values

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

Example: 30.5 kg

1.3 Rights to claim under limited warranty

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

1.4 Recycling, reprocessing, reuse

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

1.5 Product names and trademarks

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

1.6 Copyright notice

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2 Safety notes

2.1 Preliminary information

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

2.2 Duties of the user

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

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

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

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

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

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

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2.3 Target group

Specialist for mechanical work

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

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

Specialist for electrotechnical work

Any electrotechnical work may be performed only by electrically skilled persons with a suitable education. Electrically skilled persons in the context of this documentation are persons who are familiar with electrical installation, startup, troubleshooting, and maintenance of the product, and who possess the following qualifications:

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

Additional qualifications

In addition to that, these persons must be familiar with the valid safety regulations and laws, as well as with the requirements of the standards, directives, and laws specified in this documentation.

The persons must have the express authorization of the company to operate, program, parameterize, label, and ground devices, systems, and circuits in accordance with the standards of safety technology.

Instructed persons

All work in the areas of transport, storage, installation, operation and waste disposal may only be carried out by persons who are trained and instructed appropriately. These instructions must enable the persons to carry out the required activities and work steps safely and in accordance with regulations.

2.4 IT security

2.4.1 Contact



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

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

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2.4.2 IT security of the product



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

Further information, e.g. regarding additional organizational measures to meet regulatory requirements, refer to "IT security in the context of regulatory requirements" (→ 🗎 12).

Possible hazards

Access points for manipulations

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

Potential hazards

Potential hazards posed by unauthorized individuals with remote access to the software functions include:

- Manipulation of the speed, resulting in accelerations and decelerations.
- Unintended actuation of the power section, resulting in hazardous movement at the motor shaft.
- Unintended actuation of the brake (brake release), resulting in hazardous movement at the motor shaft.
- Excessive heating of the device and motor, resulting in thermal destruction.

Technically excluded hazards

The following hazards due to remote access by an unauthorized person are technically excluded:

- Danger due to electric shock due to corruption of general electrical safety, e.g. the separation between high and extra-low voltage.

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2.4.3 IT security of the environment



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

Observe the following:

- The IT security of the product is only guaranteed when used in an environment secured by defense-in-depth strategies.
- Particularly in networked systems based on Wi-Fi or Ethernet and at engineering interfaces, ensure that unauthorized access is prevented. Using IT-specific security standards, such as network segmentation, adds to the security of the ports.
  - For information on the communication interfaces of the device, refer to this documentation.
  - In particular, refer to chapter "Ports and services" (→ 🗎 45) regarding the provided services of the communication interfaces.
- Ensure that clear responsibility for security is guaranteed during operation. SEW-EURODRIVE recommends an IT security management system in accordance with ISO/IEC 27001 and ISO/IEC 62443-2-4.

2.4.4 IT security in the context of regulatory requirements



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

EU Machinery Regulation

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

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

Observe the following:

- Perform a risk assessment and risk minimization of the machine according to ISO 12100.
- Implement suitable technical and organizational measures to prevent unauthorized access to safety-relevant and non-safety-relevant functions, if their manipulation can lead to a hazard according to the risk assessment (see "Possible hazards" (→ 🗎 11)).

Strictly observe the following documentation:

- "Cybersecurity for generation B inverters" manual

Protection of the STO control

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

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Observe the following:

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

EU Data Act

The product offers "Access by Design" for all data generated by the product and thus meets the requirements of the EU Data Act (Regulation 2023/2851):

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

Accessing data
- All data can be read from the product using freely available engineering software from SEW-EURODRIVE or via local interfaces or network connections. Corresponding HMI systems and external controllers can also access the data of the product.

Deleting data
- For information on deleting data, refer to "IT security guidelines for secure disposal" (→ 🗎 307).

Data transmission
- The product does not automatically transfer data to devices in it's environment.

Quality of service
- The device has different qualities of service for data communication:
  - Cyclic communication to control the device. A few bytes are transferred real-time capably and cyclically.
  - Acyclic access to all idle data stored on the device.
- The response time depends on the communication interface used.
- The cycle time is determined by the controlling or requesting device, and is usually between 1 ms and 100 ms.

For information regarding the data generated by the product, stored internally and transferred to other devices in the environment, as well as regarding deletion of data, refer to "IT security guidelines for secure disposal" (→ 🗎 307).

For more information on the EU Data Act, refer to the following documentation:

- "Cybersecurity for generation B inverters" manual

2.5 Designated use

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

If the product is installed in electrical systems or machinery, startup is prohibited until it has been verified that the machine complies with local laws and regulations.

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

The systems can be mobile or stationary.

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

- AC asynchronous motors with squirrel-cage rotor

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

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

Do not use the product as a climbing aid.

2.5.1 Restrictions under the European WEEE Directive 2012/19/EU

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

2.5.2 Lifting applications

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

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

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2.5.3 Restrictions of use

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

- Use in potentially explosive areas
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, and radiation
- Use in applications with impermissibly high mechanical vibration and shock loads
- Use at an elevation of more than 4000 m above sea level

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

- The reduction of the nominal output current and/or line voltage is taken into account as per chapter "Technical data" in the associated product manual.
- Above 2000 m above sea level, the air and creepage distances are only sufficient for overvoltage class II according to EN 60664. At altitudes above 2000 m above sea level, limiting measures must therefore be taken that reduce the line side overvoltage from category III to category II for the entire system.
- If a protective electrical separation is required, implement it outside the product at altitudes of more than 2000 m above sea level.

2.6 Functional safety technology

The product optionally includes the STO safety subfunction.

The product is not permitted to perform any safety function without higher-level safety systems.

Observe the product manual of the product for use of the STO safety subfunction or other safety subfunctions.

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2.7 Transportation

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

Observe the following notes when transporting the device:

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

If necessary, use suitable, sufficiently dimensioned handling equipment.

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

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

2.8 Installation/assembly

Ensure that the product is installed and cooled in accordance with the regulations in the documentation.

Protect the product from excessive mechanical strain. The product and its mounted components must not protrude into the path of persons or vehicles. Ensure that no components are deformed or no insulation spaces are modified, particularly during transportation. Electrical components must not be mechanically damaged or destroyed.

Observe the notes in chapter "Mechanical installation" in the documentation.

2.9 Electrical installation

Ensure that all of the required covers are correctly attached after the electrical installation.

Make sure that protective measures and protection devices comply with the applicable regulations (e.g. EN 60204-1 or EN 61800-5-1).

2.9.1 Required protective measure

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

2.9.2 Voltage test

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

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2.10 Protective separation

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

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

2.11 Startup/operation

Observe the safety notes in chapters "Startup" (→ 🗎 170) and "Operation" in this documentation.

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

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

When the system is switched on, dangerous voltages are present on all voltage-controlled product parts as well as any cables and terminals that are connected. This also applies even when the product is inhibited and the motor is in an idle state. Do not touch the components during operation.

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

If you disconnect the product from the voltage supply, do not touch any live components or power connections because capacitors might still be charged. Observe the following minimum switch-off time:

1 minute.

Observe the corresponding information signs on the product.

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

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

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

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3 Product description

3.1 MOVIMOT®

3.1.1 Description

INFORMATION

This catalog provides a brief overview of MOVIMOT® drives to facilitate drive selection.

For detailed descriptions, project planning information and dimension drawings, refer to the "MOVIMOT® Gearmotors" catalog.

The following figure shows an example of MOVIMOT® sizes MM03 – MM15:



9007211163081227

MOVIMOT®, the combination of the AC (brake)motors and a digital frequency inverter, is available in the power range 0.37 – 4.0 kW. Decentralized drive tasks in particular can be easily and economically solved with this.

You can use the MOVIMOT® drives to equip extensive plants with a modular system or flexibly integrate them into existing plants. MOVIMOT® is also the electronic replacement for pole-changing motors or mechanical variable-speed gear units.

MOVIMOT® is available as a motor, brakemotor, gearmotor or geared brakemotor in many different standard versions and designs.

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MOVIMOT® features

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

Advantages of MOVIMOT®

- Low total volume
- Interference-free connection between inverter and motor
- Closed design with integrated protection functions
- Inverter cooling independent of the motor speed
- No control cabinet space required
- Optimum preset of the parameters for the expected applications
- Simple installation, startup and maintenance
- Service-friendly in retrofitting and replacement

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Functional safety

Order information

INFORMATION

- The SafetyDRIVE design must be ordered explicitly. (Order note: "– SafetyDRIVE").
- In safety applications, only components may be used that were supplied by SEW-EURODRIVE in this design and that are marked with the FS logo for functional safety.

Permitted SafetyDRIVE designs

Only the following combinations with MOVIMOT® are permitted for safety-relevant applications:

Approved designs	MOVIMOT® type designation
MOVIMOT® with binary control (control via terminals)	D../MM.. – SafetyDrive MM..D-503-00 – SafetyDrive
MOVIMOT® with AS-Interface option MLK32A	
MOVIMOT® with MBG11A option	
MOVIMOT® with MWA 21A option	
MOVIMOT® with MBK11A or MBK12A option	
MOVIMOT® with BEM option	
MOVIMOT® with URM option	
MOVIMOT® with MNF21A option	

3.1.2 MOVIMOT® options (/MO)

MOVIMOT® can be supplemented by many different "options" (→ 🗎 21).

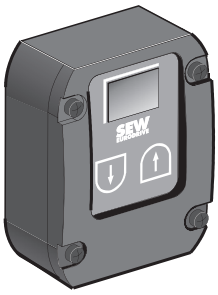
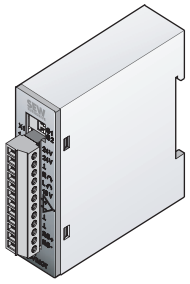
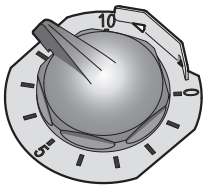
The type designation contains "/MO" no matter whether one or several of the following options are used.

Designation	Description
BEM	Brake control
URM	Voltage relay
MLU13A	Internal DC 24 V voltage supply (380 – 500 V)
MNF21A	Internal line filter (MM03 – MM15)
MLU11A	DC 24 V voltage supply (380 – 500 V)
MLU21A	DC 24 V voltage supply (200 – 240 V)
MLG11A	Setpoint adjuster with DC 24 V voltage supply (380 – 500 V)
MLG21A	Setpoint adjuster with DC 24 V voltage supply (200 – 240 V)

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Options

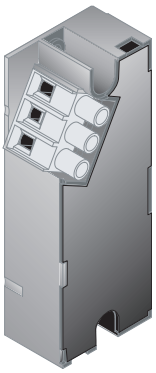
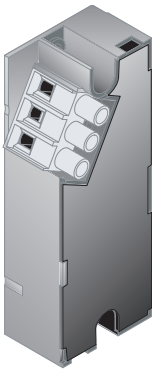
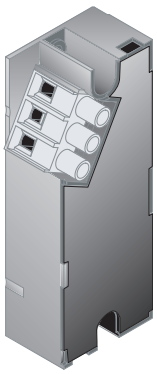
The following tables show the options for MOVIMOT® MM..D.

Option	Image	Description
DC 24 V supply **MLU11A** (input voltage AC 380 – 500 V) part number: 08233837 **MLU21A** (input voltage AC 200 – 240 V) part number: 0823387X		The MLU.1A option is mounted with a MOVIMOT® cable gland. The option provides the DC 24 V voltage supply for the MOVIMOT® inverter, including one option with a maximum power consumption of 70 mA (MBG11A, MWA21A). An external 24 V auxiliary voltage is not required.
Setpoint adjuster with DC 24 V supply **MLG11A** (input voltage AC 380 – 500 V) part number: 08233845 **MLG21A** (input voltage AC 200 – 240 V) part number: 08233888		The MLG.1A option is mounted with a MOVIMOT® cable gland. The option allows to set the input speed in the range of -100% – +100% f_{max} (potentiometer f1). An external 24 V auxiliary voltage is not required.
Setpoint adjuster MBG11A part number: 08225478		The MBG11A setpoint adjuster has 2 buttons and a display. The buttons enable remote speed control in the range from -100% – +100% f_{max} (potentiometer f1). Up to 31 MOVIMOT® drives can be controlled simultaneously (broadcasting).
Setpoint converter MWA21A part number: 08230064		The MWA21A setpoint converter converts an analog setpoint and control signals into an RS485 protocol. This allows to control the MOVIMOT® drive from the control cabinet remotely. Up to 31 MOVIMOT® drives can be controlled simultaneously (broadcasting).
Control knob **MBK11A** (for MOVIMOT® MMD03 – MMD15..) part number: 28230035 **MBK12A** (for MOVIMOT® MMD22 – MMD40..) part number: 28230043		The drive speed can be set in the range of 0 – 100% using the adjusting knob. The MBK.. control knob is mounted onto the setpoint potentiometer f1 of the MOVIMOT® inverter instead of the screw plug. **NOTICE** The MOVIMOT® inverter with control knob has the degree of protection IP54.

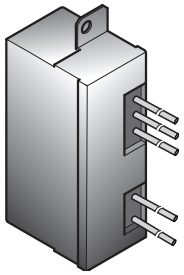
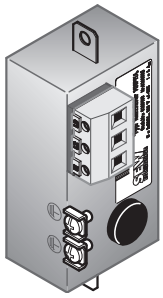
Options integrated in connection box

The following table shows the options for MOVIMOT® MM..D that are installed in the connection box:

- The options BEM, BES, URM, MLU13A, and MNF21A are integrated in the MOVIMOT® connection box.
- The MLU13A and MNF21A options can only be designed in combination with a modular connection box.
- The modular connection box is assigned depending on the ordered option and the MOVIMOT® size.

Option	Image	Description
BEM brake control Part number: 08296111		The BEM brake rectifier serves to control the brake of the MOVIMOT® drive. The BEM brake control system enables rapid release and rapid application of the mechanical brake. **NOTICE: The brake coil must correspond to the connection voltage**.
BES brake control Part number: 08298475		The BES brake rectifier serves to control the DC 24 V brake (not standard) of the MOVIMOT® drive. Control is performed by parameterization or activation of additional function 7 or 9. The BES brake control system enables normal release and rapid application of the mechanical brake. **NOTICE: The brake coil must be designed as a DC 24 V coil.**
URM voltage relay Part number: 08276013		The URM voltage relay implements the rapid application of the mechanical brake. **NOTICE: The brake coil must correspond to the MOVIMOT® standard (AC 120 V or AC 230 V).**

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Option	Image	Description
Internal DC 24 V supply MLU13A Part number: 18205968		The MLU13A option is installed in the modular connection box of the MOVIMOT® drive as standard. The option provides the DC 24 V voltage supply for the MOVIMOT® inverter, including one option with a maximum power consumption of 70 mA (MBG11A, MWA21A). An external 24 V auxiliary voltage is not required. Note that the height of the connection box is higher for MOVIMOT® MM03 to MM15 by **18 mm**.
Internal line filter MNF21A Part number: 08042659		The MNF21A option is mounted in the connection box of the MOVIMOT® (MM03 – MM15). The option enables implementing a drive system that complies with category C1 in accordance with EN 61800-3 with respect to interference emission. This option requires the modular connection box with larger dimensions. Note that the height of the connection box is higher for MOVIMOT® MM03 to MM15 by **18 mm**.

3.2 Mounting close to the motor MOVIMOT®

3.2.1 Description

The following figure shows the MOVIMOT® design for mounting close to the motor (on the left size MM03 to MM15, on the right size MM22 to MM40):



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- The P2.A option is used to mount the MOVIMOT® inverter in close proximity to the motor (i.e. separate from the motor).
- The connection to the "assigned motor" (→ 🗎 27) is made via a prefabricated "hybrid cable".
- MOVIMOT® with P2.A option has degree of protection IP65.

3.2.2 Options

Factory-installed external options

The following options can be installed at the connection box ex works (mounted and wired in working order):

- Local DC 24 V supply (MLU.1A)
- Local setpoint adjuster with DC 24 V supply (MLG.1A)

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3.2.3 Motor assignment

Motor requirements

The following table lists the basic requirements and restrictions for the assigned motors. Observe these specifications without fail when ordering the drive assigned to MOVIMOT® drive (design for mounting close to the motor):

<table>
<tr><th>Characteristics</th><th colspan="3">Requirements for the assigned AC motor</th></tr>
<tr><td>Permitted motors</td><td colspan="3">Only motors listed in chapters
"Motor assignment 1400 min^{-1}" (→ 🗎 27) and
"Motor assignment 2900 min^{-1}" (→ 🗎 30) are approved.</td></tr>
<tr><td rowspan="10">Permitted nominal voltage</td><td colspan="3">Depending on motor series:</td></tr>
<tr><td>Motor type</td><td>Nominal voltage V</td><td>Line frequency Hz</td></tr>
<tr><td>DR2S..</td><td>230/400</td><td>50</td></tr>
<tr><td>DRS..</td><td>230/400</td><td>50</td></tr>
<tr><td>DRE..</td><td>230/400</td><td>50</td></tr>
<tr><td>DRS../DRE..</td><td>230/400</td><td>50</td></tr>
<tr><td>DRN..</td><td>230/400</td><td>50</td></tr>
<tr><td>DRN..</td><td>266/460</td><td>60</td></tr>
<tr><td>DRU..</td><td>230/400</td><td>50</td></tr>
<tr><td>DRU..</td><td>266/460</td><td>60</td></tr>
<tr><td rowspan="7">Permitted brakes</td><td colspan="3">Depending on motor series:</td></tr>
<tr><td>Motor type</td><td>Standard brake type</td><td>Optional brake type</td></tr>
<tr><td>DR63L4</td><td>BR03</td><td>–</td></tr>
<tr><td>DR2S63M4</td><td>BE03</td><td>BE03</td></tr>
<tr><td>DRN71MS4</td><td>BE03</td><td>BE05</td></tr>
<tr><td>DR2S71MS4</td><td>BE05</td><td>BE1</td></tr>
<tr><td>DRS71S4
DRE80S4
DRN71M4</td><td>BE05</td><td>BE1</td></tr>
<tr><td>DR2S71M4
DR2S80MK4
DRS71M4
DRS80S4
DRE80M4
DRN80M4
DRN80MK4
DRU90S4</td><td>BE1</td><td>BE05</td></tr>
</table>

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Characteristics	Requirements for the assigned AC motor		
	DR2S80M4 DRS80M4 DRE90M4 DRN90S4 DRU100LSR4 DRU90L4	BE2	BE1
	DRS90M4 DRE90L4 DRN90L4 DRU100LS4	BE2	BE1
	DRS90L4 DRE100M4 DRE100L4 DRN100LS4 DRU100L4	BE5	BE2
	DRS100M4 DRS100L4 DRS100LC4 DRE100LC4 DRN100L4	BE5	BE2
	DRE132S4 DRN112M4 DRU112M4 DRU112MR4 DRU132S4	BE5	BE11
Preferred brake voltage	MM..D-503, size 1 (MM03.. – MM15..)		230 V
	MM..D-503, BG 2 (MM22.. – MM40..)		120 V
Brake rectifier	The assigned motor must always be ordered **without brake rectifier**.		
Permitted connectors	MM../P2.A/RO.A/APG4: • ASB4 connector • ISU4 connector See the chapter "Hybrid cables" for additional information.		
Permitted motor protection	SEW-EURODRIVE recommends to always order the motor with **TH thermostat** (bimetallic switch). Motor protection can also be implemented in the Expert mode of the MOVIMOT® inverter.		

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Motor assignment 1400 min^{-1}

Power kW	Motor (230/400 V, 50 Hz) 人	MOVIMOT® with P.2A option
0.25	DR63L4/TH DR**2S**63M4/TH DR**E**80S4/TH. DR**N**71MS4/TH.	MM03D-503-00/**0**/**BW1**/P21A..[1)]
	DR63L4/**BR..**/TH. DR**2S**63M4/**BE..**/TH. DR**E**80S4/**BE.**/TH. DR**N**71MS4/**BE.**/TH.	MM03D-503-00/**0**/P21A/..[1)]
0.37	DR**2S**71MS4/TH. DR**S**71S4/TH. DR**E**80S4/TH. DR**N**71M4/TH.	MM03D-503-00/**0**/**BW1**/P21A.. MM05D-503-00/**0**/**BW1**/P21A..[1)]
	DR**2S**71MS4/**BE.**/TH. DR**S**71S4/**BE.**/TH. DR**E**80S4/**BE.**/TH. DR**N**71M4/**BE.**/TH.	MM03D-503-00/**0**/P21A.. MM05D-503-00/**0**/P21A..[1)]
0.55	DR**2S**71M4/TH. DR**S**71M4/TH. DR**E**80M4/TH. DR**N**80MK4/TH.	MM05D-503-00/**0**/**BW1**/P21A.. MM07D-503-00/**0**/**BW1**/P21A..[1)]
	DR**2S**71M4/**BE.**/TH. DR**S**71M4/**BE.**/TH. DR**E**80M4/**BE.**/TH. DR**N**80MK4/**BE.**/TH.	MM05D-503-00/**0**/P21A.. MM07D-503-00/**0**/P21A..[1)]
0.75	DR**2S**80MK4/TH. DR**S**80S4/TH. DR**E**80M4/TH. DR**N**80M4/TH. DR**U**90S4/TH.	MM07D-503-00/**0**/**BW1**/P21A.. MM11D-503-00/**0**/**BW1**/P21A..[1)]
	DR**2S**80MK4/**BE.**/TH. DR**S**80S4/**BE.**/TH. DR**E**80M4/**BE.**/TH. DR**N**80M4/**BE.**/TH. DR**U**90S4/**BE.**/TH.	MM07D-503-00/**0**/P21A.. MM11D-503-00/**0**/P21A..[1)]

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Power kW	Motor (230/400 V, 50 Hz) 人	MOVIMOT® with P.2A option
1.1	DR**2S**80M4/TH. DR**S**80M4/TH. DR**E**90M4/TH. DR**N**90S4/TH. DR**U**100LSR4/TH.	MM11D-503-00/**0**/**BW1**/P21A.. MM15D-503-00/**0**/**BW1**/P21A..[1)]
	DR**2S**80M4/**BE.**/TH. DR**S**80M4/**BE.**/TH. DR**E**90M4/**BE.**/TH. DR**N**90S4/**BE.**/TH. DR**U**100LSR4/**BE.**/TH.	MM11D-503-00/**0**/P21A.. MM15D-503-00/**0**/P21A..[1)]
1.5	DR**S**90M4/TH. DR**E**90L4/TH. DR**N**90L4/TH. DR**U**100LS4/TH.	MM15D-503-00/**0**/**BW1**/P21A.. MM22D-503-00/**0**/**BW2**/P22A..[1)]
	DR**S**90M4/**BE.**/TH. DR**E**90L4/**BE.**/TH. DR**N**90L4/**BE.**/TH. DR**U**100LS4/**BE.**/TH.	MM15D-503-00/**0**/P21A.. MM22D-503-00/**0**/P22A..[1)]
2.2	DR**S**90L4/TH. DR**E**100M4/TH. DR**N**100LS4/TH. DR**U**100L4/TH.	MM22D-503-00/**0**/**BW2**/P22A.. MM30D-503-00/**0**/**BW2**/P22A..[1)]
	DR**S**90L4/**BE.**/TH. DR**E**100M4/**BE.**/TH. DR**N**100LS4/**BE.**/TH. DR**U**100L4/**BE.**/TH.	MM22D-503-00/**0**/P22A.. MM30D-503-00/**0**/P22A..[1)]
3.0	DR**S**100M4/TH. DR**E**100LC4/TH. DR**N**100L4/TH. DR**U**112M4/TH.	MM30D-503-00/**0**/**BW2**/P22A.. MM40D-503-00/**0**/**BW2**/P22A..[1)]
	DR**S**100M4/**BE.**/TH. DR**E**100LC4/**BE.**/TH. DR**N**100L4/**BE.**/TH. DR**U**112M4/**BE.**/TH.	MM30D-503-00/**0**/P22A.. MM40D-503-00/**0**/P22A..[1)]

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Power kW	Motor (230/400 V, 50 Hz) 人	MOVIMOT® with P.2A option
4.0	DR**S**100LC4/TH. DR**E**132S4/TH. DR**N**112M4/TH. DR**U**132S4/TH.	MM40D-503-00/**0**/**BW2**/P22A..
	DR**E**100LC4/**BE.**/TH. DR**E**132S4/**BE.**/TH. DR**N**112M4/**BE.**/TH. DR**U**132S4/**BE.**/TH.	MM40D-503-00/**0**/P22A..

1) Combination with increased short-term torque

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Motor assignment 2900 min^{-1}

Power kW	Motor (230/400 V, 50 Hz) ▵	MOVIMOT® with P2A option
0.37	DR63L4/TH	MM03D-503-00/**1**/**BW1**/P21A..
	DR**2S**63M4/TH DR**E**80S4/TH DR**N**71MS4/TH	MM05D-503-00/**1**/**BW1**/P21A..[1)]
	DR63L4/**BR..**/TH.	MM03D-503-00/**1**/P21A..
	DR**2S**63M4/**BE..**/TH. DR**E**80S4/**BE..**/TH. DR**N**71MS4/**BE..**/TH.	MM05D-503-00/**1**/P21A..[1)]
0.55	DR**2S**71MS4/TH.	MM05D-503-00/**1**/**BW1**/P21A..
	DR**S**71S4/TH. DR**E**80S4/TH. DR**N**71M4/TH.	MM07D-503-00/**1**/**BW1**/P21A..[1)]
	DR**2S**71MS4/**BE.**/TH.	MM05D-503-00/**1**/P21A..
	DR**S**71S4/**BE.**/TH. DR**E**80S4/**BE.**/TH. DR**N**71M4/**BE.**/TH.	MM07D-503-00/**1**/P21A..[1)]
0.75	DR**2S**71M4/TH.	MM07D-503-00/**1**/**BW1**/P21A..
	DR**S**71M4/TH. DR**E**80M4/TH. DR**N**80MK4/TH.	MM11D-503-00/**1**/**BW1**/P21A..[1)]
	DR**2S**71M4/**BE.**/TH.	MM07D-503-00/**1**/P21A..
	DR**S**71M4/**BE.**/TH. DR**E**80M4/**BE.**/TH. DR**N**80MK4/**BE.**/TH.	MM11D-503-00/**1**/P21A..[1)]
1.1	DR**2S**80MK4/TH.	MM11D-503-00/**1**/**BW1**/P21A..
	DR**S**80S4/TH. DR**E**80M4/TH. DR**N**80M4/TH. DR**U**90S4/TH.	MM15D-503-00/**1**/**BW1**/P21A..[1)]
	DR**2S**80MK4/**BE.**/TH.	MM11D-503-00/**1**/P21A..
	DR**S**80S4/**BE.**/TH. DR**E**80M4/**BE.**/TH. DR**N**80M4/**BE.**/TH. DR**U**90S4/**BE.**/TH.	MM15D-503-00/**1**/P21A..[1)]

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Power kW	Motor (230/400 V, 50 Hz) △	MOVIMOT® with P2A option
1.5	DR**2S**80M4/**BE.**/TH. DR**S**80M4/TH. DR**E**90M4/TH. DR**N**90S4/TH. DR**U**100LSR4/TH.	MM15D-503-00/**1**/**BW1**/P21A.. MM22D-503-00/**1**/**BW2**/P22A..[1)]
	DR**2S**80M4/**BE.**/TH. DR**S**80M4/**BE.**/TH. DR**E**90M4/**BE.**/TH. DR**N**90S4/**BE.**/TH. DR**U**100LSR4/**BE.**/TH.	MM15D-503-00/**1**/P21A.. MM22D-503-00/**1**/P22A..[1)]
2.2	DR**S**90M4/TH. DR**E**90L4/TH. DR**N**90L4/TH. DR**U**100LS4/TH.	MM22D-503-00/**1**/**BW2**/P22A.. MM30D-503-00/**1**/**BW2**/P22A..[1)]
	DR**S**90M4/**BE.**/TH. DR**E**90L4/**BE.**/TH. DR**N**90L4/**BE.**/TH. DR**U**100LS4/**BE.**/TH.	MM22D-503-00/**1**/P22A.. MM30D-503-00/**1**/P22A..[1)]
3.0	DR**S**90L4/TH. DR**E**100M4/TH. DR**N**100LS4/TH. DR**U**100L4/TH.	MM30D-503-00/**1**/**BW2**/P22A.. MM40D-503-00/**1**/**BW2**/P22A..[1)]
	DR**S**90S4/**BE.**/TH. DR**E**100M4/**BE.**/TH. DR**N**100LS4/**BE.**/TH. DR**U**100L4/**BE.**/TH.	MM30D-503-00/**1**/P22A.. MM40D-503-00/**1**/P22A..[1)]
4.0	DR**S**100M4/TH. DR**E**100LC4/TH. DR**N**100L4/TH. DR**U**112M4/TH.	MM40D-503-00/**1**/**BW2**/P22A..
	DR**S**100M4/**BE.**/TH. DR**E**100LC4/**BE.**/TH. DR**N**100L4/**BE.**/TH. DR**U**112M4/**BE.**/TH.	MM40D-503-00/**1**/P22A..

1) Combination with increased short-term torque

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3.3 Hybrid cables

INFORMATION

This chapter shows the technical data of the hybrid cables from SEW-EURODRIVE.

The assignment of hybrid cables to the products can be found in the corresponding chapters.

3.3.1 Description

The following figure shows examples of hybrid cables from SEW-EURODRIVE:



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SEW-EURODRIVE hybrid cables ..

- Combine energy transfer, control voltage and communication in one cable jacket
- Ensure optimum EMC shielding and cable impedances
- Are delivered prefabricated with plug-in connection.

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4 Technical data

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

MOVIMOT® type		MM 03D-503-00	MM 05D-503-00	MM 07D-503-00	MM 11D-503-00	MM 15D-503-00	MM 22D-503-00	MM 30D-503-00	MM 40D-503-00
Part number		**1821 4991**	**1821 5009**	**1821 5017**	**1821 5025**	**1821 5033**	**1821 5041**	**1821 5068**	**1821 5076**
Size		**1**					**2**		**2L**
Apparent output power at V_{line} = AC 380 – 500 V	S_N	1.1 kVA	1.4 kVA	1.8 kVA	2.2 kVA	2.8 kVA	3.8 kVA	5.1 kVA	6.7 kVA
Connection voltages **Permitted range**	V_{line}	AC 3 x 380 V/**400 V**/415 V/460 V/500 V V_{line} = AC 380V -10% – AC 500V +10%							
Line frequency	f_{line}	50 – 60 Hz ±10%							
Nominal line current at V_{line} = AC 400 V	I_{line}	AC 1.3 A	AC 1.6 A	AC 1.9 A	AC 2.4 A	AC 3.5 A	AC 5.0 A	AC 6.7 A	AC 7.3 A
Unaffected short-circuit current according to EN 61800-5-1		5 kA							
Maximum rated current		25 A							
Power factor	cos φ	0.99							
Output voltage	V_A	0 – V_{line}							
Output frequency **Resolution** **Operating point**	f_A	2 – 120 Hz 0.01 Hz 400 V at 50/100 Hz							
Nominal output current	I_N	AC 1.6 A	AC 2.0 A	AC 2.5 A	AC 3.2 A	AC 4.0 A	AC 5.5 A	AC 7.3 A	AC 8.7 A
Motor power S1	P_{Mot}	**0.37 kW** 0.5 HP	**0.55 kW** 0.75 HP	**0.75 kW** 1.0 HP	**1.1 kW** 1.5 HP	**1.5 kW** 2.0 HP	**2.2 kW** 3.0 HP	**3.0 kW** 4.0 HP	**4.0 kW** 5.4 HP
PWM frequency		4 (factory setting)/8/16 kHz [1]							
Current limitation	I_{max}	Motoring operation: 160% for ⅄ and △ Regenerative operation: 160% for ⅄ and △							
Maximum motor cable length		15 m when MOVIMOT® inverter is mounted close to the motor (with SEW-EURODRIVE hybrid cable)							
External braking resistor	R_{min}	150 Ω					68 Ω		
Interference immunity		Complies with EN 61800-3							

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MOVIMOT® type		MM 03D-503-00	MM 05D-503-00	MM 07D-503-00	MM 11D-503-00	MM 15D-503-00	MM 22D-503-00	MM 30D-503-00	MM 40D-503-00
Part number		1821 4991	1821 5009	1821 5017	1821 5025	1821 5033	1821 5041	1821 5068	1821 5076
Size		1					2		2L
Interference emission		Complies with category C2 according to EN 61800-3 (limit class A to EN 55011 and EN 55014)							
Ambient temperature	ϑ_A	-25 (-30) – +40 °C depending on the motor P_N reduction: 3% I_N per K up to max. 60 °C							
Climate class		EN 60721-3-3, class 3K22							
Storage temperature 2)		-30 to +85 °C (EN 60721-3-3, class 3K22)							
Maximum permitted vibration and impact load		3M7 according to DIN EN 60721-3-3 According to DIN EN 61800-5-1 and EN 60068-2-6							
Degree of protection (depending on the motor)		IP54, IP55, IP65, IP66 (optional, specify when ordering) (Connection box closed and all cable entries sealed; if the motor has a lower degree of protection, the degree of protection of the MOVIMOT® drive is reduced accordingly)							
Operating mode		S1, S3 max. cycle duration 10 minutes (EN 60034-1)							
Type of cooling		Natural cooling (DIN 41751)							
Installation altitude		h ≤ 1000 m: No reduction h > 1000 m: I_N reduced by 1% per 100 m h > 2000 m: I_N reduction by 1% per 100 m, overvoltage category II h_{max} = 3800 m See also chapter "Installation altitudes above 1000 m above sea level" (→ 🗎 125)							
Mass		See "MOVIMOT® gearmotors" catalog							
Dimensions, dimension drawings									
Output torques									
Required preventive measures		Grounding of the device							
Motor protection		Motor protection model: see chapter "Parameter 340" Motor current 140% – 190% of I_N: Switch-off between 60 s and 134 s, (depending on the actual speed and the thermal memory)							

1) 16 kHz PWM frequency (low-noise): When DIP SWITCH S1/7 is set to ON, the devices operate at a PWM frequency of 16 kHz (low noise) and switch back in steps to lower clock frequencies depending on the heat sink temperature and the load.

2) If the device is stored for long periods, apply line voltage to the device for at least 5 minutes every 2 years. Otherwise, the service life of the device will be reduced.

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4.2 Motor with operating point 460 V/60 Hz

MOVIMOT® type		MM 03D-503-00	MM 05D-503-00	MM 07D-503-00	MM 11D-503-00	MM 15D-503-00	MM 22D-503-00	MM 30D-503-00	MM 40D-503-00
Part number		**1821 4991**	**1821 5009**	**1821 5017**	**1821 5025**	**1821 5033**	**1821 5041**	**1821 5068**	**1821 5076**
Size		**1**					**2**		**2L**
Apparent output power at V_{line} = AC 380 – 500 V	S_N	1.1 kVA	1.4 kVA	1.8 kVA	2.2 kVA	2.8 kVA	3.8 kVA	5.1 kVA	6.7 kVA
Connection voltages	V_{line}	AC 3 x 380 V/400 V/415 V/**460 V**/500 V							
Permitted range		V_{line} = AC 380 V -10% – AC 500 V +10%							
Line frequency	f_{line}	50 – 60 Hz ±10%							
Nominal line current at V_{line} = AC 460 V	I_{line}	AC 1.1 A	AC 1.4 A	AC 1.7 A	AC 2.1 A	AC 3.0 A	AC 4.3 A	AC 5.8 A	AC 6.9 A
Unaffected short-circuit current according to EN 61800-5-1		5 kA							
Maximum rated current		25 A							
Power factor	cos φ	0.99							
Output voltage	V_A	0 – V_{line}							
Output frequency	f_A	2 – 120 Hz							
Resolution		0.01 Hz							
Operating point		460 V at 60 Hz							
Nominal output current	I_N	AC 1.6 A	AC 2.0 A	AC 2.5 A	AC 3.2 A	AC 4.0 A	AC 5.5 A	AC 7.3 A	AC 8.7 A
Motor power	P_{Mot}	**0.37 kW** 0.5 HP	**0.55 kW** 0.75 HP	**0.75 kW** 1.0 HP	**1.1 kW** 1.5 HP	**1.5 kW** 2.0 HP	**2.2 kW** 3.0 HP	**3.7 kW** 5.0 HP	**4 kW** 5.4 HP
PWM frequency		4 (factory setting)/8/16 kHz [1]							
Current limitation	I_{max}	Motoring operation: 160% for ⅄ and △							
		Regenerative operation: 160% for ⅄ and △							
Maximum motor cable length		15 m when MOVIMOT® inverter is mounted close to the motor (with SEW-EURODRIVE hybrid cable)							
External braking resistor	R_{min}	150 Ω					68 Ω		
Interference immunity		Complies with EN 61800-3							

MOVIMOT® type		MM 03D-503-00	MM 05D-503-00	MM 07D-503-00	MM 11D-503-00	MM 15D-503-00	MM 22D-503-00	MM 30D-503-00	MM 40D-503-00
Part number		1821 4991	1821 5009	1821 5017	1821 5025	1821 5033	1821 5041	1821 5068	1821 5076
Size		1					2		2L
Interference emission		Complies with category C2 according to EN 61800-3 (limit class A to EN 55011 and EN 55014)							
Ambient temperature	ϑ_A	-25 (-30) – +40 °C depending on the motor P_N reduction: 3% I_N per K up to max. 60 °C							
Climate class		EN 60721-3-3, class 3K22							
Storage temperature 2)		-30 to +85 °C (EN 60721-3-3, class 3K22)							
Maximum permitted vibration and impact load		3M7 according to DIN EN 60721-3-3 According to DIN EN 61800-5-1 and EN 60068-2-6							
Degree of protection (depending on the motor)		IP54, IP55, IP65, IP66 (optional, specify when ordering) (Connection box closed and all cable entries sealed; if the motor has a lower degree of protection, the degree of protection of the MOVIMOT® drive is reduced accordingly)							
Operating mode		S1, S3 max. cycle duration 10 minutes (EN 60034-1)							
Type of cooling		Natural cooling (DIN 41751)							
Installation altitude		h ≤ 1000 m: No reduction h > 1000 m: I_N reduced by 1% per 100 m h > 2000 m: I_N reduction by 1% per 100 m, overvoltage category II h_{max} = 3800 m See also chapter "Installation altitudes above 1000 m above sea level" (→ 🗎 125)							
Mass		See "MOVIMOT® gearmotors" catalog							
Dimensions, dimension drawings									
Output torques									
Required preventive measures		Grounding of the device							
Motor protection		Motor protection model: see chapter "Parameter 340" Motor current 140% – 190% of I_N: Switch-off between 60 s and 134 s, (depending on the actual speed and the thermal memory)							

1) 16 kHz PWM frequency (low-noise): When DIP SWITCH S1/7 is set to ON, the devices operate at a PWM frequency of 16 kHz (low noise) and switch back in steps to lower clock frequencies depending on the heat sink temperature and the load.

2) If the device is stored for long periods, apply line voltage to the device for at least 5 minutes every 2 years. Otherwise, the service life of the device will be reduced.

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4.3 Motor with operating point 230 V/60 Hz

MOVIMOT® type		MM 03D-233-00	MM 05D-233-00	MM 07D-233-00	MM 11D-233-00	MM 15D-233-00	MM 22D-233-00
Part number		**18215084**	**18215092**	**18215106**	**18215114**	**18215122**	**18215130**
Size		**1**			**2**		
Apparent output power at V_{line} = AC 200 – 240 V	S_N	1.0 kVA	1.3 kVA	1.7 kVA	2.0 kVA	2.9 kVA	3.4 kVA
Connection voltages **Permitted range**	V_{line}	AC 3 x 200 V/**230 V**/240 V V_{line} = AC 200V -10% – AC 240V +10%					
Line frequency	f_{line}	50 to 60 Hz ± 10%					
Nominal line current at V_{line} = AC 230 V	I_{line}	AC 1.9 A	AC 2.4 A	AC 3.5 A	AC 5.0 A	AC 6.7 A	AC 7.3 A
Unaffected short-circuit current according to EN 61800-5-1		5 kA					
Maximum rated current		25 A					
Power factor	cos φ	0.99					
Output voltage	V_A	0 – V_{line}					
Output frequency **Resolution** **Operating point**	f_A	2 – 120 Hz 0.01 Hz 230 V at 60 Hz					
Nominal output current	I_N	AC 2.5 A	AC 3.2 A	AC 4.0 A	AC 5.5 A	AC 7.3 A	AC 8.7 A
Motor power S1	P_{Mot}	**0.37 kW** 0.5 HP	**0.55 kW** 0.75 HP	**0.75 kW** 1.0 HP	**1.1 kW** 1.5 HP	**1.5 kW** 2.0 HP	**2.2 kW** 3.0 HP
PWM frequency		4 (factory setting)/8/16 kHz [1)]					
Current limitation	I_{max}	Motoring operation: 160% for ⅄ and △ Regenerative operation: 160% for ⅄ and △					
Maximum motor cable length		15 m when mounting close to the motor of the MOVIMOT® frequency inverter (with SEW-EURODRIVE hybrid cable)					
External braking resistor	R_{min}	150 Ω			68 Ω		
Interference immunity		Complies with EN 61800-3					
Interference emission		Complies with category C2 according to EN 61800-3 (limit value class A to EN 55011 and EN 55014)					
Ambient temperature	ϑ_A	-25 (-30) – +40 °C depending on the motor P_N reduction: 3% I_N per K up to max. 60 °C					
Climate class		EN 60721-3-3, class 3K22					

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MOVIMOT® type		MM 03D-233-00	MM 05D-233-00	MM 07D-233-00	MM 11D-233-00	MM 15D-233-00	MM 22D-233-00
Part number		**18215084**	**18215092**	**18215106**	**18215114**	**18215122**	**18215130**
Size		**1**			**2**		
Storage temperature [2]		-30 to +85 °C (EN 60721-3-3, class 3K22)					
Maximum permitted vibration and impact load		3M7 according to DIN EN 60721-3-3 According to DIN EN 61800-5-1 and EN 60068-2-6					
Degree of protection (depending on the motor)		IP54, IP55, IP65, IP66 (optional, specify when ordering) (Connection box closed and all cable entries sealed; if the motor has a lower degree of protection, the degree of protection of the MOVIMOT® drive is reduced accordingly)					
Operating mode		S1, S3 max. cycle duration 10 minutes (EN 60034-1)					
Type of cooling		Natural cooling (DIN 41751)					
Installation altitude		h ≤ 1000 m: No reduction h > 1000 m: I_N reduced by 1% per 100 m h > 2000 m: I_N reduction by 1% per 100 m, overvoltage category II h_{max} = 3800 m See also chapter "Installation altitudes above 1000 m above sea level" (→ 🗎 125)					
Mass		See "MOVIMOT® gearmotors" catalog					
Dimensions, dimension drawings							
Output torques							
Required preventive measures		Grounding of the device					
Motor protection		Motor protection model: see chapter "Parameter 340" Motor current 140% – 190% of I_N: Switch-off between 60 s and 134 s, (depending on the actual speed and the thermal memory)					

1) 16 kHz PWM frequency (low-noise): When DIP SWITCH S1/7 is set to ON, the devices operate at a PWM frequency of 16 kHz (low noise) and switch back in steps to lower clock frequencies depending on the heat sink temperature and the load.

2) If the device is stored for long periods, apply line voltage to the device for at least 5 minutes every 2 years. Otherwise, the service life of the device will be reduced.

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4.4 Inverter data

4.4.1 Content of the chapter

This document contains a list of points stipulated by the EU Ecodesign Regulation 2019/1781 and by the UK Ecodesign Regulations (S.I. 2010 No. 2617 and S.I. 2021 No. 745) for the inverter series.

These points are:

(1)	Power loss in % of the apparent output power S_N Standby losses (W, %)
(2)	Efficiency level according to IEC 61800-9-2
(3)	Manufacturer's name or trademark, commercial registration number, and address
(4)	Model identifier of the product
(5)	Apparent output power or range of apparent output power (kVA)
(6)	Indicative motor rated output power P_N (kW)
(7)	Nominal output current (A)
(8)	Maximum operating temperature (°C)
(9)	Rated supply frequency (Hz)
(10)	Nominal input voltage or range of nominal input voltage (V)

Point 1 first lists the power losses in percent of the rated apparent output power at the 8 operating points specified by the regulation, and second, standby losses for each device.

The operating points are indicated in the regulation with 2 numbers separated by a semicolon, such as "0;50". The first number is the relative motor stator frequency, the second number indicates the relative torque-producing current.

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4.4.2 Connection voltage 380 V – 500 V

MOVIMOT® MM..D - MM03 - 15D-..3-00

Model identifier		MOVIMOT® MM..D				
Type		MM03 - 15D-..3-00				
Performance class		03	05	07	11	15
(1) Power loss in % of the apparent output power	0;25	2.24	1.73	1.50	1.31	1.21
	0;50	2.26	1.87	1.65	1.46	1.38
	0;100	2.49	2.22	2.01	1.83	1.78
	50;25	2.29	1.77	1.54	1.35	1.26
	50;50	2.34	1.95	1.73	1.54	1.46
	50;100	2.63	2.37	2.17	2.00	1.95
	90;50	2.41	2.02	1.80	1.62	1.54
	90;100	2.76	2.51	2.31	2.15	2.12
(1) Power loss in standby	W	3.0	3.0	3.0	3.0	3.0
	%	0.3	0.2	0.2	0.1	0.1
(2) Efficiency level according to IEC 61800-9-2		IE2				
(3) Manufacturer		SEW-EURODRIVE GmbH & Co KG RG Mannheim, HRB 230207 D-76646 Bruchsal				
(5) Apparent output power	kVA	1.11	1.39	1.73	2.22	2.77
(6) Indicative motor rated power output	kW	0.37	0.55	0.75	1.10	1.50
(7) Rated output current	A	1.60	2.00	2.50	3.20	4.00
(8) Maximum operating temperature	°C	40				
(9) Rated supply frequency	Hz	50 – 60 ±10%				
(10) Range of rated supply voltage	V	3 × 380 – 500 ±10%				

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MOVIMOT® MM..D - MM22 - 30D-..3-00

Model identifier	MOVIMOT® MM..D		
Type	MM22 – 30D-..3-00		
Performance class		22	30
(1) Power loss in % of the apparent output power	0;25	0.89	0.84
	0;50	1.10	1.04
	0;100	1.61	1.51
	50;25	0.93	0.88
	50;50	1.18	1.12
	50;100	1.77	1.68
	90;50	1.26	1.20
	90;100	1.93	1.84
(1) Power loss in standby	W	3.0	3.0
	%	0.1	0.1
(2) Efficiency level according to IEC 61800-9-2	IE2		
(3) Manufacturer	SEW-EURODRIVE GmbH & Co KG RG Mannheim, HRB 230207 D-76646 Bruchsal		
(5) Apparent output power	kVA	3.81	5.06
(6) Indicative motor rated power output	kW	2.20	3.00
(7) Rated output current	A	5.50	7.30
(8) Maximum operating temperature	°C	40	
(9) Rated supply frequency	Hz	50 – 60 ±10%	
(10) Range of rated supply voltage	V	3 × 380 – 500 ±10%	

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MOVIMOT® MM..D - MM40D-..3-00

Model identifier		MOVIMOT® MM..D
Type		**MM40D-..3-00**
Performance class		**40**
(1) Power loss in % of the apparent output power	0;25	0.84
	0;50	1.04
	0;100	1.53
	50;25	0.88
	50;50	1.13
	50;100	1.70
	90;50	1.21
	90;100	1.87
(1) Power loss in standby	W	3.0
	%	0.1
(2) Efficiency level according to IEC 61800-9-2		IE2
(3) Manufacturer		SEW-EURODRIVE GmbH & Co KG RG Mannheim, HRB 230207 D-76646 Bruchsal
(5) Apparent output power	kVA	6.03
(6) Indicative motor rated power output	kW	4.00
(7) Rated output current	A	8.70
(8) Maximum operating temperature	°C	40
(9) Rated supply frequency	Hz	50 – 60 ±10%
(10) Range of rated supply voltage	V	3 × 380 – 500 ±10%

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4.4.3 Connection voltage 200 V – 240 V

MOVIMOT® MM..D - MM03 - 07D-..3-00

Model identifier		MOVIMOT® MM..D		
Type		MM03 - 07D-..3-00		
Performance class		03	05	07
(1) Power loss in % of the apparent output power	0;25	2.21	2.01	1.50
	0;50	2.24	2.04	1.73
	0;100	2.59	2.42	2.32
	50;25	2.30	2.10	1.57
	50;50	2.38	2.19	1.88
	50;100	2.85	2.68	2.62
	90;50	2.50	2.31	2.02
	90;100	3.08	2.93	2.91
(1) Power loss in standby	W	3.0	3.0	3.0
	%	0.3	0.2	0.2
(2) Efficiency level according to IEC 61800-9-2		IE2		
(3) Manufacturer		SEW-EURODRIVE GmbH & Co KG RG Mannheim, HRB 230207 D-76646 Bruchsal		
(5) Apparent output power	kVA	1.00	1.27	1.59
(6) Indicative motor rated power output	kW	0.37	0.55	0.75
(7) Rated output current	A	2.50	3.20	4.00
(8) Maximum operating temperature	°C	40		
(9) Rated supply frequency	Hz	50 – 60 ±10%		
(10) Range of rated supply voltage	V	3 × 200 – 240 ±10%		

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MOVIMOT® MM..D - MM11 - 22D-..3-00

Model identifier		MOVIMOT® MM..D		
Type		MM11 - 22D-..3-00		
Performance class		11	15	22
(1) Power loss in % of the apparent output power	0;25	1.19	1.12	1.12
	0;50	1.48	1.39	1.39
	0;100	2.20	2.04	2.08
	50;25	1.26	1.19	1.19
	50;50	1.62	1.53	1.54
	50;100	2.48	2.33	2.37
	90;50	1.75	1.67	1.68
	90;100	2.74	2.62	2.67
(1) Power loss in standby	W	3.0	3.0	3.0
	%	0.1	0.1	0.1
(2) Efficiency level according to IEC 61800-9-2		IE2		
(3) Manufacturer		SEW-EURODRIVE GmbH & Co KG RG Mannheim, HRB 230207 D-76646 Bruchsal		
(5) Apparent output power	kVA	2.19	2.91	3.47
(6) Indicative motor rated power output	kW	1.10	1.50	2.20
(7) Rated output current	A	5.50	7.30	8.70
(8) Maximum operating temperature	°C	40		
(9) Rated supply frequency	Hz	50 – 60 ±10%		
(10) Range of rated supply voltage	V	3 × 200 – 240 ±10%		

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4.5 Electronics data

Electronics data	Terminal		
External electronics supply	24 V X6:1, 2, 3	V = +24 V ± 25%, EN 61131-2, residual ripple max. 13% I_E ≤ 250 mA (typically 120 mA at 24 V) Input capacitance 120 µF	
Three digital inputs		Isolated via optocoupler; PLC compatible (EN 61131-2) R_i ≈ 3.0 kΩ, I_E ≈ 10 mA, sampling cycle ≤ 5 ms	
Signal level		+13 – +30 V -3 – +5 V	= "1" = Contact closed = "0" = Contact open
Control functions	R ↷ X6:11, 12	CW/Stop	
	L↶ X6:9, 10	CCW/Stop	
	f1/f2 X6:7, 8	"0" = setpoint 1 "1 = setpoint 2	
Output relay Contact information	K1a X5:25, 26	Response time ≤ 15 ms DC 24 V/0.6 A/DC 12 according to IEC 60947-5-1 (only SELV or PELV circuits)	
	K1b X5:27, 28		
Signaling function		NO contact for ready signal	Contact closed: • With voltage present (24 V + power supply) • If no error was detected • At the end of self-testing phase (after power on)
Serial interface	RS+ X5:29, 30	RS485	
	RS- X5:31, 32		

4.6 Ports and services

The product has no Wi-Fi or Ethernet-based ports or services.

For information on other communication interfaces, refer to the relevant chapters of this documentation.

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4.7 Integrated RS485 interface

RS485 interface	
Standard	RS485 to EIA standard (with integrated dynamic terminating resistor)
Baud rate	9.6 kBaud 31.25 kBaud (in connection with MF.., MQ.., MOVIFIT® MC)
Start bits	1 start bit
Stop bits	1 stop bit
Data bits	8 data bits
Parity	1 parity bit, completing for even parity (even parity)
Data direction	Bidirectional
Operating mode	Asynchronous, semi-duplex
Timeout time	1 s
Cable length	Max. 200 m for RS485 operation with 9600 baud Max. 30 m at transmission rate: 31250 Baud[1)]
Number of devices	• max. 32 devices (1 bus master [2)]) broadcast and group addresses possible • 15 MOVIMOT® can be addressed individually

1) Transmission rate of 31,250 Bd will be detected automatically in case of operation with MF.. fieldbus interface.

2) ext. control or option MBG11A, MWA21A or MLG..A + 31 MOVIMOT®

4.8 Diagnostic interface

Diagnostic interface X50	
Standard	RS485 to EIA standard (with integrated dynamic terminating resistor)
Baud rate	9.6 kbaud
Start bits	1 start bit
Stop bits	1 stop bit
Data bits	8 data bits
Parity	1 parity bit, completing for even parity (even parity)
Data direction	Bidirectional
Operating mode	Aynchronous, semi-duplex
Connection	RJ10 socket

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4.9 Technical data – functional safety

The table below shows the technical data for MOVIMOT® MM..D relating to the integrated safety technology. The technical data and approvals from the operating instructions "MOVIMOT® MM..D..." must also be observed.

Technical data safety-related 24 V supply voltage				
	Min.	**Typical**	**Max.**	**Unit**
Input voltage range	18	24	30	V (DC)
Power consumption		3.4	3.7	W
Input capacitance		100	120	µF
Switch-on/switch-off threshold		7.5		V
Input voltage for OFF state (STO)			5	V
Permitted leakage current of the external safety controller		0	10	mA
Time from disconnecting the 24 V supply until the deactivation of the rotating field		25	50	ms

Safety characteristics	
Tested safety classes	Performance level d according to EN ISO 13849-1 SIL 2 according to EN 61800-5-2
Probability of dangerous failure per hour (PFH value)	0 (error exclusion)
Service life or proof test interval according to EN 61508	20 years, after which the component must be replaced with a new one.
Safe state	Safe torque off (STO)

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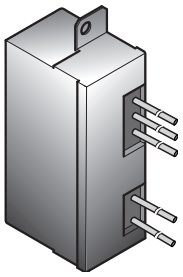
4.10 Technical data of options and accessories

4.10.1 MLU11A/MLU21A



Option	MLU11A	MLU21A
Part number	08233837	0823387X
Function	24 V voltage supply	
Input voltage	AC 380 – 500 V ± 10% (50/60 Hz)	AC 200 – 240 V ± 10% (50/60 Hz)
Output voltage	DC 24 V ± 25%	
Output power	max. 6 W	
Degree of protection	IP65	
Ambient temperature	-25 – +60°C	
Storage temperature	-25 – +85°C	

4.10.2 MLU13A



Option	MLU13A
Part number	18205968
Function	24 V voltage supply
Input voltage	AC 380 – 500 V ± 10% (50/60 Hz)
Output voltage	DC 24 V ± 25%
Output power	max. 8 W
Degree of protection	IP20
Ambient temperature	-25 – +85°C
Storage temperature	-25 – +85°C

4.10.3 MLG11A/MLG21A

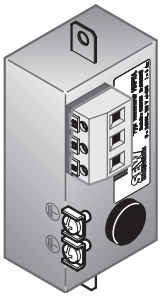


Option	MLG11A	MLG21A
Part number	08233845	08233888
Function	Setpoint adjuster and DC 24 V voltage supply	
Input voltage	AC 380 – 500 V ±10% (50/60 Hz)	AC 200 – 240 V ±10% (50/60 Hz)
Output voltage	DC 24 V ±25%	
Output power	Max. 6 W	
Setpoint resolution	1%	
Serial interface[1)]	RS485 for connecting a MOVIMOT® inverter	
Degree of protection	IP65	
Ambient temperature	-15 to +60 °C	
Storage temperature	-25 – +85 °C	

1) with integrated dynamic terminating resistor

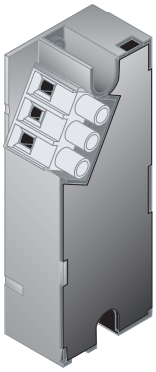
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4.10.4 MNF21A



Option	MNF21A (only for MM03D-503-00 – MM15D-503-00)
Part number	08042659
Function	3-phase line filter (allows for category C1 to EN 61800-3)
Input voltage	V = 3x AC 380 V – 500 V ±10% (50/60 Hz)
Input current	4 A
Degree of protection	IP20
Ambient temperature	-25 – +60 °C
Storage temperature	-25 – +85 °C

4.10.5 URM



Option	URM
Part number	08276013
Function	Voltage relay, ensures quick application of the mechanical brake
Rated voltage V_N	DC 36 – 167 V (Brake coil AC 88 – 400 V)
Braking current I_N	0.75 A
Degree of protection	IP20
Ambient temperature	-25 – +60°C
Storage temperature	-25 – +85°C
Disconnection time t_{off}	Approx. 40 ms (without URM option: 100 ms) (cut-off in the DC circuit)

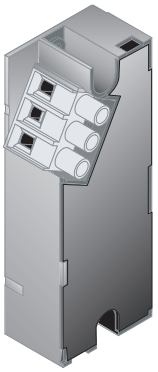
4.10.6 BEM

NOTICE

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

Damage to the BEM brake rectifier or the brake coil.

- Select a brake with rated brake voltage that matches the nominal line voltage!



Option	BEM
Part number	08296111
Function	Brake rectifier ensures the rapid switching (release and application) of the mechanical brake.
Rated supply voltage	AC 230 V – AC 500 V + 10%/- 15% 50 – 60 Hz ±5% Black connection wires
Control voltage	DC 0 to 5 V
	MOVIMOT® connection: PCB connector X10
Brake current	Max. DC 0.8 A
	Brake connection 13, 14, 15
Degree of protection	IP20
Ambient temperature	-25 to +60 °C
Storage temperature	-25 – +85 °C
Disconnection time t_{off}	10 – 20 ms

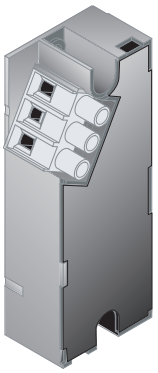
4.10.7 BES (for 24 V brake coil)

NOTICE

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

Damage to the BES brake rectifier or the brake coil.

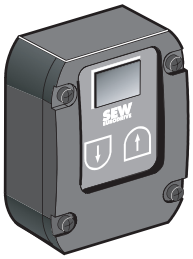
- Select a brake with a DC 24 V brake coil.



Option	BES
Part number	08298475
Function	Brake rectifier ensures the rapid switching (release and application) of the mechanical brake.
Supply voltage	DC 24 V +10%/-15%
Control voltage	DC 0 to 5 V
	MOVIMOT® connection: PCB connector X10
Brake current	Max. DC 3.0 A
Degree of protection	IP20
Ambient temperature	-25 to +60 °C
Storage temperature	-25 – +85 °C
Disconnection time t_{off}	10 – 20 ms

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4.10.8 MBG11A



Option	MBG11A
Part number	08225478
Function	Setpoint adjuster
Input voltage	DC 24 V ±25%
Current demand	approx. 70 mA
Setpoint resolution	1%
Serial interface[1)]	RS485 for connecting a maximum of 31 MOVIMOT® inverters (max. 200 m, 9600 baud)
Degree of protection	IP65
Ambient temperature	-15 to +60 °C
Storage temperature	-25 – +85 °C

1) with integrated terminating resistor

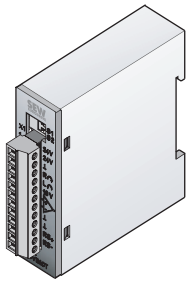
4.10.9 DBG



Option	DBG60B-01	DBG60B-02	DBG60B-03	DBG60B-04
Part number	18204031	18204058	18204066	18208509
Function	Keypad			
Connection	RJ10 connector For connection to the X50 diagnostic interface			
Degree of protection	IP40 (EN 60529)			
Ambient temperature	0 – +40 °C			
Storage temperature	-20 – +80 °C			

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4.10.10 MWA21A



Option	MWA21A
Part number	08230064
Function	Setpoint converter
Input voltage	DC 24 V ±25%
Current demand	approx. 70 mA
Serial interface[1)]	RS485 for connecting max. 31 MOVIMOT® inverters (max. 200 m) max. 9600 Baud Unidirectional communication Cycle time: 100 ms
Analog input	0 – 10 V/2 – 10 V, $R_i \approx 12$ kΩ 0 – 20 mA/4 – 20 mA, $R_i \approx 22$ Ω
Setpoint resolution analog input	8 bits (± 1 bits)
Signal level binary inputs	+13 – +30 V = "1" -3 – +5 V = "0"
Degree of protection	IP20
Ambient temperature	-15 to +60 °C
Storage temperature	-25 – +85 °C

1) with integrated terminating resistor

4.10.11 Forced cooling fan V

Option	V forced cooling fan				
for motor size DR..	**71**	**80**	**90**	**100**	**112/132**
Input voltage	DC 24 V				
Current consumption	0.35 A	0.5 A	0.75 A	0.75/ 1.1 A	1.64 A
Power demand	10 W	12 W	14 W	14/19 W	29 W
Air discharge rate	60 m^3/h		170 m^3/h	210 m^3/h	295 m^3/h
Connection	Terminal strip				
Max. cable cross section	3 x 1.5 mm^2				
Cable gland	M16 x 1.5				
Degree of protection	IP66				
Ambient temperature	–20 – +60°C				

4.11 Switching work, working air gap, braking torque of brake

For the latest technical data of the switching work, working air gap and braking torque of the brake, refer to the documentation of the corresponding motor.

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4.12 Braking torque assignment

Motor type	Brake type	Braking torque steps [Nm]												
DR.71	BE03	0.9	1.3	1.7	2.1	2.7	3.4							
	BE05	1.8	2.5	3.5	5.0									
	BE1				5.0	7.0	10							
DR.80	BE05	1.8	2.5	3.5	5.0									
	BE1				5.0	7.0	10							
	BE2					7.0	10	14	20					
DR.90	BE1				5.0	7.0	10							
	BE2					7.0	10	14	20					
	BE5								20	28	40	55		
DR.100	BE2					7.0	10	14	20					
	BE5								20	28	40	55		
DR.112	BE5									28	40	55		
	BE11										40	55	80	110
DR.132	BE5									28	40	55		
	BE11										40	55	80	110

Preferred brake voltage

MOVIMOT® type		Preferred brake voltage
MOVIMOT® MM..D-503, size 1	(MM03.. up to MM15..)	230 V
MOVIMOT® MM..D-503, size 2	(MM22.. up to MM40..)	120 V
MOVIMOT® MM..D-223[1], size 1 and 2	(MM03.. up to MM40..)	

1) In connection with MOVIMOT MM..D-233, only the brakes with a nominal voltage of 120 V are permitted.

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4.13 Assignment of internal braking resistors

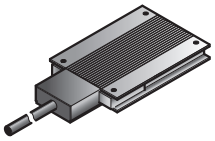
MOVIMOT® type	Braking resistor	Part number
MM03D-503-00 – MM15D-503-00 MM03D-233-00 – MM07D-233-00	BW1	08228973[1)]
MM22D-503-00 – MM40D-503-00 MM11D-233-00 – MM22D-233-00	BW2	08231362[1)]

1) 2 screws M4 × 8 included in the scope of delivery.

4.14 Assignment of external braking resistors

MOVIMOT® type	Braking resistor	Part no.	Protective grid
MM03D-503-00 – MM15D-503-00 MM03D-233-00 – MM07D-233-00	BW200-003/K-1.5	08282919	0813152X
	BW200-005/K-1.5	08282838	–
	BW150-006/T	17969565	–
MM22D-503-00 – MM40D-503-00 MM11D-233-00 – MM22D-233-00	BW100-003/K-1.5	08282935	0813152X
	BW100-005/K-1.5	08282862	–
	BW068-006/T	17970008	–
	BW068-012/T	17970016	–

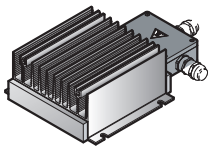
4.14.1 BW100.. BW200..



	BW100-003/ K-1.5	BW100-005/ K-1.5	BW200-003/ K-1.5	BW200-005/ K-1.5
Part number	08282935	08282862	08282919	08282838
Function	Dissipating the regenerative energy			
Degree of protection	IP65			
Resistance	100 Ω	100 Ω	200 Ω	200 Ω
Power in S1, 100% cdf	100 W	200 W	100 W	200 W
Dimensions W x H x D	146 x 15 x 80 mm	252 x 15 x 80 mm	146 x 15 x 80 mm	252 x 15 x 80 mm
Line length	1.5 m			

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4.14.2 BW150.. BW068..



	BW150-006-T	BW68-006-T	BW68-012-T
Part number	17969565	17970008	17970016
Function	Dissipating the regenerative energy		
Degree of protection	IP66		
Resistance	150 Ω	68 Ω	68 Ω
Power according to UL in S1, 100% cdf	600 W	600 W	1200 W
Power according to CE in S1, 100% cdf	900 W	900 W	1800 W
Dimensions W x H x D	285 x 75 x 174 mm	285 x 75 x 174 mm	635 x 75 x 174 mm
Maximum permitted cable length	15 m		

INFORMATION

Generally speaking, the application does not need the temperature sensor of the braking resistor. The higher-level controller can evaluate the temperature sensor's signal and switch off the supply voltage of the drive when necessary.

4.15 Brake coil assignment

The following table shows the assignment of the brake coil to the respective motor. For the regenerative current-carrying capacity of the brake coil, refer to chapter "4Q operation with motors with mechanical brake" (→ 🗎 58).

Motor	Assignment of the brake coil	
	Standard brake	Optional brake
DR63L4	BR03	–
DR2S63M4	BE03	BE03
DRN71MS4	BE03	BE05
DR2S71MS4 DRS71S4 DRE80S4 DRN71M4	BE05	BE1

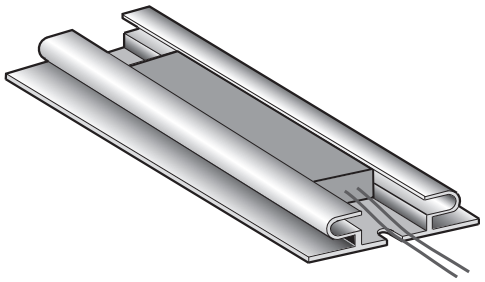
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Motor	Assignment of the brake coil	
	Standard brake	Optional brake
DR2S71M4 DR2S80MK4 DRS71M4 DRS80S4 DRE80M4 DRN80M4 DRN80MK4 DRU90S4	BE1	BE05
DRS80M4 DRE90M4 DRN90S4 DRU100LSR4 DRU90L4	BE2	BE1
DR2S80M4 DRS90M4 DRE90L4 DRN90L4 DRU100LS4	BE2	BE1
DRS90L4 DRE100M4 DRE100L4 DRN100LS4 DRU100L4	BE5	BE2
DRS100M4 DRS100L4 DRS100LC4 DRE100LC4 DRN100L4	BE5	BE2
DRE132S4 DRN112M4 DRU112M4 DRU112MR4 DRU132S4	BE5	BE11

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4.16 4Q operation with integrated BW.. braking resistor

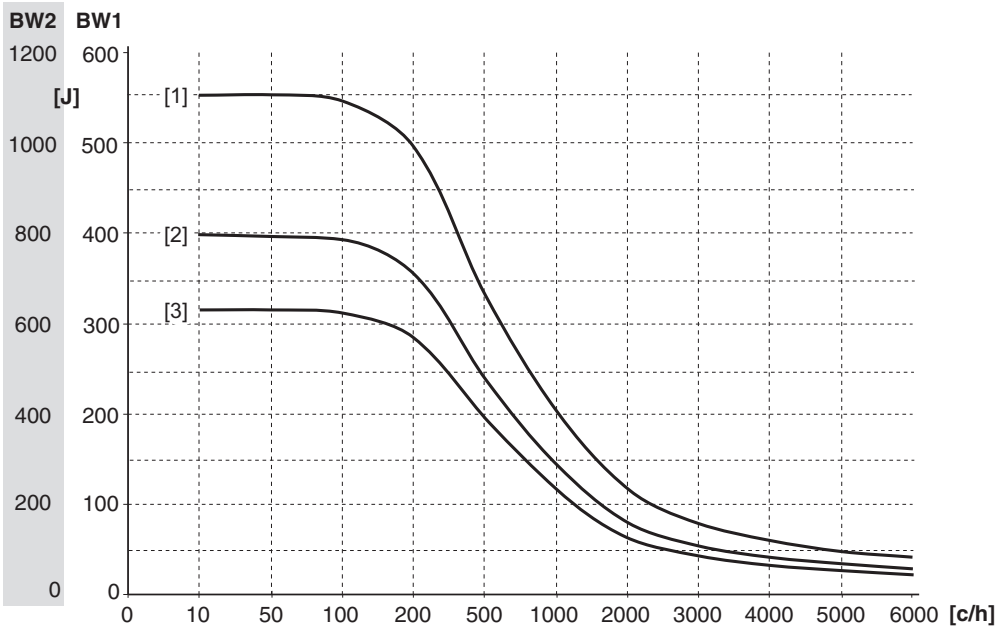
- 4Q operation with integrated braking resistor is recommended for applications in which the level of regenerative energy is low.
- The resistor protects itself (reversible) against regenerative overload by changing abruptly to high resistance and no longer consuming any more energy. The inverter then switches off and issues the error "overvoltage" (error code 07).



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4.16.1 Regenerative current-carrying capacity of internal braking resistors

The following figure shows the regenerative current-carrying capacity of the internal braking resistors:



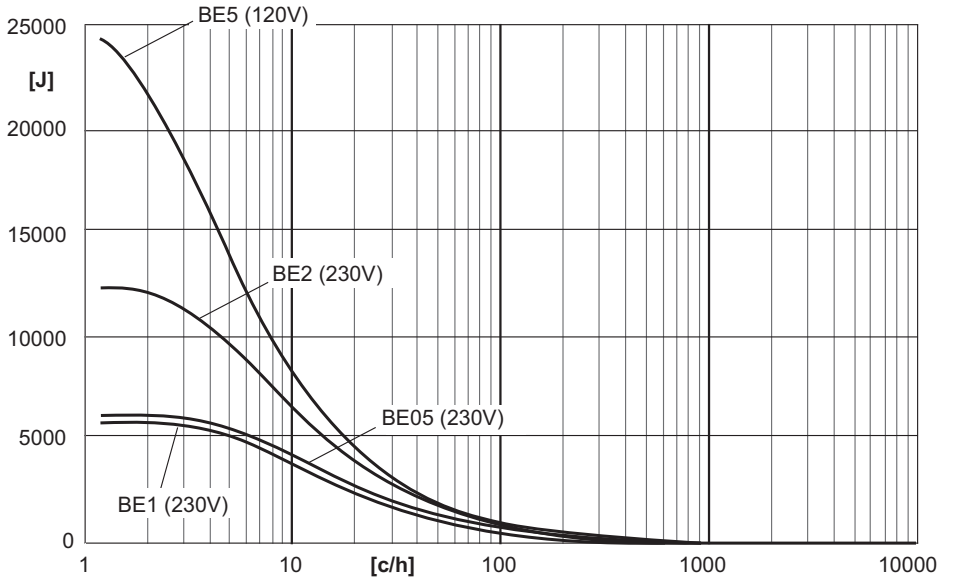
9007200742150795

[c/h] Cycles/hour
[1] Brake ramp 10 s
[2] Brake ramp 4 s
[3] Brake ramp 0.2 s

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4.17 4Q operation for motors with mechanical brake

- The brake coil can be used as a braking resistor in 4-Q operation.
- Brake voltage is generated internally within the unit, which means it is grid-independent.
- Should the regenerative current-carrying capacity not be sufficient for the application, refer to the chapter "4Q operation with integrated brake and external brake resistor" (→ 🗎 59):
- The following figure shows the current-carrying capacity of the DR.. motor brake coils:



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4.18 4Q operation with integrated brake and external braking resistor

4Q operation with external braking resistor is necessary for applications with a large amount of regenerative energy.

NOTICE

In case of incorrect assignment of the inverters, an overload may occur at the braking resistor and damage the braking resistor.

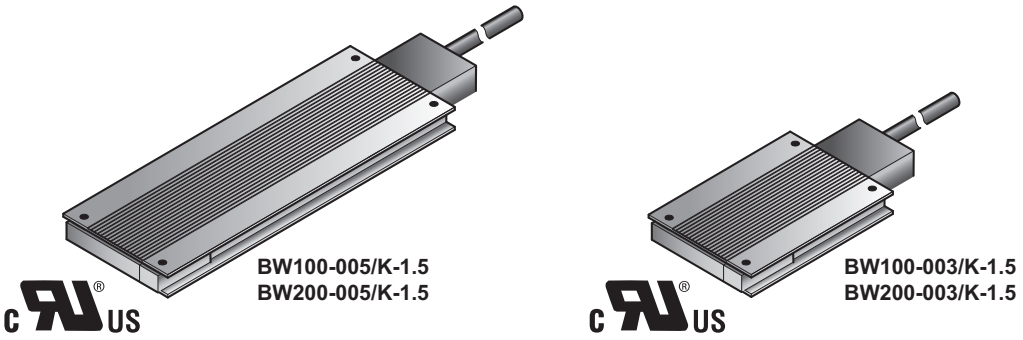
Damage to braking resistor.

- Observe the assignment of the braking resistor to the inverter and the project planning guidelines.

Flat-type resistors have internal thermal protection (fuse cannot be replaced) that interrupts the current circuit in the event of overload. Additional components for thermal monitoring are not necessary.

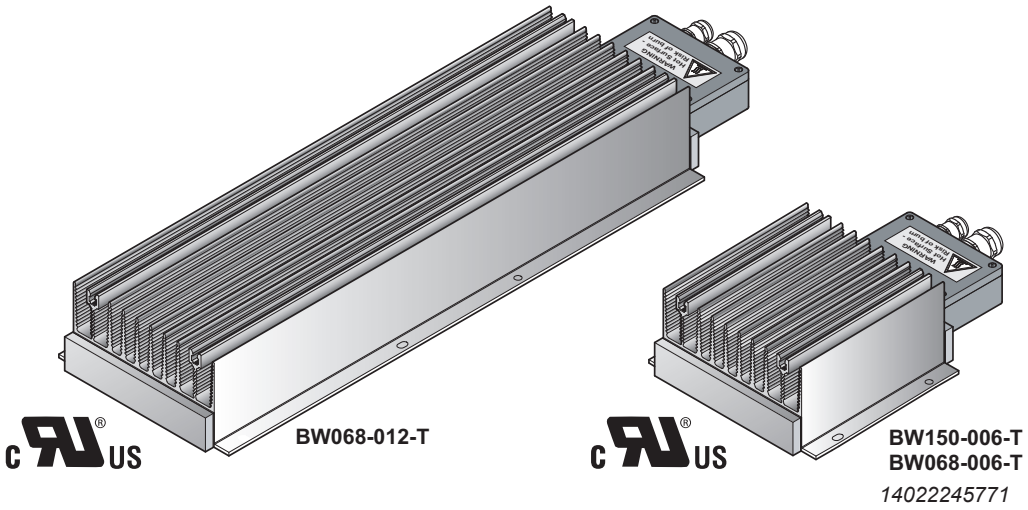
4.18.1 Braking resistors with IP65 degree of protection

The following figure shows the external braking resistors with IP65 degree of protection:



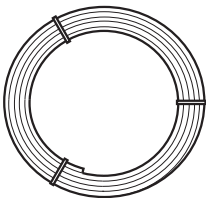
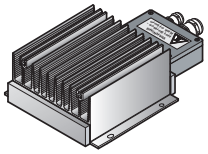
4.18.2 Braking resistors with IP66 degree of protection

The following figure shows the external braking resistors with IP66 degree of protection:



Connection cable

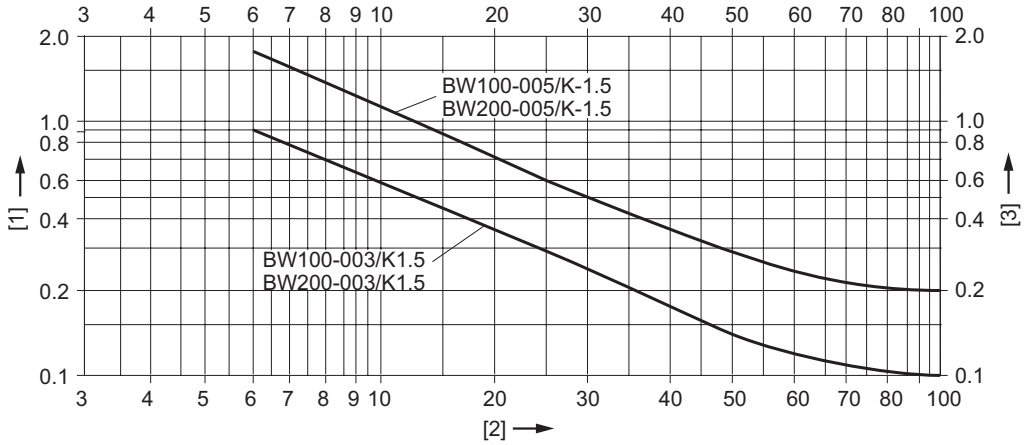
The following cable is available for connecting the external braking resistors:

Inverter	Connection cable	Length	Braking resistor
MOVIFIT® FC MOVIMOT®	Part number: 13230409 (cable roll) 	30 m	BW068-012-T BW068-006-T BW150-006-T 

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4.18.3 Power diagrams BW100-003/K1.5, BW200-003/K1.5, BW100-005/K1.5 and BW200-005/K1.5

The following figure shows the power diagrams of braking resistors BW100-003/K1.5, BW200-003/K1.5, BW100-005/K1.5 and BW200-005/K1.5:

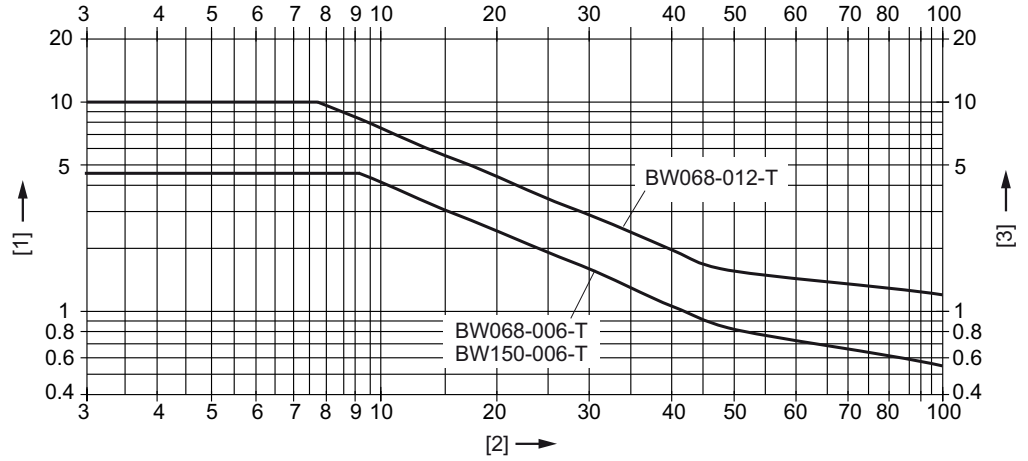


9007200744805003

[1] Short-term power in kW
[2] Cyclic duration factor cdf in %
[3] Continuous power 100% cdf in kW

4.18.4 Rating diagrams for BW150-006-T, BW068-006-T and BW068-012-T according to UL approval

The following figure shows the rating diagrams of braking resistors BW150-006-T, BW068-006-T and BW068-012-T according to UL approval:



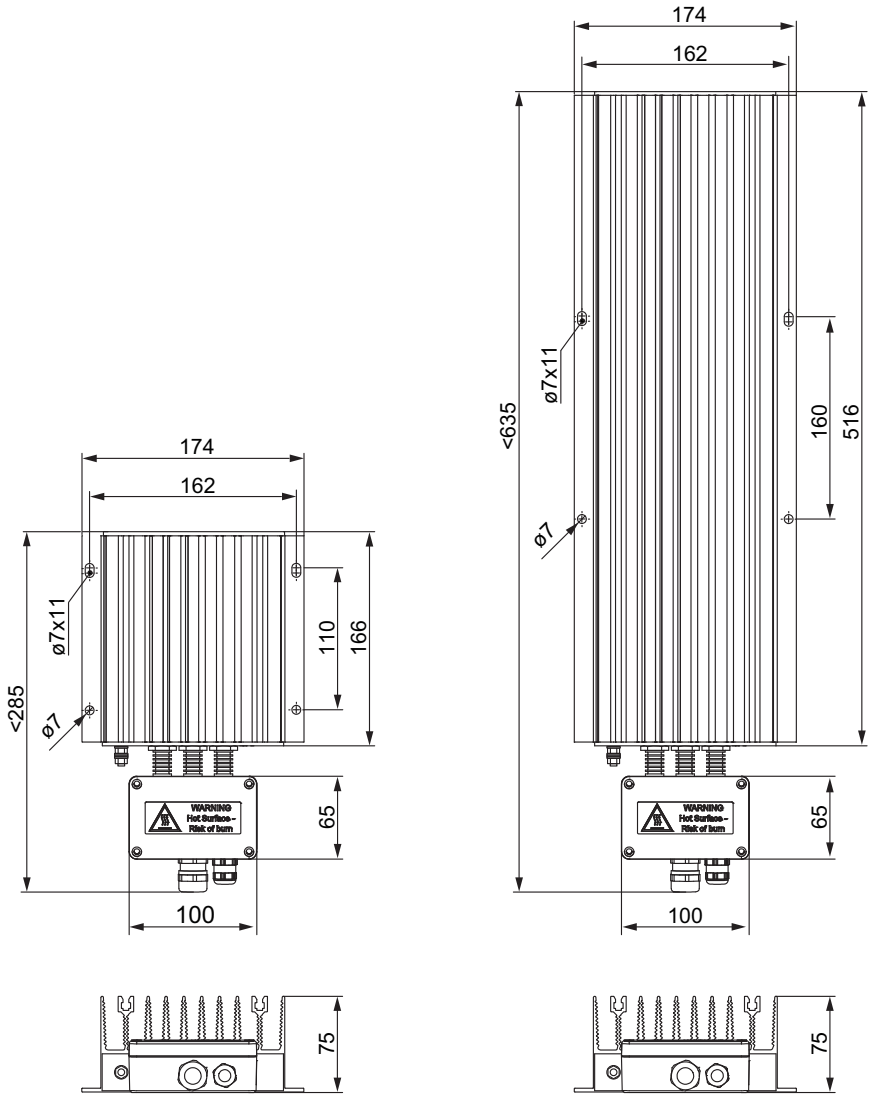
9007204312468235

[1] Short-term braking power in kW
[2] Cyclic duration factor cdf in %
[3] Continuous power 100% cdf in kW

cdf = Cyclic duration factor of the braking resistor in relation to a cycle duration $T_D \leq$ 120 s.

4.18.5 Dimension drawing of BW150-006-T, BW068-006-T, and BW068-012-T

The following figure shows the dimensions of the external braking resistors BW150-006-T, BW068-006-T, and BW068-012-T[1]:



BW150-006-T
BW068-006-T

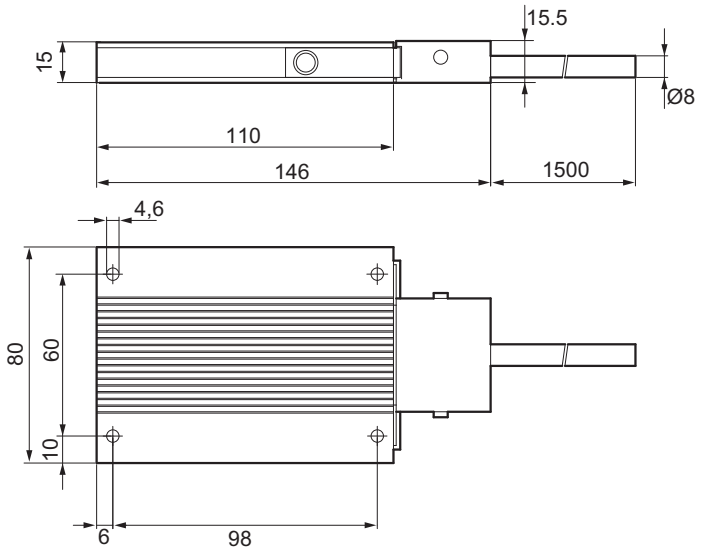
BW068-012-T

18014399999698315

1) The braking resistor is equipped with a temperature sensor.

4.18.6 Dimension drawing of BW100-003/K-1.5 and BW200-003/K-1.5

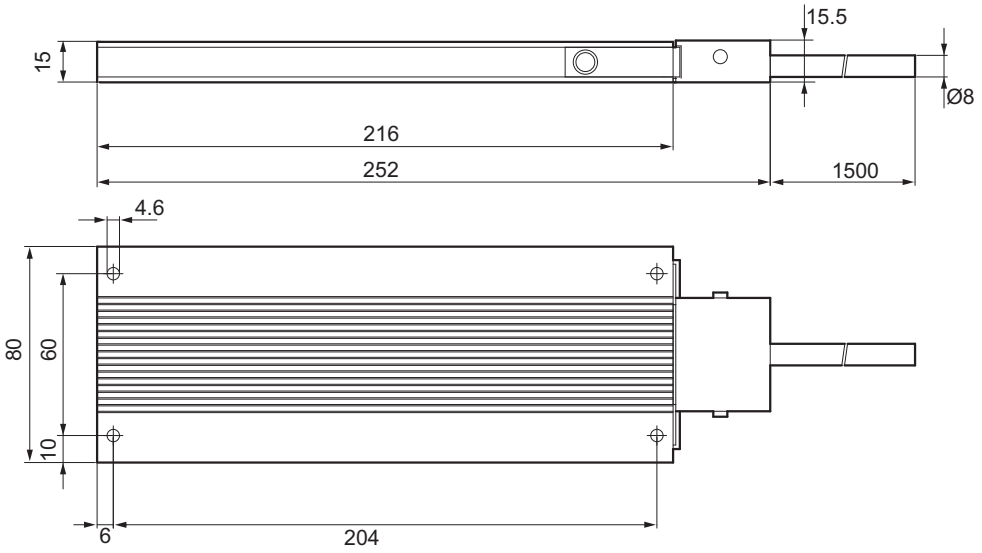
The following figure shows the dimensions of the external braking resistors BW100-003/K-1.5 and BW200-003/K-1.5:



9007200744953483

4.18.7 Dimension drawing of BW100-005/K-1.5 and BW200-005/K-1.5

The following figure shows the dimensions of the external braking resistors BW100-005/K-1.5 and BW200-005/K-1.5:



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4.19 Resistance and assignment of the brake coil

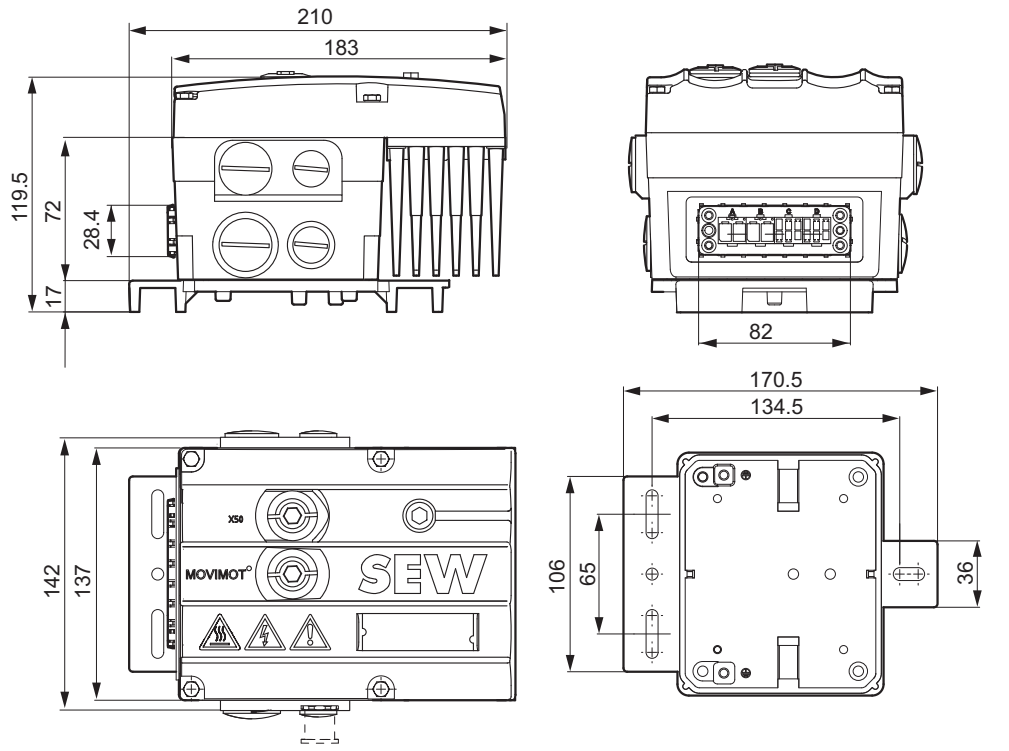
Brake	Resistance of the brake coil[1]		
	120 V	230 V	400 V
BE03	76 Ω	378 Ω	1197 Ω
BE05	78 Ω	312 Ω	985 Ω
BE1	78 Ω	312 Ω	985 Ω
BE2	58 Ω	232 Ω	732 Ω
BE5	51 Ω	200 Ω	640 Ω
BE11	33 Ω	130 Ω	412 Ω

1) Nominal value measured between the red connection (terminal 13) and the blue connection (terminal 15) at 20°C, temperature-dependent fluctuations in the range –25% / +40% are possible.

4.20 Dimension drawings

4.20.1 Dimension drawing of MM03 to MM15 with option P21A (APG4 connector)

The following figure shows the dimensions of MM03 to MM15 with option P21A (APG4 connector):

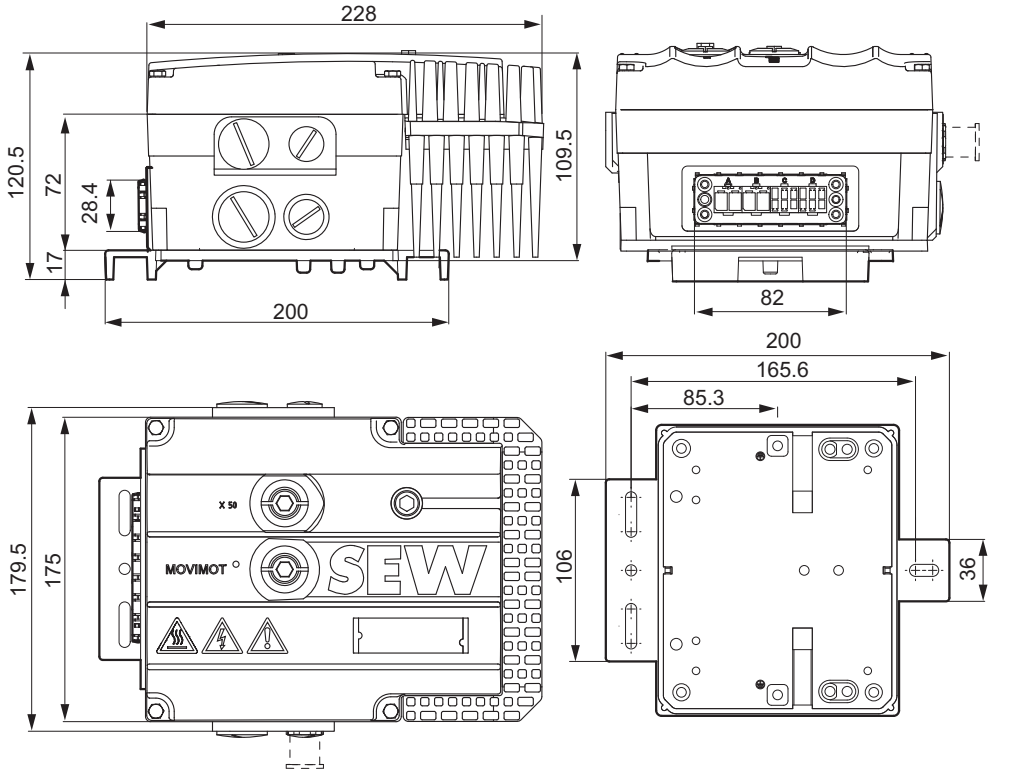


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4.20.2 Dimension drawing of MM22 to MM30 with option P22A (APG4 connector)

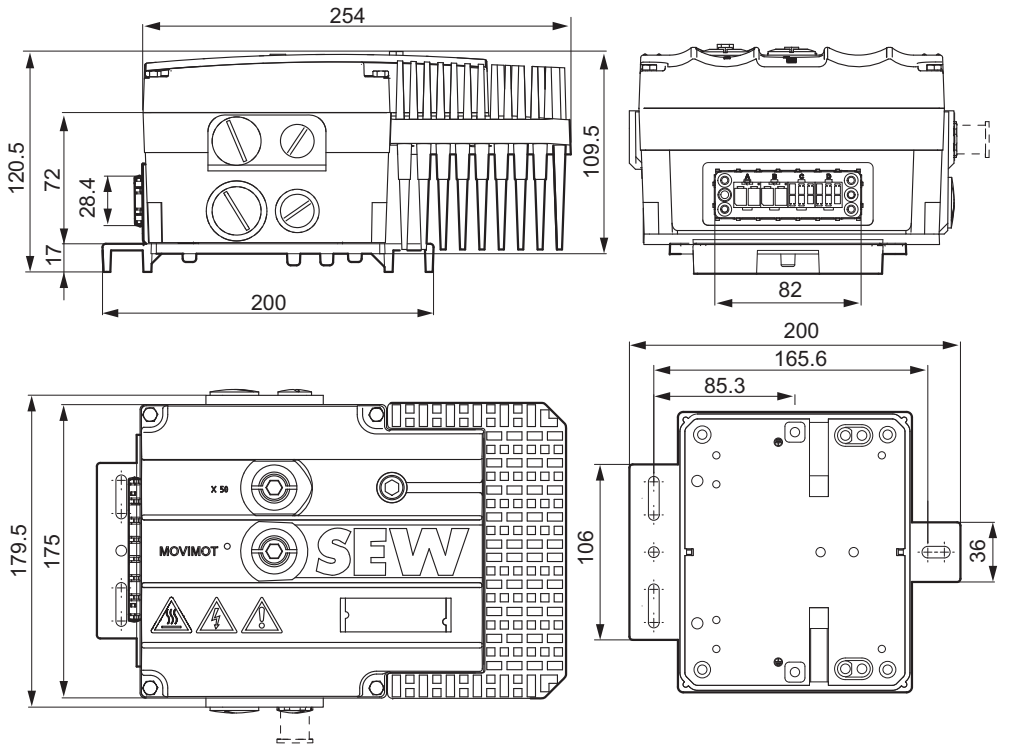
The following figure shows the dimensions of MM22 to MM30 with option P22A (APG4 connector):



9007200786059147

4.20.3 MM40 dimension drawing with option P22A (APG4 connector)

The following figure shows the dimensions of MM40 with option P22A (APG4 connector):



9007200940484875

5 Project planning of the device

5.1 MOVIMOT®

5.1.1 Available MOVIMOT® motor combinations

Motor identification for MOVIMOT® (/M

Each MOVIMOT® drive has a motor identification module (drive ID module) for easy and fast startup. The drive ID module is included in the delivery of the MOVIMOT® motor or MOVIMOT® gearmotor.

When a DR.. motor/brakemotor is ordered without MOVIMOT® inverter, a drive ID module suitable for the energy efficiency class can be included in the delivery. The drive ID module is attached in the standard terminal box of the DR.. motor or the DR...BE brakemotor. On the type designation of the DR.. motor/brakemotor, the drive ID module is indicated by /MI.

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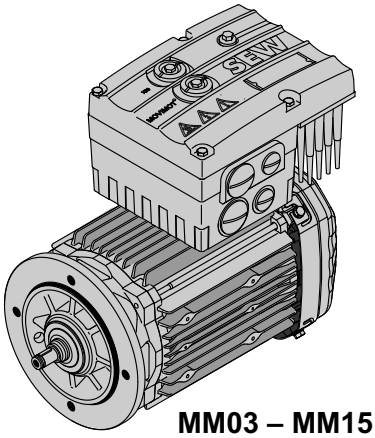
Assignment of the drive ID module

Motor			Drive ID module		
Type	Line voltage V	Line frequency Hz	Identification	Identification color	Part number
DR2S..	230/400	50	DR2S/400/50	Light gray/ white striped	28249720
DR2S..	266/460	60	DR2S/460/60[1)]	Yellow/white striped	28249739
DRS..	230/400	50	DRS/400/50	White	18214371
DRE..	230/400	50	DRE/400/50	Orange	18214398
DRS..	266/460	60	DRS/460/60[1)]	Yellow	18214401
DRE..	266/460	60	DRE/460/60[1)]	Green	18214428
DRS../DRE..	220/380	60	DRS/DRE/380/60[1)]	Red	18234933
DRS../DRE..	220 – 240/380 – 415 254 – 277/440 – 480	50 60	DRS/DRE/50/60	Violet	18214444
DRE...J..	230/400	50	DRE...J/400/50	Orange	28203816
DRU...J..	230/400	50	DRU...J/400/50	Gray	28203194
DRN..	220/380	60	DRN/380/60[1)]	Red/white striped	28240227
DRN..	230/400	50	DRN/400/50	Light blue	28222040
DRN..	266/460	60	DRN/460/60[1)]	Blue/white striped	28241819
DRS../DRN..	220 – 230/380 – 400 266/460	50 60	DRS/DRN/50/60	Green/white striped	28241827
DRN..	220 – 230/380 – 400 266/460	50 60	DRN/50/60	Violet/white striped	28249747
DRU..	230/400	50	DRU/400/50	Dark brown/ white striped	28291646
DRU..	266/460	60	DRU/460/60	Light brown/ white striped	28312406

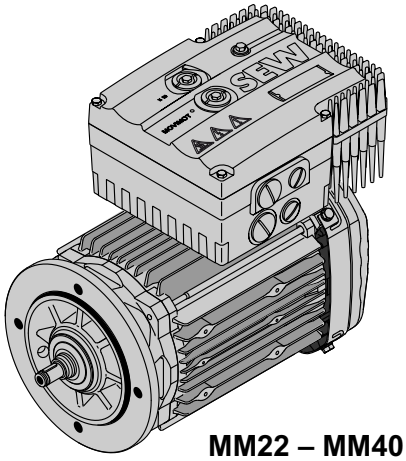
1) This drive ID module can also be combined with MOVIMOT® MM..D-233.

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MOVIMOT® drives with DRN.. motors



MM03 – MM15



MM22 – MM40

280 – 1400 min^{-1} ⅄ 3 × 380 – 500 V (400 V, 50 Hz)

IEC or UL

Type	P_N kW	M_N Nm	M_A/M_N f > 5 Hz	n_N min^{-1}	I_N A	cosφ	J_{Mot} 10^{-4} kgm^2	J_{BMot} 10^{-4} kgm^2	M_B Nm	m_{Mot} kg	m_{BMot} kg
DRN71M4/../MM03	0.37	2.5	1.5	1400	1.3	0.99	7.1	8.4	5	9.6	11.6
DRN80MK4/../MM05	0.55	3.65	1.5	1400	1.6	0.99	17.1	18.6	10	12.6	15.6
DRN80M4/../MM07	0.75	5.1	1.5	1400	1.9	0.99	24.7	26.2	10	15.6	19.6
DRN90S4/../MM11	1.1	7.5	1.5	1400	2.4	0.99	54.0	58.7	20	21.6	26.2
DRN90L4/../MM15	1.5	10.2	1.5	1400	3.5	0.99	67.2	71.9	20	24.6	29.2
DRN100LS4/../MM22	2.2	15.0	1.5	1400	5.0	0.99	81.4	87.4	28	29.3	35.2
DRN100L4/../MM30	3.0	20.5	1.5	1400	6.7	0.99	112	118	40	36.3	42.2
DRN112M4/../MM40	4.0	27.3	1.5	1400	7.3	0.99	178	183	55	48.2	55.4

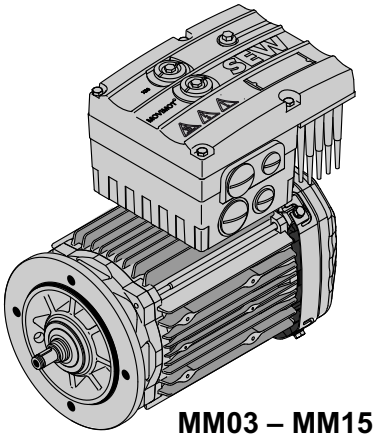
290 – 2900 min^{-1} △ 3 × 380 – 500 V (400 V, 50 Hz)

IEC or UL

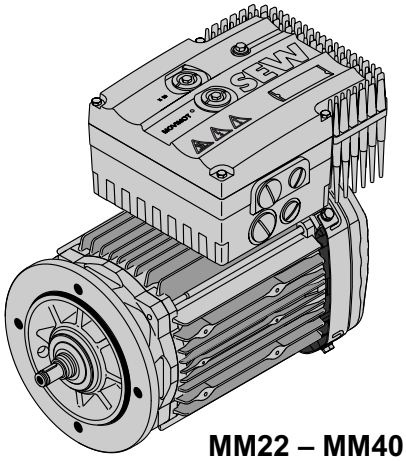
Type	P_N kW	M_N Nm	M_A/M_N f > 5 Hz	n_N min^{-1}	I_N A	cosφ	J_{Mot} 10^{-4} kgm^2	J_{BMot} 10^{-4} kgm^2	M_B Nm	m_{Mot} kg	m_{BMot} kg
DRN71MS4/../MM03	0.37	1.22	1.5	2900	1.3	0.99	5.4	6.1	5	8.4	10.2
DRN71M4/../MM05	0.55	1.81	1.5	2900	1.6	0.99	7.1	8.4	5	9.6	11.6
DRN80MK4/../MM07	0.75	2.47	1.5	2900	1.9	0.99	17.1	18.6	10	12.6	15.6
DRN80M4/../MM11	1.1	3.62	1.5	2900	2.4	0.99	24.7	26.2	10	15.6	19.6
DRN90S4/../MM15	1.5	4.95	1.5	2900	3.5	0.99	54.0	58.7	20	21.6	26.2
DRN90L4/../MM22	2.2	7.25	1.5	2900	5.0	0.99	67.2	71.9	20	25.3	29.9
DRN100LS4/../MM30	3.0	9.9	1.5	2900	6.7	0.99	81.4	87.4	28	29.3	35.2
DRN100L4/../MM40	4.0	13.2	1.5	2900	7.3	0.99	112	118	40	37.2	43.1

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MOVIMOT® drives with DRN.. motors and increased short-term torque



MM03 – MM15



MM22 – MM40

280 – 1400 min^{-1} ⅄ 3 × 380 – 500 V (400 V, 50 Hz)

IEC or UL

Type	P_N kW	M_N Nm	M_A/M_N f > 5 Hz	n_N min^{-1}	I_N A	cosφ	J_{Mot} 10^{-4} kgm^2	J_{BMot} 10^{-4} kgm^2	M_B Nm	m_{Mot} kg	m_{BMot} kg
DRN71MS4/../MM03	0.25	1.69	2.1	1400	1.0	0.99	5.42	6.72	5	8.4	10.8
DRN71M4/../MM05	0.37	2.5	2.1	1400	1.3	0.99	7.1	8.4	5	9.6	11.6
DRN80MK4/../MM07	0.55	3.65	2.1	1400	1.6	0.99	17.1	18.6	10	12.6	15.6
DRN80M4/../MM11	0.75	5.1	2.1	1400	1.9	0.99	24.7	26.2	10	15.6	19.3
DRN90S4/../MM15	1.1	7.5	2.1	1400	2.4	0.99	54.0	58.7	20	21.6	26.2
DRN90L4/../MM22	1.5	10.2	2.1	1400	3.5	0.99	67.2	71.9	20	25.3	29.9
DRN100LS4/../MM30	2.2	15.0	2.1	1400	5.0	0.99	81.4	87.4	28	29.3	35.2
DRN100L4/../MM40	3.0	20.5	2.1	1400	6.7	0.99	112	118	40	37.2	43.1

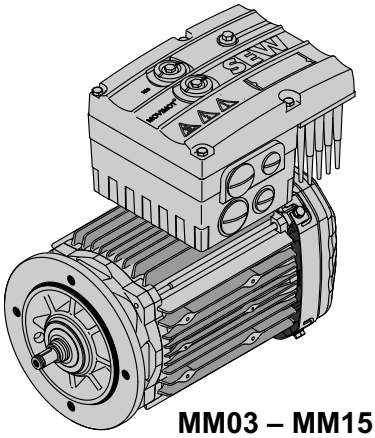
290 – 2900 min^{-1} △ 3 × 380 – 500 V (400 V, 50 Hz)

IEC or UL

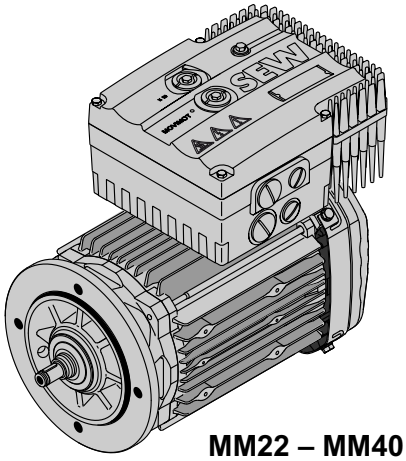
Type	P_N kW	M_N Nm	M_A/M_N f > 5 Hz	n_N min^{-1}	I_N A	cosφ	J_{Mot} 10^{-4} kgm^2	J_{BMot} 10^{-4} kgm^2	M_B Nm	m_{Mot} kg	m_{BMot} kg
DRN71MS4/../MM05	0.37	1.22	2.2	2900	1.3	0.99	5.4	6.1	5	8.4	10.2
DRN71M4/../MM07	0.55	1.81	2.2	2900	1.6	0.99	7.1	8.4	5	9.6	11.6
DRN80MK4/../MM11	0.75	2.47	2.2	2900	1.9	0.99	17.1	18.6	10	12.6	15.6
DRN80M4/../MM15	1.1	3.62	2.1	2900	2.4	0.99	24.7	26.2	10	15.6	19.3
DRN90S4/../MM22	1.5	4.95	2.1	2900	3.5	0.99	54.0	58.7	20	22.3	26.9
DRN90L4/../MM30	2.2	7.25	2.1	2900	5.0	0.99	67.2	71.9	20	25.3	29.9
DRN100LS4/../MM40	3.0	9.9	2.1	2900	6.7	0.99	81.4	87.4	28	30.2	36.1

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MOVIMOT® drives with DRE.. motors



MM03 – MM15



MM22 – MM40

280 – 1400 min^{-1} ⅄ 3 × 380 – 500 V (400 V)

IEC or UL

Type	P_N	M_N	M_A/M_N	n_N	I_N	cosφ	J_{Mot}	J_{BMot}	M_B	m_{Mot}	m_{BMot}
	kW	Nm	f > 5 Hz	min^{-1}	A		10^{-4} kgm^2	10^{-4} kgm^2	Nm	kg	kg
DRE80S4 /../MM03	0.37	2.52	1.5	1400	1.3	0.99	14.9	16.4	5	12.7	15.7
DRE80M4 /../MM05	0.55	3.75	1.5	1400	1.6	0.99	21.5	23	10	15.5	18.5
DRE80M4 /../MM07	0.75	5.1	1.5	1400	1.9	0.99	21.5	23	10	15.5	18.5
DRE90M4 /../MM11	1.1	7.5	1.5	1400	2.4	0.99	35.5	40	20	19.6	24.2
DRE90L4 /../MM15	1.5	10.2	1.5	1400	3.5	0.99	43.5	48.5	20	22.6	27.2
DRE100M4 /../MM22	2.2	15	1.5	1400	5.0	0.99	56	62	28	28.3	34.2
DRE100LC4 /../MM30	3.0	20.5	1.5	1400	6.7	0.99	90	96	40	33.5	39.4
DRE132S4 /../MM40	4.0	27.3	1.5	1400	7.3	0.99	190	195	55	49.2	56.4

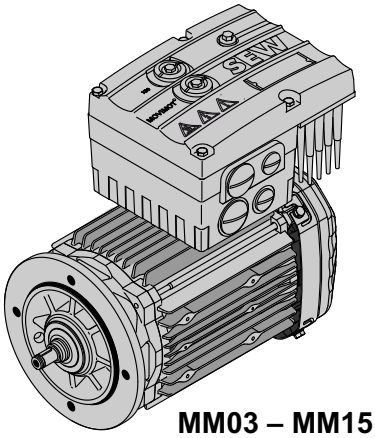
290 – 2900 min^{-1} △ 3 × 380 – 500 V (400 V)

IEC or UL

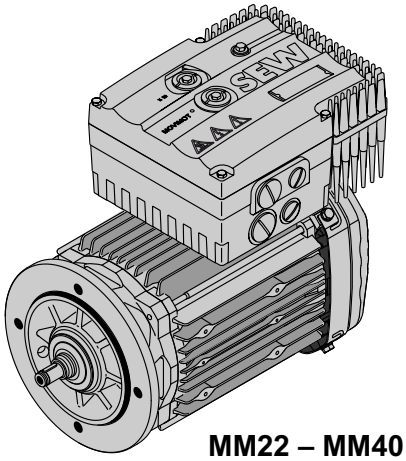
Type	P_N	M_N	M_A/M_N	n_N	I_N	cosφ	J_{Mot}	J_{BMot}	M_B	m_{Mot}	m_{BMot}
	kW	Nm	f > 5 Hz	min^{-1}	A		10^{-4} kgm^2	10^{-4} kgm^2	Nm	kg	kg
DRE80S4 /../MM03	0.37	1.22	1.5	2900	1.3	0.99	14.9	16.4	5	12.7	15.7
DRE80S4 /../MM05	0.55	1.81	1.5	2900	1.6	0.99	14.9	16.4	5	12.7	15.7
DRE80M4 /../MM07	0.75	2.47	1.5	2900	1.9	0.99	21.5	23	10	15.5	18.5
DRE80M4 /../MM11	1.1	3.62	1.5	2900	2.4	0.99	21.5	23	10	15.5	18.5
DRE90M4 /../MM15	1.5	4.95	1.6	2900	3.5	0.99	35.5	40	20	19.6	24.2
DRE90L4 /../MM22	2.2	7.25	1.6	2900	5.0	0.99	43.5	48.5	20	23.7	28.2
DRE100M4 /../MM30	3.0	9.9	1.6	2900	6.7	0.99	56	62	28	28.3	34.2
DRE100LC4 /../MM40	4.0	13.2	1.6	2900	7.3	0.99	90	96	40	34.1	40.0

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MOVIMOT® drives with DRE.. motors and increased short-term torque



MM03 – MM15



MM22 – MM40

280 – 1400 min^{-1} ⅄ 3 × 380 – 500 V (400 V)

IEC or UL

Type	P_N	M_N	M_A/M_N	n_N	I_N	cosφ	J_{Mot}	J_{BMot}	M_B	m_{Mot}	m_{BMot}
	kW	Nm	f > 5 Hz	min^{-1}	A		10^{-4} kgm^2	10^{-4} kgm^2	Nm	kg	kg
DRE80S4 /../MM05	0.37	2.52	2.1	1400	1.3	0.99	14.9	16.4	5	12.7	15.7
DRE80M4 /../MM07	0.55	3.75	2.1	1400	1.6	0.99	21.5	23	10	15.5	18.5
DRE80M4 /../MM11	0.75	5.1	2.1	1400	1.9	0.99	21.5	23	10	15.5	18.5
DRE90M4 /../MM15	1.1	7.5	2.1	1400	2.4	0.99	35.5	40	20	19.6	24.2
DRE90L4 /../MM22	1.5	10.2	2.1	1400	3.5	0.99	43.5	48.5	20	23.7	28.3
DRE100M4 /../MM30	2.2	15.0	2.1	1400	5.0	0.99	56	62	28	28.3	34.2
DRE100LC4 /../MM40	3.0	20.5	2.1	1400	6.7	0.99	90	96	40	34.1	40.0

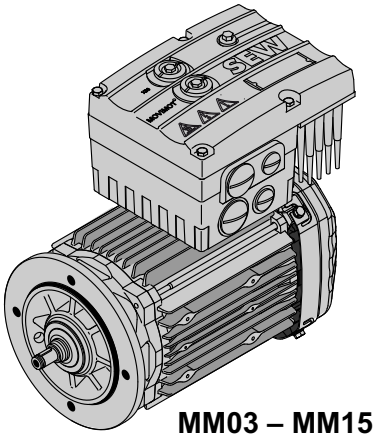
290 – 2900 min^{-1} △ 3 × 380 – 500 V (400 V)

IEC or UL

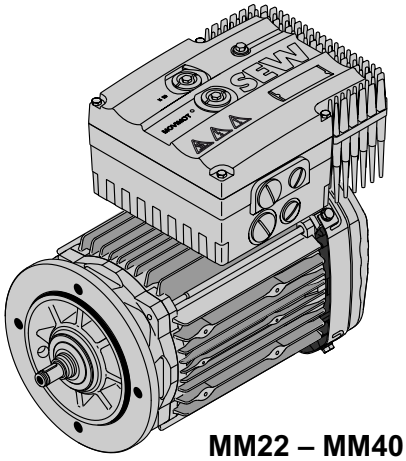
Type	P_N	M_N	M_A/M_N	n_N	I_N	cosφ	J_{Mot}	J_{BMot}	M_B	m_{Mot}	m_{BMot}
	kW	Nm	f > 5 Hz	min^{-1}	A		10^{-4} kgm^2	10^{-4} kgm^2	Nm	kg	kg
DRE80S4 /.../MM05	0.37	1.22	2.2	2900	1.3	0.99	14.9	16.4	5	12.7	15.7
DRE80S4 /.../MM07	0.55	1.81	2.2	2900	1.6	0.99	14.9	16.4	5	12.7	15.7
DRE80M4 /.../MM11	0.75	2.47	2.2	2900	1.9	0.99	21.5	23	10	15.5	18.5
DRE80M4 /.../MM15	1.1	3.62	2.2	2900	2.4	0.99	21.5	23	10	15.5	18.5
DRE90M4 /.../MM22	1.5	4.95	2.2	2900	3.5	0.99	35.5	40	20	20.7	25.3
DRE90L4 /.../MM30	2.2	7.25	2.2	2900	5.0	0.99	43.5	48.5	20	23.7	28.3
DRE100M4 /.../MM40	3.0	9.9	2.2	2900	6.7	0.99	56	62	28	28.9	34.8

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MOVIMOT® drives with DRS.. motors



MM03 – MM15



MM22 – MM40

280 – 1400 min^{-1} ⅄ 3 × 380 – 500 V (400 V)

IEC or UL

Type	P_N	M_N	M_A/M_N	n_N	I_N	cosφ	J_{Mot}	J_{BMot}	M_B	m_{Mot}	m_{BMot}
	kW	Nm	f > 5 Hz	min^{-1}	A		10^{-4} kgm^2	10^{-4} kgm^2	Nm	kg	kg
DRS71S4 /../MM03	0.37	2.52	1.5	1400	1.3	0.99	4.9	6.2	5	9.0	11.4
DRS71M4 /../MM05	0.55	3.75	1.5	1400	1.6	0.99	7.1	8.4	10	10.3	12.9
DRS80S4 /../MM07	0.75	5.1	1.5	1400	1.9	0.99	14.9	16.4	10	12.7	15.7
DRS80M4 /../MM11	1.1	7.5	1.5	1400	2.4	0.99	21.5	26	14	15.5	19.2
DRS90M4 /../MM15	1.5	10.2	1.5	1400	3.5	0.99	35.5	40	20	19.6	24.2
DRS90L4 /../MM22	2.2	15.0	1.5	1400	5.0	0.99	43.5	49.5	40	23.7	29.6
DRS100M4 /../MM30	3.0	20.5	1.5	1400	6.7	0.99	56	62	40	28.3	34.2
DRS100LC4 /../MM40	4.0	27.3	1.5	1400	7.3	0.99	90	96	50	34.1	40.0

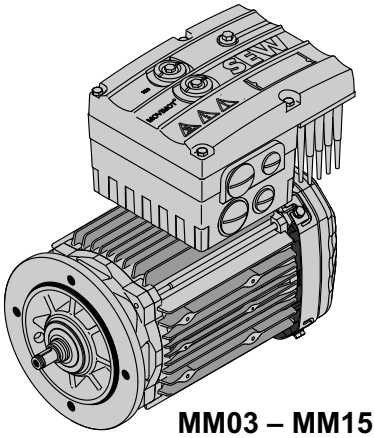
290 – 2900 min^{-1} △ 3 × 380 – 500 V (400 V)

IEC or UL

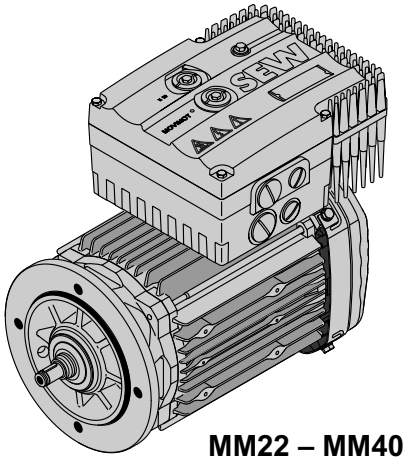
Type	P_N	M_N	M_A/M_N	n_N	I_N	cosφ	J_{Mot}	J_{BMot}	M_B	m_{Mot}	m_{BMot}
	kW	Nm	f > 5 Hz	min^{-1}	A		10^{-4} kgm^2	10^{-4} kgm^2	Nm	kg	kg
DRS71S4 /../MM05	0.55	1.81	2.0	2900	1.6	0.99	4.9	6.2	5	9.0	11.4
DRS71M4 /../MM07	0.75	2.47	2.0	2900	1.9	0.99	7.1	8.4	10	10.3	12.9
DRS80S4 /../MM11	1.1	3.62	2.0	2900	2.4	0.99	14.9	16.4	10	12.7	15.7
DRS80M4 /../MM15	1.5	4.95	1.6	2900	3.5	0.99	21.5	26	14	15.5	19.2
DRS90M4 /../MM22	2.2	7.25	1.6	2900	5.0	0.99	35.5	40	20	20.7	25.3
DRS90L4 /../MM30	3.0	9.9	1.6	2900	6.7	0.99	43.5	49.5	40	23.7	29.6
DRS100M4 /../MM40	4.0	13.2	1.6	2900	7.3	0.99	56	62	40	28.9	34.8

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MOVIMOT® drives with DRS.. motors and increased short-term torque



MM03 – MM15



MM22 – MM40

280 – 1400 min^{-1} ⅄ 3 × 380 – 500 V (400 V)

IEC or UL

Type	P_N	M_N	M_A/M_N	n_N	I_N	cosφ	J_{Mot}	J_{BMot}	M_B	m_{Mot}	m_{BMot}
	kW	Nm	f > 5 Hz	min^{-1}	A		10^{-4} kgm^2	10^{-4} kgm^2	Nm	kg	kg
DRS71S4 /../MM05	0.37	2.52	2.1	1400	1.3	0.99	4.9	6.2	5	9.0	11.4
DRS71M4 /../MM07	0.55	3.75	2.1	1400	1.6	0.99	7.1	8.4	10	10.3	12.9
DRS80S4 /../MM11	0.75	5.1	2.1	1400	1.9	0.99	14.9	16.4	10	12.7	15.7
DRS80M4 /../MM15	1.1	7.5	2.1	1400	2.4	0.99	21.5	26	14	15.5	19.2
DRS90M4 /../MM22	1.5	10.2	2.1	1400	3.5	0.99	35.5	40	20	20.7	25.3
DRS90L4 /../MM30	2.2	15.0	2.1	1400	5.0	0.99	43.5	49.5	40	23.7	29.6
DRS100M4 /../MM40	3.0	20.5	2.0	1400	6.7	0.99	56	62	40	28.9	34.8

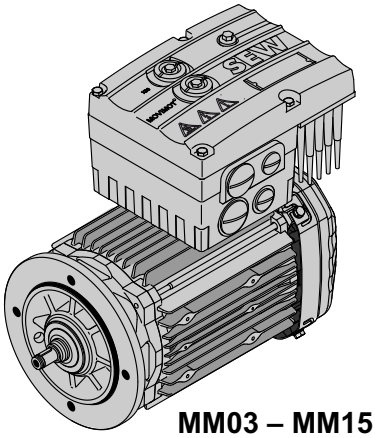
290 – 2900 min^{-1} △ 3 × 380 – 500 V (400 V)

IEC or UL

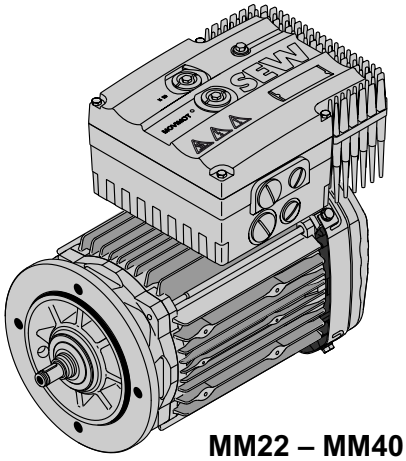
Type	P_N	M_N	M_A/M_N	n_N	I_N	cosφ	J_{Mot}	J_{BMot}	M_B	m_{Mot}	m_{BMot}
	kW	Nm	f > 5 Hz	min^{-1}	A		10^{-4} kgm^2	10^{-4} kgm^2	Nm	kg	kg
DRS71S4 /../MM07	0.55	1.81	2.4	2900	1.6	0.99	4.9	6.2	5	9.0	11.4
DRS71M4 /../MM11	0.75	2.47	2.4	2900	1.9	0.99	7.1	8.4	10	10.3	12.9
DRS80S4 /../MM15	1.1	3.62	2.4	2900	2.4	0.99	14.9	16.4	10	12.7	15.7
DRS80M4 /../MM22	1.5	4.95	2.2	2900	3.5	0.99	21.5	26	14	16.6	20.3
DRS90M4 /../MM30	2.2	7.25	2.2	2900	5.0	0.99	35.5	40	20	20.7	25.3
DRS90L4 /../MM40	3.0	9.9	2.0	2900	6.7	0.99	43.5	49.5	40	24.3	30.2

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MOVIMOT® drives with DR2S.. motors



MM03 – MM15



MM22 – MM40

280 – 1400 min^{-1} ⅄ 3 × 380 – 500 V (400 V)

IEC or UL

Type	P_N	M_N	M_A/M_N	n_N	I_N	cosφ	J_{mot}	J_{BMot}	M_B	m_{Mot}	m_{BMot}
	kW	Nm	f > 5 Hz	min^{-1}	A		10^{-4} kgm^2	10^{-4} kgm^2	Nm	kg	kg
DR2S71MS4/../MM03	0.37	2.6	1.5	1 400	1.3	0.99	5.42	6.72	5	8.4	10.8
DR2S71M4/../MM05	0.55	3.85	1.5	1 400	1.6	0.99	7.14	8.44	10	9.6	12.6
DR2S80MK4/../MM07	0.75	5.1	1.5	1 400	1.9	0.99	17.1	18.6	10	12.6	15.6
DR2S80M4/../MM11	1.1	7.4	1.5	1 400	2.4	0.99	24.7	29.2	14	15.6	19.6
DR2S90S4/../MM15	1.5	10.2	1.5	1 400	3.5	0.99	54	58.7	20	21.6	26.2
DR2S90L4/../MM22	2.2	15	1.5	1 400	5	0.99	67.2	71.9	28	25.3	29.9
DR2S4100LS4/../ MM30	3	20.5	1.5	1 400	6.7	0.99	81.4	87.4	40	29.3	35.3
DR2S100L4/../MM40	4	27.3	1.5	1 400	7.3	0.99	112	118	55	37.2	43.1

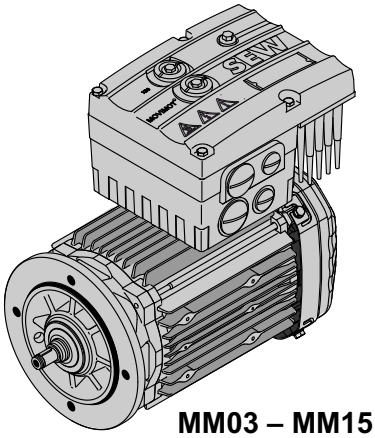
290 – 2900 min^{-1} △ 3 × 380 – 500 V (400 V)

IEC or UL

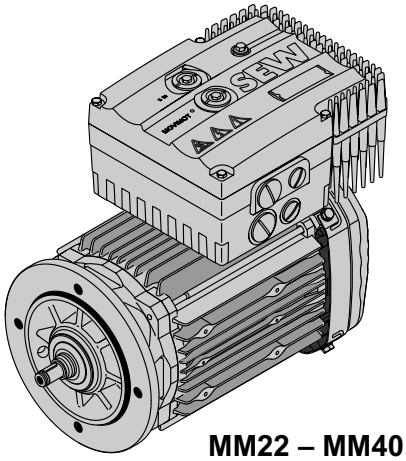
Type	P_N	M_N	M_A/M_N	n_N	I_N	cosφ	J_{mot}	J_{BMot}	M_B	m_{Mot}	m_{BMot}
	kW	Nm	f > 5 Hz	min^{-1}	A		10^{-4} kgm^2	10^{-4} kgm^2	Nm	kg	kg
DR2S71MS4/../MM05	0.55	1.81	2	2900	1.6	0.99	5.42	6.72	5	8.4	10.8
DR2S71M4/../MM07	0.75	2.47	2	2900	1.9	0.99	7.14	8.44	10	9.6	12.6
DR2S80MK4/../MM11	1.1	3.62	2	2900	2.4	0.99	17.1	18.6	10	12.6	15.6
DR2S80M4/../MM15	1.5	4.95	1.6	2900	3.5	0.99	24.7	29.2	14	15.6	19.6
DR2S90S4/../MM22	2.2	7.25	1.6	2900	5	0.99	54	58.7	20	22.3	26.9
DR2S90L4/../MM30	3	9.9	1.6	2900	6.7	0.99	67.2	71.9	28	25.3	29.9
DR2S4100LS4/../ MM40	4	13.2	1.6	2900	7.3	0.99	81.4	87.4	40	30.2	36.1

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MOVIMOT® drives with DR2S.. motors and increased short-term torque



MM03 – MM15



MM22 – MM40

280 – 1400 min^{-1} ⅄ 3 × 380 – 500 V (400 V)

IEC or UL

Type	P_N kW	M_N Nm	M_A/M_N f > 5 Hz	n_N min^{-1}	I_N A	cosφ	J_{mot} 10^{-4} kgm^2	J_{BMot} 10^{-4} kgm^2	M_B Nm	m_{Mot} kg	m_{BMot} kg
DR2S71MS4/../MM05	0.37	2.6	2.1	1 400	1.3	0.99	5.42	6.72	5	8.4	10.8
DR2S71M4/../MM07	0.55	3.85	2.1	1 400	1.6	0.99	7.14	8.44	10	9.6	12.6
DR2S80MK4/../MM11	0.75	5.1	2.1	1 400	1.9	0.99	17.1	18.6	10	12.6	15.6
DR2S80M4/../MM15	1.1	7.4	2.1	1 400	2.4	0.99	24.7	29.2	14	15.6	19.6
DR2S90S4/../MM22	1.5	10.2	2.1	1 400	3.5	0.99	54	58.7	20	22.3	26.9
DR2S90L4/../MM30	2.2	15	2.1	1 400	5	0.99	67.2	71.9	28	25.3	29.9
DR2S4100LS4/../ MM40	3	20.5	2	1 400	6.7	0.99	81.4	87.4	40	30.2	36.1

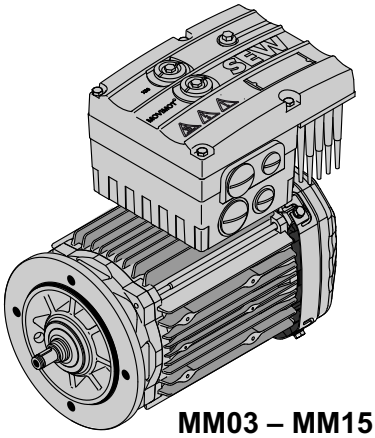
290 – 2900 min^{-1} △ 3 × 380 – 500 V (400 V)

IEC or UL

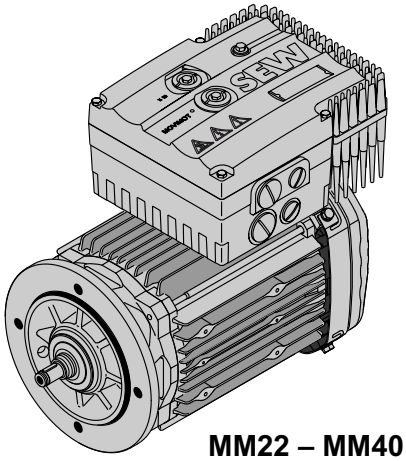
Type	P_N kW	M_N Nm	M_A/M_N f > 5 Hz	n_N min^{-1}	I_N A	cosφ	J_{mot} 10^{-4} kgm^2	J_{BMot} 10^{-4} kgm^2	M_B Nm	m_{Mot} kg	m_{BMot} kg
DR2S71MS4/../MM07	0.55	1.81	2.4	2900	1.6	0.99	5.42	6.72	5	8.4	10.8
DR2S71M4/../MM011	0.75	2.47	2.4	2900	1.9	0.99	7.14	8.44	10	9.6	12.6
DR2S80MK4/../MM15	1.1	3.62	2.4	2900	2.4	0.99	17.1	18.6	10	12.6	15.6
DR2S80M4/../MM22	1.5	4.95	2.2	2900	3.5	0.99	24.7	29.2	14	22.3	26.3
DR2S90S4/../MM30	2.2	7.25	2.2	2900	5	0.99	54	58.7	20	22.3	26.9
DR2S90L4/../MM40	3	9.9	2	2900	6.7	0.99	67.2	71.9	28	26.2	30.8

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MOVIMOT® drives with DRU.. motors (400 V)



MM03 – MM15



MM22 – MM40

280 – 1400 min^{-1} ⅄ 3 × 380 – 500 V (400 V)

IEC or UL

Type	P_N kW	M_N Nm	M_A/M_N f > 5 Hz	n_N min^{-1}	I_N A	cosφ	J_{Mot} 10^{-4} kgm^2	J_{BMot} 10^{-4} kgm^2	M_B Nm	m_{Mot} kg	m_{BMot} kg
DRU90S4/.. /../MM07	0.75	5.1	1.5	1400	1.9	0.99	54	55.6	10	21.6	24.6
DRU100LSR4/../MM11	1.1	7.5	1.5	1400	2.4	0.99	81.4	86.1	20	28.6	33.6
DRU100LS4/../MM15	1.5	10.2	1.5	1400	3.5	0.99	81.4	86.1	20	28.6	33.6
DRU100L4/../MM22	2.2	15.0	1.5	1400	5.0	0.99	112	118	28	36.3	42.2
DRU112M4/../MM30	3.0	20.5	1.5	1400	6.7	0.99	178	183	40	47.3	54.3
DRU132S4/../MM40	4.0	27.3	1.5	1400	7.3	0.99	241	246	55	59.2	67.2

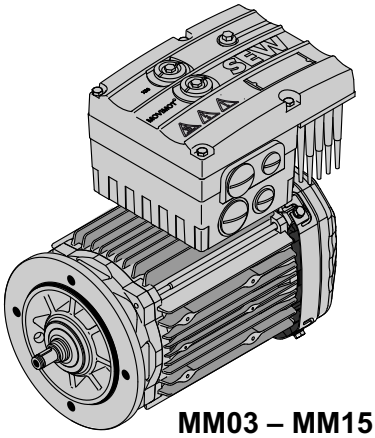
290 – 2900 min^{-1} △ 3 × 380 – 500 V (400 V)

IEC or UL

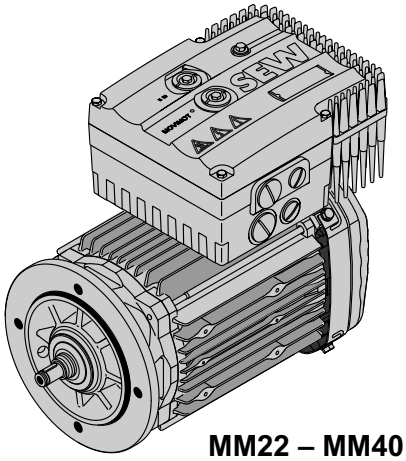
Type	P_N kW	M_N Nm	M_A/M_N f > 5 Hz	n_N min^{-1}	I_N A	cosφ	J_{Mot} 10^{-4} kgm^2	J_{BMot} 10^{-4} kgm^2	M_B Nm	m_{Mot} kg	m_{BMot} kg
DRU90S4/.. /../MM11	1.1	3.6	1.5	2900	2.4	0.99	54	55.6	10	21.6	24.6
DRU100LSR4/../MM15	1.5	4.9	1.5	2900	3.5	0.99	81.4	86.1	20	28.6	33.6
DRU100LS4/../MM22	2.2	7.2	1.5	2900	5.0	0.99	81.4	86.1	20	28.6	33.6
DRU100L4/../MM30	3.0	9.9	1.5	2900	6.7	0.99	112	118	28	36.3	42.2
DRU112M4/../MM40	4.0	13.2	1.5	2900	7.3	0.99	178	183	40	47.3	54.3

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MOVIMOT® drives with DRU.. motors and increased short-term torque (400 V)



MM03 – MM15



MM22 – MM40

280 – 1400 min^{-1} ⅄ 3 × 380 – 500 V (400 V)

IEC or UL

Type	P_N kW	M_N Nm	M_A/M_N f > 5 Hz	n_N min^{-1}	I_N A	cosφ	J_{Mot} 10^{-4} kgm^2	J_{BMot} 10^{-4} kgm^2	M_B Nm	m_{Mot} kg	m_{BMot} kg
DRU90S4/../MM11	0.75	5.1	2.1	1400	1.9	0.99	54	55.6	10	21.6	24.6
DRU100LSR4/../MM15	1.1	7.5	2.1	1400	2.4	0.99	81.4	86.1	20	28.6	33.6
DRU100LS4/../MM22	1.5	10.2	2.1	1400	3.5	0.99	81.4	86.1	20	28.6	33.6
DRU100L4/../MM30	2.2	15.0	2.1	1400	5.0	0.99	112	118	28	36.3	42.2
DRU112M4/../MM40	3.0	20.5	2.1	1400	6.7	0.99	178	183	40	47.3	54.3

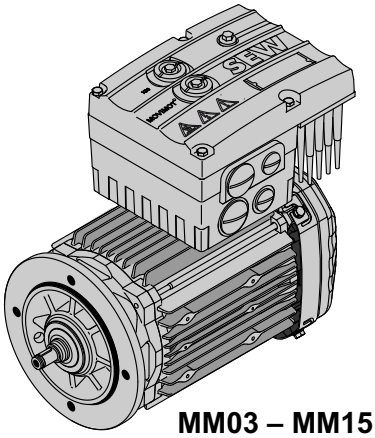
290 – 2900 min^{-1} △ 3 × 380 – 500 V (400 V)

IEC or UL

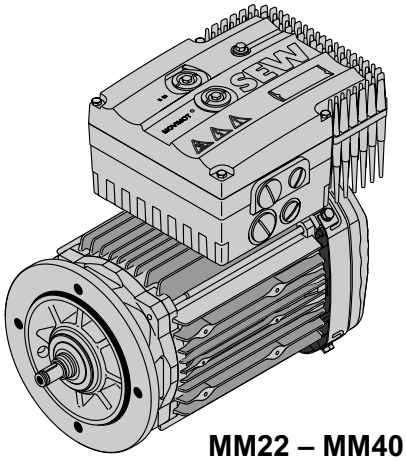
Type	P_N kW	M_N Nm	M_A/M_N f > 5 Hz	n_N min^{-1}	I_N A	cosφ	J_{Mot} 10^{-4} kgm^2	J_{BMot} 10^{-4} kgm^2	M_B Nm	m_{Mot} kg	m_{BMot} kg
DRU90S4/../MM15	1.1	3.6	2.1	2900	2.4	0.99	54	55.6	10	21.6	24.6
DRU100LSR4/../MM22	1.5	4.9	2.1	2900	3.5	0.99	81.4	86.1	20	28.6	33.6
DRU100LS4/../MM30	2.2	7.2	2.1	2900	5.0	0.99	81.4	86.1	20	28.6	33.6
DRU100L4/../MM40	3.0	9.9	2.1	2900	6.7	0.99	112	118	28	36.3	42.2

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MOVIMOT® drives with DRU.. motors (460 V)



MM03 – MM15



MM22 – MM40

280 – 1700 min^{-1} ⅄ 3 × 380 – 500 V (460 V)

UL

Type	P_N kW	M_N Nm	M_A/M_N f > 5 Hz	n_N min^{-1}	I_N A	cosφ	J_{Mot} 10^{-4} kgm^2	J_{BMot} 10^{-4} kgm^2	M_B Nm	m_{Mot} kg	m_{BMot} kg
DRU90S4/../MM07	0.75	4.2	1.5	1700	1.7	0.99	54	55.6	10	21.6	24.6
DRU90L4/../MM11	1.1	6.2	1.5	1700	2.1	0.99	67.2	71.9	14	24.6	28.6
DRU100LS4/../MM15	1.5	8.4	1.5	1700	3.0	0.99	81.4	86.1	20	28.6	33.6
DRU112MR4/../MM22	2.2	12.4	1.5	1700	4.3	0.99	178	183	28	47.3	54.3
DRU112M4/../MM30	3.0	16.9	1.5	1700	5.8	0.99	178	183	40	47.3	54.3
DRU132S4/../MM40	4.0	22.5	1.5	1700	6.9	0.99	241	246	55	59.2	67.2

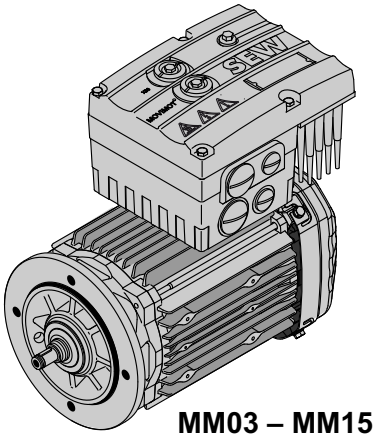
290 – 2900 min^{-1} △ 3 × 380 – 500 V (460 V)

UL

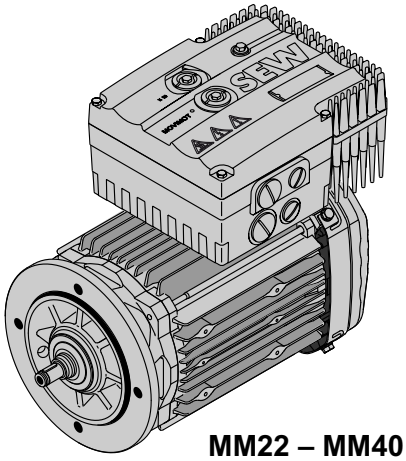
Type	P_N kW	M_N Nm	M_A/M_N f > 5 Hz	n_N min^{-1}	I_N A	cosφ	J_{Mot} 10^{-4} kgm^2	J_{BMot} 10^{-4} kgm^2	M_B Nm	m_{Mot} kg	m_{BMot} kg
DRU90S4/../MM11	1.1	3.6	1.5	2900	2.1	0.99	54	55.6	10	21.6	24.6
DRU90L4/../MM15	1.5	4.9	1.5	2900	3.0	0.99	67.2	71.9	14	24.6	28.6
DRU100LS4/../MM22	2.2	7.2	1.5	2900	4.3	0.99	81.4	86.1	20	28.6	33.6
DRU112MR4/../MM30	3.0	9.9	1.5	2900	5.8	0.99	178	183	28	47.3	54.3
DRU112M4/../MM40	4.0	13.2	1.5	2900	6.9	0.99	178	183	40	47.3	54.3

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MOVIMOT® drives with DRU.. motors and increased short-term torque (460 V)



MM03 – MM15



MM22 – MM40

280 – 1700 min^{-1} ⅄ 3 × 380 – 500 V (460 V)

UL

Type	P_N kW	M_N Nm	M_A/M_N f > 5 Hz	n_N min^{-1}	I_N A	cosφ	J_{Mot} 10^{-4} kgm^2	J_{BMot} 10^{-4} kgm^2	M_B Nm	m_{Mot} kg	m_{BMot} kg
DRU90S4/../MM11	0.75	4.2	2.8	1700	1.7	0.99	54	55.6	10	21.6	24.6
DRU90L4/../MM15	1.1	6.2	2.8	1700	2.1	0.99	67.2	71.9	14	24.6	28.6
DRU100LS4/../MM22	1.5	8.4	2.8	1700	3.0	0.99	81.4	86.1	20	28.6	33.6
DRU112MR4/../MM30	2.2	12.4	2.8	1700	4.3	0.99	178	183	28	47.3	54.3
DRU112M4/../MM40	3.0	16.9	2.8	1700	5.8	0.99	178	183	40	47.3	54.3

290 – 2900 min^{-1} △ 3 × 380 – 500 V (460 V)

UL

Type	P_N kW	M_N Nm	M_A/M_N f > 5 Hz	n_N min^{-1}	I_N A	cosφ	J_{Mot} 10^{-4} kgm^2	J_{BMot} 10^{-4} kgm^2	M_B Nm	m_{Mot} kg	m_{BMot} kg
DRU90S4/../MM15	1.1	3.6	3.0	2900	2.1	0.99	54	55.6	10	21.6	24.6
DRU90L4/../MM22	1.5	4.9	3.0	2900	3.0	0.99	67.2	71.9	14	24.6	28.6
DRU100LS4/../MM30	2.2	7.2	3.0	2900	4.3	0.99	81.4	86.1	20	28.6	33.6
DRU112MR4/../MM40	3.0	9.9	3.0	2900	5.8	0.99	178	183	28	47.3	54.3

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5.1.2 Factory-installed external options

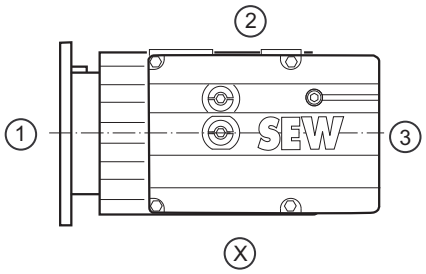
The following options can be installed at the connection box ex works (mounted and wired in working order):

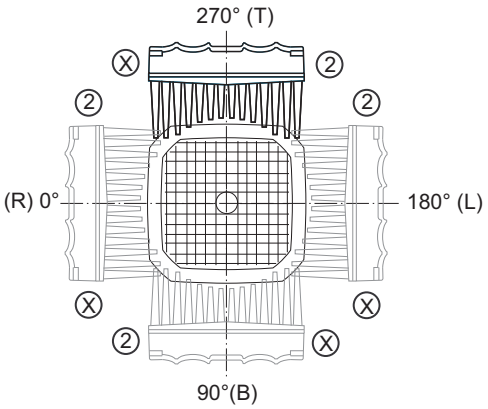
- Local DC 24 V supply (MLU.1A)
- Local setpoint adjuster with DC 24 V supply (MLG.1A)

Important order information

The external options can be installed in the following positions as standard:

- Position "2"
- Position "X" (normal)



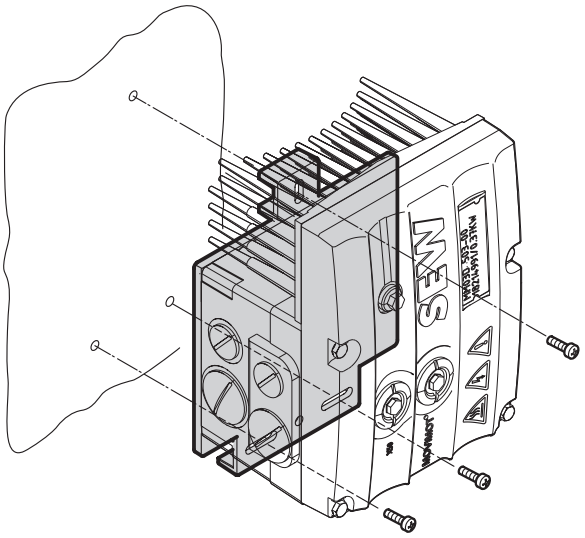


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5.2 Mounting close to the motor MOVIMOT®

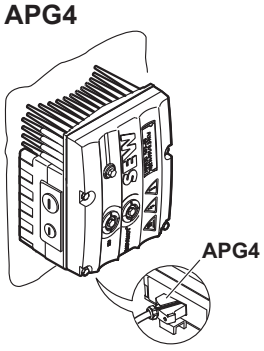
5.2.1 Available variants

The following figure shows the P21A option of MOVIMOT® sizes MM03 – MM15 as an example:



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The following designs are generally available:

Connection to the motor	MOVIMOT® size	1)	MOVIMOT® standard design	MOVIMOT® with integrated AS-Interface
APG4 	MM03 to MM15	⅄	MM..D-503-00/0/ P21A/ RO1A/APG4	MM..D-503-00/0/ P21A/ RR3A/AVSK/ APG4/MLK
		△	MM..D-503-00/1/ P21A/ RO1A/APG4	MM..D-503-00/1/ P21A/ RR3A/AVSK/ APG4/MLK
	MM22 to MM40	⅄	MM..D-503-00/0/ P22A/ RO2A/APG4	MM..D-503-00/0/ P22A/ RR4A/AVSK/ APG4/MLK
		△	MM..D-503-00/1/ P22A/ RO2A/APG4	MM..D-503-00/1/ P22A/ RR4A/AVSK/ APG4/MLK

1) Connection type of connected motor

5.2.2 Ordering of an integrated braking resistor

MM22D-503-00/0/**BW.**/P22A/RO2A/APG4

→ MM03 – MM15: **BW1**
MM22 – MM40: **BW2**

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For the regenerative current-carrying capacity of the braking resistors, refer to chapter "4Q operation with integrated BW.. braking resistor" (→ 🗎 57).

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5.3 UL-compliant installation

The following information is provided in English and partly in French, regardless of the language of this documentation, due to UL specifications.

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

5.3.1 Field wiring power terminals

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

5.3.2 Short circuit current rating

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

For 240 V systems:

250 V minimum, 25 A maximum non-semiconductor fuses or

250 V minimum, 25 A maximum inverse time circuit breakers

The max. voltage is limited to 240 V.

For 500 V systems:

500 V minimum, 25 A maximum, non-semiconductor fuses or

500 V minimum, 25 A maximum, inverse time circuit breakers

The max. voltage is limited to 500 V.

Group installation

For 240 V systems:

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

For 500 V systems:

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

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5.3.3 Branch circuit protection

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

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

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

For maximum branch circuit protection see table below.

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

5.3.4 Motor overload protection

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

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

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

5.3.5 Ambient temperature

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

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

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6 Project planning for functional safety

6.1 Integrated safety technology

The safety technology of MOVIMOT® MM..D described below has been developed and tested in accordance with the following safety requirements:

- SIL 2 according to EN 61800-5-2
- Performance level d according to EN ISO 13849-1

Observe the versions of the applicable standards as specified on the declaration of conformity or on the TÜV certificate. This was certified by TÜV Nord. A copy of the TÜV certificate is available from SEW-EURODRIVE.

6.2 Safe condition

For safety-related operation of MOVIMOT® MM..D, **safe torque off is defined as safe condition** (see STO safety function).

This is the basis of the underlying safety concept.

6.3 Safety concept

- The MOVIMOT® MM..D frequency inverter is characterized by the optional connection of an external safety controller/safety relay. They de-energize all active elements that generate the pulse trains to the power output stage (IGBT) when a connected command device (e.g. emergency stop button with latching function) is activated, by disconnecting the safety-related 24 V supply voltage. This ensures that the frequency inverter does not supply energy to the motor that can generate a torque.
- Disconnecting the 24 V supply voltage ensures that the voltage supplies required for operation of the drive are safely interrupted.
- Instead of galvanic isolation of the drive from the supply system using contactors or switches, the disconnection of the DC 24 V supply described here safely prevents the gating of the power semiconductors in the frequency inverter. The rotary-field generation for the respective motor is deactivated even though the line voltage is still present.

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6.4 Safety subfunctions

The following safety subfunctions can be used.

- **STO** (Safe Torque Off in accordance with EN 61800-5-2) by disconnecting the safety-related 24 V supply.

  If the STO function is activated, the frequency inverter no longer supplies power to the motor for generating torque. This safety function corresponds to a non-controlled stop according to EN 60204-1, stop category 0.

  The safety-related 24 V power supply must be switched off by a suitable external safety controller or a suitable external safety relay.

- **SS1-t** (Safe Stop 1) – safe stop 1 with time control according to EN 61800-5-2) by means of suitable control (e.g. safety relay delayed disconnection).

  Adhere to the following procedure:

  – Decelerate the drive via the setpoint input using a suitable braking ramp.

  – Disconnect the safety-related 24 V power supply (= triggering the STO function) after a specified safety-related time delay.

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

6.5 Limitations

- The brake controller integrated in MOVIMOT® and the standard brake integrated in brakemotors is not safety-related and therefore not part of the safety functions mentioned above. If the brake controller and/or the motor brake fails, the drive can coast for much longer depending on the application (i.e. the friction and inertia of the system). For regenerative load conditions (e.g. lifting axes, transport track with incline), the drive can even accelerate. This must be taken into account in the risk analysis of the system/machine. If necessary, additional safety measures will have to be implemented (e.g. safety brake system).

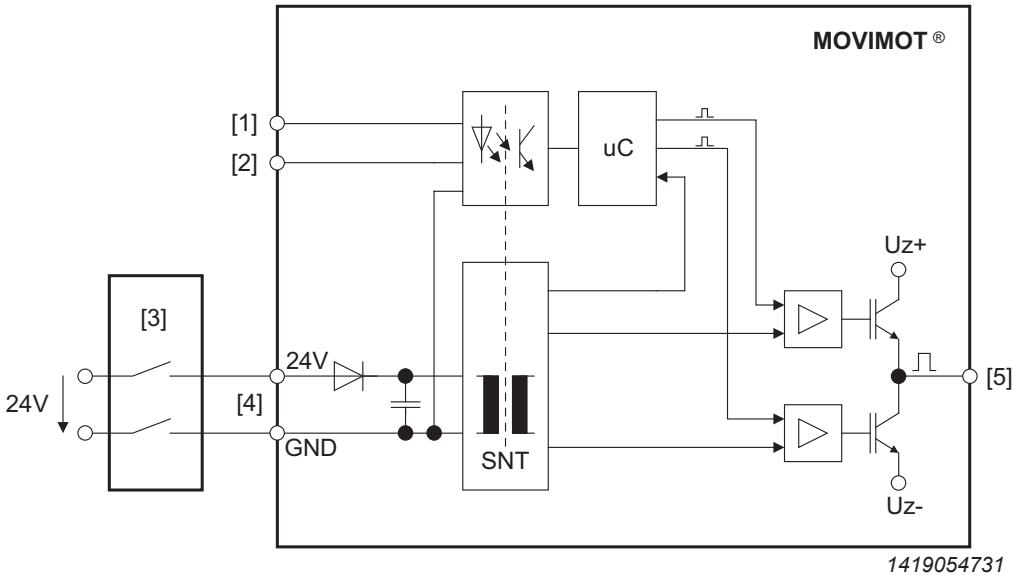
  – The MOVIMOT® drive must not be used without an additional brake system for application-specific safety functions that require active deceleration (braking) of the dangerous movement.

- When using the SS1-t function as described above, the brake ramp of the drive is not monitored with respect to safety. In the case of an error, the drive might not be decelerated during the delay time, or it might even be accelerated in the worst case. In this case, the safety-related disconnection via the STO function is only activated after the set time delay has elapsed (see above). You must take the resulting danger into account in the risk analysis of the system/machine and you must implement additional safety measures, if necessary.
- The system/machine manufacturer must perform a system/machine-specific risk analysis. The use of the drive system with MOVIMOT® must be taken into account.
- **The safety concept is suitable only for performing mechanical work on driven system/machine components.**
- When using the thermistor protection, the protection against restart is not guaranteed when the thermistor protection is triggered. This must be taken into account for a risk analysis and secured by suitable measures if required.

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- If the 24 V supply voltage is disconnected, the line voltage is still present at the frequency inverter DC link.
- **If work is carried out on the electrical section of the drive system, you have to disconnect the supply voltage using an external maintenance switch.**

Schematic diagram "Safety concept for MOVIMOT®"



[1] RS485
[2] Binary inputs "R", "L", "f1/f2"
[3] Safety relay external
[4] Safety-related 24 V voltage supply
[5] Motor phase

6.6 Safety requirements

You must only use the safety subfunctions of MOVIMOT® MM..D for the safe operation of the system/machine if they are correctly integrated into an application-specific higher-level safety function or a safety system. It is essential that the system/machine manufacturer conducts a system-specific/machine-specific risk analysis (e.g. according to ISO 14121). Before startup, the system/machine manufacturer must validate the required safety requirements and functions. The system/machine manufacturer and the operator are responsible for compliance of the system/machine with applicable safety regulations.

The following requirements are mandatory when installing and operating MOVIMOT® MM..D in safety-related applications.

The conditions are divided into the following sections:

- Approved device combinations
- Installation requirements
- External safety control requirements
- Startup requirements
- Requirements for operation

6.6.1 Permitted unit combinations



Only MOVIMOT® drives marked with the FS logo for functional safety on the nameplate may be used in safety applications.

Only the following combinations with MOVIMOT® MM..D are permitted for safety-relevant applications:

- MOVIMOT® with binary control (control via terminals)
- MOVIMOT® for operation on the IT system
- MOVIMOT® with AS-Interface option MLK32A
- MOVIMOT® with MBG11A option
- MOVIMOT® with MWA21A option
- MOVIMOT® with control knob MBK11A or MBK12A
- MOVIMOT® with BEM option
- MOVIMOT® with URM option
- MOVIMOT® with MNF21A option

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MOVIMOT® for operation on the IT system

Unit designation

The following table shows an example of the type designation of the MOVIMOT® inverter MM03D-503-16:

MM	**Series**	MM = MOVIMOT® MM..D
03	**Motor power**	03 = 0.37 kW
D	**Version D**	
–		
50	**Connection voltage**	50 = AC 380 – 500 V 23 = AC 200 – 240 V
3	**Connection type**	3 = 3-phase
–		
16	**Design**	**16 = special design for IT system**

Changes compared to the standard MOVIMOT® drive

- This special design with functional safety is intended for operation in IT systems (non-grounded star point).

Limitations

- For technical reasons, interference suppression of the device and UL approval is not possible.
- The MOVIMOT® inverter must not be connected to a line filter (e.g. MNF21A option).

Further combinations

Any combinations and option modules listed in other publications are not permitted.

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6.6.2 Installation requirements

- Use only hybrid cables from SEW-EURODRIVE to connect the M.Z.6. field distributor to the MOVIMOT® drive.
- To connect the M.Z.7., M.Z.8, or M.Z.9. field distributors or MOVIFIT® MC to the motor, SEW-EURODRIVE recommends using the specifically designed, prefabricated hybrid cables by SEW-EURODRIVE.
- To connect the MOVIMOT® inverter to the motor (mounting close to the motor), SEW-EURODRIVE recommends using the specifically designed prefabricated hybrid cable by SEW-EURODRIVE.
- Hybrid cables by SEW-EURODRIVE must not be shortened. Use these hybrid cables with the original cable lengths and the prefabricated connectors. Make sure that the connection is correct.
- Supply system cables and the safety-related control cables must be routed separately (exception: hybrid cables by SEW-EURODRIVE).
- Tie all cores with the same voltage level (e.g. L1 – L3) directly at the terminal using a cable tie.
- The line length between the safety controller and MOVIMOT® must not exceed 100 m.
- The wiring must comply with EN 60204-1.
- Route the safety-related control cables in compliance with EMC requirements.
  - Outside an electrical installation space: Shielded cables must be routed permanently (fixed) and protected against external damage, or take other equivalent measures.
  - Inside an installation space: You may route single conductors.
- Do not use the safety-related 24 V supply voltage for feedback.
- The terminals K1a and K1b must not be used.
- Make sure that no parasitic voltages can be generated in the safety-related control cables.
- You must strictly adhere to the values specified for the safety components when designing the safety circuits.
- Only the voltage for the safety-related 24 V supply is permitted for connecting the direction of rotation signals and setpoint changeover (terminals "R", "L", "f1/f2").
- Connect the shielding of the safety-related 24 V supply cable to the housing on both sides.
- For all 24 V supply voltages of the MOVIMOT® inverter, the field distributor and all devices on the fieldbus, only voltage sources with safe disconnection (SELV/PELV) in accordance with EN 60204-1 and EN 61131-2 are permitted.

  In addition, in case of a single fault, the voltage between the outputs or between any output and grounded parts must not exceed 60 V DC.
- When planning the installation, observe the technical data of MOVIMOT® MM..D.
- Observe the following when installing option MBG11A or MWA21A:
  - Do not connect any other field unit (e.g. PLC) to the RS485 interface.
  - Use safety-related 24 V supply voltage.
  - Ensure a protected routing of the connected cables.
- Install the field distributor in such a way that at least the IP 54 degree of protection is ensured. Do not make any changes to the field distributor that diminish the degree of protection.

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6.6.3 External safety controller requirements

You can also use a safety relay as an alternative to a safety controller. The following requirements apply mutatis mutandis.

- For safety-relevant applications up to Performance Level d according to EN ISO 13849-1, the safety controller and all other safety-related subsystems must be approved for at least Performance Level d according to EN ISO 13849-1 or SIL 2 according to EN 61508. To determine the performance level of the overall application, you can use the method described in EN ISO 13849-1 to combine several safety-related subsystems (without a PFH-value calculation). However, SEW-EURODRIVE recommends determining the PFH value for the overall application. The PFH value for MOVIMOT® MM..D is 0 1/h (fault exclusion).
- For safety-related applications up to SIL 2 according to EN 62061, the safety controller and all other safety-related subsystems must be approved for at least SIL 2 according to EN 61508 or Performance Level d according to EN ISO 13849-1. You must also determine the probability of a dangerous failure per hour (PFH value). To determine the PFH value for the overall application, the PFH value for MOVIMOT® = 0 1/h (fault exclusion).

Application	Requirement for safety controller
Performance level d according to EN ISO 13849-1	Performance level d according to EN ISO 13849-1 SIL 2 according to EN 61508
SIL 2 according to EN 62061	Performance level d according to EN ISO 13849-1 SIL 2 according to EN 61508

- The wiring of the safety controller must be suitable for the endeavored safety class (see manufacturer's documentation). Safety circuits with MOVIMOT® MM..D require 2-pole disconnection.
- You must strictly adhere to the values specified for the safety controller when designing the circuit.
- The switching capacity of the safety relays or the relay outputs of the safety controller must correspond at least to the maximum permitted, limited output current of the 24 V voltage supply.

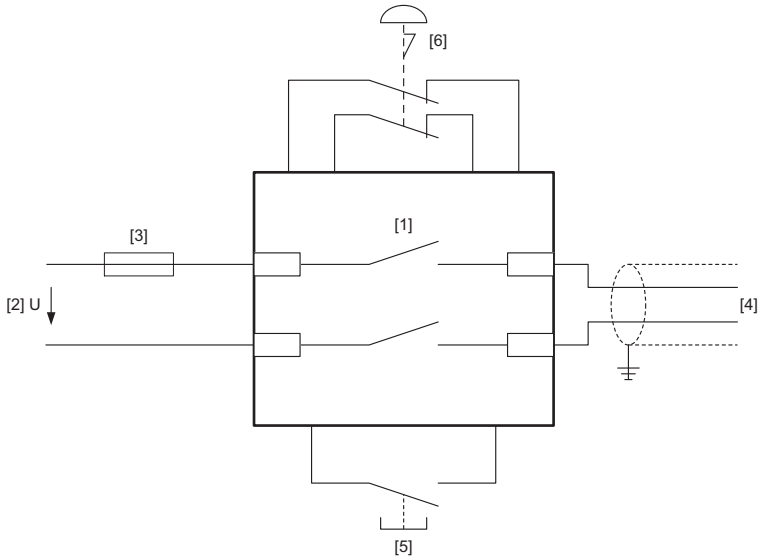
  Observe the manufacturer's instructions concerning the permitted contact loads and fusing that may be required for the safety contacts. If the manufacturer provides no specific information, the contacts must be protected with 0.6 times the nominal value of the maximum contact rating specified by the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

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- To ensure protection against unintended restart in accordance with DIN EN ISO 14118, the safety controllers must be configured and connected in such a way that resetting the command device alone does not lead to a restart. Restart is only permitted after a manual reset of the safety circuit.
- The 24 V power supply input of MOVIMOT® inverter comes equipped with a serial polarity protection diode as well as a buffer capacitor with C = 120 µF. This must be considered as load when dimensioning the switching output.

"Safety relay" switching example

The following figure shows the basic connection of an external safety relay (according to the requirements listed above) to the MOVIMOT® MM..D drive. Observe the information in the respective manufacturer data sheets when connecting.



27021599358181899

[1] Safety relay with approval
[2] DC 24 V voltage supply
[3] Fuses according to the manufacturer's specifications for the safety relay
[4] Safety-related DC 24 V voltage supply
[5] Reset button for manual reset
[6] Approved emergency stop actuating device

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6.6.4 Startup requirements

- Startup of the system/machine must be documented. The safety functions of the system/machine must be checked and verified. Observe the limitations for the safety functions of the MOVIMOT® in chapter "Limitations" (→ 🗎 86) for the verification of the safety functions. If necessary, deactivate non-safety-related parts and components (e.g. motor brake) that affect the result of the verification.
- For the operation of MOVIMOT® MM..D in safety-related applications, the disconnecting device and correct wiring must always be checked and protocolled during startup.
- During startup/function test, you must ensure the correct assignment of the respective voltage supply (e.g. safety power X40, bus module supply X29) by measuring.
- You must perform the function test one after the other for all potentials, i.e. separate from each other.

6.6.5 Operation requirements

- Operation is only permitted within the limits specified on the data sheets. This principle applies to the external safety relay as well as to MOVIMOT® MM..D and approved options.
- Check the safety functions for proper functioning at regular intervals. Define the test intervals according to the risk analysis.

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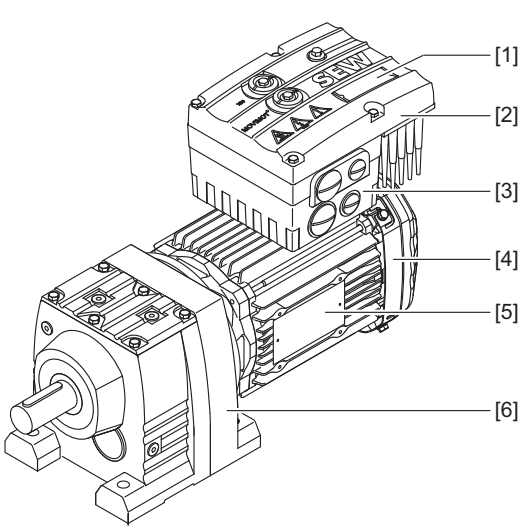
7 Unit design

7.1 MOVIMOT® drive

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

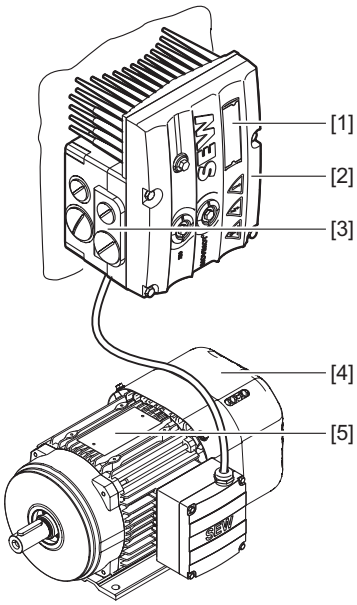
MOVIMOT® drive
with integrated inverter

A



MOVIMOT® drive
with mounting close to the motor

B



9007202786375819

[1] Identification tag MOVIMOT® inverter
[2] MOVIMOT® inverter
[3] Connection box
[4] Motor
[5] Drive nameplate
[6] Helical gear unit

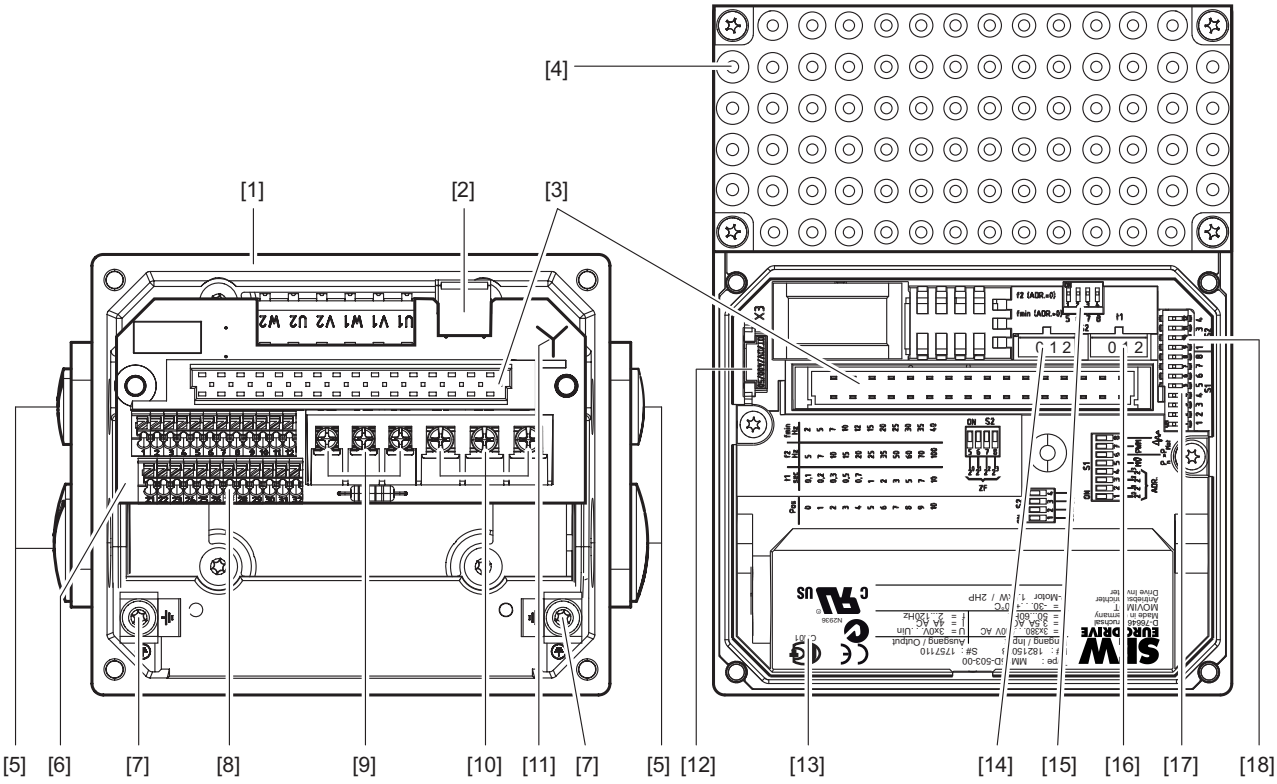
A MOVIMOT® drive is a combination of:

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

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7.2 MOVIMOT® inverter

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

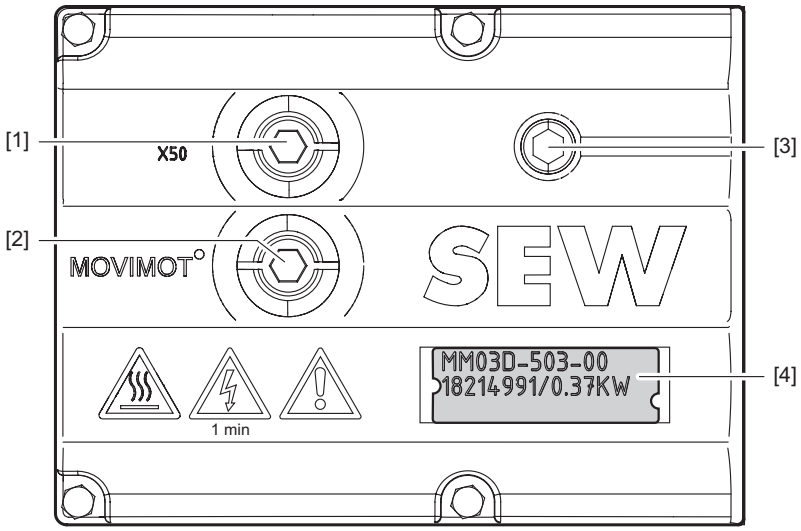


9007199880561035

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

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



9007199769143947

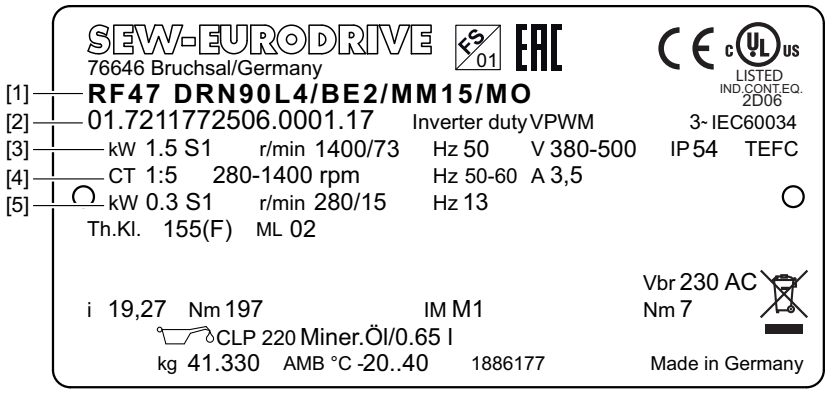
[1] X50: Diagnostics interface with screw plug
[2] Setpoint potentiometer f1 with screw plug
[3] Status LED
[4] Identification tag

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7.3 Type designation MOVIMOT® drive

7.3.1 Nameplate

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



18014418618212107

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

Year of manufacture

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

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

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

7.3.2 Type designation

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

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

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

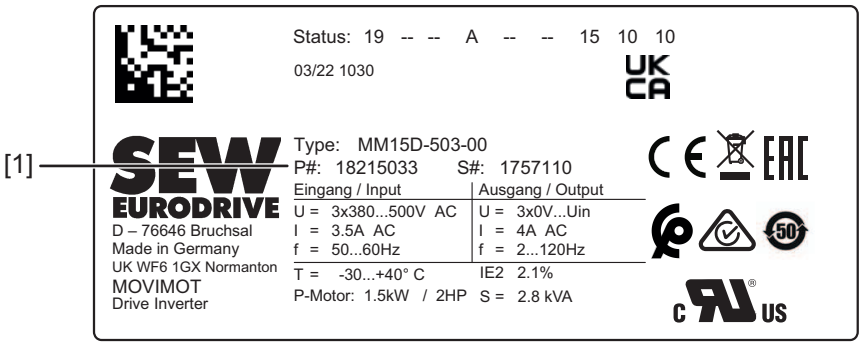
The available designs can be found in the "MOVIMOT® gearmotors" catalog.

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7.4 MOVIMOT® inverter type designation

7.4.1 Nameplate

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



36028798976891275

[1] Part number

7.4.2 Type designation

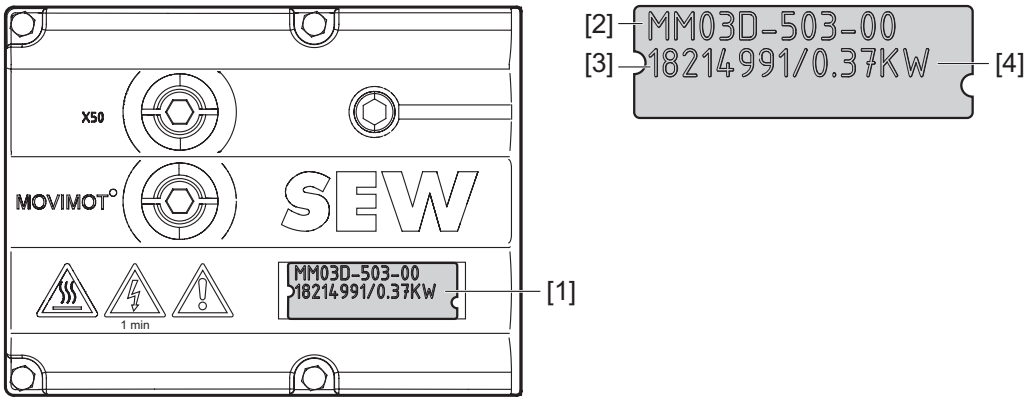
The following table shows an example of the type designation of the MOVIMOT® inverter **MM15D-503-00**:

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

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

7.4.3 Unit identification

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



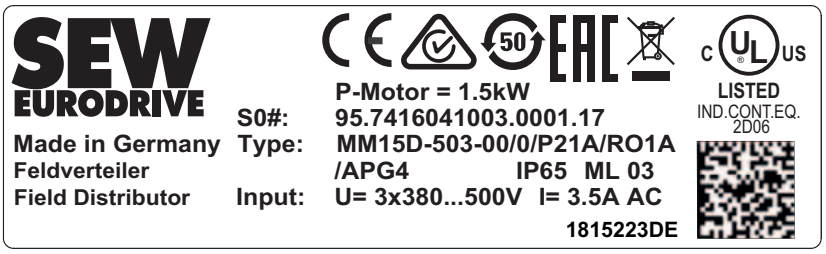
18014398967398539

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

7.5.1 Nameplate

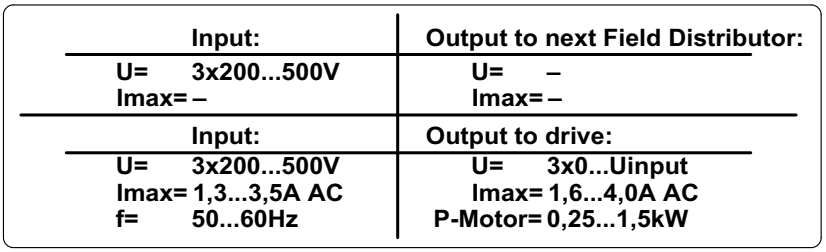
Order-specific nameplate

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



General nameplate

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



7.5.2 Type designation

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

MM15D-503-00	**MOVIMOT® inverter**
/	
0	**Connection type** 0 = ⅄ 1 = △
/	
P21A	**Adapter for mounting close to the motor**
/	
RO1A	**Connection box design**
/	
APG4	**Connector** for connection to the motor

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7.6 Markings

The following table shows an example of the markings on the nameplate.

CE	The CE mark states compliance with the following European directives: • Low Voltage Directive 2014/35/EU • EMC Directive 2014/30/EU • Machinery Directive 2006/42/EC • Directive 2011/65/EU for limiting the use of certain hazardous substances in electrical and electronic equipment
	The waste disposal of this product is performed in compliance with the WEEE Directive 2012/19/EU.
c UL US LISTED	The UL and cUL mark indicate UL approval. cUL is equally eligible for approval by the CSA.
c US	cURus mark to confirm that UL (Underwriters Laboratory) and CSA (Canadian Standard Association) know the registered components.
NOM	Confirms compliance with the official Mexican standard NOM-016-ENER-2016, energy efficiency of AC induction motors.
UK CA	The UKCA mark indicates compliance with British directives (see UK declaration of conformity or UK declaration of incorporation).
EAC	The EAC mark indicates compliance with the requirements of the technical regulations of the Customs Union (Eurasian Economic Union), Armenia, Belarus, Kazakhstan, Kyrgyzstan, and Russia.
UA.TR. 013	The UA.TR mark declares conformity with the technical regulations of Ukraine.
	The RCM mark indicates compliance with the technical regulations of the Australian Communications and Media Authority (ACMA).
	The China RoHS mark indicates compliance with the directive SJ/T 11364-2014 regarding the restriction of use of certain hazardous substances in electrical and electronic equipment and its packaging.
	The KC mark declares compliance with §3 of Article 58-2 for the Korean Radio Wave Act.

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7.6.1 FS logo



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

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

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

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8 Mechanical installation

8.1 Installation notes

INFORMATION

You must observe the general safety notes.

⚠ WARNING



Improper assembly/disassembly of MOVIMOT® drives and add-on parts.

Risk of injury.

- You must observe the information regarding installation and disassembly.
- Before releasing any shaft connections, make sure there is no active torque on the shaft (tension within the system).

⚠ WARNING



Risk of injury due to unintentional start-up of the drive and danger due to electrical voltage.

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

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

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

8.2 Tools required

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

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8.3 Installation tolerances

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

Shaft end	Flange
Diameter tolerance according to EN 50347 • ISO j6 at Ø ≤ 26 mm • ISO k6 with Ø ≥ 38 mm up to ≤ 48 mm • ISO m6 at Ø > 55 mm • Centering bore according to DIN 332, shape DR..	Centering shoulder tolerance according to EN 50347 • ISO j6 at Ø ≤ 250 mm • ISO h6 at Ø > 300 mm

8.4 Installation requirements

Make sure that the following requirements are met before installation:

- The data on the nameplate of the drive matches the voltage supply system.
- The drive is undamaged (no damage caused by transportation or storage).
- The ambient temperature corresponds to the specifications in chapter "Technical data". Note that the temperature range of the gear unit might also be restricted, see operating instructions of the gear unit.
- The MOVIMOT® drive must not be installed under the following harmful ambient conditions:
  - In potentially explosive atmospheres
  - Oils
  - Acids
  - Gases
  - Vapors
  - Radiation
  - etc.
- When the drive is installed in abrasive ambient conditions, protect the output end oil seals against wear.

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8.5 Installation of MOVIMOT® gearmotor

8.5.1 Setting up MOVIMOT®

NOTICE

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

Damage to the MOVIMOT® inverter.

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

Observe the following notes and regulations for installing the MOVIMOT® drive:

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

  Open condensation drain holes are not permitted. Higher degrees of protection are no longer valid for open condensation drain holes.

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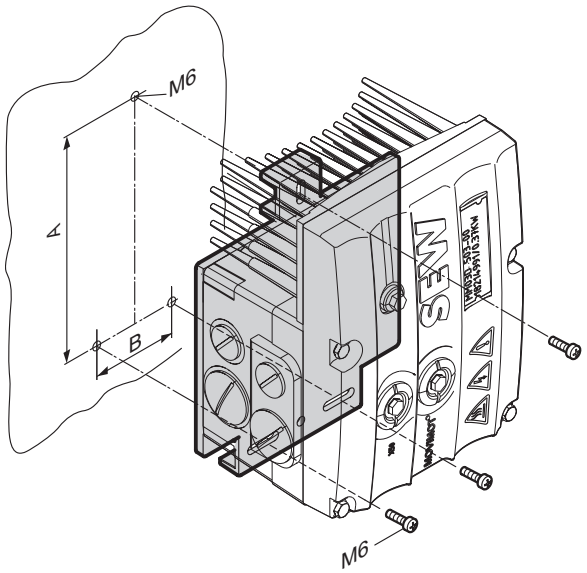
8.5.2 Installation in damp areas or outdoors

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

- Use suitable cable glands for the supply cable. If necessary, use reducers.
- Coat the thread of cable glands and screw plugs with sealing compound and tighten them well. Then coat the cable glands again.
- Seal the cable entries properly.
- Thoroughly clean the sealing surfaces of the MOVIMOT® inverter before reassembly.
- If the corrosion protection coating is damaged, restore the coating.
- Check whether the degree of protection specified on the nameplate is permitted in the ambient conditions on site.

8.6 Mounting MOVIMOT® inverter close to the motor

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



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

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8.7 Installation of MOVIMOT® options

8.7.1 Installing options MLU11A/MLU12A/MLG..A

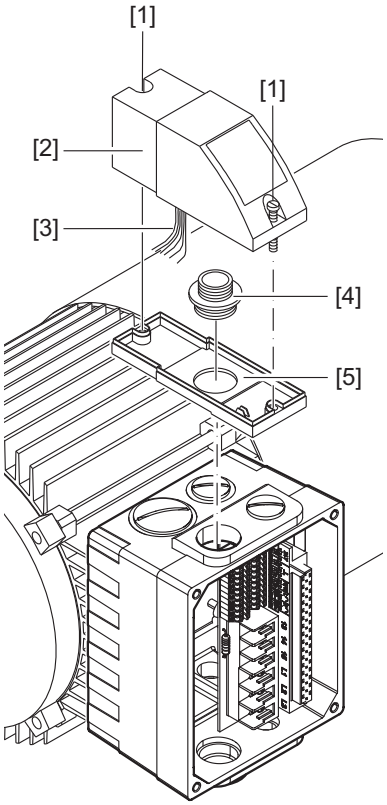
Scope of delivery

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

Assembly

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

Only install the option in the following position:



18014398967767819

For information on connecting the MLU11A/MLU21A option, refer to chapter "Connection of MLU11A/MLU21A option" (→ 🗎 155).

For more information about connecting the MLG..A option, refer to chapter "Connection of MLG..A option" (→ 🗎 157).

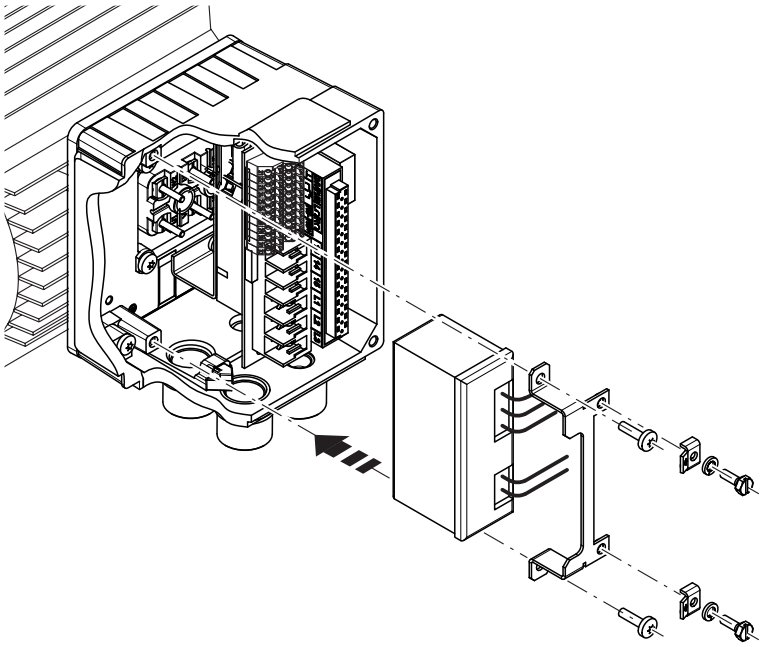
8.7.2 Installation of MLU13A option

The MLU13A option is installed in the modular connection box at the factory. If you have any questions about retrofitting the option, do not hesitate to contact SEW-EURODRIVE Service.

INFORMATION

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

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



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For more information about connecting the MLU13A option, refer to chapter "Connection of MLU13A option" (→ 🗎 156).

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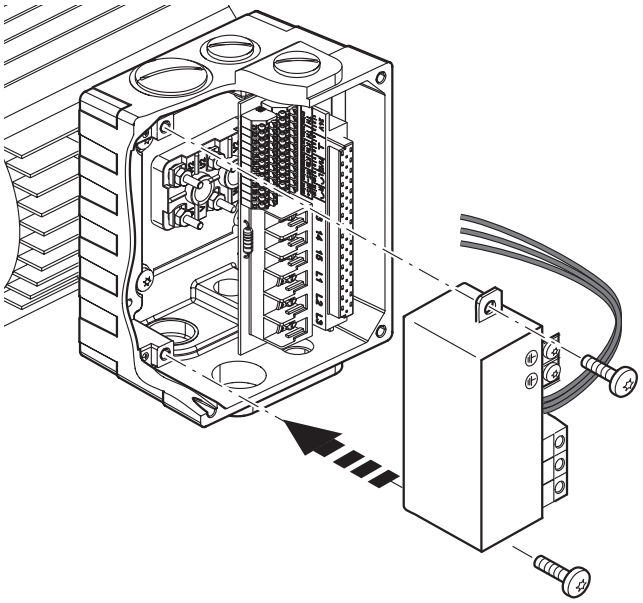
8.7.3 Installation of MNF21A option

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

INFORMATION

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

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



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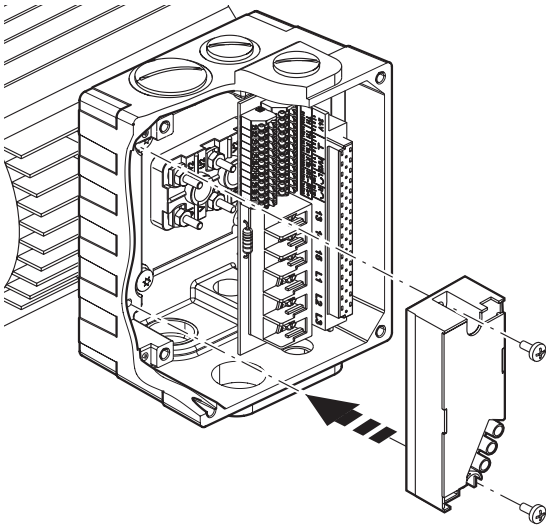
For more information about connecting the MNF21A option, refer to chapter "Connection of MNF21A option" (→ 🗎 158).

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8.7.4 Installation of URM / BEM / BES options

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

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



458307467

For information on connecting the URM option, refer to chapter "Connection of URM option" (→ 🗎 159).

For information on connecting the BEM option, refer to chapter "Connection of BEM option" (→ 🗎 160).

For information on connecting the BES option, refer to chapter "Connection of BES option" (→ 🗎 161).

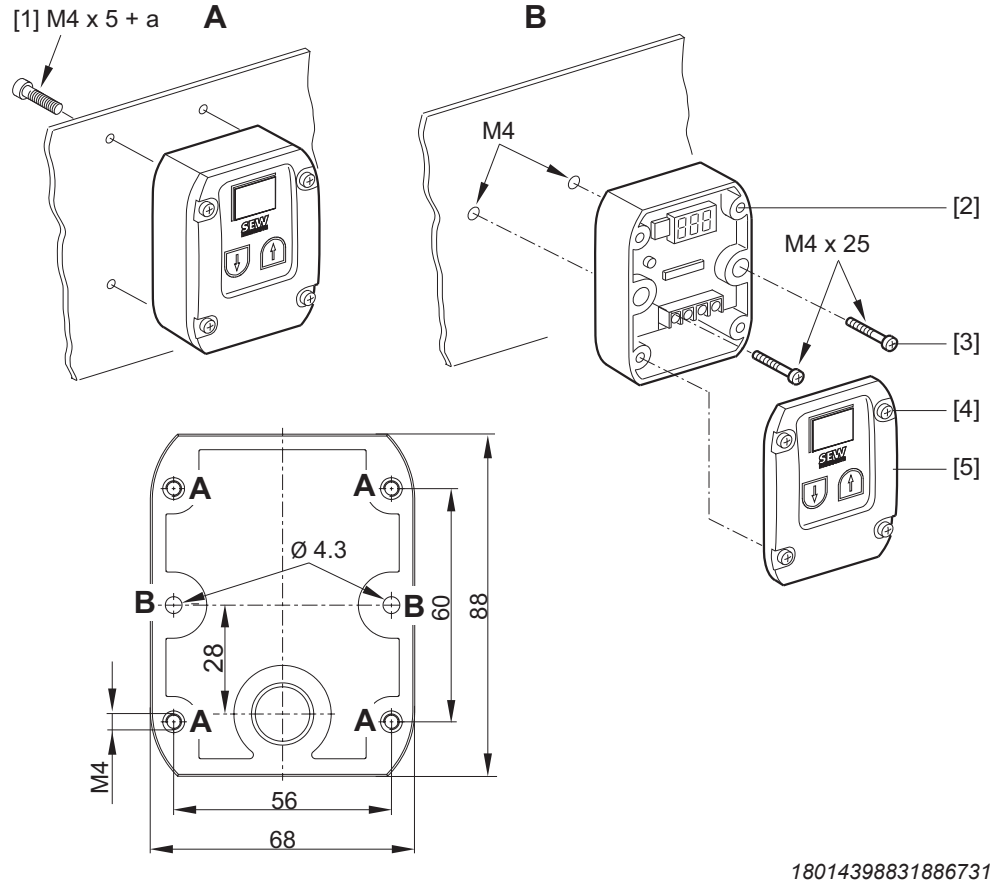
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8.7.5 Installation of MBG11A option

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

A: Mounting from the rear using 4 tapped holes.
(tightening torque of retaining screw [1]: 1.6 – 2.0 Nm)

B: Mounting from the front using 2 mounting holes
(tightening torque of retaining screw [3]: 1.6 – 2.0 Nm)



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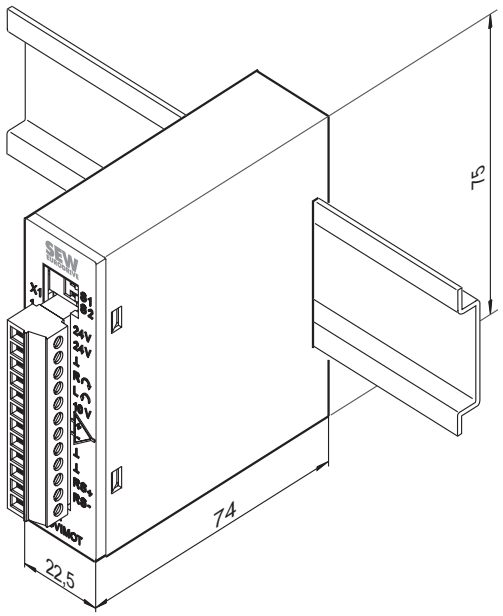
[1] a = Wall thickness
Screws are **not** included in the scope of delivery!

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

For information on connecting the MBG11A option, refer to chapter "Connection of MBG11A option" (→ 🗎 162).

8.7.6 Installation of MWA21A option

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



18014398831893899

For information on connecting the MWA21A option, refer to chapter "Connection of MWA21A option" (→ 🗎 163).

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8.7.7 Installing braking resistors

The surfaces of the braking resistors will reach temperatures of up to 250 °C when the braking resistors are subjected to the nominal power. The installation location of the braking resistor must be designed to accommodate the high temperatures. For this reason, the braking resistors are usually mounted outside the control cabinet. Non-permissible installation might lead to heat build-up in the braking resistor due to reduced convection. A tripping temperature contact or an overheated braking resistor can lead to a system standstill.

Minimum distances

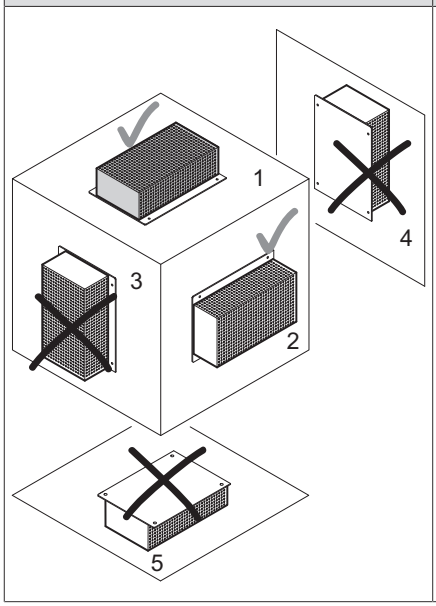
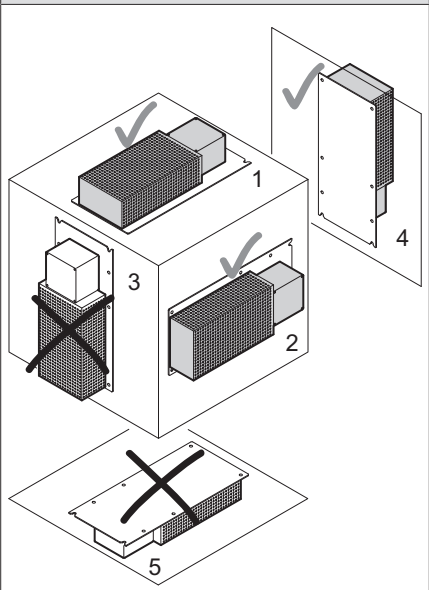
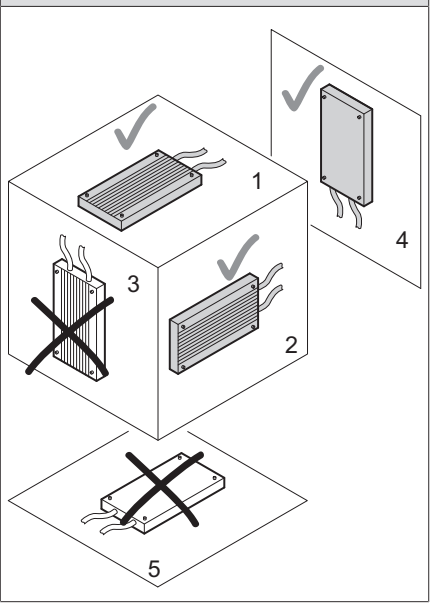
Depending on the continuous braking power and the mounting position, observe the following minimum clearances:

Continuous braking power at 100% cdf	Mounting position	Lateral distance in mm	Distance below in mm	Distance above in mm
up to 1 kW	horizontal[1)]	200	0	350
	vertical[2)]	150	250	300
up to 10 kW	horizontal[1)]	300	0	650
	vertical[2)]	250	350	600

1) Corresponds to mounting position 1, 2, 5, 6 (identical to mounting position 2).
2) Corresponds to mounting position 3, 4.

Permitted mounting positions

The following table shows the permitted mounting positions of the braking resistors:

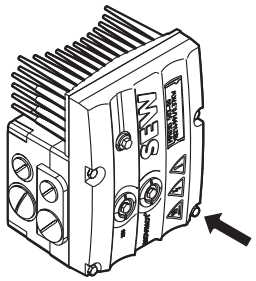
Grid resistor, frame resistor	Wire resistor	Flat type resistor
		

The BW003-420-T and BW1.0-170 braking resistors may only be used in position 1.

8.8 Tightening torques

8.8.1 MOVIMOT® inverter

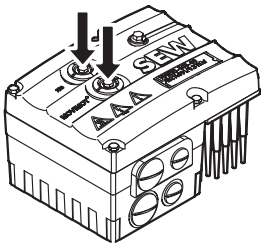
Tighten the retaining screws of the MOVIMOT® inverter to 3.0 Nm in diametrically opposite sequence.



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8.8.2 Screw plugs

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

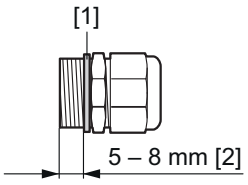


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8.8.3 Cable glands

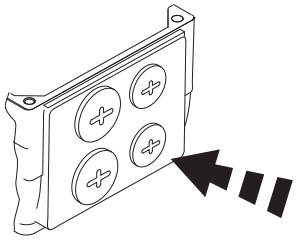
Observe the manufacturer's specifications and the following information for cable glands:

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



8.8.4 Screw plugs for cable entries

Tighten screw plugs with 2.5 Nm.

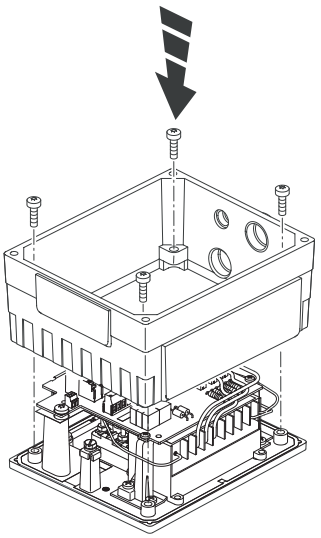


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8.8.5 Modular connection box

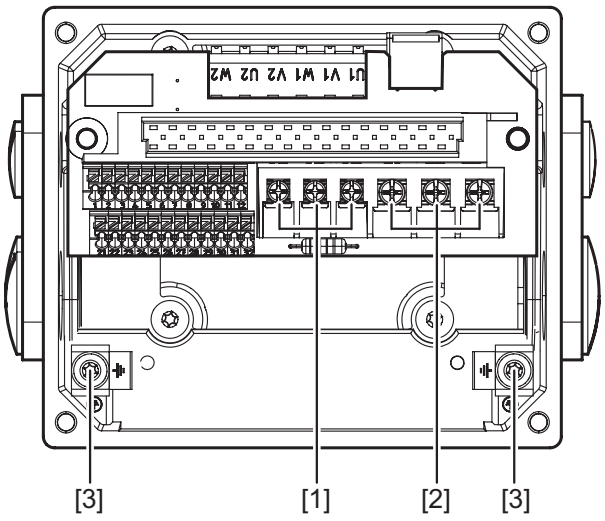
Tighten the retaining screws of the connection box on the mounting plate to 3.3 Nm.



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8.8.6 Tightening torques for terminals

Observe the following tightening torques for terminals during installation work:



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

9 Electrical installation

9.1 EMC-compliant installation

INFORMATION

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

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

With respect to the EMC regulation, frequency inverters cannot be operated as standalone 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.

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9.1.1 Recommendation for improving the grounding (EMC), HF grounding

For improved, low-impedance grounding at high frequencies, the following connections are recommended. SEW-EURODRIVE recommends to use corrosion-resistant connection elements.

HF grounding is not installed as standard.

The option HF grounding can be combined with the PE connection in the connection box (NF grounding).

The option HF grounding is available as follows:

- Completely preassembled at the factory
- Or as a "grounding terminal" kit for customer installation; part numbers listed in the following table.

Motor size	Part number of "grounding terminal" kit
DR..71S/M DR..80S/M, DRN80	13633953
DR..90M/L, DRN90	
DR..100M, DRN100LS	
DR..100L – 132, DRN100L – 132S	13633945

INFORMATION

All parts of the kit are made from stainless steel.

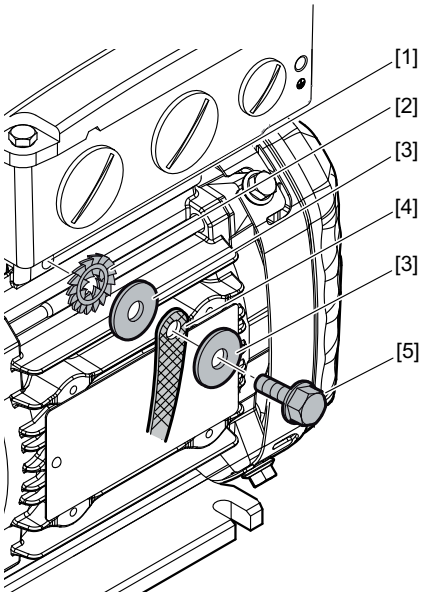
INFORMATION

For further information regarding the grounding, refer to the SEW publication "Drive Engineering – Practical Implementation, EMC in Drive Engineering."

INFORMATION

If you use 2 or more ground straps, they must be attached with a longer screw. The specified tightening torques refer to a strap thickness of t ≤ 3 mm.

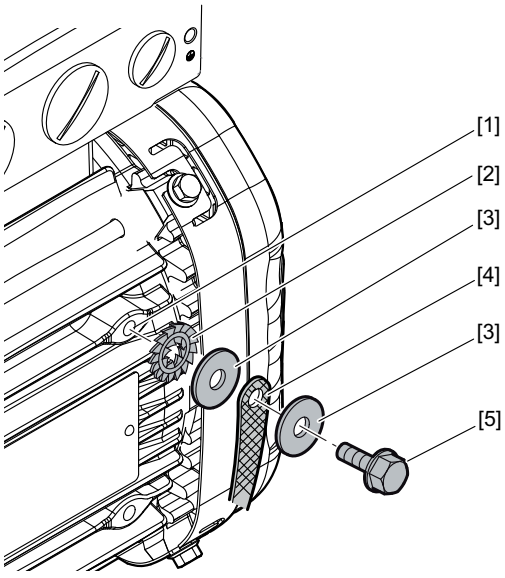
DR..71 – 80, DRN71 – 80, DR2..71 – 80 motors with HF(+LF) grounding



18014406536249995

[1] Use of the pre-cast bore on the stator housing
[2] Serrated lock washer
[3] Washer ISO 7093
[4] Ground strap (not included in the scope of delivery)
[5] Self-tapping screw M6 × 16, tightening torque 10 Nm

DR..90, DRN90 motors with HF(+LF) grounding

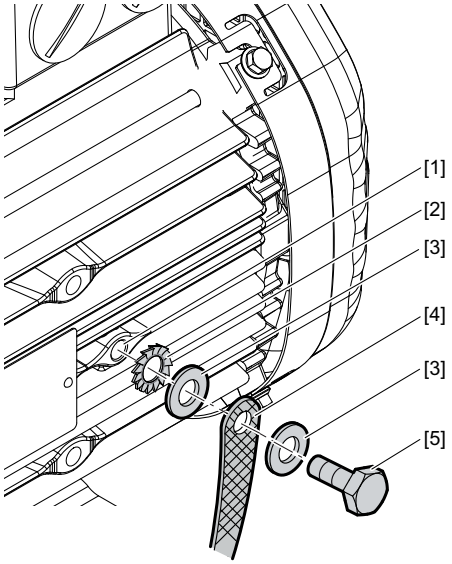


18014406536255115

[1] Use of the pre-cast bore on the stator housing
[2] Serrated lock washer
[3] Washer ISO 7093
[4] Ground strap (not included in the scope of delivery)
[5] Self-tapping screw M6 × 16, tightening torque 10 Nm

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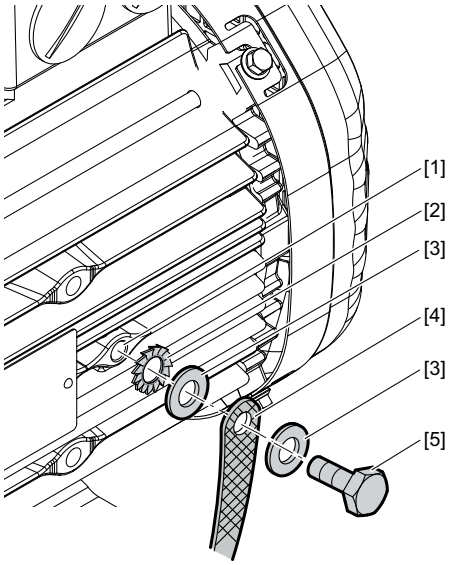
DR..100M, DRN100LS motors with HF(+LF) grounding



36028800574033931

[1] Use of the pre-cast bore on the stator housing
[2] Serrated lock washer
[3] Washer ISO 7093
[4] Ground strap (not included in the scope of delivery)
[5] Self-tapping screw M6 × 16, tightening torque 10 Nm

DR..100L – 132, DRN100LM – 132S motors with HF(+LF) grounding



36028800574033931

[1] Use of tapped hole for lifting eyes
[2] Serrated lock washer DIN 6798
[3] Washer ISO 7089/ISO 7090
[4] Ground strap (not included in the scope of delivery)
[5] Hex head screw ISO 4017 M8 × 18, tightening torque 10 Nm

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9.2 Installation notes

Observe the following information on electrical installation:

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

9.3 Installation instructions

9.3.1 Connecting power supply cables

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

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

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

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

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9.3.2 Permitted cable cross section of the MOVIMOT® terminals

Power terminals

Observe the permitted cable cross sections for installation:

Power terminals	
Cable cross section	1.0 mm^2 – 4.0 mm^2 (2 x 4.0 mm^2)
Conductor end sleeves	• **For single assignment:** Connect only single-wire conductors or flexible conductors with conductor end sleeves (DIN 46228, material E-CU) **with or without plastic collars**. • **For double assignment:** Connect only flexible conductors with conductor end sleeve (DIN 46228 - 1, material E-CU) **without plastic collar**. • Permitted length of the conductor end sleeve: at least 8 mm

Control terminals

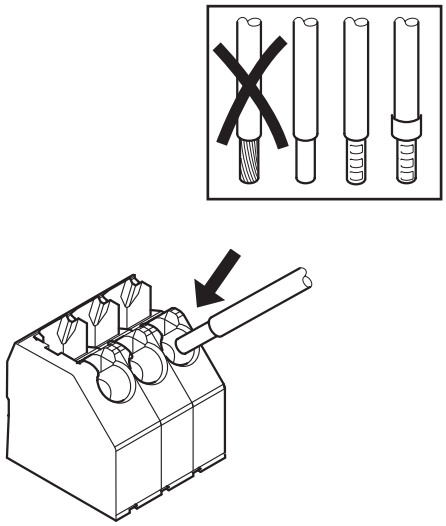
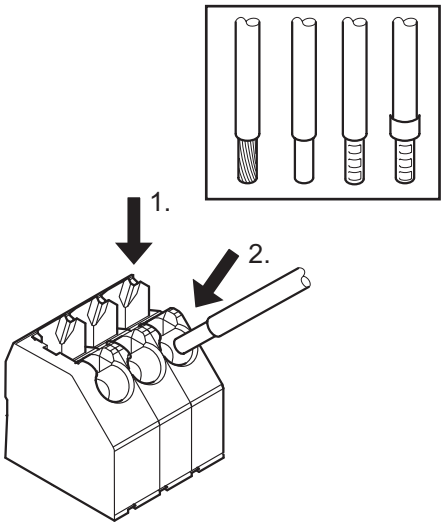
Observe the permitted cable cross sections for installation:

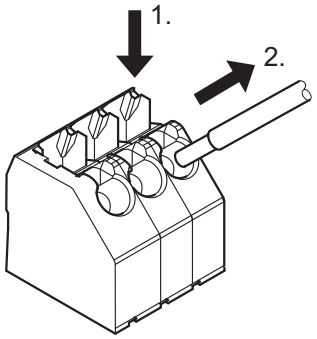
Control terminals	
Cable cross section • Single-wire conductor (bare wire) • Flexible conductor (bare litz wire) • Conductor end sleeve **without** plastic collar	0.5 mm^2 – 1.0 mm^2
• Conductor end sleeve **with** plastic collar	0.5 mm^2 – 0.75 mm^2
Conductor end sleeves	• Connect only single-wire conductors or flexible wire conductors **with or without** conductor end sleeve (DIN 46228, material E-CU). • Permitted length of the conductor end sleeve: at least 8 mm

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9.3.3 Using the control terminals X5 – X6

Note the following information for actuating the control terminal clamps:

Connect conductor without pressing the activation button.	**Connect conductor after pressing the activation button.**
 *18014399174706827*	 *18014399877894923*
The following conductors can be installed directly (without tools) up to two cross section sizes below the nominal cross section: • Single-wire conductors • Flexible conductors with end sleeves	When connecting the following conductors, you must press the actuation button on top to open the clamping spring: • Untreated, flexible conductors • Conductors with small cross sections that cannot be plugged in directly

Removing the conductor. **First press the activation button.**


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

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9.3.4 Selecting the residual current device

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

Proceed as follows to select the residual current device:

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

9.3.5 Line contactor

NOTICE

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

Damage to the MOVIMOT® inverter.

- Do not use the line contactor for jog mode, but only for switching the inverter on and off.
- Observe a minimum switch-off time of 2 s for the line contactor.

- Use only a contactor of utilization category AC3 (EN 60947-4-1) as a line contactor.

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

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9.3.6 Information on PE connection

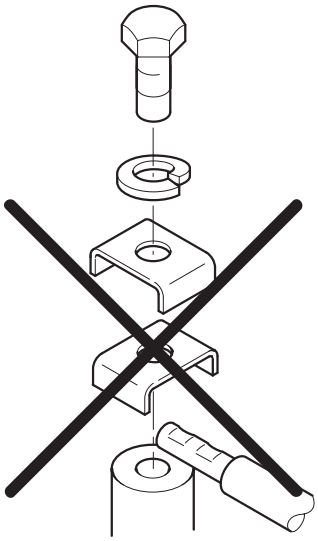
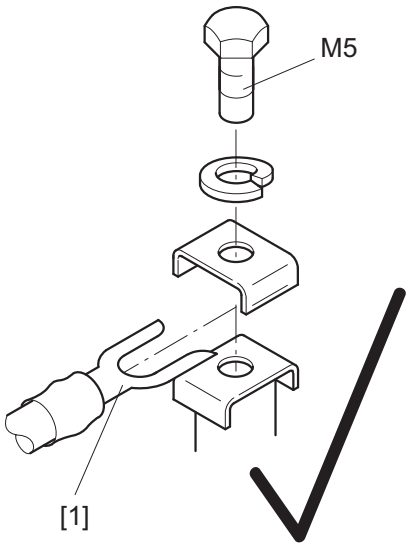
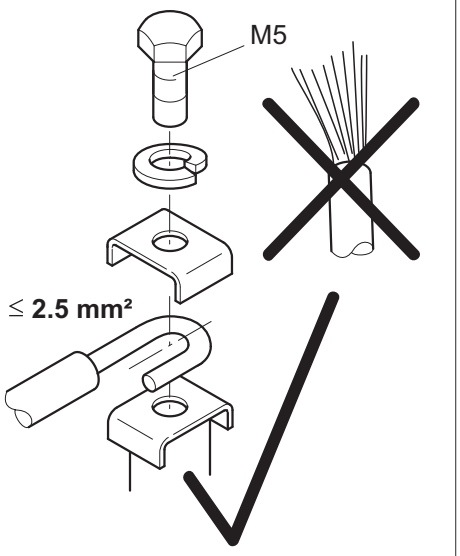


⚠ WARNING

Electric shock due to incorrect connection of PE.

Severe or fatal injuries.

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

Not permitted mounting	Recommendation: Installation with forked cable lug Permitted for all cross sections	Installation with solid connection wire Permitted for cross sections up to maximum 2.5 mm²
		

[1] Forked cable lug suitable for M5 PE screws

During normal operation, leakage currents ≥ 3.5 mA may occur. In order to fulfill EN 61800-5-1, observe the following information:

- The ground connection (PE) must be installed so that it meets the requirements for systems with high leakage currents.
- This usually means
  - Installing a PE connection cable with a minimum cross section of 10 mm²
  - or installing a second PE connection cable in parallel to the protective earth.

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9.3.7 Connecting the 24 V supply

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

9.3.8 Binary control

Connect the required control cables

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

9.3.9 Control via RS485 interface

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

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

INFORMATION

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

9.3.10 Protection devices

MOVIMOT® drives have integrated protection devices against overload and short circuit. External overload devices are not required.

9.3.11 Installation above 1000 m above sea level

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

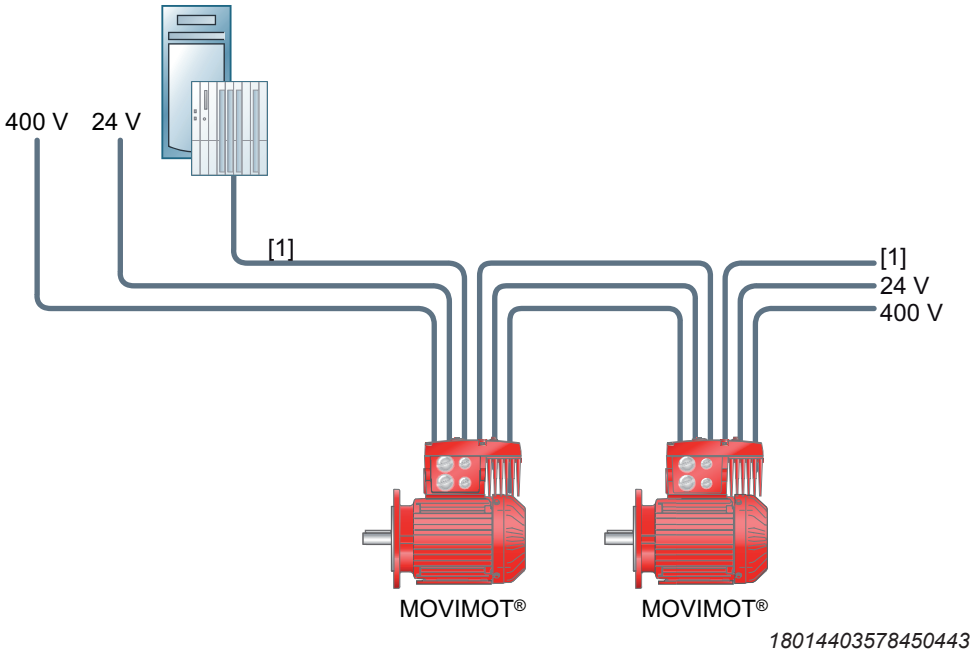
- At heights above 1000 m above sea level, the nominal continuous power is reduced due to reduced cooling: I_N reduction by 1% per 100 m.
- At altitudes of 2000 to 3800 m above mean sea level, you must take limiting measures which reduce the line side overvoltage from category III to category II for the entire system.

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9.4 Installation topology

9.4.1 Installation topology for MOVIMOT® drive with integrated inverter

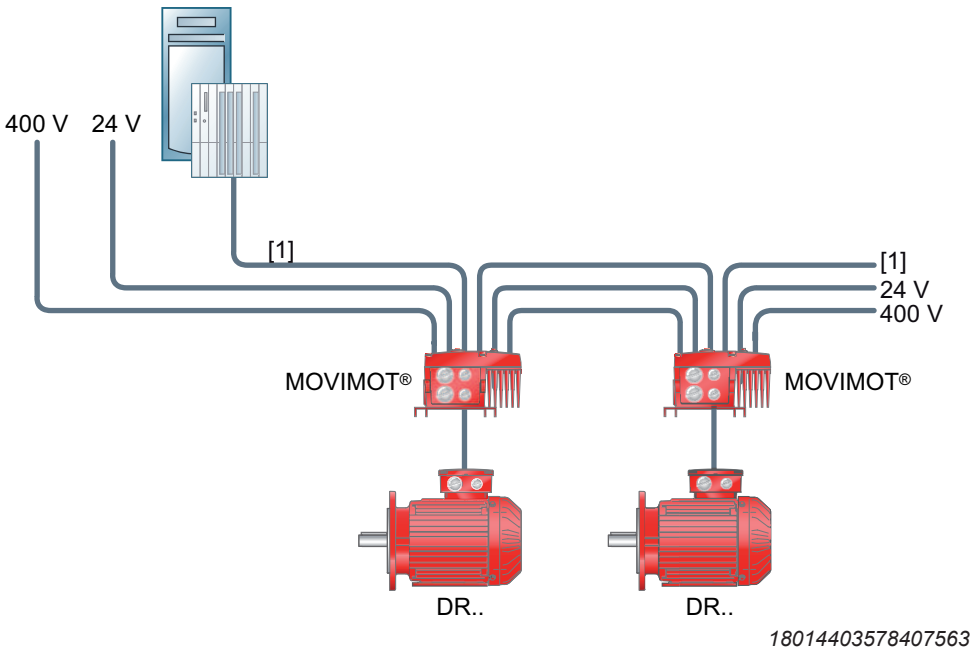
The following figure shows the basic installation topology of the MOVIMOT® drive with integrated inverter:



[1] Control

9.4.2 Installation topology of MOVIMOT®, mounting close to the motor

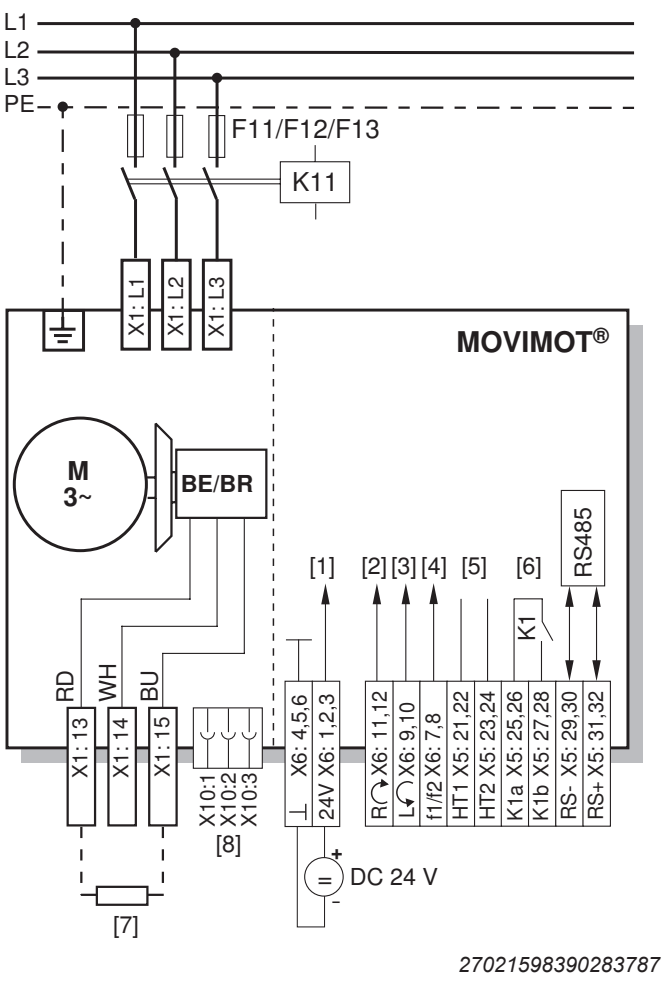
The following figure shows the basic installation topology of the MOVIMOT® drive for mounting close to the motor:



[1] Control

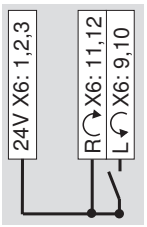
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9.5 MOVIMOT® drive connection

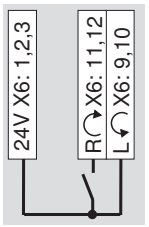


27021598390283787

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

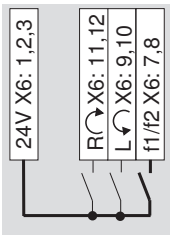


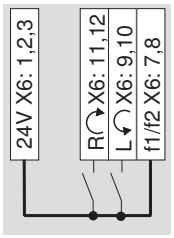
Direction of rotation **CW** active



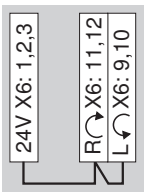
Direction of rotation **CCW** active

Functions of terminals f1/f2:

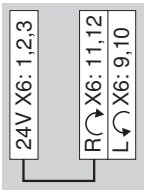




Functions of the CW/stop and CCW/stop terminals with control via RS485 interface/fieldbus:

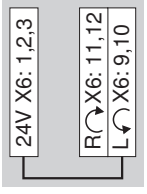


Both directions of rotation are enabled.



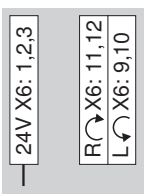
Only **CW** direction of rotation is enabled.

Setpoint input for CCW rotation will stop the drive.



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

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



Drive is blocked or brought to a stop.

[1] DC 24 V supply
(external or MLU..A/MLG..A options)

[2] CW/stop (binary input)

[3] CCW/stop (binary input)

[4] Setpoint changeover f1 / f2 (binary input)

[5] HT1/HT2: Intermediate terminals for specific wiring diagrams

[6] Ready signal
(contact closed = ready for operation)

[7] BW.. braking resistor (only for MOVIMOT® drives without mechanical brake)

[8] Connector for connecting the BEM or BES option

9.6 Brake chopper output

Observe the following information:

- Do not connect capacitive or inductive loads.
- Only connect ohmic loads (braking resistors).
- Connect the braking resistor to the connections +R and -R.
- Note that the maximum permissible cable length between the braking resistor and inverter is 15 m.
- Use a shielded cable or twisted single cores.

9.7 Electrical installation – functional safety

9.7.1 Connection variants

24 V voltage supply for group disconnection

Basic considerations

- For group drives, the 24 V supply of several MOVIMOT® drives can be made available by a single safety relay. The maximum possible number of units ("n" units) results from the maximum permitted contact load of the safety relay and the maximum permitted voltage drop of the DC supply for MOVIMOT® inverters.
- Other requirements of the safety relay manufacturer (such as protecting the output contacts against welding) must be strictly observed. The basic conditions described in the conditions of the certification report for MOVIMOT® MM..D also apply to cable routing.
- For EMC reasons, the maximum cable length is limited to 100 m. Other instructions published by the manufacturer on the use of safety relays for specific applications must also be observed.
- A calculation based on the technical data for MOVIMOT® MM..D must be performed separately for each group disconnection.

Determining the maximum number of** MOVIMOT® **drives for group disconnection:

The number "n" of MOVIMOT® MM..D drives that can be disconnected as a group is limited by the following factors:

- **Switching capacity of the safety relay**

  You must connect a fuse in front of the safety contacts according to the specifications of the safety relay manufacturer to prevent the contacts from welding together.

  It is mandatory to observe the information about the switching capacity according to EN 60947-4-1 and EN 60947-5-1 and the contact protection in the operating instructions of the safety relay manufacturer. Compliance with these specifications is the responsibility of the project planner.

- **Maximum permitted voltage drop in the 24 V supply cable**

  When configuring group drives, observe the values of the maximum cable lengths and the permitted voltage drops.

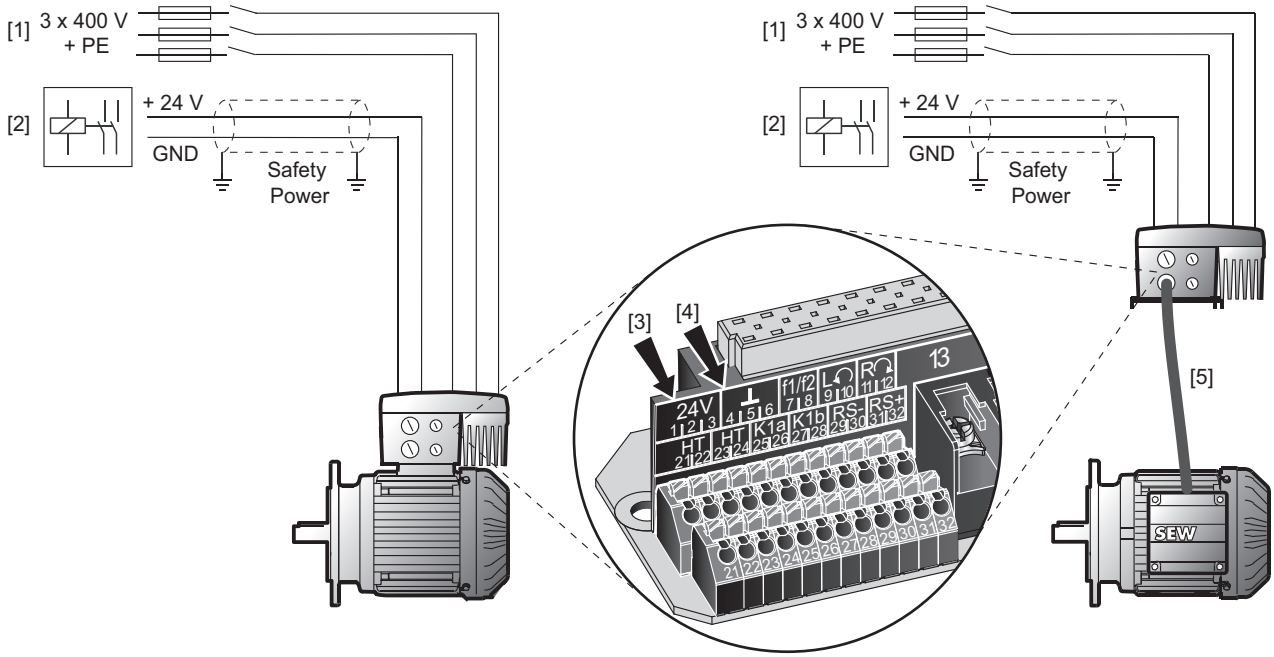
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MOVIMOT® with binary control (control via terminals)

General structure

MOVIMOT® with binary control (control via terminals):

Inverter mounted to the motor **Mounting close to the motor**

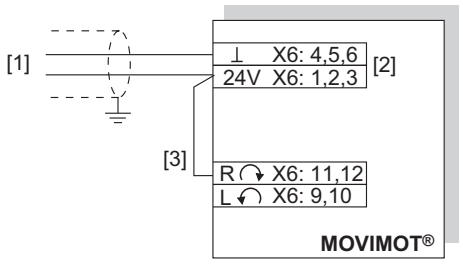


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[1] Line connection
[2] 24 V supply from the safety relay
[3] Safety contact "24V"
[4] Safety contact "⊥"
[5] Hybrid cable

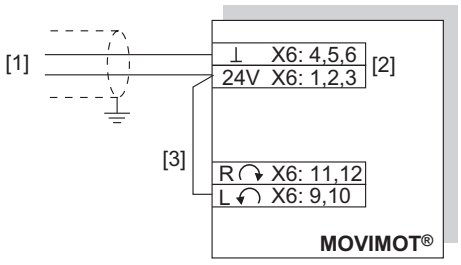
Permitted terminal assignment for direction of rotation signals (jumpers in terminal box)

Variant 1: "Clockwise rotation"



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Variant 2: "Counterclockwise rotation"



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Make sure that "24V" and "⊥" are connected correctly and verify this with a test!

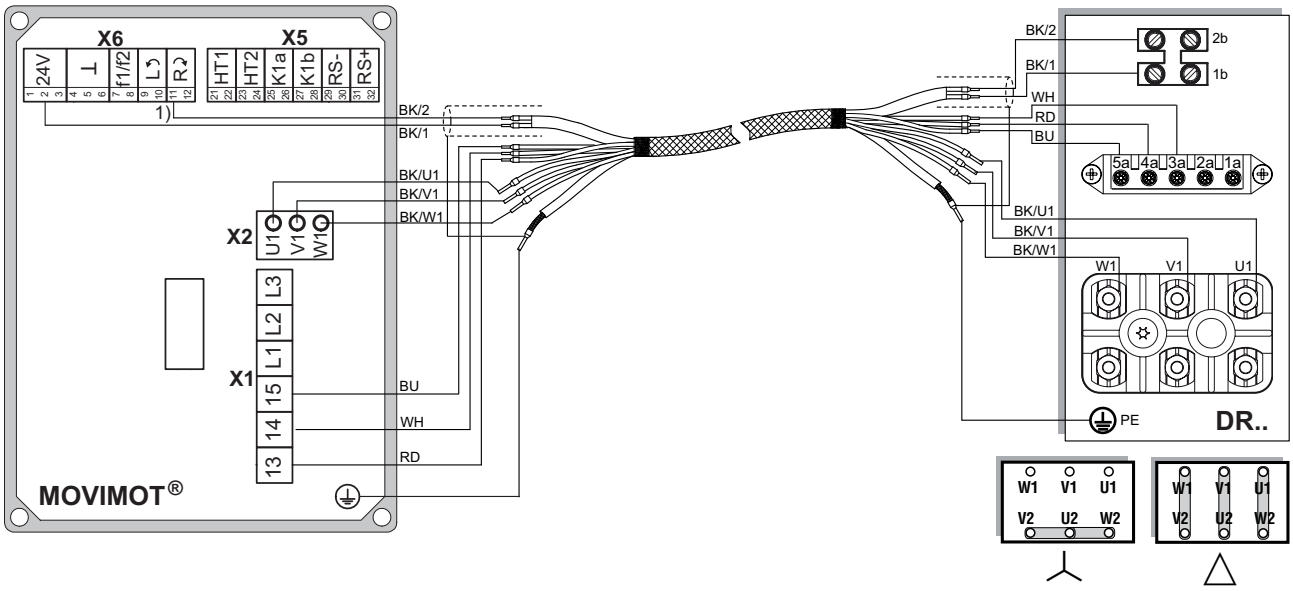
[1] Safety-related 24 V supply from the safety relay

[2] Safety contacts

[3] Jumper inside the terminal box (no switch)

Connection hybrid cable (motor cable) for installation close to the motor

The following figure shows the core assignment of the hybrid cable and the corresponding terminals of the MOVIMOT® connection box and the DR.. motor:



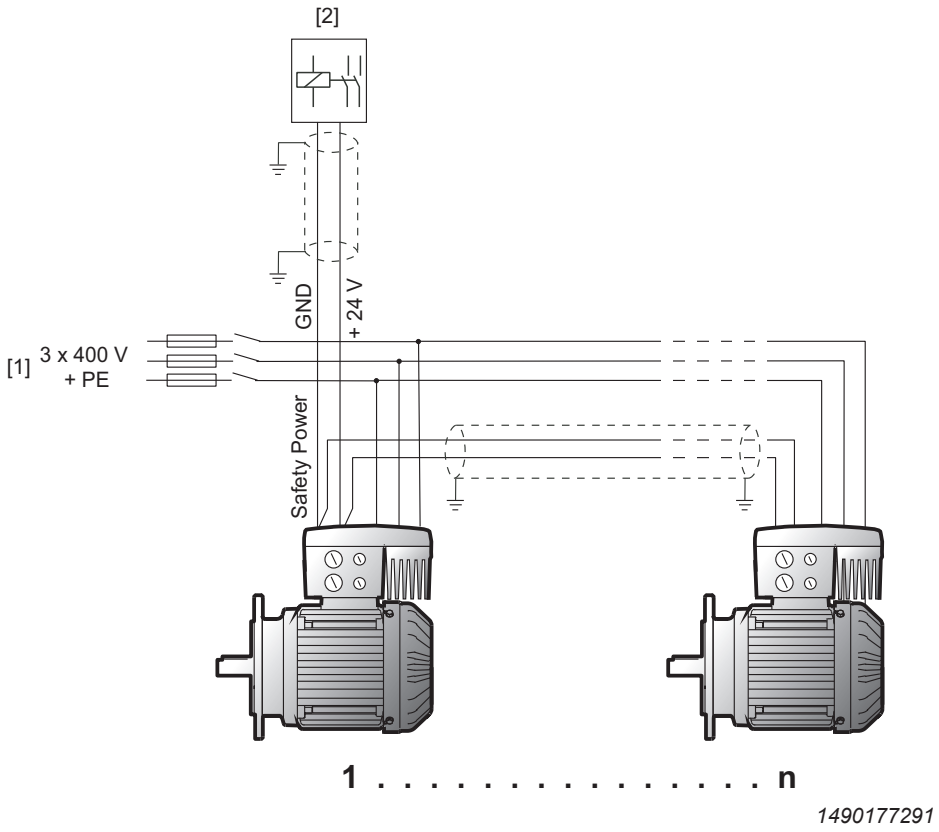
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MOVIMOT® Terminal		Hybrid cable Wire color/designation	DR.. motor Terminal
X2	U1	Black/U1	U1
	V1	Black/V1	V1
	W1	Black/W1	W1
X1	13	Red/13	4a
	14	White/14	3a
	15	Blue/15	5a
X6	24V	Black/1	1b
	R or L[1)]	Black/2	2b
PE connection		Green/yellow + shield end (inner shield)	PE connection

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

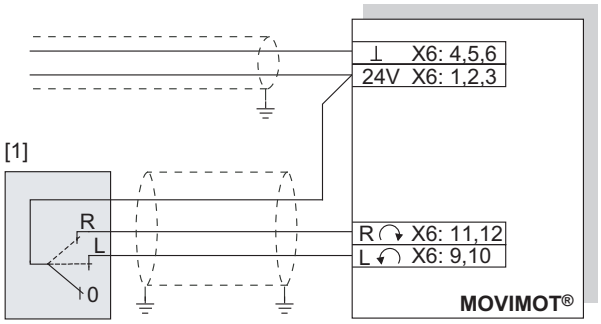
Group disconnection

For information on determining the number "n" MOVIMOT® for group disconnection, refer to chapter "24 V voltage supply for group disconnection" (→ 🗎 128).



[1] Line connection
[2] Safety-related 24 V supply from the safety relay

Controlling the direction of rotation signals via an external switch



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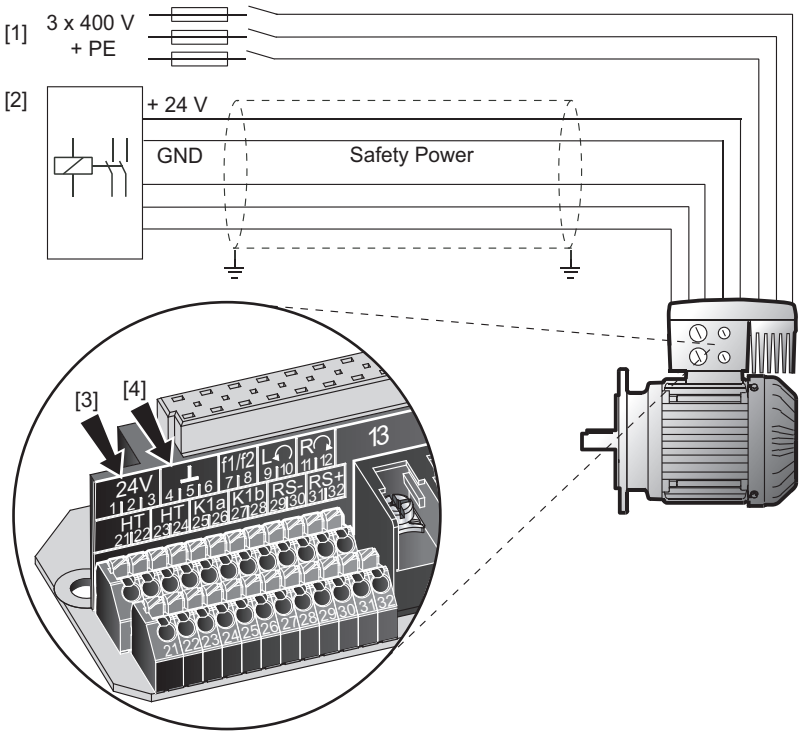
[1] Switch

- Route the cables to the external switch according to the general information so that neither parasitic voltages nor induced voltages can occur.
- Control of the direction of rotation via the external switch is not permitted for group drives. The switch must be designed according to EN 60204-1 or EN 61800-5-1 "Protective separation", for example.
- The cable length between the MOVIMOT® drive and the external switch must be included in the total cable length.

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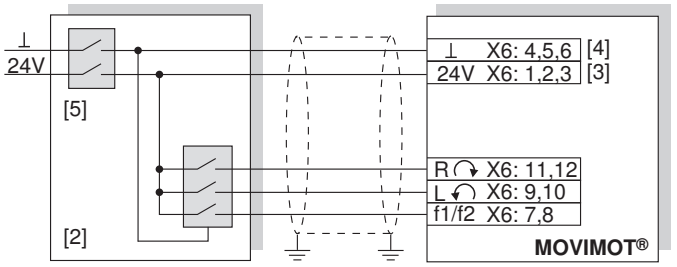
Binary control via safe outputs

MOVIMOT® with binary control (control via terminals):



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Terminal assignment (clockwise rotation, counterclockwise rotation, setpoint changeover):



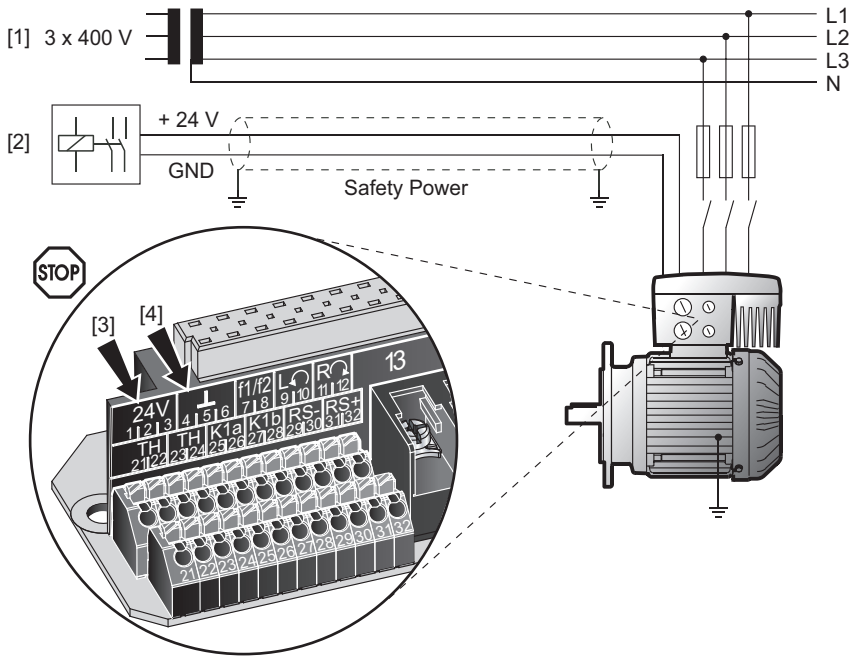
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Observe the correct connection of "24V" and "⊥" and verify by testing!

[1] Line connection
[2] Safe I/O peripheral system
[3] Safety contact "24V"
[4] Safety contact "⊥"
[5] Safe 2-pole switching output (relay or electronic switch)

- You can connect the control signals "R", "L", "f1/f2" as single-pole connections. Supply the switching element from the safety-related 24 V supply.
- The maximum cable length of 100 m between MOVIMOT® and safe PLC is only permitted if all signals for direction of rotation and setpoint selection are routed in a shielded cable. If you distribute the signals over 2 shielded cables, the permitted cable length is reduced to half (= 50 m).

MOVIMOT® with binary control (control via terminals) for IT system



[1] Line connection 3 x 400 V

[2] 24 V supply from the safety relay (e.g. PNOZ..)

[3] Safety contact "24V"

[4] Safety contact "⊥"

If necessary, the drive can be grounded using a connecting element to the motor housing.

Other setup variants

INFORMATION

The line connection of all other configuration variants for IT systems (3 × 400 V) is identical to the line connection shown in the figure above.

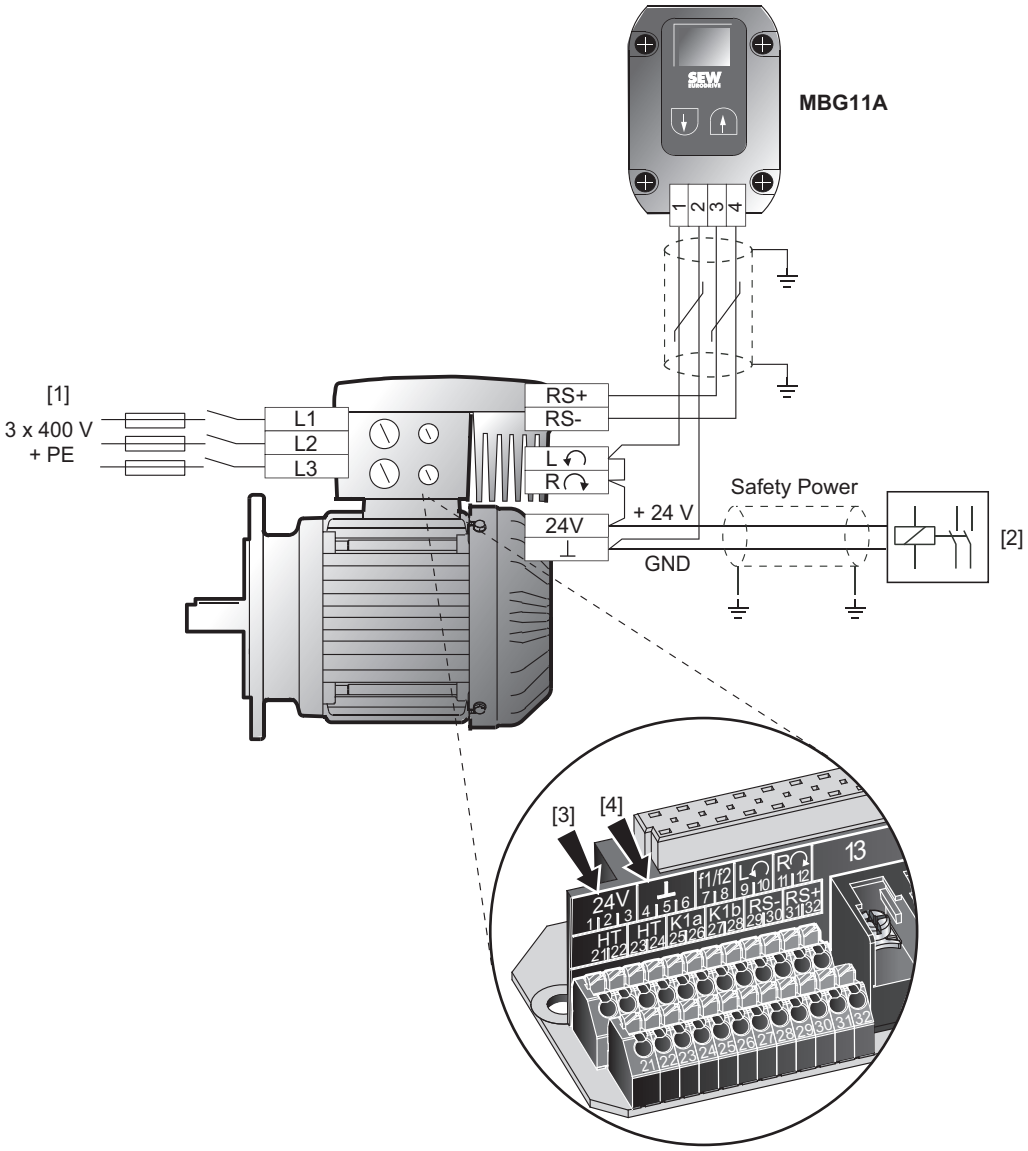
Connect all MOVIMOT® drives with functional safety for operation on IT systems to the IT system according to the figure above.

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MOVIMOT® with MBG11A option

General structure

MOVIMOT® drive with MBG11A option (setpoint adjuster):

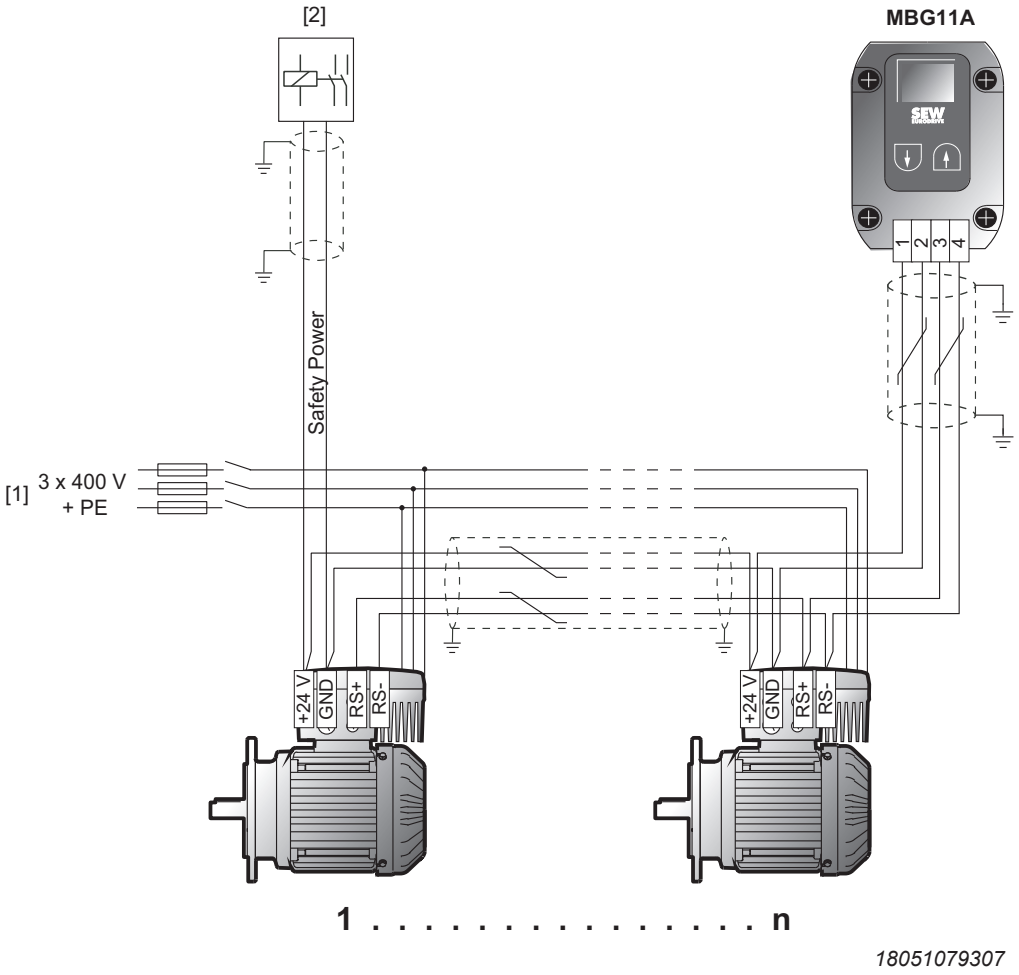


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[1] Line connection
[2] 24 V supply from the safety relay
[3] Safety contact "24V"
[4] Safety contact "⊥"

Group disconnection

For information on determining the number "n" MOVIMOT® for group disconnection, refer to chapter "24 V voltage supply for group disconnection" (→ 🗎 128).



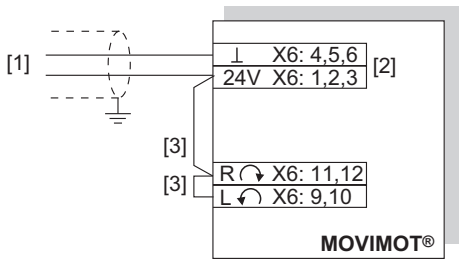
[1] Line connection
[2] Safety-related 24 V supply from the safety relay

Direction of rotation enable on MOVIMOT®

Observe the correct connection of "24V" and "⊥" and verify by testing!

Variant 1

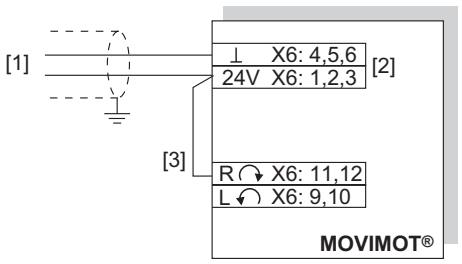
- Both directions of rotation are enabled.



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Variant 2

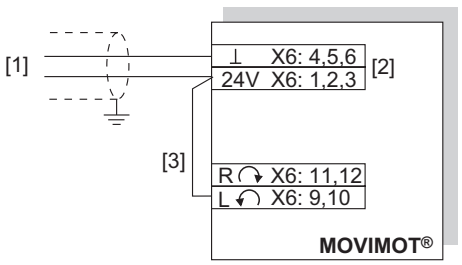
- Clockwise direction of rotation is enabled.



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Variant 3

- Counterclockwise direction of rotation is enabled.



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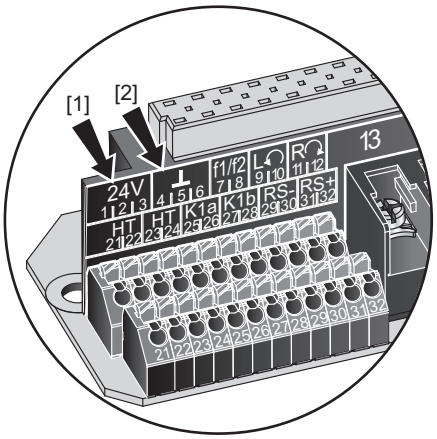
[1] Safe 24 V supply from the safety relay

[2] Safety contacts

[3] Jumper in the connection box (no switch)

Safety contact "24V" [1] is marked in red.

Safety contact "⊥" [2] is marked in blue.



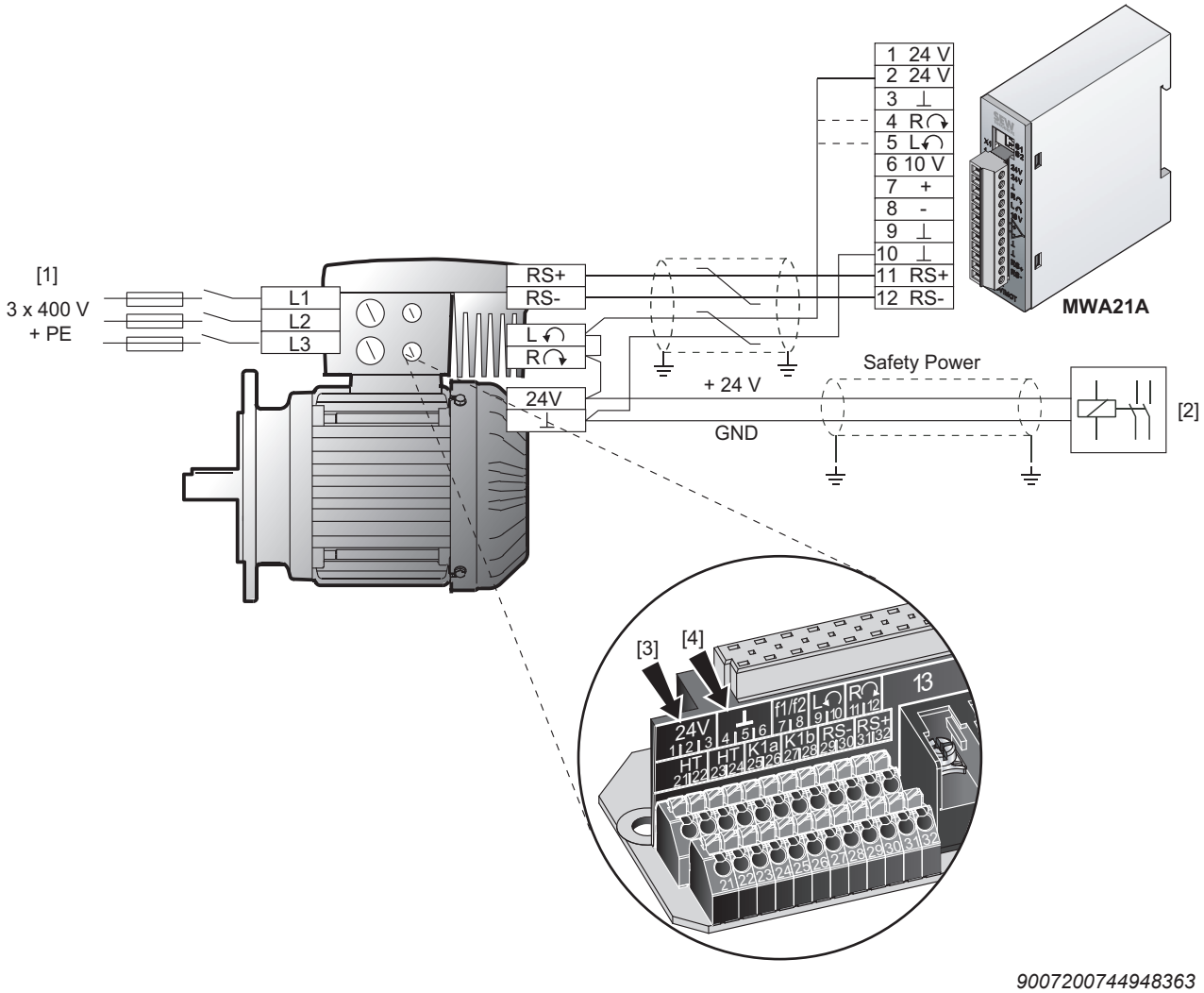
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MOVIMOT® with MWA21A option

General structure

MOVIMOT® drive with MWA21A option (setpoint adjuster):

Supply terminals 1 to 10 of option MWA21A from the same 24 V source and switch them off via the external safety relay.

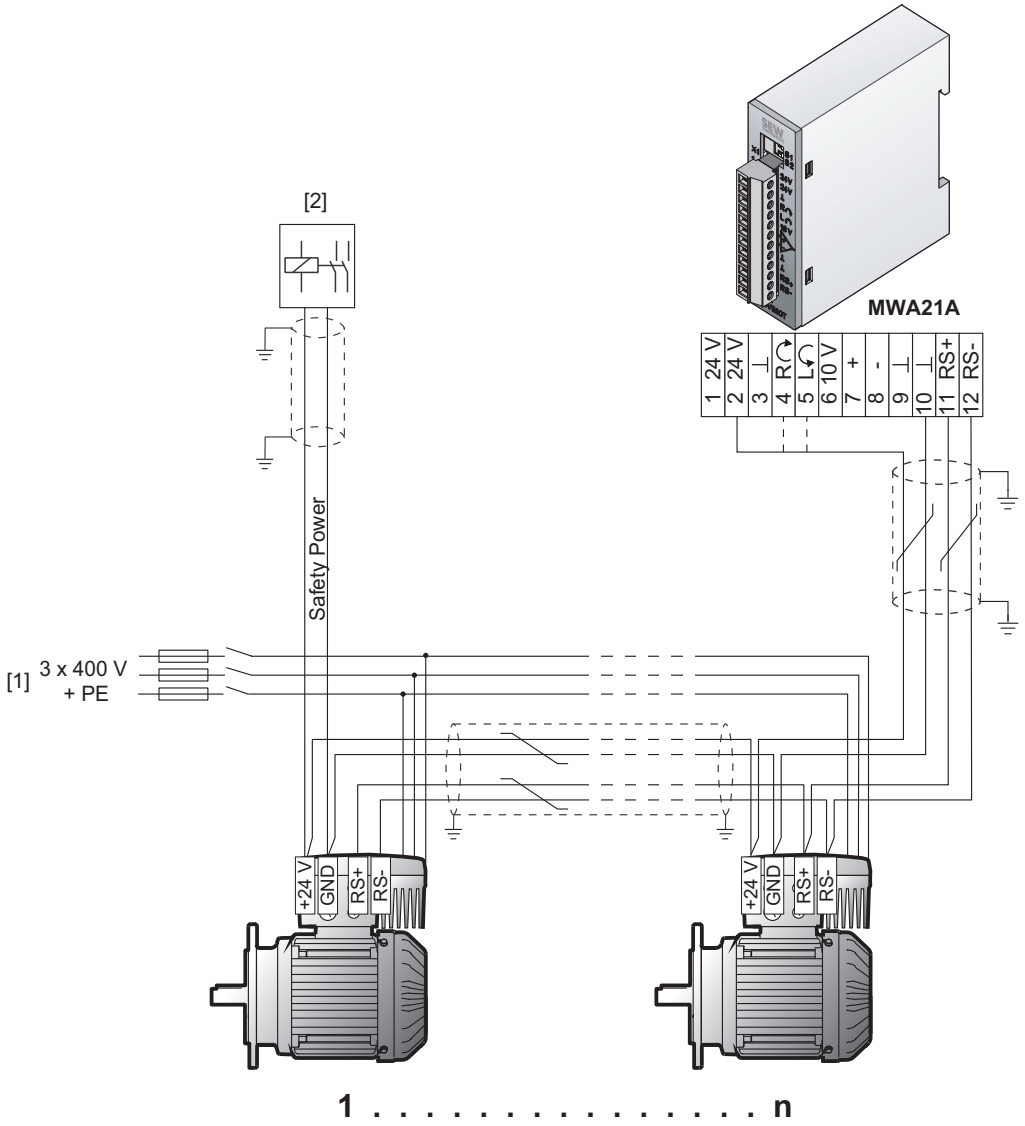


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[1] Line connection
[2] 24 V supply from the safety relay
[3] Safety contact "24V"
[4] Safety contact "⊥"

Group disconnection

For information on determining the number "n" MOVIMOT® for group disconnection, refer to chapter "24 V voltage supply for group disconnection" (→ 🗎 128).



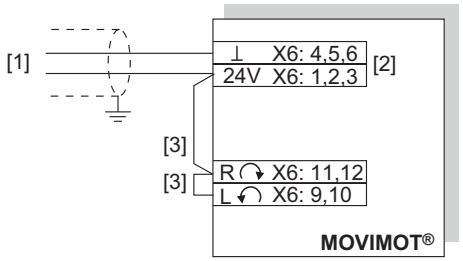
[1] Line connection
[2] Safety-related 24 V supply from the safety relay

Direction of rotation enable on MOVIMOT®

Observe the correct connection of "24V" and "⊥" and verify by testing!

Variant 1

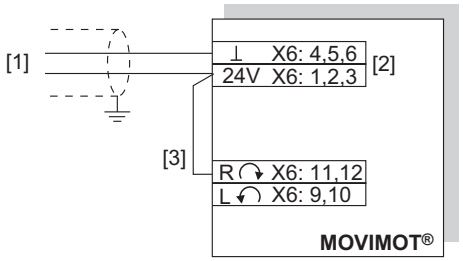
- Both directions of rotation are enabled.



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Variant 2

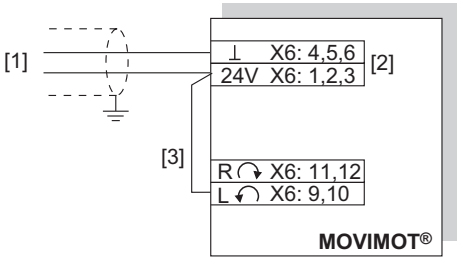
- Clockwise direction of rotation is enabled.



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Variant 3

- Counterclockwise direction of rotation is enabled.



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[1] Safe 24 V supply from the safety relay (e.g. PNOZ..)

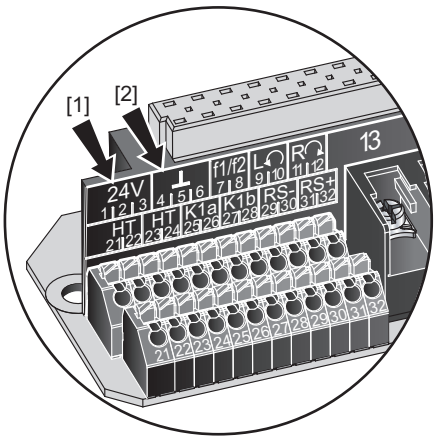
[2] Safety contacts

[3] Jumper inside the connection box

(No switch)

Safety contact "24V" [1] is marked in red.

Safety contact "⊥" [2] is marked in blue.



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9.8 Hybrid cables

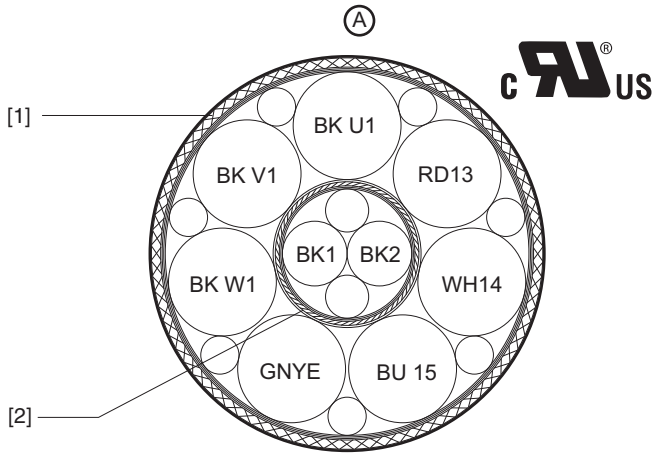
INFORMATION

This chapter shows the technical data of the hybrid cables from SEW-EURODRIVE.

The assignment of hybrid cables to the products can be found in the corresponding chapters.

9.8.1 Hybrid cable type "A"

Mechanical design



839041931

[1] Collective shield
[2] Shield

Cable type	**A**
	8179530
• Supply cores:	7 × 1.5 mm²
• Control core pair:	2 × 0.75 mm²
• Core insulation:	TPE-E (polyester)
• Conductor:	Bare E-Cu litz wire, extra fine wires with 0.1 mm individual wires
• Shield:	Made of tinned E-Cu wire
• Overall diameter:	Max. 15.9 mm
• Outer cable jacket color:	Black
• Cable jacket insulation:	TPE-U (polyurethane)

Electrical properties

- Conductor resistance for 1.5 mm² (20 °C): max. 13 Ω/km
- Conductor resistance for 0.75 mm² (20 °C): max. 26 Ω/km
- Operating voltage for core 1.5 mm²: Max. 600 V according to c UL us
- Operating voltage for core 0.75 mm²: Max. 600 V according to c UL us
- Insulation resistance at 20 °C: min. 20 MΩ x km

Mechanical properties

- Suitability for cable carriers
  - Bending cycles > 2.5 million
  - Travel speed ≤ 3 m/s
- Bending radius in the cable carrier: 10 × diameter
  in fixed installation: 5 × diameter
- Torsional strength (e.g. rotary table applications)
  - Torsion ±180° for a cable length > 1 m
  - Torsional cycles > 100 000

INFORMATION

If alternating bending and high torsional stress occur over a length of < 3 m during the motion sequence, the mechanical boundary conditions must be examined more closely. Contact SEW-EURODRIVE in such cases.

Thermal properties

- Processing and operation: -30 °C – +90 °C (load capacity according to DIN VDE 0298-4)
  -30 – +80 °C according to c UL us
- Transport and storage: -40 °C – +90 °C (load capacity according to DIN VDE 0298-4)
  -30 – +80 °C according to c UL us
- Flame retardant according to UL1581 Vertical Wiring Flame Test (VW-1)
- Flame retardant according to CSA C22.2 Vertical Flame Test (FT-1)

Chemical properties

- Oil-resistant according to DIN VDE 0472 part 803 method B
- General fuel resistance (such as diesel, gasoline) according to DIN ISO 6722 parts 1 and 2
- General resistance to acids, alkalis, cleaning agents
- General resistance against dusts (e.g. bauxite, magnesite)

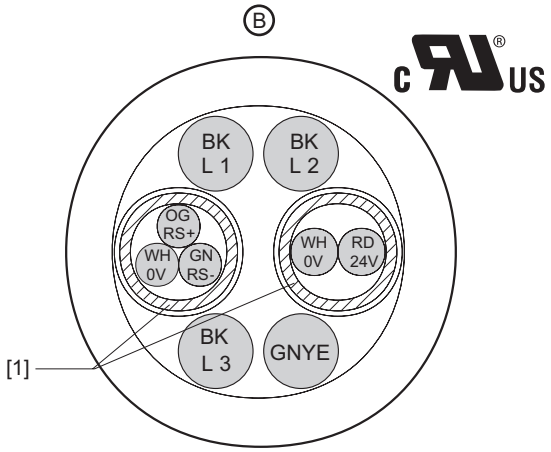
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- Insulation and cable jacket material is halogen free according to DIN VDE 0472 part 815
- Within the specified temperature range, free from substances interfering with wetting agents (silicone-free)

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9.8.2 Hybrid cable type "B" and "B/2.5"

Mechanical design



1031705739

Cable type	B	B/2.5
	8145172	13284363
• Supply cores:	4 × 1.5 mm²	4 × 2.5 mm²
• Control core pair:	2 × 0.75 mm²	2 × 0.75 mm²
• Control core group:	3 × 0.75 mm²	3 × 0.75 mm²
• Core insulation:	TPE-E (polyester)	TPE-E (polyester)
• Conductor:	Bare E-Cu litz wire, extra fine wires with 0.1 mm individual wires	
• Shield:	Made of tinned E-Cu wire	Made of tinned E-Cu wire
• Overall diameter:	13.2 – 13.8 mm	14.4 – 15.2 mm
• Outer cable jacket color:	Black	Black
• Cable jacket insulation:	TPE-U (polyurethane)	TPE-U (polyurethane)

Electrical properties

Cable type	B	B/2.5
• Conductor resistance for 1.5/2.5 mm² (20 °C):	Max. 13 Ω/km	Max. 8 Ω/km
• Conductor resistance for 0.75 mm² (20 °C):	max. 26 Ω/km	Max. 26 Ω/km
• Operating voltage for core 1.5/2.5 mm²:	Max. 600 V according to cULus	Max. 600 V according to cULus
• Operating voltage for core 0.75 mm²:	Max. 600 V according to cULus	Max. 600 V according to cULus
• Insulation resistance at 20 °C:	Min. 20 MΩ x km	Min. 20 MΩ x km

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Mechanical properties

- Suitability for cable carriers
  - Bending cycles > 2.5 million
  - Travel speed ≤ 3 m/s
- Bending radius in the cable carrier: 10 × diameter
  in fixed installation: 5 × diameter
- Torsional strength (e.g. rotary table applications)
  - Torsion ±180° for a cable length > 1 m
  - Torsional cycles > 100 000

INFORMATION

If alternating bending and high torsional stress occur over a length of < 3 m during the motion sequence, the mechanical boundary conditions must be examined more closely. Contact SEW-EURODRIVE in such cases.

Thermal properties

- Processing and operation: -30 to +90 °C (current-carrying capacity according to DIN VDE 0298-4)
  -30 to +80 °C according to c UL us
- Transport and storage: -40 to +90 °C (current-carrying capacity according to DIN VDE 0298-4)
  -30 to +80 °C according to c UL us
- Flame-retardant according to UL1581 Vertical Wiring Flame Test (VW-1)
- Flame-retardant according to CSA C22.2 Vertical Flame Test (FT-1)

Chemical properties

Cable type	B	B/2.5
• Oil resistant:	In accordance with VDE 0472	In accordance with VDE 0282
	part 803, method B	part 10 HD 22.10 S1

- General fuel resistance (such as diesel, gasoline) according to DIN ISO 6722 parts 1 and 2
- General resistance to acids, alkalis, cleaning agents
- General resistance against dusts (e.g. bauxite, magnesite)
- Insulation and cable jacket material is halogen free in accordance with VDE 0472 part 815
- Within the specified temperature range, free from paint-wetting impairment substances (silicone free)

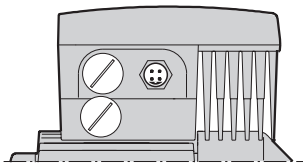
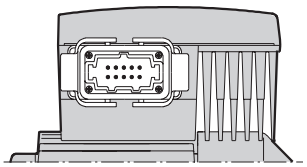
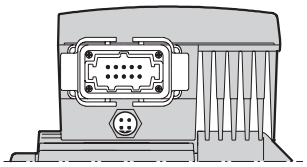
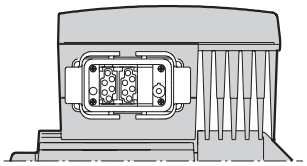
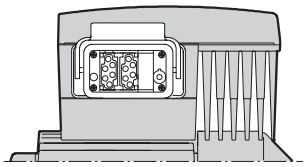
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9.9 MOVIMOT® connectors

9.9.1 Overview connection technology MOVIMOT® standard design

Without specific order information, MOVIMOT® MM..D will be delivered without connector.

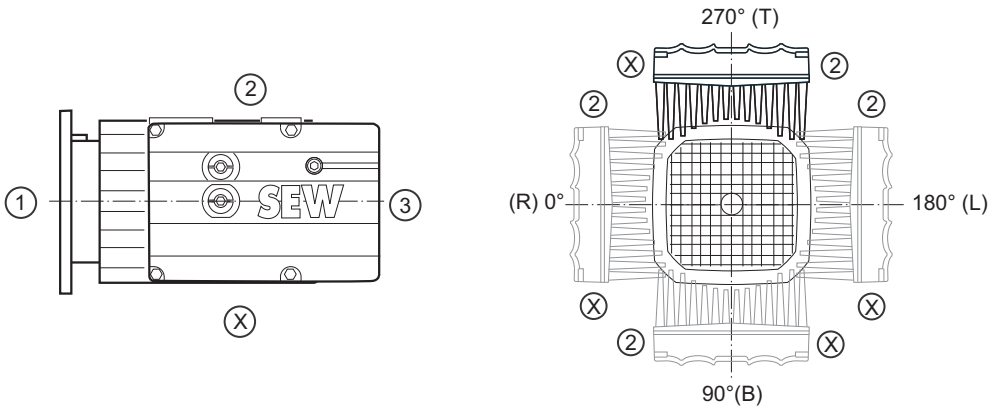
The following table the available connector variants:

Order designation	Function	Manufacturer's designation
MM../AVT1 	• RS485	Circular connector M12 x 1
MM../ASA3 	• Power	Harting Han® 10 ES pin insert (built-on housing with 2 locking levers)
MM../ASA3/AVT1 	• Power • RS485	Harting Han® 10 ES pin insert (built-on housing with 2 locking levers) + Circular connector M12 x 1
MM../AMA6 	• Power/RS485	Harting Han-Modular® pin insert (built-on housing with 2 locking levers)
MM../AMD6 	• Power/RS485	Harting Han-Modular® pin insert (built-on housing with 1 locking lever)

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9.9.2 Possible connector positions (MOVIMOT® standard design)

The following positions are possible for the connectors:



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Connector	Possible positions
AVT1	X (normal)
	2
ASA3	X (normal)
	2
ASA3/AVT1	ASA3 = X (normal) + AVT1 = X (normal)
	ASA3 = 2 + AVT1 = 2
AMA6	X (normal)
AMD6	2

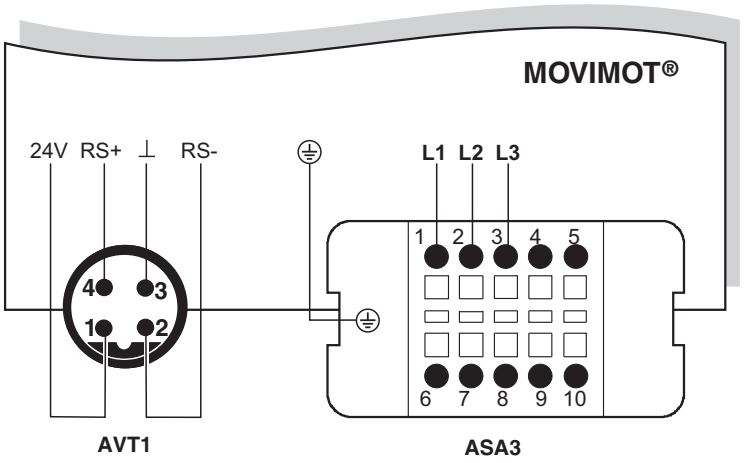
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9.9.3 AVT1, ASA3 connectors

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

Available variants:

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



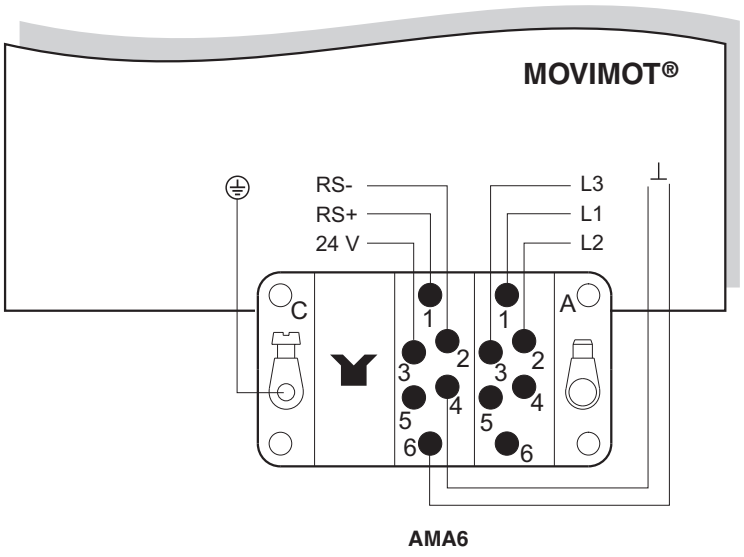
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9.9.4 AMA6 connector

The following figure shows the assignment of the optional AMA6 connector:

Possible design:

- MM../AMA6



27021598088102539

For designs with connector, both directions of rotation are enabled at the factory. If only one direction of rotation is required, observe chapter "Connecting MOVIMOT® drive".

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9.10 Connection between MOVIMOT® and motor with mounting close to the motor

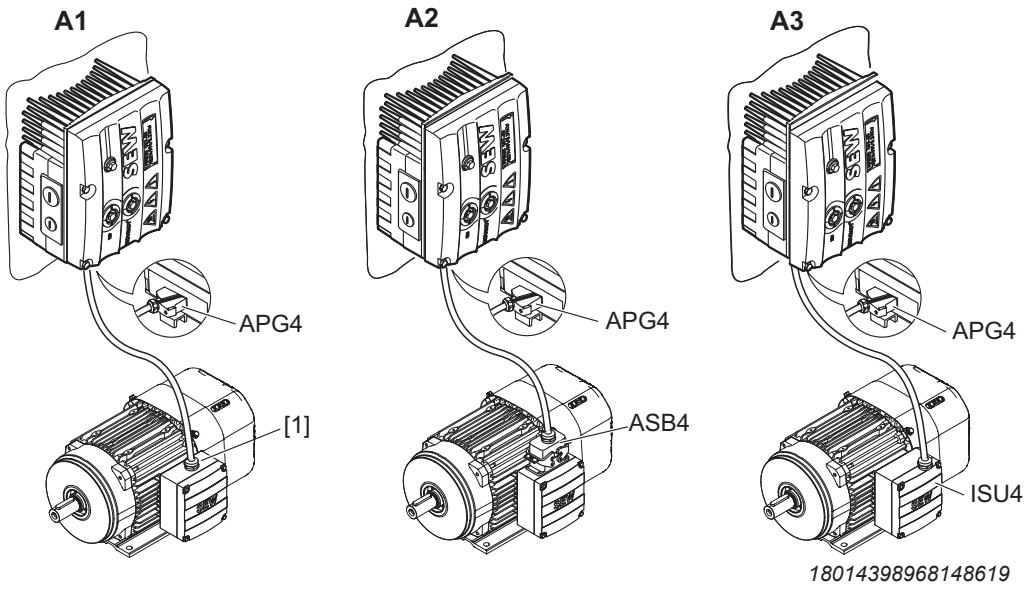
If the MOVIMOT® inverter is mounted close to the motor, the connection to the motor is realized with a prefabricated hybrid cable.

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

9.10.1 MOVIMOT® with APG4 connector

The APG4 design provides the following connection options to the motor, depending on the hybrid cable used:

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

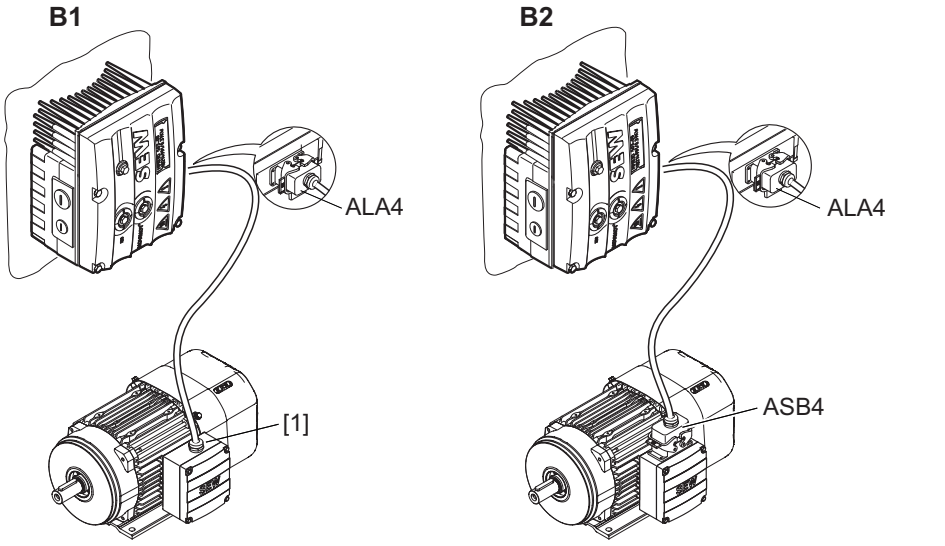


[1] Connection via terminals

9.10.2 MOVIMOT® with ALA4 connector

The ALA4 design provides the following connection options to the motor, depending on the hybrid cable used:

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

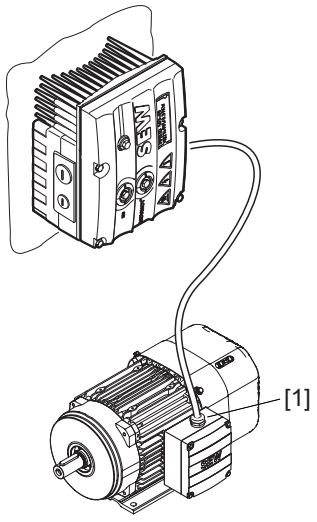


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[1] Connection via terminals

9.10.3 Connecting without connector

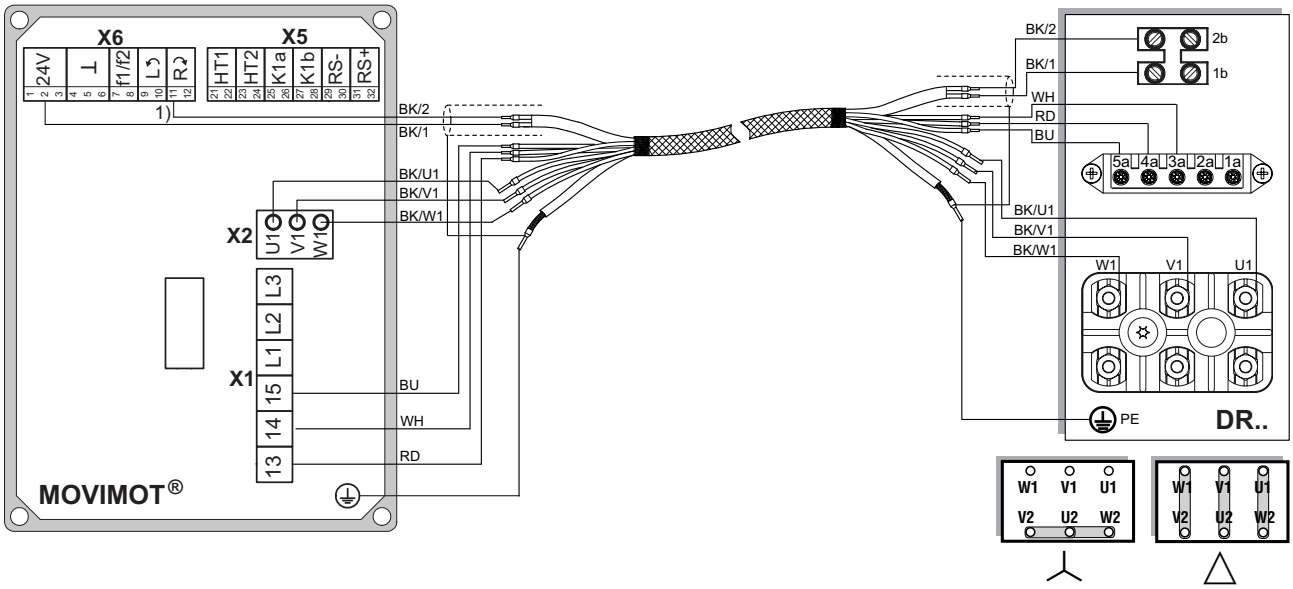
In the design without connector, the motor is connected directly via the terminals of the MOVIMOT®.



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[1] Connection via terminals

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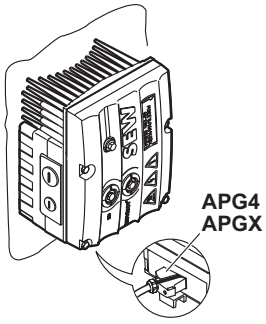
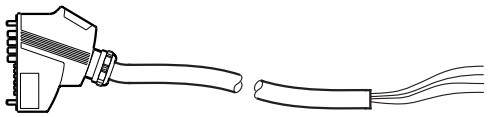
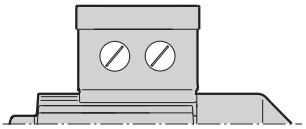
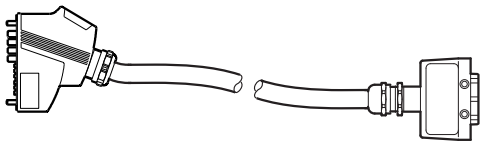
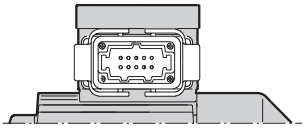
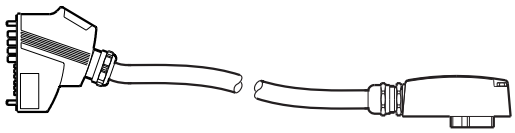
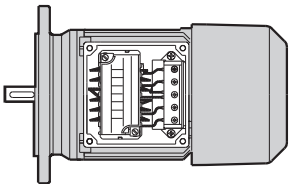
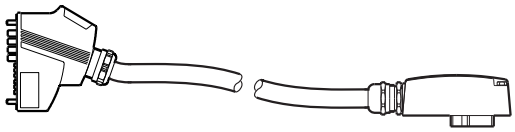
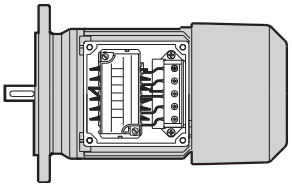
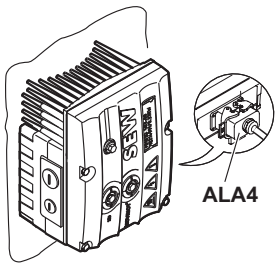
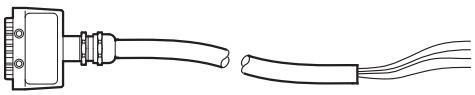
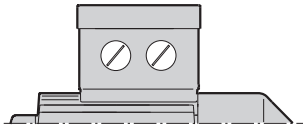
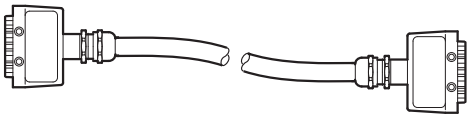
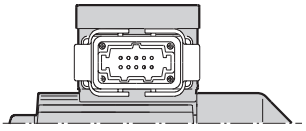


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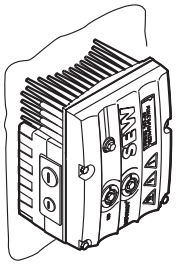
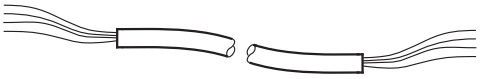
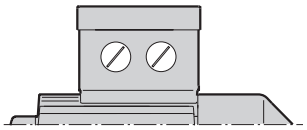
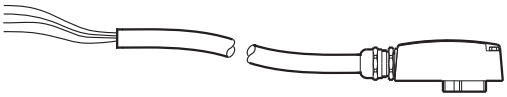
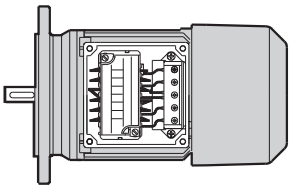
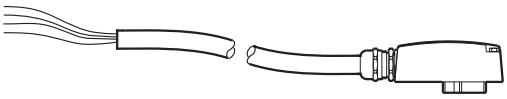
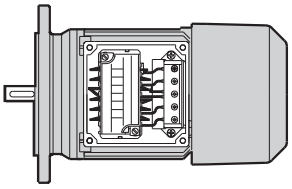
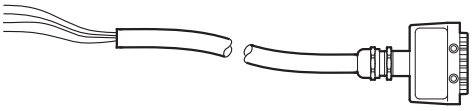
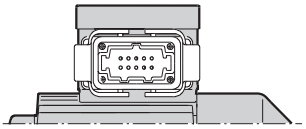
MOVIMOT® Terminal		Hybrid cable Wire color/designation	DR.. motor Terminal
X2	U1	Black/U1	U1
	V1	Black/V1	V1
	W1	Black/W1	W1
X1	13	Red/13	4a
	14	White/14	3a
	15	Blue/15	5a
X6	24 V	Black/1	1b
	R or L[1)]	Black/2	2b
PE connection		Green/yellow + shield end (inner shield)	PE connection

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

9.10.4 Overview of connection between MOVIMOT® and motor with mounting close to the motor

MOVIMOT® inverter	Connection cable	Drive
MM../P2.A/RO.A/APG4 **MM../P2.A/RO.A/APGX** 	Part number DR.71 – DR.100: 01867423 Part number DR.112 – DR.132: 18116620 	AC motors with cable gland 
	Part number: 05930766 	AC motors with ASB4 connector 
	Part number: 05932785 (⅄) Part number: 08163251 (△) 	AC motors with ISU4 connector size DR.63 
	Part number: 05937558 (⅄) Part number: 0816326X (△) 	AC motors with ISU4 connector size DR.71 – 132 
MM../P2.A/RE.A/ALA4 	Part number: 08179484 	AC motors with cable gland 
	Part number: 08162085 	AC motors with ASB4 connector 

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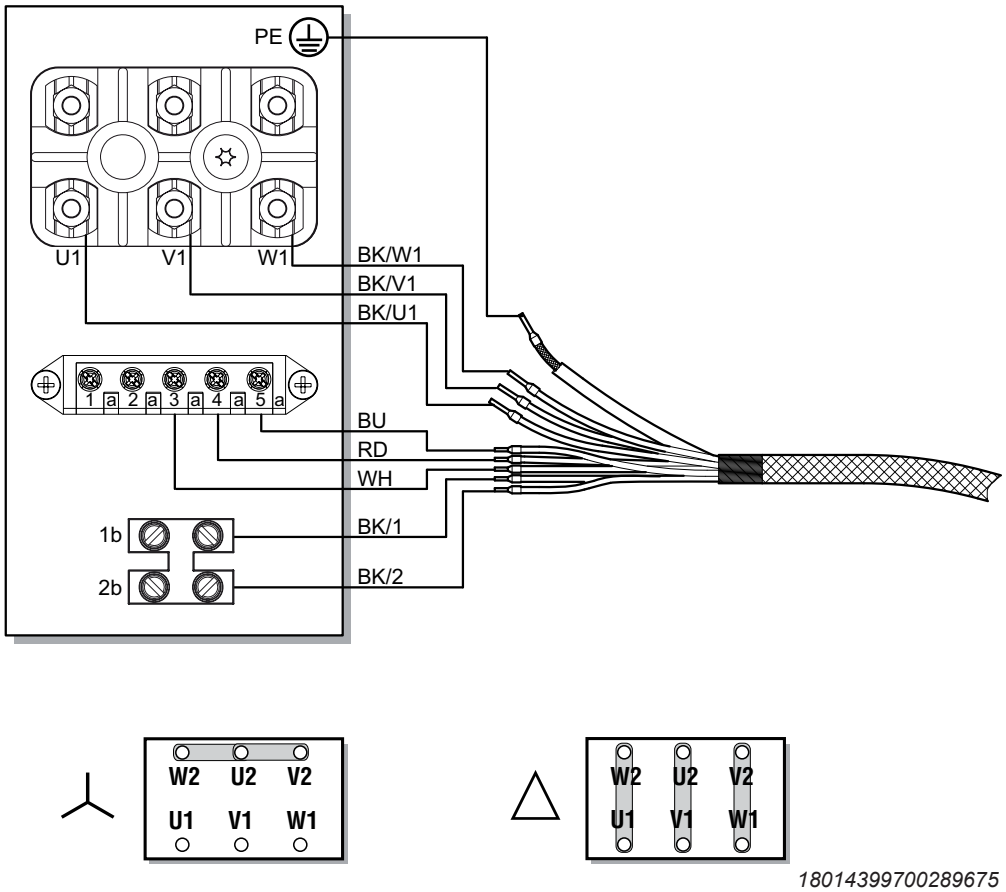
MOVIMOT® inverter	Connection cable	Drive
MM../P2.A/.. 	Part number: 08184380 	AC motors with cable gland 
	Part number: 08187843 (⅄) Part number: 08165262 (△) 	AC motors with ISU4 connector size DR.63 
	Part number 08185336 (⅄) Part number: 08178178 (△) 	AC motors with ISU4 connector size DR.71 – 132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

9.10.5 Hybrid cable connection

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

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

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



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INFORMATION

Do not install an external brake rectifier with brakemotors.

With brakemotors, the MOVIMOT® inverter controls the brake directly.

NOTICE

Damage to the drive due to a ground fault.

Damage to property

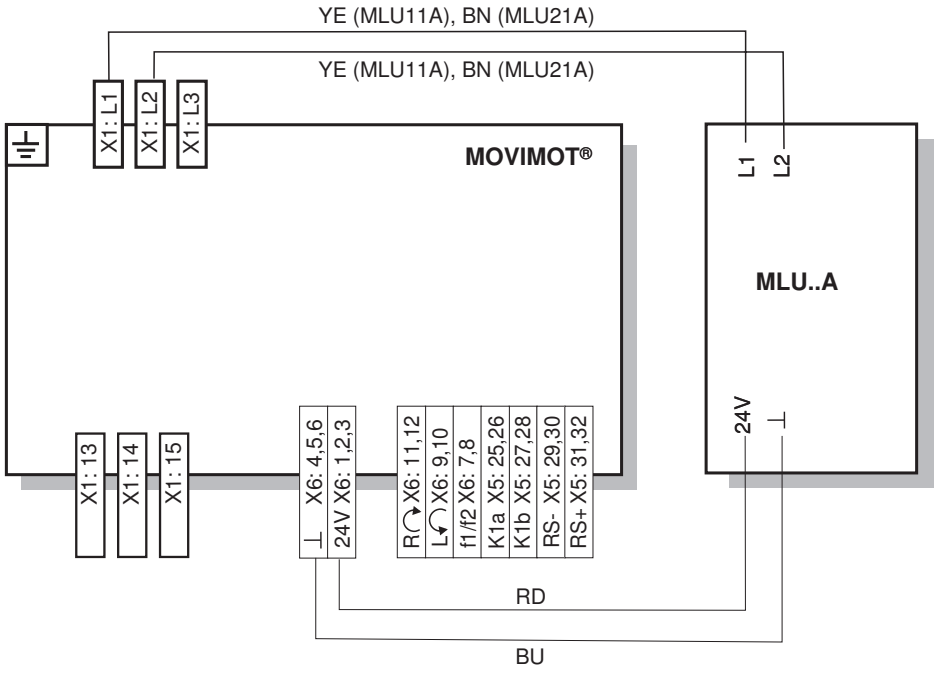
- During installation, avoid conductive connections between the motor output and the ground potential.
- During installation, avoid conductive connections between the brake output and the ground potential.

9.11 MOVIMOT® options connection

9.11.1 Connection of MLU11A/MLU21A option

For information on installing the MLU11A and MLU21A options, refer to chapter "Installing options MLU11A/MLU12A/MLG..A" (→ 🗎 107).

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



640436235

9.11.2 Connection of MLU13A option

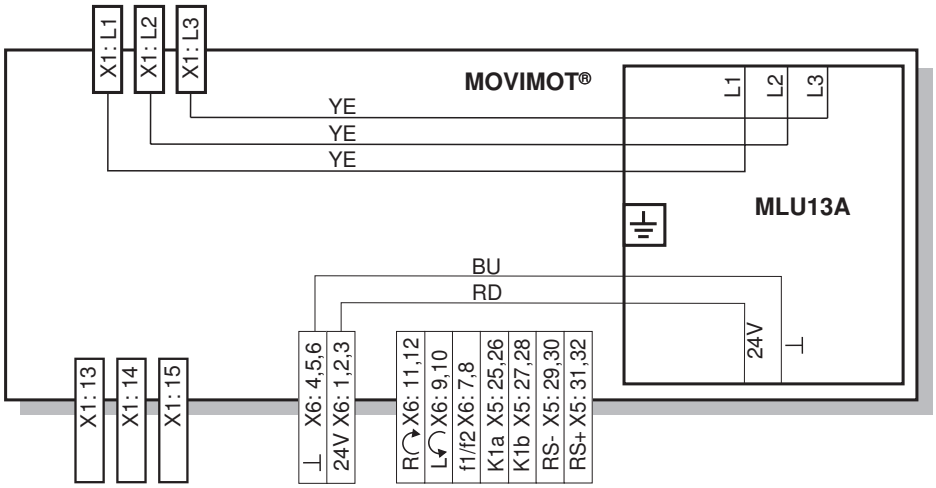
INFORMATION

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

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

For information about installing the MLU13A option, refer to chapter "Installing options MLU11A/MLU12A/MLG..A" (→ 🖹 107).

The following figure shows how to connect the MLU13A option:



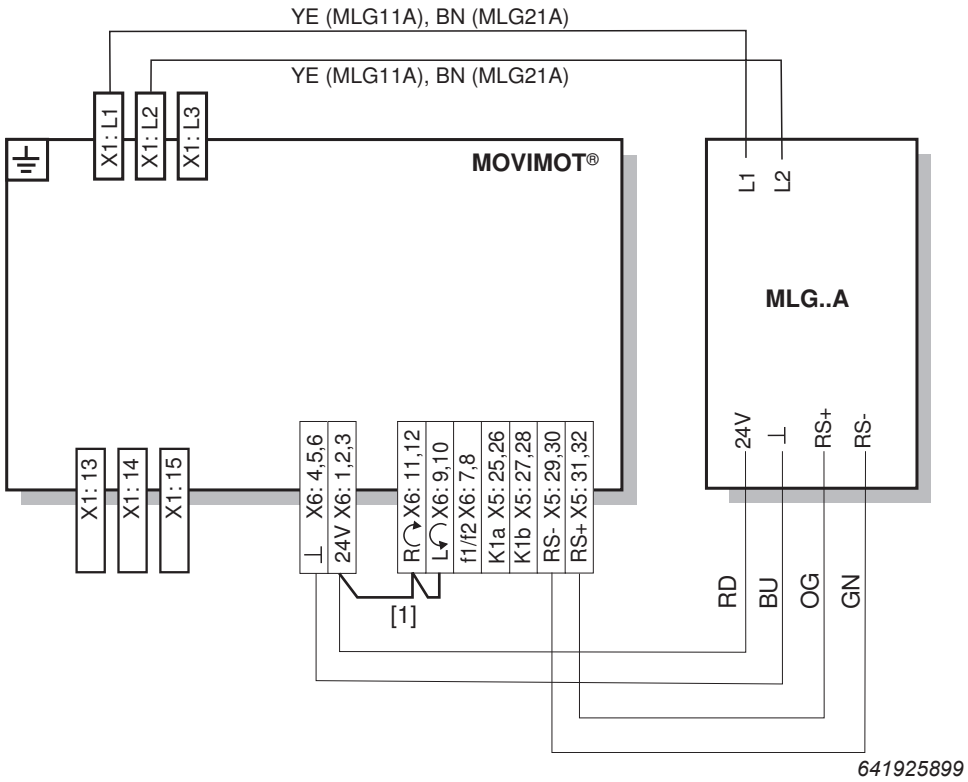
9007199578708363

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9.11.3 Connection of MLG..A option

For information about installing the MLG..A option, refer to chapter "Installing options MLU11A/MLU12A/MLG..A" (→ 🗎 107).

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



[1] Note the enabled direction of rotation.
See chapter "Connection of MOVIMOT® drive" (→ 🗎 127),
Functions of the CW/Stop and CCW/Stop terminals with control via RS485 interface

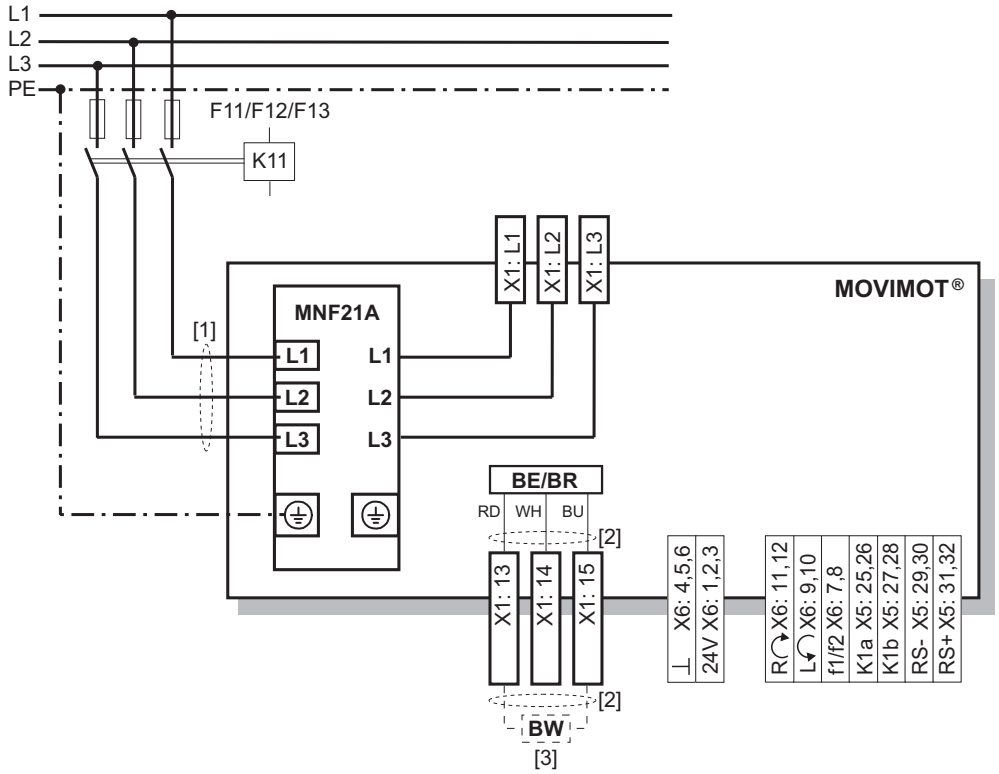
9.11.4 Connection of MNF21A option

INFORMATION

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

For more information about the installation of the MNF21A option, refer to chapter "Installation of MNF21A option" (→ 🗎 109).

The following figure shows how to connect the MNF21A option:



18014400263933707

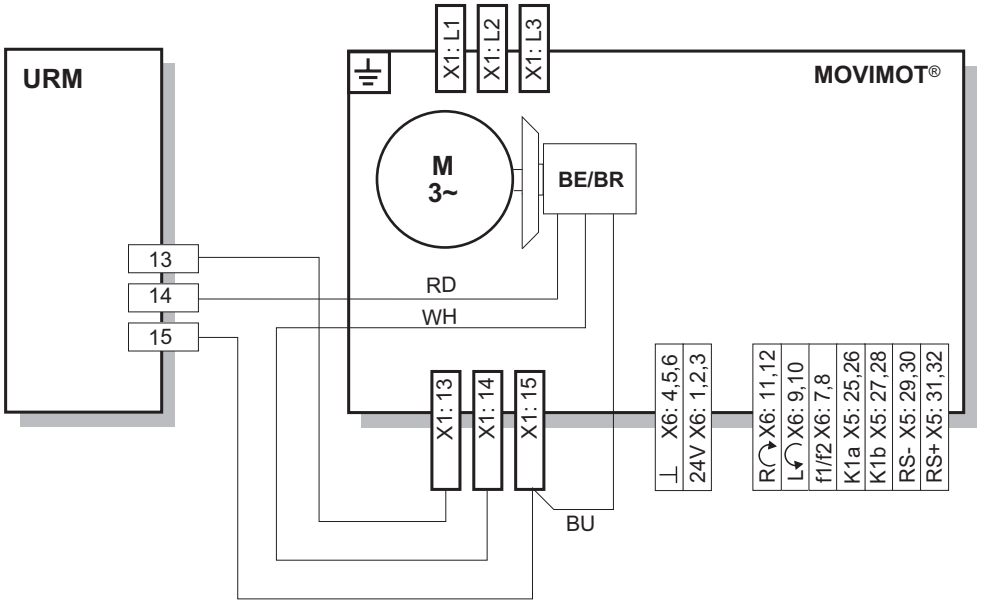
[1] Design the cable length of the power supply as short as possible!
[2] Design the length of the brake cables as short as possible!
Do not route brake cables in parallel, but as far away as possible from power supply cables!
[3] BW braking resistor (only in MOVIMOT® without mechanical brake)

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9.11.5 Connection of URM option

For information about installing the URM option, refer to chapter "Installation of URM / BEM / BES options" (→ 🗎 110).

The following figure shows how to connect the URM option:

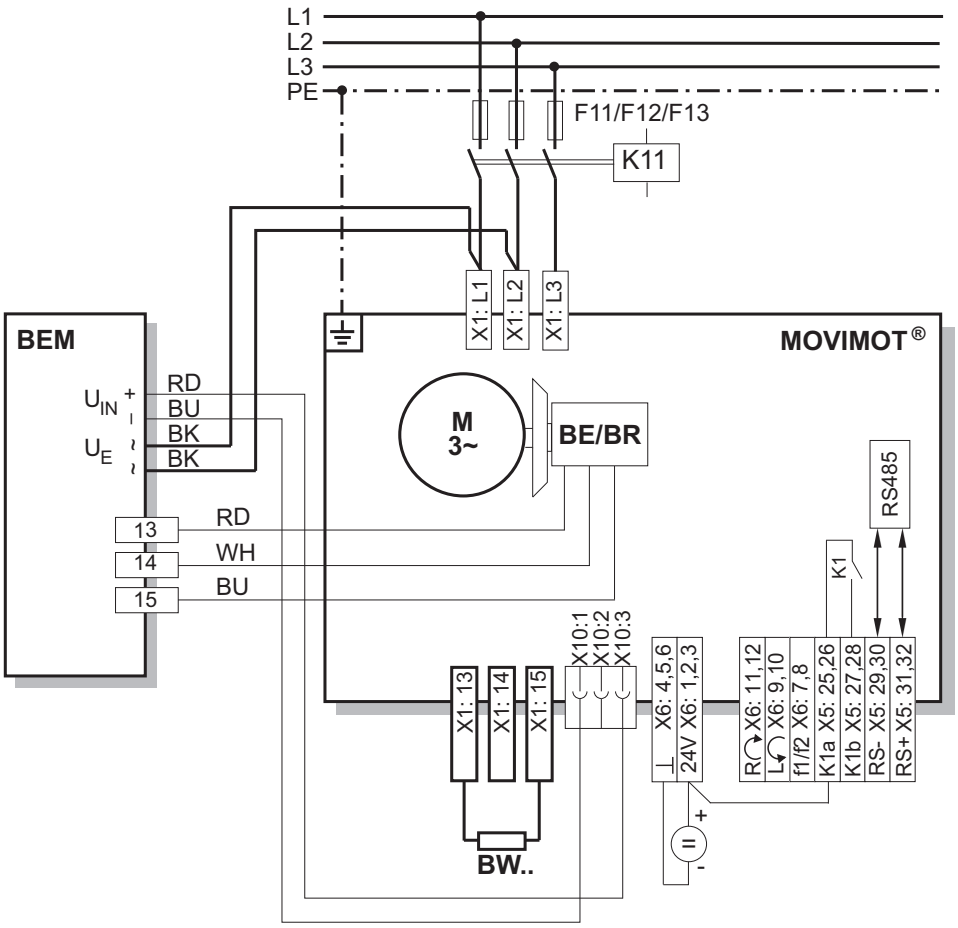


324118411

9.11.6 Connection of BEM option

For information about installing the BEM option, refer to chapter "Installation of URM / BEM / BES options" (→ 🗎 110).

The following figure shows how to connect the BEM option:



18014398833616523

9.11.7 Connection of BES option

NOTICE

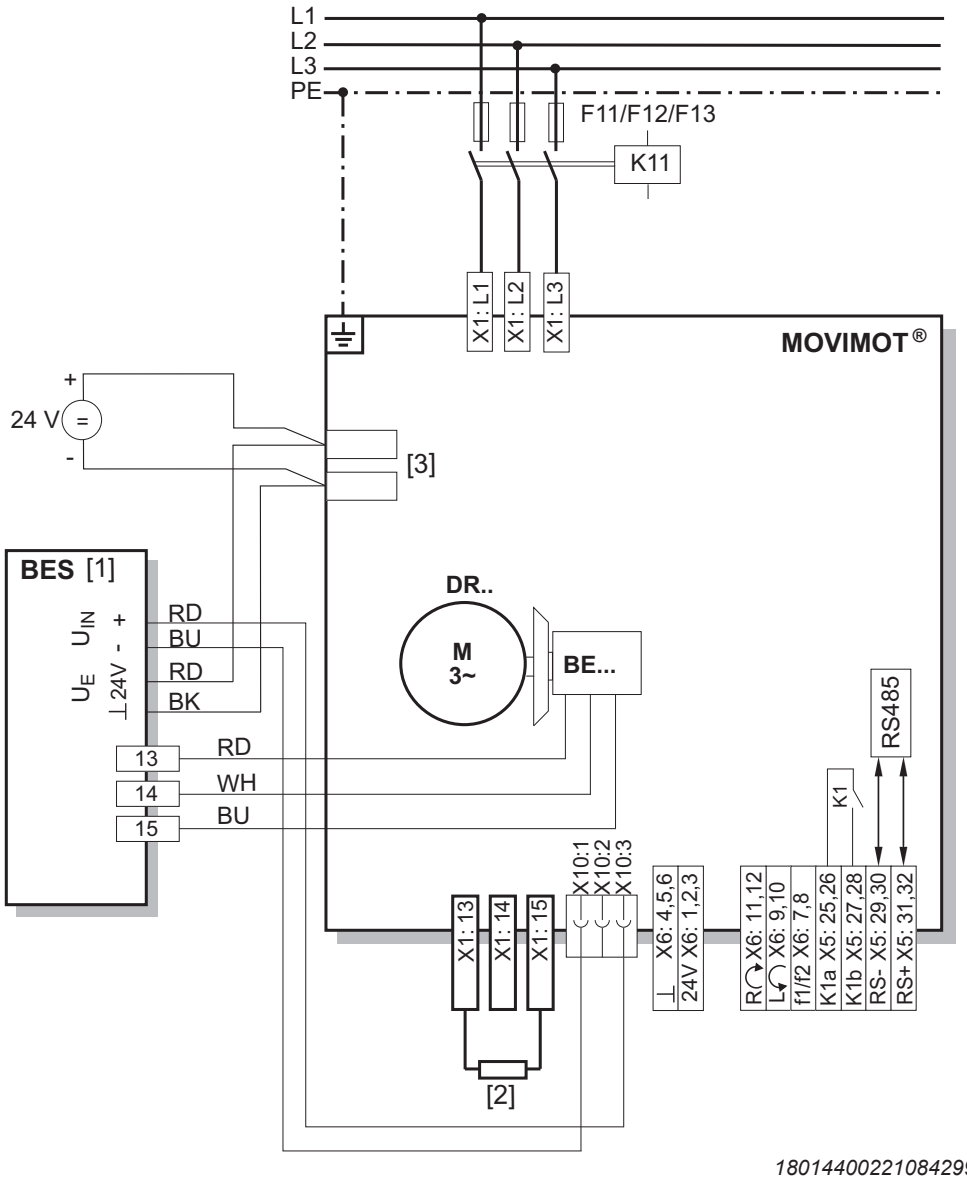
If the connection voltage is too high, the BES option or the brake coil connected to it can be damaged.

Damage to the BES option of the brake coil.

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

For information about installing the BES option, refer to chapter "Installation of URM / BEM / BES options" (→ 🗎 110).

The following figure shows how to connect the BES option:



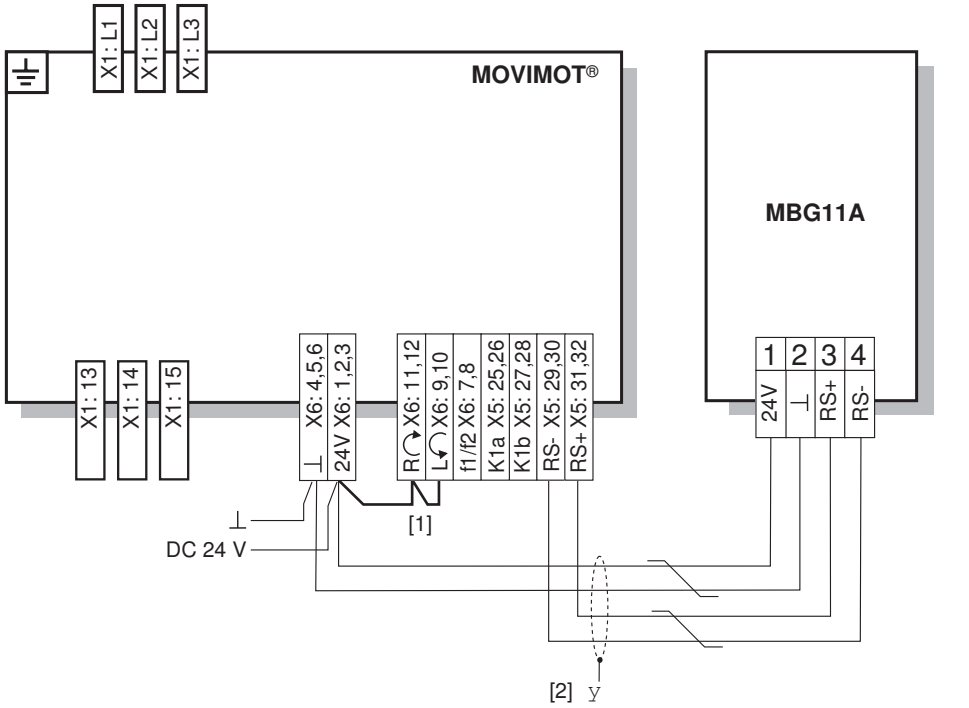
18014400221084299

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

9.11.8 Connection of MBG11A option

For information about installing the MBG11A option, refer to chapter "Installation of MBG11A option" (→ 🗎 111).

The following figure shows how to connect the MBG11A option:



18014398833528715

[1] Note the enabled direction of rotation.
See chapter "Connection of MOVIMOT® drive" (→ 🗎 127),
Functions of the CW/Stop and CCW/Stop terminals with control via RS485 interface

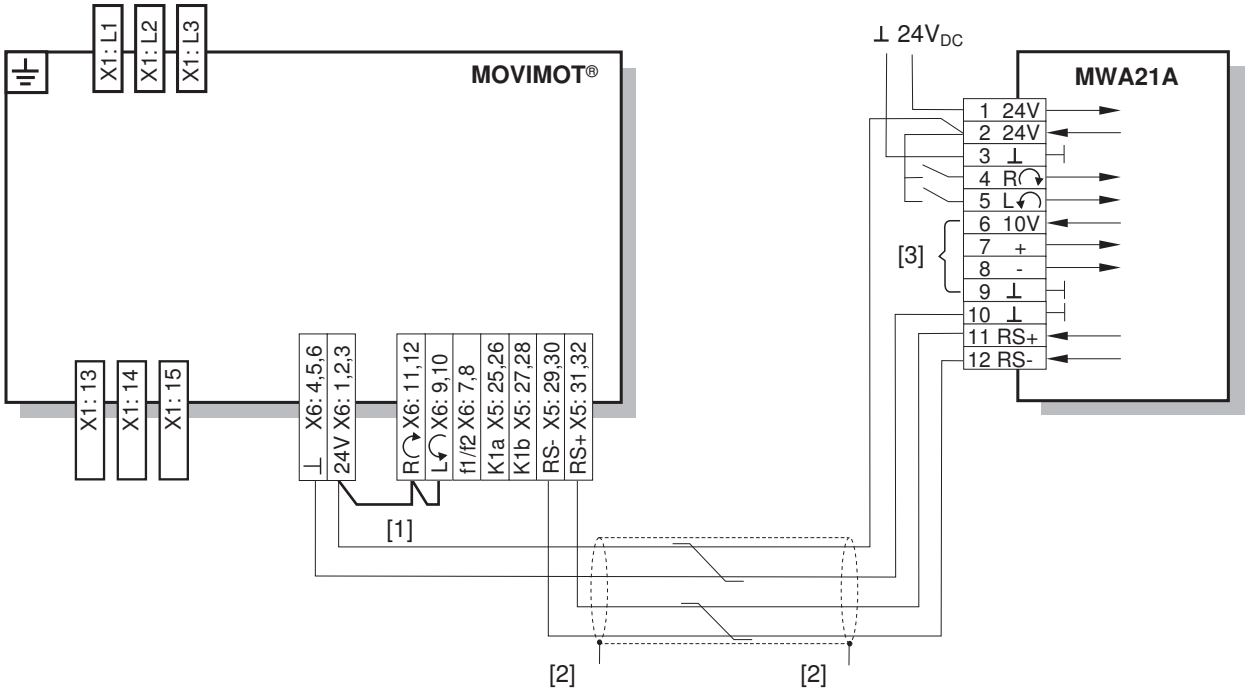
[2] EMC metal cable gland

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9.11.9 Connection of MWA21A option

For information about installing the MWA21A option, refer to chapter "Installation of MWA21A option" (→ 🗎 112).

The following figure shows how to connect the MWA21A option:

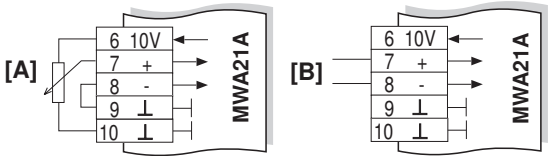


324061323

[1] Note the enabled direction of rotation.
See chapter "Connection of MOVIMOT® drive" (→ 🗎 127),
Functions of the CW/Stop and CCW/Stop terminals with control via RS485 interface

[2] EMC metal cable gland

[3] Potentiometer using the 10 V reference voltage **[A]**
or potential-free analog signal **[B]**



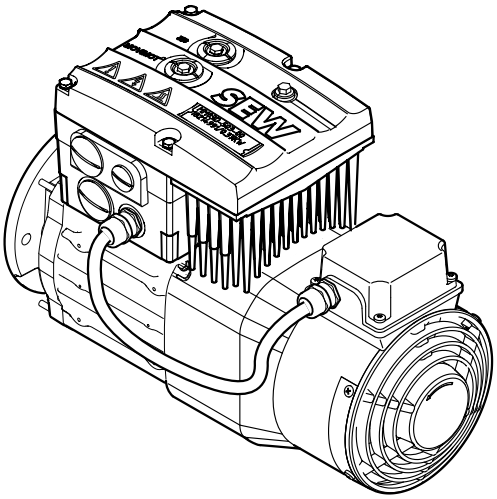
9.11.10 Connection of forced cooling fan V

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

INFORMATION

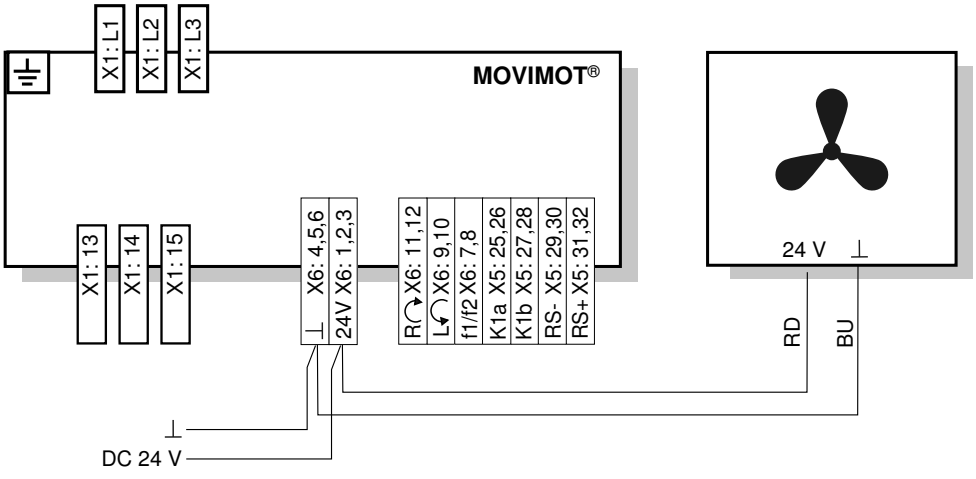
- For motors with V forced cooling fans, the *P341 type of cooling* parameter must be set to "forced air cooling".
- When using MOVIMOT® drives with functional safety (STO), do not connect the forced cooling fan to the connection box. Instead, use an external DC 24 V supply to supply the forced cooling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

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



18014401679145483

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



9007202436852107

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9.11.11 BW.. braking resistors

Intrinsically safe braking resistors

A braking resistor is considered intrinsically safe if

- It becomes high-impedance under load
- It is internally protected by a fuse
- It is dimensioned in such a way that it can be permanently connected to the line voltage

Protecting the braking resistors from thermal overload

INFORMATION

A PTC braking resistor becomes highly resistive in the event of an overload.

INFORMATION

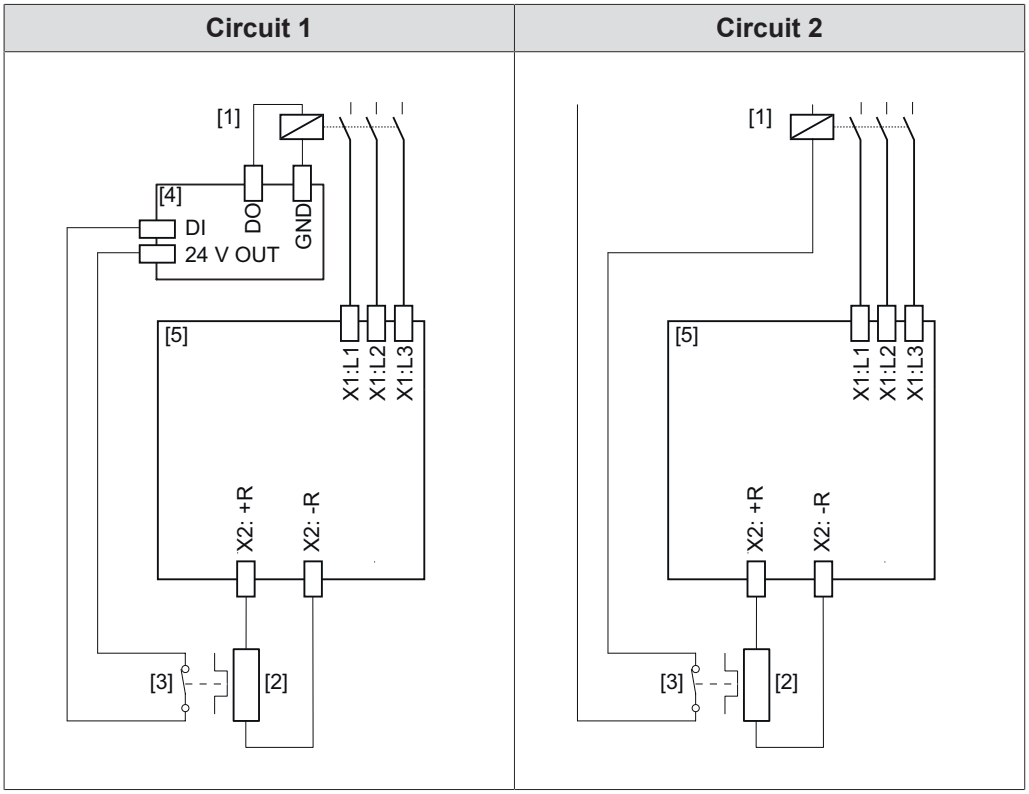
Flatpack resistors have internal thermal protection (non-replaceable fuse), which interrupts the circuit in the event of an overload and protects against consequential damage. No additional thermal protection is required.

Observe the project planning specifications and the documented assignments of inverter and braking resistor.

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Description of the circuit if the criterion "intrinsically safe" does not apply

The following 2 circuits exist:



[1] Line contactor
[2] Braking resistor
[3] Internal temperature switch or overload relay
[4] PLC
[5] Inverter

Circuit 1

The signal contact is only evaluated in the PLC.

If the internal temperature switch responds, note the following:

- The PLC must disconnect the power supply.
- There is no direct response in the inverter.

With circuit 1, it is possible that the PLC finishes the current travel cycle although the thermal circuit breaker has tripped. Only then is the power supply disconnected. In this case, the residual braking energy $W_{res} = P_{BR\_nom} \times 20$ s must not be exceeded.

Circuit 2

The signal contact directly affects the line contactor.

If the internal temperature switch responds, note the following:

- A response by the PLC is not required.
- There is no direct response in the inverter.

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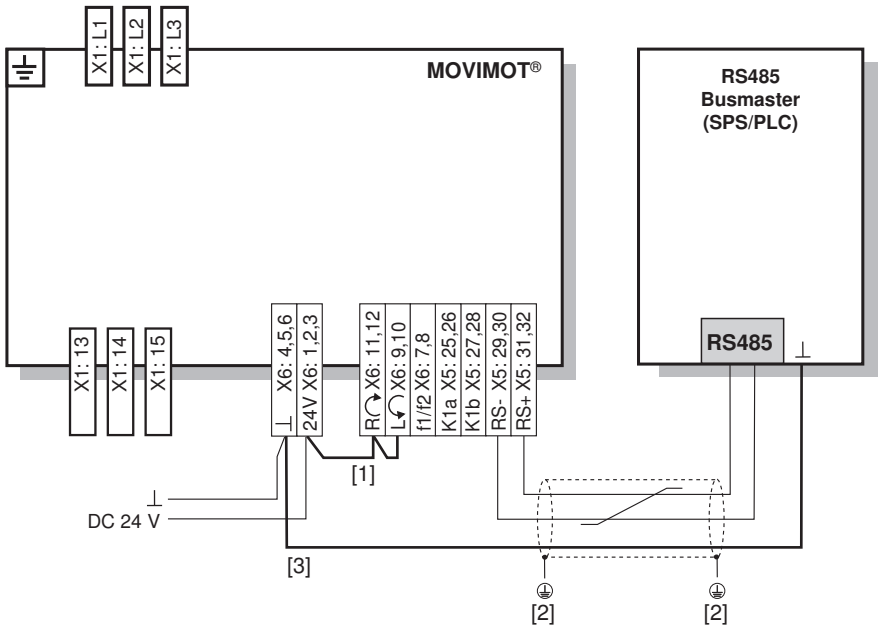
Connecting braking resistors in parallel

It is permitted to connect several identical braking resistors in parallel. In that case, the following applies:

- Connect the power connections of the braking resistors to +R and -R in parallel.
- Pay attention to the minimum permitted braking resistance value R_{BR_min} when connecting braking resistors in parallel.
- For BW.. braking resistors, each braking resistor requires separate protection against thermal overload, e.g. an external thermal overload relay.
- For BW..-T braking resistors (T = with integrated temperature switch), the signal contacts (NC contacts) must be connected in series.

9.12 Connection of the RS485 bus master

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



36028797343253515

[1] Observe direction of rotation enable.
See chapter "Connection of MOVIMOT® drive" (→ 🗎 127),
Functions of the CW/Stop and CCW/Stop terminals with control via RS485 interface

[2] EMC metal cable gland

[3] MOVIMOT®/RS485 master equipotential bonding

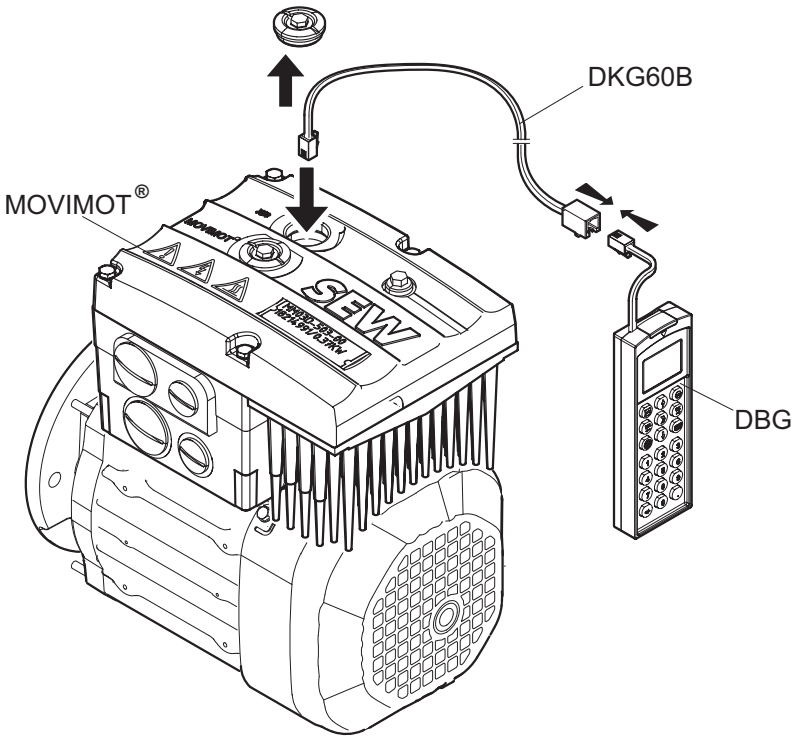
9.13 Connection of DBG keypad

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

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

Before inserting the connector into the diagnostic interface, unscrew the screw plug.

⚠ **WARNING!** Risk of burns due to hot surfaces of the MOVIMOT® drive (in particular the heat sink). Severe injury.
Wait for the MOVIMOT® drive to cool down sufficiently before touching it.



27021598908358283

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

Extension cable	Description (= scope of delivery)	Part number
DKG60B	• Length 5 m • 4-core shielded cable (AWG26)	08175837

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9.14 PC/laptop connection

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

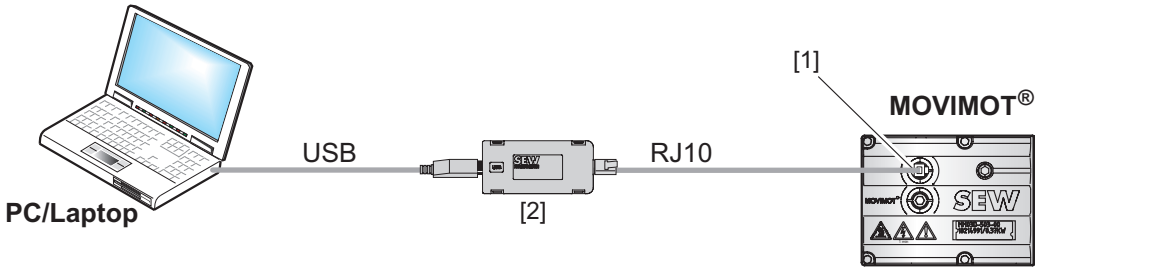
The diagnostic interface [1] is located underneath the screw plug on top of the MOVIMOT® inverter.

Before inserting the connector into the diagnostic interface, unscrew the screw plug.

⚠ **CAUTION!** The ensured degree of protection will be lost if the screw plug of the X50 diagnostic interface is not installed. Damage to the MOVIMOT® drive.
If no screw plug is screwed into the diagnostic interface, you must ensure that no moisture and dust can penetrate the MOVIMOT® drive.

⚠ **WARNING!** Risk of burns due to hot surfaces of the MOVIMOT® drive (in particular the heat sink). Severe injury.
Wait for the MOVIMOT® drive to cool down sufficiently before touching it.

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



18014398968268043

[1] Diagnostic interface
[2] Interface adapter

Scope of delivery:

- Interface adapter
- Cables with RJ10 connector
- USB interface cable

The following interface adapters are available:

Designation	Part number
USM21A	28231449
USB11A	08248311

10 Startup

10.1 Overview

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

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

  For more information on startup in expert mode, refer to chapter ""Expert" startup with parameter function" (→ 🗎 234).

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10.2 General information concerning startup

INFORMATION

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

⚠ WARNING



Risk of crushing due to missing or defective protective covers.

Severe or fatal injuries.

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

⚠ WARNING



Electric shock from capacitors that have not been fully discharged.

Severe or fatal injuries.

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

⚠ WARNING



Device malfunction due to incorrect device setting.

Severe or fatal injuries.

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

⚠ WARNING



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

Severe injuries.

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

INFORMATION

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

INFORMATION

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

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10.3 Easy startup

10.3.1 Requirements

The following prerequisites are required for startup:

- The MOVIMOT® drive must be installed correctly both mechanically and electrically.
- Appropriate safety measures prevent the drives from starting up unintentionally.
- Appropriate safety measures must be taken to prevent risk of injury or damage to the machine.

10.3.2 Description of the control elements

Setpoint potentiometer f1

NOTICE

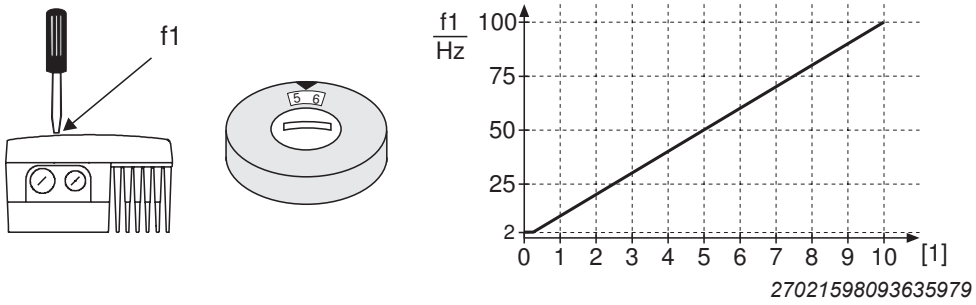
Loss of guaranteed degree of protection if the screw plugs on the f1 setpoint potentiometer and diagnostic interface are not installed or not installed correctly.

Damage to the MOVIMOT® inverter.

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

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

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



[1] Potentiometer setting

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Switch f2

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

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



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

Switch t1

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



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

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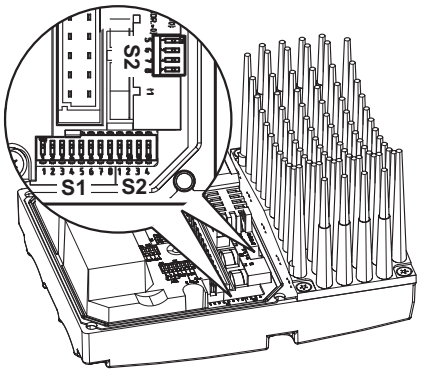
DIP switches S1 and S2

NOTICE

Damage to the DIP switches caused by unsuitable tools.

Damage to the DIP switches.

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



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DIP switch S1:

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

DIP switch S2:

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

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10.3.3 Description of the DIP switches S1

DIP switches S1/1 – S1/4

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

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

X = ON – = OFF

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

Control	RS485 address
Binary control	0
Via keypad (MLG..A, MBG..A)	1
Via RS485 master	1 – 15
Via MWF11A setpoint converter	1 – 15

DIP switch S1/5

Motor protection switched on / switched off

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

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

DIP switch S1/6

Lower motor power rating

- When activated, the DIP switch S1/6 allows the MOVIMOT® inverter to be assigned to a motor with a lower motor power rating. The nominal device power remains unchanged.
- When using a motor with a lower power rating, the MOVIMOT® inverter is a power level higher from the motor's perspective. The overload capacity of the drive may be increased as a result. For a short time, a larger current can be impressed, which results in higher torques.
- The aim of the DIP switch S1/6 is to achieve short-term utilization of the motor's peak torque. The current limit of the respective device is always the same regardless of the switch position. The motor protection function is adjusted depending on the switch position.
- Stall protection for the motor is not possible in this operating mode at S1/6 = "ON".
- The necessary setting for the DIP switch S1/6 depends on the motor type and therefore also on the drive ID module in the MOVIMOT® inverter.

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

Motor with operating point 400 V/50 Hz

Applies to MOVIMOT® with the following drive ID modules:

Drive ID module			Motor	
Identification	Identification color	Part number	Line voltage V	Line frequency Hz
DR2S/400/50	Light gray/white striped	28249720	230/400	50
DRS/400/50	White	18214371	230/400	50
DRE/400/50	Orange	18214398	230/400	50
DRP/230/400	Brown	18217907	230/400	50
DRN/400/50	Light blue	28222040	230/400	50
DRU/400/50	Dark brown/ white striped	28291646	230/400	50

Setting of DIP switch S1/6:

Power	Motor type	MOVIMOT® MM..D-503-00 inverter			
		Motor in ⅄-connection		Motor in △-connection	
kW		S1/6 = OFF	S1/6 = ON	S1/6 = OFF	S1/6 = ON
0.25	DR**2S**63M4/.. DR63L4/.. DR**E**80S4/.. DR**N**71MS4	–	MM**03**D..	MM**03**D..	MM**05**D..
0.37	DR**2S**71MS4/.. DR**S**71S4/.. DR**E**80S4/.. DR**N**71M4	MM**03**D..	MM**05**D..	MM**05**D..	MM**07**D..
0.55	DR**2S**71M4/.. DR**S**71M4/.. DR**E**80M4/.. DR**N**80MK4	MM**05**D..	MM**07**D..	MM**07**D..	MM**11**D..
0.75	DR**2S**80MK4/.. DR**S**80S4/.. DR**E**80M4/.. DR**P**90M4/.. DR**N**80M4/.. DR**U**90S4/..	MM**07**D..	MM**11**D..	MM**11**D..	MM**15**D..
1.1	DR**2S**80M4/.. DR**S**80M4/.. DR**E**90M4/.. DR**P**90L4/.. DR**N**90S4/.. DR**U**100LSR4/..	MM**11**D..	MM**15**D..	MM**15**D..	MM**22**D..
1.5	DR**2S**90S4/.. DR**S**90M4/.. DR**E**90L4/.. DR**P**100M4/.. DR**N**90L4/.. DR**U**100LS4/..	MM**15**D..	MM**22**D..	MM**22**D..	MM**30**D..
2.2	DR**2S**90L4/.. DR**S**90L4/.. DR**E**100M4/.. DR**P**100L4/.. DR**N**100LS4/.. DR**U**100L4/..	MM**22**D..	MM**30**D..	MM**30**D..	MM**40**D..
3.0	DR**2S**100LS4/.. DR**S**100M4/.. DR**E**100LC4/.. DR**P**112M4/.. DR**N**100L4/.. DR**U**112M4/..	MM**30**D..	MM**40**D..	MM**40**D..	–
4.0	DR**2S**100L4/.. DR**S**100LC4/.. DR**E**132S4/.. DR**N**112M4/.. DR**U**132S4/..	MM**40**D..	–	–	–

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Motor with operating point 460 V/60 Hz

Applies to MOVIMOT® with the following drive ID modules:

Drive ID module			Motor	
Identification	Identification color	Part number	Line voltage V	Line frequency Hz
DR2S/460/60	Yellow/white striped	28249739	266/460	60
DRS/460/60	Yellow	18214401	266/460	60
DRE/460/60	Green	18214428	266/460	60
DRP/266/460	Beige	18217915	266/460	60
DRN/460/60	Blue/white striped	28241819	266/460	60
DRU/460/60	Light brown/white striped	28312406	266/460	60

Setting of DIP switch S1/6:

Power	Motor type	MOVIMOT® MM..D-503-00 inverter			
		Motor in ⅄-connection		Motor in △-connection	
kW		S1/6 = OFF	S1/6 = ON	S1/6 = OFF	S1/6 = ON
0.25	DR**2S**63M4/.. DR**N**71MS4/..	–	MM**03**D..	MM**03**D..	MM**05**D..
0.37	DR**2S**71MS4/.. DR**S**71S4/.. DR**N**71M4/..	MM**03**D..	MM**05**D..	MM**05**D..	MM**07**D..
0.55	DR**2S**71M4/.. DR**S**71M4/.. DR**N**80MK4/..	MM**05**D..	MM**07**D..	MM**07**D..	MM**11**D..
0.75	DR**2S**80MK4/.. DR**S**80S4/.. DR**E**80M4/.. DR**P**90M4/.. DR**N**80M4/.. DR**U**90S4/..	MM**07**D..	MM**11**D..	MM**11**D..	MM**15**D..
1.1	DR**2S**80M4/.. DR**S**80M4/.. DR**E**90M4/.. DR**P**90L4/.. DR**N**90S4/.. DR**U**90L4/..	MM**11**D..	MM**15**D..	MM**15**D..	MM**22**D..
1.5	DR**2S**90S4/.. DR**S**90M4/.. DR**E**90L4/.. DR**P**90L4/.. DR**N**90L4/.. DR**U**100LS4/..	MM**15**D..	MM**22**D..	MM**22**D..	MM**30**D..
2.2	DR**2S**90L4/.. DR**S**90L4/.. DR**E**100L4/.. DR**P**112M4/.. DR**N**100L4/.. DR**U**112MR4/..	MM**22**D..	MM**30**D..	MM**30**D..	MM**40**D..
3.0	DR**U**112M4/..	MM**30**D..	MM**40**D..	–	–
3.7	DR**2S**100LS4/.. DR**S**100M4/.. DR**E**100LC4/.. DR**P**132S4/.. DR**N**100L4/..	MM**30**D..	MM**40**D..	–	–
4.0	DR**2S**100L4/.. DR**S**100LC4/.. DR**E**132S4/.. DR**N**112M4/.. DR**U**132S4/..	MM**40**D..	–	–	–

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Motor with 50/60 Hz voltage range

Applies to MOVIMOT® with the following drive ID modules:

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

Setting of DIP switch S1/6:

Power rating kW	Motor type	MOVIMOT® MM..D-503-00 inverter			
		Motor in ⅄ connection		Motor in △ connection	
		S1/6 = OFF	S1/6 = ON	S1/6 = OFF	S1/6 = ON
0.25	DR63L4/.. DR**N**71MS4/..	–	MM**03**D..	MM**03**D..	MM**05**D..
0.37	DR**S**71S4/.. DR**N**71M4/..	MM**03**D..	MM**05**D..	MM**05**D..	MM**07**D..
0.55	DR**S**71M4/.. DR**N**80MK4/..	MM**05**D..	MM**07**D..	MM**07**D..	MM**11**D..
0.75	DR**E**80M4/.. DR**N**80M4/..	MM**07**D..	MM**11**D..	MM**11**D..	MM**15**D..
1.1	DR**E**90M4/.. DR**N**90S4/..	MM**11**D..	MM**15**D..	MM**15**D..	MM**22**D..
1.5	DR**E**90L4/.. DR**N**90L4/..	MM**15**D..	MM**22**D..	MM**22**D..	MM**30**D..
2.2	DR**E**100L4/.. DR**N**100LM4/..	MM**22**D..	MM**30**D..	MM**30**D..	MM**40**D..
3.0	DR**E**100LC4/.. DR**N**100L4/..	MM**30**D..	MM**40**D..	MM**40**D..	–
4.0	DR**E**132S4/.. DR**N**112M4/..	MM**40**D..	–	–	–

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

Applies to MOVIMOT® with the following drive ID modules:

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

Setting of DIP switch S1/6:

Power	Motor type	MOVIMOT® MM..D-503-00 inverter			
		Motor in ⅄-connection		Motor in △-connection	
kW		S1/6 = OFF	S1/6 = ON	S1/6 = OFF	S1/6 = ON
0.25	DR**N**71MS4/..	–	MM**03**D..	MM**03**D..	MM**05**D..
0.37	DR**S**71S4/.. DR**N**71M4/..	MM**03**D..	MM**05**D..	MM**05**D..	MM**07**D..
0.55	DR**S**71M4/.. DR**N**80MK4/..	MM**05**D..	MM**07**D..	MM**07**D..	MM**11**D..
0.75	DR**E**80S4/.. DR**N**80M4/..	MM**07**D..	MM**11**D..	MM**11**D..	MM**15**D..
1.1	DR**E**80M4/.. DR**N**90S4/..	MM**11**D..	MM**15**D..	MM**15**D..	MM**22**D..
1.5	DR**E**90M4/.. DR**N**90L4/..	MM**15**D..	MM**22**D..	MM**22**D..	MM**30**D..
2.2	DR**E**90L4/.. DR**N**100LM4/..	MM**22**D..	MM**30**D..	MM**30**D..	MM**40**D..
3.0	DR**E**100M4/.. DR**N**100L4/..	MM**30**D..	MM**40**D..	MM**40**D..	–
4.0	DR**E**100L4/.. DR**N**100L4/..	MM**40**D..	–	–	–

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Motor with operating point 400 V/50 Hz and LSPM technology

Applies to MOVIMOT® with the following drive ID module:

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

Setting of DIP switch S1/6:

Power	Motor type	MOVIMOT® MM..D-503-00 inverter			
		Motor in 人-connection		Motor in △-connection	
kW		S1/6 = OFF	S1/6 = ON	S1/6 = OFF	S1/6 = ON
0.25	DR**U**71SJ/..	–	MM**03**D..	MM**03**D..	MM**05**D..
0.37	DR**U**71MJ4/..	MM**03**D..	MM**05**D..	MM**05**D..	MM**07**D..
0.55	DR**U**80SJ4/..	MM**05**D..	MM**07**D..	MM**07**D..	MM**11**D..
0.75	DR**U**80MJ4/..	MM**07**D..	MM**11**D..	MM**11**D..	MM**15**D..
1.1	DR**U**90MJ4/..	MM**11**D..	MM**15**D..	MM**15**D..	MM**22**D..
1.5	DR**U**90LJ4/..	MM**15**D..	MM**22**D..	MM**22**D..	MM**30**D..
2.2	DR**U**100MJ4/..	MM**22**D..	MM**30**D..	MM**30**D..	MM**40**D..
3.0	DR**U**100LJ4/..	MM**30**D..	MM**40**D..	MM**40**D..	–

DIP switch S1/7

Setting the maximum PWM frequency

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

DIP switch S1/8

No-load vibration damping

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

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10.3.4 Description of the DIP switches S2

DIP switch S2/1

Brake type

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

Motor				Standard brake [type]	Optional brake [type]
400 V/50 Hz 460 V/60 Hz 50/60 Hz voltage range		380 V/60 Hz ABNT Brazil	400 V/50 Hz LSPM Technology	S2/1 = OFF	S2/1 = ON
DR63L4				BR03	–
DR2S63M4				BE03	BE03
	DRN71MS4	DRN71MS4		BE03	BE05
DRS71S4 DRE80S4	DR2S71MS4 DRN71M4 DRN71MK4	DRS71S4 DRN71M4	DRE71SJ4 DRU71SJ4 DRU71MJ4	BE05	BE1
DRS71M4 DRS80S4 DRE80M4	DR2S71M4 DR2S80MK4 DRN80MK4 DRN80M4	DRS71M4 DRE80S4 DRN80MK4 DRN80M4	DRE71MJ4 DRU80SJ4	BE1	BE05
DRP90M4			DRU80MJ4	BE1	BE2
DRS80M4 DRE90M4 DRP90L4	DR2S80M4 DRN90S4	DRE80M4 DRN90S4	DRE80SJ4 DRU90MJ4	BE2	BE1
DRS90M4 DRE90L4	DR2S90S4 DRN90L4	DRE90M4 DRN90L4	DRE80MJ4	BE2	BE1
DRP100M4			DRU90LJ4	BE2	BE5
DRS90L4 DRE100M4 DRE100L4 DRP100L4	DR2S90L4 DRN100LS4	DRE90L4	DRE90MJ4 DRE90LJ4 DRU100MJ4	BE5	BE2
DRS100M4 DRS100L4 DRS100LC4 DRE100LC4	DR2S100LS4 DR2S100L4 DRN100L4 DRN100LM4	DRE100M4 DRE100L4 DRN100L4 DRN100LM4	DRE100MJ4 DRU100LJ4	BE5	BE2
DRP112M4 DRE132S4 DRP112S4	DRN112M4			BE5	BE11
DRU90S	DRU90S4			BE1	BE05
DRU100LSR4	DRU90L4			BE2	BE1
DRU100LS4	DRU100LS4			BE2	BE1
DRU100L4				BE5	BE2
DRU112M4	DRU112MR4 DRU112M4			BE5	BE11
DRU132S4	DRU132S4			BE5	BE11

Preferred brake voltage

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

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DIP switch S2/2

Brake release without enable

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

Binary control functions

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

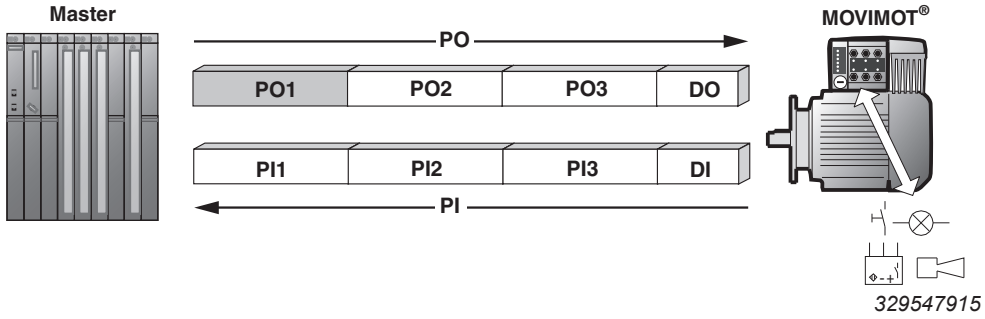
Terminal state			Enable status	Fault status	Brake function
R ↻ X6:11,12	L ↺ X6:9,10	f1/f2 X6:7,8			
"1" "0"	"0" "1"	"0"	Device enabled	No device fault	The MOVIMOT® inverter controls the brake. Setpoint f1
"1" "0"	"0" "1"	"1"	Device enabled	No device fault	The MOVIMOT® inverter controls the brake. Setpoint f2
"1" "0"	"1" "0"	"0"	Unit not enabled	No device fault	Brake is applied.
"1"	"1"	"1"	Unit not enabled	No device fault	Brake is applied.
"0"	"0"	**"1"**	**Device not enabled**	**No device fault**	**Brake is released for manual movement.**[1)]
All states possible			Unit not enabled	Device fault	Brake is applied.

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

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Functions with control via RS485

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

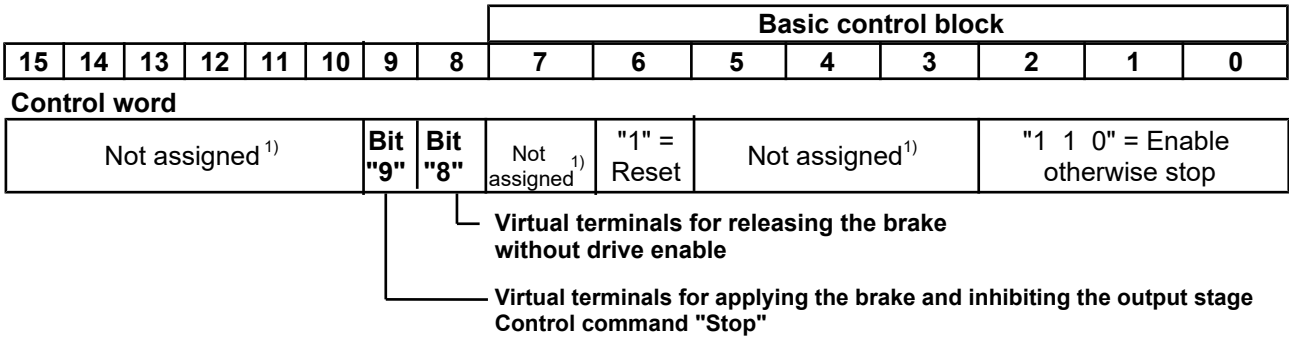


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PO = Process output data
PO1 = Control word
PO2 = Speed [%]
PO3 = Ramp
DO = Binary outputs

PI = Process input data
PI1 = Status word 1
PI2 = Output current
PI3 = Status word 2
DI = Binary inputs

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



62269895691

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

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

Setpoint selection for binary control

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

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

Behavior if unit not ready

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

LED display

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

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

DIP switch S2/4

Speed monitoring

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

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

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

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

Overview of the available additional functions

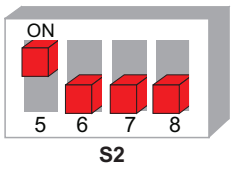
You can activate the following additional function at DIP switches S2/5 to S2/8:

Decimal value	Brief description	Operating mode		Description
		Control via RS485	Binary control	
0	Basic functionality, no additional function active	X	X	–
1	MOVIMOT® with increased ramp times	X	X	"Additional function 1" (→ 🗎 186)
2	MOVIMOT® with adjustable current limitation (error if exceeded)	X	X	"Additional function 2" (→ 🗎 186)
3	MOVIMOT® with adjustable current limitation (can be changed using the terminal f1/f2 X6:7,8)	X	X	"Additional function 3" (→ 🗎 187)
5	MOVIMOT® with motor protection via TH	X	–	"Additional function 5" (→ 🗎 190)
6	MOVIMOT® with maximum 8 kHz PWM frequency	X	X	"Additional function 6" (→ 🗎 191)
7	MOVIMOT® with rapid start/stop	X	X	"Additional function 7" (→ 🗎 192)
8	MOVIMOT® with minimum frequency 0 Hz	X	X	"Additional function 8" (→ 🗎 194)
9	MOVIMOT® for lifting applications	X	X	"Additional function 9" (→ 🗎 195)
10	MOVIMOT® with minimum frequency 0 Hz and reduced torque at low frequencies	X	X	"Additional function 10" (→ 🗎 198)
11	Monitoring of line phase failure deactivated	X	X	"Additional function 11" (→ 🗎 199)
12	MOVIMOT® with rapid start/stop and motor protection via TH	X	X	"Additional function 12" (→ 🗎 200)
13	MOVIMOT® with extended speed monitoring	X	X	"Additional function 13" (→ 🗎 203)
14	MOVIMOT® with deactivated slip compensation	X	X	"Additional function 14" (→ 🗎 207)
15	Not assigned	–	–	–

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Additional function 1

MOVIMOT® with increased ramp times



329690891

Functional description

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

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

Changed ramp times

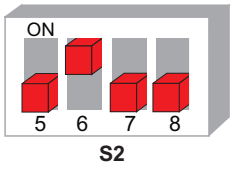


t1 switch											
Detent position	0	1	2	3	4	5	6	7	8	9	10
Ramp time t1 [s]	0.1	0.2	0.3	0.5	0.7	1	20	25	30	35	40

☐ = corresponds to default setting ▭ = changed ramp times

Additional function 2

MOVIMOT® with adjustable current limitation (error if exceeded)



329877131

Functional description

The current limit can be set on switch f2.

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

Setpoint f2: 5 Hz

Minimum frequency: 2 Hz

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

Adjustable current limits

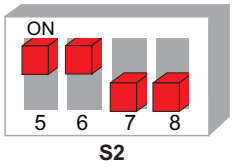


Switch f2											
Detent position	0	1	2	3	4	5	6	7	8	9	10
I_{max} [%] of I_N	90	95	100	105	110	115	120	130	140	150	160

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Additional function 3

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



329910539

Functional description

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

Response upon reaching the current limit

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

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

System internal values for setpoint f2 / minimum frequency

The following functions are no longer possible:

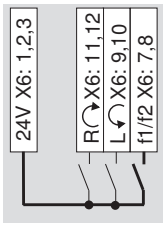
- In binary control mode, it is no longer possible to switch between setpoint f1 and setpoint f2 via terminal f1/f2.
- With control via RS485 it is not possible to set the minimum frequency. The minimum frequency is set to 2 Hz.

Adjustable current limits

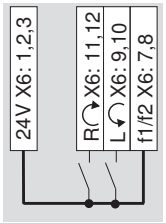


Switch f2											
Detent position	0	1	2	3	4	5	6	7	8	9	10
I_{max} [%] of I_N	60	70	80	90	100	110	120	130	140	150	160

Selecting the current limits via digital input terminal f1 / f2



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



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

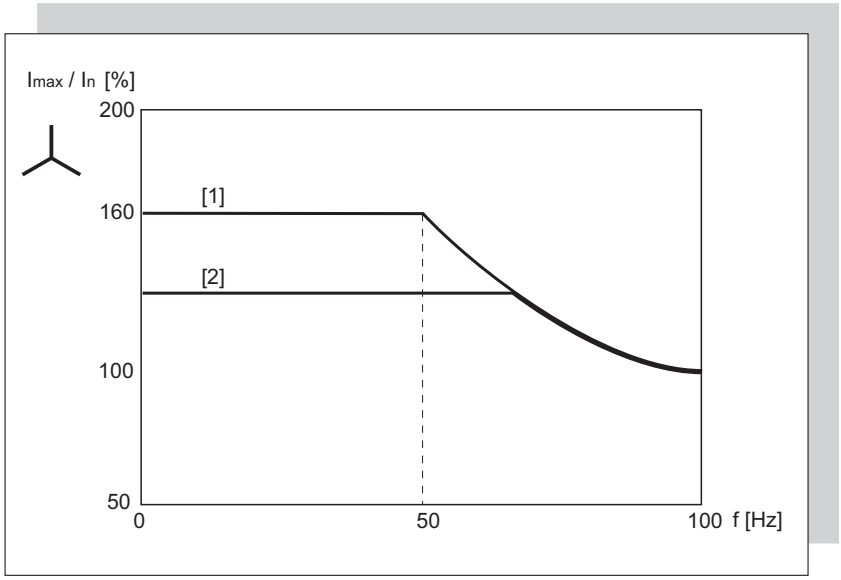
The selection can also be made when the unit is enabled.

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Influencing the current characteristic curve

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

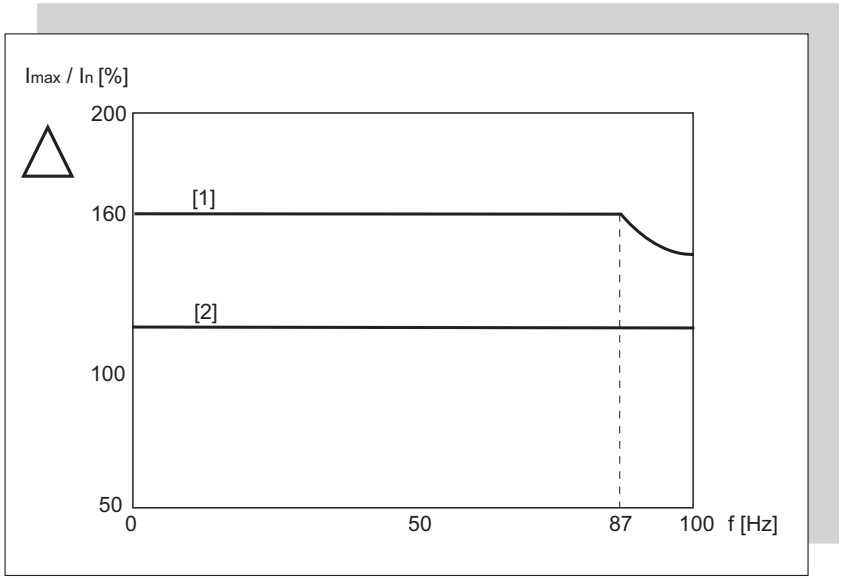
Motor with star connection



331979659

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

Motor with delta connection

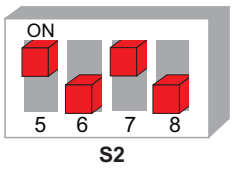


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[1] Current limit characteristic curve of standard function
[2] Reduced current limit for additional function 3 and terminals f1/f2 X6:7,8 = "1"

Additional function 5

MOVIMOT® motor protection via TH



329992459

INFORMATION

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

Functional description

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

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

Functions in combination with fieldbus interface MQ..:

- MOVIMOT® bus configuration according to "additional function 4".

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

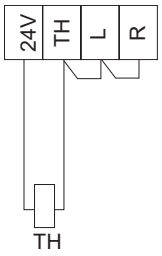
33953961/EN – 04/2026

Tripping conditions for error 84

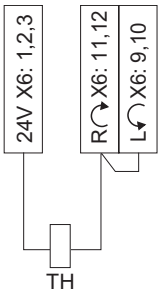
Error 84 "Motor overtemperature" is triggered when **all** the following conditions are fulfilled:

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

For field distributors:



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



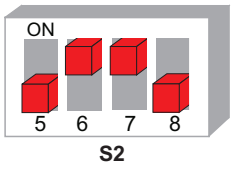
- The TH tripped due to motor overtemperature. The enable signal for the two direction of rotation terminals is canceled.
- Supply voltage is connected.

INFORMATION

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

Additional function 6

MOVIMOT® with maximum 8 kHz PWM frequency



330028171

Functional description

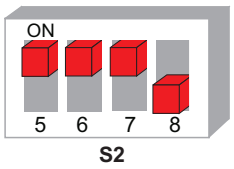
The additional function reduces the PWM frequency of 16 kHz to 8 kHz.

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

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

Additional function 7

MOVIMOT® with rapid start/stop



330064651

Functional description

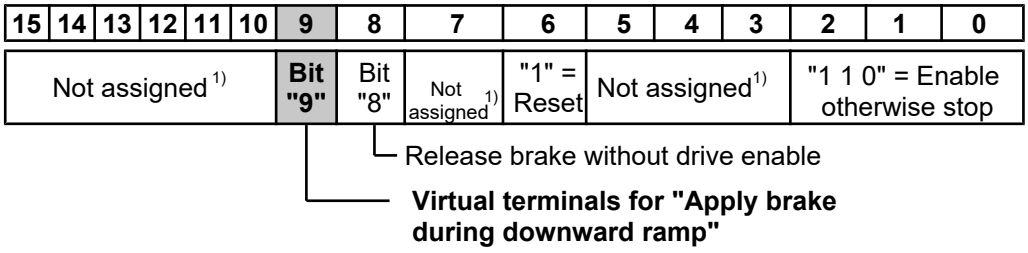
"Rapid start" subfunction (with control via RS485 + binary control)

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

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

"Rapid stop" subfunction (only with control via RS485)

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



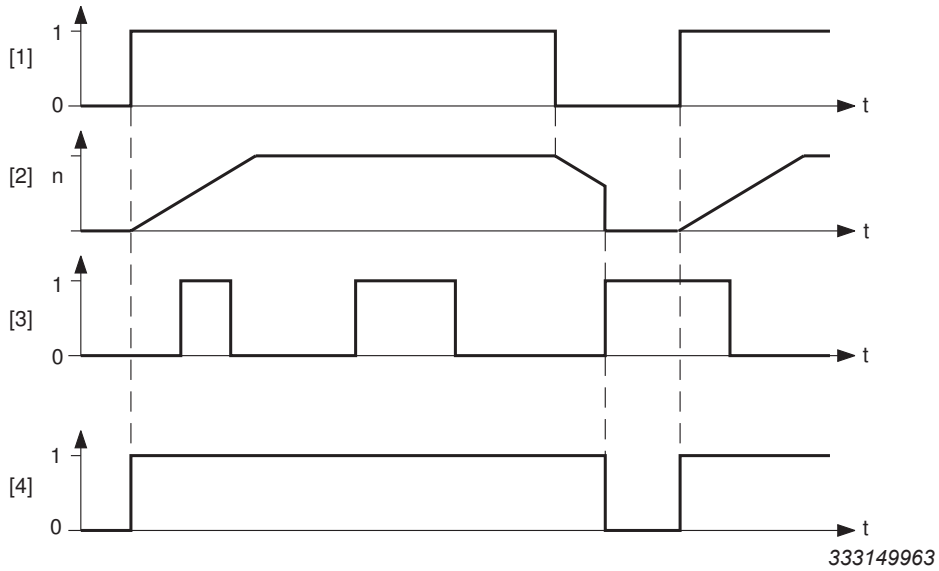
62275519499

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

- When bit 9 is set during the downward ramp, the MOVIMOT® inverter applies the brake (directly via the brake output or via the MOVIMOT® signal relay output) and blocks the output stage.
- If the motor frequency is less than the stop frequency, the brake is applied, regardless of the status of bit 9.
- After activating the rapid stop, enable may only be granted again after the drive has come to a standstill.

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Flow diagram for brake control with "rapid stop" subfunction: (control via RS485):



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

Brake control (control via RS485 + binary control)

Mechanical brake controlled by MOVIMOT® inverter:

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

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

⚠ WARNING



Risk of crushing due to unintentional startup of the drive caused by incorrect settings of the DIP switches S2/5 – S2/8. Failure to comply with chapter "Use of the relay output for additional functions 7, 9, 12, and 13" (→ 🗎 208) can result in the brakes releasing.

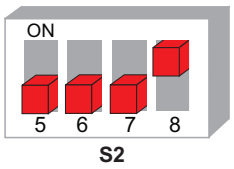
Severe or fatal injuries.

- Observe the information in chapter "Use of the relay output for additional functions 7, 9, 12, and 13" (→ 🗎 208).

- A braking resistor (BW..) must be connected to terminals X1:13 and X1:15 in the MOVIMOT® connection box. Terminal X1:14 is not assigned.
- Relay K1 acts as brake control relay. This means that the ready signal function is no longer available.

Additional function 8

MOVIMOT® with minimum frequency 0 Hz



330101899

Functional description

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

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

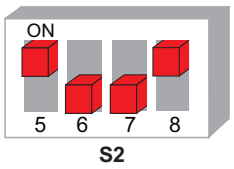
Binary control: In detent position 0 of switch f2, the setpoint f2 with the activated additional function is 0 Hz. All other values that can be set remain unchanged.

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

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Additional function 9

MOVIMOT® for lifting applications



330140427



⚠ WARNING

Danger of fatal injury due to falling hoist.

Severe or fatal injuries.

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

NOTICE

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

Damage to the inverter.

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

Requirements

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

- Additional function 9 is only possible in connection with brakemotors.
- Make sure that DIP switch S2/3 = "OFF" (VFC operation).
- It is mandatory to use a brake controller in connection with an external braking resistor.
- Activate the "speed monitoring" (→ 🗎 184) function
  (DIP switch S2/4 = "ON").

Functional description

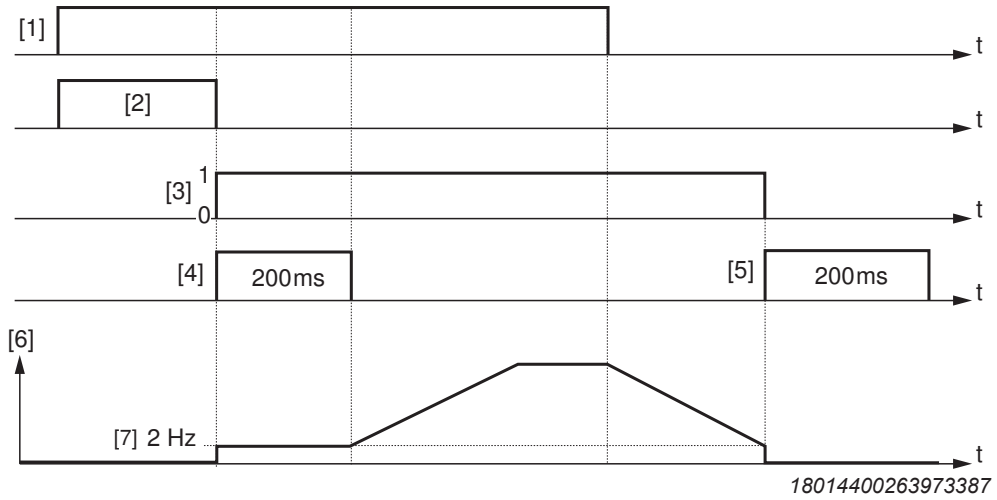
- The start frequency for binary control mode and RS485 control mode is 2 Hz. If the function is not activated, the start frequency is 0.5 Hz.
- The brake release time is fixed to 200 ms (default = 0 ms). This prevents the motor from working against the applied brake.
- The brake application time (post-magnetization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

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

  When relay K1 is closed, the brake is released.

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



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

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

⚠ WARNING



Risk of crushing due to unintentional startup of the drive caused by incorrect settings of the DIP switches S2/5 – S2/8. Failure to comply with chapter "Use of the relay output for additional functions 7, 9, 12, and 13" (→ 🗎 208) can result in the brakes releasing.

Severe or fatal injuries.

- Observe the information in chapter "Use of the relay output for additional functions 7, 9, 12, and 13" (→ 🗎 208).

- A braking resistor (BW..) must be connected to terminals X1:13 and X1:15 in the MOVIMOT® connection box. Terminal X1:14 is not assigned.
- Relay K1 acts as brake control relay. This means that the ready signal function is no longer available.

INFORMATION

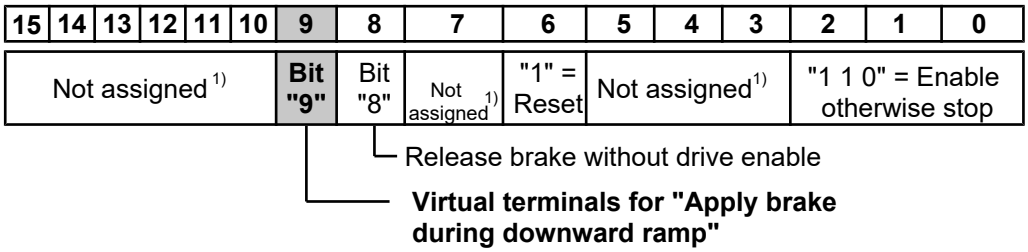


In hoist operation, the "Release brake without enable" function is not effective.

"Rapid stop" subfunction (only with control via RS485)

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

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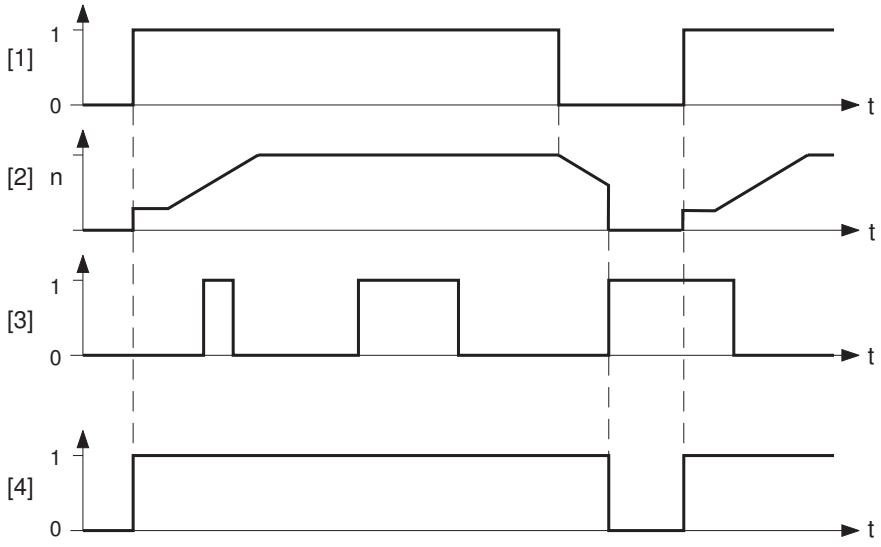


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1) Recommendation for all bits that are not assigned = "0"

- When bit 9 is set during the downward ramp, the MOVIMOT® inverter applies the brake (directly via the brake output or via the MOVIMOT® signal relay output) and blocks the output stage.
- If the motor frequency is less than the stop frequency, the brake is applied, regardless of the status of bit 9.
- After activating the rapid stop, enable may only be granted again after the drive has come to a standstill.

Flow diagram for brake control with "rapid stop" subfunction: (control via RS485):

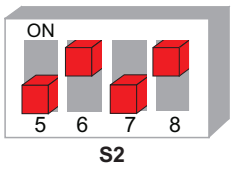


18014398843975179

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

Additional function 10

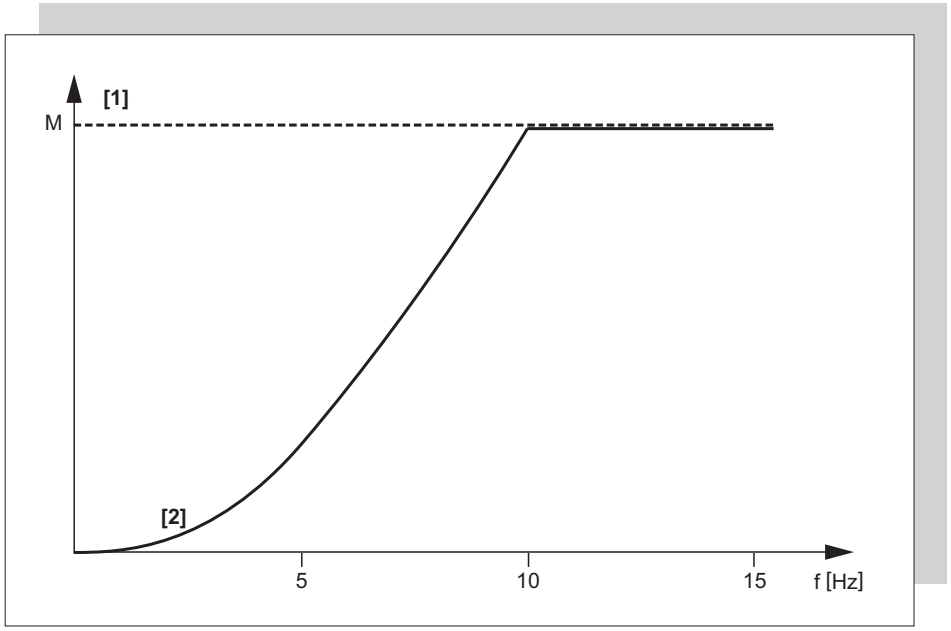
MOVIMOT® with reduced torque at low frequencies



9007199584920203

Functional description

- Through reducing the slip compensation and active current at low speeds, the drive only develops a reduced torque (see the figure which follows):
- Minimum frequency = 0 Hz, see "additional function 8" (→ 🗎 194).



334866315

[1] Maximum torque in VFC mode
[2] Maximum torque when additional function 10 is activated

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Additional function 11

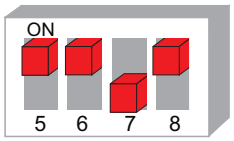
Deactivation of the line phase failure check

NOTICE

Deactivating the line phase failure check can damage the device if conditions are unfavorable.

Damage to the inverter.

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



S2

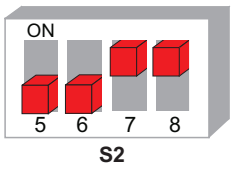
9007199584959755

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.

Additional function 12

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



330259595

Functional description

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

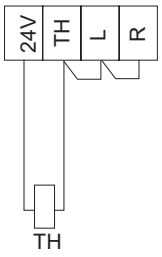
Subfunction "Motor protection via TH evaluation"

This function is only active with control via RS485. The additional function triggers error 84 "Motor overtemperature".

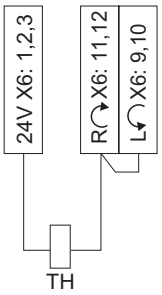
The error is triggered when **all** the following conditions are fulfilled:

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

For field distributor:



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



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

INFORMATION

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

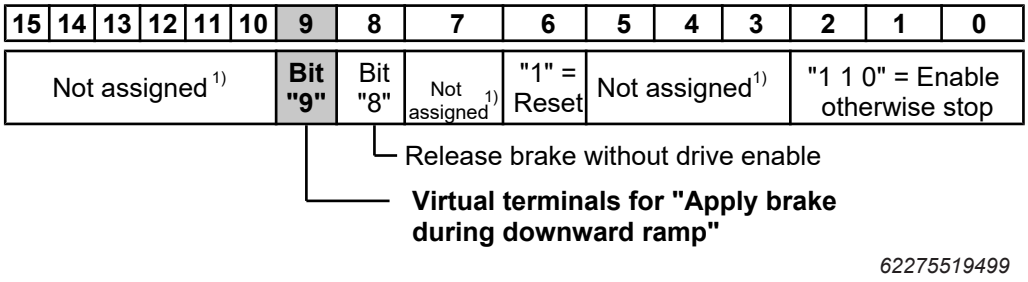
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"Rapid start" subfunction (control via RS485 + binary control)

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

"Rapid stop" subfunction (only with control via RS485)

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

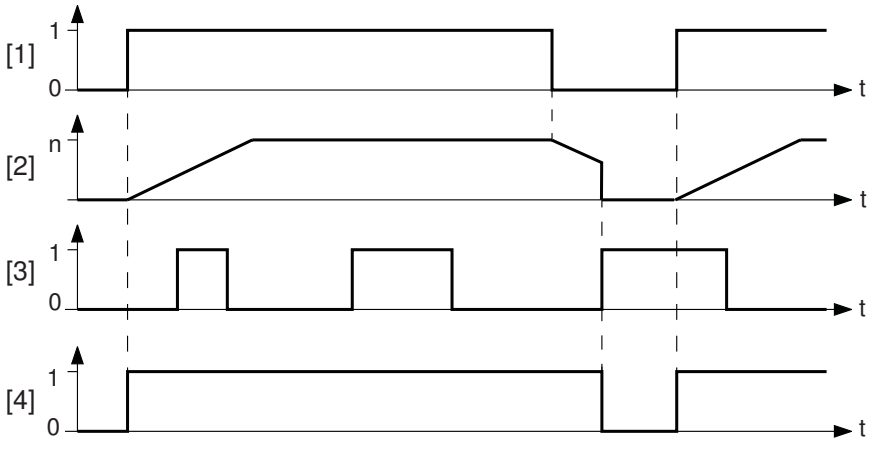


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1) Recommendation for all bits that are not assigned = "0"

- When bit 9 is set during the downward ramp, the MOVIMOT® inverter applies the brake (directly via the brake output or via the MOVIMOT® signal relay output) and blocks the output stage.
- If the motor frequency is less than the stop frequency, the brake is applied at the downwards ramp, regardless of the status of bit 9.
- After activating the rapid stop, enable may only be granted again after the drive has come to a standstill.

Brake control flow diagram with the subfunction "rapid stop" (control via RS485):



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

Brake control (control via RS485 + binary control)

Mechanical brake controlled by MOVIMOT® inverter:

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

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



⚠ WARNING

Risk of crushing due to unintentional startup of the drive caused by incorrect settings of the DIP switches S2/5 – S2/8. Failure to comply with chapter "Use of the relay output for additional functions 7, 9, 12, and 13" (→ 🗎 208) can result in the brakes releasing.

Severe or fatal injuries.

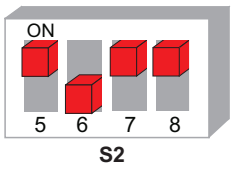
- Observe the information in chapter "Use of the relay output for additional functions 7, 9, 12, and 13" (→ 🗎 208).

- A braking resistor (BW..) must be connected to terminals X1:13 and X1:15 in the MOVIMOT® connection box. Terminal X1:14 is not assigned.
- Relay K1 acts as brake control relay. This means that the ready signal function is no longer available.

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Additional function 13

MOVIMOT® with extended speed monitoring



330300683

⚠ WARNING



Danger of fatal injury due to falling hoist.

Severe or fatal injuries.

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

Requirements

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

- Additional function 13 is only possible in connection with brakemotors.
- Make sure that DIP switch S2/3 = "OFF" (VFC operation).
- It is mandatory to use a brake controller in connection with an external braking resistor.
- Note the descriptions and information for "additional function 9" (→ 🗎 195).

Functional description

Additional function 13 includes the following functions:

- "Additional function 9" (→ 🗎 195), MOVIMOT® for lifting applications
- Speed monitoring with adjustable monitoring time

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

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

Binary control

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

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

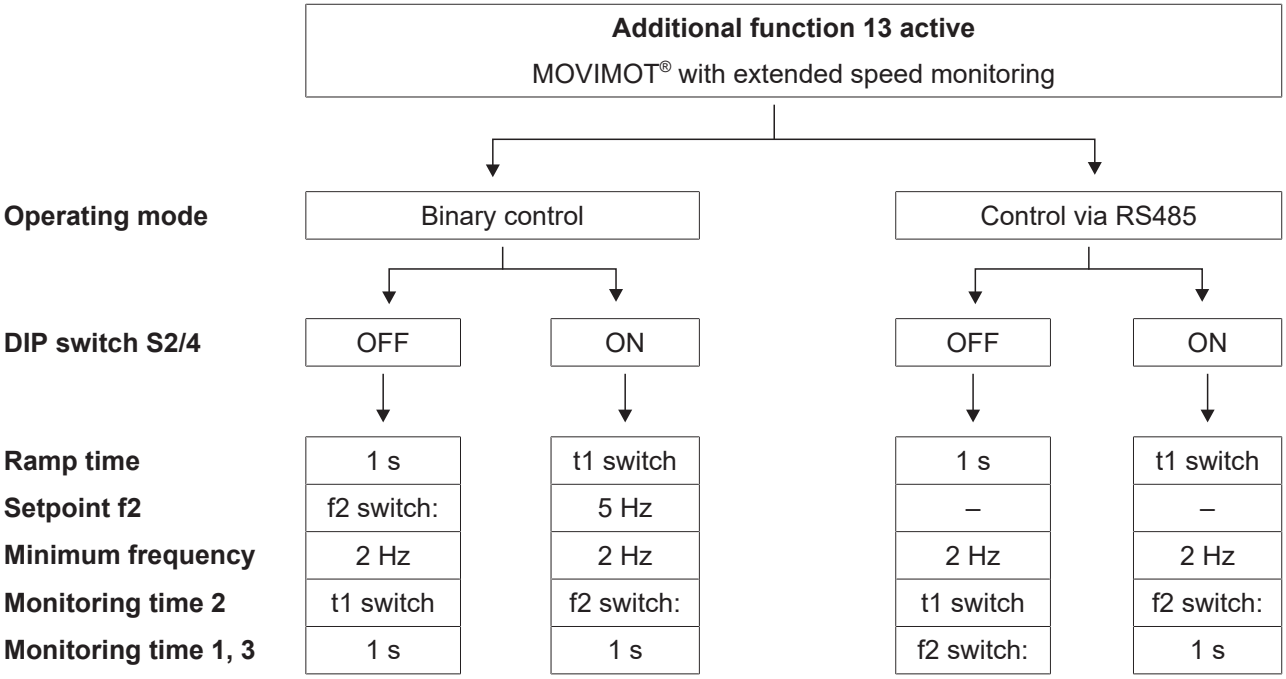
Control via RS485

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

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

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Setting options for additional function 13



Setting the speed monitoring times

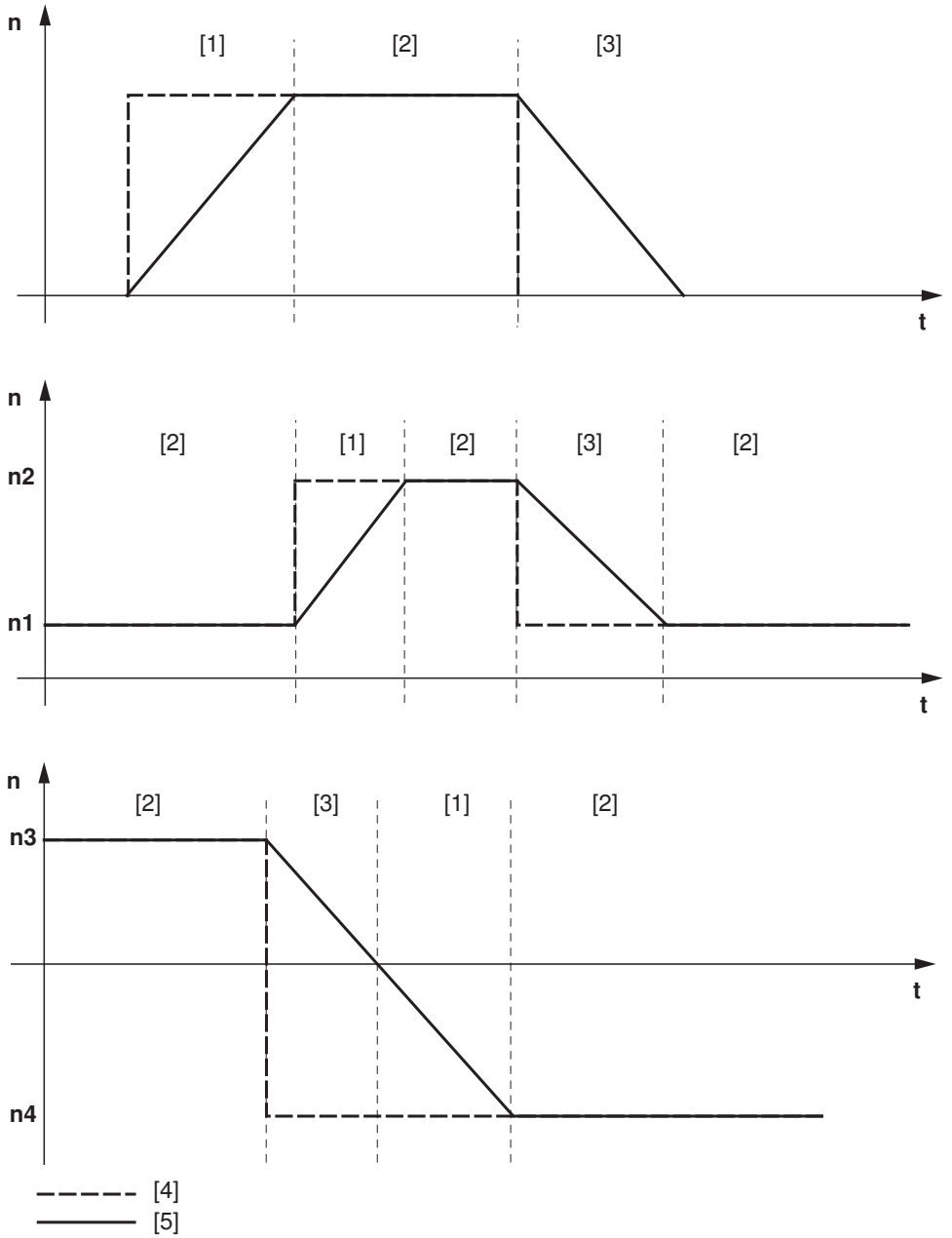
When additional function 13 is active, the following values may be set as monitoring times on switches t1 and f2:



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

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Validity of the speed monitoring times



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[1] Validity of monitoring time 1
[2] Validity of monitoring time 2
[3] Validity of monitoring time 3
[4] Speed setpoint
[5] Speed output (actual value)

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

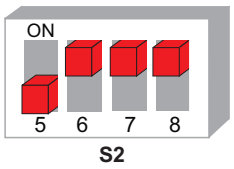
The validity range of monitoring time 2 begins when the setpoint is reached.

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

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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.

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



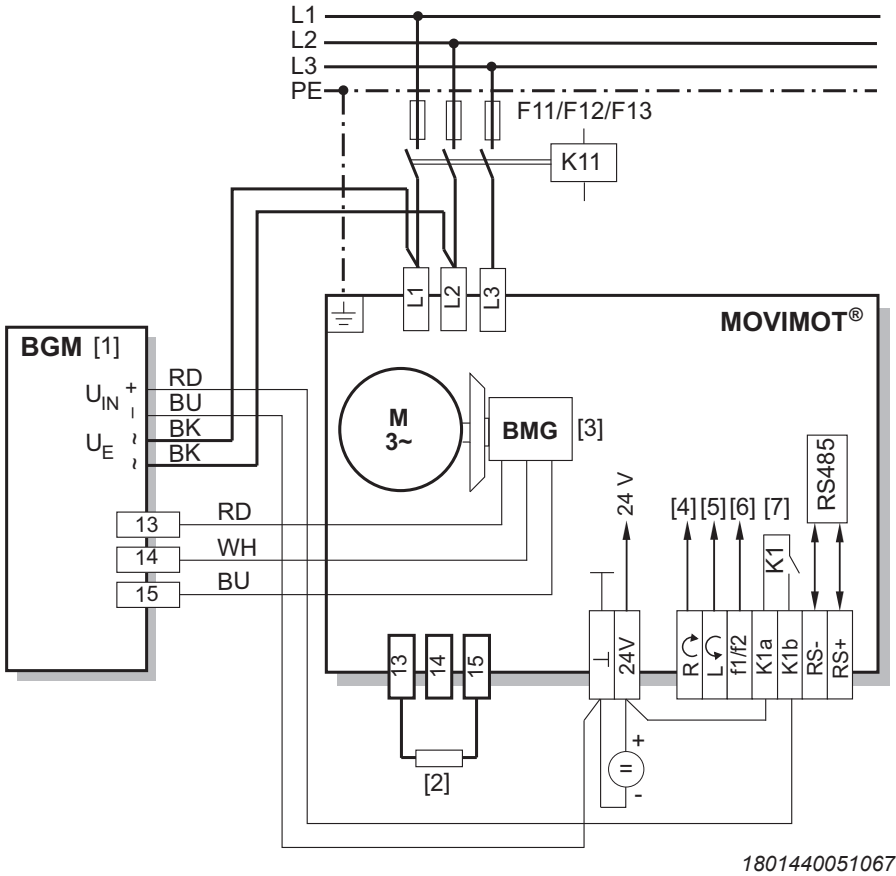
⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- The brake coil must match the line voltage (e.g. 400 V).
- Do not assign port X1:14.
- One of the additional functions 7, 9,12, or 13 must be activated, otherwise the brake is released permanently. Be sure to keep this in mind when replacing the MOVIMOT® inverter. If none of these functions is activated, relay contact K1 acts as ready signal contact. This means that the brake is released even without enable when using the BGM option.

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



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[1] BGM brake control mounted in the connection box
[2] BW external braking resistor (assignment see chapter "Technical data")
[3] DC 24 V supply
[4] Clockwise/stop
[5] Counterclockwise/stop, observe direction of rotation, see chapter "Connection of MOVIMOT® drive" (→ 🗎 127)
[6] Setpoint changeover f1/f2
[7] Brake relay

10.3.6 Startup with binary control



⚠ WARNING

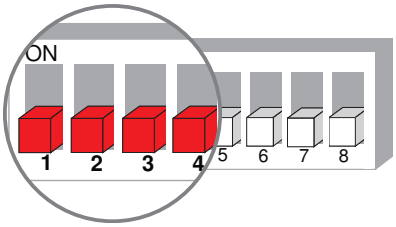
Electric shock from capacitors that have not been fully discharged.

Severe or fatal injuries.

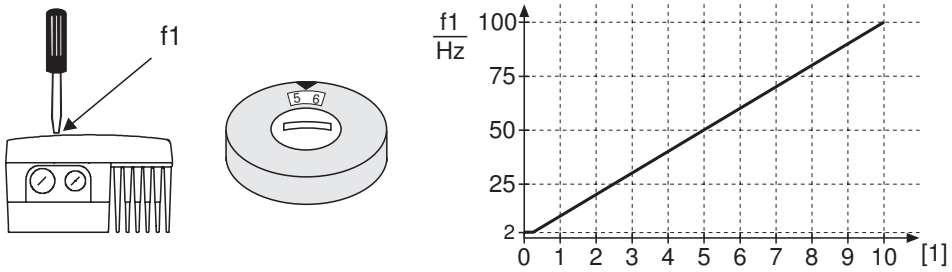
- Disconnect the inverter from the power. Observe the minimum switch-off time after disconnection from the supply system:
  - **1 minute**

1. Remove the MOVIMOT® inverter from the connection box.
2. Check whether the MOVIMOT® drive is installed correctly both mechanically and electrically.

   ⇨ Refer to chapters "Mechanical Installation" and "Electrical Installation".
3. Make sure that the DIP switches S1/1 – S1/4 are set to "OFF" (=address 0). This means that MOVIMOT® is controlled via the terminals using binary signals.



4. Set the first speed at setpoint potentiometer f1 (active when terminals f1/f2 X6:7,8 = "0"), factory setting: about 50 Hz (1500 min^{-1}).



[1] Potentiometer setting

5. **NOTICE!** Loss of the specified degree of protection if the screw plugs on the f1 setpoint potentiometer and the X50 diagnostic interface are not installed or not installed correctly. Damage to the MOVIMOT® inverter.
   Reinstall the screw plug of the setpoint potentiometer with the seal.
6. Set the second speed at switch f2 (active when terminals f1/f2 X6,7,8 = "1").



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

INFORMATION

During operation, the 1st speed can be continuously adjusted using the externally accessible setpoint potentiometer f1.

The speeds f1 and f2 can be set independently of each other.

7. Set the ramp time using switch t1.
   ⇨ The ramp time is based on a setpoint step change of 1500 min^{-1} (50 Hz).



t1 switch:											
Detent position	0	1	2	3	4	5	6	7	8	9	10
Setpoint f2 [Hz]	0.1	0.2	0.3	0.5	0.7	1	2	3	5	7	10

8. Place the MOVIMOT® inverter onto the connection box and screw it in place.
9. Switch on the DC 24 V control voltage and the line voltage.

Inverter behavior depending on terminal signal level

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

Inverter behavior	Terminal signal level					Status LED
	Supply system	24V	f1/f2	CW/stop	CCW/ stop	
	X1:L1 – L3	X6:1,2,3	X6:7,8	X6:11,12	X6:9,10	
Inverter off	0	0	X	X	X	Off
Inverter off	1	0	X	X	X	Off
Stop, supply missing	0	1	X	X	X	Flashes yellow
Stop	1	1	X	0	0	Yellow
CW rotation at f1	1	1	0	1	0	Green
CCW rotation at f1	1	1	0	0	1	Green
CW rotation at f2	1	1	1	1	0	Green
CCW rotation at f2	1	1	1	0	1	Green
Stop	1	1	x	1	1	Yellow

Key:

0 = No voltage

1 = Voltage

X = Any

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10.3.7 Startup with options MBG11A or MLG..A



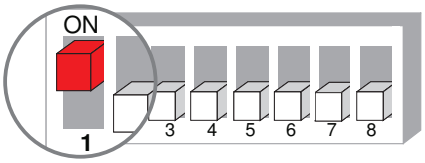
⚠ WARNING

Electric shock from capacitors that have not been fully discharged.

Severe or fatal injuries.

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

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



4. Set the minimum frequency f_{min} using the switch f2.



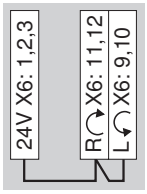
f2 switch:											
Detent position	0	1	2	3	4	5	6	7	8	9	10
Minimum frequency f_{min} [Hz]	2	5	7	10	12	15	20	25	30	35	40

5. Set the ramp time using switch t1.
   ⇨ The ramp time is based on a setpoint step change of 1500 min^{-1} (50 Hz).

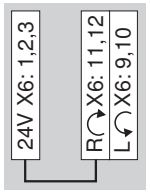
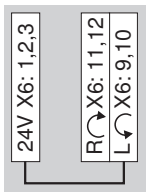
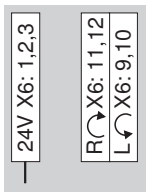


t1 switch											
Detent position	0	1	2	3	4	5	6	7	8	9	10
Setpoint f2 [Hz]	0.1	0.2	0.3	0.5	0.7	1	2	3	5	7	10

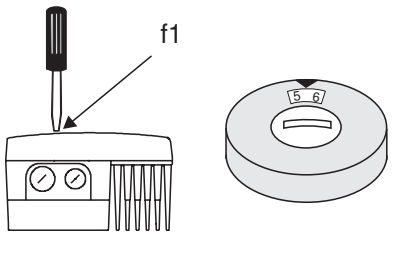
6. Check to see if the required direction of rotation has been enabled.

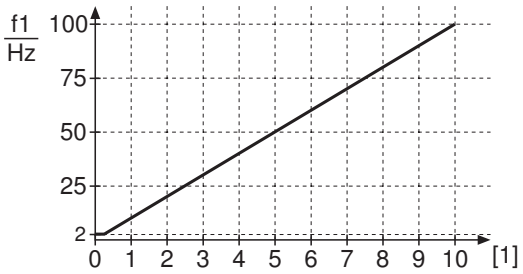
Clockwise/ stop	Counter-clockwise/ stop	Meaning
Activated	Activated	• Both directions of rotation are enabled.
		

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Clockwise/ stop	Counter-clockwise/ stop	Meaning
Activated	Not activated	• Only CW rotation is enabled. • Setpoint input for CCW rotation will stop the drive.
		
Not activated	Activated	• Only CCW rotation is enabled. • Setpoint input for CW rotation will stop the drive.
		
Not activated	Not activated	• The device is inhibited or the drive is stopped.
		

7. Place the MOVIMOT® inverter onto the connection box and screw it in place.
8. Set the maximum speed required using setpoint potentiometer f1.





[1] Potentiometer setting

9. **NOTICE!** Loss of the specified degree of protection if the screw plugs on the f1 setpoint potentiometer and the X50 diagnostic interface are not installed or not installed correctly. Damage to the MOVIMOT® inverter.
   Make sure the screw plug of the setpoint potentiometer has a seal and screw it in.
10. Switch on the DC 24 V control voltage and the line voltage.

INFORMATION

For notes on operation with the MBG11A or MLG..A options, refer to chapter "MBG11A and MLG..A keypads" (→ 🗎 286).

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10.3.8 Startup with MWA21A option



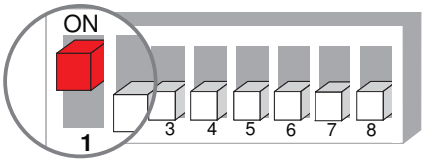
⚠ WARNING

Electric shock from capacitors that have not been fully discharged.

Severe or fatal injuries.

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

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



4. Set the minimum frequency f_{min} using the switch f2.



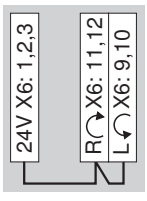
f2 switch:											
Detent position	0	1	2	3	4	5	6	7	8	9	10
Minimum frequency f_{min} [Hz]	2	5	7	10	12	15	20	25	30	35	40

5. Set the ramp time using switch t1.
   ⇨ The ramp time is based on a setpoint step change of 1500 min^{-1} (50 Hz).

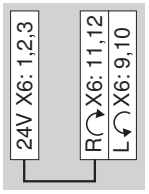
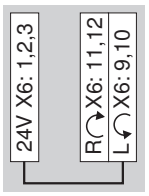
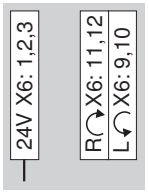


t1 switch											
Detent position	0	1	2	3	4	5	6	7	8	9	10
Ramp time t1 [s]	0.1	0.2	0.3	0.5	0.7	1	2	3	5	7	10

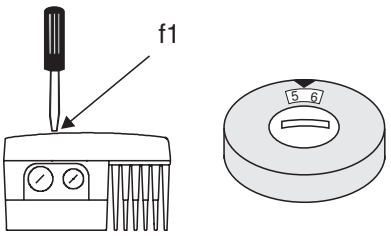
6. Check to see if the required direction of rotation has been enabled.

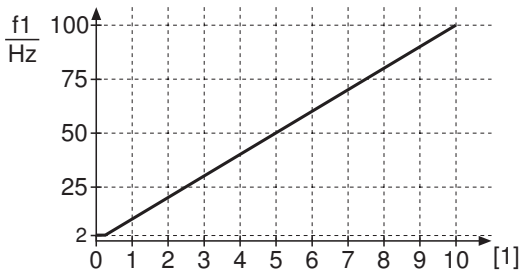
Clockwise/ stop	Counter-clockwise/ stop	Meaning
Activated	Activated	• Both directions of rotation are enabled.
		

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Clockwise/ stop	Counter-clockwise/ stop	Meaning
Activated	Not activated	• Only CW rotation is enabled. • Setpoint input for CCW rotation will stop the drive.
		
Not activated	Activated	• Only CCW rotation is enabled. • Setpoint input for CW rotation will stop the drive.
		
Not activated	Not activated	• The device is inhibited or the drive is stopped.
		

7. Place the MOVIMOT® inverter onto the connection box and screw it in place.
8. Set the required maximum speed using setpoint potentiometer f1 of the MOVIMOT® inverter.





[1] Potentiometer setting

9. **NOTICE!** Loss of the specified degree of protection if the screw plugs on the f1 setpoint potentiometer and the X50 diagnostic interface are not installed or not installed correctly. Damage to the MOVIMOT® inverter.
   Make sure the screw plug of the setpoint potentiometer has a seal and screw it in.
10. Select the signal type for the analog input (terminals 7 and 8) of the MWA21A option using switches S1 and S2.

	S1	S2	Stop by setpoint 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	

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

INFORMATION

For notes on operation with the MWA21A option, refer to chapter "MWA21A setpoint converter" (→ 🗎 287).

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10.3.9 Additional information for installation close to the motor

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

Checking the connection type for the connected motor

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



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For brakemotors, no brake rectifier must be installed in the motor terminal box!

Motor with Option /MI

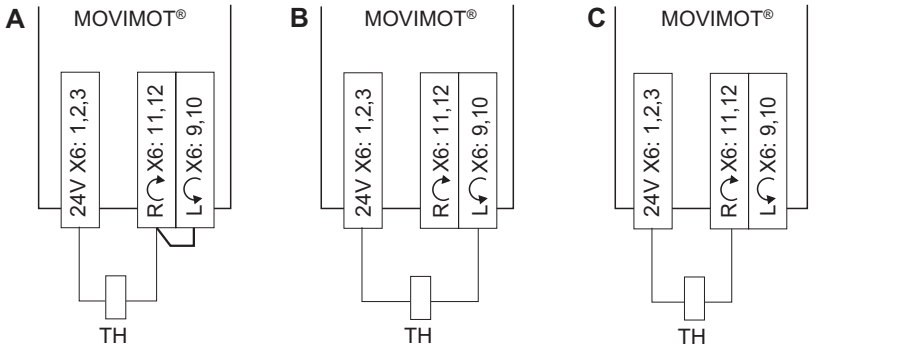
Make sure a drive ID module suitable to the energy efficiency class of the motor is plugged into the MOVIMOT® inverter.

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

Motor protection and direction of rotation enable

The connected motor must be equipped with a TH.

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



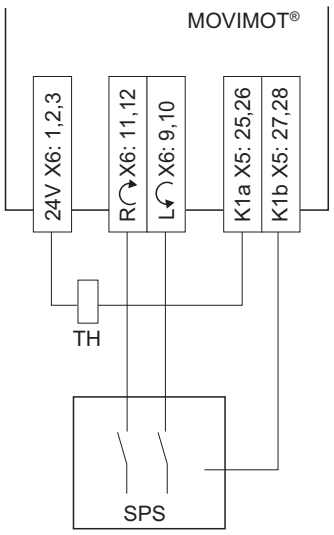
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[A] Both directions of rotation are enabled.
[B] Only **CCW** direction of rotation is enabled.
[C] Only **CW** direction of rotation is enabled.

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

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



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DIP switch

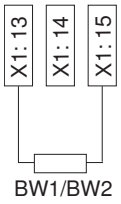
When the MOVIMOT® inverter is installed close to the motor, the DIP switch S1/5 must be set to "ON" instead of the factory setting:

S1	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Meaning	**Binary coding RS485 unit address**				**Motor protection**	**Motor power rating**	**PWM frequency**	**No-load damping**
	2^0	**2^1**	**2^2**	**2^3**				
ON	1	1	1	1	**Off**	Motor one stage smaller	Variable (16, 8, 4 kHz)	On
OFF	**0**	**0**	**0**	**0**	On	**Adapted**	**4 kHz**	**Off**

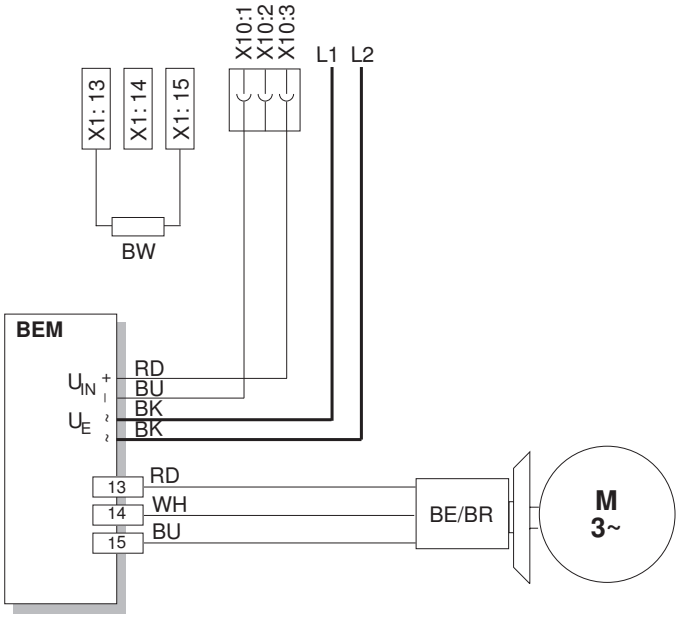
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Braking resistor

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



- For **brake motors without BEM option**, a braking resistor must not be connected to the MOVIMOT®.
- For **brakemotors with BEM option** and external braking resistor, the external braking resistor BW and the brake must be connected as follows.



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10.4 "Easy" startup with RS485 interface

10.4.1 Requirements

The following prerequisites are required for startup:

- The MOVIMOT® drive must be installed correctly both mechanically and electrically.
- Appropriate safety measures prevent the drives from starting up unintentionally.
- Appropriate safety measures must be taken to prevent risk of injury or damage to the machine.

10.4.2 Startup procedure



⚠ WARNING

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

Severe or fatal injuries.

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

1. Remove the MOVIMOT® inverter from the connection box.
2. Check whether the MOVIMOT® drive is installed correctly both mechanically and electrically.
   ⇨ Refer to chapters "Mechanical Installation" and "Electrical Installation".
3. Set the correct RS485 address of the drive at DIP switches S1/1 – S1/4.
   ⇨ In conjunction with fieldbus interfaces MF../MQ., always set address "1".

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

X = ON – = OFF

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4. Set the minimum frequency f_{min} using the switch f2.



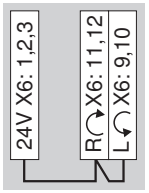
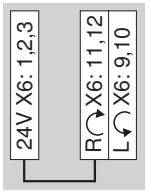
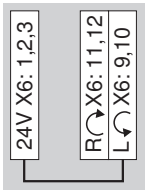
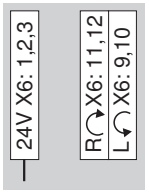
f2 switch:											
Detent position	0	1	2	3	4	5	6	7	8	9	10
Minimum frequency f_{min} [Hz]	2	5	7	10	12	15	20	25	30	35	40

5. If the ramp time is not specified via the fieldbus, set the ramp time at switch t1.
   ⇨ The ramp time is based on a setpoint step change of 1500 min^{-1} (50 Hz).



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

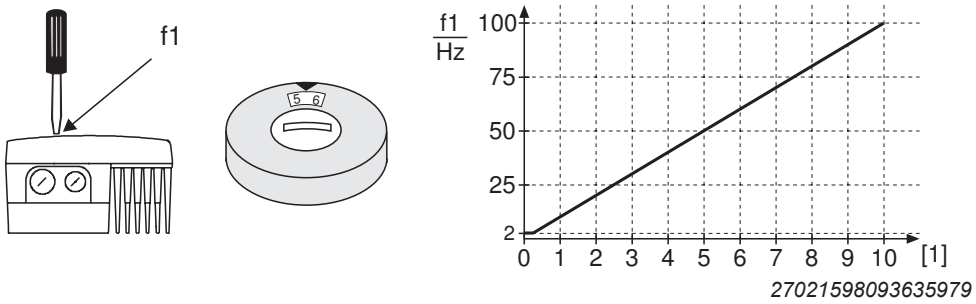
6. Check to see if the required direction of rotation has been enabled.

CW/stop	CCW/stop	Meaning
Activated	Activated	• Both directions of rotation are enabled.
		
Activated	Not activated	• Only CW rotation is enabled. • Setpoint input for CCW rotation will stop the drive.
		
Not activated	Activated	• Only CCW rotation is enabled. • Setpoint input for CW rotation will stop the drive.
		
Not activated	Not activated	• The device is inhibited or the drive is stopped.
		

7. Place the MOVIMOT® inverter onto the connection box and screw it in place.

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



[1] Potentiometer setting

9. **NOTICE!** Loss of the specified degree of protection if the screw plugs on the f1 setpoint potentiometer and the X50 diagnostic interface are not installed or not installed correctly. Damage to the MOVIMOT® inverter.
   Make sure the screw plug of the setpoint potentiometer has a seal and screw it in.
10. Switch on the DC 24 V control voltage and the line voltage.

For further information on the function in conjunction with the RS485 master, refer to chapter "Function with RS485 master" (→ 🗎 229).

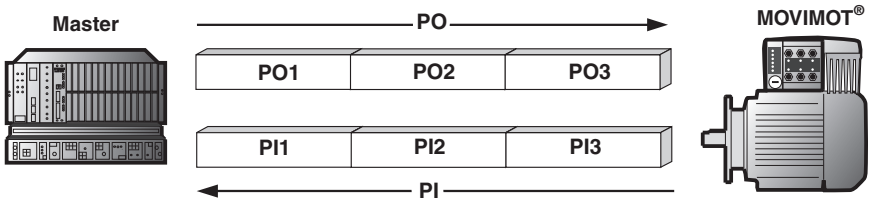
For information on the function in connection with fieldbus interfaces, refer to the corresponding fieldbus manuals.

10.4.3 Coding of process data

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

MOVIMOT® is available in the following variants:

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



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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

2 process data words

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

3 process data words

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

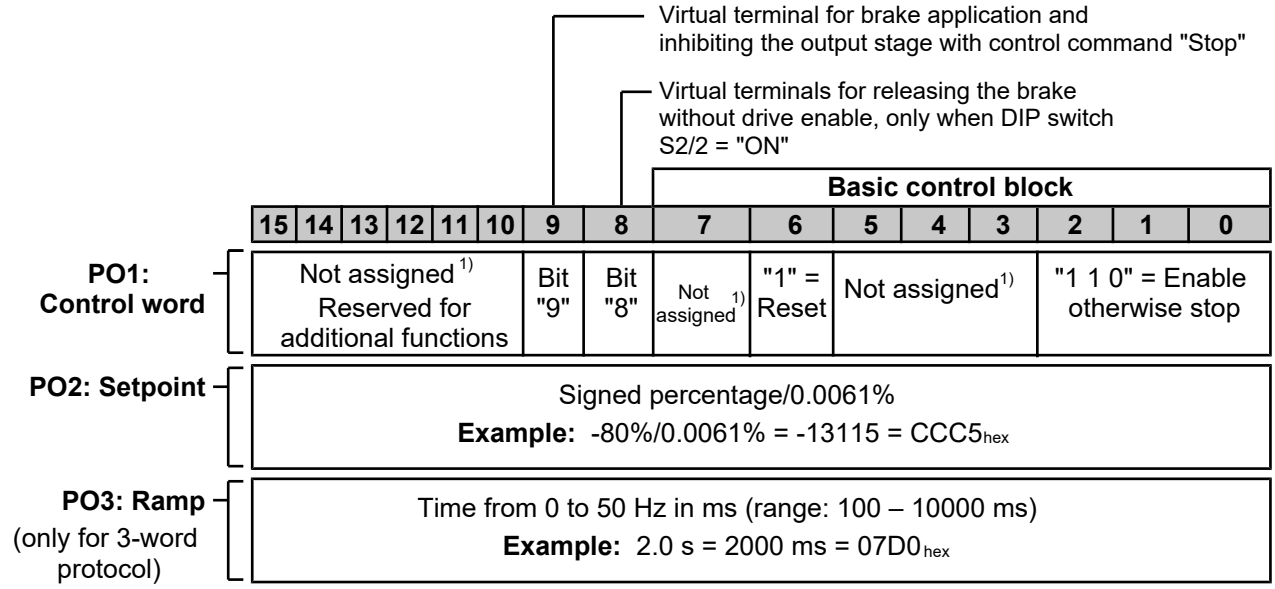
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Process output data

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

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

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



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

Control word, bit 0 – 2

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

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

Control word, bit 6 = reset

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

Control word, bit 8 = release brake without drive enable

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

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

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

INFORMATION

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

Speed [%]

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

Coding:	$C000_{hex}$	= -100% (CCW rotation)
	4000_{hex}	= +100% (CW rotation)
	→ 1 digit	= 0.0061%
Example:	80% f_{max}, CCW rotation	
Calculation:	-80%/0.0061 % = -13115_{dec} = $CCC5_{hex}$	

Ramp

If the process data is exchanged via 3 process data, the current integrator ramp is transferred in the process data output word PO3. The integrator ramp set with switch t1 is used if MOVIMOT® is controlled by two process data items.

Coding:	→ 1 digit = 1 ms
Range:	100 – 10000 ms
Example:	2.0 s = 2000 ms = 2000_{dec} = $07D0_{hex}$

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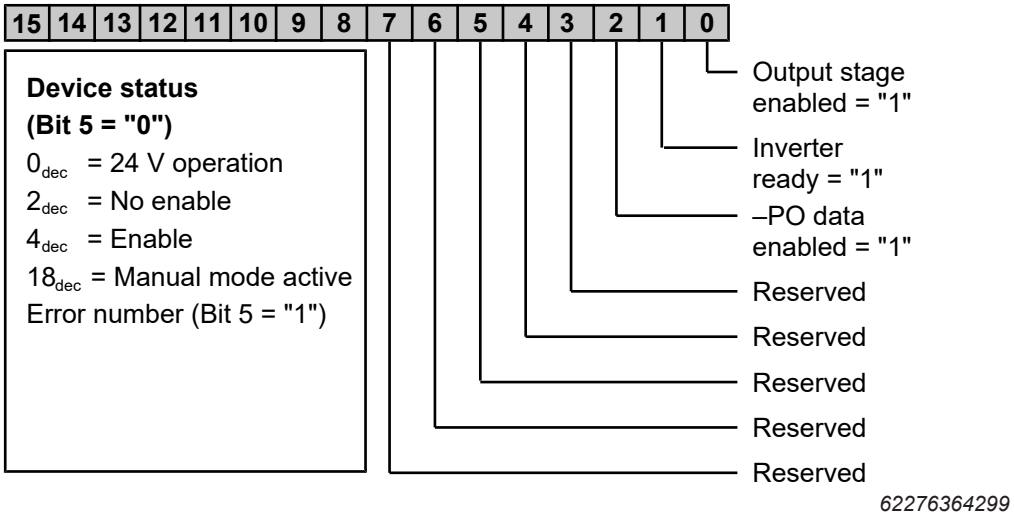
Process input data

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

The MOVIMOT® inverter supports the following process input data:

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

PI1: Status word 1

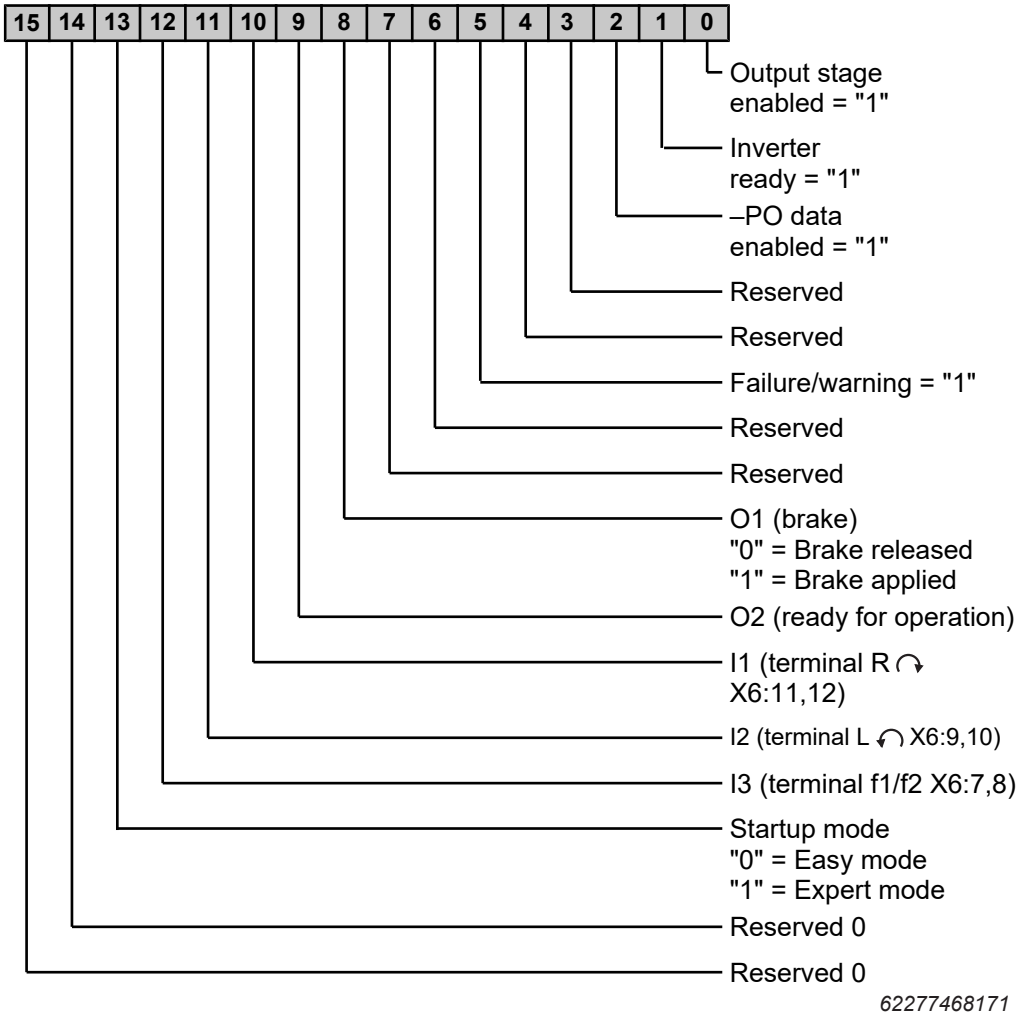


PI2: Current actual value

16 bit integer with sign x 0.1% I_N
Example: 0320_{hex} = 800 × 0.1% I_N = 80% I_N

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



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Assignment status word 1

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

Assignment of status word 2

Bit	Meaning	Explanation
0	**Output stage enabled**	1: MOVIMOT® drive is enabled.
		0: MOVIMOT® drive is not enabled.
1	**Inverter ready**	1: MOVIMOT® drive is ready for operation.
		0: MOVIMOT® drive is not ready for operation.
2	**PO data enabled**	1: Process data is enabled. Drive can be controlled via fieldbus.
		0: Process data is inhibited. Drive cannot be controlled via fieldbus.
3	Reserved	Reserved = 0
4	Reserved	Reserved = 0
5	**Error/warning**	1: Error/warning present.
		0: No error/warning present.
6	Reserved	Reserved = 0
7	Reserved	Reserved = 0
8	**O1 brake**	1: Brake applied
		0: Brake released
9	**O2 ready for operation**	1: MOVIMOT® drive is ready for operation.
		0: MOVIMOT® drive is not ready for operation.
10	**I1 (R X6:11,12)**	1: Binary input is set. 0: Binary input is not set.
11	**I2 (L X6:9,10)**	
12	**I3 (f1/f2 X6:7,8)**	
13	**Startup mode**	1: "Expert" startup mode
		0: "Easy" startup mode
14	Reserved	Reserved = 0
15	Reserved	Reserved = 0

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10.4.4 Function with RS485 master

- The higher-level controller (e.g. PLC) is the master, the MOVIMOT® inverter is the slave.
- 1 start bit, 1 stop bit and 1 parity bit (even parity) are used.
- Transmission complies with the SEW MOVILINK® protocol (see chapter "Coding of process data" (→ 🗎 222)) with a fixed transfer rate of 9600 baud.

Telegram structure



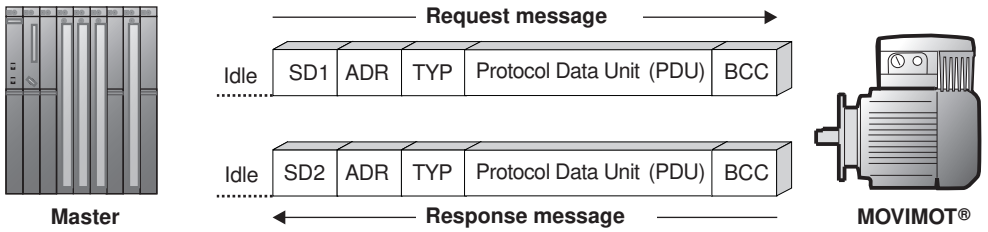
⚠ WARNING

Danger of fatal injury due to uncontrolled operation.

Timeout monitoring is not performed when "acyclic" telegrams (type = "acyclic") are transferred. If the bus connection is interrupted, the drive can continue to run uncontrollably.

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

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



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Idle = Idle period of at least 3.44 ms
SD1 = Start delimiter 1: Master → MOVIMOT®: 02_{hex}
SD2 = Start delimiter 2: MOVIMOT® → Master: $1D_{hex}$
ADR = Address 1 – 15
Group address 101 – 115
254 = Point-to-point
255 = Broadcast
TYPE = Payload data type
PDU = Payload data
BCC = Block Check Character: XOR of all bytes

INFORMATION



When "cyclic" messages (type = "cyclic") are sent, the MOVIMOT® inverter expects the next bus activity after a maximum time of 1 second (master protocol). If the MOVIMOT® inverter does not detect this bus activity, the MOVIMOT® inverter automatically stops the drive (timeout monitoring).

Idle and start delimiter

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

Address (ADR)

The MOVIMOT® inverter supports the address range from 0 – 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.

Group address

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

The master can now specify new group setpoints for these groups with ADR = 101 (setpoints to inverters of group 1) and ADR = 102 (setpoints to group 2). The inverters do not provide a response for this addressing variant. The master must observe a min. rest time of 25 ms between two broadcast or group messages!

User data type (TYPE)

As a rule, the MOVIMOT® inverter 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	Payload data
03_{hex}	Cyclic	2 words	Control word, speed [%], status word 1, output current
83_{hex}	Acyclical	2 words	
05_{hex}	Cyclic	3 words	Control word, speed [%], ramp, status word 1, output current, status word 2
85_{hex}	Acyclical	3 words	

Timeout monitoring

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

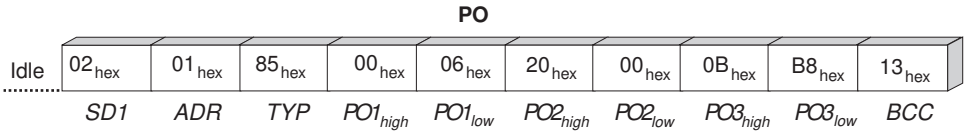
Block check character BCC

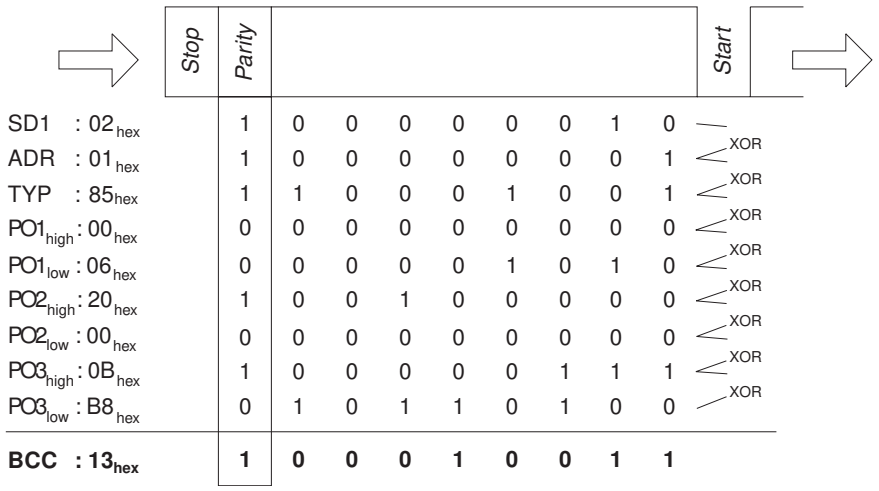
The block check character (BCC) is used in conjunction with even parity formation to ensure reliable data transfer. The block check character is formed by means of an XOR logic operation of all message characters. The result is transmitted at the end of the telegram in the BCC.

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Example

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





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Telegram processing in the MOVILINK®master

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

a) Send request message

Example: Send setpoints to the MOVIMOT® inverter.

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

b) Receive response message

(Acknowledgment signal + actual values from MOVIMOT® inverter)

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

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

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Sample message

This example deals with the control of a MOVIMOT® drive using three process data words of PDU type 85_{hex} (3 PD acyclical). The RS485 master sends three process output data words (PO) to the MOVIMOT® inverter. The MOVIMOT® inverter replies by sending three process input data words (PI).

Request message from RS485 master to MOVIMOT®

PO1: 0006$_{hex}$	Control word 1 = enable
PO2: 2000$_{hex}$	Speed [%] setpoint = 50% (of f_{max} [1)])
PO3: 0BB8$_{hex}$	Ramp = 3 s

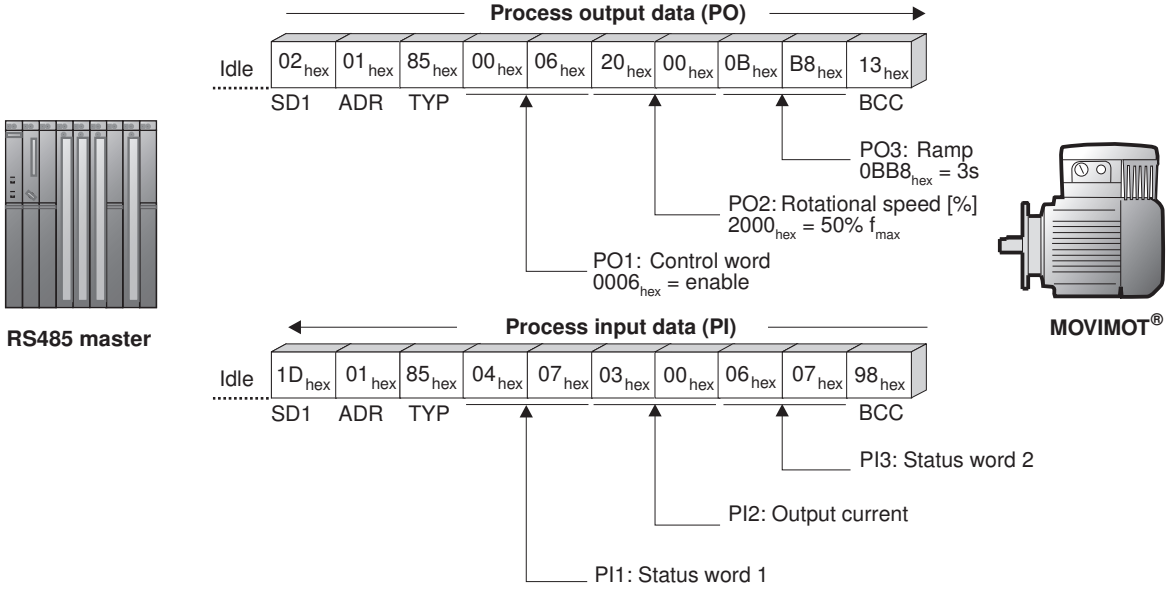
1) fmax is specified on setpoint potentiometer f1.

Response message from MOVIMOT® to RS485 master

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

For information on coding of the process data, refer to chapter "Coding of process data" (→ 🗎 222).

Sample message "3 PD acyclical"



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

10.5 Expert startup with parameter function

INFORMATION

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

Startup in Expert mode is only possible if:

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

10.5.1 Requirements

The following prerequisites are required for startup:

- The MOVIMOT® drive must be installed correctly both mechanically and electrically.
- Appropriate safety measures prevent the drives from starting up unintentionally.
- Appropriate safety measures must be taken to prevent risk of injury or damage to the machine.

The following hardware must be present for startup:

- PC or laptop, see chapter "PC/laptop connection" (→ 🗎 169)

The following software must be installed on the PC or laptop for startup:

- MOVITOOLS® MotionStudio

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10.5.2 MOVITOOLS® MotionStudio

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

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

MOVITOOLS® MotionStudio can communicate with the drive units using different communication and fieldbus systems.

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

Integrating MOVIMOT® into MOVITOOLS® MotionStudio

INFORMATION

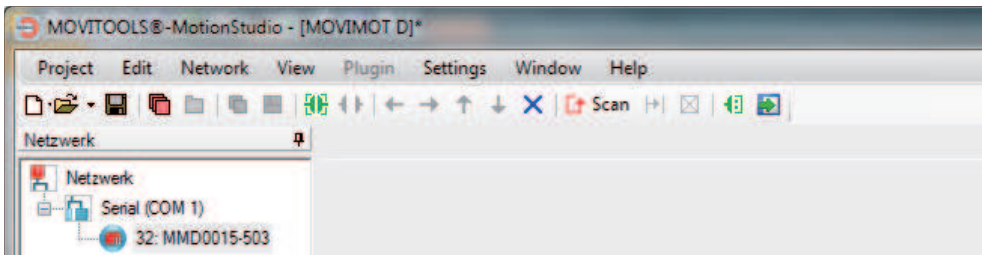
For a detailed description of the following steps please refer to the comprehensive online help in MOVITOOLS® MotionStudio.

1. Start MOVITOOLS® MotionStudio.
2. Create a project and a network.
3. Configure the communication channel on the PC/laptop.
4. Make sure that the 24 V supply of the MOVIMOT® inverter is connected.
5. Perform an online scan.
   ⇨ Check the set scanning range in MOVITOOLS® MotionStudio.

INFORMATION

- The diagnostic interface has fixed **address 32**. Adapt the scanning range in MOVITOOLS® MotionStudio so that address 32 is also scanned.
- The baud rate is 9.6 kBaud.
- The online scan may take a longer time.

6. MOVIMOT® is displayed in MOVITOOLS® MotionStudio as shown in the example below:



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7. By right-clicking "32: MMD0015-503", tools for startup and diagnostics of MOVIMOT® are available in the context menu.

10.5.3 Startup and function expansion with individual parameters

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

INFORMATION

Startup in "Expert" mode is only possible if:

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

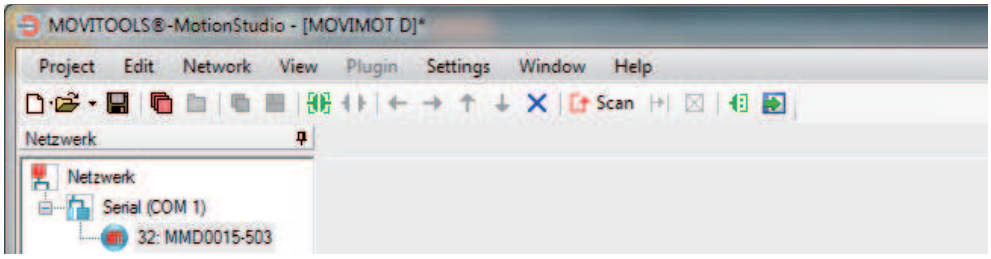
1. Perform startup in "Easy" mode.
   ⇨ See chapter "Easy startup" (→ 🗎 172)
2. Connect the PC/laptop or the DBG keypad to the MOVIMOT® inverter.
   ⇨ See chapter "PC/laptop connection" (→ 🗎 169) or chapter "DBG keypad connection" (→ 🗎 168).
3. Connect the 24 V supply of the MOVIMOT® inverter.
4. When using a PC/laptop, start MOVITOOLS® MotionStudio and integrate the MOVIMOT® inverter.
   ⇨ See chapter "Integrating MOVIMOT® into MOVITOOLS® MotionStudio" (→ 🗎 235)
5. Set parameter *P805 Startup mode* to "Expert".
6. Specify the parameters which you want to change.
7. Check whether these parameters depend on the mechanical control elements.
   ⇨ See chapter "Integrating MOVIMOT® into MOVITOOLS® MotionStudio" (→ 🗎 235)
8. Deactivate the respective control elements by adjusting the bit-coded selection box of parameter *P102*.
   ⇨ See chapter "Parameter 102" (→ 🗎 255)
9. Change the set parameters.
   ⇨ For information on parameter setting with the DBG keypad, refer to chapter "Parameter mode" (→ 🗎 281).
10. Check the functionality of the MOVIMOT® drive.
    Optimize the parameters if necessary.
11. Disconnect the PC/laptop or the DBG keypad from the MOVIMOT® inverter.
12. **NOTICE!** Loss of the specified degree of protection if the screw plugs on the f1 setpoint potentiometer and the X50 diagnostic interface are not installed or not installed correctly. Damage to the MOVIMOT® inverter.
    Reinstall the screw plug of the setpoint potentiometer with the seal.

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Example

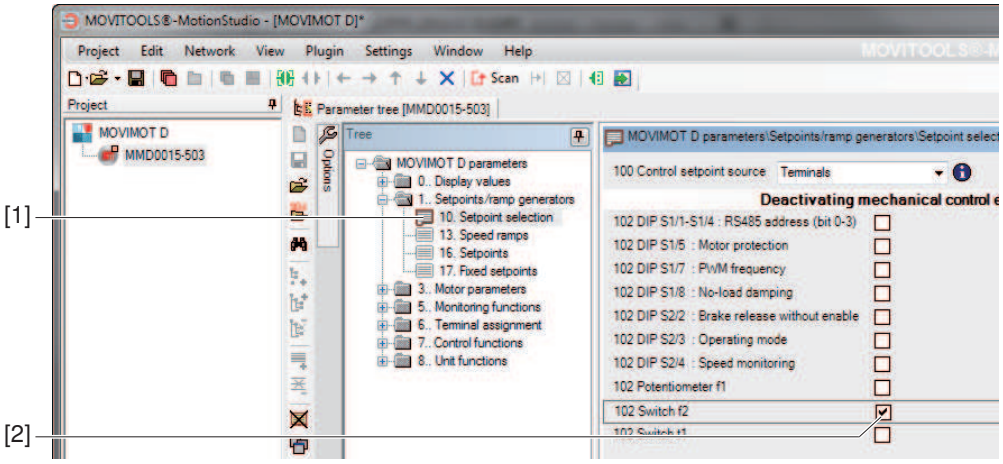
Fine adjustment of setpoint f2 using MOVITOOLS® MotionStudio

1. Perform "Easy" startup using switch f2 for rough adjustment, e.g. setting 5 (25 Hz = 750 min^{-1}).
2. Connect the PC/laptop to the MOVIMOT® inverter.
3. Connect the 24 V supply of the MOVIMOT® inverter.
4. Start MOVITOOLS® MotionStudio.
5. Create a project and a network.
6. Configure the communication channel on the PC/laptop.
7. Perform an online scan.



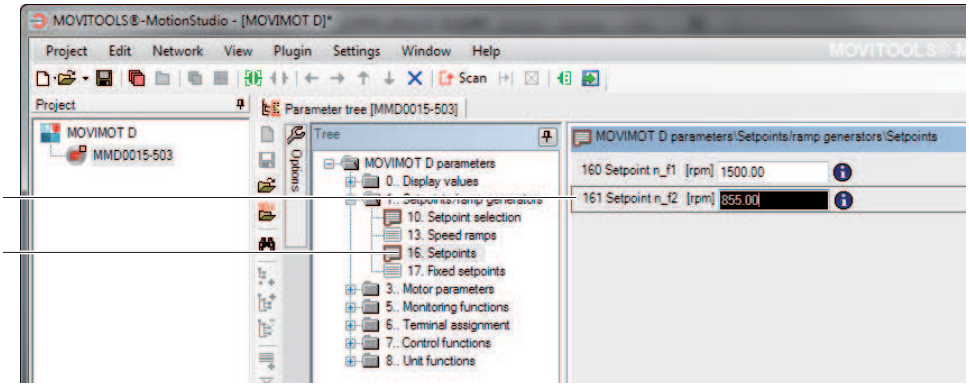
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8. Open the context menu by clicking the right mouse button and select the menu item "Startup" > "Parameter tree".
9. Set parameter *P805 Startup mode* to "Expert".



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10. Open the "Setpoint preselection" folder [1].
    Deactivate switch f2 by setting the check box of parameter *P102 Deactivating mechanical controls* [2] (parameter *P102:14* = "**1**" => *P102* = "0**1**00 0000 0000 0000").



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11. Open the "Setpoints" folder [2].
    Adjust parameter *P161 setpoint n_f2* [1] until the application runs optimally, e.g. parameter *P161* = 855 min^{-1} (= 28.5 Hz)
12. Disconnect the PC/laptop from the MOVIMOT® inverter.
13. **NOTICE!** Loss of the specified degree of protection if the screw plugs on the f1 setpoint potentiometer and the X50 diagnostic interface are not installed or not installed correctly. Damage to the MOVIMOT® inverter.
    Reinstall the screw plug of the setpoint potentiometer with the seal.

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10.5.4 Startup by transferring the parameter set

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

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

INFORMATION

The parameter set can only be transferred if:

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

Transferring the parameter set using MOVITOOLS® or the DBG keypad

1. Remove the MOVIMOT® inverter from the connection box.
2. Check the connection of the MOVIMOT® inverter.
   ⇨ See chapter "Electrical installation".
3. Set all mechanical control elements identical to the reference device.
4. Place the MOVIMOT® inverter onto the connection box and screw it in place.
5. Connect the PC/laptop or the DBG keypad to the MOVIMOT® inverter.
   ⇨ See chapter "PC/laptop connection" (→ 🗎 169) or chapter "Connection of DBG keypad" (→ 🗎 168).
6. Connect the 24 V supply of the MOVIMOT® inverter.
7. When using a PC/laptop, start MOVITOOLS® MotionStudio and integrate the MOVIMOT® inverter in MOVITOOLS®.
   ⇨ See chapter "Integrating MOVIMOT® into MOVITOOLS® MotionStudio" (→ 🗎 235).
8. Transfer the entire parameter set of the MOVIMOT® reference unit to the MOVIMOT® inverter.
   ⇨ For information on transferring the parameter set with the DBG keypad, refer to chapter "Copy function of the DBG keypad" (→ 🗎 285).
9. Check the functionality of the MOVIMOT® drive.
10. Disconnect the PC/laptop or the DBG keypad from the MOVIMOT® inverter.
11. **NOTICE!** Loss of the specified degree of protection if the screw plugs on the f1 setpoint potentiometer and the X50 diagnostic interface are not installed or not installed correctly. Damage to the MOVIMOT® inverter.
    Make sure the screw plug of the setpoint potentiometer has a seal and screw it in.

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10.5.5 Parameter list

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

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

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No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (range/factory setting)	MOVILINK® scaling
081	Error t-1		Background information for errors that occurred at t-1		
	8367	0	Error code	Error code	
	9305	0	Sub error code		
	8884	0	Internal error		
	8372	0	Status of binary inputs	[Bit field bit 0, bit 1, bit 2]	
	8382	0	Status of binary outputs K1, X10	[Bit field bit 0, bit 1]	
	8392	0	Inverter status	[Text]	
	8397	0	Heat sink temperature	[°C]	1 digit = 1 °C
	8402	0	Speed	[min^{-1}]	1 digit = 0.001 min^{-1}
	8407	0	Output current	[%I_N]	1 digit = 0.001% I_N
	8412	0	Active current	[%I_N]	1 digit = 0.001% I_N
	8417	0	Device utilization	[%]	1 digit = 0.001% I_N
	8422	0	DC link voltage	[V]	1 digit = 0.001 V
	8427	0	Power-applied hours	[h]	1 digit = 1 min.
	8432	0	Drive running hours	[h]	1 digit = 1 min.
082	Error t-2		Background information for errors that occurred at t-2		
	8368	0	Error code	Error code	
	9306	0	Sub error code		
	8885	0	Internal error		
	8373	0	Status of binary inputs	[Bit field bit 0, bit 1, bit 2]	
	8383	0	Status of binary outputs K1, X10	[Bit field bit 0, bit 1]	
	8393	0	Inverter status	[Text]	
	8398	0	Heat sink temperature	[°C]	1 digit = 1 °C
	8403	0	Speed	[min^{-1}]	1 digit = 0.001 min^{-1}
	8408	0	Output current	[%I_N]	1 digit = 0.001% I_N
	8413	0	Active current	[%I_N]	1 digit = 0.001% I_N
	8418	0	Device utilization	[%]	1 digit = 0.001% I_N
	8423	0	DC link voltage	[V]	1 digit = 0.001 V
	8428	0	Power-applied hours	[h]	1 digit = 1 min.
	8433	0	Drive running hours	[h]	1 digit = 1 min.

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No.	Index dec.	Sub-index dec.	Name	MOVITOOLS® MotionStudio (range/factory setting)	MOVILINK® scaling
083	Error t-3		Background information for errors that occurred at t-3		
	8369	0	Error code	Error code	
	9307	0	Sub error code		
	8886	0	Internal error		
	8374	0	Status of binary inputs	[Bit field bit 0, bit 1, bit 2]	
	8384	0	Status of binary outputs K1, X10	[Bit field bit 0, bit 1]	
	8394	0	Inverter status	[Text]	
	8399	0	Heat sink temperature	[°C]	1 digit = 1 °C
	8404	0	Speed	[min^{-1}]	1 digit = 0.001 min^{-1}
	8409	0	Output current	[$\%I_N$]	1 digit = 0.001% I_N
	8414	0	Active current	[$\%I_N$]	1 digit = 0.001% I_N
	8419	0	Device utilization	[%]	1 digit = 0.001% I_N
	8424	0	DC link voltage	[V]	1 digit = 0.001 V
	8429	0	Power-applied hours	[h]	1 digit = 1 min.
	8434	0	Drive running hours	[h]	1 digit = 1 min.
084	Error t-4		Background information for errors that occurred at t-4		
	8370	0	Error code	Error code	
	9308	0	Sub error code		
	8887	0	Internal error		
	8375	0	Status of binary inputs	[Bit field bit 0, bit 1, bit 2]	
	8385	0	Status of binary outputs K1, X10	[Bit field bit 0, bit 1]	
	8395	0	Inverter status		
	8400	0	Heat sink temperature	[°C]	1 digit = 1 °C
	8405	0	Speed	[min^{-1}]	1 digit = 0.001 min^{-1}
	8410	0	Output current	[$\%I_N$]	1 digit = 0.001% I_N
	8415	0	Active current	[$\%I_N$]	1 digit = 0.001% I_N
	8420	0	Device utilization	[%]	1 digit = 0.001% I_N
	8425	0	DC link voltage	[V]	1 digit = 0.001 V
	8430	0	Power-applied hours	[h]	1 digit = 1 min.
	8435	0	Drive running hours	[h]	1 digit = 1 min.
09_	**Bus diagnostics**				
094	8455	0	PO 1 setpoint	[hex]	
095	8456	0	PO 2 setpoint	[hex]	
096	8457	0	PO 3 setpoint	[hex]	
097	8458	0	PI 1 actual value	[hex]	
098	8459	0	PI 2 actual value	[hex]	

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

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

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

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

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

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

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10.5.6 Parameter description

Display values

Parameter 000

Speed (signed)

The displayed speed is the calculated actual speed.

Parameter 002

Frequency (signed)

Output frequency of the inverter

Parameter 004

Output current (amount)

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

Parameter 005

Active current (signed)

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

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

Direction of rotation	Load	Speed	Active current
Clockwise rotation	Motor	Positive (n > 0)	Positive (I_W > 0)
Counterclockwise rotation	Motor	Negative (n < 0)	Negative (I_W < 0)
Clockwise rotation	Regenerative	Positive (n > 0)	Negative (I_W < 0)
Counterclockwise rotation	Regenerative	Negative (n < 0)	Positive (I_W > 0)

Parameter 006

Motor utilization

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

Parameter 008

DC link voltage

Voltage in V measured in the DC link

Parameter 009

Output current (value)

Apparent current in A

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Parameter 010

Inverter status

Inverter statuses

- INHIBITED
- ENABLED

Parameter 011

Operating status

The following operating statuses are available:

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

Parameter 012

Error status

Error status in text form

Parameter 013

Startup mode

Startup mode "Easy" or "Expert"

Parameter 014

Heat sink temperature

Heat sink temperature of the inverter

Parameter 015

Power-applied hours

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

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

Parameter 016

Drive running hours

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

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

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Parameter 017

DIP switch setting S1 and S2

Display of DIP switch settings for S1 and S2:

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

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

Parameter 018

Setting switch f2

Display of switch f2 setting

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

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Parameter 019

Setting of switch t1

Displays the setting of switch t1

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

Parameter 020

Setting of setpoint potentiometer f1

Displays the setting of setpoint potentiometer f1

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

Parameter 031

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

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

Parameter 032

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

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

Parameter 033

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

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

Parameter 050

Setting / assignment of signal relay K1

Displays the status of the signal relay K1

Parameter 051

Setting output X10

Displays the status of the output for controlling the BEM option

Parameter 070

Device type

The device type is displayed

Parameter 071

Nominal output current

The nominal unit current is displayed in [A]

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Parameter 072

Drive ID module slot option

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

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

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

Parameter 076

Firmware basic unit

Displays the part number and version of the unit firmware

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Parameter 700

Operating mode

The selected operating mode is displayed

Parameter 080 – 084

Error t-0 – t-4

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

Parameter 094

PO 1 Setpoint (display value)

Process data output word 1

Parameter 095

PO 2 Setpoint (display value)

Process data output word 2

Parameter 096

PO 3 Setpoint (display value)

Process data output word 3

Parameter 097

PI 1 Actual value (display value)

Process data input word 1

Parameter 098

PI 2 Actual value (display value)

Process data input word 2

Parameter 099

PI 3 Actual value (display value)

Process data input word 3

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Setpoints/ramp generators

Parameter 100

INFORMATION

Parameter *P100* can only be changed if

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

Control setpoint source

- When selecting "Binary", the drive is controlled via the digital input terminals.
  - If the mechanical controls f1 and f2 are **not** deactivated (see parameter *P102*), the setpoints are specified with setpoint potentiometer f1 and switch f2.
  - If the mechanical controls f1 and f2 are deactivated (see parameter *P102*), the setpoints are specified by selecting setpoints n_f1 or n_f2 (conditions see parameters *P160*/*P161*).
- When selecting "RS485", the drive is controlled via the digital input terminals and the bus control word. The setpoint is selected via the system bus.

Parameter 102

Deactivation of mechanical setting elements

Deactivate on this MOVIMOT® inverter. The factory-set value of the parameter is configured so that all mechanical setting elements are effective.

Bit	Meaning	INFORMATION	
0	Reserved		
1	Deactivation of the DIP switch S1/1 – S1/4 (RS485 address)	Bit not set:	DIP switches S1/1 – S1/4 active
		Bit set:	DIP switches S1/1 – S1/4 not active Setting the RS485 address, RS485 group address and control / setpoint source using parameters *P810*, *P811* and *P100*
2 – 4	Reserved		
5	Deactivation of DIP switch S1/5 (motor protection)	Bit not set:	DIP switch S1/5 active
		Bit set:	DIP switch S1/5 not active: Switching the motor protection function on/off using the parameter *P340*.
6	Reserved		
7	Deactivation of DIP switch S1/7 (PWM clock frequency)	Bit not set:	DIP switch S1/7 active
		Bit set:	DIP switch S1/7 not active Setting the PWM clock frequency using parameter *P860*

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Bit	Meaning	INFORMATION	
8	Deactivation of DIP switch S1/8 (no-load damping)	Bit not set:	DIP switch S1/8 active
		Bit set:	DIP switch S1/8 not active Activation/deactivation of no-load damping using parameter *P325*
9	Reserved		
10	Deactivation of DIP switch S2/2 (brake release)	Bit not set:	DIP switch S2/2 active
		Bit set:	DIP switch S2/2 not active Activation / deactivation of brake release without drive enable using parameter *P738*
11	Deactivation of DIP switch S2/3 (operating mode)	Bit not set:	DIP switch S2/3 active
		Bit set:	DIP switch S2/3 not active Selection of operating mode using parameter *P700*
12	Deactivation of DIP switch S2/4 (speed monitoring)	Bit not set:	DIP switch S2/4 active
		Bit set:	DIP switch S2/4 not active Activation / deactivation of speed monitoring using parameter *P500*
13	Deactivating the setpoint potentiometer f1	Bit not set:	Setpoint potentiometer f1 active
		Bit set:	Setpoint potentiometer f1 not active Setting the setpoint and the maximum speed using parameter *P160* and *P302*
14	Deactivation of switch f2	Bit not set:	Switch f2 active
		Bit set:	Switch f2 not active Setting the setpoint and the minimum speed using parameter *P161* and *P301*
15	Deactivation of switch t1	Bit not set:	Switch t1 active Acceleration ramp time = deceleration ramp time
		Bit set:	Switch t1 not active Setting the ramp times using parameters *P130* and *P131*

Parameter 130

Ramp t11 up

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Acceleration ramp

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

Parameter 131

Ramp t11 down

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

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

Parameter 134

Ramp t12 up = down

Acceleration and deceleration ramp at S pattern

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

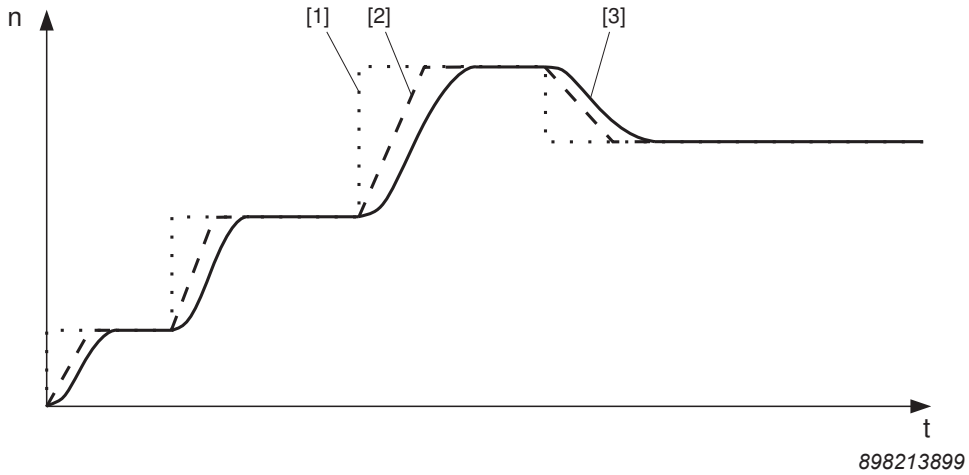
The ramp time sets the acceleration and deceleration if parameter *P135S pattern t12* has been set to grade 1, grade 2 or grade 3.

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Parameter 135

S pattern t12

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



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

INFORMATION

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

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

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

Parameter 136

Stop ramp t13

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

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

Parameter 160

Setpoint n_f1

The setpoint n_f1 is valid if

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

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Parameter 161

Setpoint n_f2

The setpoint n_f2 is valid if

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

Parameter 170 – 173

Fixed setpoint n0 – n3

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

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

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

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

Motor parameters

Parameter 300

Start/stop speed

This parameter defines the smallest speed request which the inverter sends to the motor when enabled. The transition to the speed determined in the setpoint selection is made using the active acceleration ramp. When the enable is revoked, the parameter determines the frequency at which the MOVIMOT® inverter detects the motor standstill and starts to apply the brake.

Parameter 301

Minimal speed (when switch f2 is deactivated)

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

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

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Parameter 302

Maximum speed (when switch f1 is deactivated)

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

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

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

Parameter 303

Current limit

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

Parameter 320

Automatic adjustment

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

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

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

Parameter 321

Boost

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

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

Parameter 322

IxR adjustment

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

Parameter 323

Premagnetization

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

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Parameter 324

Slip compensation

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

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

Parameter 325

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

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

Parameter 340

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

Activation/deactivation of the thermal protection model for the MOVIMOT® drive

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

Depending on the thermal characteristic curve of the motor, the MOVIMOT® inverter switches off when the model limit temperature is exceeded. Refer to the "DRN.. AC Motors" catalog for the threshold line

Parameter 341

Type of cooling

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

Parameter 347

Motor cable length

This parameter is used for defining the motor cable length (= length of SEW-EURODRIVE hybrid cable between MOVIMOT® and motor) which is the basis for calculating the motor temperature. You only need to change this parameter with mounting close to the motor.

Parameter 348

Output phase failure check

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

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Monitoring functions

Parameter 500

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

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

Parameter 501

Deceleration time

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

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

Parameter 522

Line phase failure check

NOTICE

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

Damage to the inverter.

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

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

Parameter 523

Power off check

Use this parameter to adapt the power off check of the inverter to operation with MOVITRANS®.

Parameter 590

Localization

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

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Terminal assignment

Parameter 600

Terminal configuration

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

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

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

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

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

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Parameter 620

Function of the signal relay K1



⚠ WARNING

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

Severe or fatal injuries

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

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

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

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Control functions

Parameter 700

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

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

VFC / V/f characteristic curve

Default setting for asynchronous motors.

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

VFC hoist

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



⚠ WARNING

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

Severe or fatal injuries.

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

The motor brake must be controlled via the inverter for a correct operation of the hoist function.

The VFC hoist operating mode influences the following parameters:

No.	Index dec.	Sub-index dec.	Name	Value
P300	8515	0	Start/stop speed	= 60 min^{-1} If the start/stop speed is set to less than 60 min^{-1}
P301	8516	0	Minimum speed	= 60 min^{-1} If the minimum speed is set to less than 60 min^{-1}
P303	8518	0	Current limit	= nominal motor current If the current limit is set to less than the nominal motor current
P323	8526	0	Premagnetization	= 20 ms If premagnetization is set to a lower value than 20 ms
P500	8557	0	Speed monitoring	= 3: Motor/generator mode
P620	8350	0	Signal output K1	= 5: Brake on
P731	8749	0	Brake release time	= 200 ms If the brake release time is set to less than 200 ms

No.	Index dec.	Sub-index dec.	Name	Value
P732	8585	0	Brake application time	= 200 ms If the brake application time is set to less than 200 ms
P738	8893	0	Activate brake release without drive enable	= 0: OFF

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

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

The brake release without drive enable function cannot be activated in the VFC hoist operating mode.

The function of the signal relay output can be parameterized.

VFC / V/f DC braking

With this setting, the asynchronous motor brakes via a current injection. The motor brakes without a braking resistor on the inverter.

⚠ WARNING



Risk from uncontrolled braking. With DC braking, no guided stop or adherence to a specific ramp is possible.

Severe or fatal injuries.

- Use a different operating mode if required.

Parameter 710

Standstill current

⚠ WARNING



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

Severe or fatal injuries

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

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

The standstill current fulfills the following functions:

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

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

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Parameter 720 – 722

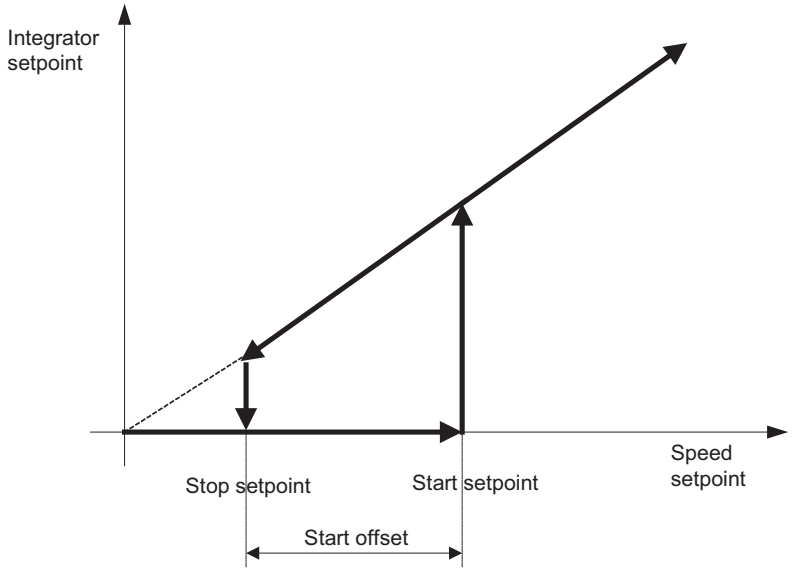
Setpoint stop function

Stop setpoint

Start offset

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

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



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Parameter 731

Brake release time

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

Parameter 732

Brake application time

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

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Parameter 738

Activation of brake release without drive enable

(when DIP switch S2/2 is deactivated)

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

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

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

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

Parameter index 10501.1

Brake chopper

The MOVIMOT® drive is equipped with a brake chopper. The brake chopper can be used to transfer regenerative energy to either a braking resistor or a brake coil. The braking resistor can be connected to terminals X1:13 and X1:15. The brake coil can be connected to terminals X1:13, X1:14, and X1:15. The brake chopper level is 850 V. If the MOVIMOT® drive is operated in conjunction with other frequency inverters on a common DC voltage grid, you can deactivate the function of the brake chopper or select a raised brake chopper level of 920 V.

Parameter 770

Energy saving function

If this parameter is set to "ON", the inverter reduces the no-load current.

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Unit functions

Parameter 802

Factory setting

If you set this parameter to "Delivery state", all parameters

- That have a factory setting
- And **cannot** be set using DIP switches S1/S2 or switches t1/f2

are set to this factory setting value.

For those parameters that are set at the DIP switches S1/S2 or at switches t1/f1, the setting of the mechanical setting element becomes active when the factory setting "Delivery state" is selected.

Parameter 803

Parameter lock

If this parameter is set to "ON", you cannot change any of the parameters except the parameter lock. It is a good idea to use this setting once you have finished starting up the unit and optimizing the parameters. You can only change the parameters again when this parameter is set to "OFF".

Parameter 805

Startup mode

Parameterization of the startup mode

- **Easy mode**

  The MOVIMOT® is started up quickly and easily in Easy mode using DIP switches S1, S2 and switches f2, t1.
- **Expert mode**

  In "Expert" mode additional parameters are available.

Parameter 810

RS485 address (when DIP switches S1/1 – S1/4 are deactivated)

Use this parameter to set the RS485 address of the MOVIMOT® inverter.

Parameter 811

RS485 group address (when DIP switches S1/1 – S1/4 are deactivated)

Use this parameter to set the RS485 group address of the MOVIMOT® inverter.

Parameter 812

RS485 timeout interval

Use this parameter to set the timeout monitoring interval of the RS485 interface. To deactivate the RS485 timeout monitoring, set a value of "0" for the timeout monitoring time.

Parameter 830

Error response for an external error

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This parameter is used to define the error response that is revoked when the signal at terminal X6: 9, 10 (error code 26) is triggered, see parameter *P600* "terminal configuration 3".

Parameter 832

Motor overload error response

Use this parameter to determine the error response that is performed in the event of a motor overload (error code 84).

Parameter 840

Manual reset

If an error is present at the MOVIMOT® inverter, you can acknowledge the error by setting this parameter to "ON". Once the error has been reset, the parameter is set automatically to "OFF" again. If the power section does not indicate an error, setting the parameter to "ON" has no effect.

Parameters 860

PWM frequency (when DIP switch S1/7 is deactivated)

You can use this parameter to set the maximum cycle frequency at the inverter output. The cycle frequency can change automatically depending on the unit utilization.

Parameter 870

Setpoint description PO 1

Displays the assignment of the process data output word PO 1

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Parameter 871

Setpoint description PO 2

Parameterization of the assignment of the process data output word PO 2

The following assignments are available:

Setpoint speed:	The speed setpoint is specified as an absolute value.	
	Coding:	1 digit = 0.2 min^{-1}
	Example 1:	Clockwise rotation at 400 min^{-1}
	Calculation:	$400/0.2 = 2000_{dec} = 07D0_{hex}$
	Example 2:	Counterclockwise rotation at 750 min^{-1}
	Calculation:	$-750/0.2 = -3750_{dec} = F15A_{hex}$
Setpoint speed [%]:	The speed setpoint is given as a relative value in percentage and refers to the maximum speed set using the setpoint potentiometer f1.	
	Coding:	$C000_{hex}$ = -100% (counterclockwise rotation)
		4000_{hex} = +100% (clockwise rotation)
		1 digit = 0.0061%
	Example:	80% f_{max}, CCW rotation:
	Calculation:	$-80\%/0.0061\% = -13115_{dec} = CCC5_{hex}$

Parameter 872

Setpoint description PO 3

Displays the assignment of the process data output word PO 3

Parameter 873

Actual value description PI 1

Displays the assignment of the process data input word PI 1

Parameter 874

Actual value description PI 2

Parameterization of the assignment of the process data input word PI 2

The following assignments are available:

Actual speed:	Current actual speed value of the drive in min^{-1}	
	Coding:	1 digit = 0.2 min^{-1}
Output current:	Current output current of the device in % of I_N	
	Coding:	1 digit = 0.1% I_N
Active current:	Current active current of the device in % of I_N	
	Coding:	1 digit = 0.1% I_N

Actual speed [%]: Current actual speed value of the drive in % of setpoint potentiometer f1 or of $n_{max.}$

Coding: 1 digit = 0.0061%

-100% – +100% = 0xC000 – 0x4000

Parameter 875

Actual value description PI 3

(see chapter"Process output data" (→ 🗎 225))

Displays the assignment of the process data input word PI 3

Parameter 876

PO data enable

YES: The process output data that was sent from the fieldbus control become effective immediately.

NO: The last valid process output data remain in effect.

INFORMATION

If the assignment of the process data output word PO2 is changed, the PO data is inhibited. It must be re-enabled in parameter *P876*.

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Parameters that depend on mechanical controls

The following mechanical control elements influence the user parameters:

- DIP switch S1
- DIP switch S2
- Setpoint potentiometer f1
- Switch f2
- Switch t1

INFORMATION

Parameter *P100* can only be changed if

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

Control element	Influenced parameter	Effect of parameter *P102* Bit	
DIP switches S1/1 – S1/4	*P810 RS485 address* *P811 RS485 group address* *P100 Control setpoint source*	1	Bit not set: Setting RS485 address, RS485 group address and setpoint source at DIP switch S1/1 – S1/4
			Bit set: Setting RS485 address, RS485 group address and control setpoint source using parameters
DIP switch S1/5	*P340 Motor protection*	5	Bit not set: Activation/deactivation of the motor protection function at DIP switch S1/5
			Bit set: Activation/deactivation of motor protection function using parameters
DIP switch S1/7	*P860 PWM frequency*	7	Bit not set: Selection of the PWM frequency at DIP switch S1/7
			Bit set: Selection of the PWM frequency using parameters
DIP switch S1/8	*P325 No-load vibration damping*	8	Bit not set: Activation/deactivation of the no-load vibration damping function at DIP switch S1/8
			Bit set: Activation/deactivation of no-load vibration damping using parameters

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Control element	Influenced parameter	Effect of parameter *P102* Bit	
DIP switch S2/2	*P738* *Brake release without drive enable*	10	Bit not set: Activation/deactivation of the function "Brake release without drive enable" at DIP switch S2/2
			Bit set: Activation/deactivation of the function "Brake release without drive enable" using parameters
DIP switch S2/3	*P700* *Operating mode*	11	Bit not set: Selection of the operating mode at DIP switch S2/3
			Bit set: Selection of the operating mode using parameters
DIP switch S2/4	*P500* *Speed monitoring*	12	Bit not set: Activation/deactivation of the speed monitoring function at DIP switch S2/4
			Bit set: Activation/deactivation of no-load vibration damping using parameters
Setpoint potentiometer f1	*P302* *Maximum speed*	13	Bit not set: Setting maximum speed at setpoint potentiometer f1
			Bit set: Setting maximum speed using parameters
Switch f2	*P301* *Minimum speed*	14	Bit not set: Setting minimum speed at switch f2
			Bit set: Setting minimum speed using parameters
Switch t1	*P130* *Acceleration ramp* *P131* *Deceleration ramp*	15	Bit not set: Setting the ramps at switch t1
			Bit set: Setting the ramps using parameters

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11 Operation

11.1 Operating notes

⚠ WARNING



Electric shock due to dangerous voltages at connections, cables, and motor terminals.

When the device is switched on, dangerous voltages are present at the connections as well as at any connected cables and motor terminals. This even applies when the device is inhibited and the motor is in an idle state.

Severe or fatal injuries.

- Avoid switching under load.
- Before performing any work on the device, disconnect it from the voltage supply. Note that dangerous voltages can be present at the terminals and connections for up to 1 minute after the controller is switched off.
- Block the output stage of the inverter before switching at the output of the device.

⚠ WARNING



Electric shock from capacitors that have not been fully discharged.

Severe or fatal injuries.

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

⚠ WARNING



Danger if the motor starts up unintentionally

Severe or fatal injuries.

- Observe the startup instructions.
- Deactivate all control signals.

⚠ WARNING



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

Severe injuries.

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

INFORMATION



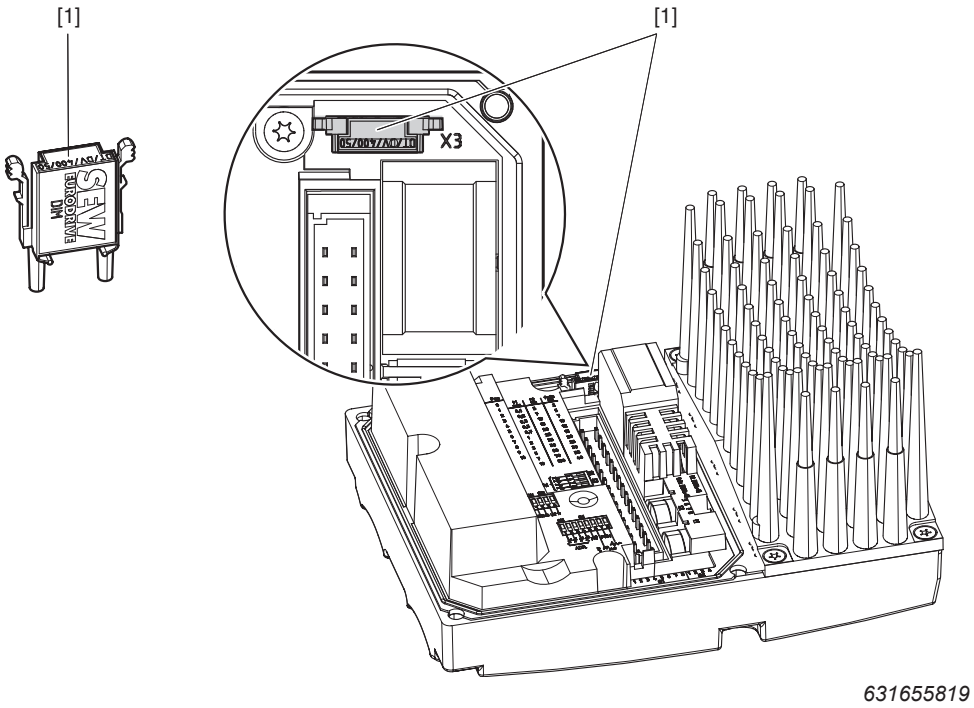
- The maximum output frequency in any operating mode is 120 Hz.
- If the maximum output frequency is exceeded, the status LED of the MOVIMOT® inverter flashes slowly red (fault 08 "speed monitoring").

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11.2 Drive ID module

The pluggable drive ID module is installed in the basic unit.

The following figure shows the Drive ID module and its position in the MOVIMOT® inverter.



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[1] Drive ID module

The drive ID module contains a memory module on which the following information is saved:

- Motor data
- Brake data
- User parameter

If a MOVIMOT® inverter has to be replaced, you can re-startup the system by simply re-plugging the Drive ID module without a PC/laptop or data backup.

If, during a device replacement

- the DIP switch setting is not transmitted correctly,
- or a MOVIMOT® inverter with a different part number is used (e.g. with a different device power),

the MOVIMOT® inverter detects a change in configuration. This may reinitialize certain startup parameters.

This is why the MOVIMOT® inverter must only be replaced with a MOVIMOT® inverter with the same part number.

For information on device replacement, refer to chapter "Unit replacement" (→ 🗎 302).

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11.3 DBG keypad

11.3.1 Description

Function

You can use the DBG keypad for parameterization and manual operation of MOVIMOT® drives. In addition to that, the keypad displays important information about the state of the MOVIMOT® drive.

Features

- Illuminated plain text display, up to 7 languages can be set
- Keypad with 21 keys
- Can be connected via extension cable DKG60B (5 m)

Overview

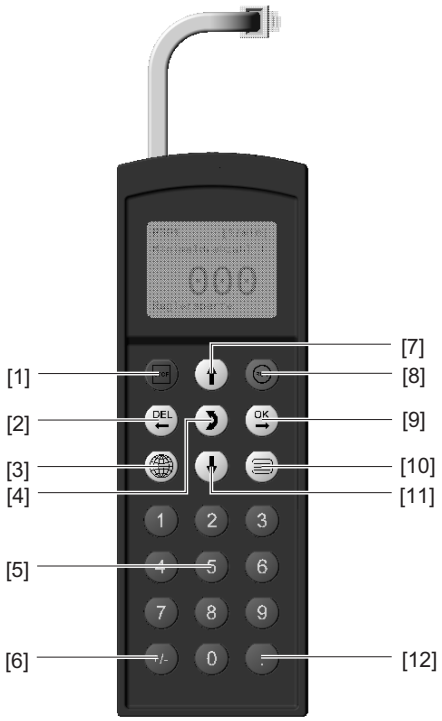
Keypad		Language
	DBG60B-01	DE, EN, FR, IT, ES, PT, NL (German, English, French, Italian, Spanish, Portuguese, Dutch)
	DBG60B-02	DE, EN, FR, FI, SV, DA, TR (German, English, French, Finnish, Swedish, Danish, Turkish)
	DBG60B-03	DE, EN, FR, RU, PL, CS (German, English, French, Russian, Polish, Czech)
	DBG60B-04	DE, EN, FR, ZH (German, English, French, Chinese)

For notes on connecting the DBG keypad, refer to chapter "Connection of DBG keypad" (→ 🖹 168).

NOTICE! Loss of warranted degree of protection if the screw plugs of the f1 setpoint potentiometer or the X50 diagnostic interface are installed incorrectly or not at all. Damage to the MOVIMOT® inverter.
Screw the screw plug back on with the seal after performing parameterization, diagnostics or manual operation.

Key assignment DBG

The following figure shows the key assignment of the DBG keypad:



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[1]	Key	STOP	Stop
[2]	Key	DEL	Delete previous entry
[3]	Key		Select the required language
[4]	Key		Change the menu
[5]	Key	<0> – <9>	Digits 0 – 9
[6]	Key	+/-	Changes signs
[7]	Key		Up arrow, moves up to the next menu item
[8]	Key	RUN	Start
[9]	Key	OK	OK, confirms the entry
[10]	Key		Calls up the context menu
[11]	Key		Down arrow, moves down to the next menu item
[12]	Key	.	Decimal point

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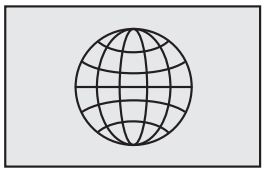
11.3.2 Operation

Selecting a language

1. When the DBG keypad is switched on for the first time or when the delivery state is activated, the following appears on the display for a few seconds:



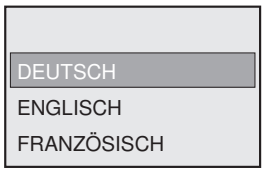
   Afterwards, the display shows the icon for the language selection.



2. Press the  key until the desired language appears.

   Press the  key to confirm your selection.

   The DBG keypad searches for the connected devices and displays them in the device selection list.



Context menu

Use the  key to go to the context menu.

In the context menu of the DBG keypad, the following menu items are available for the MOVIMOT® MM..D inverter:

- "BASIC DISPLAY"
- "PARAMETER MODE"
- "MANUAL MODE"
- "COPY TO DBG"
- "COPY IN MM"
- "DBG DELIVERY"
- "DEVICE SETTINGS"
- "SIGNATURE"
- "EXIT"

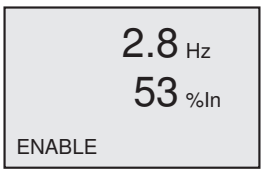
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Basic display

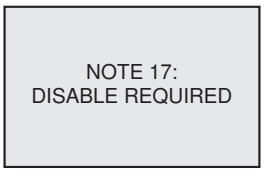
The "BASIC DISPLAY" menu serves to display important characteristic values.



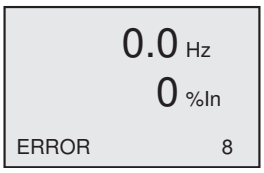
Display for inhibited MOVIMOT® inverter



Display for enabled MOVIMOT® inverter



Information message



Fault display

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Parameter mode

In the "PARAMETER MODE" menu, you can check and change the settings of parameters.

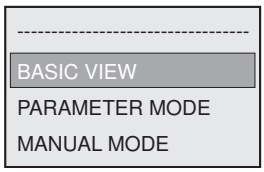
INFORMATION

You can only change parameters if

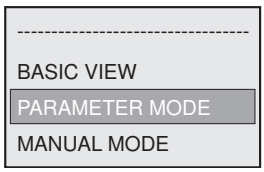
- a drive ID module is plugged into the MOVIMOT® inverter
- and no additional function is active.

To change parameters in parameter mode, proceed as follows:

1. Use the key to call up the context menu. The "PARAMETER MODE" menu item is in the second position.

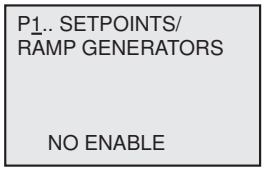


2. Press the key to select the "PARAMETER MODE" menu item.

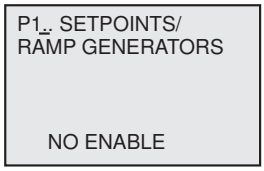


3. Press the key to select "PARAMETER MODE". The first display parameter P000 "SPEED" appears.

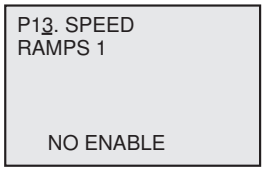
   Use the or key to select main parameter groups 0 – 9.



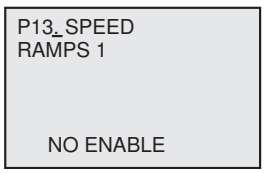
4. Press the key to activate the parameter subgroup selection in the required main parameter group. The flashing cursor moves one digit to the right.



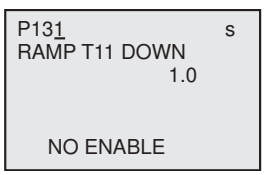
5. Use the or key to select the desired parameter subgroup. The flashing cursor is below the number of the parameter subgroup.



6. Press the key to activate the parameter selection in the required parameter subgroup. The flashing cursor moves one digit to the right.

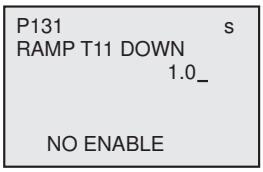


7. Use the or key to select the desired parameter. The flashing cursor is positioned under the third digit of the parameter number.

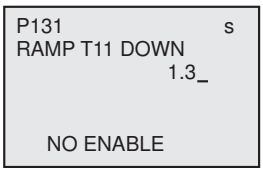


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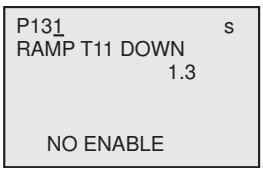
8. Use the OK key to activate the setting mode for the selected parameter. The cursor is below the parameter value.



9. Use the ↑ key or the ↓ key to set the required parameter value.



10. Press the OK key to confirm the setting. To exit the setting mode, press the → key. The flashing cursor is positioned again under the third digit of the parameter number.



11. Use the ↑ or ↓ key to select another parameter, or press the DEL key to switch to the menu of the parameter subgroups.
12. Use the ↑ or ↓ key to select another parameter subgroup or press the DEL key to switch to the menu of the main parameter groups.
13. Use the ☰ key to return to the context menu.

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Manual mode

Activation

⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

When deactivating the manual mode, the binary signals (binary control) or the process data of the master (control via RS485) become active. If the enable signal is present via the binary signals or process data, the MOVIMOT® drive can start up unintentionally when deactivating manual operation.

- Before deactivating the manual mode, set the binary signals or the process data in such way that the MOVIMOT® drive is not enabled.
- The binary signals or process data must only be changed again after deactivating manual operation.

To switch to manual mode, proceed as follows:

1. Use the key to switch to the context menu.
2. Use the or key to select "MANUAL MODE".
   ⇨ Press the key to confirm your selection.

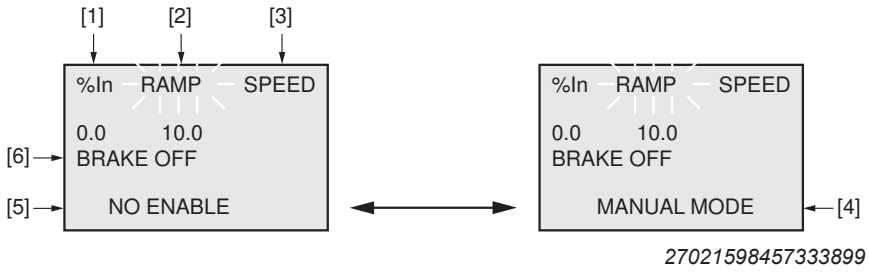
The keypad is now in manual mode.

INFORMATION

If the drive is enabled or the brake is released, you cannot switch to manual mode.

The display shows the message "NOTE 17: INV. ENABLED" for 2 seconds. The operator terminal switches to the context menu.

Display in manual mode



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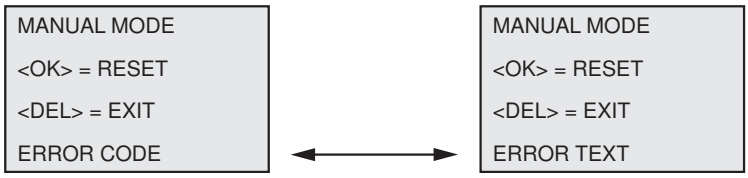
Display alternates every 2 s

[1] Output current in % of $I_{N.}$
[2] Acceleration (speed ramps in [s] in relation to setpoint step change of 50 Hz)
[3] Speed in min^{-1}
[4] Display in manual mode
[5] Inverter status
[6] Brake status

Operation

The following MOVIMOT® function can be executed in the "MANUAL MODE" menu:

Setting the ramp time.	Press the OK key.
	Use the ↑ or ↓ key to set the required ramp time.
	Press the OK key to confirm your entry.
Changing parameters.	Use the ≫ key to switch between parameters "RAMP", "SPEED" and "BRAKE".
	Switch to the "SPEED" parameter.
	The keypad flashes the currently set parameter "SPEED".
Enter speed.	Use the digit keys <0> – <9> to enter the desired speed for manual mode.
	The sign determines the direction of rotation of the drive.
	Press the OK key to confirm your entry.
Starting the drive.	Use the RUN key to start the MOVIMOT® drive.
	During operation, the operator terminal displays the current motor current in [%] of the rated motor current I_N.
Stop drive.	Use the STOP key to stop the MOVIMOT® drive.
Release brake without drive enable.	Press the ≫ key to switch to the "BRAKE" menu item.
	Use the ↑ key or the ↓ key to release or engage the brake without drive enable.
	Press the OK key to confirm your selection.
Reset the fault.	If an error occurs in manual mode, the display shows the following message:



Display alternates every 2 s

Press the OK key to have the DBG operator terminal reset the error.

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During the error reset, the following message is displayed:

MANUAL MODE
PLEASE WAIT...

After the error is reset, manual mode remains active.

The display shows manual mode again.

Deactivation

⚠ WARNING



Risk of crushing if the drive starts up unintentionally.

When deactivating the manual mode, the binary signals (binary control) or process data of the master (control via RS485) become active. If the enable signal is present via the binary signals or the process data, the drive can start up unintentionally when deactivating manual operation.

- Before deactivating the manual mode, set the binary signals or process data in such way that the MOVIMOT® drive is not enabled.
- The binary signals or process data must only be changed again after deactivating manual operation.

Deactivating manual mode

Use the ☰ or DEL ← key to deactivate the manual mode.

The following query appears:

ACTIVATE AUTOMATIC MODE ?
DEL=NO OK=YES

- Press the DEL ← key to return to manual mode.
- Press the OK → key to deactivate manual mode. The context menu appears.

Copy function of the DBG keypad

You can use the DBG keypad to copy the complete parameter set from one MOVIMOT® inverter to other MOVIMOT® inverters as follows:

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

1. In the context menu, select the menu item "COPY TO DBG".
   ⇨ Press the OK → key to confirm your selection.
2. After the copying process, connect the DBG keypad to another MOVIMOT® inverter.
3. In the context menu, select the menu item "COPY TO MM".
   ⇨ Press the OK → key to confirm your selection.

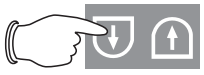
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11.4 MBG11A and MLG..A keypad

INFORMATION

For notes on startup with options MBG11A or MLG..A, refer to chapter "Startup with options MBG11A or MLG..A" (→ 🗎 211).

The following MOVIMOT® functions can be executed with the MBG11A and MBG..A keypads:

Function	Explanation
Display	Negative display value, for example  = CCW rotation Positive display value, e.g.  = CW rotation The displayed value refers to the speed set at setpoint potentiometer f1. Example: Display "50" = 50% of the speed set at the setpoint potentiometer. **NOTICE!** **If the display is "0," the drive is rotating at f_{min}.**
Increase the speed.	For CW rotation:  For CCW rotation: 
Reducing the speed.	For CW rotation:  For CCW rotation: 
Stop MOVIMOT® drive.	Simultaneously pressing the keys:  Display = 
Start MOVIMOT® drive.	 **NOTICE!** **After enable, the MOVIMOT® drive accelerates to the value and direction of rotation saved last.**
Changing the direction of rotation from CW to CCW	1.  until display =  2. Press  again to change the direction of rotation from CW to CCW.
Changing the direction of rotation from CCW to CW	1.  until display =  2. Press  again to change the direction of rotation from CCW to CW.
Memory function	When the supply system 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.

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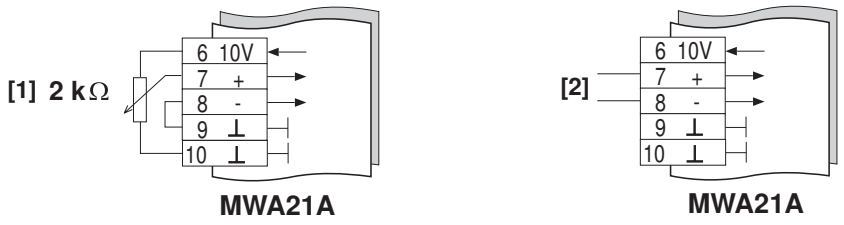
11.5 MWA21A setpoint converter

INFORMATION

- For information about connecting option MWA21A, refer to chapter "Connection of option MWA21A" (→ 🗎 163).
- For notes on startup with option MWA21A, refer to chapter "Startup with option MWA21A" (→ 🗎 213).

11.5.1 Control

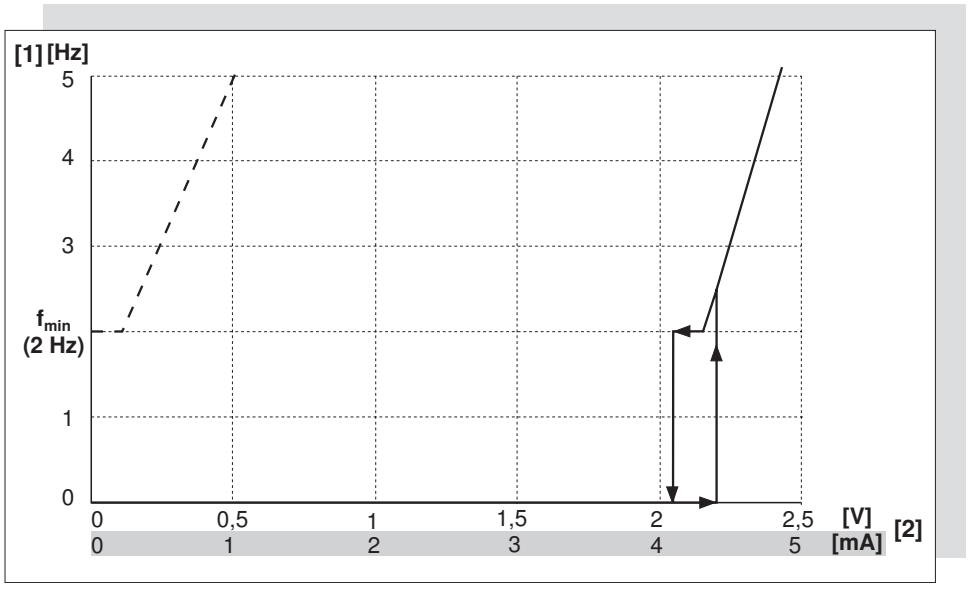
The analog signal at terminals 7 and 8 of option MWA21A is used for controlling the speed of the MOVIMOT® drive from f_{min} to f_{max}.



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[1] Potentiometer using the 10 V reference voltage (alternative 5 kΩ)
[2] Potential-free analog signal

11.5.2 Setpoint stop function



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Setting:
– – – – **0...10 V / 0...20 mA**
——— **2...10 V / 4...20 mA**

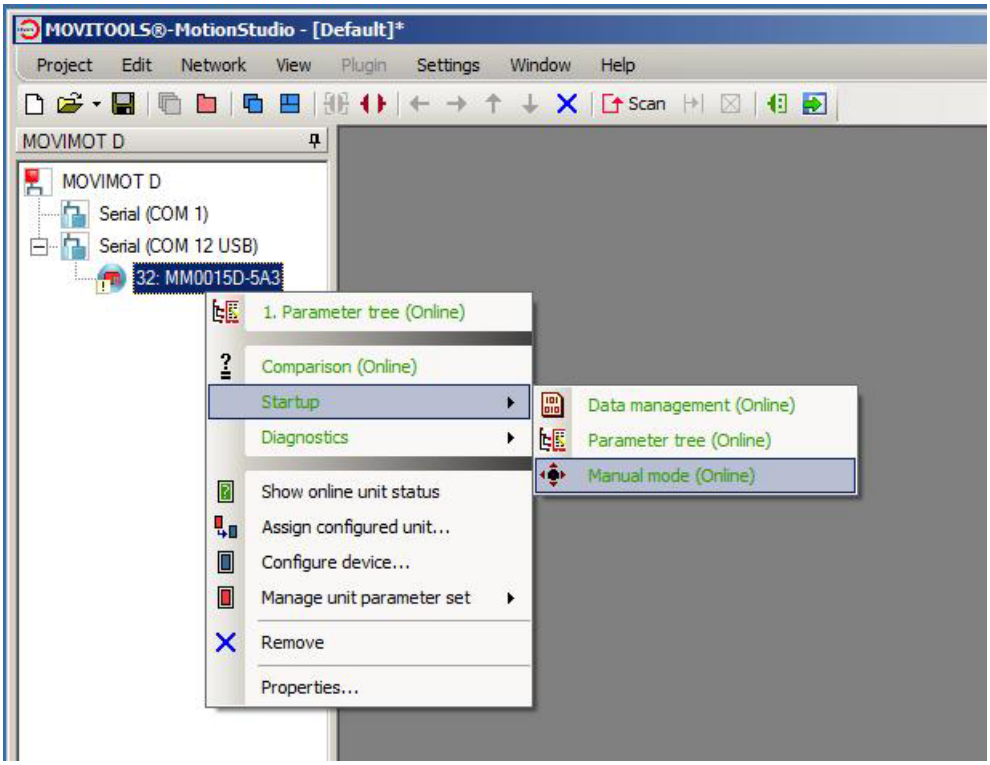
[1] Output frequency
[2] Setpoint

11.6 MOVIMOT® manual mode with MOVITOOLS® MotionStudio

MOVIMOT® drives are equipped with an X50 diagnostics interface for startup and service. This enables diagnostics, manual mode and parameterization.

For manual operation of the MOVIMOT® drive, you can use the manual mode function of the MOVITOOLS® MotionStudio software.

1. Firstly connect the PC/laptop to the MOVIMOT® inverter.
   ⇨ See chapter "PC/laptop connection" (→ 🗎 169).
2. Start the software MOVITOOLS® MotionStudio and integrate the MOVIMOT® inverter in MOVITOOLS® MotionStudio.
   ⇨ See chapter "MOVITOOLS® MotionStudio" (→ 🗎 235).
3. Once the MOVIMOT® inverter is successfully integrated, open the context menu by clicking on the right mouse button and select the menu item "Startup" > "Manual mode".



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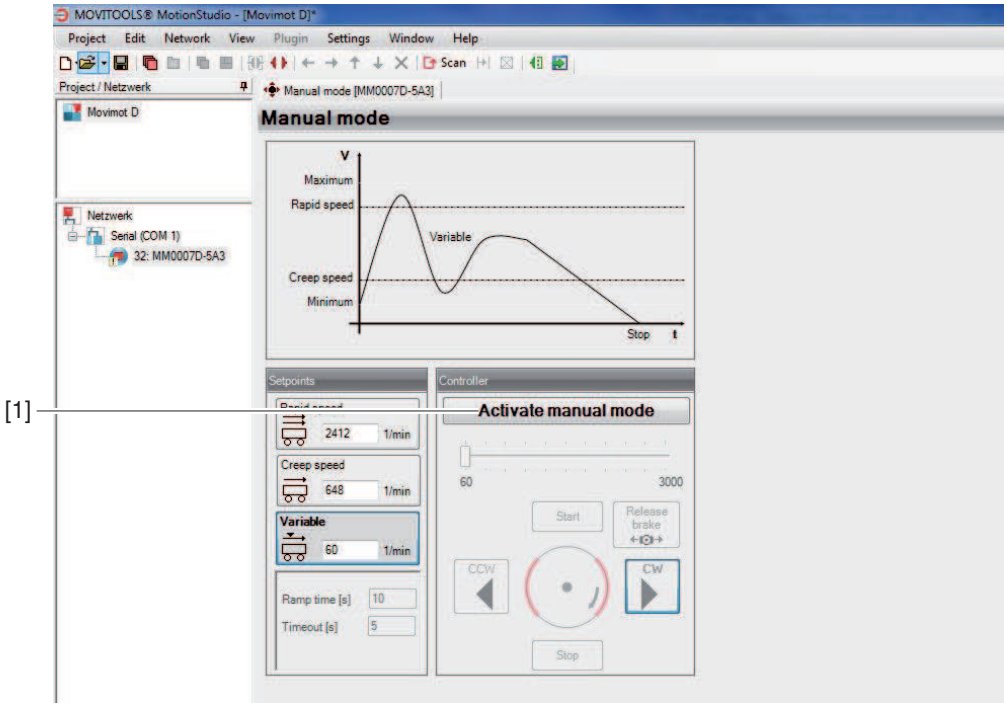
11.6.1 Activating / deactivating manual mode

Activation

Manual mode can only be activated if the MOVIMOT® drive is inhibited.

Activation is **not** possible

- If the brake is released without drive enable
- or if the inverter output stage is enabled to supply a standstill current.



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To activate manual mode, click the [Activate manual mode] button [1].

Parameter *P097 PI 1 Actual value (display value)* signals the higher-level controller that manual mode is active.

Manual mode remains active even after an error reset or after the 24 V supply has been switched off.

Deactivate manual operation before you disconnect the PC/laptop from the MOVIMOT® inverter.

Deactivation

⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- Before deactivating manual mode, reset the signals at the digital inputs and revoke drive enable via process data.
- Take additional safety precautions depending on the application to avoid injury to people and damage to machinery.

Manual operation is deactivated:

- When you click on the [Deactivate manual operation] button
- Or when you close the "Manual operation" window

INFORMATION

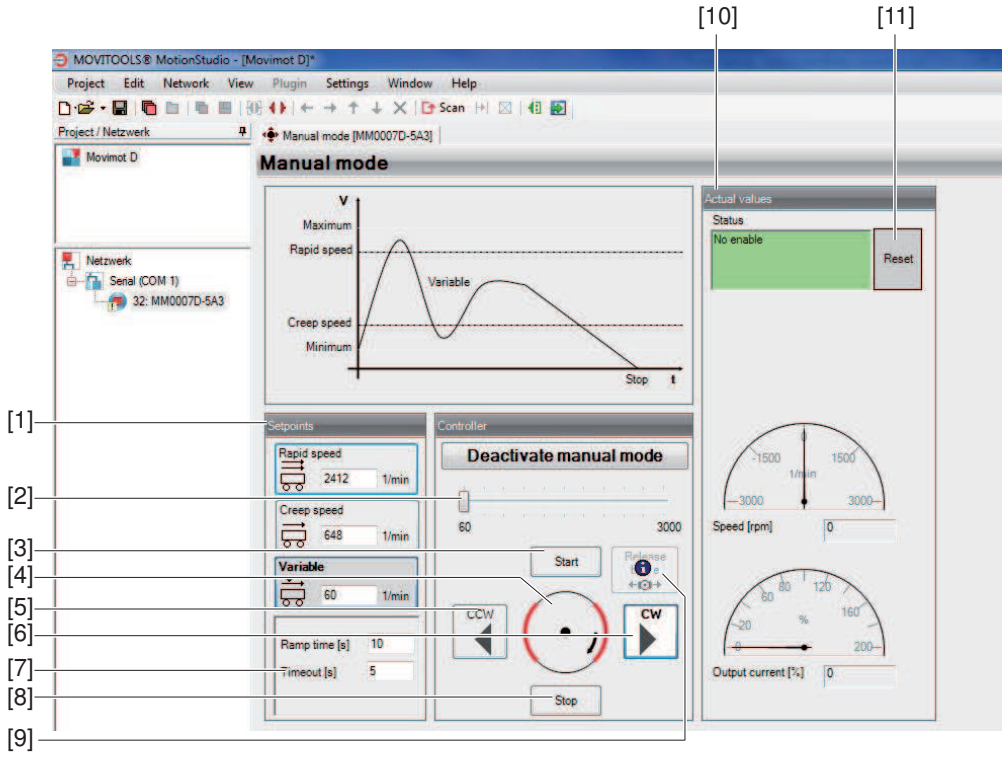
If you deactivate manual operation,

- The signals at the digital inputs become effective in binary control mode.
- The signals at the digital inputs and the process data become effective in RS485 control mode.

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11.6.2 Control in manual mode

Once manual mode has been successfully activated, you can control the MOVIMOT® drive using the controls in the "Manual mode" window of MOVITOOLS® MotionStudio.



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1. Use the slider [2] in the "Control" group to set the variable setpoint speed.
2. Use the buttons [clockwise] [6] or [counterclockwise] [5] to specify the direction of rotation..
3. Click on the [Start] button [3] to enable the MOVIMOT® drive.
   ⇨ The motor axis [4] shown in the "Control" group symbolizes the direction of rotation and the speed of the motor.
4. Use the [Stop] [8] button to stop the drive.

Alternatively, you can enter the setpoints for rapid speed, creep speed or variable speed setpoint directly in the "Setpoints" group [1].

The direction of rotation is defined by the sign (positive = clockwise rotation, negative = counterclockwise rotation).

First enter the setpoint. Press <ENTER> and click on the button that contains the setpoint input field to enable the MOVIMOT® drive.

The group "Actual values" [10] displays the following actual values of the MOVIMOT® drive:

- MOVIMOT® inverter status
- Motor speed in min^{-1}
- Output current of the MOVIMOT® inverter in [%] of I_N

On MOVIMOT® drives with a brake, you can release the brake even without drive enable by activating the "Brake release" check box [9].

INFORMATION

The brake can only be released without drive enable if:

- DIP switch S2/2 = ON
- Or this function is enabled via parameter *P738*

11.6.3 Reset in manual mode

If an error occurs at the MOVIMOT® inverter, you can reset the error by clicking the [Reset] button [11].

11.6.4 Timeout monitoring in manual mode

Timeout monitoring is active during manual mode to prevent uncontrolled operation of the MOVIMOT® drive in case of communication errors.

Enter the timeout time in the "Timeout" edit box [7].

If communication between MOVITOOLS® MotionStudio and MOVIMOT® inverter is interrupted longer than this timeout interval,

- The enable signal for the MOVIMOT® drive unit is revoked
- And the brake is applied.

Manual mode remains active.

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11.7 IT security

11.7.1 Hardening measures



Perform the following hardening measures:

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

11.7.2 Guidelines for secure operation



The engineering protocol from SEW-EURODRIVE allows to activate various interfaces on the device. No authentication takes place and no user account management guidelines are applied that are used to protect against changes or to prevent attacks on IT security.

To prevent misuse of the interfaces, access must be restricted using state-of-the-art technology. For more information, refer to section "IT security of the environment" (→ 🗎 12).

11.7.3 Guidelines for user account management



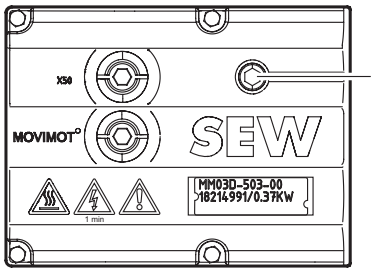
The device has no user accounts.

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12 Service

12.1 Status and error display

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



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[1] MOVIMOT® status LED

12.1.1 Meaning of the status LED

The 3-color status LED indicates the operating and error states of the MOVIMOT® inverter.

LED Color Status	MeaningOperating state error code	Possible cause
Off	Not ready for operation	No 24 V voltage supply.
Yellow Flashing steadily	Not ready for operation	Self-test phase active or 24 V power supply present but line voltage is not OK.
Yellow Flashing steadily fast	Ready	Releasing the brake without drive enable active (only with S2/2 = "ON").
Yellow steady light	Ready but unit inhibited	24 V power supply and line voltage is OK, but no enable signal. If the drive does not run when enable signal is present, check startup.
Yellow 2x flashing, pause	Ready, but manual mode without unit enable	24 V power supply and line voltage OK. Stop manual mode to activate automatic mode.
	Ready, Prioritized fixed setpoint control	Terminals R ↷ and L ↶ are supplied with 24 V. To activate RS485 operation, remove the bridges installed in the factory. See chapter "Electrical installation".
Yellow/green Flashing with alternating colors	Ready, but timeout	Communication is interrupted during cyclical data exchange.
Green Steady light	Device enabled	Motor is in operation.

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LED Color Status	MeaningOperating state error code	Possible cause
Green Flashing steadily fast	Current limit active	Drive is at the current limit.
Green Flashing steadily	Ready	Idle state current function active.
Green 2x flashing, pause	Device enabled	MOVIMOT® drive is in operation. Prioritized fixed setpoint control is active. See chapter "Parameter description" > "Parameter 600".
Green/Red/Green Flashing with alternating colors, pause	Localization function active	Localization function was activated. See parameter 590.
Red 2x flashing, pause	Fault 07	DC link voltage too high.
Red Flashing slowly	Fault 08	Speed monitoring error (only when S2/4 = "ON") or additional function 13 is active.
	Fault 09	Startup fault Additional functions 4, 5, 12 (DIP switches S2/5 – S2/8) are not permitted.
		Firmware does not support MLK..A option (only with MOVIMOT® with AS-Interface).
	Fault 15	24 V supply error
	Error 17 – 24, 37	CPU fault
	Error 25, 94	EEPROM fault
	Error 38, 45	Device and motor data error
	Fault 44	The current limit was exceeded for more than 500 ms. (only with additional function 2)
	Fault 90	Incorrect motor/inverter assignment.
	Fault 97	Error while transmitting a parameter set
Red 3x flashing, pause	Fault 01	Overcurrent in output stage
	Fault 11	Overtemperature in output stage
Red 4x flashing, pause	Fault 84	Motor overload
Red 5x flashing, pause	Fault 4	Brake chopper fault
	Fault 89	Overtemperature of the brake Incorrect motor – frequency inverter assignment. At terminals X1:13– X1:15, both brake and braking resistor are connected. This is not permitted.

LED Color Status	MeaningOperating state error code	Possible cause
Red 6x flashing, pause	Fault 06	Line phase failure
	Fault 81	Start condition
	Fault 82	Output phases are interrupted.
Red steady light	Not ready for operation	Check 24 V supply. A smoothed DC voltage with a maximum residual ripple of 13% must be present.

Flashing codes of the status LED

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

12.2 Fault description

The following table helps you with troubleshooting:

Code	Error	Possible cause	Measure
–	**Communication timeout** (Motor stops, without error code)	Missing connection ⊥, RS+, RS- between MOVIMOT® and RS485 master	Check and establish the connection, especially ground.
		EMC influence	Check the shielding of signal cables and improve, if necessary.
		Incorrect type (cyclical) for acyclical data traffic, the protocol period between the individual telegrams is longer than the set timeout interval.	Check the number of MOVIMOT® drives connected to the master. If the timeout interval is 1 s, for example, you can connect a maximum of 8 MOVIMOT® drives as slaves for cyclical communication. Reduce message cycle, increase timeout interval, or select message type "acyclic".
–	**Supply voltage not present** (Motor stops, without error code)	DC link voltage too low, Power off has been detected.	Check supply system cables and line voltage for interruption.

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Code	Error	Possible cause	Measure
–	**24 V supply not present** (Motor stops, without error code)	24 V supply voltage not present.	Check 24 V supply voltage for interruption. Check the value of the 24 V supply voltage. Permitted voltage: DC 24 V ± 25%, EN 61131-2, residual ripple max. 13% Motor restarts automatically as soon as the voltage reaches normal values.
		AUX power supply voltage not available. (only for MOVIMOT® with AS-Interface)	Check AUX power supply voltage for interruption. Check the value of the AUX power supply voltage. Permitted voltage: DC 24 V ± 25%, EN 61131-2, residual ripple max. 13% Motor restarts automatically as soon as the voltage reaches normal values.
01	**Overcurrent in output stage**	Short circuit of inverter output	Check the connection between the inverter output and the motor as well as the motor winding for short circuits. Reset the error.[1)]
04	**Brake chopper**	Overcurrent in brake output, resistor damaged, resistance too low	Check the connection of the resistor/replace it.
		Short circuit in brake coil	Replace brake.
06	**Phase failure** (The error can only be detected when the drive is under load)	Phase failure	Check the supply system cables for phase failure. Reset the error[1)]
07	**DC link voltage too high**	Ramp time too short.	Extend the ramp time. Reset the error[1)]
		Faulty brake coil/braking resistor connection	Check the braking resistor/brake coil connection. Correct, if necessary. Reset the error[1)]
		Incorrect internal resistance of brake coil/braking resistor	Check internal resistance of brake coil/braking resistor (see operating instructions, chapter "Technical data"). Reset the error[1)]
		Thermal overload in braking resistor, wrong size of braking resistor selected	Dimension the braking resistor correctly. Reset the error[1)]
		Invalid voltage range of line input voltage	Check the line input voltage for permissible voltage range. Reset the error[1)]
08	**Speed monitoring**	Rotational speed deviation due to operation at the current limit	Reduce the drive load. Reset the error[1)]

Code	Error	Possible cause	Measure
09	**Startup**	Improper drive ID module for MOVIMOT® with 230 V supply	For MOVIMOT® with 230 V supply, not all drive ID modules are permitted (see operating instructions, chapter "Assignment of the drive ID module"). Check/correct the drive ID module.
		The additional functions 4, 5, 12 are not permitted for MOVIMOT® MM..D with AS-Interface.	Correct the setting of DIP switches S2/5 to S2/8.
		Firmware does not support MLK..A option (only with MOVIMOT® with AS-Interface).	Contact SEW-EURODRIVE Service.
11	**Thermal overload of the output stage or internal unit error**	Heat sink is dirty.	Clean the heat sink. Reset the error[1)]
		Ambient temperature too high.	Lower the ambient temperature. Reset the error[1)]
		Heat build-up at MOVIMOT® drive.	Prevent heat build-up. Reset the error[1)]
		Drive load too high.	Reduce the drive load. Reset the error[1)]
15	**24 V monitoring**	Voltage dip in the 24 V supply	Check the 24 V supply. Reset the error[1)]
17 - 24 37	**CPU error**	CPU error	Reset the error[1)] If the error reoccurs, contact SEW-EURODRIVE Service.
25	**EEPROM error**	Error when accessing EEPROM	Set parameter *P802* to "Delivery state". Reset the error[1)] Re-parameterize MOVIMOT® inverter. If the error reoccurs, contact SEW-EURODRIVE Service.
26	**External terminal**	External signal at terminal X6: 9.10 **not** present.	Correct/reset external error.
38	**System software error**	Internal error	Contact SEW-EURODRIVE Service.

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Code	Error	Possible cause	Measure
43	**Communication timeout**	Communication timeout during cyclical communication via RS485. If this error occurs, the drive is decelerated and stopped along the set ramp.	Check/re-establish the communication link between the RS485 master and the MOVIMOT® inverter. **NOTICE!** When communication is restored, the drive will be enabled again.
			Check the number of slaves connected to the RS485 master. If the timeout interval of the MOVIMOT® inverter is set to 1 s, you can connect a maximum of 8 MOVIMOT® inverters (slaves) to the RS485 master for cyclical communication.
		Internal communication error (at MOVIMOT® MM..D with AS-Interface)	Contact SEW-EURODRIVE Service.
44	**Current limit exceeded**	The set current limit was exceeded for more than 500 ms. This error is only active with additional function 2. The status LED flashes red.	Reduce load or increase current limit at switch f2 (only with additional function 2).
45	**Device/motor data error during initialization**	Device/motor data error A non-IT-compatible device is connected to the IT system. MOVIMOT® hardware defect	Restore the delivery state (P802). Use an IT system device. Contact SEW-EURODRIVE Service.
81	**Start condition error**	The inverter could not be supplied with the correct amount of current during the premagnetization time. Rated motor power too small in relation to rated inverter power.	Check connection between MOVIMOT® inverter and motor.
82	**Output open error**	Two or all output phases are interrupted.	Check connection between MOVIMOT® inverter and motor.
		Rated motor power too small in relation to rated inverter power.	Check the combination of motor and MOVIMOT® inverter.

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Code	Error	Possible cause	Measure
84	**Thermal overload of the motor**	If the MOVIMOT® inverter is mounted close to the motor, the motor protection is active.	Set DIP switch S1/5 to "ON". Reset the error[1)]
		The performance level is set incorrectly for the combination of MOVIMOT® inverter and motor.	Check the setting of DIP switch S1/6. Reset the error[1)]
		Ambient temperature too high.	Lower the ambient temperature. Reset the error[1)]
		Heat build-up at MOVIMOT® drive.	Prevent heat build-up. Reset the error[1)]
		Motor load too high.	Reduce the load on the motor. Reset the error[1)]
		Speed too low.	Increase the speed. Reset the error[1)]
		If the error is signaled just after the first enable signal.	Check the combination of motor and MOVIMOT® inverter. Reset the error[1)]
		The temperature monitoring in the motor (TH winding thermostat) has tripped when using a MOVIMOT® inverter with the selected extra function 5.	Reduce the load on the motor. Reset the error[1)]
89	**Overtemperature of the brake**	Thermal overload of brake coil	Extend the ramp time. Reset the error[1)]
		Brake coil is defective.	Contact SEW-EURODRIVE Service.
		Brake coil and braking resistor connected.	Connect either brake or braking resistor to drive.
		Brake coil incorrectly connected	See chapters "Connection of MOVIMOT® drive" (→ 🗎 127) and "Connecting without connector" (→ 🗎 150).
		Inverter does not match the motor. (only if error occurs after first enable)	Check the combination of motor (brake coil) and MOVIMOT® inverter. Check/correct the settings of DIP switches S1/6 and S2/1. Reset the error[1)]

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Code	Error	Possible cause	Measure
90	**Output stage detection**	The inverter/motor combination is not permitted.	Check/correct the settings of DIP switches S1/6 and S2/1.
			Check/correct the connection type of the motor.
			Check whether the drive ID module fits the motor and is plugged in correctly.
			Use a MOVIMOT® inverter or a motor with another power rating.
91	**Communication timeout bus module – MOVIMOT®**	Timeout between the fieldbus interface and the MOVIMOT® inverter.	Check/re-establish the communication link between the fieldbus interface and the MOVIMOT® inverter. The fieldbus interface reports the error only to the higher-level controller.
94	**EEPROM checksum error**	EEPROM defective.	Contact SEW-EURODRIVE Service.
97	**Copy error**	DBG keypad or PC/laptop disconnected during the copy process.	Before acknowledging the error, load the factory setting or the complete data set from the DBG keypad or the MOVITOOLS® MotionStudio software.
		Switching the 24 V voltage supply off and on during the copying process.	Before acknowledging the error, load the factory setting or the complete data set from the DBG keypad or the MOVITOOLS® MotionStudio software.

1) With standard MOVIMOT® units, reset the error by switching off the 24 V supply voltage or by performing an error reset. With MOVIMOT® with AS-Interface, reset the error via the AS-Interface signals or by error reset via the diagnostics socket.

12.3 Repairs

All repairs must be carried out by SEW-EURODRIVE only.

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12.4 Unit replacement



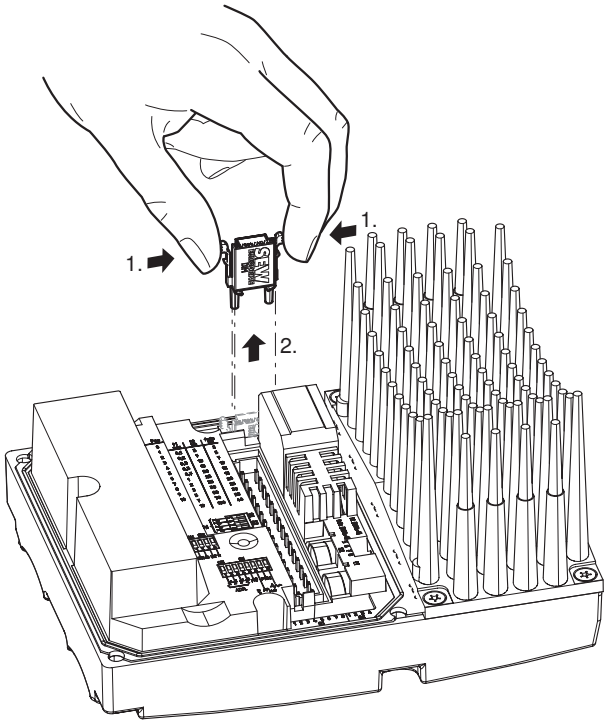
⚠ WARNING

Electric shock from capacitors that have not been fully discharged.

Severe or fatal injuries.

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

1. Remove the screws and take off the MOVIMOT® inverter from the connection box.
2. Compare the data on the nameplate of the previous MOVIMOT® inverter with the data on the nameplate of the new MOVIMOT® inverter.
   ⇨ The MOVIMOT® inverter must only be replaced with a MOVIMOT® inverter with the same part number.
3. Set the following control elements on the new MOVIMOT® inverter according to the control elements of the previous MOVIMOT® inverter:
   ⇨ DIP switch S1
   ⇨ DIP switch S2
   ⇨ Setpoint potentiometer f1
   ⇨ Switch f2
   ⇨ Switch t1
4. Unlock the drive ID module of the new MOVIMOT® inverter and pull it out carefully.



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5. Unlock the drive ID module of the previous MOVIMOT® inverter as well and pull it out carefully.

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6. Insert this drive ID module into the new MOVIMOT® inverter.
   ⇨ Make sure that the drive ID module snaps into place.
7. Place the new MOVIMOT® inverter onto the connection box and screw it in place.
8. Supply voltage to the MOVIMOT® inverter.
   ⇨ When switching on the new inverter the first time after a unit replacement, the 24 V supply must be connected for at least 10 seconds without interruptions.
   ⇨ After the unit replacement, it can take up to 6 s before the MOVIMOT® inverter signals the ready signal.
9. Check whether the new MOVIMOT® inverter is functioning properly.

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12.5 Rotating the connection box

SEW-EURODRIVE always recommends purchasing the prefabricated MOVIMOT® drive with the correct position of cable entries. In exceptional cases, the position of the cable entries can be rotated to the opposite side (only for units with a modular connection box).

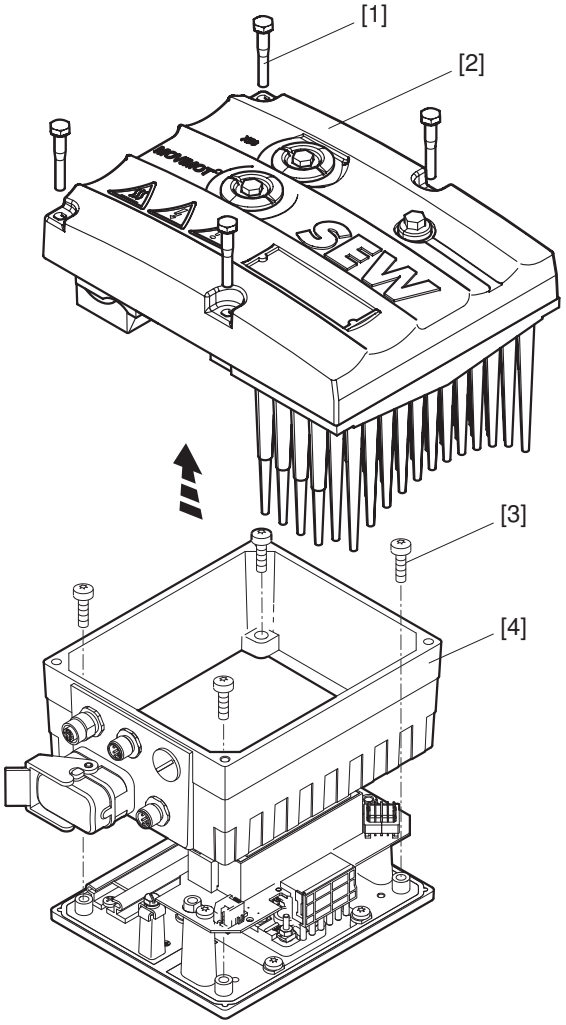
⚠ WARNING

Electric shock from capacitors that have not been fully discharged.

Severe or fatal injuries.

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

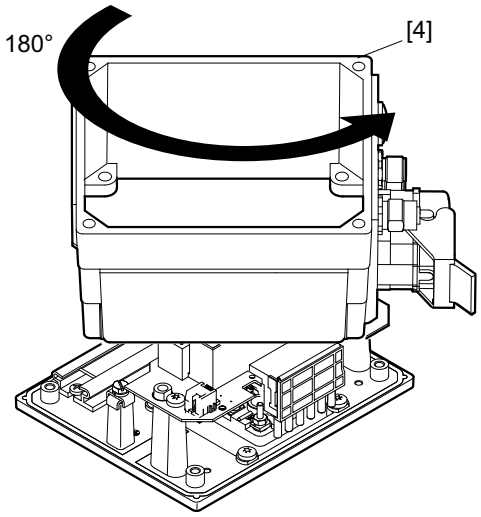
1. Label the connections of the MOVIMOT® inverter before disconnecting them for later re-installation.
2. Disconnect the supply system, control, and sensor connections.
3. Remove the screws [1] and take off the MOVIMOT® inverter [2] from the terminal box.
4. Loosen the screws [3] and remove the connection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



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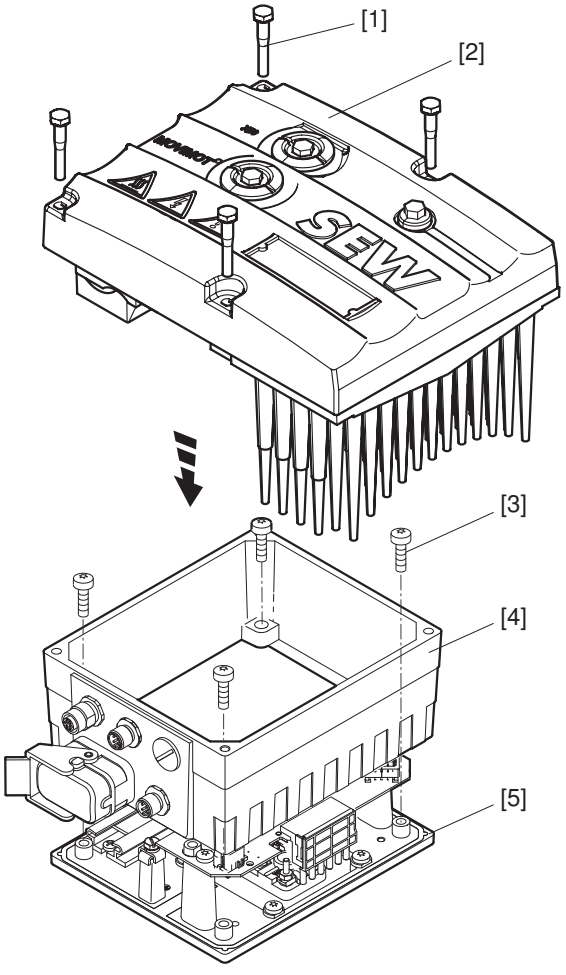
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5. Turn the connection box [4] by 180°.



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6. Place the connection box [4] on the mounting plate [5] and secure it using 4 screws [3].
7. Restore the connections.
8. Place the MOVIMOT® inverter [2] onto the connection box and secure it using 4 screws [1].



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12.6 SEW-EURODRIVE Service

12.6.1 Sending in a device for repair

If a fault cannot be repaired, contact SEW-EURODRIVE Service, see chapter "Contacting SEW-EURODRIVE" (→ 🗎 311).

Always specify the digits of the status label when contacting the SEW-EURODRIVE electronics service team. This will enable our Service personnel to assist you more effectively.

Provide the following information when sending the device in for repair:

- Serial number (see nameplate)
- Type designation
- Unit design
- Short description of the application (application, control type, etc.)
- Type of fault
- Accompanying circumstances
- Your own presumptions
- Unusual events preceding the problems, etc.

12.7 Shutdown

To shut down the MOVIMOT® drive, de-energize the drive using appropriate measures.

⚠ WARNING



Electric shock from capacitors that have not been fully discharged.

Severe or fatal injuries.

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

12.8 Storage

Observe the following instructions when shutting down or storing MOVIMOT® drive:

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

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

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12.9 Extended storage

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

12.9.1 Procedure when maintenance has been neglected

Electrolytic capacitors are used in the inverters. They are subject to aging effects when de-energized. This effect can damage the capacitors if the device is connected directly to the nominal voltage after a longer period of storage.

In the event of failure to perform maintenance, SEW-EURODRIVE recommends that you slowly increase the line voltage 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. Following this regeneration, the device can be used immediately or, with maintenance, remain in extended storage.

The following graduations are recommended:

AC 400/500 V devices:

- 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

12.10 IT security guidelines for secure disposal

12.10.1 Removing the product from its intended environment



If you consider the data stored on the product relevant to IT security, remove the data in accordance with the section "Secure removal of data stored in the product." (→ 🗎 308)

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

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

For data that can be saved with the engineering software from SEW-EURODRIVE, refer to "Deleting data saved using the engineering software" (→ 🗎 308).

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12.10.2 Secure removal of data stored in the product



Some of the data of the product is stored on a removable storage medium (DIM module). If the data on the removable storage medium is classified as sensitive data from the operator's point of view and is not intended for later use, reset the device to the factory settings using MOVITOOLS® MotionStudio before disposing of the data. This also deletes the storage medium content. Alternatively, remove the DIM module and disposed of it through a qualified disposal process.

The following data is deleted/reset:

- Configuration of the device
- Device name
- Device address
- Safety-relevant data

The following data is not reset during this procedure and can be modified individually if available on the described product:

- AS-Interface address
- DIP switch settings
- Potentiometer settings
- Scope recording of the device
- Fault memory

12.10.3 Deleting data saved using the engineering software



Using the MOVITOOLS® MotionStudio engineering software, you can retrieve all product data and store it locally or on remote storage locations.

If the data saved in this way is classified as relevant for IT security, delete the data when removing the product from the environment.

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

Software	Data type	Data volume
MOVITOOLS® MotionStudio	Proprietary SEW device format	< 1 MB

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12.11 Waste disposal

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

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

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

- Oil and grease

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



Waste disposal according to WEEE Directive 2012/19/EU

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

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

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13 Inspection and maintenance

13.1 MOVIMOT® inverter

The MOVIMOT® inverter is maintenance-free. SEW-EURODRIVE does not prescribe any inspection or maintenance work for the MOVIMOT® inverter and the fieldbus interface.

Exception: For extended storage, refer to the instructions in chapter "Extended storage" (→ 🗎 307).

13.2 Motor

The motor requires regular inspection and maintenance work.

Observe the notes and instructions in chapter "Inspection/Maintenance" of the motor operating instructions.

13.3 Gear units (only for MOVIMOT® gearmotors)

The gear unit requires regular inspection and maintenance work.

Observe the notes and instructions in chapter "Inspection/Maintenance" of the gear unit operating instructions.

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14 Contacting SEW-EURODRIVE

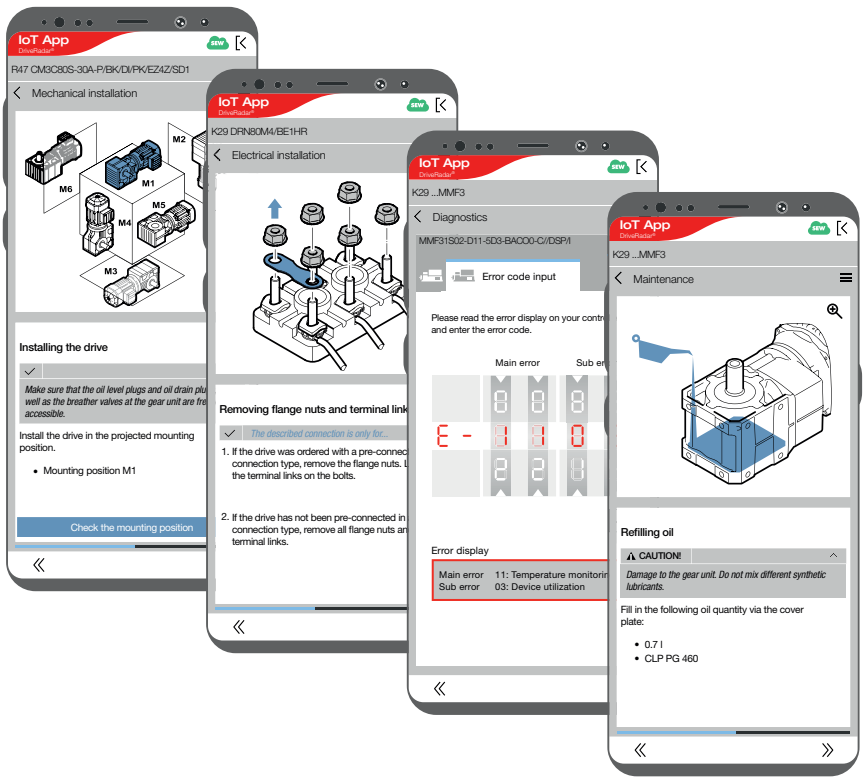
You can find the worldwide contact data and locations on the **SEW-EURODRIVE website** via the following link or the QR code shown below.

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



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IoT App
DriveRadar®



https://iotapp.io

Google Play App Store

THE GREEN SIDE OF DRIVE

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





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