SEW EURODRIVE

# Operating instructions



Decentralized Drive Systems

**MOVIMOT® MM..D with AS-Interface**

Edition 04/2026

33954631/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 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 |

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# 2 Safety notes

## 2.1 Target group

Specialist for mechanical work

All mechanical work must only be carried out by qualified specialists with appropriate training. 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 electrical work

All electrical work must only be carried out by electrically skilled persons with appropriate training. 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 must 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.

## 2.2 IT security

### 2.2.1 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.

### 2.2.2 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" (→ 🗎 8).

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### 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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### 2.2.3 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" (→ 🗎 18) 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.

### 2.2.4 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" (→ 🗎 7)).

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" (→ 🗎 91).

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" (→ 🗎 91).

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

- "Cybersecurity for generation B inverters" manual

## 2.3 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.

### 2.3.1 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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### 2.3.2 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.

## 2.4 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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## 2.5 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.

## 2.6 Installation/assembly

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

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

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

## 2.7 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).

### 2.7.1 Required protective measure

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

### 2.7.2 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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## 2.8 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.

## 2.9 Startup/operation

Observe the safety notes in chapters "Startup" (→ 🗎 45) 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.

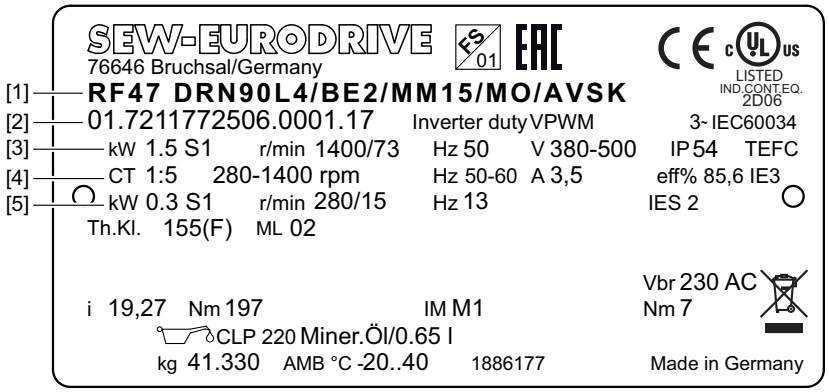
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# 3 Unit design

## 3.1 Type designation MOVIMOT® drive

### 3.1.1 Nameplate

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




*36028798704788619*

| | 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 |

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### 3.1.2 Type designation

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

| | |
|---|---|
| **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] |
| **AVSK** | **Connector for AS-Interface** |

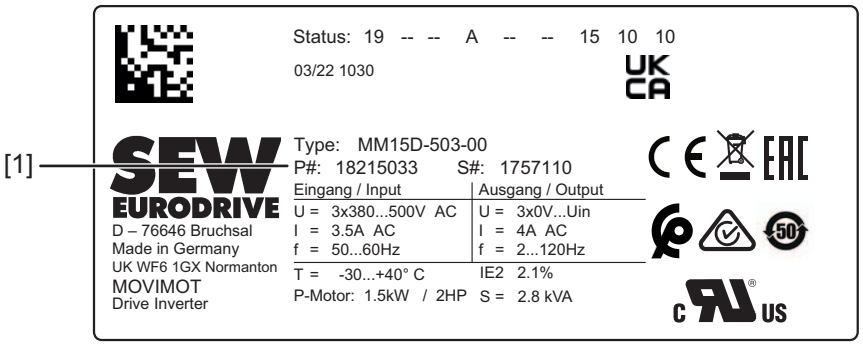
1) The nameplate only displays options installed at the factory.

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## 3.2 MOVIMOT® inverter type designation

### 3.2.1 Nameplate

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




*36028798976891275*

[1] Part number

### 3.2.2 Type designation

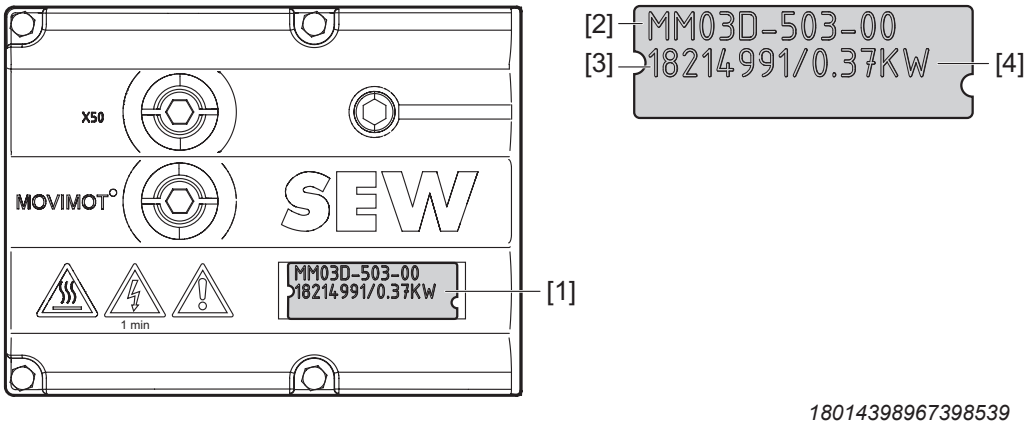
The following table shows an example of the type designation of the MOVIMOT® inverter **MM15D-503-00**:

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

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

### 3.2.3 Unit identification

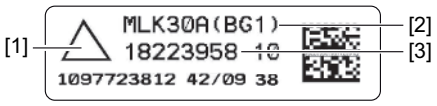
The unit identification [1] on the top of the MOVIMOT® inverter provides information about the inverter type [2], inverter part number [3], device power [4].




*18014398967398539*

### 3.2.4 AS-Interface option nameplate

The following figure shows an example of the nameplate of the AS-Interface option MLK30A:




*9007201609242891*

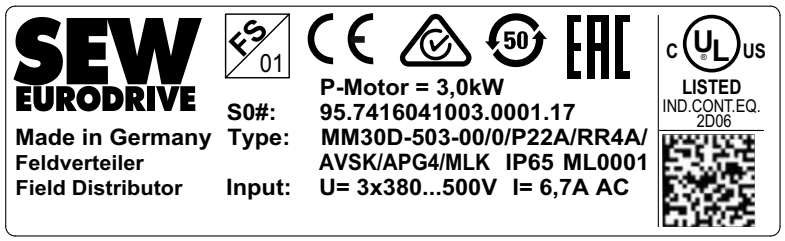
[1] Connection type identification
[2] AS-Interface option – type designation
[3] Part number

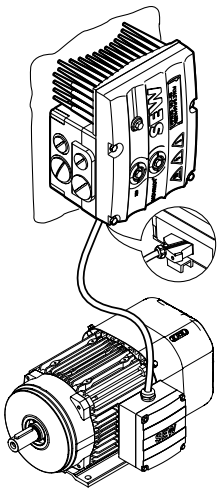
## 3.3 Type designation of the design "mounted close to the motor"

### 3.3.1 Nameplate

Order-specific nameplate

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



General nameplate

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

| Input: | Output to next Field Distributor: |
|---|---|
| U= 3x200...500V<br>Imax= – | U= –<br>Imax= – |
| **Input:** | **Output to drive:** |
| U= 3x200...500V<br>Imax= 3,5...7,3A AC<br>f= 50...60Hz | U= 3x0...Uinput<br>Imax= 4,0...8,7A AC<br>P-Motor= 1,5...4,0kW |

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### 3.3.2 Type designation

The following table shows the type designation for the MOVIMOT® inverter **MM30D-503-00/0/P22A/RR4A/AVSK/APG4/MLK** with mounting close to the motor:

| | |
|---|---|
| **MM30D-503-00** | **MOVIMOT® inverter** |
| **/** | |
| **0** | **Connection type** 0 = ⅄<br>1 = △ |
| **/** | |
| **P22A** | **Adapter for mounting close to the motor** |
| **/** | |
| **RR4A** | **Connection box design** |
| **/** | |
| **AVSK** | **Connector option** |
| **/** | |
| **APG4** | **Connector** for connection to the motor |
| **/** | |
| **MLK** | **Additional feature inverter** [1] |

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

## 3.4 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.

## 3.5 Markings

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

| | |
|---|---|
| CE | CE marking to state compliance with European directives (see EU declaration of conformity or EU declaration of incorporation). |
|  | Products and accessories may fall within the scope of the country-specific transposition of the WEEE Directive. Dispose of the product and its accessories in accordance with the national regulations of your country. |
| c UL US LISTED | The UL and cUL mark indicate UL approval.<br>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. |

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| | |
|---|---|
| NOM | Confirms compliance with the official Mexican standard NOM-016-ENER-2016, energy efficiency of AC induction motors. |
| UKCA | 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). |
| 50 | 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. |
| KC | The KC mark declares compliance with §3 of Article 58-2 for the Korean Radio Wave Act. |

### 3.5.1 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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# 4 Mechanical installation

## 4.1 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.

## 4.2 Tools required

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

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## 4.3 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<br>• ISO j6 at Ø ≤ 26 mm<br>• ISO k6 with Ø ≥ 38 mm up to ≤ 48 mm<br>• ISO m6 at Ø > 55 mm<br>• Centering bore according to DIN 332, shape DR.. | Centering shoulder tolerance according to EN 50347<br>• ISO j6 at Ø ≤ 250 mm<br>• ISO h6 at Ø > 300 mm |

## 4.4 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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## 4.5 Installation of MOVIMOT® gearmotor

### 4.5.1 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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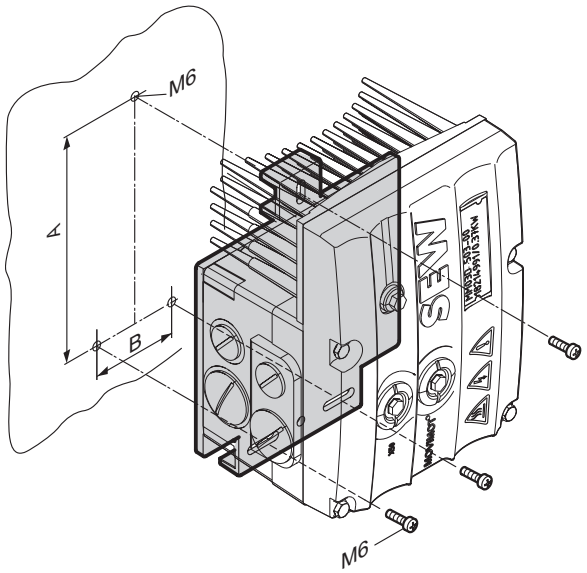
### 4.5.2 Installation in damp areas or outdoors

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.

## 4.6 Mounting MOVIMOT® inverter close to the motor

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



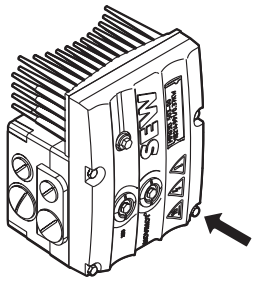

*18014398967759755*

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

## 4.7 Tightening torques

### 4.7.1 MOVIMOT® inverter

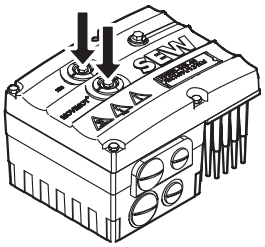
Tighten the retaining screws of the MOVIMOT® inverter to 3.0 Nm in diametrically opposite sequence.



*18014398968059915*

### 4.7.2 Screw plugs

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

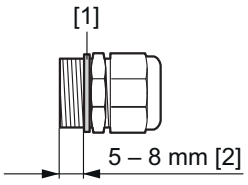


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### 4.7.3 Cable glands

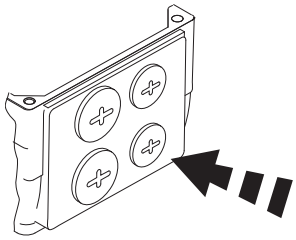
Observe the manufacturer's specifications and the following information for cable glands:

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




### 4.7.4 Screw plugs for cable entries

Tighten screw plugs with 2.5 Nm.

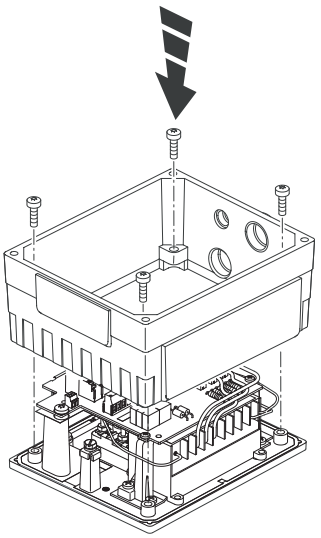


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### 4.7.5 Modular connection box

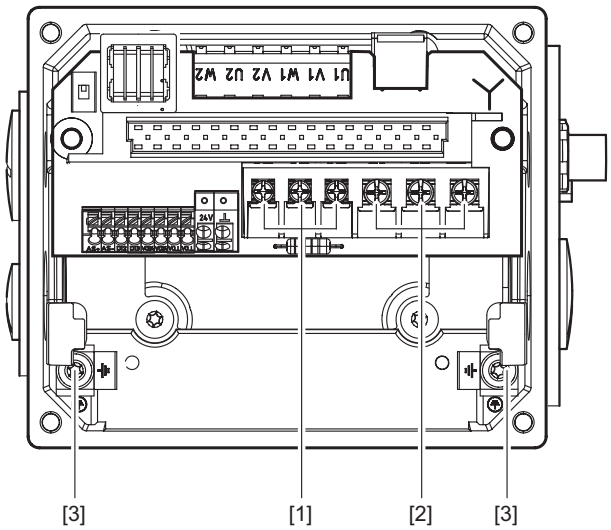
Tighten the retaining screws of the connection box on the mounting plate to 3.3 Nm.



322786187

### 4.7.6 Tightening torques for terminals

Observe the following tightening torques for terminals during installation work:




1143643275

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

# 5 Electrical installation

## 5.1 Installation notes

Observe the following information on electrical installation:

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

## 5.2 Installation instructions

### 5.2.1 Connecting power supply cables

- 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 supply system cable behind the supply bus junction, see chapter "A design with AVSK plug connector".

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

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

  Dimension the fuses according to the cable cross section.
- SEW-EURODRIVE recommends using insulation monitors with pulse-code measurement in voltage supply systems with a non-grounded star point (IT systems). Using such devices prevents false tripping of the insulation monitor due to the earth capacitance of the inverter.
- Dimension the cable cross section according to the input current $I_{supply}$ for rated power (see chapter "Technical data").

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### 5.2.2 Permitted cable cross section of the MOVIMOT® terminals

**Power terminals**

Observe the permitted cable cross sections for installation:

| Power terminals | |
|---|---|
| **Cable cross section** | 1.0 mm² – 4.0 mm² (2 x 4.0 mm²) |
| **Conductor end sleeves** | • **For single assignment:**<br>Connect only single-wire conductors or flexible conductors with conductor end sleeves (DIN 46228, material E-CU) **with or without plastic collars**.<br>• **For double assignment:**<br>Connect only flexible conductors with conductor end sleeve (DIN 46228 - 1, material E-CU) **without plastic collar**.<br>• Permitted length of the conductor end sleeve: at least 8 mm |

**24 V AUX-PWR terminals**

Observe the permitted cable cross sections for installation:

| 24 V AUX PWR terminal ("24V"/"⊥") for MLK30A , MLK31A | |
|---|---|
| **Cable cross section** | 0.2 mm² to 2.5 mm² |

## INFORMATION

MOVIMOT® with MLK32A is connected to the 24 V AUX-PWR using a M12 connector. For MOVIMOT® with MLK32A, the terminals "24V" and "⊥" are only permitted for internal wiring.

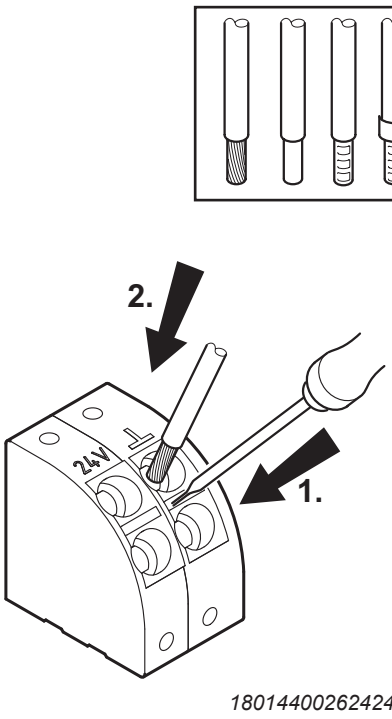
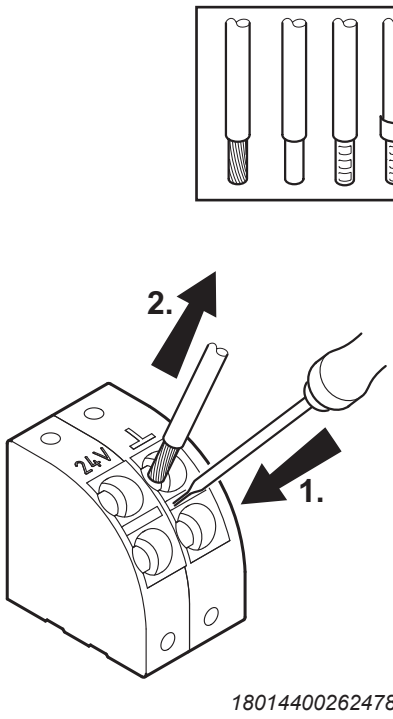
**Control terminals**

Observe the permitted cable cross sections for installation:

| Control terminals | |
|---|---|
| **Cable cross section**<br>• Single-wire conductor (bare wire)<br>• Flexible conductor (bare litz wire)<br>• Conductor end sleeve **without** plastic collar | 0.5 mm² – 1.0 mm² |
| • Conductor end sleeve **with** plastic collar | 0.5 mm² – 0.75 mm² |
| **Conductor end sleeves** | • Connect only single-wire conductors or flexible wire conductors **with or without** conductor end sleeve (DIN 46228, material E-CU).<br>• Permitted length of the conductor end sleeve: at least 8 mm |

### 5.2.3 Activating the 24-V-AUX-PWR terminals X5:1 – X5:2

(AUX PWR at MLK30A or MLK31A)

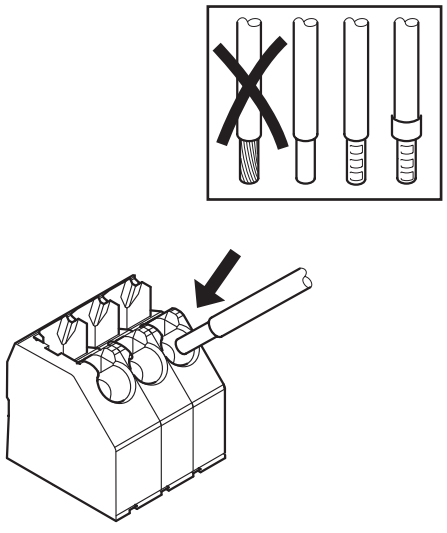
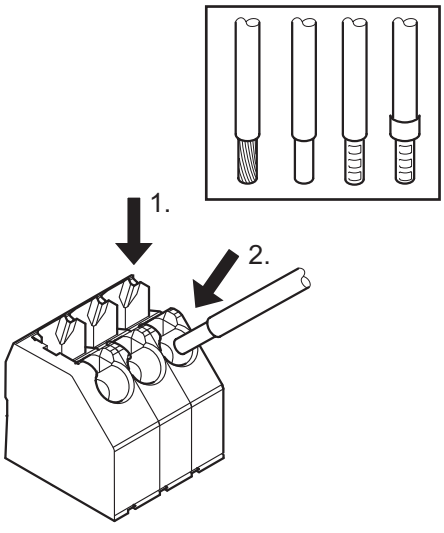
| Connect the conductor. | Loosen the conductor. |
|---|---|
|  18014400262424075 |  18014400262478219 |
| Before inserting or removing the conductor, you must insert a screwdriver (max. blade width: 3.5 mm) into the central opening to open the clamping spring. | |

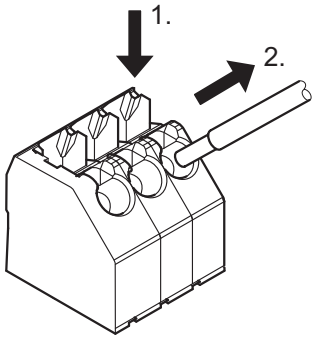
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### 5.2.4 Activating control terminals X6:1 – X6:8

(MOVIMOT® control terminals)

Observe the following information when actuating the control terminals:

| **Connect conductor, without pressing the activation button.** | **Connect conductor, after pressing the activation button.** |
|---|---|
|  *18014399174706827* |   *18014399877894923* |
| The following conductors can be plugged directly (without tools) up to at least 2 cross section stages below the nominal cross section:<br>• Single-wire conductors<br>• Flexible conductors with conductor end sleeves | When connecting the following conductors, you must press the actuating button at the top to open the clamping spring:<br>• Untreated, flexible conductors<br>• Conductors with small cross sections that do not allow direct insertion |

| **Loosen the conductor.**<br>**First press the activation button.** |
|---|
|   |

Before loosening the conductor, press the actuating button on top.

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### 5.2.5 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.

### 5.2.6 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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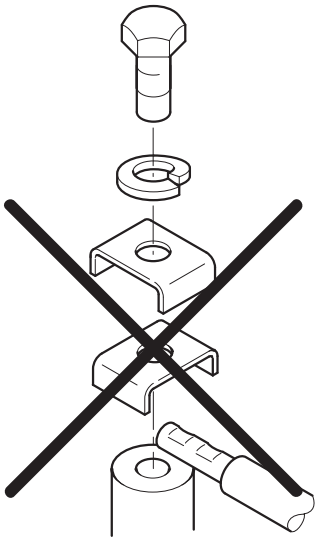
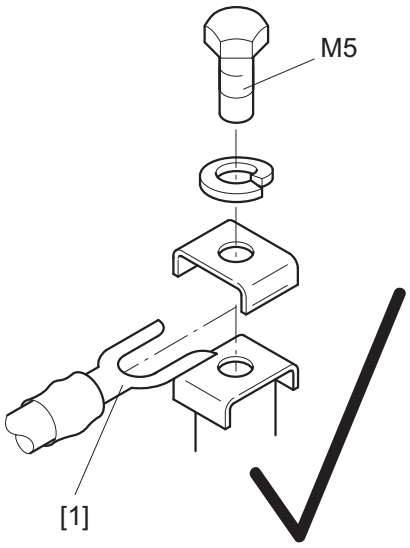
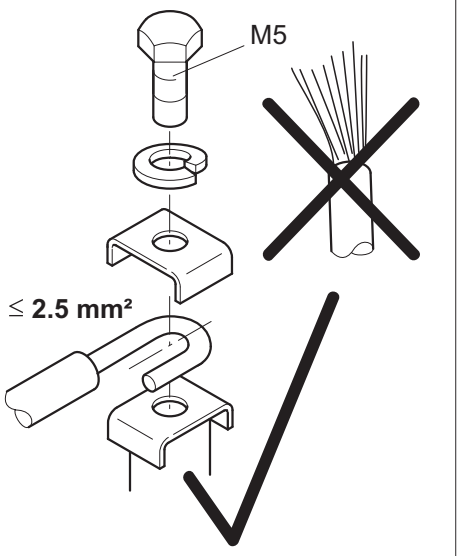
### 5.2.7 Information on PE connection

**⚠ 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:<br>Installation with forked cable lug<br>Permitted for all cross sections | Installation with solid connection wire<br>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.

### 5.2.8 Protection devices

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

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### 5.2.9 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.

### 5.2.10 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.

**Field wiring power terminals**

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

**Short circuit current rating**

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

**For 240 V systems:**

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

250 V minimum, 25 A maximum inverse time circuit breakers

The max. voltage is limited to 240 V.

**For 500 V systems:**

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

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

The max. voltage is limited to 500 V.

*Group installation*

**For 240 V systems:**

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

**For 500 V systems:**

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

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### 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 |

### Motor overload protection

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

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

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

### Ambient temperature

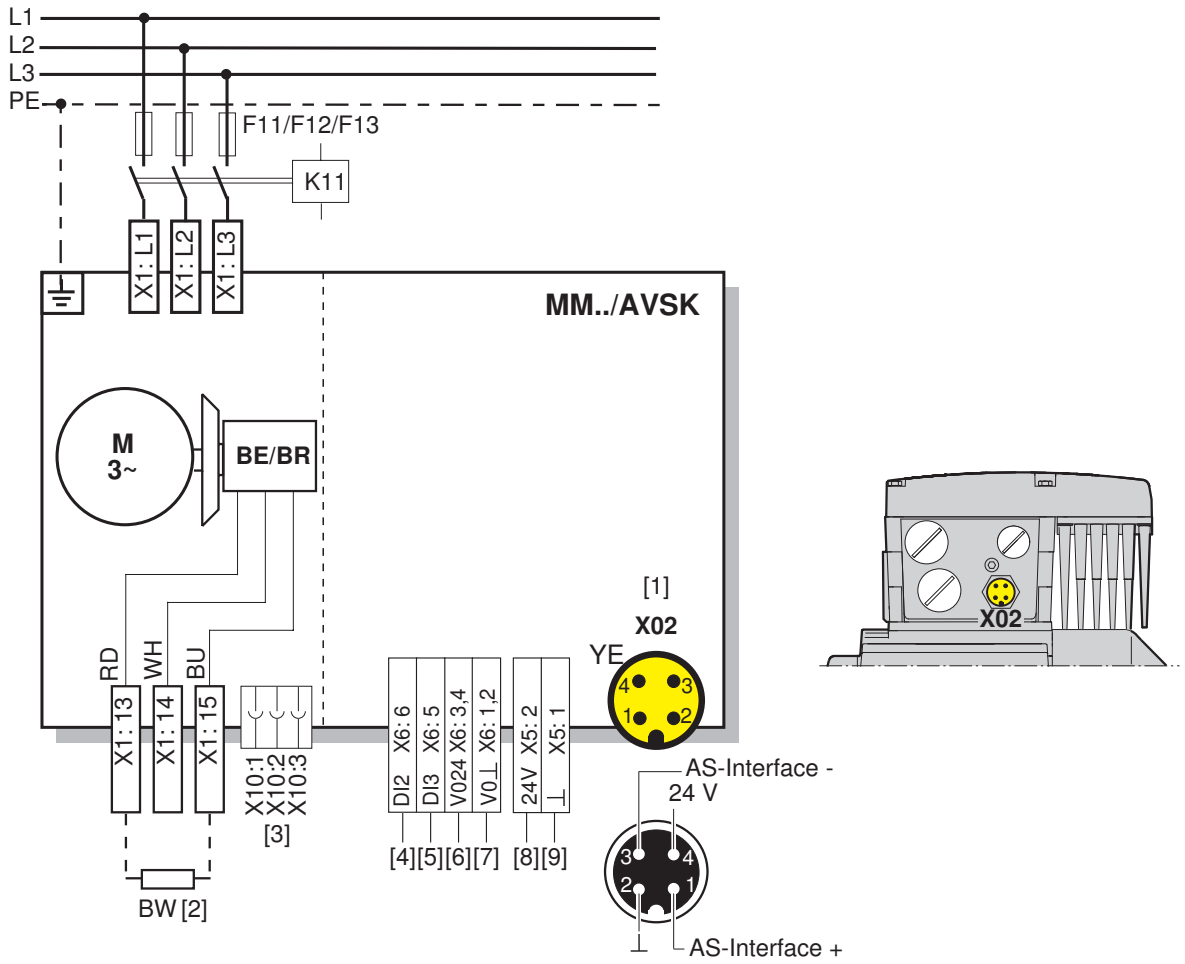
The devices are suitable for an ambient temperature of 40 °C, max. 60 °C respectively 55 °C (Z.9 only) with derated output current. To determine the output current rating at higher than 40 °C, the output current should be derated 3.0 % per °C between 40 °C and 60 °C respectively 55°C (Z.9 only).

- Only use certified units with a limited output voltage ($V_{max}$ = DC 30 V) and limited output current (I ≤ 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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## 5.3 Connection of MOVIMOT® MM../AVSK (connection option A)

The following figure shows the connection in MM../AVSK design:




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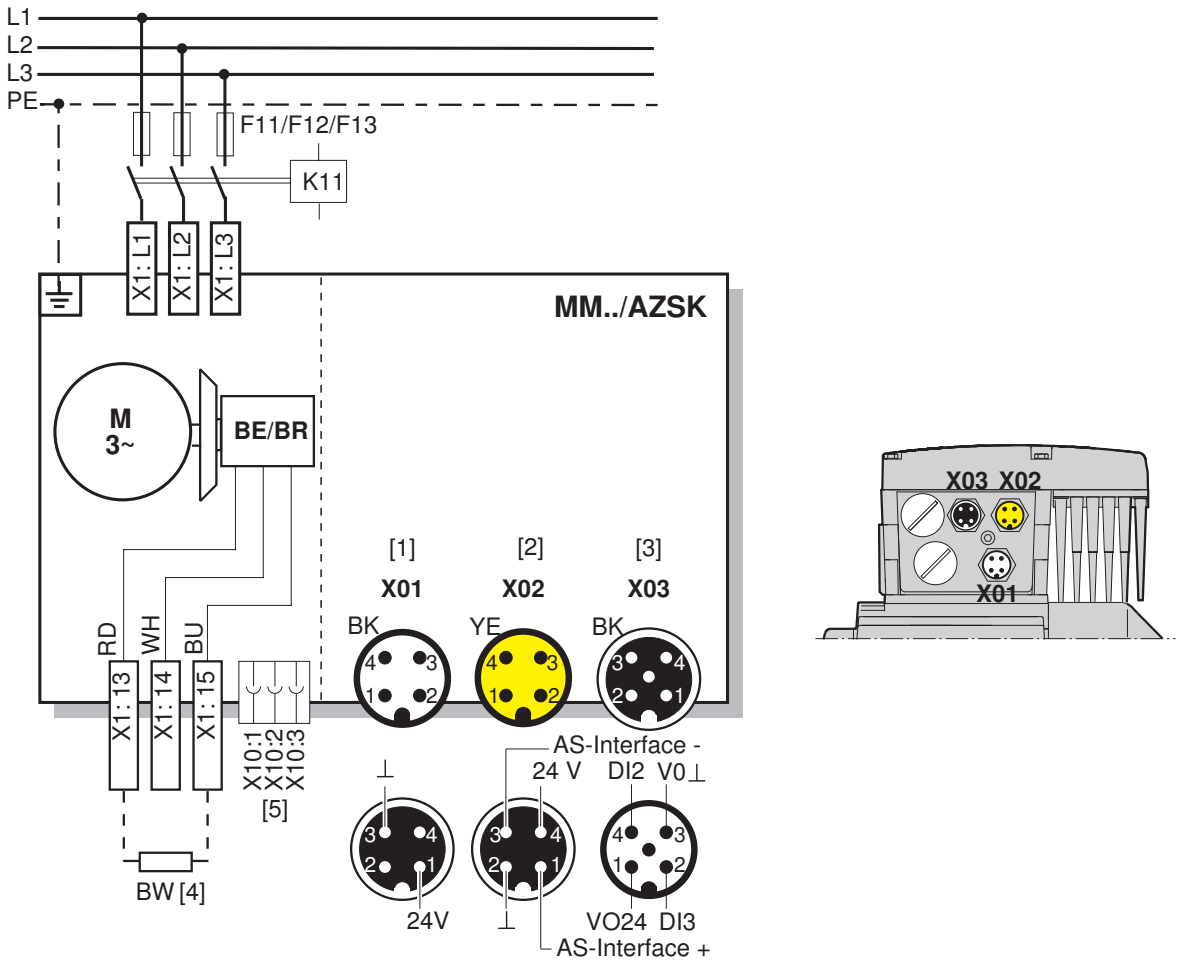
| AVSK connector | | | |
|---|---|---|---|
| [1] | **X02:**<br>M12 connector<br>(male, yellow) | 1 AS-Interface + | AS-Interface data line + |
| | | 2 0 V | AUX-PWR reference potential |
| | | 3 AS-Interface - | AS-Interface data line - |
| | | 4 24 V | 24 V supply AUX PWR |

[2] BW.. braking resistor (only for MOVIMOT® without mechanical brake)
[3] Connector for connecting the BEM option
[4] DI2 sensor input
[5] DI3 sensor input
[6] 24 V voltage supply for sensors
[7] 0 V reference potential for sensors
[8] 24 V supply AUX PWR (only for MLK30A and MLK31A)
[9] Reference potential AUX PWR (only for MLK30A and MLK31A)

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## 5.4 Connection of MOVIMOT® MM../AZSK (connection option B)

The following figure shows the connection in MM../AZSK design:




*36028798141969035*

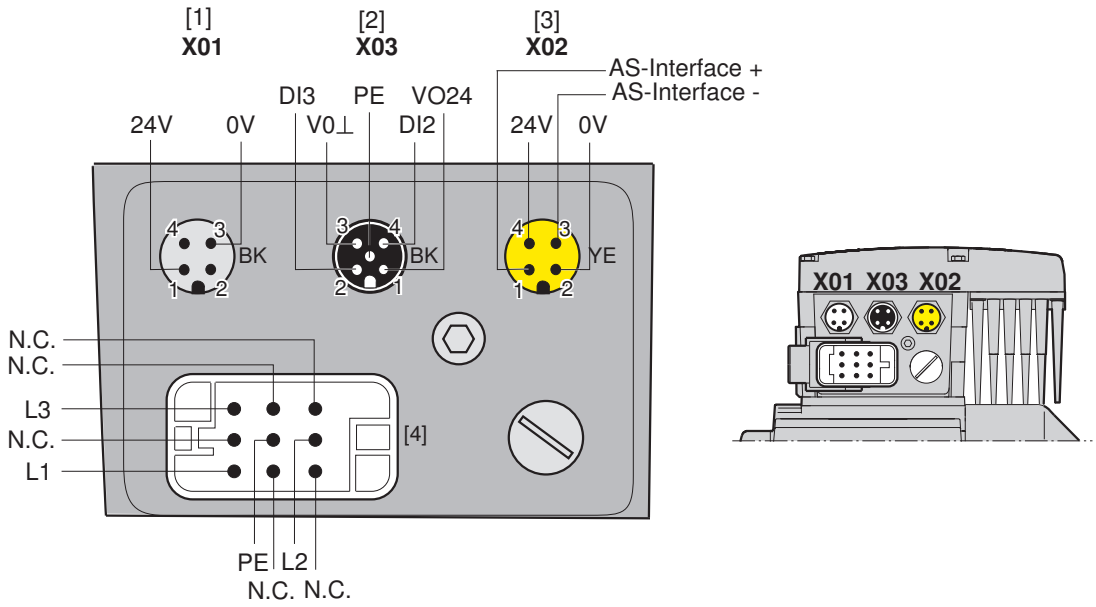
| AZSK connector | | | |
|---|---|---|---|
| [1] | **X01:**<br>M12 connector<br>(male, black) | 1 24 V | 24 V supply (AUX-PWR) |
| | | 2 N.C. | Not assigned |
| | | 3 0 V | AUX-PWR reference potential |
| | | 4 N.C. | Not assigned |
| [2] | **X02:**<br>M12 connector<br>(male, yellow) | 1 AS-Interface + | AS-Interface data line + |
| | | 2 0 V | AUX-PWR reference potential |
| | | 3 AS-Interface - | AS-Interface data line - |
| | | 4 24 V | 24 V supply (AUX-PWR) |
| [3] | **X03:**<br>M12 connector<br>(female, black) | 1 VO24 | 24 V voltage supply for sensors |
| | | 2 DI3 | DI3 sensor input |
| | | 3 V0⊥ | 0 V reference potential for sensors |
| | | 4 DI2 | DI2 sensor input |
| | | 5 PI | PE |

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

[5] Connector for connecting the BEM option

## 5.5 Connection of MOVIMOT® MM../AND3/AZSK (connection option C)

The following figure shows the connection in MM../AND3/AZSK design:



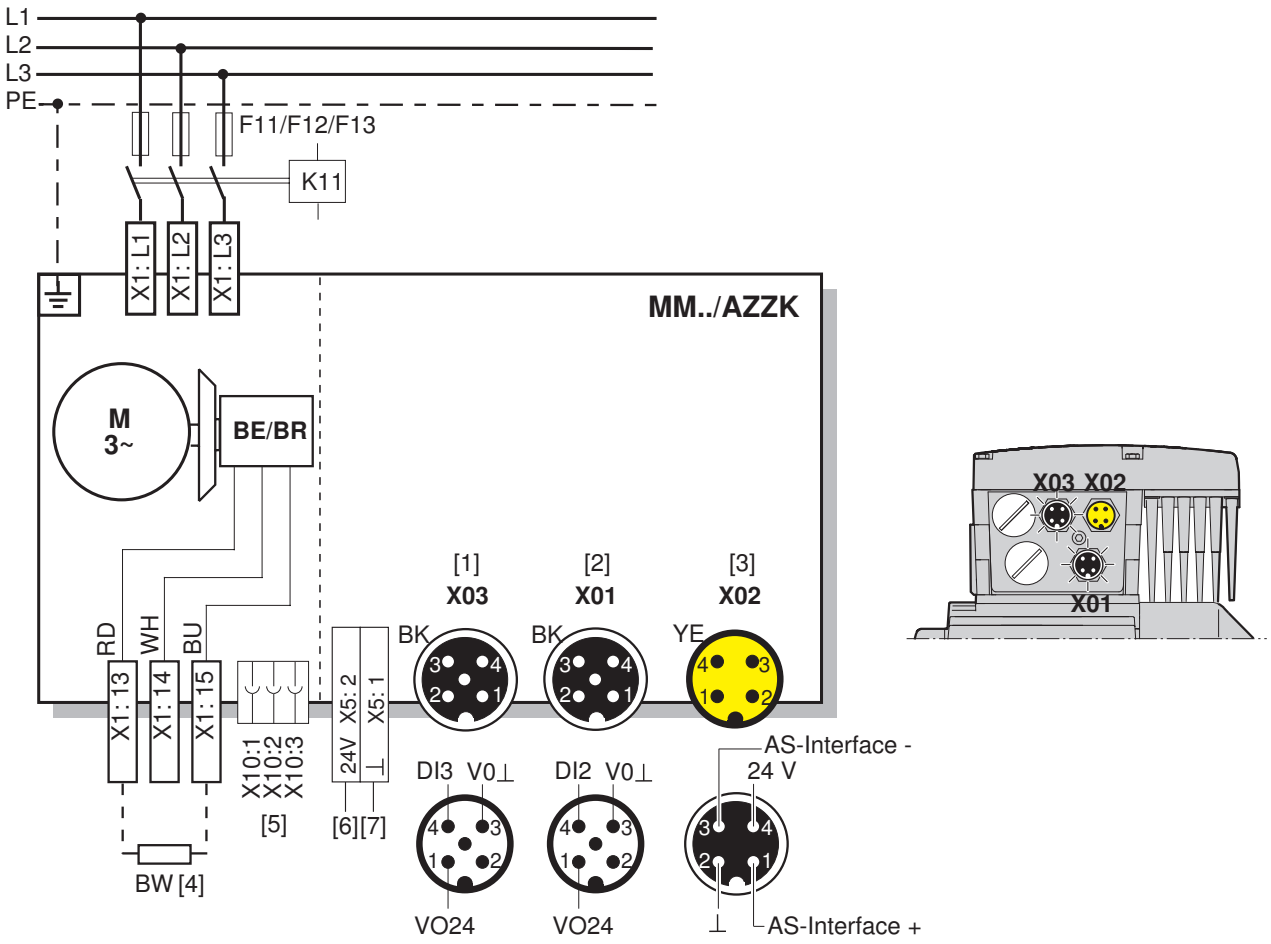

*45035997397817355*

| | | | |
|---|---|---|---|
| **AZSK connector** | | | |
| [1] | **X01:**<br>M12 connector<br>(male, black) | 1 24 V | 24 V supply (AUX-PWR) |
| | | 2 N.C. | Not assigned |
| | | 3 0 V | AUX-PWR reference potential |
| | | 4 N.C. | Not assigned |
| [2] | **X03:**<br>M12 connector<br>(female, black) | 1 VO24 | 24 V voltage supply for sensors |
| | | 2 DI3 | DI3 sensor input |
| | | 3 V0⊥ | 0 V reference potential for sensors |
| | | 4 DI2 | DI2 sensor input |
| | | 5 PI | PE |
| [3] | **X02:**<br>M12 connector<br>(male, yellow) | 1 AS-Interface + | AS-Interface data line + |
| | | 2 0 V | AUX-PWR reference potential |
| | | 3 AS-Interface - | AS-Interface data line - |
| | | 4 24 V | 24 V supply (AUX-PWR) |
| **AND3 connector** | | | |
| [4] | AND3 connector<br>(male) | 1 N.C. | Not connected (reserved for N) |
| | | 2 L2 | L2 line connection |
| | | 3 N.C. | Not assigned |
| | | 4 N.C. | Not assigned |
| | | 5 N.C. | Not assigned |
| | | 6 L3 | L3 line connection |
| | | 7 N.C. | Not assigned |
| | | 8 L1 | L1 line connection |
| | | PE | PE |

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## 5.6 Connection of MOVIMOT® MM../AZZK (connection option D1/D2)

The following figure shows the connection in MM../AZZK design:




*45035998028123659*

| AZZK connector | | | |
|---|---|---|---|
| [1] | **X03:** M12 connector (female, black) | 1 VO24 | 24 V voltage supply for sensors |
| | | 2 N.C. | Not assigned |
| | | 3 V0⊥ | 0 V reference potential for sensors |
| | | 4 DI3 | DI3 sensor input |
| | | 5 PI | PE |
| [2] | **X01:** M12 connector (Socket, black) | 1 VO24 | 24 V voltage supply for sensors |
| | | 2 N.C. | Not assigned |
| | | 3 V0⊥ | 0 V reference potential for sensors |
| | | 4 DI2 | DI2 sensor input |
| | | 5 PI | PE |
| [3] | **X02:** M12 connector (male, yellow) | 1 AS-Interface + | AS-Interface data line + |
| | | 2 0 V | AUX-PWR reference potential |
| | | 3 AS-Interface - | AS-Interface data line - |
| | | 4 24 V | 24 V supply AUX PWR |

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

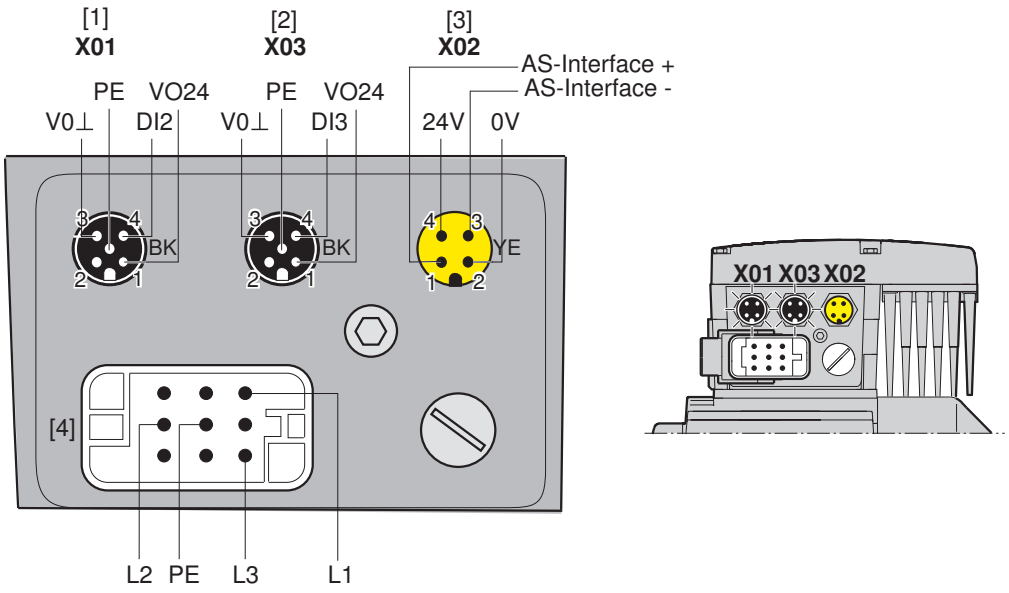
[5] Connector for connecting the BEM option

[6] 24 V supply AUX PWR (only for MLK30A and MLK31A)

[7] Reference potential AUX PWR (only for MLK30A and MLK31A)

## 5.7 Connection of MOVIMOT® MM../AND3/AZZK (connection option D3/D4)

The following figure shows the connection in MM../AND3/AZZK design:




*54043196718803595*

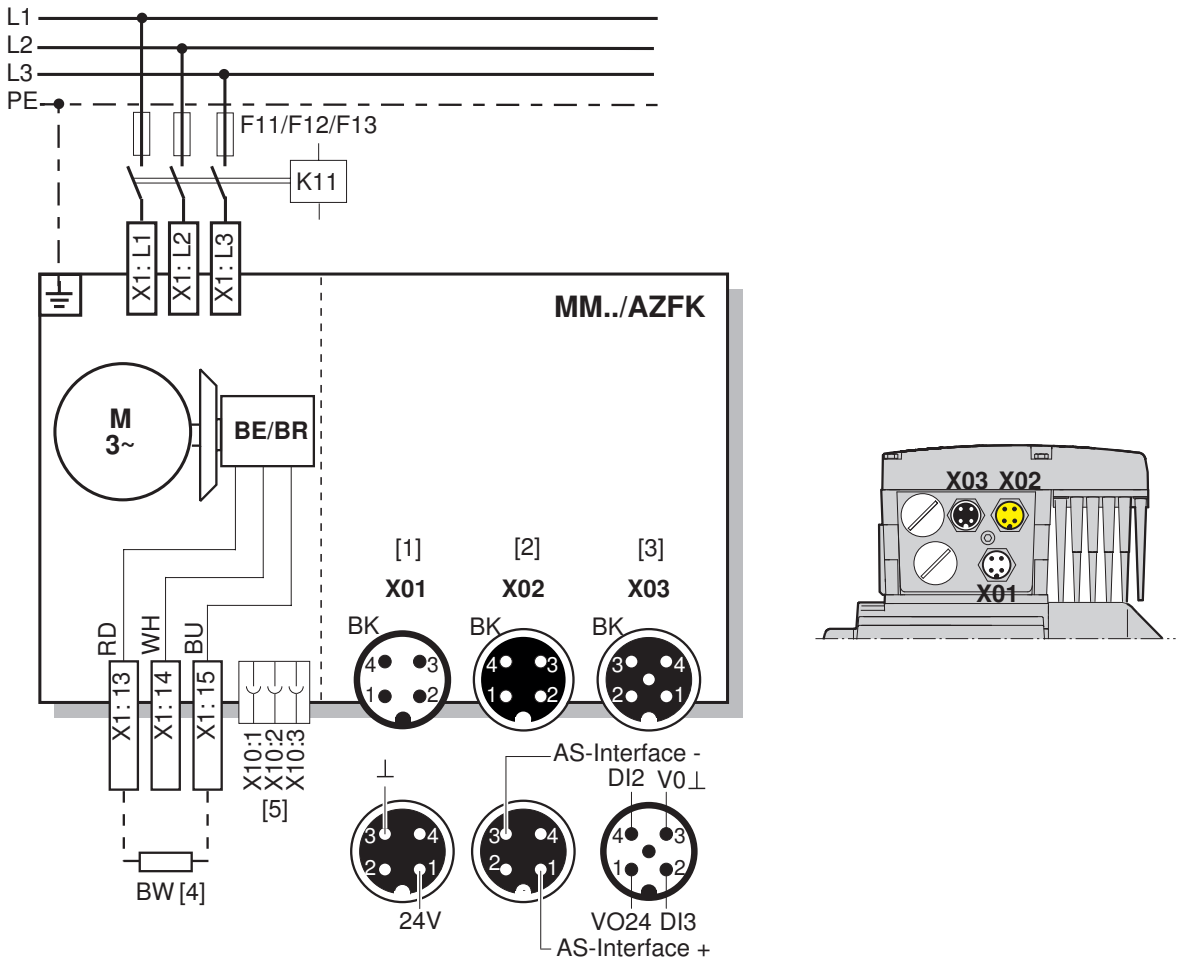
| | | | |
|---|---|---|---|
| **AZZK connector** | | | |
| [1] | **X01:** M12 connector (female, black) | 1 VO24 | 24 V voltage supply for sensors |
| | | 2 N.C. | Not assigned |
| | | 3 V0⊥ | 0 V reference potential for sensors |
| | | 4 DI2 | DI2 sensor input |
| | | 5 PI | PE |
| [2] | **X03:** M12 connector (female, black) | 1 VO24 | 24 V voltage supply for sensors |
| | | 2 N.C. | Not assigned |
| | | 3 V0⊥ | 0 V reference potential for sensors |
| | | 4 DI3 | DI3 sensor input |
| | | 5 PI | PE |
| [3] | **X02:** M12 connector (male, yellow) | 1 AS-Interface + | AS-Interface data line + |
| | | 2 0 V | AUX-PWR reference potential |
| | | 3 AS-Interface - | AS-Interface data line - |
| | | 4 24 V | 24 V supply (AUX-PWR) |
| **AND3 connector** | | | |
| [4] | AND3 connector (Connector)[1)] | L2 | L2 line connection |
| | | L3 | L3 line connection |
| | | L1 | L1 line connection |
| | | PE | PE |

1) Any pins not described are not assigned.

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## 5.8 Connection of MOVIMOT® MM../AZFK (connection option E)

The following figure shows the connection in MM../AZFK design:




18014414036691211

| AZFK connector | | | |
|---|---|---|---|
| [1] | **X01:** M12 connector (male, black) | 1 24 V | 24 V supply (AUX-PWR) |
| | | 2 N.C. | Not assigned |
| | | 3 0 V | AUX-PWR reference potential |
| | | 4 N.C. | Not assigned |
| [2] | **X02:** M12 connector (male, black) | 1 AS-Interface + | AS-Interface data line + |
| | | 2 N.C. | Not assigned |
| | | 3 AS-Interface - | AS-Interface data line - |
| | | 4 N.C. | Not assigned |
| [3] | **X03:** M12 connector (female, black) | 1 VO24 | 24 V voltage supply for sensors |
| | | 2 DI3 | DI3 sensor input |
| | | 3 V0⊥ | 0 V reference potential for sensors |
| | | 4 DI2 | DI2 sensor input |
| | | 5 PI | PE |

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

[5] Connector for connecting the BEM option

## 5.9 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.

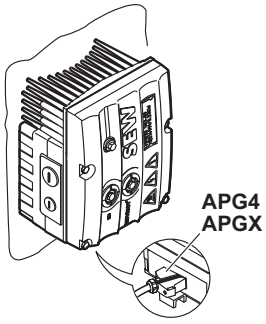
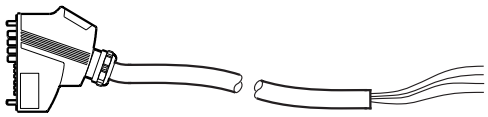
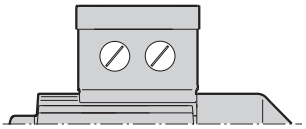
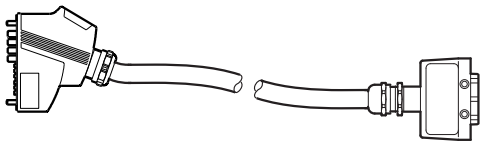
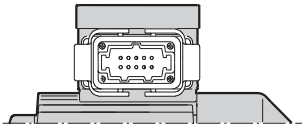
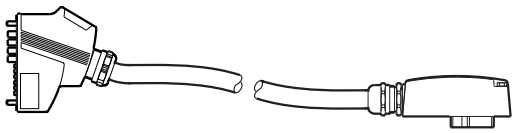
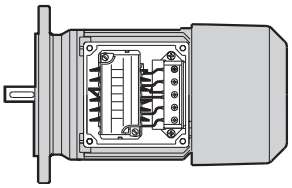
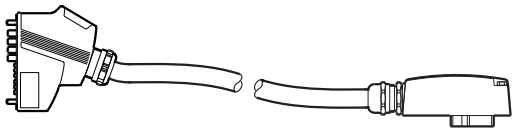
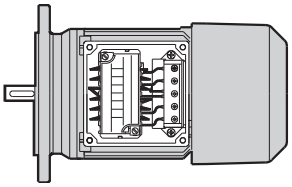
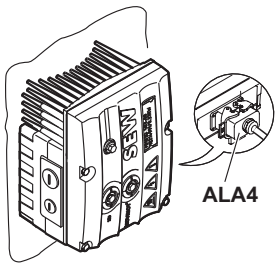
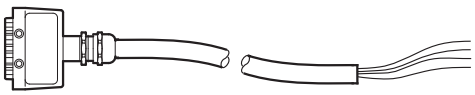
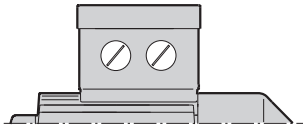
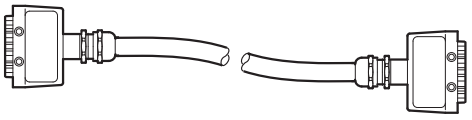
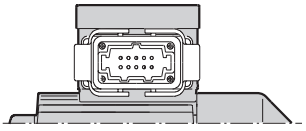
### 5.9.1 Implementing the motor protection

The implementation of the motor protection and the possible motor plug connectors depend on the selected connection option:

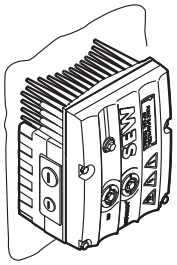
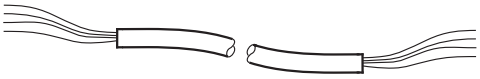
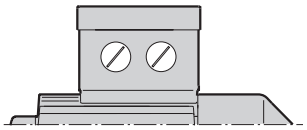
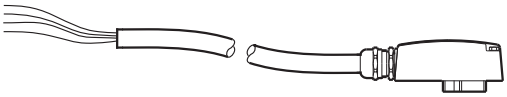
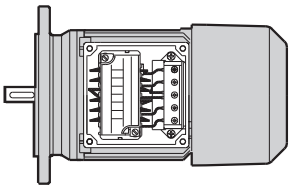
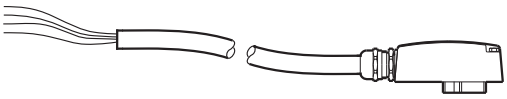
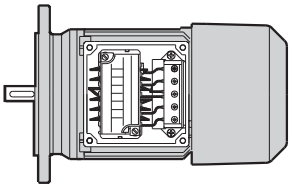
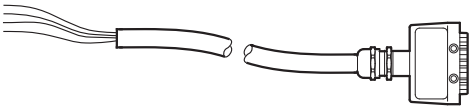
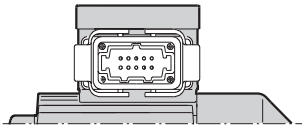
| Connection option | Implementing motor protection | Motor plug connector |
|---|---|---|
| • **MM../AVSK** | TH motor protection (bimetallic thermostat).<br>Connection at sensor input DI2 | • APG4<br>• ALA4<br>• Terminals |
| | Motor protection by thermal motor protection model.<br>Activated by parameters *P340* and *P347*.<br>See chapter "Motor protection" (→ 🗎 67). | • APGX<br>• Terminals |
| • **MM../AZSK**<br>• **MM../AND3/AZSK**<br>• **MM../AZZK**<br>• **MM../AND3/AZZK**<br>• **MM../AZFK** | Motor protection by thermal motor protection model.<br>Activated by parameters *P340* and *P347*.<br>See chapter "Motor protection" (→ 🗎 67). | • APGX<br>• Terminals |

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

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

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

### 5.9.3 Hybrid cable connection

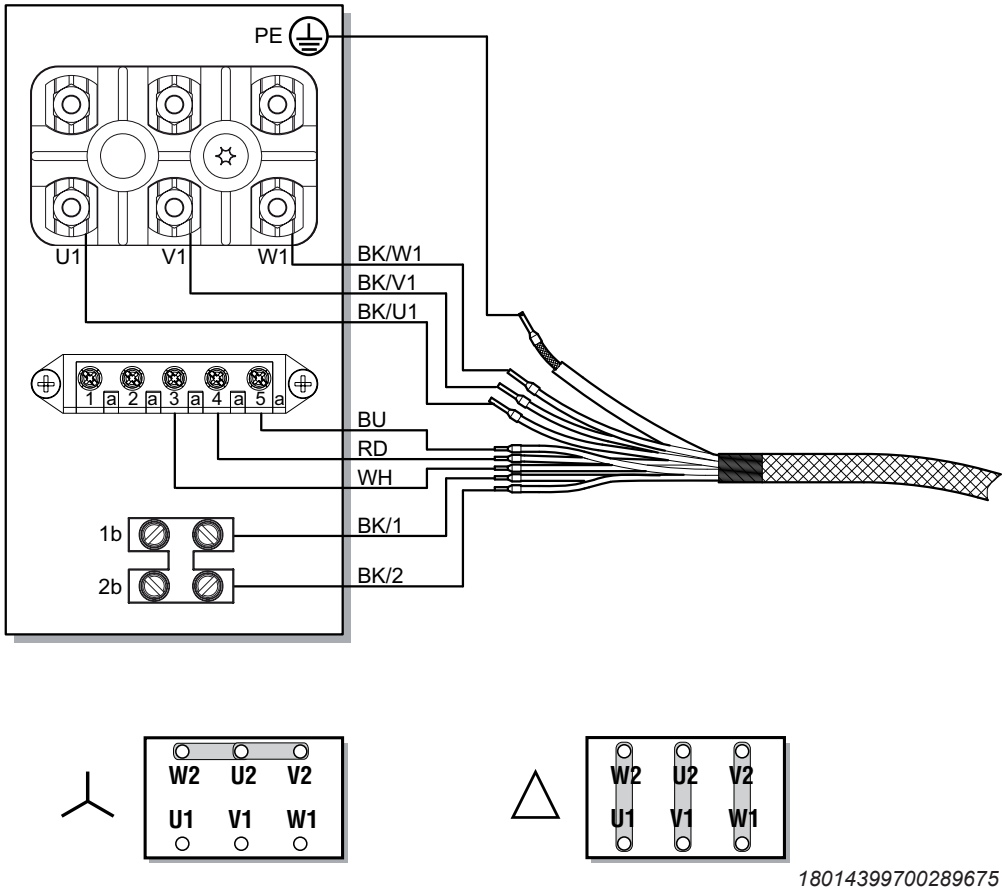
The following table shows the conductor assignment of the hybrid cables with part numbers 01867423 and 08179484 and the corresponding motor terminals of the motor DR..:

| 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 |

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| Motor terminal motor DR.. | Wire color/hybrid cable designation |
|---|---|
| **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:




*18014399700289675*

## 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.

## 5.10 PC/laptop connection

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

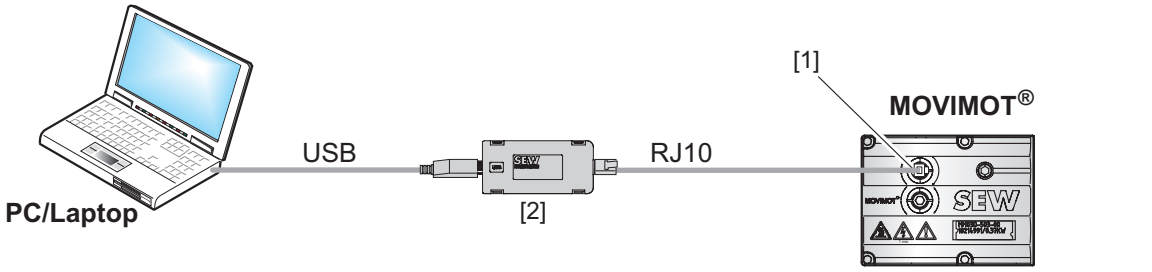
The diagnostic interface [1] is located underneath the screw plug on top of the MOVIMOT® inverter.

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 |

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# 6 Startup

## 6.1 Overview

You can select one of the following modes for starting up MOVIMOT® drives with AS-Interface:

Startup in Easy mode

When you select Easy mode, MOVIMOT® is started up quickly and easily using DIP switches S1, S2 and switches f2, t1.

Observe the following chapter during startup:

- For MOVIMOT® with **MLK30A** in Easy mode:
  - Chapter "Startup of MOVIMOT® with MLK.. in Easy mode" (→ 🗎 47)

Startup in Expert mode

An extended scope of parameters is available for startup in Expert mode. You can use the MOVITOOLS® MotionStudio software or the DBG keypad to adjust the parameters to the application.

The startup in Expert mode depends on the AS-Interface option of the MOVIMOT® drive.

Observe the following chapters during startup:

- For MOVIMOT® with **MLK30A** in Expert mode:
  - Chapter "Startup of MOVIMOT® with MLK.. in Easy mode" (→ 🗎 47)
    (only description of control elements, DIP switch, additional functions)
  - Chapter "Startup of MOVIMOT® with MLK.. in Expert mode" (→ 🗎 69)
  - Chapter "Startup of MLK30A"
- For MOVIMOT® with **MLK31A** in Expert mode:
  - Chapter "Startup of MOVIMOT® with MLK.. in Easy mode" (→ 🗎 47)
    (only description of control elements, DIP switch, additional functions)
  - Chapter "Startup of MOVIMOT® with MLK.. in Expert mode" (→ 🗎 69)
  - Chapter "Startup of MLK31A"
- For MOVIMOT® with **MLK32A** in Expert mode:
  - Chapter "Startup of MOVIMOT® with MLK.. in Easy mode" (→ 🗎 47)
    (only description of control elements, DIP switch, additional functions)
  - Chapter "Startup of MOVIMOT® with MLK.. in Expert mode" (→ 🗎 69)
  - Chapter "Startup of MLK32A"

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## 6.2 General information concerning startup

### INFORMATION

You must comply with the general safety notes in the chapter "Safety notes" during startup.

### ⚠ 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, also 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 cables during operation.

### INFORMATION

- Remove the paint protection caps from the status LED and the two AS-Interface LEDs 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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## 6.3 Startup of MOVIMOT® with MLK.. in Easy mode

### INFORMATION

When you select Easy mode, MOVIMOT® is started up quickly and easily using DIP switches S1, S2 and switches f2, t1.

### 6.3.1 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.

### 6.3.2 Description of the control elements

**Setpoint potentiometer f1**

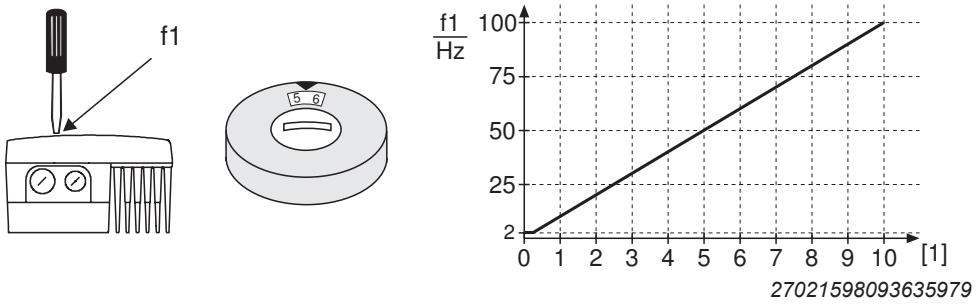
### NOTICE

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.

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

Use the f1 potentiometer to adjust setpoint f1.




[1] Potentiometer setting

Setpoint f1 is active when the AS-Interface bit DO2 "Speed f2/speed f1" = "0".

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### Switch f2




Use the f2 switch to adjust setpoint f2.

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

Setpoint f2 is active when the AS-Interface bit DO2 "Speed f2/speed f1" = "1".

### 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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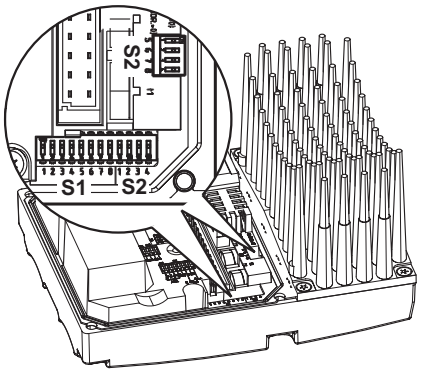
### DIP switches S1 and S2

## 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.




18014399136130571

*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** |

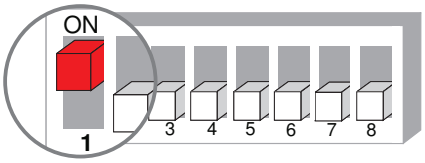
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### 6.3.3 Description of the DIP switches S1

**DIP switches S1/1 – S1/4**

**RS485 address of the MOVIMOT® inverter**

Set the DIP switches S1/1 - S1/4 as follows for MOVIMOT® with AS-Interface option MLK3.A:




*18014398847265931*

**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.

SEW-EURODRIVE recommends wiring the TH via input DI2.

- Input DI2 must be monitored by an external controller.
- As soon as input DI2 = "0", the external controller must switch off the drive (bit DO0 and DO1 = "0").

When mounted close to the motor, input DI2 is no longer available for connecting external sensors.

**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.

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*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/..<br>DR63L4/..<br>DR**E**80S4/..<br>DR**N**71MS4 | – | MM**03**D.. | MM**03**D.. | MM**05**D.. |
| **0.37** | DR**2S**71MS4/..<br>DR**S**71S4/..<br>DR**E**80S4/..<br>DR**N**71M4 | MM**03**D.. | MM**05**D.. | MM**05**D.. | MM**07**D.. |
| **0.55** | DR**2S**71M4/..<br>DR**S**71M4/..<br>DR**E**80M4/..<br>DR**N**80MK4 | MM**05**D.. | MM**07**D.. | MM**07**D.. | MM**11**D.. |
| **0.75** | DR**2S**80MK4/..<br>DR**S**80S4/..<br>DR**E**80M4/..<br>DR**P**90M4/..<br>DR**N**80M4/..<br>DR**U**90S4/.. | MM**07**D.. | MM**11**D.. | MM**11**D.. | MM**15**D.. |
| **1.1** | DR**2S**80M4/..<br>DR**S**80M4/..<br>DR**E**90M4/..<br>DR**P**90L4/..<br>DR**N**90S4/..<br>DR**U**100LSR4/.. | MM**11**D.. | MM**15**D.. | MM**15**D.. | MM**22**D.. |
| **1.5** | DR**2S**90S4/..<br>DR**S**90M4/..<br>DR**E**90L4/..<br>DR**P**100M4/..<br>DR**N**90L4/..<br>DR**U**100LS4/.. | MM**15**D.. | MM**22**D.. | MM**22**D.. | MM**30**D.. |
| **2.2** | DR**2S**90L4/..<br>DR**S**90L4/..<br>DR**E**100M4/..<br>DR**P**100L4/..<br>DR**N**100LS4/..<br>DR**U**100L4/.. | MM**22**D.. | MM**30**D.. | MM**30**D.. | MM**40**D.. |
| **3.0** | DR**2S**100LS4/..<br>DR**S**100M4/..<br>DR**E**100LC4/..<br>DR**P**112M4/..<br>DR**N**100L4/..<br>DR**U**112M4/.. | MM**30**D.. | MM**40**D.. | MM**40**D.. | – |
| **4.0** | DR**2S**100L4/..<br>DR**S**100LC4/..<br>DR**E**132S4/..<br>DR**N**112M4/..<br>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/..<br>DR**N**71MS4/.. | – | MM**03**D.. | MM**03**D.. | MM**05**D.. |
| **0.37** | DR**2S**71MS4/..<br>DR**S**71S4/..<br>DR**N**71M4/.. | MM**03**D.. | MM**05**D.. | MM**05**D.. | MM**07**D.. |
| **0.55** | DR**2S**71M4/..<br>DR**S**71M4/..<br>DR**N**80MK4/.. | MM**05**D.. | MM**07**D.. | MM**07**D.. | MM**11**D.. |
| **0.75** | DR**2S**80MK4/..<br>DR**S**80S4/..<br>DR**E**80M4/..<br>DR**P**90M4/..<br>DR**N**80M4/..<br>DR**U**90S4/.. | MM**07**D.. | MM**11**D.. | MM**11**D.. | MM**15**D.. |
| **1.1** | DR**2S**80M4/..<br>DR**S**80M4/..<br>DR**E**90M4/..<br>DR**P**90L4/..<br>DR**N**90S4/..<br>DR**U**90L4/.. | MM**11**D.. | MM**15**D.. | MM**15**D.. | MM**22**D.. |
| **1.5** | DR**2S**90S4/..<br>DR**S**90M4/..<br>DR**E**90L4/..<br>DR**P**90L4/..<br>DR**N**90L4/..<br>DR**U**100LS4/.. | MM**15**D.. | MM**22**D.. | MM**22**D.. | MM**30**D.. |
| **2.2** | DR**2S**90L4/..<br>DR**S**90L4/..<br>DR**E**100L4/..<br>DR**P**112M4/..<br>DR**N**100L4/..<br>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/..<br>DR**S**100M4/..<br>DR**E**100LC4/..<br>DR**P**132S4/..<br>DR**N**100L4/.. | MM**30**D.. | MM**40**D.. | – | – |
| **4.0** | DR**2S**100L4/..<br>DR**S**100LC4/..<br>DR**E**132S4/..<br>DR**N**112M4/..<br>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/..<br>DR**N**71MS4/.. | – | MM**03**D.. | MM**03**D.. | MM**05**D.. |
| **0.37** | DR**S**71S4/..<br>DR**N**71M4/.. | MM**03**D.. | MM**05**D.. | MM**05**D.. | MM**07**D.. |
| **0.55** | DR**S**71M4/..<br>DR**N**80MK4/.. | MM**05**D.. | MM**07**D.. | MM**07**D.. | MM**11**D.. |
| **0.75** | DR**E**80M4/..<br>DR**N**80M4/.. | MM**07**D.. | MM**11**D.. | MM**11**D.. | MM**15**D.. |
| **1.1** | DR**E**90M4/..<br>DR**N**90S4/.. | MM**11**D.. | MM**15**D.. | MM**15**D.. | MM**22**D.. |
| **1.5** | DR**E**90L4/..<br>DR**N**90L4/.. | MM**15**D.. | MM**22**D.. | MM**22**D.. | MM**30**D.. |
| **2.2** | DR**E**100L4/..<br>DR**N**100LM4/.. | MM**22**D.. | MM**30**D.. | MM**30**D.. | MM**40**D.. |
| **3.0** | DR**E**100LC4/..<br>DR**N**100L4/.. | MM**30**D.. | MM**40**D.. | MM**40**D.. | – |
| **4.0** | DR**E**132S4/..<br>DR**N**112M4/.. | MM**40**D.. | – | – | – |

*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/..<br>DR**N**71M4/.. | MM**03**D.. | MM**05**D.. | MM**05**D.. | MM**07**D.. |
| **0.55** | DR**S**71M4/..<br>DR**N**80MK4/.. | MM**05**D.. | MM**07**D.. | MM**07**D.. | MM**11**D.. |
| **0.75** | DR**E**80S4/..<br>DR**N**80M4/.. | MM**07**D.. | MM**11**D.. | MM**11**D.. | MM**15**D.. |
| **1.1** | DR**E**80M4/..<br>DR**N**90S4/.. | MM**11**D.. | MM**15**D.. | MM**15**D.. | MM**22**D.. |
| **1.5** | DR**E**90M4/..<br>DR**N**90L4/.. | MM**15**D.. | MM**22**D.. | MM**22**D.. | MM**30**D.. |
| **2.2** | DR**E**90L4/..<br>DR**N**100LM4/.. | MM**22**D.. | MM**30**D.. | MM**30**D.. | MM**40**D.. |
| **3.0** | DR**E**100M4/..<br>DR**N**100L4/.. | MM**30**D.. | MM**40**D.. | MM**40**D.. | – |
| **4.0** | DR**E**100L4/..<br>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 ⅄-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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### 6.3.4 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<br>460 V/60 Hz<br>50/60 Hz voltage range | | 380 V/60 Hz<br>ABNT<br>Brazil | 400 V/50 Hz<br>LSPM<br>Technology | S2/1 = OFF | S2/1 = ON |
| DR63L4 | | | | BR03 | – |
| DR2S63M4 | | | | BE03 | BE03 |
| | DRN71MS4 | DRN71MS4 | | BE03 | BE05 |
| DRS71S4<br>DRE80S4 | DR2S71MS4<br>DRN71M4<br>DRN71MK4 | DRS71S4<br>DRN71M4 | DRE71SJ4<br>DRU71SJ4<br>DRU71MJ4 | BE05 | BE1 |
| DRS71M4<br>DRS80S4<br>DRE80M4 | DR2S71M4<br>DR2S80MK4<br>DRN80MK4<br>DRN80M4 | DRS71M4<br>DRE80S4<br>DRN80MK4<br>DRN80M4 | DRE71MJ4<br>DRU80SJ4 | BE1 | BE05 |
| DRP90M4 | | | DRU80MJ4 | BE1 | BE2 |
| DRS80M4<br>DRE90M4<br>DRP90L4 | DR2S80M4<br>DRN90S4 | DRE80M4<br>DRN90S4 | DRE80SJ4<br>DRU90MJ4 | BE2 | BE1 |
| DRS90M4<br>DRE90L4 | DR2S90S4<br>DRN90L4 | DRE90M4<br>DRN90L4 | DRE80MJ4 | BE2 | BE1 |
| DRP100M4 | | | DRU90LJ4 | BE2 | BE5 |
| DRS90L4<br>DRE100M4<br>DRE100L4<br>DRP100L4 | DR2S90L4<br>DRN100LS4 | DRE90L4 | DRE90MJ4<br>DRE90LJ4<br>DRU100MJ4 | BE5 | BE2 |
| DRS100M4<br>DRS100L4<br>DRS100LC4<br>DRE100LC4 | DR2S100LS4<br>DR2S100L4<br>DRN100L4<br>DRN100LM4 | DRE100M4<br>DRE100L4<br>DRN100L4<br>DRN100LM4 | DRE100MJ4<br>DRU100LJ4 | BE5 | BE2 |
| DRP112M4<br>DRE132S4<br>DRP112S4 | DRN112M4 | | | BE5 | BE11 |
| DRU90S | DRU90S4 | | | BE1 | BE05 |
| DRU100LSR4 | DRU90L4 | | | BE2 | BE1 |
| DRU100LS4 | DRU100LS4 | | | BE2 | BE1 |
| DRU100L4 | | | | BE5 | BE2 |
| DRU112M4 | DRU112MR4<br>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 switch S2/2 is set to "ON", it is possible to release the brake even if there is no drive enable.

This function is only available for brakemotors.

This function is not available in hoist operation.

*Functional description*

The function described is only available for the following designs:

- MOVIMOT® with MLK30A
- MOVIMOT® with MLK31A and function module 1, 4, 5 or 7[1)]
- MOVIMOT® with MLK32A and function module 1, 4, 5 or 7[1)]

You can release the brake by setting AS-Interface bit DO2 "Speed f2/speed f1" under the following conditions:

| State of the AS-Interface bits | | | | Enable status | Fault status | Brake function |
|---|---|---|---|---|---|---|
| DO0 (R) | DO1 (L) | DO2 (f2/f1) | DO3 (reset/ enable) | | | |
| "1" "0" | "0" "1" | "0" | "1" | Device enabled | No device fault | Brake is controlled by MOVIMOT®, setpoint f1 |
| "1" "0" | "0" "1" | "1" | "1" | Device enabled | No device fault | Brake is controlled by MOVIMOT®, setpoint f2 |
| "1" "0" | "1" "0" | "0" | "1" | Device not enabled | No device fault | Brake applied |
| "1" | "1" | "1" | "1" | Device not enabled | No device fault | Brake applied |
| **"0"** | **"0"** | **"1"** | **"1"** | **Device not enabled** | **No device fault** | **Brake is released for manual movement** |
| All states possible | | | | Device not enabled | Device fault | Brake applied |

To release the brake without enabling the drive, AS-Interface bit DO3 "Reset/controller enable" must be set.

1) For further information on the function of the AS-Interface bit DO02, refer to the description of the function module, see chapter "Function module" in the operating instructions.

*Setpoint selection*

Setpoints are selected depending on the AS-Interface bit DO2 "Speed f2/speed f1":

| Enable status | AS-Interface bit | Active setpoint |
|---|---|---|
| Unit enabled | DO2 = "0" | Setpoint potentiometer f1 active |
| Unit enabled | DO2 = "1" | Setpoint potentiometer f2 active |

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*Behavior if unit not ready*

If a unit is not ready for operation, the brake is always applied, regardless of the position of the AS-Interface bit DO2 "Speed f2/speed f1".

*LED display*

The MOVIMOT® status LED flashes yellow rapidly ($t_{on}$ : $t_{off}$ = 100 ms : 300 ms) when the brake has been released for manual movement.

**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**

You can activate additional functions by binary coding of the DIP switches S2/5 to S2/8. For a description of the additional functions, refer to the product manual. Activate the possible additional functions as follows:

| 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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### 6.3.5 Startup procedure



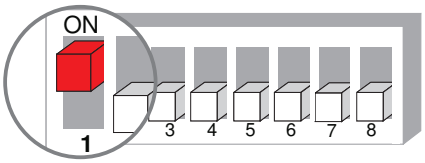
**⚠ WARNING**

Electric shock from capacitors that have not been fully discharged.

Severe or fatal injuries.

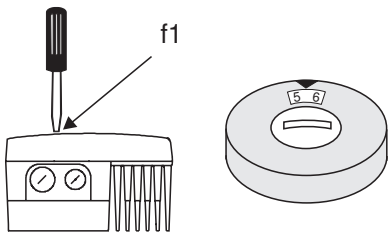
- Disconnect the inverter from the power. Observe the minimum switch-off time after disconnection from the supply system:
  - **1 minute**

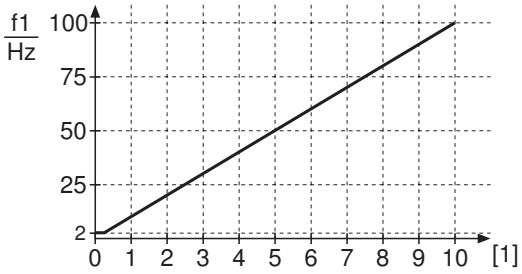
1. Remove the MOVIMOT® inverter from the connection box.
2. Set the desired AS-Interface address.
   - ⇨ With a "hand-held programming device" (→ 🖹 61)
   - ⇨ Or with a master (see description of the AS-Interface master)
3. Check the connection of the MOVIMOT® inverter.
   - ⇨ See chapter "Electrical installation".
4. Set the type of 24 V supply at switch S5 (→ 🖹 62).
5. Set DIP switches S1/1 – S1/4 as follows.




*18014398847265931*

6. Set the first speed at the setpoint potentiometer f1 (active when the AS-Interface bit DO2 = "0"). Factory setting: approx. 50 Hz (1500 min$^{-1}$)




*27021598093635979*

[1] Potentiometer setting

7. **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.
8. Set the second speed at switch f2 (active if AS-Interface bit DO2 = "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 |

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## 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.

9. 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 |

10. Place the MOVIMOT® inverter onto the connection box and screw it in place.
11. Switch on the following voltages:
    ⇨ AS-Interface voltage
    ⇨ DC 24 V auxiliary voltage
    (only with 24 V supply via the black AUX PWR cable)
    ⇨ Line voltage

**Assigning the slave address**

MOVIMOT® drives with MLK3.A AS-Interface option are set to address 0 by default.

You have the following options for assigning the AS-Interface address of the MOVIMOT® drive with AS-Interface option MLK3.A (address 1 - 31):

- Addresses are assigned automatically within a configured AS-Interface system when replacing a MOVIMOT® drive with MLK3.A AS-Interface option.

  The following requirements must be fulfilled for this:

  – The new MOVIMOT® drive with AS-Interface option MLK3.A must have the address 0.

  – If you need to replace several MOVIMOT® drives with AS-Interface option MLK3.A, you must replace them individually, one after the other.

- Manual address assignment via the system master

  The drives must be connected to the AS-Interface cable one after the other. Doing so prevents several MOVIMOT® drives with AS-Interface option MLK3.A from having assigned the same address.

- Manual address assignment with an AS-Interface hand-held programming device

  Observe the notes in the next chapter when connecting the MOVIMOT® drives with AS-Interface option MLK3.A to the AS-Interface cable.

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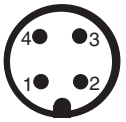
*Assigning the slave address using a hand-held programming device*

The AS-Interface handheld programming device offers the following functions:

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

  Hand-held programming devices do not provide sufficient current for operation. For this reason, an external voltage supply (AUX-PWR) is required for the functional test and test run.

When using a hand-held programming device, you need a **2-core** connection cable that fits onto the AS-interface connector of MOVIMOT® (see the following figure).




**1:** AS-Interface +
**2:** 0V24 [1]
**3:** AS-Interface -
**4:** 24V [1]

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[1] Do not connect pins 2 and 4 for address assignment.

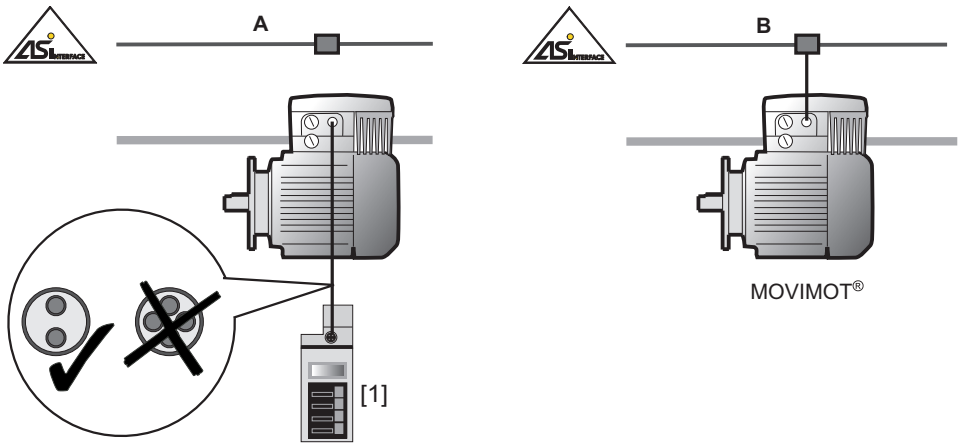
**NOTICE!** Faulty connection may result in damage to the hand-held programming device.

- The hand-held programming device must **only** be connected via pin 1 "AS-Interface +" and 3 "AS-Interface-" with the AS-Interface connector.
- Prior to the address assignment via a hand-held programming device, switch S5 in the MOVIMOT® terminal box must be set to "1".
- After addressing, you must set the S5 switch depending on the type of 24 V voltage supply.

*Example:*

Disconnect the AS-Interface nodes from the AS-Interface network **one at a time** and assign addresses via the hand-held programming device (A).

Reconnect the respective AS-Interface node to the AS-Interface network (B).

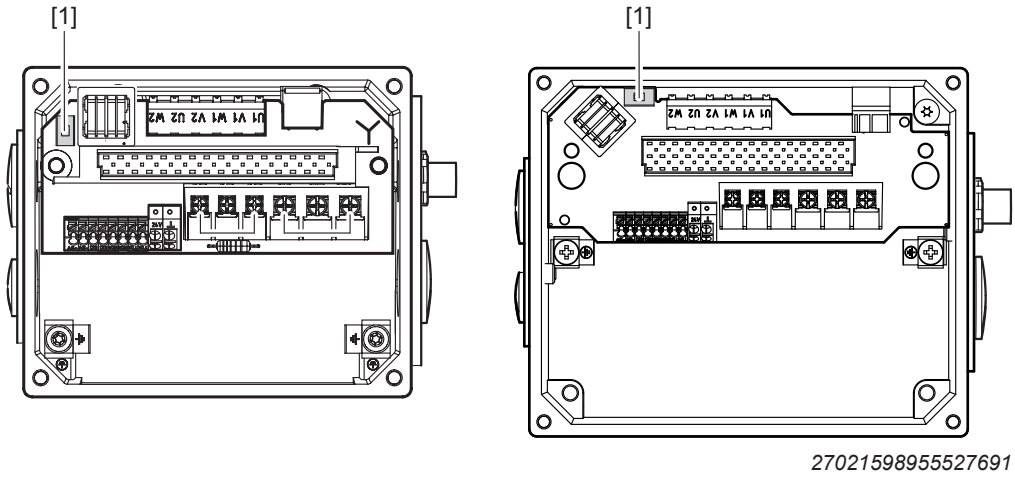



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[1] AS-Interface hand-held programming device

### 6.3.6 Setting the 24 V supply via switch S5

The S5 switch [1] is located on the connection board.

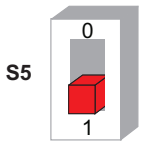
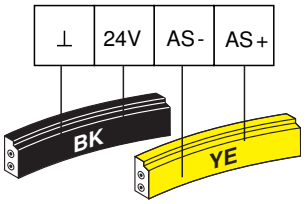
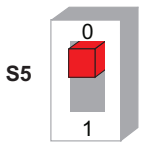
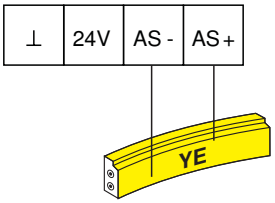



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Size 1 Size 2

[1] S5 switch

Use switch S5 to set the type of 24 V voltage supply.

| | 24 V voltage supply |
|---|---|
| **Switch S5 = "1"**<br> | MOVIMOT® and sensor supply<br>via AUX-PWR<br>(e.g. black AS-Interface cable)<br> |
| **Switch S5 = "0"**<br> | MOVIMOT® and sensor supply<br>via AS-Interface data cable<br> |

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### 6.3.7 Data AS-Interface master → MOVIMOT®

The following table shows the 4 data bits that the AS-Interface master sends to the MOVIMOT® inverter via the AS-Interface:

| AS-Interface bit | Function (see chapter "Inverter behavior depending on the AS-Interface bits" (→ 🗎 65)) |
|---|---|
| **DO0** | CW rotation/stop |
| **DO1** | CCW rotation/stop |
| **DO2** | Speed f2/speed f1 |
| **DO3** | Reset[1]/controller enable |

1) With an edge change of "0" → "1" (only effective in the event of a fault)

## INFORMATION

To enable the drive, AS-Interface bit DO3 "Reset/controller enable" must be set.

### 6.3.8 MOVIMOT® data → AS-Interface master

The following table shows the 4 data bits that the MOVIMOT® inverter sends to the AS-Interface master via the AS-Interface:

| AS-Interface bit | Function |
|---|---|
| **DI0** | Ready signal<br>0: The MOVIMOT® drive is not ready for operation.<br>1: The MOVIMOT® drive is ready for operation. |
| **DI1** | Manual mode<br>0: MOVIMOT® control via AS-Interface<br>1: MOVIMOT® control via manual mode |
| **DI2** | Sensor input 1<br>0: Signal of sensor 1 = "0"<br>1: Signal of sensor 1 = "1" |
| **DI3** | Sensor input 2<br>0: Signal of sensor 2 = "0"<br>1: Signal of sensor 2 = "1" |

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### 6.3.9 Setpoint scaling via parameter bits

The following table lists the parameter bits for setpoint scaling.

The setpoint scaling only affects setpoint f1 that can be set externally.

Setpoint f2 and the minimum frequency are not affected by the scaling.

The following table lists the possible setpoint frequencies for setpoint potentiometer f1 = 100 Hz (3000 $min^{-1}$) and f1 = 50 Hz (1500 $min^{-1}$):

| Parameter bits | | | | Factor | Setpoint frequency [Hz] | |
|---|---|---|---|---|---|---|
| P3 | P2 | P1 | P0 | | for f1 = 100 Hz | f1 = 50 Hz |
| 1 | 1 | 1 | 1 | 1.00 | 100 | 50 |
| 1 | 1 | 1 | 0 | 1.11 | 90 | 45 |
| 1 | 1 | 0 | 1 | 1.25 | 80 | 40 |
| 1 | 1 | 0 | 0 | 1.43 | 70 | 35 |
| 1 | 0 | 1 | 1 | 1.67 | 60 | 30 |
| 1 | 0 | 1 | 0 | 2.00 | 50 | 25 |
| 1 | 0 | 0 | 1 | 2.22 | 45 | 22.5 |
| 1 | 0 | 0 | 0 | 2.50 | 40 | 20 |
| 0 | 1 | 1 | 1 | 2.86 | 35 | 17.5 |
| 0 | 1 | 1 | 0 | 3.33 | 30 | 15 |
| 0 | 1 | 0 | 1 | 4.00 | 25 | 12.5 |
| 0 | 1 | 0 | 0 | 5.00 | 20 | 10 |
| 0 | 0 | 1 | 1 | 6.67 | 15 | 7.5 |
| 0 | 0 | 1 | 0 | 10.00 | 10 | 5 |
| 0 | 0 | 0 | 1 | 14.30 | 7 | 3.5 |
| 0 | 0 | 0 | 0 | 20.00 | 5 | 2.5 |

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### 6.3.10 Inverter behavior depending on the AS-Interface bits

The following table shows the behavior of the MOVIMOT® inverter depending on the status of the AS-Interface bits:

| Inverter behavior | Supply system X1: L1-L3 | AS-Interface bit DO3 Reset/ controller enable | DO2 Speed f2/ speed f1 | DO0 CW rotation/ stop | DO1 CCW rotation/ stop | Status LED |
|---|---|---|---|---|---|---|
| Inverter off | 0 | 0 | x | x | x | Flashes yellow |
| Inverter off | 1 | 0 | x | x | x | Yellow |
| 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 |

0 = No voltage  1 = Voltage  x = Any

### 6.3.11 Brake release without enable

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

See chapter "DIP switch S2/2" (→ 🗎 57).

This function is only available for brakemotors.

This function is not available in hoist operation.

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### 6.3.12 Additional information for installation close to the motor

Observe the notes in the following sections when the MOVIMOT® inverter is installed close to the motor.

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

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




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**NOTICE: 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.

#### 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** |

#### Motor protection

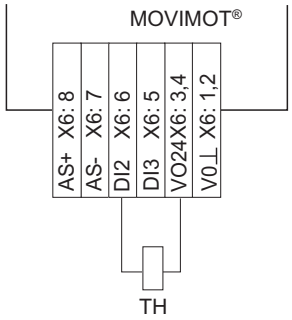
## INFORMATION

This chapter only applies to MM../AVSK design.

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The connected motor must be equipped with a TH. SEW-EURODRIVE recommends wiring the TH via input DI2, see following figure.

- Input DI2 must be monitored by an external controller.
- As soon as input DI2 = "0", the external controller must switch off the drive (bit DO0 and DO1 = "0").




When mounted close to the motor, input DI2 is no longer available for connecting external sensors.

**Motor protection**

## INFORMATION

This chapter only applies to the following designs.

- MM../AZSK
- MM../AND3/AZSK
- MM../AZZK
- MM../AND3/AZZK
- MM../AZFK

The inputs DI. are assigned to the sensor inputs. No TH can be connected to the MOVIMOT® inverter. Motor protection via TH is not possible.

The motor protection must be ensured via the thermal motor protection model of the MOVIMOT® inverter as follows:

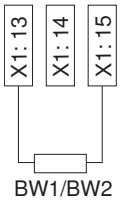
- Start up the MOVIMOT® drive in Expert mode.
  See chapter "Startup of MOVIMOT® with MLK.. in Expert mode" (→ 🗎 69).
- Set the following parameters according to the following table:

| Parameter | | | | Required settings |
|---|---|---|---|---|
| No. | Index | Subindex | Designation | |
| 340 | 8533 | 0 | Motor protection | 1: ON |
| 347 | 10096 | 32 | Motor cable length | Motor cable length in [m] |

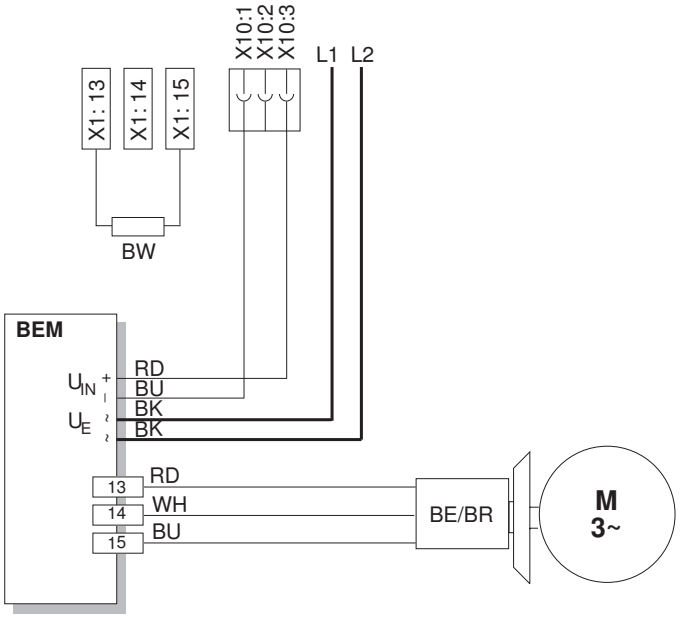
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### Braking resistor

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




- 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 and the brake must be connected as follows:




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## 6.4 Startup of MOVIMOT® with MLK.. in Expert mode

### 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* = "Expert" is set.

### 6.4.1 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.

**The following hardware must be present for startup:**

- PC or laptop, see chapter "PC/laptop connection" (→ 🗎 44)

**The following software must be installed on the PC or laptop for startup:**

- MOVITOOLS® MotionStudio

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### 6.4.2 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

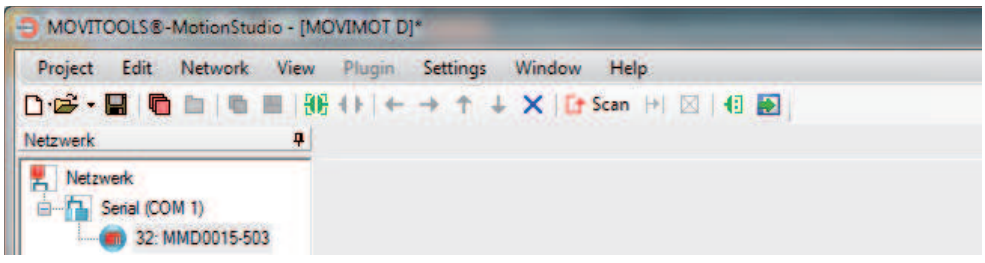
For a detailed description of the following steps please refer to the comprehensive online help in MOVITOOLS® MotionStudio.

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.

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### 6.4.3 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" is set.

1. Perform startup in Easy mode.
2. Connect the PC/laptop or the DBG keypad to the MOVIMOT® inverter.
   ⇨ See chapter "PC/laptop connection" (→ 🗎 44) or chapter "Connection of DBG keypad (in preparation)".
3. Connect the MOVIMOT® inverter to the voltage supply.
4. When using a laptop, start MOVITOOLS® MotionStudio and integrate the MOVIMOT® inverter, see chapter "Integrating MOVIMOT® into MOVITOOLS® MotionStudio" (→ 🗎 70).
5. In the context menu "Startup" > "Parameter tree", set parameter *P805 Startup mode* to "Expert".
6. Specify which parameters you want to change.
7. Check whether these parameters depend on the mechanical control elements.
   ⇨ See chapter "Parameters that depend on mechanical control elements".
8. Deactivate the respective control elements by adjusting the bit-coded selection box of parameter *P102*.
   ⇨ See chapter "Parameter 102".
9. Change the set parameters.
   ⇨ For information on parameter setting with the DBG keypad, refer to chapter "Parameter mode".
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.
    Make sure the screw plug of the setpoint potentiometer has a seal and screw it in.

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### 6.4.4 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" (→ 🗎 44) or chapter "Connection of DBG keypad (in preparation)".
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" (→ 🗎 70).
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".
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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# 7 Operation

## 7.1 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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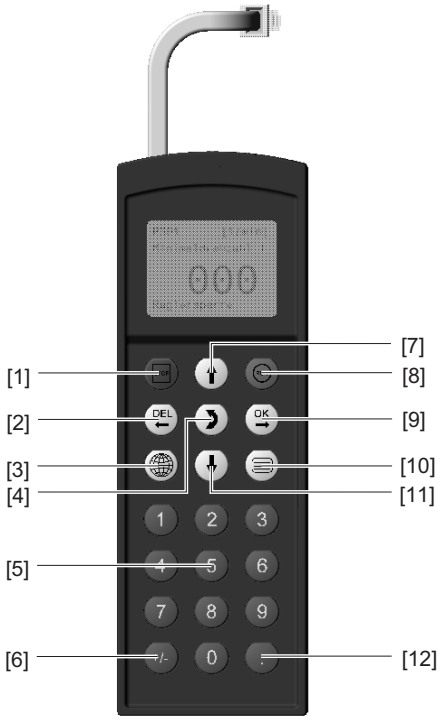
## 7.2 DBG keypad (only in conjunction with MLK30A)

### 7.2.1 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.

### 7.2.2 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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### 7.2.3 Activation



**⚠ WARNING**

Risk of crushing if the drive starts up unintentionally. When manual mode is deactivated, the AS-Interface signals take effect. If the enable signal is present via the AS-Interface signals DO0 – DO3, the MOVIMOT® drive can start up unintentionally when deactivating manual operation.

- Set the AS-Interface signals DO0 – DO3 to "0" prior to deactivating manual mode. The MOVIMOT® drive is then not ready for operation.
- Do not change the AS-Interface signals DO0 – DO3 until after you have deactivated manual mode.

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.

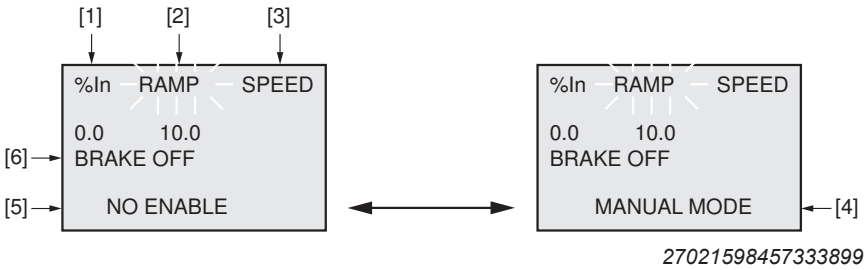
The keypad is now in manual mode.



**INFORMATION**

If the drive is enabled or the brake is released, you cannot switch to manual mode.

**Display in manual mode**




Display alternates every 2 s

[1] Output current in [%] of $I_{N.}$
[2] Acceleration (speed ramps in [s] in relation to a setpoint step change of 1500 $min^{-1}$/50 Hz)
[3] Speed in [$min^{-1}$]
[4] Display in manual mode
[5] Inverter status
[6] Brake status

### 7.2.4 Operation

The following MOVIMOT® function can be executed in the "MANUAL MODE" menu:

| | |
|---|---|
| Setting the ramp time. | Press the OK key.<br>Use the ↑ or ↓ key to set the required ramp time.<br>Press the OK key to confirm your entry. |
| Changing parameters. | Use the ❯ key to switch between parameters "RAMP", "SPEED" and "BRAKE".<br>Switch to the "SPEED" parameter.<br>The keypad flashes the currently set parameter "SPEED". |
| Enter speed. | Use the digit keys <0> – <9> to enter the desired speed for manual mode.<br>The sign determines the direction of rotation of the drive.<br>Press the OK key to confirm your entry. |
| Starting the drive. | Use the RUN key to start the MOVIMOT® drive.<br>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.<br>Use the ↑ key or the ↓ key to release or engage the brake without drive enable.<br>Press the OK key to confirm your selection. |
| Reset the error. | If an error occurs in manual mode, the display shows the following message: |

| | | |
|---|---|---|
| MANUAL MODE<br><OK> = RESET<br><DEL> = EXIT<br>ERROR CODE | ⟷ | MANUAL MODE<br><OK> = RESET<br><DEL> = EXIT<br>ERROR TEXT |

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...

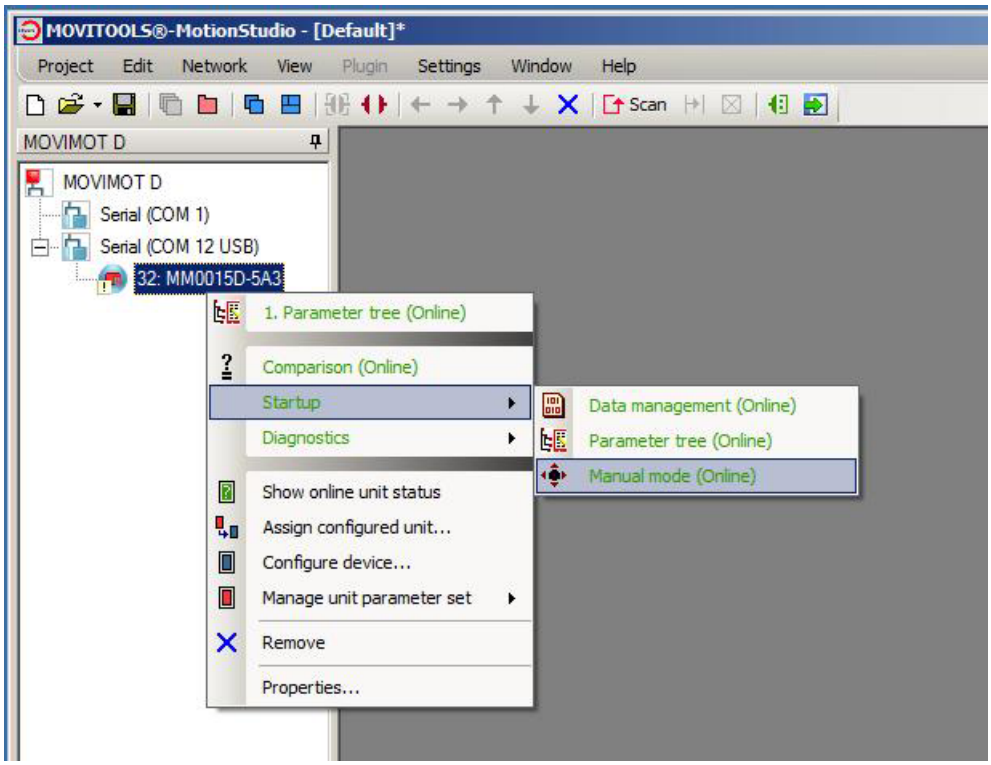
After the error is reset, manual mode remains active. The display shows manual mode again.

## 7.3 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" (→ 🗎 44).
2. Start the software MOVITOOLS® MotionStudio and integrate the MOVIMOT® inverter in MOVITOOLS® MotionStudio.
   ⇨ See chapter "MOVITOOLS® MotionStudio" (→ 🗎 70).
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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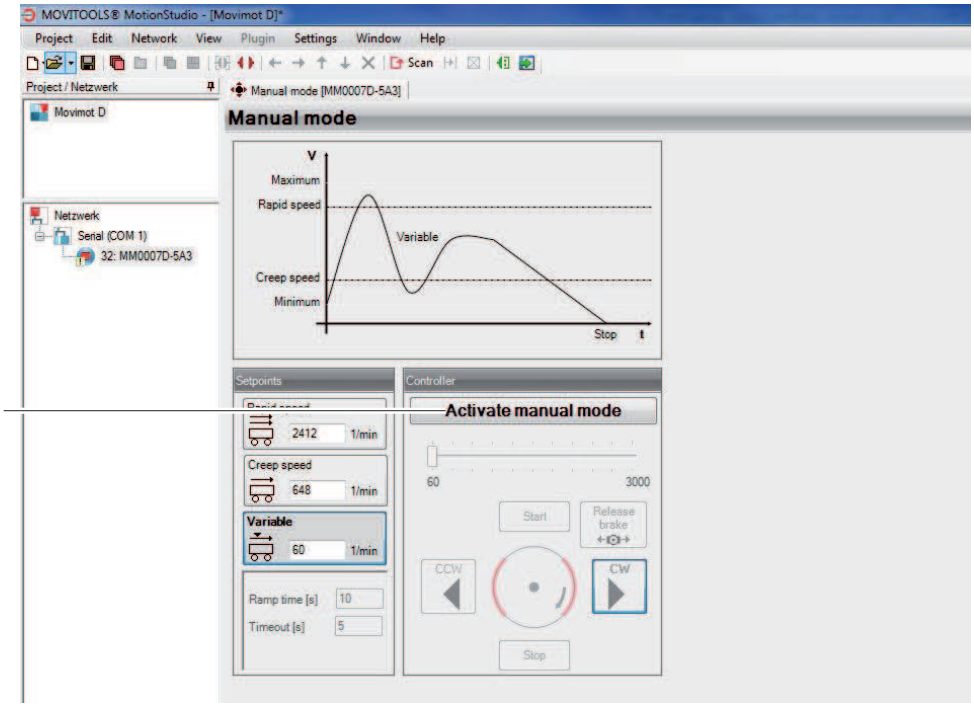
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### 7.3.1 Activation

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].

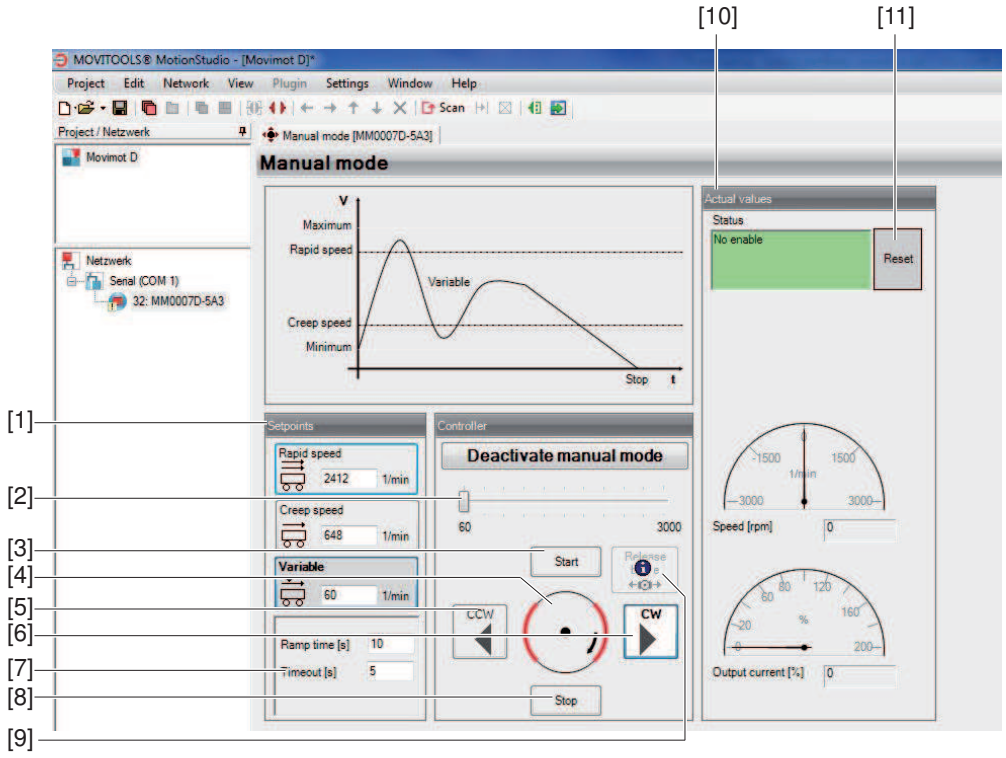
AS-Interface bit DI1 signals the higher-level controller that manual mode is active (for MLK31A/MLK32A, see also chapter "Function modules").

Manual mode remains active even after an error reset or after the 24 V supply has been switched off.

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### 7.3.2 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*

## 7.4 IT security

### 7.4.1 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.

### 7.4.2 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" (→ 🗎 8).

### 7.4.3 Guidelines for user account management

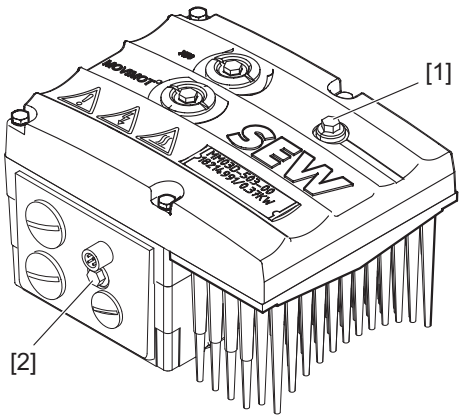
The device has no user accounts.

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# 8 Service

## 8.1 Status and error display

The following figure shows the position of the status and AS-Interface LED on the MOVIMOT® drive:




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[1] MOVIMOT® status LED
[2] AS-Interface LED

### 8.1.1 Meaning of the AS-Interface LED

The AS-Interface LED indicates the status of the AS-Interface slaves.

**MLK30A, MLK32A**

| LED<br>Color<br>State | Meaning<br>Operating state | Possible cause |
|---|---|---|
| Off | Not ready | Supply voltage at AS-Interface connection missing. |
| **Green**<br>Steady light | Ready | Normal mode<br>Supply voltage at AS-Interface connection is OK.<br>Communication established. |
| **Red**<br>Steady light | Not ready | Communication is interrupted<br>or slave address set to 0. |

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**MLK31A**

| LED<br>Color<br>State | Meaning<br>Operating state | Possible cause |
|---|---|---|
| Off | Not ready | Supply voltage at AS-Interface connection missing. |
| **Green**<br>Steady light | Ready | Normal mode<br>Supply voltage at AS-Interface connection is OK.<br>Communication established. |
| **Red**<br>Steady light | Not ready | Communication error at A- or B-slave. |
| **Red**<br>Flashing steadily | Not ready | Protocol error<br>No CTT3 communication with A-slave or no CTT2 communication with B-slave. |
| **Red/Yellow**<br>Flashing steadily | Not ready | Slave address = 0 |

### 8.1.2 Meaning of the status LED

The 3-color status LED indicates the operating and error states of the MOVIMOT® inverter.

| LED<br>Color<br>Status | MeaningOperating state error code | Possible cause |
|---|---|---|
| **Off** | Not ready for operation | No 24 V voltage supply. |
| **Yellow**<br>Flashing steadily | Not ready for operation | Self-test phase active or 24 V power supply present but line voltage is not OK. |
| **Yellow**<br>Flashing steadily fast | Ready | Releasing the brake without drive enable active (only with S2/2 = "ON"). |
| **Yellow**<br>steady light | Ready but unit inhibited | 24 V power supply and line voltage is OK, but no enable signal.<br>If the drive does not run when enable signal is present, check startup. |
| **Yellow**<br>2x flashing, pause | Ready,<br>but manual mode without unit enable | 24 V power supply and line voltage OK.<br>Stop manual mode to activate automatic mode. |
| | Ready,<br>Prioritized fixed setpoint control | Terminals R ↷ and L ↶ are supplied with 24 V.<br>To activate RS485 operation, remove the bridges installed in the factory. See chapter "Electrical installation". |

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| LED<br>Color<br>Status | MeaningOperating state error code | Possible cause |
|---|---|---|
| **Yellow/green**<br>Flashing with alternating colors | Ready, but timeout | Communication is interrupted during cyclical data exchange. |
| **Green**<br>Steady light | Device enabled | Motor is in operation. |
| **Green**<br>Flashing steadily fast | Current limit active | Drive is at the current limit. |
| **Green**<br>Flashing steadily | Ready | Idle state current function active. |
| **Green**<br>2x flashing, pause | Device enabled | MOVIMOT® drive is in operation.<br>Prioritized fixed setpoint control is active. See chapter "Parameter description" > "Parameter 600". |
| **Green/Red/Green**<br>Flashing with alternating<br>colors, pause | Localization function active | Localization function was activated.<br>See parameter 590. |
| **Red**<br>2x flashing, pause | Fault 07 | DC link voltage too high. |
| **Red**<br>Flashing slowly | Fault 08 | Speed monitoring error (only when S2/4 = "ON")<br>or additional function 13 is active. |
| | Fault 09 | Startup fault<br>Additional functions 4, 5, 12 (DIP switches S2/5 – S2/8) are not permitted. |
| | | Firmware does not support MLK..A option<br>(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**<br>3x flashing, pause | Fault 01 | Overcurrent in output stage |
| | Fault 11 | Overtemperature in output stage |
| **Red**<br>4x flashing, pause | Fault 84 | Motor overload |

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| LED<br>Color<br>Status | MeaningOperating state error code | Possible cause |
|---|---|---|
| **Red**<br>5x flashing, pause | Fault 4 | Brake chopper fault |
| | Fault 89 | Overtemperature of the brake<br>Incorrect motor – frequency inverter assignment.<br>At terminals X1:13– X1:15, both brake and braking resistor are connected. This is not permitted. |
| **Red**<br>6x flashing, pause | Fault 06 | Line phase failure |
| | Fault 81 | Start condition |
| | Fault 82 | Output phases are interrupted. |
| **Red**<br>steady light | Not ready for operation | Check 24 V supply.<br>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 |

## 8.2 Fault description

The following table helps you with troubleshooting:

| Code | Error | Possible cause | Measure |
|---|---|---|---|
| – | **Communication timeout**<br>(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.<br>Reduce message cycle, increase timeout interval, or select message type "acyclic". |
| – | **Supply voltage not present**<br>(Motor stops, without error code) | DC link voltage too low,<br>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**<br>(Motor stops, without error code) | 24 V supply voltage not present. | Check 24 V supply voltage for interruption.<br>Check the value of the 24 V supply voltage.<br>Permitted voltage: DC 24 V ± 25%, EN 61131-2, residual ripple max. 13%<br>Motor restarts automatically as soon as the voltage reaches normal values. |
| | | AUX power supply voltage not available.<br>(only for MOVIMOT® with AS-Interface) | Check AUX power supply voltage for interruption.<br>Check the value of the AUX power supply voltage.<br>Permitted voltage: DC 24 V ± 25%, EN 61131-2, residual ripple max. 13%<br>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.<br>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**<br>(The error can only be detected when the drive is under load) | Phase failure | Check the supply system cables for phase failure.<br>Reset the error[1)] |
| 07 | **DC link voltage too high** | Ramp time too short. | Extend the ramp time.<br>Reset the error[1)] |
| | | Faulty brake coil/braking resistor connection | Check the braking resistor/brake coil connection. Correct, if necessary.<br>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").<br>Reset the error[1)] |
| | | Thermal overload in braking resistor, wrong size of braking resistor selected | Dimension the braking resistor correctly.<br>Reset the error[1)] |
| | | Invalid voltage range of line input voltage | Check the line input voltage for permissible voltage range.<br>Reset the error[1)] |
| 08 | **Speed monitoring** | Rotational speed deviation due to operation at the current limit | Reduce the drive load.<br>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").<br>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.<br>Reset the error[1)] |
| | | Ambient temperature too high. | Lower the ambient temperature.<br>Reset the error[1)] |
| | | Heat build-up at MOVIMOT® drive. | Prevent heat build-up.<br>Reset the error[1)] |
| | | Drive load too high. | Reduce the drive load.<br>Reset the error[1)] |
| **15** | **24 V monitoring** | Voltage dip in the 24 V supply | Check the 24 V supply.<br>Reset the error[1)] |
| **17 - 24 37** | **CPU error** | CPU error | Reset the error[1)]<br>If the error reoccurs, contact SEW-EURODRIVE Service. |
| **25** | **EEPROM error** | Error when accessing EEPROM | Set parameter *P802* to "Delivery state".<br>Reset the error[1)]<br>Re-parameterize MOVIMOT® inverter.<br>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.<br>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.<br>**NOTICE!**<br>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<br>(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<br>A non-IT-compatible device is connected to the IT system.<br>MOVIMOT® hardware defect | Restore the delivery state (P802).<br>Use an IT system device.<br>Contact SEW-EURODRIVE Service. |
| **81** | **Start condition error** | The inverter could not be supplied with the correct amount of current during the premagnetization time.<br>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".<br>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.<br>Reset the error[1)] |
| | | Ambient temperature too high. | Lower the ambient temperature.<br>Reset the error[1)] |
| | | Heat build-up at MOVIMOT® drive. | Prevent heat build-up.<br>Reset the error[1)] |
| | | Motor load too high. | Reduce the load on the motor.<br>Reset the error[1)] |
| | | Speed too low. | Increase the speed.<br>Reset the error[1)] |
| | | If the error is signaled just after the first enable signal. | Check the combination of motor and MOVIMOT® inverter.<br>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.<br>Reset the error[1)] |
| 89 | **Overtemperature of the brake** | Thermal overload of brake coil | Extend the ramp time.<br>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" and "Connecting without plug connector". |
| | | Inverter does not match the motor.<br>(only if error occurs after first enable) | Check the combination of motor (brake coil) and MOVIMOT® inverter.<br>Check/correct the settings of DIP switches S1/6 and S2/1.<br>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.

## 8.3 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

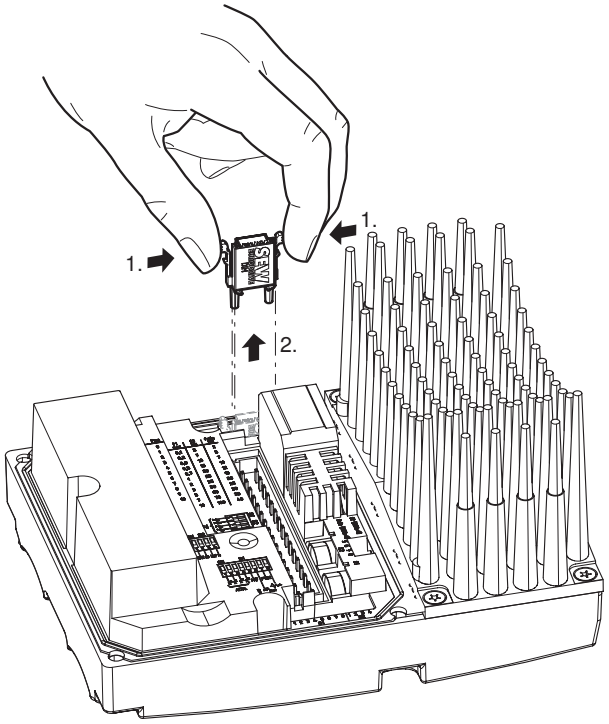
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⇨ Setpoint potentiometer f1

⇨ 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.
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.

## 8.4 Shutdown

To shut down the MOVIMOT® drive, de-energize the drive using appropriate measures.

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**⚠ 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**

## 8.5 IT security guidelines for secure disposal

### 8.5.1 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." (→ 🗎 91)

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" (→ 🗎 92).

### 8.5.2 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

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### 8.5.3 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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## 8.6 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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# 9 Inspection and maintenance

## 9.1 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".

## 9.2 Motor

The motor requires regular inspection and maintenance work.

Observe the notes and instructions in chapter "Inspection/Maintenance" of the motor operating instructions.

## 9.3 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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# 10 Contacting SEW-EURODRIVE

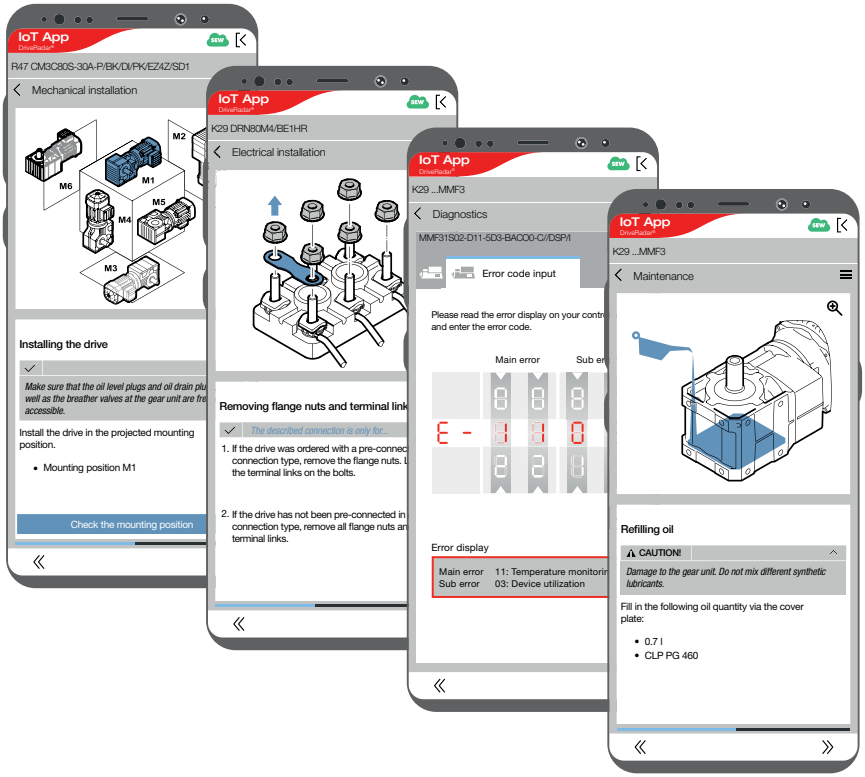
You can find the worldwide contact data and locations on the **SEW-EURODRIVE website** via the following link or the QR code shown below.

https://www.sew-eurodrive.de/contacts-worldwide



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# IoT App
DriveRadar®

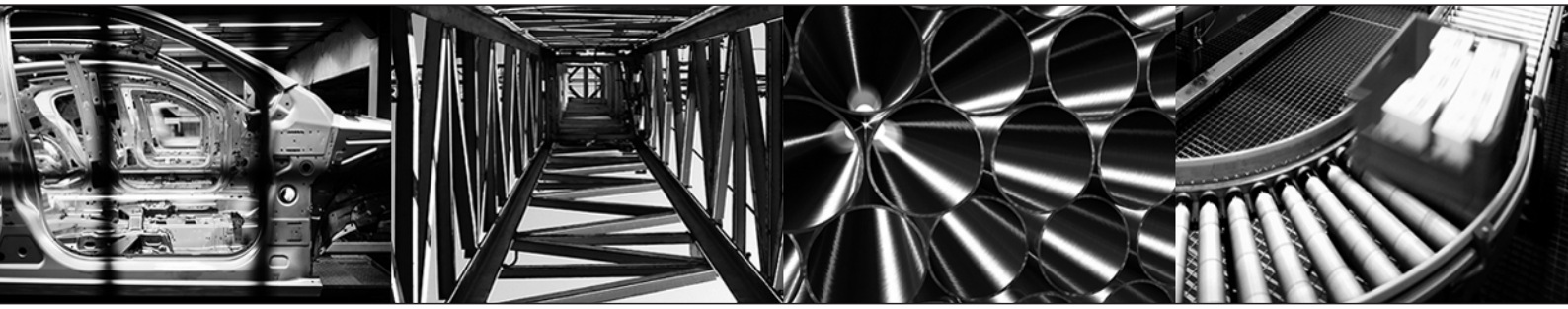


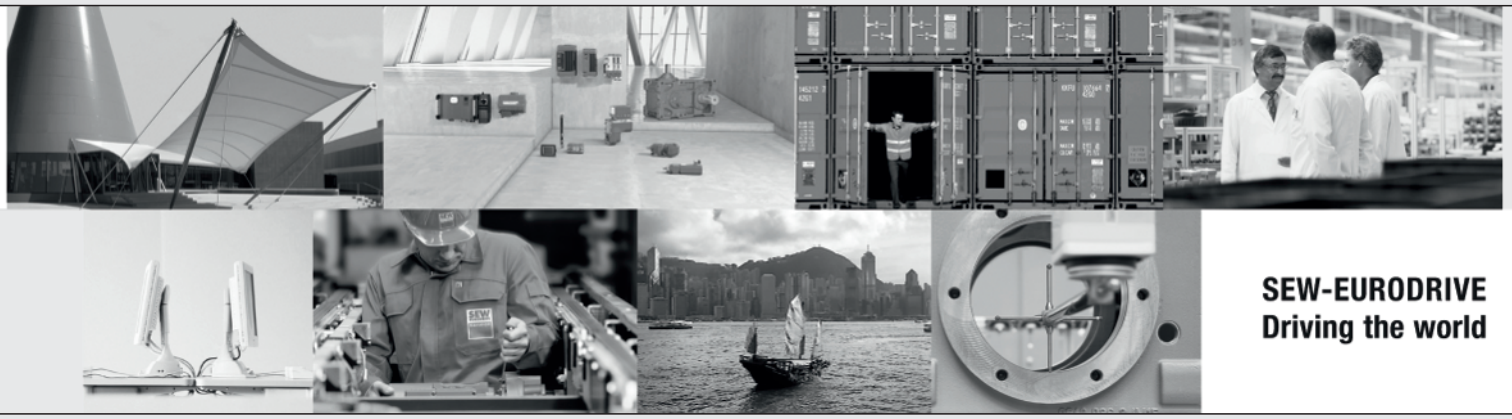

**https://iotapp.io**

Google Play App Store

## THE GREEN SIDE OF DRIVE

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**Driving the world**

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